

SERIES M MACHINES
Type 70 Machines
CARRIAGES

Symbol List

March 31, 1949

Issued _____

To _____

Of _____

Property of and to be returned to

**BURROUGHS ADDING
MACHINE COMPANY**

DETROIT 32, MICHIGAN

CARRIAGES

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817 $\frac{1}{4}$ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817 $\frac{1}{2}$ ZL, 8828 $\frac{1}{4}$ C, 8828 $\frac{1}{2}$ B, 47 $\frac{3}{4}$, 49 $\frac{1}{4}$ —2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

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LUBRICATING CHART (Plate A)

SERIES M MACHINES

The following chart is offered as a guide for servicemen to assure that all working parts of the Series M Machines are properly lubricated.

Excess oil and grease should be removed following application of any lubricant, and the machine's exterior, including the apron and stand, should be left in clean condition.

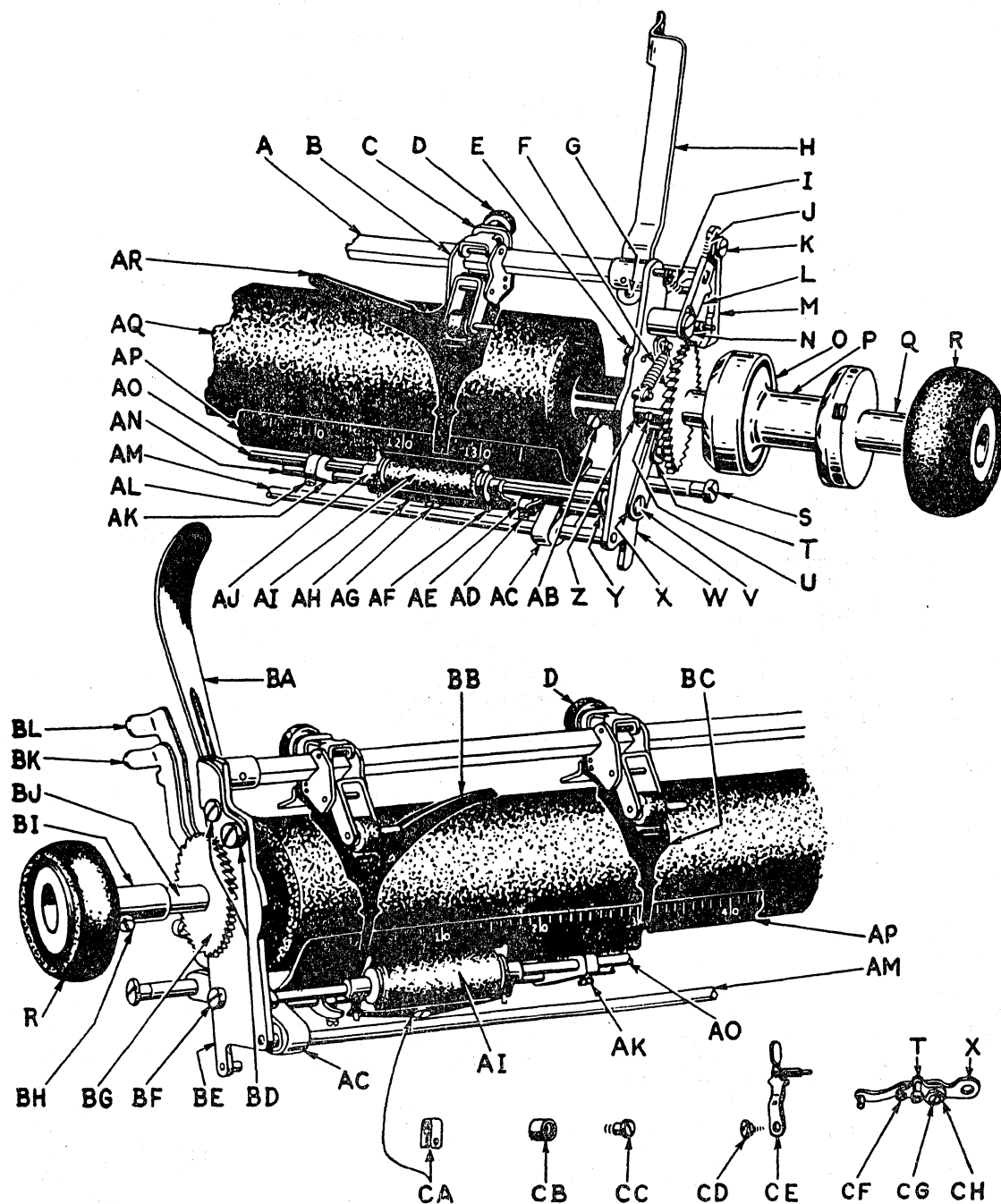
SECTION	POINTS OF LUBRICATION	LUBRICANT
Carriage	Rolls on each end of auxiliary aligning table Z (Plate 4, Carriage Symbol List) Roll and pivot point of auxiliary aligning table bracket AV (Plate 4) Pivoting points of all pressure rolls (one drop) All friction points of Escapement Assembly T (Plate 15) Pulley on casting J (Plate 25) at pivot points Front and rear carriage rails CF and CH (Plate 2) All friction and pivot points of carriage governor and clutch U (Plate 23) Pivot points on selective column tabulation keys AQ (Plate 8) Bearing surface of the short member of the split platen on the long member (one or two drops—spread with finger) All bearing and friction points on the carriage	Machine Oil (Kit 131)
	Ball bearings in roll BC (Plate 32-1) of the brace for highback Spring and bearing of Drum Spring Assembly AH (Plate 25) Worm screw W (Plate 25)	Bearing Grease (Kit 167 $\frac{1}{4}$)
	Stud on arm AB (Plate 11) contacting bail AZ (Plate 11) Gear Y (Plate 16) of the Escapement Assembly	Light Grease (Kit 168 $\frac{7}{8}$)
Keyboard	Keystems BB (Plate 2, Keyboard Symbol List) at the keyboard and at the base (one drop each place) Pivot points of all bell cranks in casting BE (Plate 7) and in the similar casting for the multiplying key bell cranks Pivot points of all bell cranks attached to the posts on the bottom plate (Plate 8) All pivot points of the indexing wires and the parts to which they are connected Intermediate keyboard stops O (Plate 2)	Machine Oil (Kit 131)
Printing	Typewriter keylevers AJ (Plate 24-2, Printing Symbol List) at the points where they enter combs AM and AP (Plate 24-2) Pivot points of type hangers D (Plate 14) All friction and pivot points of Ribbon Reverse Shaft Assembly AT (Plate 16) All friction and pivot points of Ribbon Mechanism S (Plate 16) All friction and pivot points of shaft assembly AR (Plate 16) All pivot and bearing points of the Hammer Section Assembly (Plate 1) All bearing points and movable parts of typewriter	Machine Oil (Kit 131)
	Screw S and eccentric W (Plate 3) Internal bearing surfaces of the wheels and plunger pins of Rotary Calendar Assembly AD (Plate 24)	Light Grease (Kit 168 $\frac{7}{8}$)

(OVER)

SERIES M MACHINES—CARRIAGES

SECTION	POINTS OF LUBRICATION	LUBRICANT
Accumulation	All friction and pivot points of the Subtractor Section Assembly Register pilot shafts H (Plate 41, Accumulation Symbol List) and F (Plate 40) Pinions on assemblies M (Plate 40), G (Plate 10), and BF (Plate 8) Shaft BF (Plate 8) and shaft G (Plate 10) Carry pawls on shaft assemblies A (Plate 10) and Z (Plate 8) Carry trip pawls AE (Plate 13) and carry racks F (Plate 14) at the points where they pivot on their respective retaining shafts Carry latches AF (Plate 13) and AK (Plate 15) at their respective latch combs All friction points, turning points, slides, and component parts (not already specified) of the Head Section Assembly	Machine Oil (Kit 131)
	Spring L (Plate 40) and ball bearings J (Plate 40) Spring R (Plate 8-1)	Bearing Grease (Kit 167 $\frac{1}{4}$)
	Teeth of gear R (Plate 22-1) and segment gear L (Plate 14, Power Symbol List) and the bracket which supports the shaft to which gear R (Plate 22-1, Accumulation Symbol List) is pinned Slots in right and left side plates R (Plate 23) for the raise bar Points D and AB (Plate 10) at which cams J (Plate 11) contact Crossfooter Section J (Plate 10) Screw S and all gears shown on Plate 46	Light Grease (Kit 168 $\frac{7}{8}$)
Power	Wick R (Plate 2, Power Symbol List) of grease cup S (Plate 2) Oil-holes in side frame for main operating shaft (Plate 13) Bearing points in brackets X and S (Plate 19) for shafts U, W, and AC (Plate 19) Bearing point in plate AQ for shaft AC (Plate 19) Spring AM (Plate 19) and leather washer AI (Plate 19)	Machine Oil (Kit 131)
	Bearing screws of shafts W (Plate 7) and R (Plate 3, Keyboard Symbol List) where they enter the side frames Eccentric AK (Plate 14, Power Symbol List) and screw T (Plate 14) Slot of cam AQ (Plate 3, Keyboard Symbol List) Cam surface of cam BD (Plate 7, Accumulation Symbol List) Slot of cam AA (Plate 7, Accumulation Symbol List) Roll on arm D (Plate 13, Power Symbol List) Roll E (Plate 14) Bushing in base for shaft O (Plate 3) Gears N, S, M and A (Plate 3) and the shaft of gear assembly M (Plate 3) Gears W, U, V, gear on shaft T, and rolls AH (Plate 23) Gears AA, Z, V, and T (Plate 19)	Light Grease (Kit 168 $\frac{7}{8}$)
	The Drive Unit should periodically be drained and thoroughly flushed to prevent an accumulation of foreign matter. The correct procedure for flushing the Drive Unit is as follows: With the machine sitting level to facilitate draining, and all fluid oil drained off, pour in two ounces of solvent, and operate the machine for approximately ten minutes to permit cleaning of the clutch members. Drain the dirty solvent and repeat this application until the solvent drains clear. Pour in two ounces of the approved mineral spirits being used in the Branch for cleaning machines, operate the machine for two minutes, and drain.	Solvent (Kit 131 $\frac{3}{4}$)
	Refill the Drive Unit with two ounces of Drive Oil.	Drive Oil (Kit 165 $\frac{1}{2}$ B)

INNER CARRIAGE, STANDARD (Plate 1)



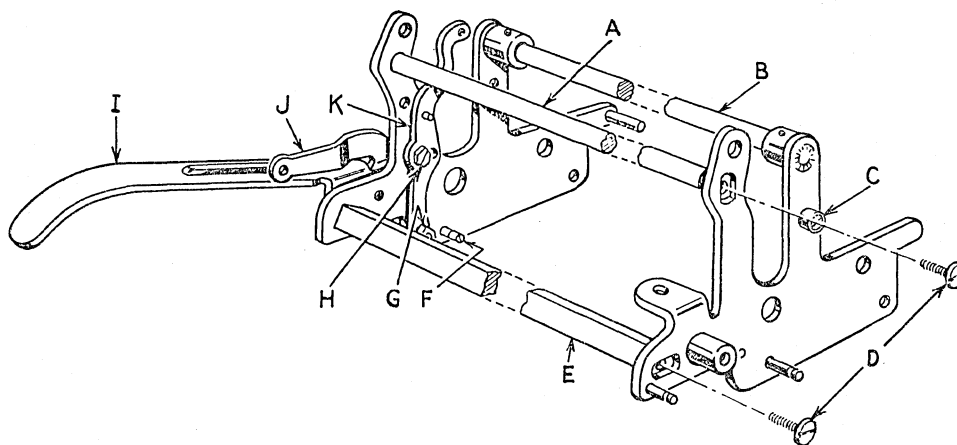
Symbols for Plate 1 are on the back

SYMBOLS (Plate 1)

- A** Inner carriage frame includes A, W, BE
1-73001 No. 1 Style 12, 15, 18 rear feed carriage } for machines before serial No. A696950
21-73001 No. 1 Style 12, 15, 18 rear feed carriage with continuous billing form feature having geared pressure rolls }
Use 11-73001A No. 2 } for all rear feed carriages between serial No. A-696950 and M 5728D
 Style 12, 18 }
703001B No. 1 }
 Style 12, 18 } (M 200), M 6372D
73112 No. 2 } (M 700), M 5816D
 10057½ 2 req. } (M 800)
Use 11-73001A No. 2 }
 Style 12, 18 }
73002A No. 1 } for front feed carriages without pick-up fingers } for machines before serial No. M 5728D (M 200), M 6372D (M 700), M 5816D (M 800)
 Style 12, 18 }
73112 No. 2 }
 10057½ 2 req. }
Use 11-73001A No. 2 }
 Style 12, 18 } for front feed carriages with pick-up fingers }
73002A No. 2 }
 Style 12, 18 }
 73112 No. 2 }
 10057½ 2 req. }
1B-73001 No. 2 Style 15 front feed 15" carriage without pick-up fingers
11-73001 No. 2 Style 15 front feed 15" carriage with pick-up fingers
11-73001A No. 2 Style 12, 18 for rear feed and front feed carriages after machine serial No. M 5728D (M 200), M 6372D (M 700), M 5816D (M 800)
B **1-73192 No. 1** includes C, D, used with standard or collating ege
1-73192 No. 2 used with continuous billing form fte.
C **73192 No. 1**
73192 No. 2 used with continuous billing form fte.
D **73381**
E **72593** screw
F **73816**
G **73634** screw, use 47 nut
H **1-73138A**
I **73820**
J **73819**
K **73616** use 49½ nut
L **1-73245** specify 25 or 28 tooth
M **73257**
N **73604**
O **1-73258R** specify 25 or 28 tooth
P **73365** coil spring on inside 2881B
Q **Use 21-2839½** D includes R, use 8850½ screw
R **Use 2896¼** No. 3 rubber
S **703523A**
T **1-73136R** detent
U **73621** screw
V **200560½**
W **73568** used with geared pressure rolls
X Included in A
1-73253 No. 4 includes T, CF, CG, CH, 28 tooth ratchet
2-112R Fte. 86 used with 25 tooth ratchet
1-73253 No. 5 used on left, with collating table fte. S&N construction, 28 tooth ratchet
11-73253 No. 5 used on left, with collating table fte. S&N construction, 56 tooth ratchet
Y **73131 No. 1** used with standard ege.
73131 No. 2 used with collating ege.
1-73131 No. 3 used with continuous billing form fte.
1-73356 includes U
Z **73622A No. 1** use 403582Z screw on left
AB **73254 No. 1, 2** req. for standard ege., 1 req. on right } use
 for collating ege. } screw
AC **73254 No. 3** used for collating ege., 1 req. on left } **73612**
AD **75618**
AE **1-73337** collar, included in AN
AF **73247 No. 1** use with standard or collating ege.
73247 No. 2 used with continuous billing form fte.
AG **73611** screw, fastened to block **73939**
AH **73255**
AI **1-73345 No. 1** used with standard or collating ege.
1-73345 No. 2 used with continuous billing form fte.
1-73319 used with geared pressure roll shaft, use screws **73567**
AJ **1-73330 No. 1** used with standard or collating ege.
1-73330 No. 2 used with continuous billing form fte.
AK **1-73938** includes AL, use **1-73937** in center
AL **75618**
AM **1-73006** Style 12, 15, 18 used for collating ege.
11-73006 Style 12, 15, 18 used for standard ege.
21-73006 Style 12, 15, 18 used for continuous billing form fte. with geared pressure rolls
AN **1-73005 No. 1** Style 12, 15, 18—25 or 28 tooth includes Y, AD, AE, AF, AG, AH, AI, AJ, AK, AO, AP, BK, BL, CA
73005 No. 2 Style 12, 15, 18 assembled
1-73005 No. 2 Style 12, 15, 18 includes letters shown above, used for collating ege.
73005 No. 3 Style 12, 15, 18 used for continuous billing form fte.
1-73005 No. 3 Style 12, 15, 18—28 tooth, used with continuous billing form fte.
11-73005 No. 3 Style 12, 15, 18 used for collating ege. with continuous billing form fte.
AO **1-73024 No. 1** Style 12, 15, 18 includes shaft and BK, BL, used for standard ege.
1-73132 No. 2 Style 12, 15, 18 includes shaft and BK, BL, used for collating ege.
1-73024 No. 2 Style 12, 15, 18, geared pressure roll shaft includes pressure rolls and gear only
AP **1-73130 No. 1** Style 12, 15, 18—25 or 28 tooth, black, for rear insertion carriage without geared pressure rolls } for black rear insertion carriage with geared pressure rolls
Use 1-73130 No. 1 Style 12, 15, 18—25th }
Use 1-73130 No. 1 Style 12, 18—28th }
Use 1-73130 No. 3 Style 15—28th }
1-73130 No. 2 Style 12, 15, 18 black } for front or rear insertion carriage
1A-73130 No. 2 Style 12, 18 gray }
Use 1-73130 No. 2 Style 12, 18 } for black front insertion ege.
1-73130 No. 4 Style 15 } with geared pressure rolls
11A-73130 No. 2 Style 12, 18 for machines before serial No. A696950 } for front or rear insertion carriages with form chute No. 2B, specify style and machine number
21A-73130 No. 2 Style 12, 18 for machines after serial No. A696950 }
1-730130 No. 1 Style 30 black } for black rear insertion carriages
Use 1A-730130 No. 2 Style 22 gray, for 22" black eges. }
1A-730130 No. 2 Style 22, 30 gray, standard for all Series M machines with 22", 30" carriages, except selective column tabulation
21-730130 No. 2 Style 22, 30 for front or rear insertion carriages with form chute No. 2B, specify machine style and number
1-730130 No. 4 Style 22, 30 black } for selective column tabulation carriages
1A-730130 No. 4 Style 22, 30 gray }
AQ **1-73998 No. 1** Style 12, 15, 18-19, 28 tooth—9, 12 carbon, for front or rear insertion carriages } see plate 1-1 for other styles
21A-73998 No. 1 Style 12, 15, 18—28 tooth—9, 12 carbon, for continuous billing feature }
31-73998 No. 1 Style 12, 15, 18—12 carbon, for 1/5" spacing, use 403582Z screw on left and 2850½ on right }
AR **73246 No. 1** black
73246A No. 1 gray
BA **73112 No. 1** used with standard ege.
73112 No. 2 used for collating ege.
BB **73246 No. 3** black
73246A No. 3 gray
BC **73246 No. 2** black
73246A No. 2 gray
BD **73607**
BE Included in A
BF **73561**
BG **1-73258L No. 1, 25 or 28 tooth**, use screw **73617**
BH **8850½**
BI **Use 1A-2839½** B includes R
BJ **73321**
BK **73133 No. 1** use screw **79503** and **72833** spring
73133 No. 2 for collating ege. use **72656** screw, **2887½** spring
73133 No. 3 use for continuous billing form fte. with geared pressure rolls, use **79503** screw and **284** spring
BL Included in AN
CA **73939**
CB **73335** roller fits in end plate W, BE
CC **73603** screw }
CD **72593**
CE **1-73248 No. 1** used with standard ege.
1-73248 No. 2 used with collating ege.
1-73248 No. 3 used with 19 tooth spacing
CF **73514** screw
CG **73515** screw
CH **73340** eccentric

INNER CARRIAGE FRAME FOR FRONT OR REAR FORM INSERTION CARRIAGE (Plate 1A)

NOTE: This construction began with Machine Serial No. M5728D (M 200), M6372D (M 700) and M5816D (M 800).



SYMBOLS (Plate 1A)

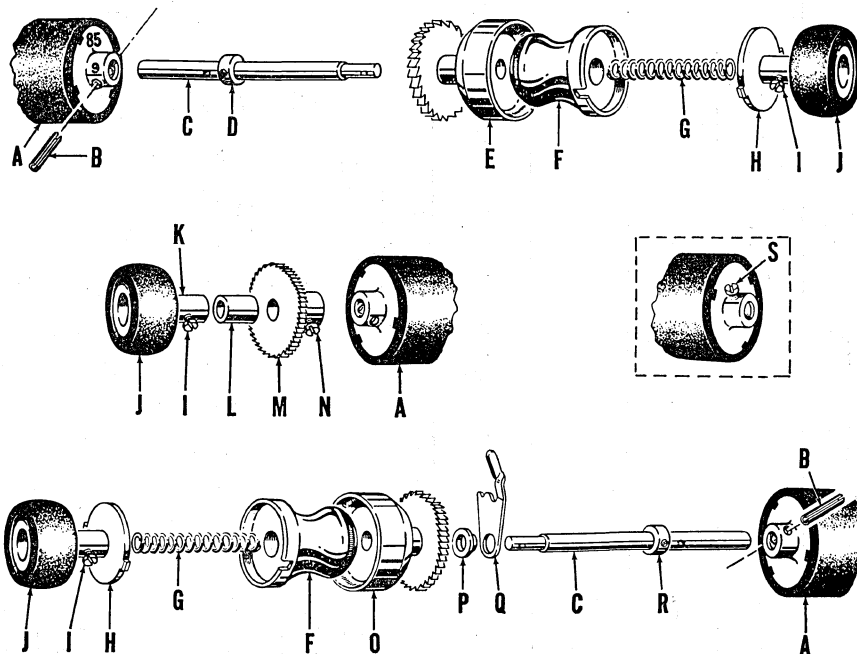
A	73002A No. 1 Style 12, 18 703002A No. 1 Style 22, 30 73002A No. 2 Style 12, 18 703002A No. 2 Style 22, 30	plain shaft grooved shaft
B	11-73001A No. 2 Style 12, 18 1-703001A No. 2 Style 22, 30 21-703001A No. 2 Style 22, 30 selective column tabulation	complete inner carriage frame
C	73335 roller } 2 req. 73603 screw }	
D	10057 3/8	
E	703001B No. 1 Style 12, 18, 22, 30	
F	73502 2 req.	
G	72567 screw	
H	46 1/4 nut	
I	404616 screw	
J	46 1/4 nut	
K	73112 No. 2 703112A No. 4 selective column tabulation 7357 1/2 screws 73114 1-73133 1/2	

PLATENS, SHAFTS, AND ACCESSORIES—SERIES M 200, M 700, M 800 (Plate 1-1)

Note: Machines beginning with Machine Serial No. M11271D contain platens and platen shafts with cleared holes and are assembled with rolled pins.

Platens ordered for service replacement for use on machines prior to Machine Serial No. M11271D necessitates the ordering of right and left platen shafts (see platen shaft chart below) and two rolled pins.

Platen shafts having the cleared hole are usable with the platens that have the threaded hole.



SYMBOLS (Plate 1-1)

- | | | | |
|---|---|---|--|
| A | See platen chart below | K | 1A-2839 1/4" B includes I, J |
| B | X36-7 rolled pin | L | 73321 1/4" long, for all carriage styles except selective column tabulator |
| C | See platen shaft chart below | M | 703321 1/4" long, for selective column tabulator carriages |
| D | 1-73356 collar, includes 73621 set screw | | 1-73258L No. 1 28 Tooth 1/6" vertical spacing, |
| E | 1-73258R 28 Tooth 1/6" vertical spacing, stamped 28, 28 teeth, 1 1/4" overall length | | 1-110L Fte. 86 19 Tooth 1/4" vertical spacing, stamped 19, 57 teeth |
| | 1-110R Fte. 86 19 Tooth 1/4" vertical spacing, stamped 19, 19 teeth, 1 1/4" overall length | | 1-110L Fte. 86 23 Tooth 1/5" vertical spacing, stamped 23, 69 teeth |
| | 1-110R Fte. 86 23 Tooth 1/5" vertical spacing, stamped 23, 23 teeth, 1 1/4" overall length | | 73617 set screw, included in M |
| | 1-703258R 28 Tooth 1/6" vertical spacing, stamped 28, 28 teeth, 1 1/4" overall length | | 1-73258L No. 2 28 Tooth 1/6" vertical spacing, stamped 28, 56 teeth, 1 1/4" overall length |
| | 11-110R Fte. 86 19 Tooth 1/4" vertical spacing, stamped 19, 19 teeth, 1 1/4" overall length | | 1-111L Fte. 86 19 Tooth 1/4" vertical spacing, stamped 19, 57 teeth, 1 1/4" overall length |
| | 11-110R Fte. 86 23 Tooth 1/5" vertical spacing, stamped 23, 23 teeth, 1 1/4" overall length | | 1-111L Fte. 86 23 Tooth 1/5" vertical spacing, stamped 23, 69 teeth, 1 1/4" overall length |
| | | | 1-703258L 28 Tooth 1/6" vertical spacing, stamped 28, 56 teeth, 1 1/4" overall length |
| | | | 11-111L Fte. 86 19 Tooth 1/4" vertical spacing, stamped 19, 57 teeth |
| F | 73365 | P | 73357 |
| G | 2881B | Q | 73262 |
| H | 21-2839 1/4" D includes I, J | R | 1-73358 collar, includes 73621 set screw |
| I | 8850 1/4" set screw, included in H | S | 8850 1/4" set screw |
| J | 2896 1/4" No. 3 brown rubber, included in H or K | | |

SYMBOLS (Plate 1-1) Continued

PLATEN CHART

Description	Total Rubber Length	Vertical Spaces per Inch	Right End Stamped	Right Hub Stamped	Right Hub Counter-sunk	Part Number
Before ordering platens, refer to Note on preceding page.	12"	4	12	9		1A-73998 No. 1 Style 12—19 Tooth—9 Carbon
	12"	6	85	9		1A-73998 No. 1 Style 12—28 Tooth—9 Carbon
	12"	4	12	12		1A-73998 No. 1 Style 12—19 Tooth—12 Carbon
	12"	6	85	12		1A-73998 No. 1 Style 12—28 Tooth—12 Carbon
	18"	4	12	9		1A-73998 No. 1 Style 18—19 Tooth—9 Carbon
	18"	6	85	9		1A-73998 No. 1 Style 18—28 Tooth—9 Carbon
	18"	4	12	12		1A-73998 No. 1 Style 18—19 Tooth—12 Carbon
	18"	6	85	12		1A-73998 No. 1 Style 18—28 Tooth—12 Carbon
Solid platen for front or rear	18"	4	12	9		1A-703998 Style 22—19 Tooth—9 Carbon
insertion carriage	18"	6	85	9		1A-703998 Style 22—28 Tooth—9 Carbon
with 1/4" or 1/8" vertical spacing	18"	4	12	12		1A-703998 Style 22—19 Tooth—12 Carbon
	22"	6	85	12		1A-703998 Style 22—28 Tooth—12 Carbon
	22"	4	12	9		1A-703998 Style 30—19 Tooth—9 Carbon
	22"	6	85	9		1A-703998 Style 30—28 Tooth—9 Carbon
	30"	4	12	12		1A-703998 Style 30—19 Tooth—12 Carbon
	30"	6	85	12		1A-703998 Style 30—28 Tooth—12 Carbon
	30"	4	12	9		21B-73998 No. 1 Style 12—19 Tooth—9 Carbon
	30"	6	85	9		21B-73998 No. 1 Style 12—28 Tooth—9 Carbon
	30"	4	12	12		21B-73998 No. 1 Style 12—19 Tooth—12 Carbon
	30"	6	85	12		21B-73998 No. 1 Style 12—28 Tooth—12 Carbon
	30"	4	12	9		21B-73998 No. 1 Style 18—19 Tooth—9 Carbon
	30"	6	85	9		21B-73998 No. 1 Style 18—28 Tooth—9 Carbon
	30"	4	12	12		21B-73998 No. 1 Style 18—19 Tooth—12 Carbon
	30"	6	85	12		21B-73998 No. 1 Style 18—28 Tooth—12 Carbon
Solid platen for front or rear	12"	4	12	9	Yes	31A-73998 No. 1 Style 12—12 Carbon
insertion carriage	12"	6	85	9	Yes	31A-73998 No. 1 Style 12—0 Carbon
with geared pressure rolls and 1/4" or 1/8" vertical spacing	12"	4	12	12	Yes	31A-73998 No. 1 Style 18—12 Carbon
	12"	6	85	12	Yes	31A-73998 No. 1 Style 18—9 Carbon
	18"	4	12	9	Yes	
	18"	6	85	9	Yes	
	18"	4	12	12	Yes	
	18"	6	85	12	Yes	
Solid platen for front or rear with 1/5" vertical spacing	12"	5	70	12		1A-73998 No. 3 Style 12—19 Tooth—9 Carbon—(*)
	12"	5	70	0		1A-73998 No. 3 Style 12—28 Tooth—9 Carbon—(*)
	18"	5	70	12		11A-73998 No. 3 Style 12—19 Tooth—12 Carbon—(*)
	18"	5	70	0		11A-73998 No. 3 Style 12—28 Tooth—12 Carbon—(*)
	12"	4	12	0		1A-73998 No. 3 Style 18—19 Tooth—9 Carbon—(*)
	12"	6	85	0		1A-73998 No. 3 Style 18—28 Tooth—9 Carbon—(*)
	12"	4	12	12		11A-73998 No. 3 Style 18—19 Tooth—12 Carbon—(*)
	12"	6	85	12		11A-73998 No. 3 Style 18—28 Tooth—12 Carbon—(*)
	18"	4	12	0		1A-73998 No. 3 Style 22—19 Tooth—9 Carbon—(*)
	18"	6	85	0		1A-73998 No. 3 Style 22—28 Tooth—9 Carbon—(*)
	18"	4	12	12		11A-73998 No. 3 Style 22—19 Tooth—12 Carbon—(*)
	18"	6	85	12		11A-73998 No. 3 Style 22—28 Tooth—12 Carbon—(*)
	22"	4	12	0		1A-73998 No. 3 Style 30—19 Tooth—9 Carbon—(*)
	22"	6	85	0		1A-73998 No. 3 Style 30—28 Tooth—9 Carbon—(*)
	22"	4	12	12		11A-73998 No. 3 Style 30—19 Tooth—12 Carbon—(*)
	22"	6	85	12		11A-73998 No. 3 Style 30—28 Tooth—12 Carbon—(*)
	30"	4	12	0		
	30"	6	85	0		
	30"	4	12	12		
	30"	6	85	12		
Split and normal platen for front or rear insertion carriages with 1/4" or 1/8" spacing	12"	4	12	0	Yes	21B-73998 No. 3 Style 12—19 Tooth—9 Carbon—(*)
	12"	6	85	0	Yes	21B-73998 No. 3 Style 12—28 Tooth—9 Carbon—(*)
	12"	4	12	12	Yes	21B-73998 No. 3 Style 12—19 Tooth—12 Carbon—(*)
	12"	6	85	12	Yes	21B-73998 No. 3 Style 12—28 Tooth—12 Carbon—(*)
	18"	4	12	0	Yes	21B-73998 No. 3 Style 18—19 Tooth—9 Carbon—(*)
	18"	6	85	0	Yes	21B-73998 No. 3 Style 18—28 Tooth—9 Carbon—(*)
	18"	4	12	12	Yes	21B-73998 No. 3 Style 18—19 Tooth—12 Carbon—(*)
	18"	6	85	12	Yes	21B-73998 No. 3 Style 18—28 Tooth—12 Carbon—(*)
	22"	4	12	9	Yes	21B-73998 No. 3 Style 22—19 Tooth—9 Carbon—(*)
	22"	6	85	9	Yes	21B-73998 No. 3 Style 22—28 Tooth—9 Carbon—(*)
	22"	4	12	12	Yes	21B-73998 No. 3 Style 22—19 Tooth—12 Carbon—(*)
	22"	6	85	12	Yes	21B-73998 No. 3 Style 22—28 Tooth—12 Carbon—(*)

(*) The part number must include length of rubber on left split.

Example: Part Number for a 12" Platen Split 3" x 9" will be, 1A-73998 No. 3 Style 12—19 Tooth—9 Carbon—3" Length.

Available Lengths of Left Split.

2" Length	6" Length	9" Length	13" Length	17" Length	21" Length
3" Length	7" Length	10" Length	14" Length	18" Length	24" Length
4" Length	7 1/2" Length	11" Length	15" Length	19" Length	25" Length
5" Length	8" Length	12" Length	16" Length	20" Length	

PLATEN SHAFT CHART

Description	Overall Length	From Shoulder to First Hole	From Shoulder to Second Hole	Diameter	Part Number
Selective column tabulator carriage with solid or split and normal platen (Right side).....	4 3/8"	2"	2 5/8"	3/32"	703029AR No. 3
Selective column tabulator carriage with split and normal platen (Left side).....	4 1/8"	2 1/4"	2 1/2"	3/32"	703029AL No. 3
Front or rear insertion carriage with solid platen, with or without geared pressure rolls, or split and normal platen without geared pressure rolls (Right side).....	4 1/8"	1 3/4"	2 1/8"	3/32"	703029AR No. 4
Front or rear insertion carriage with solid platen, with or without geared pressure rolls (Left side).....	3"	1 3/4"		3/32"	703029AL No. 4
Front or rear insertion carriage with split and normal platen, with or without geared pressure rolls (Left side).....	4 1/8"	1 3/4"	2 1/8"	3/32"	703029AL No. 5
Selective column tabulator carriage with solid platen (Left side).....	3 3/4"	1 1/4"		3/32"	703029AL No. 6
Front or rear insertion carriage with split and normal platen, with geared pressure rolls (Right side).....	4 1/8"	1 3/4"	2 1/8"	3/32"	73029B No. 5

Assembled shafts for 28 Tooth, 1/8" vertical spacing.

Right side (includes C, D, E, F, G, H, I, J)

For solid or split and normal platen without geared pressure rolls

For solid or split platens with geared pressure rolls

Left side (includes C, F, G, H, I, J, O, P, Q, R)

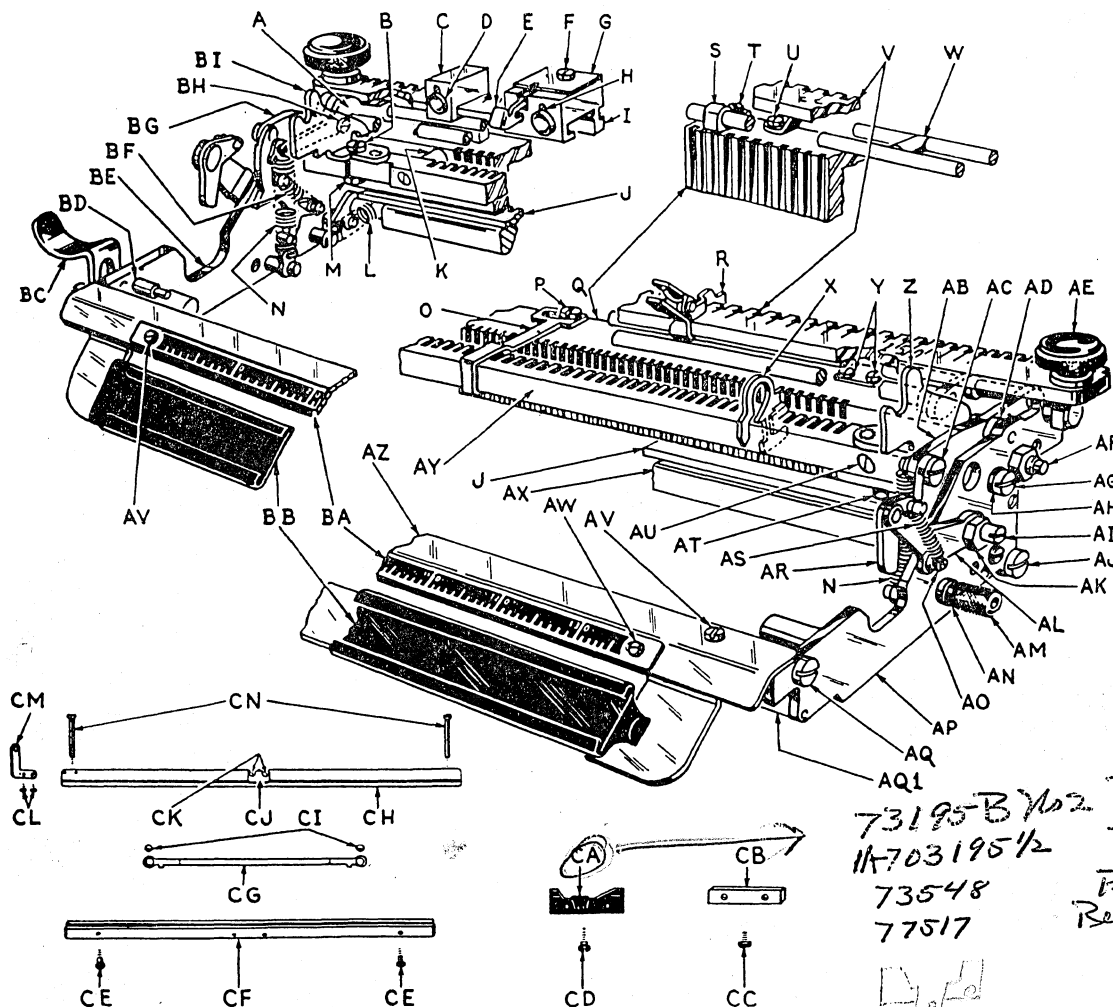
For split and normal platen with or without geared pressure rolls

1-703029AR No. 4

1-73029B No. 5

1-703029AL No. 5

OUTER CARRIAGE, FRONT, STANDARD (Plate 2)



SYMBOLS (Plate 2)

A	1-73237A	S	Included in W	AK	73385 No. 2 eccentric used for Style 12, 15, 18 ege.
B	73659 use 46 nut	T	79543	AL	1-73212AR includes AR
C	1-73993 No. 3 assembled block includes 73811 spring, 1-73019 No. 1 plunger, 203557½ plunger screw	U	79503	AM	73327, 73578 pin, 73326 stud, included in AP
D	1-73019 No. 1	V	Use 1-73913B Style 12, 15, 18 see plate 26-1 for other styles	AN	73807 wire ring
E	73229 use hair spring 73812 and 73599 screw	W	1-73016 Style 12, 15, 18 includes S	AO	73664
F	73563	X	73201A No. 1 thin stop	AP	Use 1B-73210R includes AN, AM
G	1-73231A plate	Y	1-73201A No. 2 wide stop	AQ	73561
H	Use 203557½ plunger screw to retain 73811 spring	Z	1-73104R No. 1 standard ege.	AQ1	1-73966 No. 1 Style 12, 15, 18
I	1-73993 No. 2 assembled block includes D, E, F, G, H		1-73104AR No. 2 used for collating ege.	AR	Included in AL
J	73917 Style 12 73917 Style 15 1-73917A Style 18	AB	1-73104AR No. 3 used for collating ege. with ledger chutes	AS	73829
K	73320	AC	73233 early	AT	73329 collar, use 73562 screws
L	73806	AD	73233A later	AU	72614
M	46 nut	AE	73606A	AV	73548
N	1-73808		73333 use 73605 screw	AW	73548 use 49½ nuts
O	73205		Use 503B Fte. 717 screw	AX	1-73018 Style 12, 15, 18
P	75615		703108 tool for tightening slotted screw	AY	73011 Style 12, 15, 18
Q	1A-73965 Style 15, includes 73530 restoring stud on right end, for automatic tab. arm	AF	703533 later	AZ	1-73100 No. 3
	Use 1B-73965 Style 12, 18 upper ege. rail, 1-73201A No. 3 tab. stop and 1-73201¼ rebound stud bracket	AG	73560 early		Style 12, 15, 18 includes AW, 1-703100 No. 3 BA, BB
R	1-73286 No. 2	AH	1097¼ washer	BA	Use 73221A Style 12 brown, for Style 12 black
		AI	Use 200567½ for Style 12 or 15 ege.		73221 Style 15, 18 black
		AJ	73644 No. 2 for Style 18, 22, 30 ege.		Use 703221A Style 22 brown, for Style 22 black
			73565		703221 Style 30 black
					73221A Style 12, 18 brown
					703221A Style 22, 30 brown

73195-B No. 2 R+P
11-703195½ Left P
73548 Front Sec
77517 Rear Sec

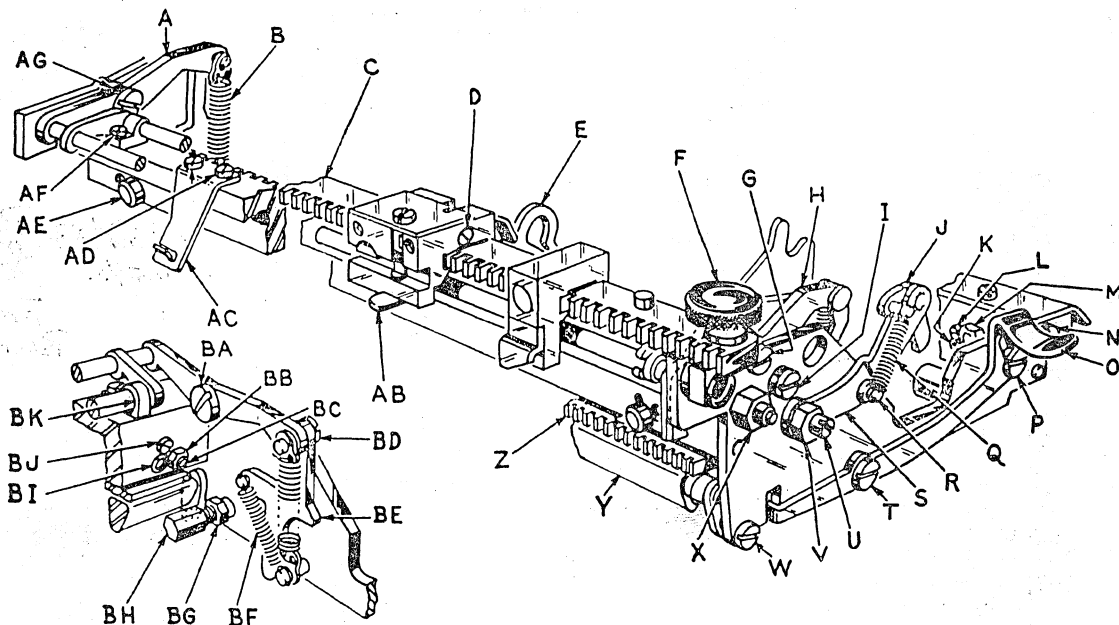


Symbols continued on back

SYMBOLS (Plate 2)—Continued

- BB 1-73101 No. 3 Style 12, 15, 18 1" wide
1-703101A Style 22, 30 1" wide
1A-703101 No. 2 Style 22, 30 skip
tab. cge.
celluloid for above form holders
73904 Style 12, 15, 18 1/2" wide
73904 No. 2 Style 12, 18
103918 Style 15
703904A Style 22, 30 } 1" wide
- BC 73224
BD 73573
BE Use 1B-73210L includes BD
BF 73805
BG 1-73222L
BH 73382 screw nut
BI 1-73104L No. 1 standard cge.
1-73104AL No. 2 used for collating cge.
1-73104AL No. 3 used for collating
cge. with ledger chutes
- CA 73195 No. 1 early, used for Style 7202
73195 No. 2 early, used for Style 7205
73195 No. 3 early, used for Style 7402,
7488, 7603 to 7605
- 73195 No. 4 used for Style 7202 with
form heading holder
73195 No. 5 used for Style 7205 with
form heading holder
73195 No. 6 used for Style 7400 and
7600 with form heading holder
73195 No. 7 early, common to all style
machines with 1/4 fractions
73195 No. 8 used for Styles 7205, 7206
and 7207 with collating table cge.
73195 No. 9 used for Styles 7281, 7282,
7402 thru 7409, 7603 thru 7605 with
collating table cge.
73195 No. 10 common to all style
machines with 1/4 fractions and col-
lating table cge.
73195 No. 11 used for Styles 7202 thru
7204 with collating table cge.
- CB 73198
CC 79565
CD 73548
CE 73595
CF 73967 No. 2 Style 15, 18 front rail
- 703967 No. 8 Style 22, 30
CG 1-73266 No. 1 Style 12, 15, 18 used in
rear rail
1-73266 No. 2 Style 12, 15, 18 used in
front rail
1-703266 No. 1 Style 22, 30 used in
rear rail
1-703266 No. 2 Style 22, 30 used in
front rail
CH 1-73967 No. 1 Style 12, 18 rear rail—
use Style 12 for Style 15 cge.
1-73967 No. 1 Style 22, 30
CI 73991
CJ 70512
CK 73548
CL 73548
CM 73218
CN 73594 screw used for 12, 15, 18 cge.
705585 screw, 47 1/4 nut used with 22
and 30 cge.
705603 No. 2 screw, 47 nut—used in
front rail—for 22 and 30 cge.

OUTER CARRIAGE, REAR, STANDARD (Plate 3)

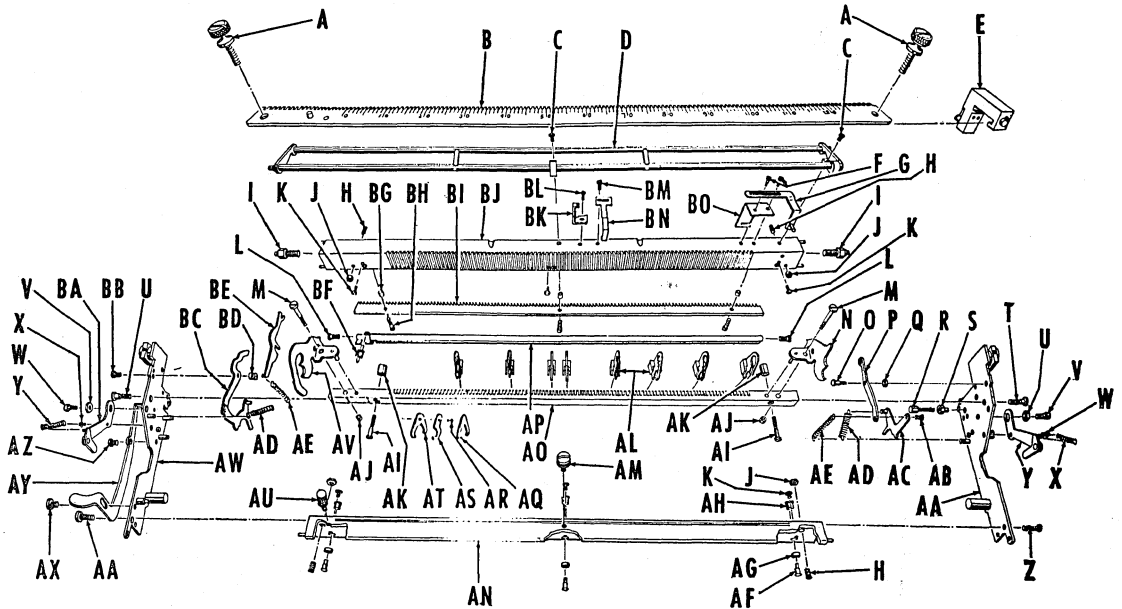


SYMBOLS (Plate 3)

- A 73233 early
73233A later
B 1-73808
C Use 1-73913B Style 12, 15, 18
Use 2Z-73913B Style 12, 15, 18, 22,
30 complete assembled control bar;
submit forms and machine serial
number
Note: See plate 26-1 for other styles
D 73599
E 1-73201A No. 2
F Use 503B Fte. 717
slotted screw } see plate 26-1
703108 tool for tighten- } for other
ing slotted screw } styles
- G 73564A
H 1-73222L
I 75617, 1097% washer
J Included in S
K 73379 No. 1 eccentric, 73552 stud,
73370 roll
- L 73548
M 47 1/4 nut, 73549 screw
N 73561
O 73224
P 73566
Q 73829
R 73664
S 1-73212AL includes J
T 74529
U Use 200567 1/2 for Style 12, 15 cge.
73644 No. 2 for Style 18, 22, 30 cge.
73385 No. 2 eccentric, used for Style
12, 15, 18 cge.
V 73565 without cge. governor
W 703514 Style 30 with cge. governor
X 703533
Y 73560 early
Z 1-73018 Style 12, 15, 18
73917 Style 12, 15
Use 1-73917A Style 18, use 73562
screws, 73329 collars
- AB 1-73034 No. 2
AC 73219
AD 73548
AE 73552 stud, 73370 roll, 73379 No. 1
eccentric, use 73379 No. 2 in center
AF 79543
AG 73333
BA 73605 use collar 73333
BB 46
BC 73549 screw
BD 73606A
BE 1-73222AR
BF 73805
BG 73380
BH 73579
BI 73379 No. 1 eccentric
BJ 73548
BK Included in 1-73016 Style 12, 15, 18,
see part AZ, plate 11

CARRIAGE, OUTER (Plate 3-1)

SERIES M 200, M 700 AND M 800

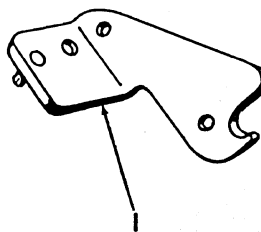
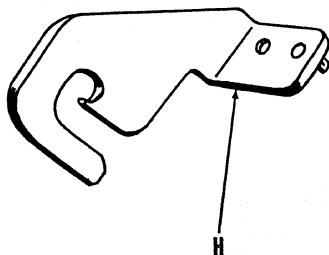
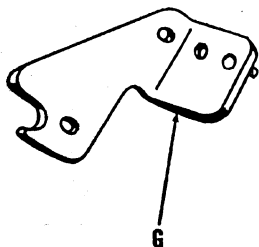
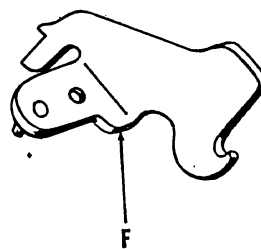
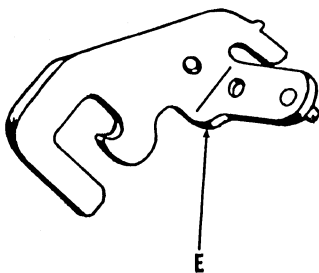
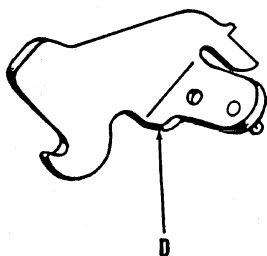
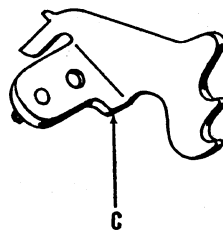
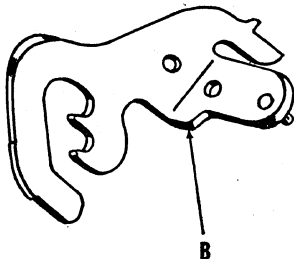
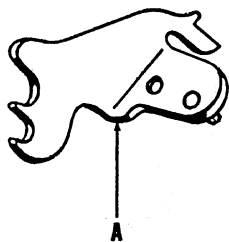


SYMBOLS (Plate 3-1)

A	503B Fte. 717	AB	73606A	AR	73563 screw
B	1-73913C Style 12, 18	AC	1-73222AR	AS	703152A
C	1-703913C Style 22, 30	AD	73805	AT	703154
D	79543	AE	1-73808	AU	703583 No. 4
E	1-73016 Style 12, 18	AF	73552	AV	1-73104L No. 6 see Plate 3-2 for other styles
F	1-703016 Style 22, 30	AG	73370	AW	1A-703210L Style 30
G	1-73993 No. 3	AH	73379 No. 1	AX	73566
H	79543	AI	72614	AY	73224
I	1-73201 1/4	AJ	46	AZ	74529
J	73549	AK	73320	BA	1-73212AL
K	703533	AL	1-73201A No. 2	BB	73564A
L	703514 Style 30		three land stop	BC	1-73222L
M	73659		1-73201A No. 3	BD	73382
N	1-73104AR No. 2 see Plate 3-2 for other styles		two land stop	BE	1-73237A
O	73605	AM	703502 1/4	BF	73806A
P	73233A	AN	1-73966 No. 1	BG	73329
Q	73333		Style 12, 18	BH	73562
R	73333		1-703966	BI	73917 Style 12
S	73579		Style 22, 30		1-73917A Style 18
T	73380		1-73866 No. 3		1-703917A Style 22
U	75617 screw, use 1097 7/8 lock washer		Style 12		1-703917 Style 30
V	73385 No. 2		1-703966A No. 4		1B-73965 Style 12, 18
W	73644 No. 2		Style 18, 22, 30		1A-703965 Style 22, 30
X	73664	AO	703011 Style 12, 18	BK	703249
Y	73829		703011 No. 2 Style 22	BL	75621
Z	1-73212AR	AP	703011 No. 1 Style 30	BM	75615
AA	73561	AQ	703018A Style 12, 18	BN	73205
	1A-703210R Style 30 includes S, T		703018A Style 22, 30	BO	73219

RESTS, INNER CARRIAGE (Plate 3-2)

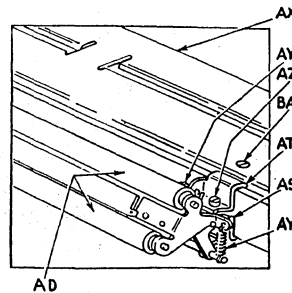
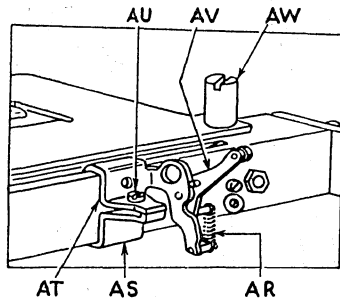
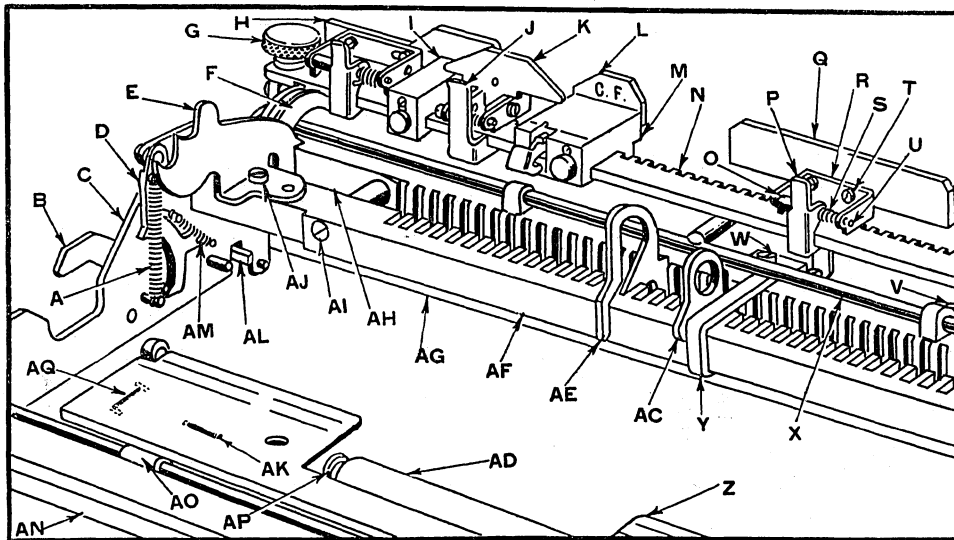
SERIES M 200, M 700 AND M 800



SYMBOLS (Plate 3-2)

- A 1-73104AL No. 2 for 12", 18", 22", 30" front or rear insertion carriage with S&N platen
- B 1-73104L No. 6 for 12", 18", 22", 30" front or rear insertion carriage with solid platen
- C 1-73104AR No. 2 for 12", 18", 22", 30" front or rear insertion carriage with S&N or solid platen
- D 1-73104AL No. 3 for 12", 18", 22", 30" front insertion carriage with form chute No. 1 and S&N platen
- E 1-73104L No. 4 for 12", 18", 22", 30" front insertion carriage with form chute No. 1 and solid platen
- F 1-73104AR No. 3 for 12", 18", 22", 30" front insertion carriage with form chute No. 1 and S&N or solid platen
- G 1-703104L No. 3 for 22", 30" selective column tabulation carriage with S&N platen
- H 1-703104L No. 4 for 22", 30" selective column tabulation carriage with solid platen
- I 1-703104R No. 3 for 22", 30" selective column tabulation carriage with S&N or solid platen

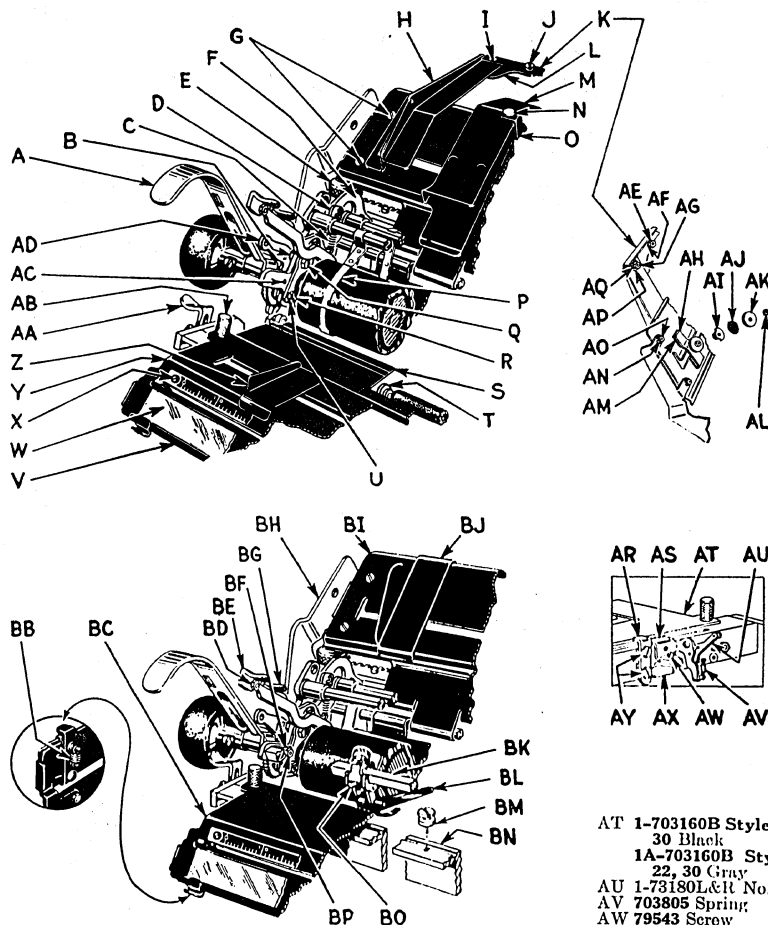
COLLATING CARRIAGE, OUTER (Plate 4)



SYMBOLS (Plate 4)

- Mac 308*
- | | | |
|--|---------------------------------------|--|
| A 1-73808 | R 1-73214 includes O, P, S, U | AH 1A-73965 Style 12, 15, 18 uses eccen- |
| B 73212 early, use 73612 screws | S 1-73214 No. 3 early | trics 73379 No. 1 and 73379 No. 2 |
| C 1-73212AL uses screws 73644 No. 2, | T 73804 | screws 73548, 73549, 73552 and |
| 1-73385 No. 2 eccentric, 73829 spring | U 73804A No. 2 for 1-703214A No. 4 | 73560; collars 73370, nut 47/4 |
| 1A-73210L (1B-73210L) used for Style | V 72592 | 1-703965 Style 22, 30 |
| 12, 15, 18, 22 | W 73709 Clip, 73015 shaft | AI 74532 (72614) Screw, 73320 collar |
| 1-703210L Style 30 (1A-703210L Style | X 79543 | AJ 73659 Screw, 46 nut |
| 30) | Y 75615 | AK 73809 |
| D 1-73222L | Z 1-73016 Style 12, 15, 18 | AL 73224 |
| 1-703222L used for sel. skip tab., Cl. | 1-703016 Style 22, 30 | AM 73805 |
| 75 and 77 | Y 73205 | AN 1-73966 No. 1 Style 12, 15, 18 |
| E 1-73104AL No. 2 for Style 12, 15, 18 | Z 1-73283 Style 12, 15, 18, 25 or 28 | 1-703966 Style 22, 30 |
| 1-703203AL for Style 22, 30 | tooth blank | AO 73171A uses screw 79543 |
| F 1-73237A | 1-703283 Style 22, 25 or 28 tooth | AP 2-73165AL* uses screws 79543 and |
| G 73501A (73501B) end ser. } Removable | blank | springs 44805 |
| 73521 No. 2 center screw } Not remov- | 1-703283 No. 1 Style 30, 25 or 28 | AQ 44810 Spring |
| 72617 end screw } able bar | tooth blank | AR 44810 |
| H 74502 center screw | AC 73201A No. 1 | AS 73171A |
| I See chart, plate 26 | AD Complete front feed roll assembly, | AU 79543 |
| J 1-73993 No. 3 | includes AP | AV 1-73180L No. 1* complete assembly |
| K 1-73214A No. 2 | 1-73163 No. 1 (roll 3 3/8" long) | 1-73162R&L No. 1 includes AS, |
| L 1-703214A No. 4 | 1-73163 No. 3 (4 5/8") | AU, AV |
| M See chart, plate 26 | 1-73163 No. 4 (5 5/8") | AW 73545A use flat head screws 73590 in |
| N See chart, plate 26 | 1-73163 No. 5 (6 19/32") | other positions |
| 1-73993 No. 2 | 1-73163 No. 6 (7 1/4") | AX 1A-73160 No. 2 Style 12 (1B-73160 |
| 1-73913 Style 12, 15, 18 not remov- | 1-73163 No. 7 (2") | No. 2 Style 12) |
| able | AE 1-73201A No. 2 | 1A-73160 No. 2 Style 15 |
| 1-73913A Style 12, 15, 18 (1-73913B | AF 73011 Style 12, 15, 18 | 1A-73160 No. 2 Style 18 (1B-73160 |
| Style 12, 15, 18) removable | 703011 No. 1 Style 30 | No. 2 Style 18) |
| 1-703913A Style 22, 30 (1-703913B | 703011 No. 2 Style 22 | 1A-703160A Style 22 (1B-703160A |
| Style 22, 30) removable | AG 73917 Style 12, 15 | Style 22) |
| O 73322 Collar | 73917 Style 18 | 1A-703160A Style 30 |
| P 703322 Collar | (1-73917A Style 18) } Uses collars | AY 44805 |
| Q 73215 | 703917 Style 22 } 73329 and | AZ 79543 |
| See chart, plate 26 | 1-703917 Style 30 } screws 73562 | BA 73590 |

STANDARD CARRIAGE, IMPROVED, WIDE BASE—NOT SKIP TAB SERIES M MACHINES (Plate 4-1)



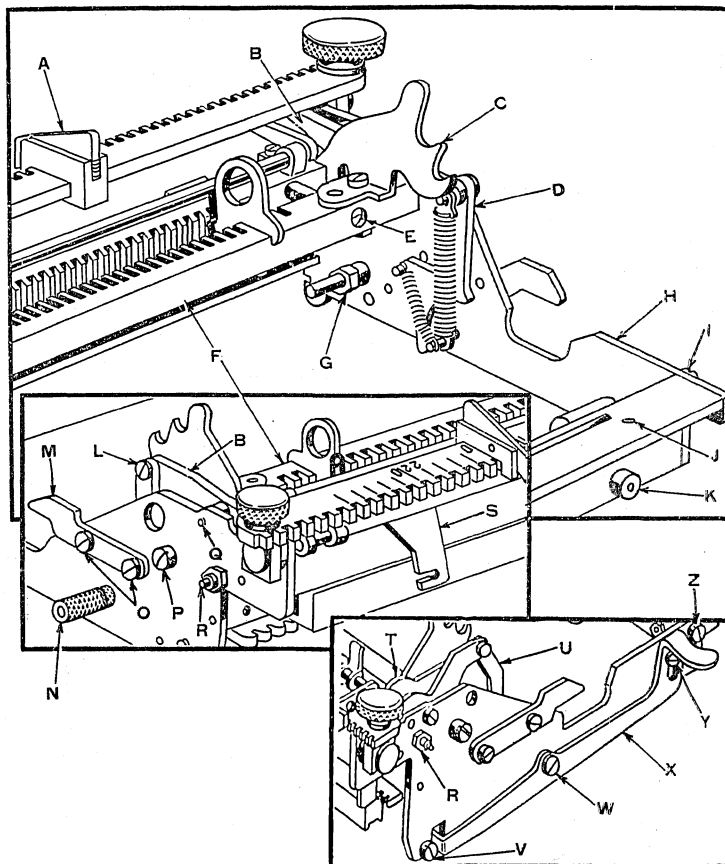
- A 703112A No. 4
- B 46 1/4 Nut
- C 10180 Spring
- D 1-73133 1/2 Bracket
- E 73501B Thumbscrew
- F 1-703104L No. 4
- G 2859 1/2 Screw
- H 1-73226R No. 10 } Black
- I 1-73226L No. 10 } Black
- J 1A-73226R No. 10 } Gray
- K 1A-73226L No. 10 } Gray
- L 2859 1/2 Screw
- M 73611 Screw
- N 73143 Style 12, 15, 18 Black } Cross
- O 73143A Style 12, 15, 18 Gray } brace
- P 703143 Style 22, 30 Black
- Q 703143A Style 22, 30 Gray
- R 73143 1/2 Black
- S 73143 1/2A Gray
- T 1-73226A No. 5 } Black
- U 1-73226AL No. 5 } Black
- V 1A-73226A No. 5 } Gray
- W 1A-73226AL No. 5 } Gray
- X 73662 Screw
- Y 1-73669 includes N
- Z 1-28 3/4 Fte. 98 No. 2
- AA 104506 (404616) Screw
- AB 4456 1/2 Screw
- AC 1-703283 No. 3 Style 12, 18, 22, 30
- AD Black, black
- AE 1A-703283 No. 3 Style 12, 18, 22, 30
- AF Black, gray
- AG 11-73165A small rolls
- AH 1-73163 No. 1, 3 1/2" rolls
- AI 1-73163 No. 3, 4 1/2" rolls
- AJ 1-73163 No. 4, 5 1/2" rolls
- AK 1-73163 No. 5, 6 1/2" rolls
- AL 1-73163 No. 6, 7 1/2" rolls
- AM 1-73163 No. 7, 2" rolls
- AN Complete front feed roll assembly
- AO 1-73163 No. 1, 3 1/2" rolls
- AP 1-73163 No. 3, 4 1/2" rolls
- AQ 1-73163 No. 4, 5 1/2" rolls
- AR 1-73163 No. 5, 6 1/2" rolls
- AS 1-73163 No. 6, 7 1/2" rolls
- AT 1-73163 No. 7, 2" rolls

SYMBOLS (Plate 4-1) ✓

- U 46 1/4 Nut
- V 1-703101B Style 12, 18, 22, 30 Black
- W 1A-703101B Style 12, 18, 22, 30 Gray
- X 73904 No. 2 Style 12, 18 } Celluloid
- Y 703904A Style 22, 30
- Z 74502 Screw, 49 1/4 nut
- AA 1-703160B Style 12, 18, 22, 30 Black
- AB 1A-703160B Style 12, 18, 22, 30 Gray
- AC 1-73166AR No. 1 } Black
- AD 1-73166AL No. 1 } Black
- AE 1A-73166AR No. 1 } Gray
- AF 1A-73166AL No. 1 } Gray
- AG 73224
- AH 703583 No. 4
- AI 7357 1/2 Screw
- AJ 73114
- AK 46 Nut
- AL 1097 3/4 Lock washer
- AM 46 Nut
- AN 1-73144B No. 3
- AO 73388 Eccentric
- AP 3892 1/4
- AQ 73376 No. 2
- AR 49 3/4 Nut
- AS 73990 No. 10 Felt
- AT 1097 3/4 Lock washer
- AU 46 Nut
- AV 73145 Washer
- AW 1097 3/4 Lock washer
- AX 703171 1/4
- AY 1-703162L&R No. 1 complete assembled bracket, includes AR, AU, AV, AW, AX, AY

- AT 1-703160B Style 12, 18, 22, 30 Black
- BB 1A-703160B Style 12, 18, 22, 30 Gray
- AU 1-73180L&R No. 1*
- AV 703805 Spring
- AW 79543 Screw
- AX 1-703171 1/4 L&R No. 2 includes AR, AY
- AY 105502
- BB 703808 Spring
- BC 1-703160B No. 2 Style 12, 18, 22, 30 Black
- BD 1A-703160B No. 2 Style 12, 18, 22, 30 Gray
- BE 46 1/4 Nut
- BF 1-73132 No. 2 Style 12, 18
- BG 1-703132 No. 2
- BH 703110 1/2 Locking blank
- BI 73133A No. 2
- BJ 703153L&R No. 8
- BK 31-73225 No. 2 Style 12, 18
- BL 31A-73225 No. 2 Style 12, 18 Gray
- BM 11A-703225 No. 2 Style 22, 30 Black
- BN 11B-703225 No. 2 Style 22, 30 Gray
- BO 1-73226R No. 8 } Black
- BP 1-73226L No. 8 } Black
- BQ 1A-73226R No. 8 } Gray
- BR 1A-73226L No. 8 } Gray
- BS 703001A No. 1 Style 12, 18, 22, 30
- BT Square shaft, use 71541 screw on right end of shaft
- BU 73246 No. 3 Black } Used on left
- BV 73246A No. 3 Gray } Paper
- BW 73246 No. 2 Black } fingers
- BX 73246A No. 2 Gray } Used on center
- BY 73246 No. 1 Black } Used on right
- BZ 73246A No. 1 Gray } Used on right
- CA 703502 1/4
- CB 1-73966 No. 1 Style 12, 18
- CC 1-703966 Style 22, 30
- CD 1-73192 No. 1 Holder for paper fingers
- CE 4456 1/2 Screw, 40 1/4 nut

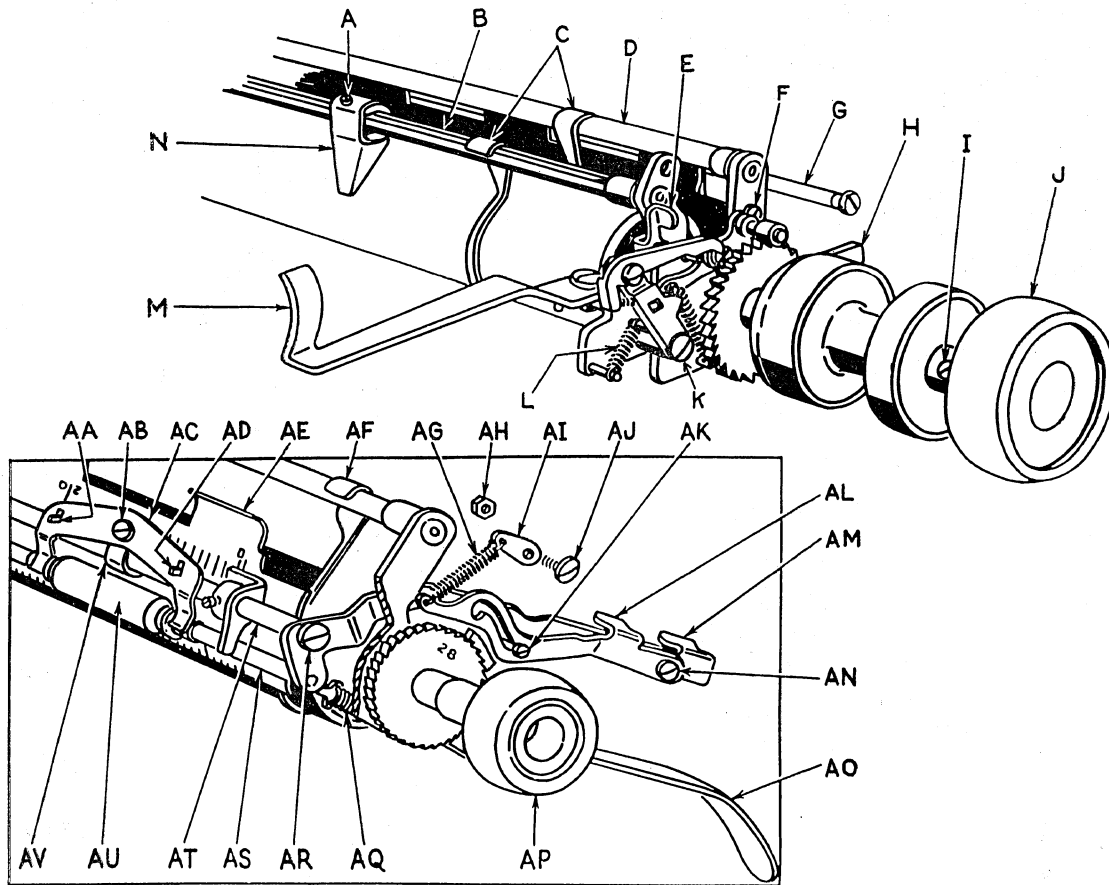
COLLATING CARRIAGE, OUTER, REAR (Plate 5)



SYMBOLS (Plate 5)

A	1-73286 No. 2	M	73212 early
B	73233 early		1-73212AR later, use screw 73644 No. 2, 73385 No. 2 ecc., 81820A spring
	73233A later	N	73327 Knob, 73578 screw, 73326 stud, 73807 clip
C	1-73104AR No. 2 for Style 12, 15, 18; see plate 2, letter Z	O	73612
	1-733203AR for Style 22, 30	P	75617, Lock washer 1097 $\frac{1}{8}$
D	1-73222AR	Q	73605 Screw, 73333 collar
E	74532 Screw, 73320 collar	R	73560 early
F	73011 Style 12, 15, 18		703533 later
	703011 No. 1, Style 30	S	73219
	703011 No. 2, Style 22		703219 use with sel. skip tab
G	73380	T	1-73237A
H	1A-73210R (1B-73210R) for Style 12, 15, 18, 22	U	1-73222L
	1-703210R Style 30 (1A-703210R Style 30)		1-703222L used with sel. skip tab
I	73559	V	73565
J	73561	W	74529
K	73548 Screw, 73370 roll, 73552 stud, 73379 No. 1 eccentric	X	73224
L	73606A	Y	73566
		Z	73561

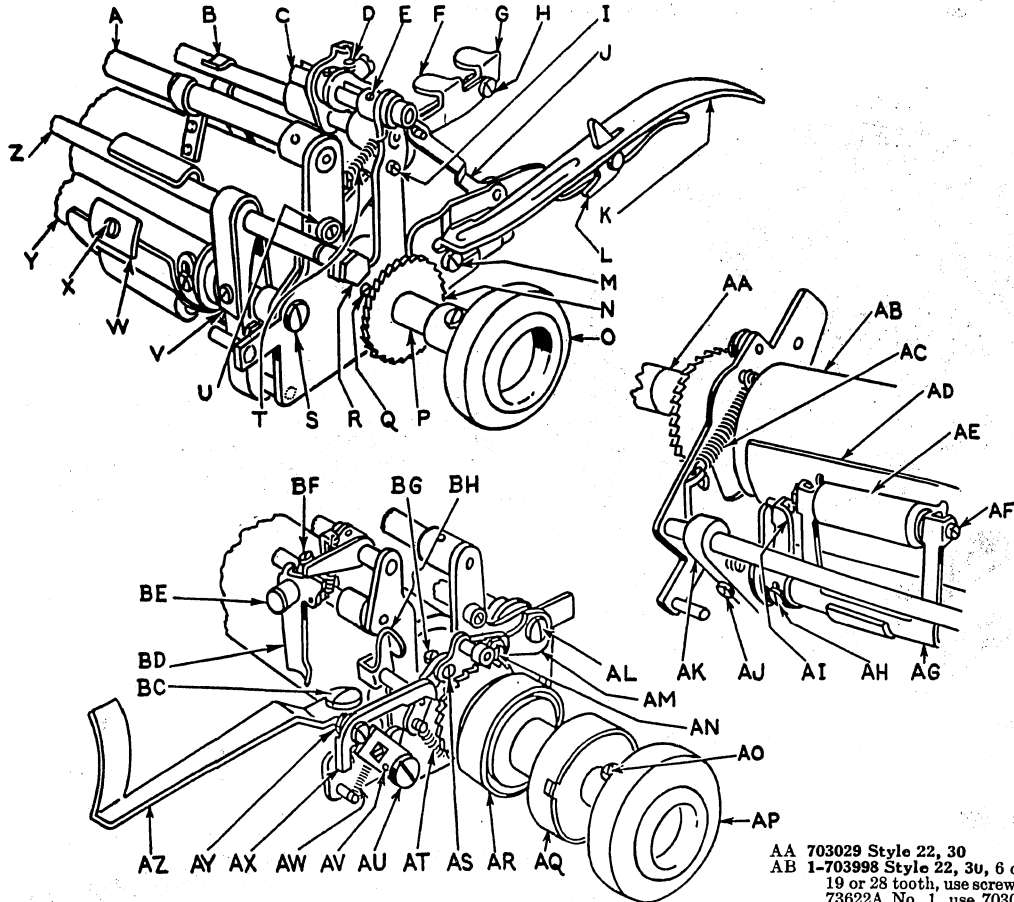
COLLATING CARRIAGE, INNER (Plate 6)



SYMBOLS (Plate 6)

A	73527 (703527 No. 2)	AC	73255
B	73002 Style 12, 15, 18*	AD	1-73330 No. 1
C	73251R (1-29 Fte. 98 No. 2)	AE	1-73130 No. 2 Style 12, 15, 18
D	1B-73001 No. 2 Style 12 (11-73001 No. 2 Style 12)	AF	73251L (1-29 Fte. 98 No. 2)
	1B-73001 No. 2 Style 15	AG	10180
	1B-73001 No. 2 Style 18 (11-73001 No. 2 Style 18)	AH	103354
E	Shaft assembly includes B, II	AI	72281 (20 No. 89)
	1-73248 No. 2	AJ	259½
	1-73248 No. 3 used with 19 tooth spacing	AK	73533
F	73335 Roll, 73603 screw	AL	73133 No. 2
G	1-73006 Style 12 (21-73006 Style 12)	AM	73132 No. 2*
	1-73006 Style 15	AN	73608 (72656) Screw, 49¼ nut
	1-73006 Style 18 (21-73006 Style 18)	AO	73112 No. 2 use 73607 screw
H	1-73110AR No. 2*	AP	2896¼ No. 1 Rubber
I	2850½	AQ	1-73802 Style 12
J	2896¼ No. 1 Rubber	AR	73528
K	73604	AS	73005 No. 2 Style 12, 15, 18 assembled
L	73820		1-73005 No. 2 Style 12, 15, 18 includes AA, AB, AC, AD, AE, AT, AU, AV
M	1-73138A	AT	1-73132 No. 2 Style 12, 15, 18 includes AM
N	73252	AU	1-73345 No. 1
AA	73247 No. 1	AV	73939
AB	73611		

COLLATING CARRIAGE, INNER, STYLE 22 AND 30 (Plate 7)



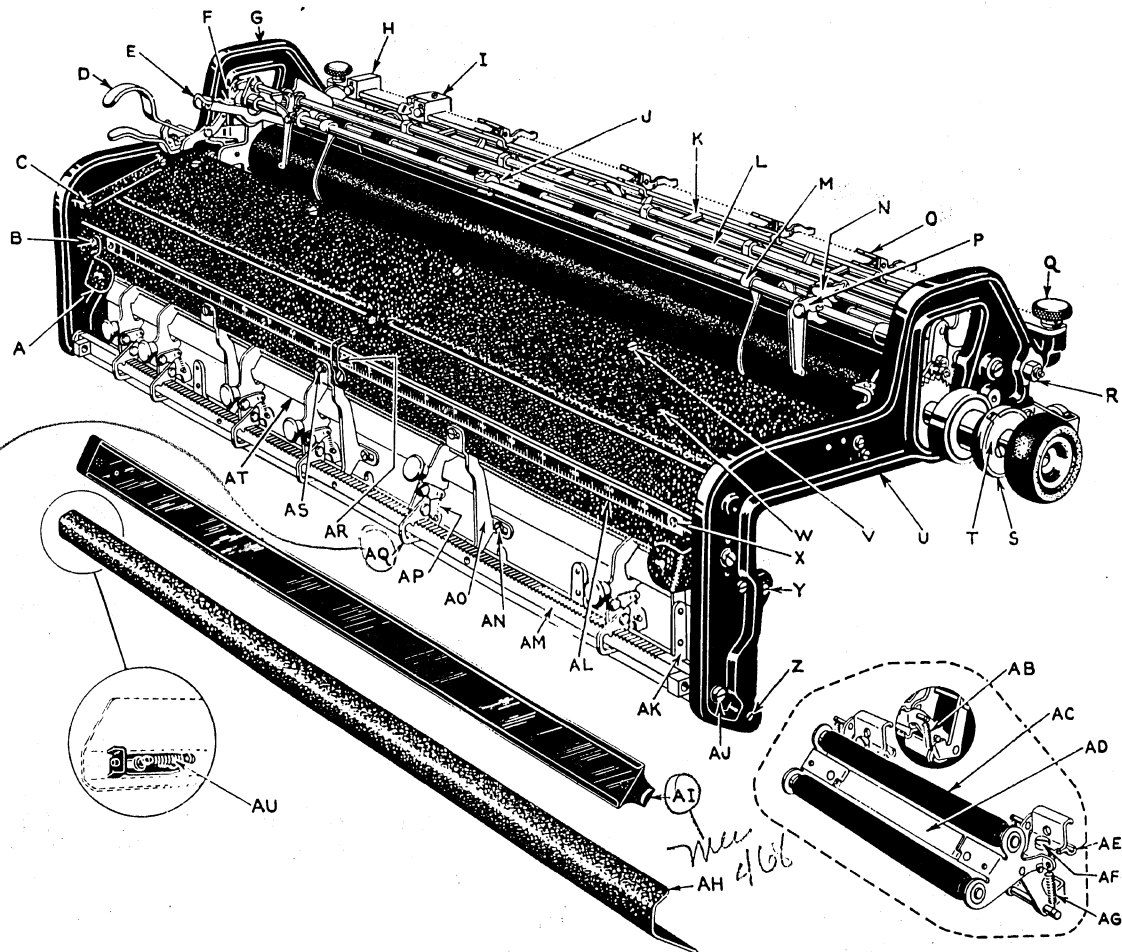
- A 1-703001 No. 1 Style 22 (1A-703001 No. 2 Style 22, 703001A No. 1 Style 22, 2-703005 No. 2 Style 22, 73533, 1-73133½, 73133A No. 2, 703110½, 73112 No. 2, 72565, 71541, 4456½, 10180, 49¼, 46¼) used with standard cge.
- 1-703001 No. 1 Style 30 (1-703001 No. 2 Style 30, 703001A No. 1 Style 30, 2-703005 No. 2 Style 30, 73533, 1-73133½, 73133A No. 2, 703110½, 73112 No. 2, 72565, 71541, 4456½, 10180, 49¼, 46¼) used with standard cge.
- 1A-703001 No. 2 Style 22 used with collating cge.
- 1-703001 No. 2 Style 30 used with collating cge.
- B 1-703122 No. 2
- 1-28¾ Fte. 98 No. 2 straight band
- 1-29 Fte. 98 No. 2 tapered to ⅛" thickness in center
- 1-29 Fte. 98 No. 3 tapered to 1/10" thickness in center
- 1-29¼ Fte. 98 adjustable band
- C 1-703008 Style 22, 30
- 1-73008 Style 12, 15, 18
- D 2887½ Spring
- E 1-73314 Collar, includes screw 79566
- F 73133 No. 2
- G 1-703132 No. 1 (703001A No. 1 Style 22, 30, 1A-703001 No. 2 Style 22 or 1-703001 No. 2 Style 30, 2-703005 No. 2 Style 22, 30, 73533, 1-73133½, 73133A No. 2, 703110½, 73112 No. 2, 72565, 71541, 4456½, 10180, 49¼, 46¼) used for standard cge., includes G
- 1-703005A No. 1 Style 30 (1-703001 No. 2 Style 30, 703001A No. 1 Style 30, 2-703005 No. 2 Style 30, 73533, 1-73133½, 73133A No. 2, 703110½, 73112 No. 2, 72565, 71541, 4456½, 10180, 49¼, 46¼) used for standard cge., includes G
- 1-703005A No. 2 Style 22, 30 used for collating skip tab. cge., includes G
- 1-703006 No. 2 Style 22 used for standard and collating cge.
- 11-703006 No. 2 Style 22 used for sel. skip tab cge.
- 1-703006 No. 1 Style 30 used for standard cge.
- 1-703006 No. 2 Style 30 used for collating cge.
- 1-703006 No. 3 Style 30 used for sel. skip tab cge.
- H 73608 (72656) Screw, 49¼ nut
- I 73533
- J 1A-73113
- 1-703111A No. 2 includes L, used for Style 22, 30, skip tab cge.
- K 73112 No. 2 used for Style 22 cge.

SYMBOLS (Plate 7) ✓

- L 703112A No. 4 used for Style 30 cge.
- M 1-73115A included in J
- N 7357½
- O 1-73258L No. 1 specify 25 or 28 tooth, includes Q
- P 1-2839½B includes 2850½ screw and rubber 2896¼ No. 1
- Q 73321
- R 73617
- S 73516 early
- T 703523A later
- U 8054¼
- V 2887½
- W 73335 Roll, 73603 screw
- X 75657 Screw, 46 nut
- Y 703115
- Z 703111
- 1-703005A No. 1 Style 22 (1A-703001 No. 2 Style 22, 703001A No. 1 Style 22, 2-703005 No. 2 Style 22, 73533, 1-73133½, 73133A No. 2, 703110½, 73112 No. 2, 72565, 71541, 4456½, 10180, 49¼, 46¼) used for standard cge., includes G
- 1-703005A No. 2 Style 22, 30 used for collating skip tab. cge., includes G
- 1-703006 No. 2 Style 22 used for standard and collating cge.
- 11-703006 No. 2 Style 22 used for sel. skip tab cge.
- 1-703006 No. 1 Style 30 used for standard cge.
- 1-703006 No. 2 Style 30 used for collating cge.
- 1-703006 No. 3 Style 30 used for sel. skip tab cge.

- AA 703029 Style 22, 30
- AB 1-703998 Style 22, 30, 6 or 12 carbon, 19 or 28 tooth, use screws 403582 and 73622A No. 1, use 703029 Style 22, 30 platen shaft
- AC 703819
- AD 1-703130 No. 2
- 1-703130 No. 2 Black Collating
- 1A-703130 No. 2 Style 22, 30 Gray
- 1-703130 No. 4 Style 22, 30 Black Selective skip tab.
- 1A-703130 No. 4 Style 22, 30 Gray
- 1-703130 No. 1 Style 30
- AE 1-703345
- AF 703024, 49¼ Nut
- AG 703815 No. 1 for standard Style 30
- 703815 No. 2 for standard Style 22 or collating Style 22, 30
- AH 73612
- AI 1-703138L
- AJ 73612
- AK 703801
- AL 73568 Screw
- AM 2-703253R
- AN 73340 Eccentric, 73515 screw
- AO 2850½
- AP 1-2839½D (21-2839½D)
- AQ 73365 uses 2881B spring on inside
- AR 1-73258R specify 25 or 28 tooth
- AS 73514
- AT 73816
- AU 73604
- AV 73245* specify 25 or 28 tooth
- 1-73245 specify 25 or 28 tooth, includes AV, AW, AX, AY
- AW 73820
- AX 73257 uses spring 73819
- AY 73616 Screw, 49¼ nut
- AZ 1-73138A
- BC 73634 Screw, 47 nut
- BD 1-73117AR used for Style 12, 15, 18, 22
- 1-703117AR&AL used for Style 30
- BE 62509*
- BF 73527 (703527 No. 2)
- BG 73622A No. 1
- BH 1-73248 No. 2
- 1-73248 No. 3 for 19 tooth

SKIP TAB CARRIAGE, FRONT, CLASSES 75-77 (Plate 8)



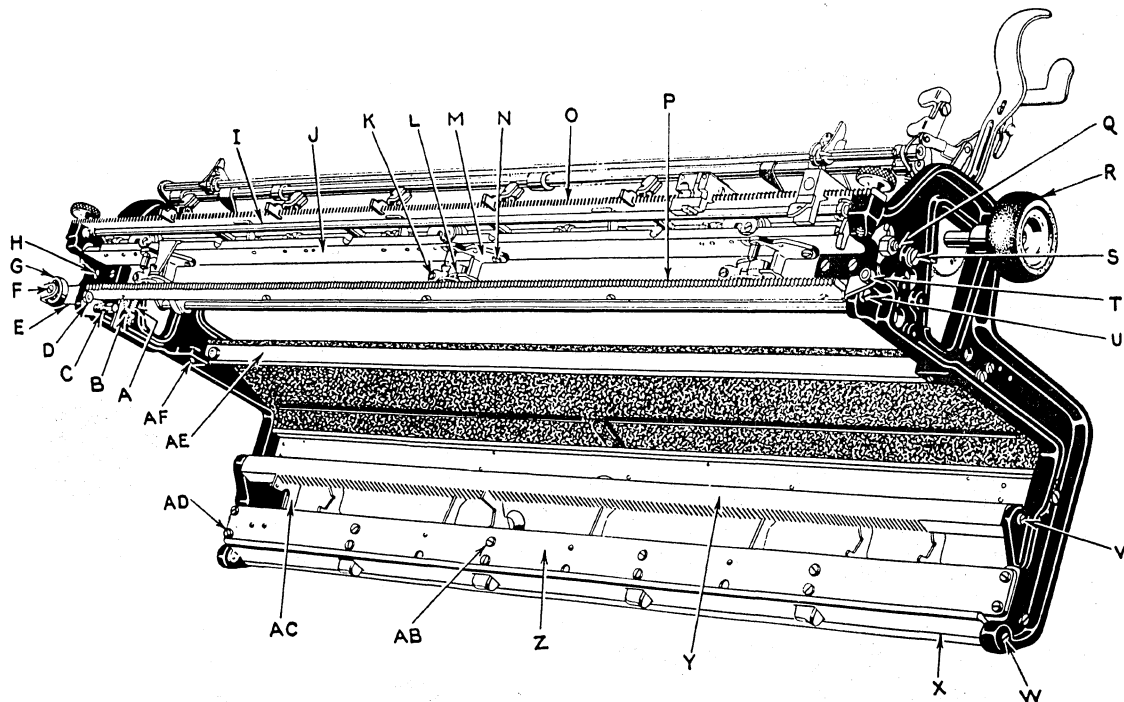
SYMBOLS (Plate 8) ✓

A 1-703289L No. 2 Black
1A-703289L No. 2 Gray
B 73611
C 73612
D 703112 No. 4
E 1-703132 No. 1 (703001A No. 1 Style 22, 30, 1A-703001 No. 2 Style 22 or 1-703001 No. 2 Style 30, 2-703005 No. 2 Style 22, 30, 73533, 1-73133½, 73133A No. 2, 703110½, 73112 No. 2, 72565, 71541, 4456½, 10180, 49¼, 46¼)
1-703132 No. 2 used for collating skip tab cge.
F 73133 No. 2 use 72656 screw, 49¼ nut
G 1-703665AL (1A-703665AL) Black
1-703665BL Gray
H 1-73993 No. 3
I 1-703993 No. 2
J 73302 use 73527 screw
K 1-703016 Style 22, 30
L 1-703008 Style 22, 30
M 73251R (1-29 Fte. 98 No. 2)
N 1-73119AR
O 1-73286 No. 2
P 1-73117AR for Style 22
1-703117AR for Style 30
Q 73501A (73501B)
R 703533
S 73365
T 1-2839¼D (21-2839¼D)

U 1-703665AR (1A-703665AR) Black
V 1-703665BR Gray
W 73560
703160 No. 4 Style 22
(703160A No. 4 Style 22, 703905A Style 22) } Black
703160 No. 4 Style 30
(703160A No. 4 Style 30, 703905A Style 30) }
703160B No. 4 Style 22 } Gray
703160B No. 4 Style 30 }
X 73548 Screw, 49¼ nut
Y 10751½
Z 703567
AB 44805
AC 1-73020 used with AD, No. 1
1-2802B Style K for No. 3
1-73021 for No. 4
1-4902½ Style 8K for No. 5
1-2802B Style H for No. 6
AD Complete assembly; includes AB, AC, AD, AE, AF, AG
1-703163 No. 1, 3½" Rolls
1-703163 No. 3, 4½" Rolls
1-703163 No. 4, 5½" Rolls
1-703163 No. 5, 6½" Rolls
1-703163 No. 6, 7¼" Rolls
1-703163 No. 7, 2" Rolls
AE 703171
AF 79543
AG 44805

AH 1-703293A Style 22, 30 Black
1A-703293A Style 22, 30 Gray
AI 1-703101 No. 2 Style 22, 30 Black
1A-703101 No. 2 Style 22, 30 Gray
AJ 71554
AK 703289R No. 2 Black
703289AR No. 2 Gray
AL 703221 Style 22 Black (703221A Style 22 Gray)
703221 Style 30 Black
703221A Style 22, 30 Gray
AM 1-703040A Style 22, 30
AN 73612
AO 703298½A
AP 9285½
AQ 1-703291A No. 1 for round red blank keys
1A-703291A No. 1 for square brown blank keys
11-703291A No. 1 for round red numeral keys
11A-703291A No. 1 for square brown numeral keys
21-703291A No. 1 for round yellow blank keys
21A-703291A No. 1 for square ivory blank keys
AR 703160½ Black } Uses screws
703160½A Gray } 73612
AS 73611
AT 703965 No. 3 Style 22, 30
AU 8384

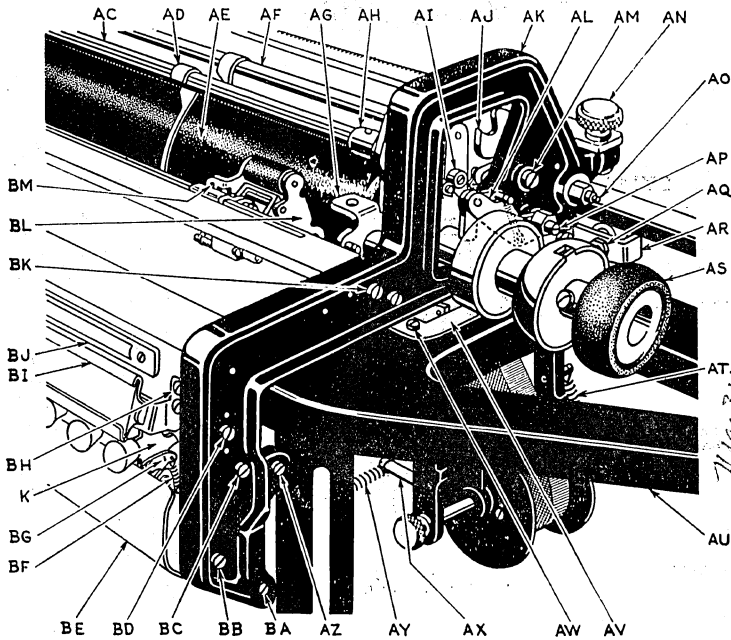
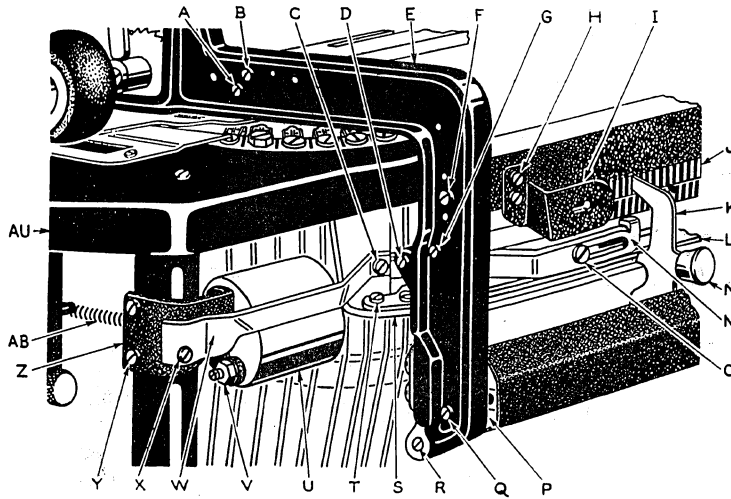
SKIP TAB CARRIAGE, REAR, CLASSES 75-77 (Plate 9)



SYMBOLS (Plate 9) ✓

A	1-73808	S	703516 1/2 A Screws for rocker shaft
B	73805	T	1-703107 1/2
C	73380 and 73579 limit	U	73595 Screw, 47 3/4 nut
D	73561 and 47 3/4 nut	V	71554
E	703107	W	703567
F	703571 Screw, 703324 eccentric, 49 1/4 nut	X	1-703036 Style 22, 30
G	1-703999	Y	703965 No. 3 Style 22, 30
H	1050 1/2	Z	703297A Style 22, 30
I	1-703016 Style 22, 30	AB	7356 1/2
J	703906 Style 22	AC	1-703291A No. 2
K	703906A Style 30	AD	72567
L	12058 1/2	AE	703905 Style 22 (703905A Style 22, 703160A No. 4 Style 22)
M	1-703197		703905 Style 30 (703905A Style 30, 703160A No. 4 Style 30)
N	75602 use 72568 screw on top		703905A
O	1-703913A Style 22, 30 (1-703913B Style 22, 30)		Style 22 } Use for
P	703917 No. 2 Style 22, 30 use 70559 screws		703905A } gray ege.
Q	703533		Style 30 } Use for
R	1-2839 1/4 D (21-2839 1/4 D) Rubber, 2896 1/4 No. 1		AF 703509 Screw, 45 1/2 nut

SKIP TAB CARRIAGE, END VIEWS, CLASSES 75-77 (Plate 10)



- V 10056 1/4 Screw, 47 nut
W 705290
X 73563
Y 71554
Z 705289 Early } Black
705289A Later }
705289B Gray }
AB 75819
AC 21-703001 No. 2 Style 22, 30
AD 73251R&L (1-29 Ftc. 98 No. 2)
AE 1-703998 Style 22, 30 specify 6 or 12
carbon, 10 or 28 tooth
AF 1-703008 Style 22, 30
AG Included in AC
AH Included in AC
AI 73335 Roller, 73603 screw
AJ 1-703104R No. 3
AK 1-703665AR (1A-703665AR) Black
1-703665BR Gray
AL 2-703253R
AM 703516 1/2 A
AN 73501A (73501B)
AO 703533
AP 73644 No. 2
AQ 49 1/4 Nut, 1-703999 wheel
AR 703107
AS 1-2839 1/4 D (21-2839 1/4 D)
AT 75814
AU 705665 No. 3 (705665A No. 3, 703195B
Nos. 8, 9, 10 as Req.) Black
705665B No. 3 Gray

- AV 75211
AW 70512
AX 71507
AY 75819
AZ 10751 1/2
BA 703567
BB 71554
BC 10751 1/2
BD 71554
BE 1-703293A Style 22, 30 Black
1A-703293A Style 22, 30 Gray
BF 9285 1/2
BG Included in K
BH 703289R No. 2 Black } Brackets; use
703289AR No. 2 Gray } screws 73611
BI 1-703101 No. 2 Style 22, 30 Black
1A-703101 No. 2 Style 22, 30 Gray
BJ 703221 Style 22 Black (703221A
Style 22 gray)
703221 Style 30 Black
703221A Style 22, 30 Gray
BK 72567
BL 11-703165 includes BM
BM 2887 1/2

SYMBOLS (Plate 10) ✓

- A 10751 1/2
B 10751 1/2
C 73563
D 10751 1/2
E 1-703665AL (1-703665AL) Black
1-703665BL Gray
F 71554
G 10751 1/2
H 73611
I 1-703289L No. 2 Black
1A-703289L No. 2 Gray
J 703965 No. 3 Style 22, 30
K 1-703291A No. 1 See plate 8 for other
symbols
L 1-705139

- M 7291 Blank, red, yellow body } Round
703991 Number, red body } keytop
numbered 1 thru 20
703991A Number, brown } Square
body numbered 1 thru 20 } keytop
703991A Blank, maroon,
brown, gray, ivory body
N 1-705146
O 705566
P 1-703040A Style 22, 30
Q 71554
R 703567
S 1-705139
T 75608
U 1-705447

CARRIAGES, COMPLETE AND INNER (Plate 10-1)

Specify style of machine when ordering carriages.

Standard style carriages are furnished with 1/6" (28 tooth) spacing, 6 carbon platens. For carriages other than standard, specify spacing and carbon; also furnish forms complete with operations and machine serial number.

Split platen carriages have minimum split 3" from either end.

Carriage rails for typewriter top plate are not furnished with 12", 18" or 22" carriages. Machines before Serial No. A696950 with 12", 18" or 22" carriages, the carriage rails must be changed when changing length of carriage. Order new rails separately. Machines after Serial No. A696950 with 12", 18" or 22" carriages are standardly equipped with 22" carriage rails.

Black carriages are no longer available. Use gray carriages for field replacement.

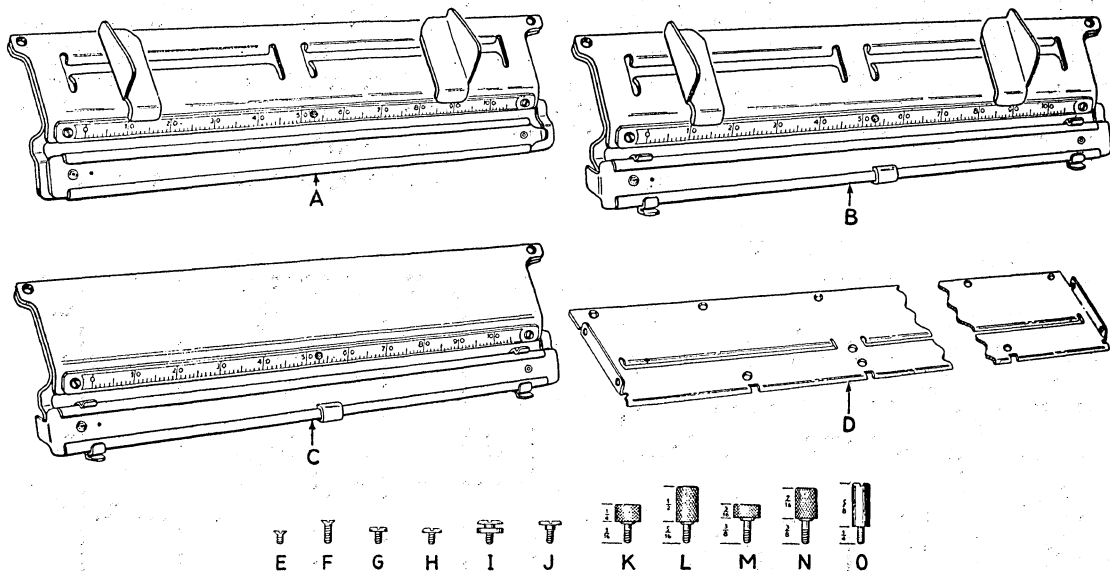
FRONT INSERTION CARRIAGES

Color	Machine Class or Series	Style of Machine Base	Style of Platen	Carriage Controlled Totals	Geared Pressure Rolls	Selective Column Tabulation	Part Number	
							Complete Assembled Carriage	Assembled Inner Carriage
Gray	Class 70 & Series M	Narrow, Wide & New Wide	Solid				82B-73965 Style 12, 18 82A-703965 Style 2, 30	2-73001 No. 2 Style 12, 18 Front Insertion 2-703001 No. 2 Style 22, 30 Front Insertion
Gray	Class 70 & Series M	Narrow, Wide & New Wide	Solid		Yes		142A-73965 Style 12, 18	12-73001 No. 2 Style 12, 18 Front Insertion
Gray	Class 70 & Series M	Narrow, Wide & New Wide	S & N				162A-73965 Style 12, 18 Specify Split (even or fractional inch) 102A-703965 No. 2 Style 22, 30 Specify Split (even or fractional inch)	22-73001 No. 2 Style 12, 18 Front Insertion Specify Split (even or fractional inch) 42-703001 No. 2 Style 22, 30 Front Insertion Specify Split (even or fractional inch)
Gray	Class 70 & Series M	Narrow, Wide & New Wide	Split		Yes		182A-73965 Style 12, 18 Specify Split (even or fractional inch)	32-73001 No. 1 Style 12, 18 Front Insertion Specify Split (even or fractional inch)
Gray	Series M	New Wide	Solid	Yes			152Z-703965 Style 12, 18, 22, 30	2-73001 No. 2 Style 12, 18 Front Insertion 2-703001 No. 2 Style 22, 30 Front Insertion
Gray	Series M	New Wide	Solid	Yes	Yes		162Z-703965 Style 12, 18	12-73001 No. 2 Style 12, 18 Front Insertion
Gray	Series M	New Wide	S & N	Yes			172Z-703965 Style 18, 22, 30 Specify Split (even or fractional inch)	22-73001 No. 2 Style 18 Front Insertion Specify Split (even or fractional inch) 42-703001 No. 2 Style 22, 30 Front Insertion Specify Split (even or fractional inch)
Gray	Class 77 & Series M	Wide	Solid			Yes	12A-703965 No. 3 Style 22, 30	22-703001 No. 2 Style 22, 30 Front Insertion
Gray	Class 77 & Series M	Wide	S & N			Yes	52A-703965 No. 3 Style 22, 30 Specify Split (even or fractional inch)	62-703001 No. 2 Style 22, 30 Front Insertion Specify Split (even or fractional inch)

REAR INSERTION CARRIAGES

Gray	Class 70 & Series M	Narrow, Wide & New Wide	Solid				52A-73965 Style 12, 18 52A-703965 Style 22, 30	2-73001 No. 2 Style 12, 18 Rear Insertion 2-703001 No. 2 Style 22, 30 Rear Insertion
Gray	Class 70 & Series M	Narrow, Wide & New Wide	S & N				62A-73965 Style 12, 18 Specify Split (even or fractional inch) 62A-703965 Style 22, 30 Specify Split (even or fractional inch)	22-73001 No. 2 Style 12, 18 Rear Insertion Specify Split (even or fractional inch) 42-703001 No. 2 Style 22, 30 Rear Insertion Specify Split (even or fractional inch)
Gray	Class 70 & Series M	Narrow, Wide & New Wide	Solid		Yes		102A-73965 Style 12, 18	12-73001 No. 2 Style 12, 18 Rear Insertion
Gray	Class 70 & Series M	Narrow, Wide & New Wide	Split		Yes		122A-73965 Style 12, 18 Specify Split (even or fractional inch)	32-73001 No. 1 Style 12, 18 Rear Insertion Specify Split (even or fractional inch)
Gray	Class 77 & Series M	Wide	Solid			Yes	32A-703965 No. 3 Style 22, 30	22-703001 No. 2 Style 22, 30 Rear Insertion
Gray	Class 77 & Series M	Wide	S & N			Yes	72A-703965 No. 3 Style 22, 30 Specify Split (even or fractional inch)	62-703001 No. 2 Style 22, 30 Rear Insertion Specify Split (even or fractional inch)

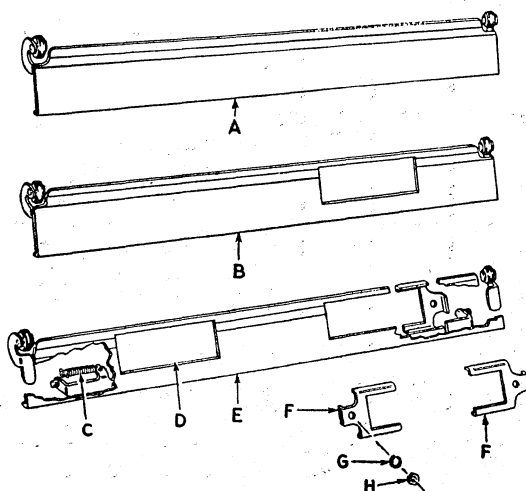
COLLATING TABLES FOR FRONT INSERTION CARRIAGES AND FORM TABLE FOR REAR INSERTION CARRIAGES (Plate 10-2)



SYMBOLS (Plate 10-2)

- | | | | |
|---|---|--|---|
| A | 1B-73160 No. 2 Style 12, 18
1A-73160 No. 2 Style 15
1B-703160A Style 22
1A-703160A Style 30
1A-703160B Style 12, 18, 22 gray
1-703160B Style 12, 18, 22 black
1A-703160B Style 30 gray
1-703160B Style 30 black
1A-703160B Style 30 gray—removable
11A-703160B Style 18 gray—with guides
marked for 13/16" printing line—
sterling machines only | black—with 1" snap on
form heading holder | |
| B | 1A-703160B No. 2
Style 12, 18, 22 gray
1-703160B No. 2
Style 12, 18, 22 black
1A-703160B No. 2 Style 30 gray
1-703160B No. 2 Style 30 black | removable
not removable
removable
not removable | with 1"
spring clip on
form heading
holder |
| C | 1A-703160B No. 2
Style 12, 18, 22 gray
1-703160B No. 2
Style 12, 18, 22 black
1A-703160B No. 2 Style 30 gray
1-703160B No. 2 Style 30 black | removable
not removable
removable | with 1"
spring clip on
form heading
holder |
| D | 703160B No. 4 Style 22, 30 gray
703160A No. 4 Style 22, 30 black | | |
| E | 8064 1/2 to hold table to carriage rail—selective column
tabulation | | |
| F | 73590 to hold table to carriage rail | | |
| G | 73612 to hold table to carriage side frames—selective column
tabulation | | |
| H | 74587 for front control bar brace—in right or left position | | |
| I | 703502 1/4 guide screw for table—without front control bar
brace | | |
| J | 703508 guide screw for table—with front control bar brace in
central position | | |
| K | 703583 No. 1 for left end of table | without enclosed | |
| L | 703583 No. 2 for right end of table | typewriter | |
| M | 703583 No. 3 for left end of table | with enclosed | |
| N | 703583 No. 4 for right end of table | typewriter | |
| O | 703545 limit screw for pressure roll release lever on left end
of table—selective column tabulation | | |

ALIGNING TABLES FOR FRONT INSERTION CARRIAGE (Plate 10-3)



SYMBOLS (Plate 10-3)

NOTE: When ordering aligning tables with pressure roll cutouts, inserts, or slots for snap guides, furnish complete sketch showing right and left ends of tables and all dimensions. Include machine style and serial number.

Pressure roll cutouts cannot be less than 1 3/4" from right end or 2 1/4" from left end.

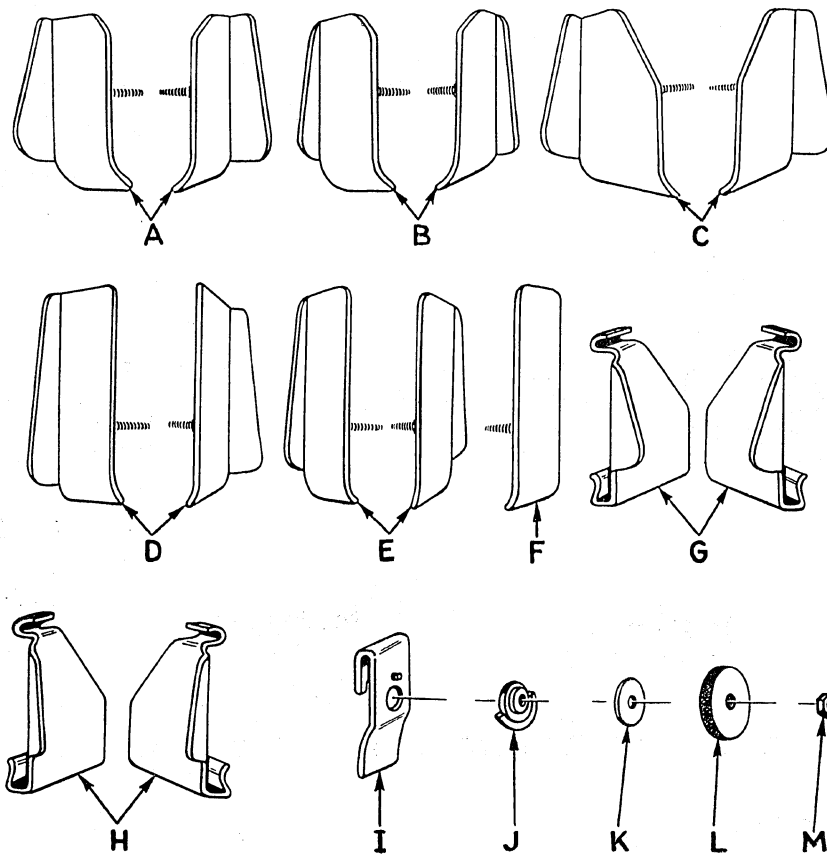
Inserts cannot be less than 1 3/4" from right end or 2 3/4" from left end. There must be at least 1" between inserts, and 1/2" between inserts and cutouts.

- | | | |
|---|---|---|
| A | 1A-703283 No. 3 Style 12, 18, 22, 30
1A-703283 No. 2 Style 22, 30 for
selective column tabulation
1-73283 Style 12, 15, 18—25 or 28 tooth
1-703283 Style 22—25 or 28 tooth
1-703283 No. 1 Style 30—25 or 28 tooth
1-703283 No. 2 Style 22, 30 for selective
column tabulation
1-703283 No. 3 Style 12, 18, 22, 30 for
enclosed typewriter
31-73283 Specify Length, 28 Tooth—
for form chutes No. 2A, 2B, 2C or No. 6
11-73283 Style 12, 18—
25 or 28 Tooth with slots for
snap guides | gray
black
regular
aligning
table
black—see note above |
|---|---|---|

SYMBOLS (Plate 10-3) Continued

B	21A-703283 No. 3 Style 12, 18, 22, 30	gray	aligning table with one plastic insert—see note above	D	73930 Specify Length and Location of Printing Line	plastic insert		
	21-703283 No. 2 Style 22, 30 for selective column tabulation				E 31A-703283 No. 3 Style 12, 18, 22, 30			
	21-73283 Style 12, 18—28 Tooth	black			31-703283 No. 2 Style 22, 30 for selective column tabulation	gray		
	21-703283 Style 22—28 Tooth				31-703283 Style 22—25 or 28 Tooth —with or without selective column tabulation		black	
21-703283 No. 3 Style 12, 18, 22, 30 for enclosed typewriter	black			F G H	31-703283 No. 3 Style 12, 18, 22, 30 for enclosed typewriter	aligning table with two plastic inserts—see note above		
21-73283 No. 1 Style 18—28 Tooth—with a 1½" plastic insert 2¼" from right end								
21-73283 No. 2 Style 18—28 Tooth—length 9¾" overall, with 1½" plastic insert 2¼" from right end. Use on 18" carriage with No. 6 form chute							73283 ½	
							1097 5/8	
C	73809 spring				49 ¾			

GUIDES FOR COLLATING TABLES (Plate 10-4)

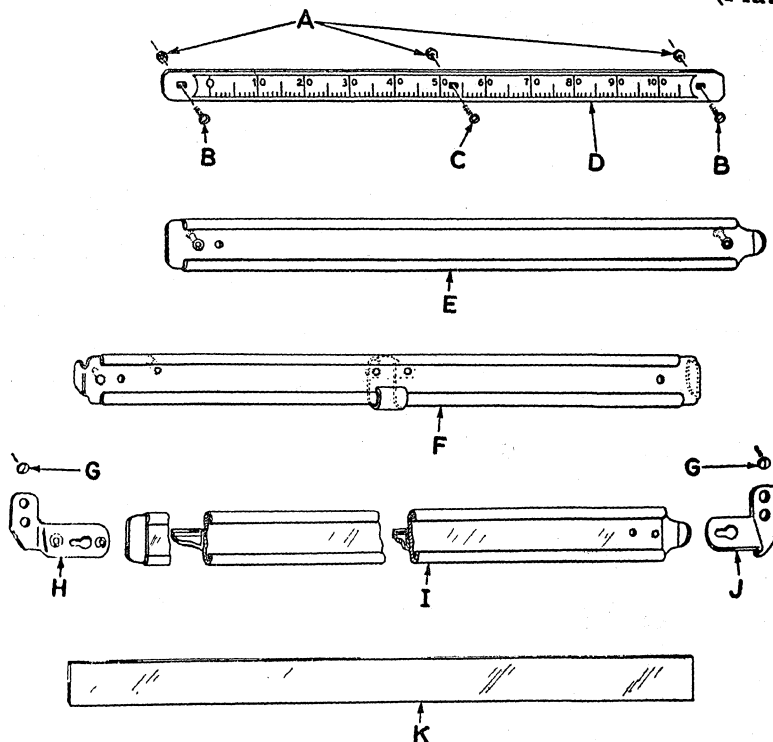


SYMBOLS (Plate 10-4)

A	1A-73166AR No. 1	gray	paper guide—27 ³ / ₃₂ " wide with 1/2" high side	sterling machines only	D	1A-703166R No. 3	gray	paper guide—27 ³ / ₃₂ " wide with 1/2" high side— selective column tabulation					
	1A-73166AL No. 1				1A-703166L No. 3								
	1-73166AR No. 1	black			1-703166R No. 3	black							
	1-73166AL No. 1				1-703166L No. 3								
	11A-73166AR No. 1	gray			paper guide—27 ³ / ₃₂ " wide with 1/2" high side— with line for 2 3/4" printing line	E	1A-703166R No. 4		gray	ledger guide—27 ³ / ₃₂ " wide with 3/8" high side— selective column tabulation			
	11-73166AR No. 1					1A-703166L No. 4							
	11-73166AL No. 1	black				1-703166R No. 4	black						
						1-703166L No. 4							
	21A-73166AR No. 1	gray				paper guide—27 ³ / ₃₂ " wide with 1/2" high side— with line for 1 29 ³ / ₃₂ " printing line	F		1A-703166 No. 3		gray	center paper guide—27 ³ / ₃₂ " wide without side—selective column tabulation	
	21A-73166AL No. 1						1-703166 No. 3						
	black		black										
B	1A-73166R No. 2	gray	ledger guide—27 ³ / ₃₂ " wide with 3/8" high side				G	73166AR No. 3	gray		snap guide—2 3/4" wide with 3/8" high side		
	1A-73166L No. 2						73166AL No. 3						
	1-73166R No. 2	black			73166R No. 3		black						
	1-73166L No. 2				73166L No. 3								
C	1A-73166R No. 5	gray			paper guide—1 1/4" wide with 1/2" high side			H	73166R No. 4	black			snap guide—2 3/4" wide with 1/8" high side
	1A-73166L No. 5							73166L No. 4					
	1-73166R No. 5	black						black					
	1-73166L No. 5												
						I		1-73144C No. 3					
						J		73388A					
			K	3892 1/4 leather washer									
			L	73376 No. 2									
			M	49 3/8 nut									

SEE EXPLANATION ON INSIDE OF FRONT COVER

ALIGNING SCALE AND FORM HEADING HOLDERS (Plate 10-5)

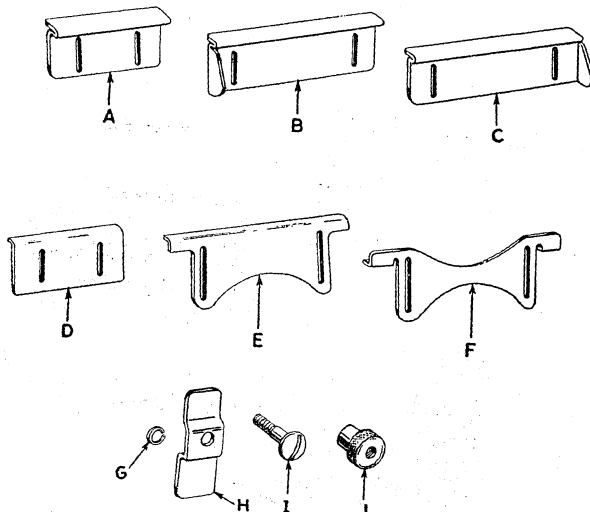


SYMBOLS (Plate 10-5)

- A 49 1/4 nut
- B 74502 end screws
- C 73248 center screws
- D 73221A Style 12, 18 } gray—use for replacement
- E 73221A Style 22, 30 } on gray or black carriages
- F 73221 Style 15 black—for all 15" carriages
- G 1-73101 No. 3 Style 12, 15, 18 } black—1" wide—snap on
- H 1A-703101B Style 22, 30 } 1" wide—spring clip
- I 1-703101B Style 12, 18, 22, 30 gray } 1" wide—spring clip
- J 1-703101B Style 12, 18, 22, 30 black } 1" wide—spring clip
- K 73611 screw

- H 1A-703289L No. 2 gray
- I 1-703289L No. 2 black
- J 1A-703101 No. 2 Style 22, 30 gray } 1" wide—selective
- K 1-703101 No. 2 Style 22, 30 black } column tabulation
- L 703289AR No. 2 gray
- M 703289R No. 2 black
- N 73904 No. 2 Style 12
- O 103918 Style 15
- P 73904 No. 2 Style 18
- Q 703904A Style 22, 30 } 1" wide celluloid

FORM STOPS FOR COLLATING TABLE (Plate 10-6)

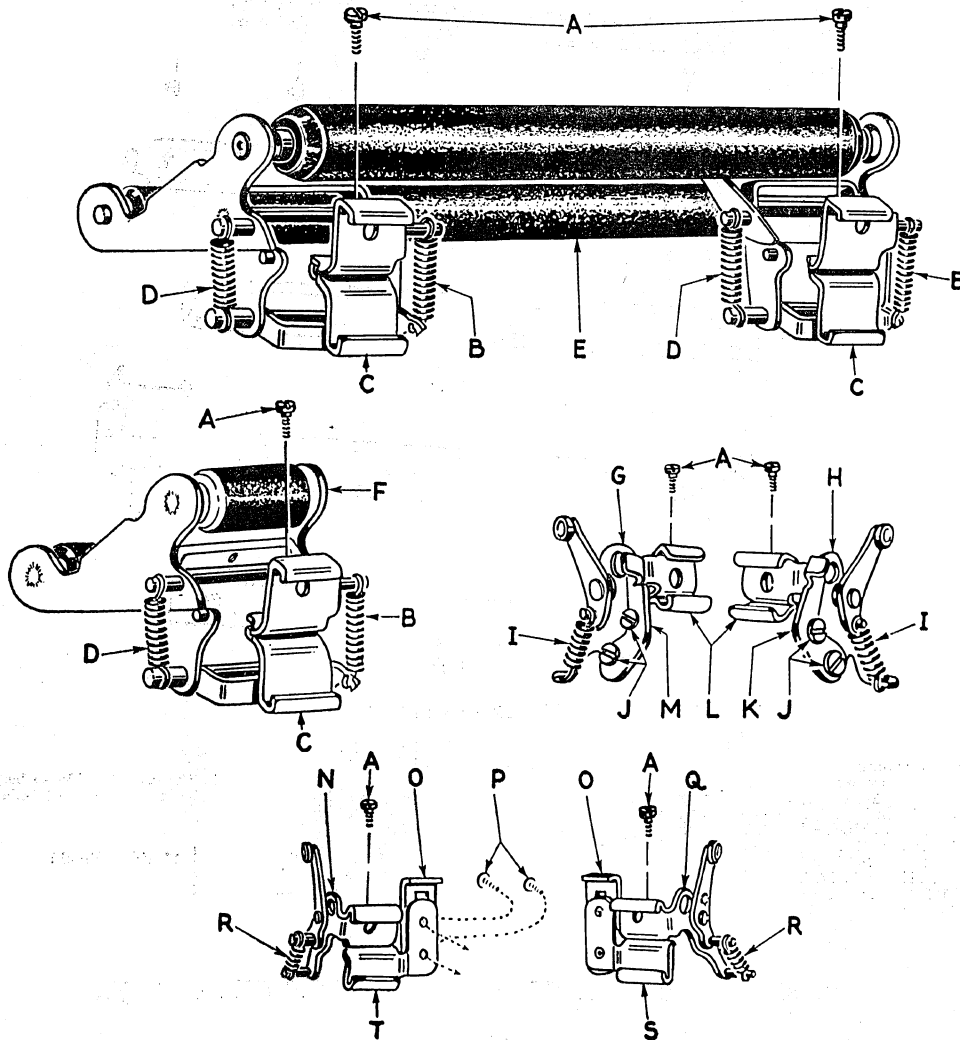


SYMBOLS (Plate 10-6)

- A 1-73181A gray
- B 1-73181 black
- C 1-73181L No. 4 black
- D 1-73181R No. 4 black
- E 1-73181 No. 17 Env. 824 use with plastic inserts
- F 73181A No. 2 gray
- G 73181 No. 2 black
- H 73181A No. 3 gray
- I 73181 No. 3 black
- J 1097 1/4 lock washer
- K 73144A No. 1
- L 73526
- M 73381

SEE EXPLANATION ON INSIDE OF FRONT COVER

① PRESSURE ROLL ASSEMBLIES, FRONT, AND BRACES FOR
ALIGNING TABLES (Plate 10-7)

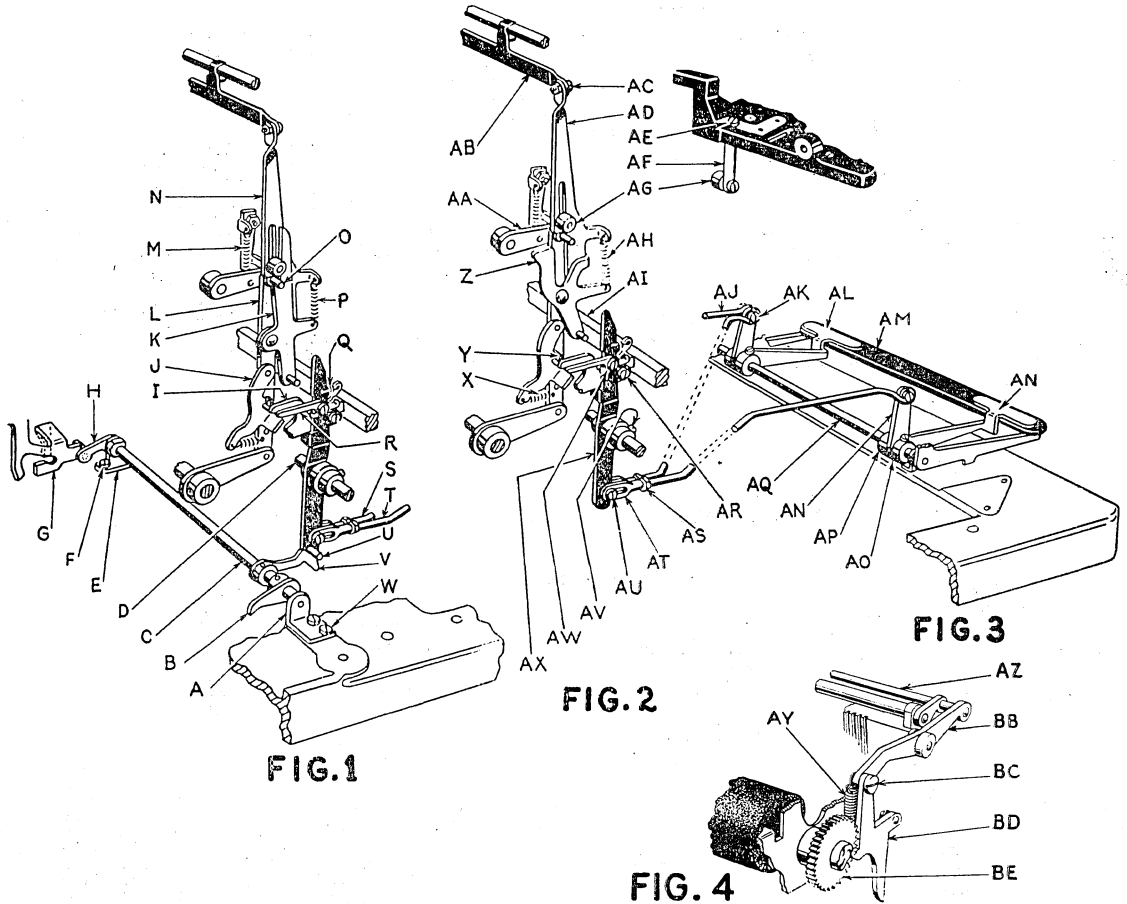


SYMBOLS (Plate 10-7)

A	79543		1-73163 No. 6 rubber	} 7 1/8" pressure rolls		
B	44805		11-73163 No. 6 brass			
C	73171A		1-703163 No. 6 rubber, selective column tabulation			
D	703171	selective column tabulation	1-73163 No. 7 rubber	} 2 3/4" pressure rolls		
E	73820	Pressure roll assembly, includes A, B, C, D	1-703163 No. 7 rubber, selective column tabulation			
	1-73163 No. 1 rubber	} 3 1/8" pressure rolls	F	11-73165A rubber	} 3 5/8" pressure rolls, assembly includes A, B, C, D	
	11-73163 No. 1 brass			11-703165 rubber, selective column tabulation		
	1-703163 No. 1 rubber, selective column tabulation					
	1-73163 No. 3 rubber	} 4 11/16" pressure rolls	G	1-703164L includes A, I, J, L, M	} selective column tabulation	
	11-73163 No. 3 brass			1-703164R includes A, I, J, K, L		
	1-703163 No. 3 rubber, selective column tabulation			9285 1/2 spring, selective column tabulation		
	1-73163 No. 4 rubber	} 5 13/16" pressure rolls	J	73563		
	11-73163 No. 4 brass			K	703171 1/2R	
	1-703163 No. 4 rubber, selective column tabulation			L	703171	
	1-73163 No. 5 rubber	} 6 15/16" pressure rolls	M	703171 1/2L		
	11-73163 No. 5 brass			N	1-703162L No. 1 includes A, O, P, T	
	1-703163 No. 5 rubber, selective column tabulation			O	703171 3/4	
			P	703594		
			Q	1-703162R No. 1 includes A, O, P, S		
			R	703805		
			S	1-703171 1/2R No. 2 includes O, P		
			T	1-703171 1/2L No. 2 includes O, P		

SEE EXPLANATION ON INSIDE OF FRONT COVER

VERTICAL FEED BAR (Plate 11)

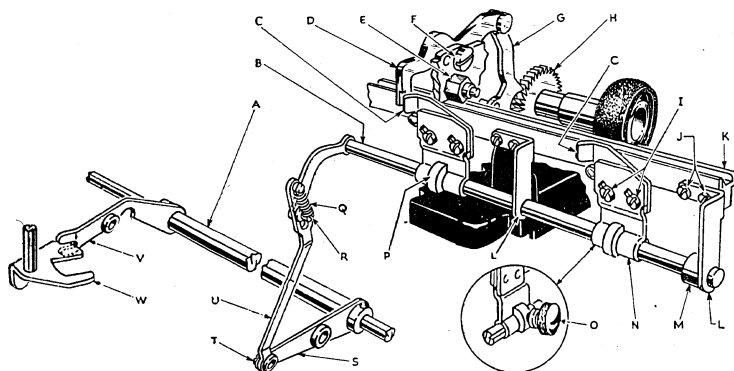


SYMBOLS (Plate 11)

A	72208 No. 2	O	77512A Screw, 46 nut	AJ	1-72700 No. 5
B	Included in C	P	75830	AK	72572 No. 2 Screw, 72324 collar
C	1-72036A specify machine No., includes B and V	Q	82809	AL	72119 No. 2 tab.
	1-702036A No. 1 for clear signal	R	75150	AM	2-72125 No. 3 blank
	11-702036A No. 1 for clear signal and cr. bal.	S	1-72700 No. 6 for Cl. 72	AN	72119 No. 1 non-space
	21-702036A No. 1 for clear signal, cr. bal. and cr. register symbols	T	1-72700 No. 1 for Cl. 76, 77	AO	1-72301 No. 2
D	11B-75014	U	1-72700 No. 7 includes AS, AT	AP	1-72301 No. 1
	21B-75014 for Cl. 78	V	72524 for early Style AX	AQ	1-72017
	1B-705014 for Cl. 77	W	1-72100 No. 2*	AR	77517 No. 1
E	72148 Nos. 1 to 7 specify machine no.	X	72810	AS	49 1/4 included in T
F	72567	Y	77525	AT	72110 No. 1 included in T
G	1-72221	Z	1-75147 No. 2 for Cl. 78, included in AD	AU	79511
	1-72221 No. 3 for Cl. 78	AA	1-77129* on 77000 shaft	AV	1-75332
	1-702221A No. 1 for Cl. 77	AB	1-75126	AW	77529
I	1-75146	AC	75636	AX	1-75149 Cl. 72
J	Included in L	AD	11-75148 No. 2 for Cl. 78		1-705149 No. 3 Cl. 78
K	1-75147*	AE	71538		1-705149 No. 1 Cl. 77
L	1-77122 No. 2	AF	75512 No. 1	AY	1-73808
	1-77122 No. 3 for Cl. 77	AG	75356 Roller, 702656 screw	AZ	1-73016 Style 12, 15, 18
M	75830	AH	75830	BB	73233 early
N	1-75148 No. 2 includes K; for machines with positive reg. control, not Cl. 78	AI	1A-75901		73233A later, uses 73605 screw, 73333 roller
			1B-705901 No. 2 (1-705901 No. 2, 1-75217, 74502) for Cl. 77	BC	73606A
				BD	1-73222AR uses 73805 spring
				BE	1-73258R 25 or 28 tooth

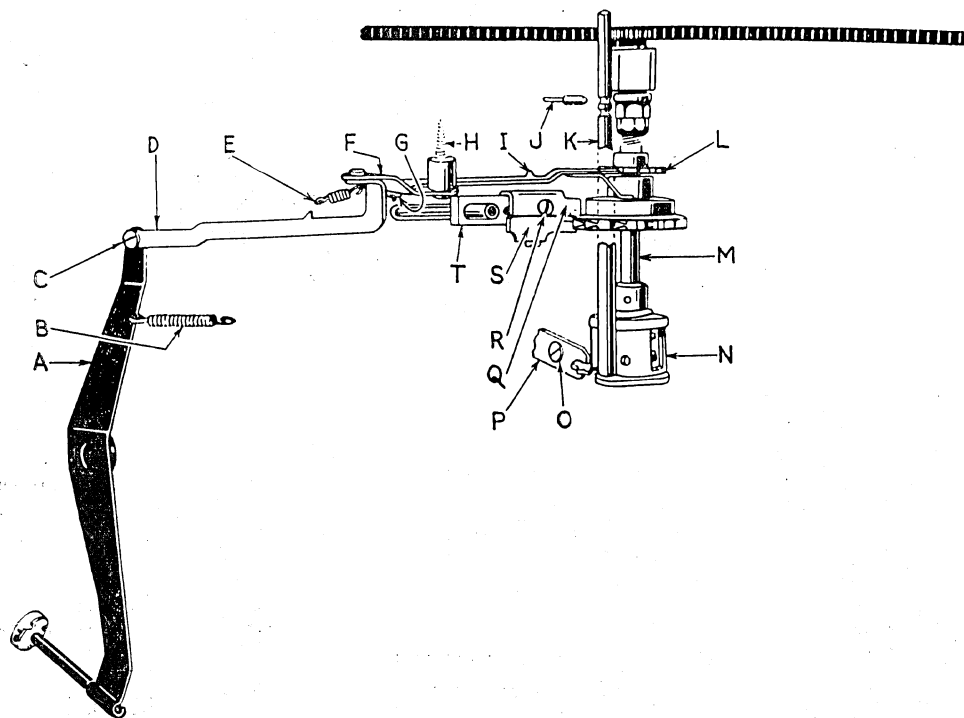
CARRIAGE RETURN SPACING MECHANISM (Plate 12)

SYMBOLS (Plate 12)



- A 1-75005 includes S, V
- B 1-75029A
- C 75224 1/2
- D 73223* included in G
- E 703533
- F 73564A
- G 1-73222L
- H 1-73258L No. 1, 25 or 28 tooth, use 73617 screw
- I 72592
- J 73548
- K 1-73967 No. 1 Style 12, 18 use Style 12 for Style 15 cge.
- L 73218
- M 1-75376 includes 75616 screw
- N 1-75224B No. 1 includes C, I
- O 75607
- P 11-75341A (75341, 75607)
- Q 76806
- R 706508
- S 1-75221*
- T 79503
- U 1-75222A
- V 1-75203*
- W 1A-75023A

BACK SPACE LEVER (Plate 13)



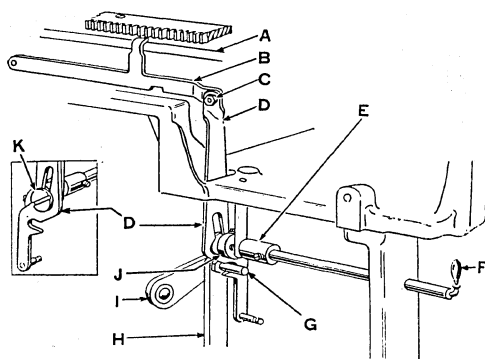
SYMBOLS (Plate 13)

- A 1-75112A No. 2 uses screw 73605, includes B
- B 1-705112 No. 2 for Cl. 75 and 77, includes B
- C 75819
- D 3489 for Cl. 75 and 77
- E 75645 Screw, 49 1/4 nut
- F 1-75175 (1-75175A, 1A-75283) includes F
- G 89800
- H 1-75196* included in D
- I 73607
- J 75646
- K 1-75182
- L 75561
- M 1A-75023A

- N 11-75023A for narrow base machines with Style 30 cge.
- O 1-75331* included in M
- P 1-75009 see plate 21, power symbol list
- Q 1-75353 (1-705353)
- R 79503
- S 1-75203* included in 1-75005
- T 75203 No. 2 (705203 No. 3, 1-75222B) for narrow base machines with Style 30 cge.
- U 75169
- V 70512
- W 75168 uses screw 75634
- X 75906A complete assembly 1A-75022 includes R, S and spring 203823

SEE EXPLANATION ON INSIDE OF FRONT COVER

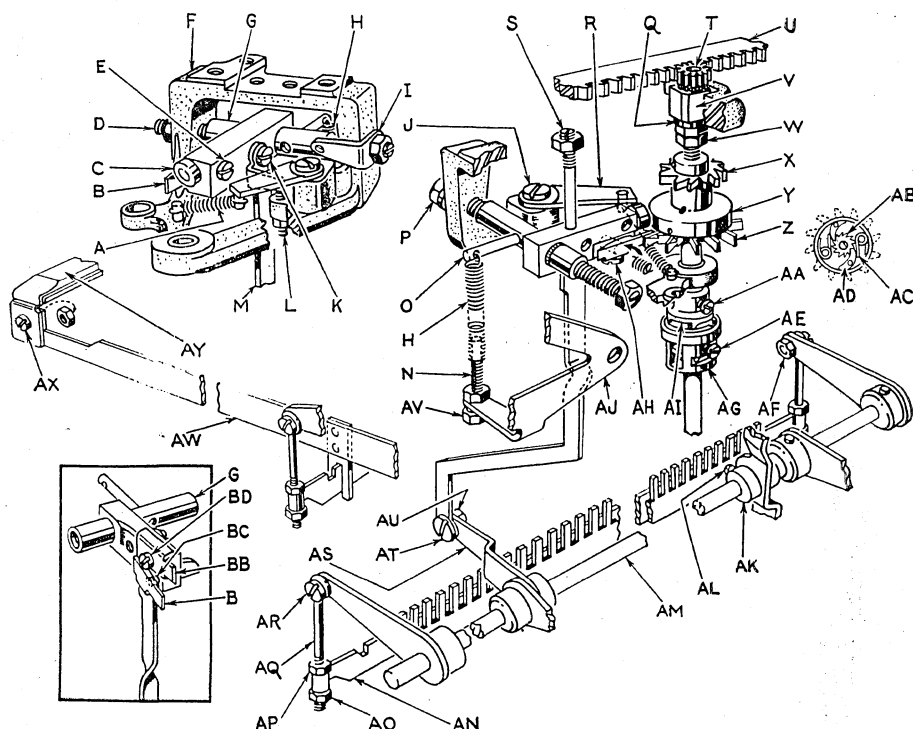
SPACE OR NON-SPACE CONTROL, EARLY (Plate 14)



SYMBOLS (Plate 14)

- A 1-73016 Style 12, 15, 18
- B 75126
- C 75636 Screw, 49 1/4 nut
- D 75148 No. 1
- E 75021* uses screw 75613
- F 1-75020 includes E
- G 77512A Screw, 46 nut
- H 1-77122 No. 1
- I 1-77120*
- J 1-75320
- K 75636

ESCAPEMENT AND SPACE BAR MECHANISM (Plate 15)



SYMBOLS (Plate 15)

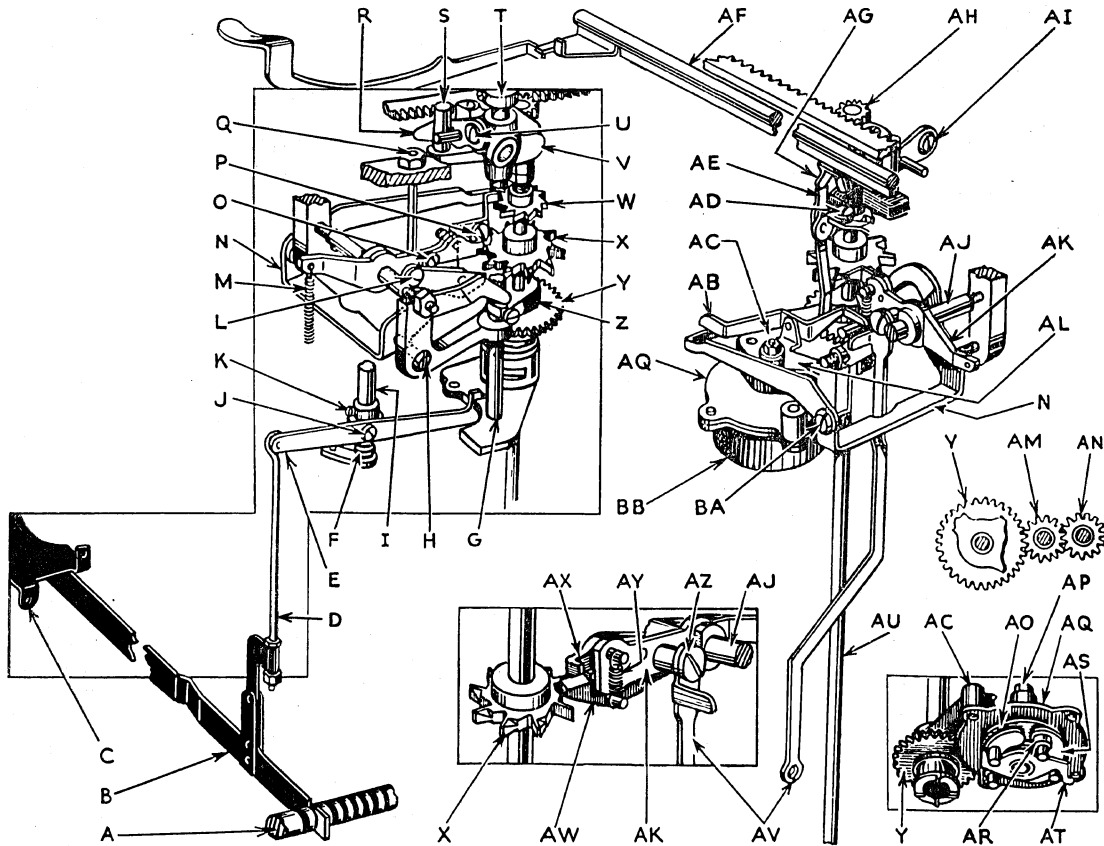
- A 10783
- B 75168 Flex. dog, use compression spring 203823
- C 75315 (705356A) Roller, 75555 pin
- D 75658
- E 73548
- F 75674B* assembled 1-75674B includes A, B, C, D, E, F, G, J, R, O, P, AH
- G 1A-75022 includes B, C, E, O, AH
- H 75813
- I 75165 (20 No. 100)
- J 73608 (72565)
- K 71546
- L 75657 use 46 nut
- M 75154
- N 75659
- O 75523* (705625*)
- P 45
- Q 75350*
- R 1-75164
- S 75655 Screw, 47 nut

- T 1-75009 includes Q, V, W, X, Y, Z, AB, AC, see plate 21, power symbol list
- U 73917 Style 12, 15
- V 73917 Style 18 (1-73917A Style 18)
- W 75905*
- X 75355*
- Y 1-75331*
- Z 1-75322*
- AA 1-75229
- AB 72573
- AC 75328* included with Z
- AD 75827 Coil spring
- AE 75230 Ratchet
- AF 75616
- AG 49 1/4
- AH 1-75353 (1-705353)
- AI 75634
- AJ 1-75323 No. 1 includes AA
- AK 75239A* assembled 1-75239A
- AL 1-75332
- AM 75618 Screw

- AN 75014* assembled shaft 1B-75014, early, assembled shaft 21B-75014, later, includes AK, AS
- AO 705014* assembled shaft 1B-705014 used for wide base construction
- AP 1-75187 includes AO, AP, AQ
- AQ 49 1/2
- AR 49 1/2
- AS 75700 No. 1
- AT 72572 No. 2
- AU 1-75190*
- AV 72582
- AW 49
- AX 1-75110 No. 18R (11-75110 No. 18R)
- AY 73562, 49 nut
- AZ 1-75225
- BA 75169 stationary dog
- BB 75823 (203823) Spring
- BC 70512
- BD 70512

Specify machine number

ESCAPEMENT FOR STYLE 30 CARRIAGE WITH EARLY STYLE GOVERNOR, CLASS 77 (Plate 16)

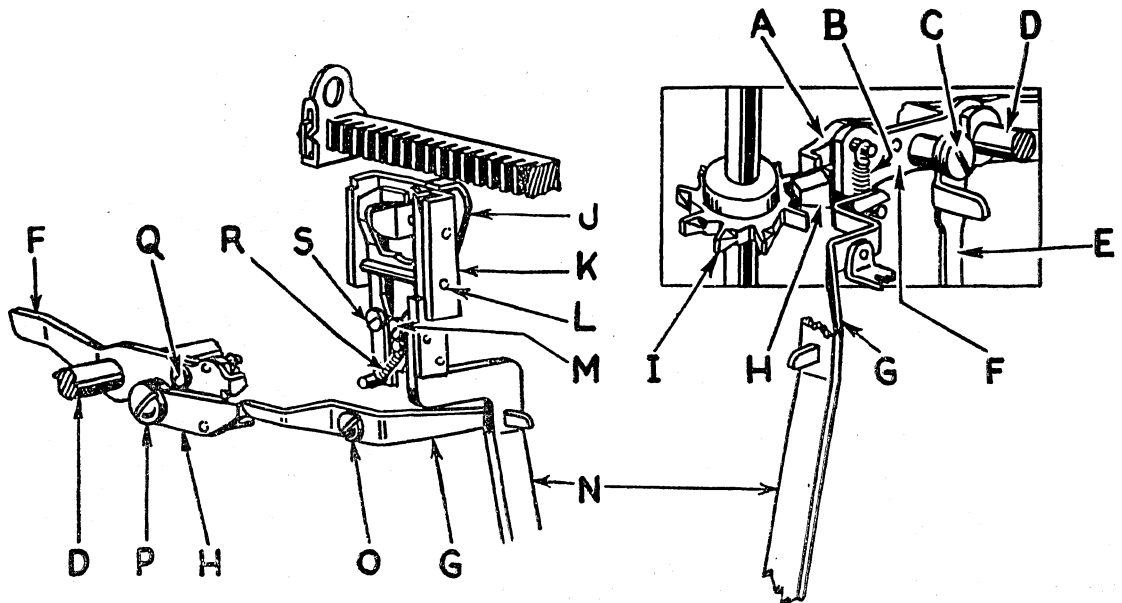


SYMBOLS (Plate 16)

A 705000 (705000 No. 2)
 B 1-705110 No. 2
 C 705237 uses screws 73562 and 72567
 D 705700 uses two 49 1/4 nuts
 E 1-705115 includes D and screw 72572 No. 1
 F 705802
 G 1-705023
 H 3656 1/4
 I 1-705008
 J 79503 Screw, 705313 collar
 K 8359 included in 1-8345
 L 705569
 M 75813 used with 75659 headless screw, 47 and 79331 No. 1 nuts
 N 705267A included in AC
 O 74502
 P 76528
 Q 75655 Screw, 47 nut
 R 1-705172
 S 705526A
 T 1-705311 (1-705311A) includes screw 75618
 U 3960 Screw, 1417 No. 2 washer
 V 1-705673A No. 1 includes R, S, U
 W 1-75331* included in AH
 X 1-75229 included in AH
 Y 1-705260 includes 705523A screw
 Z 1-705906 includes screw 73548
 AB 705168 uses 76528 screw
 AC 2-705674A No. 1 (2-705674C No. 1) includes F, I, K, N, AB, AL, AM, AN, BB

AD 9053 5/8
 AE 1-705136A (1-705136B, 705168B) uses screw 76558
 AF 703018 Style 30 (703018A Style 30, 703514 Style 30)
 AG 1-705134 uses screw 9053 5/8
 AH 1A-705009 (1B-705009) includes W, X, see plate 21, power symbol list
 AI 3960 Screw, 1417 No. 2 washer
 AJ 1-705022 (1-705022A, 75655A) complete assembly includes AK, AV, AW, AX, AZ
 AK 1-705166*
 AL 705265 uses screws 70512 and 7562
 AM 705308 (705308A, 705524A)
 AN 1-705578 (1-705578A, 3819 1/8, 1097 3/4, 46) use pin 99513
 AO 1A-705276 includes AR, AS
 AP 1097 3/4 Washer, 46 nut
 AQ 1-705261A includes AO, AR, AS, AT
 AR 705539
 AS 1-705263A
 AT Included in AQ
 AU 1-701010 No. 1
 AV 705154 (705154A)
 AW 1-705169 uses screw 705569
 AX 705167 (1-705022A) uses screw 74502
 AY 2887 1/2
 AZ 705518 Screw, 2841 3/4 B collar
 BA 12059 1/2 Screw, 705277 washer
 BB 1-705262A includes AO, AP, AQ, AR, AS, AT

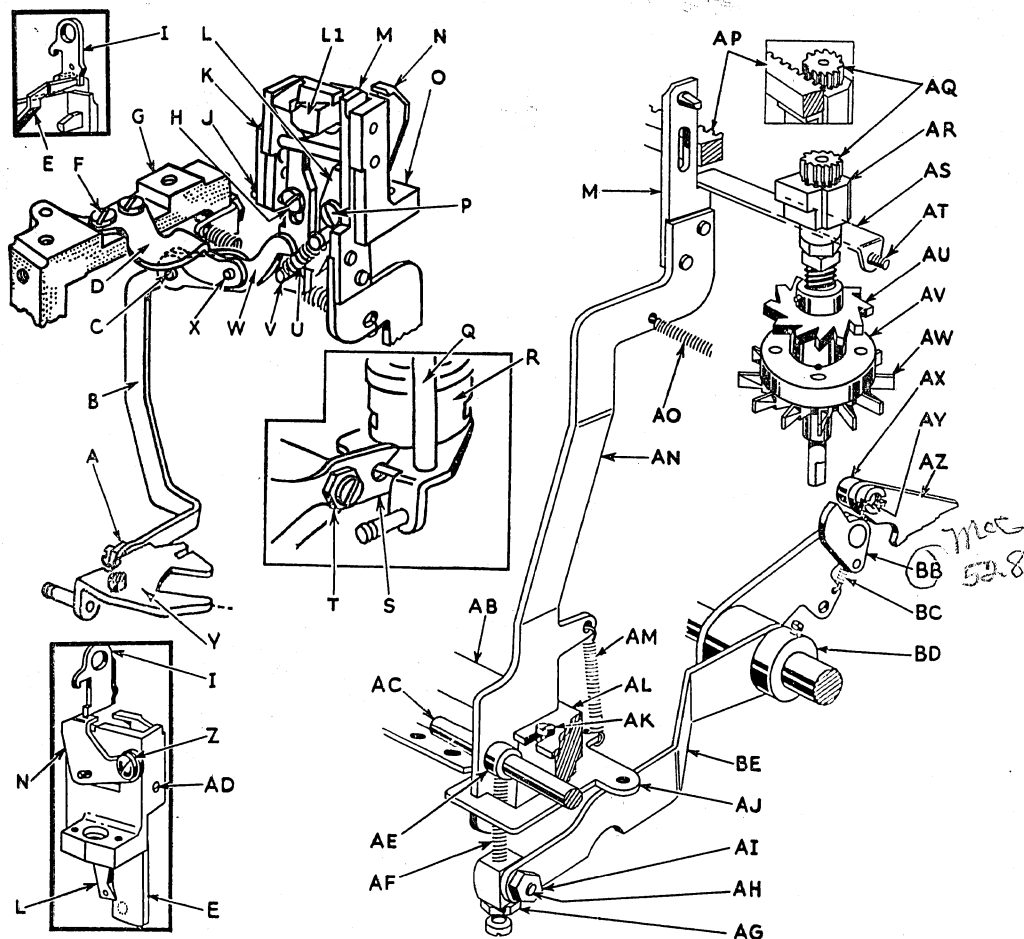
TABULATING MECHANISM, STYLE 30 CARRIAGE (Plate 17)



SYMBOLS (Plate 17)

A	705167 (1-705022A)	J	705155 uses screw 75641
B	2887 1/2	K	1A-705938A No. 1 includes J, L, M, R, S
C	705518 Screw, 2841 3/4 B collar	L	75567
D	1-705022 (1-705022A, 75655A) includes A, C, E, F, H, P, Q	M	75640
E	705154 (705154A)	N	1-75197A
F	1-705166*	O	76528
G	705168A (705168B, 1-705136B)	P	705569
H	1-705169	Q	74502
I	1-75229 included in 1B-705009 see plate 21, power symbol list	R	10784
		S	75639

AUTOMATIC TABULATING MECHANISM (Plate 18)



SYMBOLS (Plate 18)

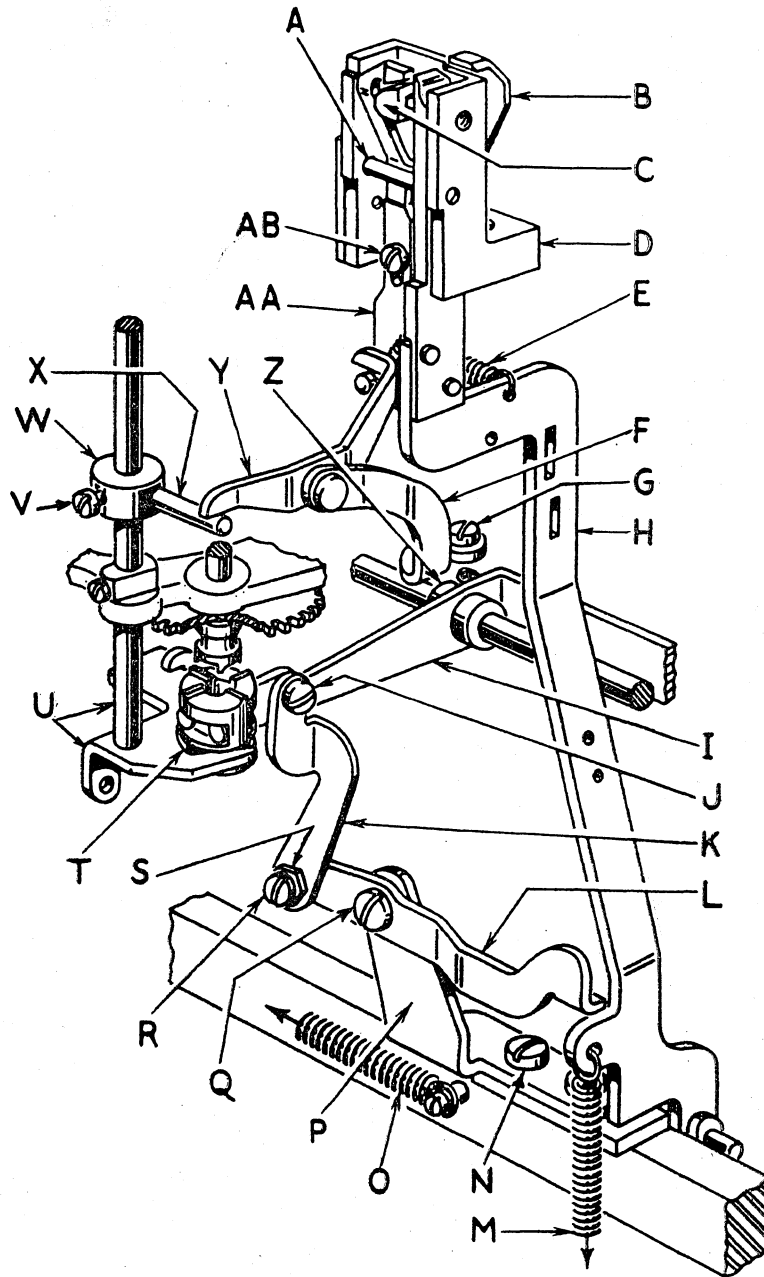
A 71361 Eccentric, 79543 screw
 B 75249
 C 79503
 D 75247
 E 1-75152A No. 2
 F 7357 1/2
 G 1-75674B early, assembled casting includes B, C, D, F, W, X
 H 1A-75674B later
 I 75639
 J 1-73201A No. 2
 K 73548 use 705573 screw for Style 30 cge.
 L 75152 1/2 use 705152 1/2 plate for Style 30 cge.
 M 1-75153A
 N 1-75151A tip on tab stem, use 79558 rivets
 O 75155 (705155A)
 P 705155 for Style 30 cge.
 Q 1-75938A No. 2 use screw 73561, assembled block 12A-75938A No. 2, used for Style 12, 15, 18 cge. includes E, H, J, K, L, M, N, O, P, U, V, Z, AD, AN; assembled block 2A-75938A No. 2 used for Style 22 cge., assembled block 1A-705938A No. 1 used for Style 30 cge.

P 75640
 Q 1A-75023A includes Y
 R 1-75353 (1-705353)
 S 1-75284A
 T 72307 Eccentric, 7357 1/2 screw
 U 10784
 V 79614
 W 75248
 X 72627
 Y 75171A*
 Z 75641
 AB 1A-75901 early
 11A-75901A (1-75901B, 1-75217, 74502, 2 req.) later
 1B-705901 No. 2 (1-705901A, No. 2, 1-75217, 74502) used for wide base construction
 AC 1-75015A No. 2 includes AE
 AD 75567
 AE 75316*
 AF 71543
 AG 79331 No. 1
 AH 71544
 AI 47
 AJ 75122 use screw 7062
 AK 73611

AL 75192 (705192 No. 1) Limit plate for AN
 AM 75828 (405801)
 AN 1-75197A used for Style 12, 15, 18, 30 cge.
 11-75197A used for Style 22 cge.
 AO 984
 AP 73917 Style 12, 15
 73917 Style 18 (1-73917A Style 18)
 AQ 1-75009 includes AR, AU, AV, AW, see plate 21, power symbol list
 AR 75905*
 AS 75170
 AT 75643
 AU 1-75331*
 AV 1-75322*
 AW 1-75229
 AX 71301A
 AY 71500A
 AZ 1A-71125*
 BB 1-71136 use screw 71542
 1-701136
 BC 71803
 BD 1-71330 use screw 550 3/4
 BE 71140* assembled 1-71137, early, includes AF, AG, AH, AI, BB, BE assembled 1-71137 No. 2, later

TABULATOR ARM AND CARRIAGE RETURN CLUTCH INTERLOCK (Plate 18-1)

All Styles Except Selective Column Tabulation



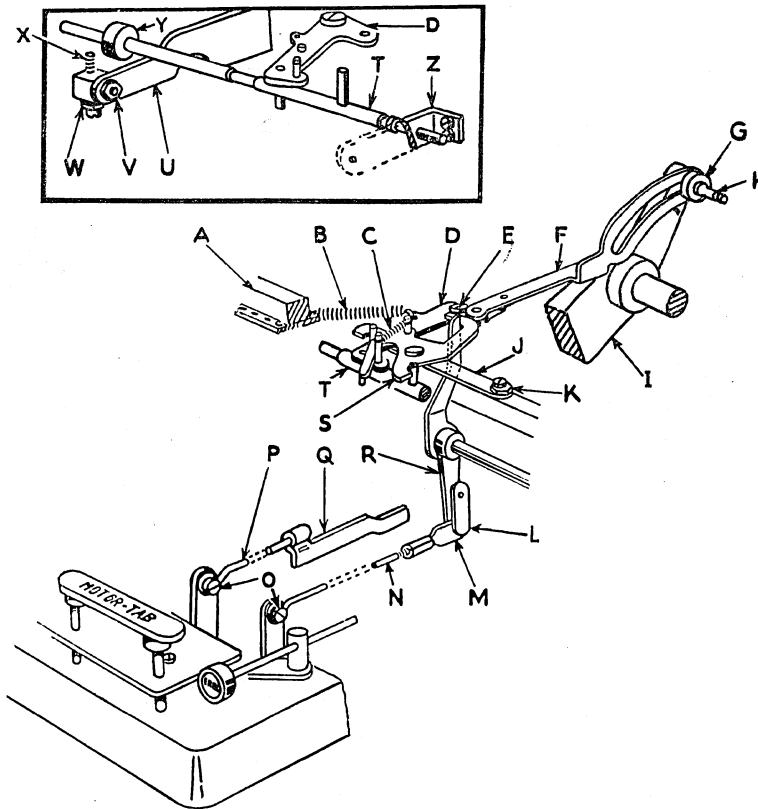
SYMBOLS (Plate 18-1)

A 75567 Long screw
 B 705155 use 75641 screw
 C 75510A* included in D
 D 1A-705938A No. 1 assembled tab block
 for wide and narrow base machines,
 includes A, B, C, H, AA, AB
 E 984 Spring
 F 1-705265B includes Y
 G 74531
 H 1-75197A
 I 705203 No. 3

J 70507 Screw
 K 75197 1/4
 L 75197 1/2
 M 75828 (405801)
 N 2854 1/8
 O 8084A
 P 75197 1/4
 Q 104518
 R 79543 Screw

S 104380 Ecc.
 T 1-705353
 U 11A-75023A
 V 11-705023
 W 12055 1/2
 X 1-75381 includes V, X
 Y 75500 1/2* included in W
 Z 705265 1/2* included in F
 AA 1-28345 Collar, includes 75618 screw
 AB 1-75152A No. 2 use 75831 spring
 AB 75639 Screw

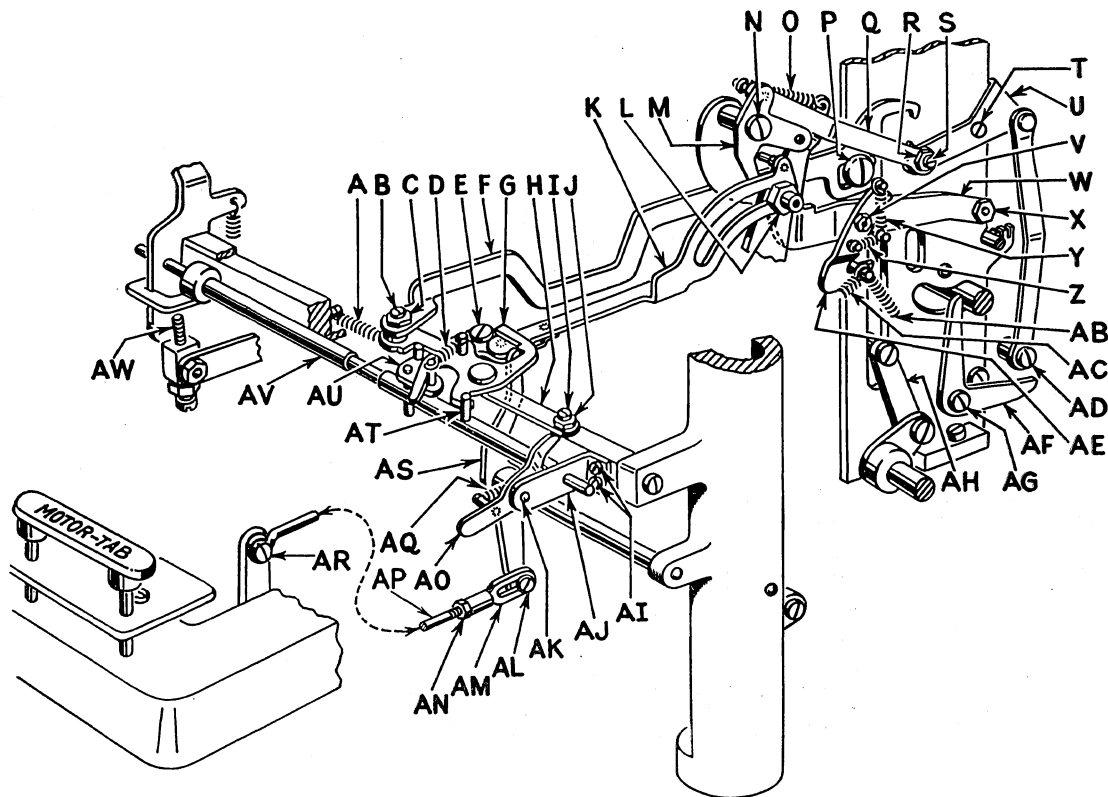
AUTOMATIC TABULATION CONTROL (Plate 19)



SYMBOLS (Plate 19)

- | | | | |
|---|---|---|------------------------|
| A | 11A-75901A (1-75901B, 1-75217, 74502, 2 req.) | 1-75107 No. 2 used with ege. tab on 2nd stroke, Cl. 78 | |
| B | 1B-705901 No. 2 (1-705901A No. 2, 1-75217, 74502) used for wide base machines | 71361 use screw 79543 | |
| C | 10780 early | 10213 1/4 * | |
| D | 8084A later | 72110 No. 2 use 79503 screw | |
| E | 2887 1/2 | 1A-72710 | |
| F | 1-75108A | 1-72710 early | |
| | 73608 (72656) | 72572 No. 1 | |
| | 1-75105 (1-75105Z) used for narrow base machines | 72707 No. 2 | |
| | 11-75105 (1-75105Z) used for ege. tab on 2nd stroke, Cl. 78 | 1-72102 No. 2 | |
| | 1-705105 used for wide base machines | 1-75159 No. 2* assembled on 21B-75014 | Specify machine number |
| | 11-705105 used for ege. tab on 2nd stroke, Cl. 78 | 1-705159* assembled on 1B-705014 | |
| G | 1-75332 includes screw 75618 | 1-75135A* | |
| H | 701521 use 45 nut | 1-75015A No. 2 includes Y | |
| I | 1-71121* assembled on 61A-71001 narrow base | 71140* assembled 1-71137 early, assembled 1-71137 No. 2 later | Specify machine number |
| J | 1-701121A* assembled on 61A-701001 wide base | 71544 Screw, use 47 nut | |
| | 1-75107B includes S | 79331 No. 1 | |
| | | 71543 | |
| | | 75316* | |
| | | 1-75217 use screw 74502 | |

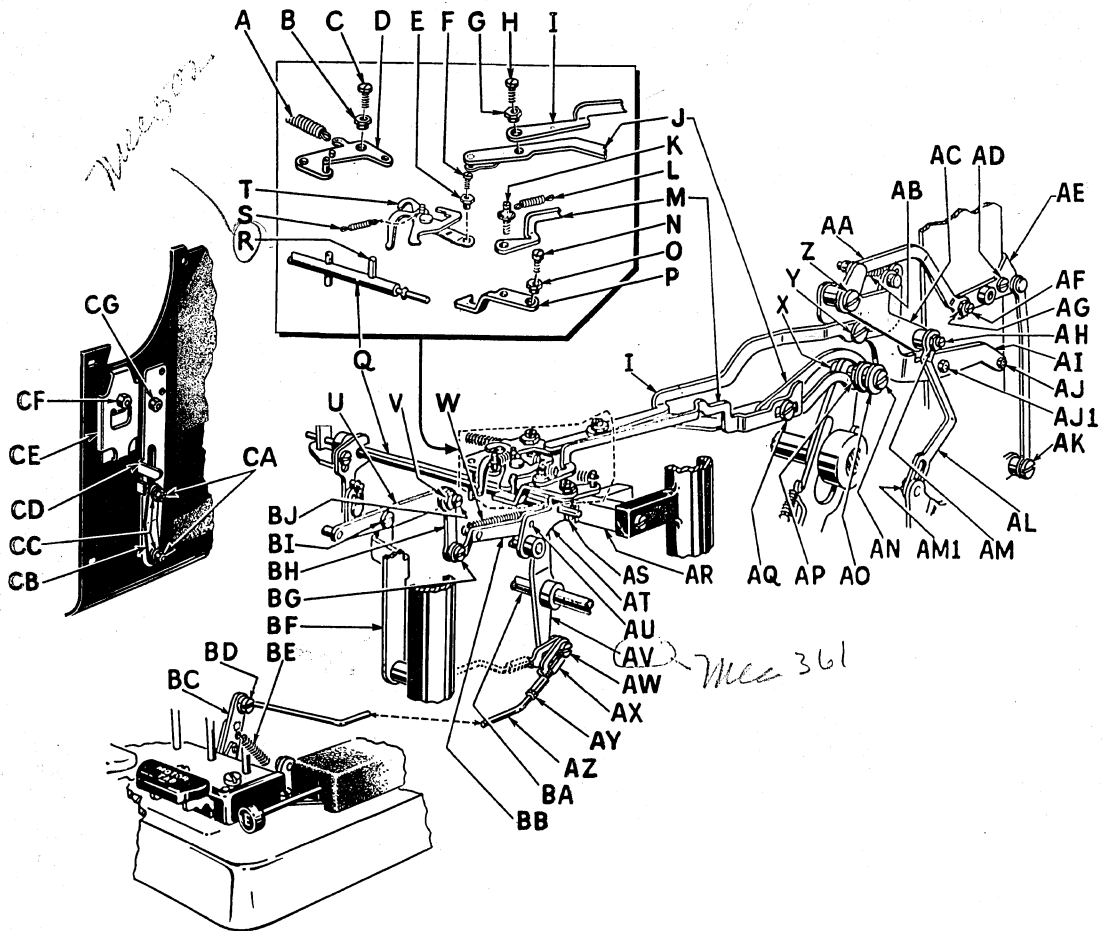
CARRIAGE TABULATION CONTROL FROM SUBTRACT OPERATION—EARLY CLASS 78, ALL STYLES (Plate 19-1)



SYMBOLS (Plate 19-1)

A	8084A	X	79610 use 46 1/4 nut
B	79543	Y	82809
C	104380	Z	73820
D	2887 1/2	AB	3489
E	73608 (72656)	AC	74803
F	1-75108 1/2	AD	72502 1/2
G	1-75135A* included in H	AE	1-74264
H	75107 No. 2* assembled 1-75107 No. 2 includes G	AF	1-74257
I	79543	AG	203644B (74597)
J	71361	AH	74123
K	11-75105 (1-75105Z)	AI	79543
L	11-705105	AJ	1-75217R
M	71524A (71394A, 71524B)	AK	79503
N	74261* assembled 1-74261	AL	707505
O	72629	AM	72110 No. 1
P	3282	AN	46 1/4
Q	74500 No. 3	AO	1-75237A
R	74262* included in M	AP	1A-72710
S	71361	AQ	3981
T	72573	AR	72572 No. 1
U	74500 No. 2 (74500)	AS	1-75159 No. 2* assembled 21B-75014
V	1-74113B No. 2	AT	75508 1/2
W	72379 use 79565 screw	AU	75107A
	1-74263	AV	1-75015A No. 2
		AW	71543

CARRIAGE TABULATION CONTROL FROM SUBTRACT OPERATION— IMPROVED SERIES M—CLASS 78 (Plate 19-2)



SYMBOLS (Plate 19-2)

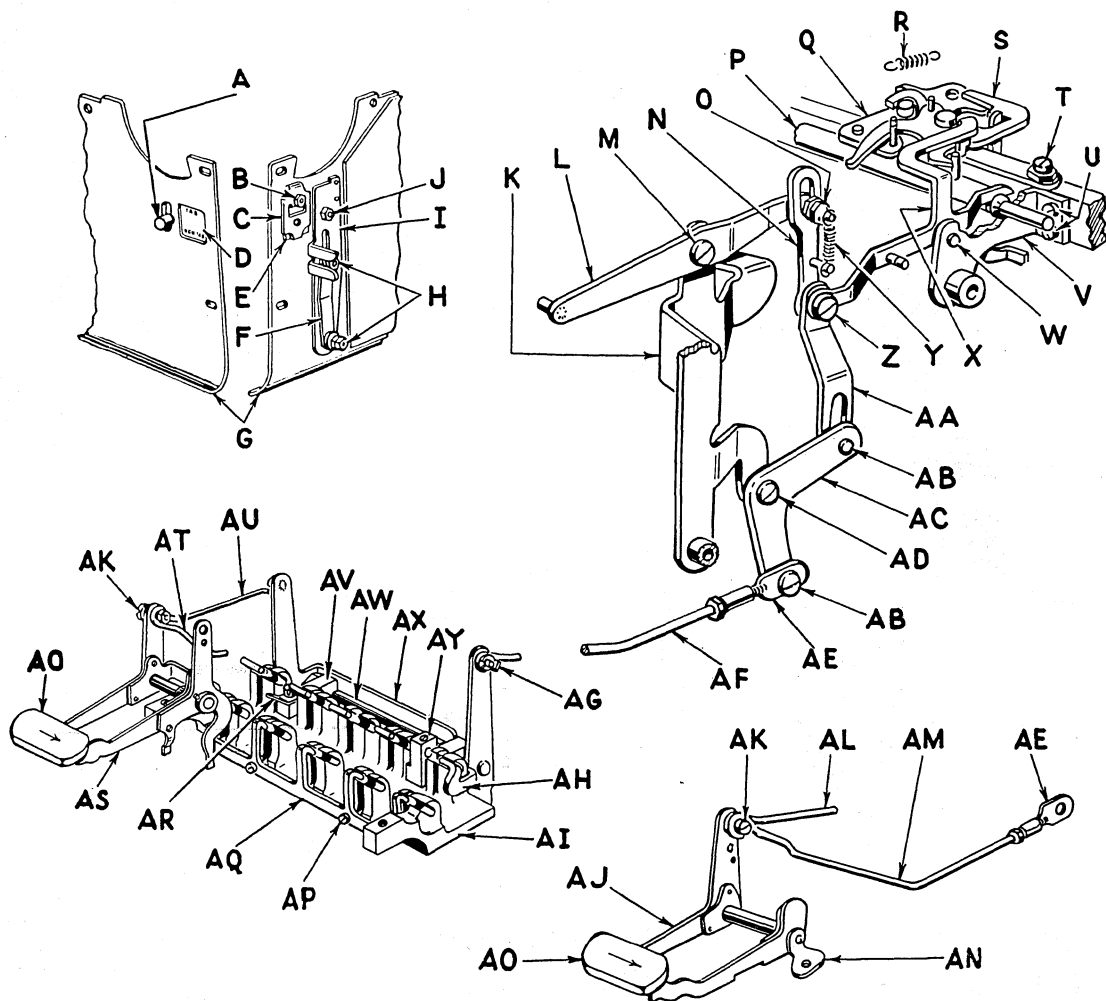
A 3880 1/2
B 71361 Eccentric
C 79543 Screw
D 1-75108A
E 71361 Eccentric
F 79543 Screw
G 104380 Eccentric
H 79543
I 1-705101 1/2
J 1-75105Z Narrow base
K 1-705105 No. 2 Wide base
L 72514 No. 2
M 72803
N 75105 1/2 Z Narrow base
O 705102 1/2 Wide base
P 79543
Q 104380
R 705103 1/2
S 1-75015B No. 2 includes R
T 75508 1/2
U 2887 1/2
V 1-75107B
W 705128 1/2
X 79333 No. 1 Eccentric
Y 1080 1/4 Spring
Z 315 Fte. 146
Y 10056

Z 72624
AA 704262* included in AC
AB 3282 Spring
AC 1-704261 includes AA
AD 74500
AE 1-74113B No. 2 Narrow base
1-704113C No. 2 Wide base, except
Sterling
1-704113 No. 4 Sterling
AF 72573 Screw
AG 71361
AH 74502
AI 1-704263
AJ 49 Nut, 74528 screw
AJ-1 46 1/4 Nut, 79610 screw
AK 72502 1/2
AL 123 Fte. 141 No. 2
AM 71361
AM-1 75638 Screw
AN 8054 3/4
AO 71394A Roller
AP 71524B Hexagon post
AQ 72599
AR 1-75901B Narrow base
11-705901A No. 2 Wide base
AS 74502 Screw, 2 req.

AT 1-75217AR
AU 74502 Screw, 71361 eccentric
AV 1-705159 No. 2* included in BA
AW 707505
AX 72110 No. 1
AY 49 3/8 Nut
AZ 1-702732 includes AX, AY
BA 21B-75014 Narrow base
31B-705014 Class 78, except 78 06 80,
78 08 80
51-705014 Classes 78 06 80, 78 08 80
BB 1-705237 1/2
BC 11-702117 1/2 No. 1
BD 72572 No. 1
BE 7780
BF 1-705129 1/2 use 2859 3/4 B screw, 2 req.
BG 76580
BH 705136 1/2
BI 104518
BJ 74523
CA 46 Nut
CB 705103 1/2
CC 12020 3/4 Washer
CD 705102 1/2 R&L
CE 705102 1/2
CF 46 Nut
CG 49 Nut, 1097 3/4 washer

CARRIAGE TABULATING MOTOR BAR TO DISABLE THE MANUAL NON-TABULATING CONTROL, SERIES M200 AND M800 (Plate 19-2A)

NOTE: This construction began with Machine Serial No. M6467D, M1537C, M2465E (M200) and M6400D, M1537C, M2237E (M800)



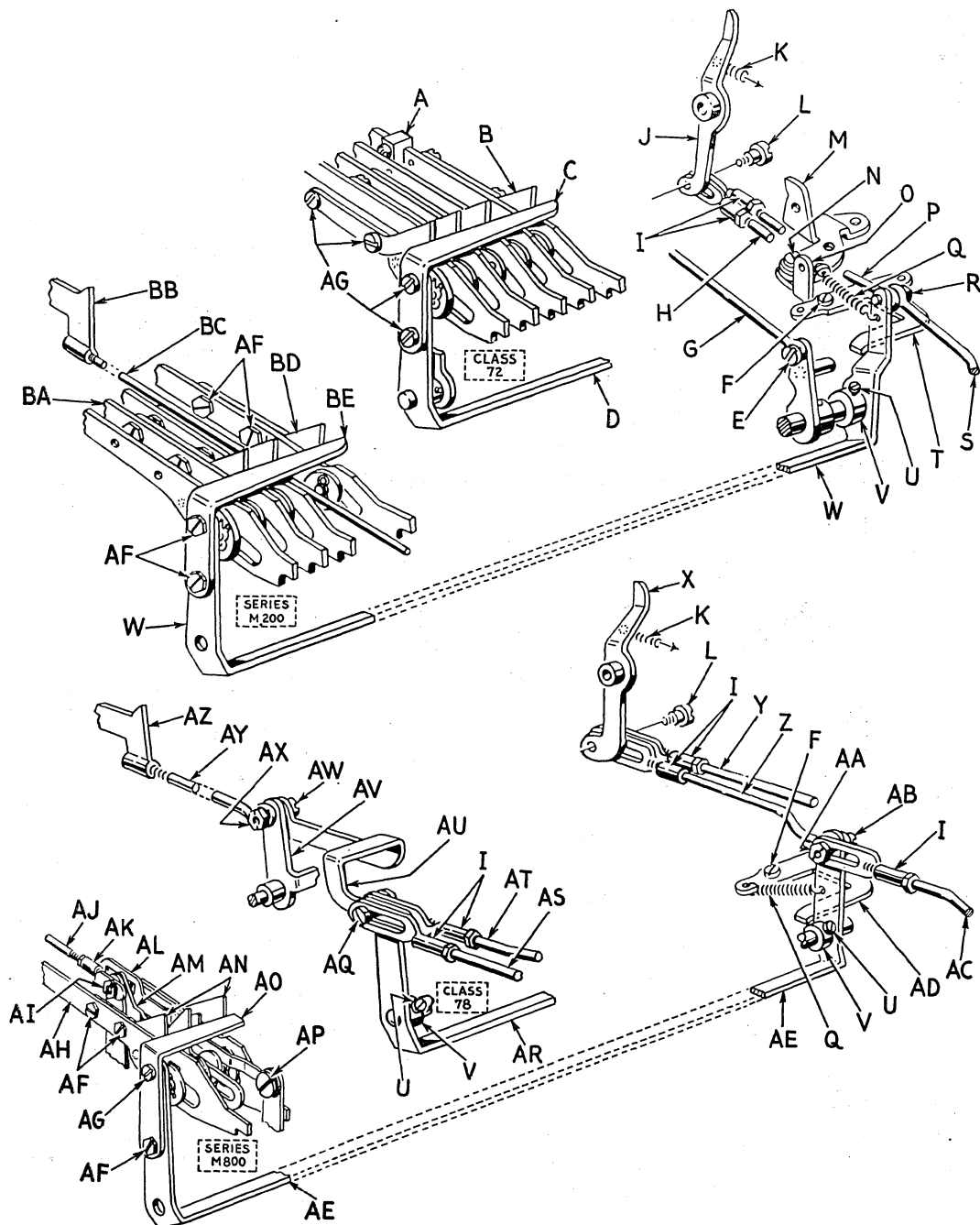
SYMBOLS (Plate 19-2A)

A 1A-705582 includes, 705916A keytop
 B 46 1/4 nut
 C 705102 3/4 clamp
 D 705920 No. 2 (NON TAB) cardboard
 E 705915 clear plastic
 F 705103 3/4
 G See Front Panel Controls, Key-board Symbol List, for all styles
 H 46 nut
 I 12020 3/4 washer
 J 705102 3/4 AR
 K 49 nut
 L 1097 3/4 washer
 M 1-705129 1/2
 N 1-705128 1/2 No. 2
 O 705508 1/2
 P 1-705136 1/2
 Q 71614 spring screw stud
 R 75342 eccentric
 S 1-75015B No. 2
 T 1-75108A
 U 2887 1/2
 V 1-75107B

T 79543 screw
 U 71361 eccentric
 V 74502 screws
 W 1-75217BR
 X 79503 screw
 Y 1-705237 1/2 A
 Z 10180 spring
 AA 76580
 AB 705151 1/2
 AC 79615 screw
 AD 705151 3/4
 AE 72599
 AF 72110 No. 6
 AG 1-702794 includes AE
 AH 21 No. 7 clip
 AI 122 Fte. 138
 AJ 77515 screws 2 req.
 AK 670A Fte. 138
 AL 1-702117 1/2 No. 2 Series M800
 AM 75631 screw
 AN 72324 nut
 AO 1-702732A
 AP 1-705712 includes AE, Series M800
 AU 140 Fte. 146

AO 2A-702125 No. 4 - (-2)
 AU 702625 slotted nut 2 req.
 AP 79624 No. 2, 2 req.
 AQ 72113 1/2 A
 AR 20 No. 116 spring anchor
 AS 1-702017 No. 3 shaft assembly, Series M200
 AT 1-702707 No. 2
 AU 702793
 AV 21 No. 7 clip
 AW 901AL Fte. 138
 AX 72614 screw
 AY 1A Fte. 138 shaft only
 AZ 1-1A Fte. 138 with mult. to C.F. sub-transfer bar (Pos. No. 111)
 BA 11-1A Fte. 138 without mult. to C.F. sub-transfer bar (Pos. No. 111)
 BB 1-702157 No. 27 bail
 BC 1-73337 collar left
 BD 75618 set screw side for holding bail
 BE 1-7140 3/4 collar right in position
 BF 550 3/4 set screw side
 BG 1A-901AR Fte. 138
 BH 72618A screw

CARRIAGE TABULATION—INDEXED FROM POWER RESULT KEY SECTION (Plate 19-3)



Symbols on Back

Replaces General Print 9-1/M

SEE EXPLANATION ON INSIDE OF FRONT COVER

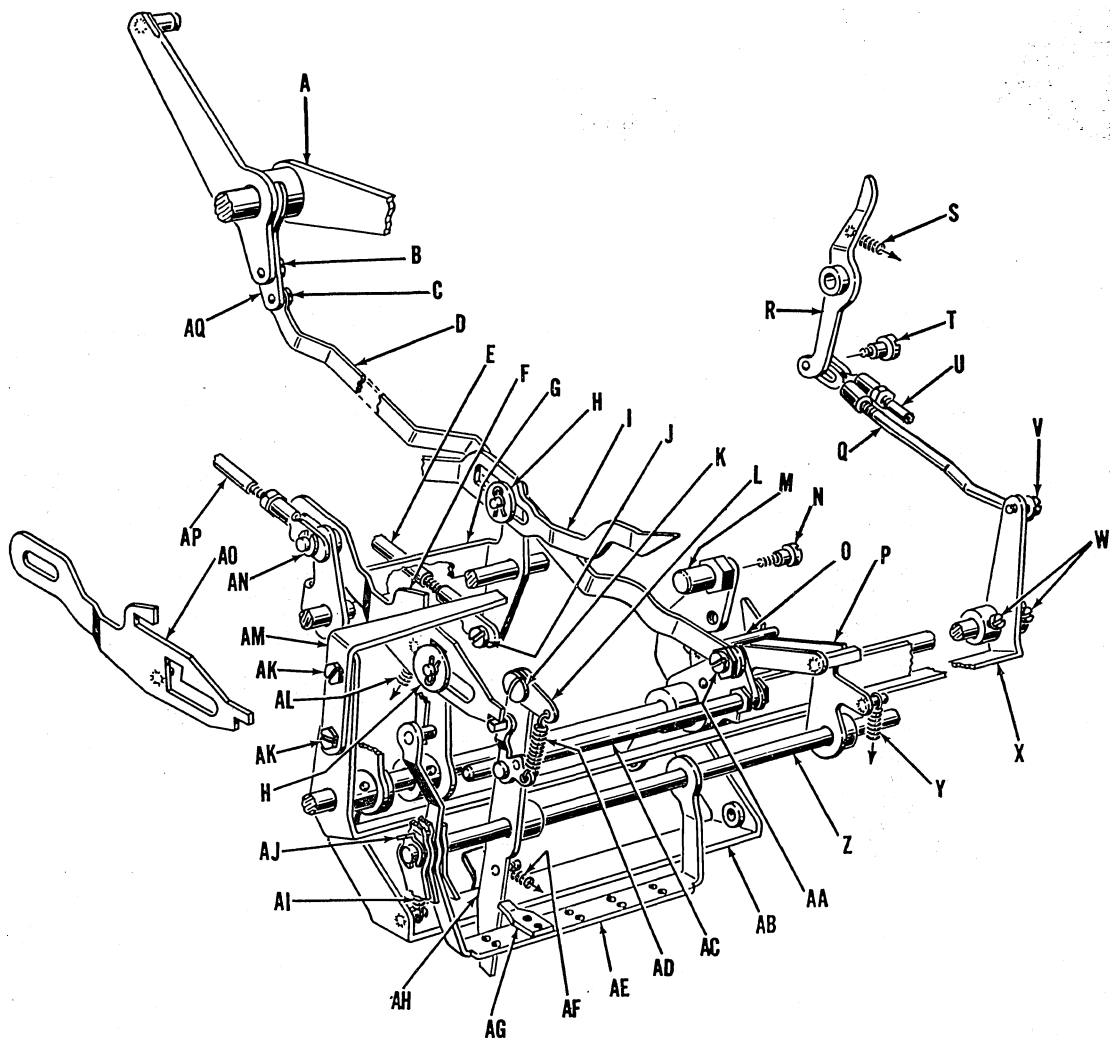
Printed in U. S. America 4-22-53

For Form 2951

SYMBOLS (Plate 19-3)

A	1-702906 includes, 702605 set screw	AH	1A-702171 No. 15 register total position
B	702227 $\frac{1}{2}$	AI	702610 screw, for machines with carriage controlled totals
C	702208 $\frac{1}{2}$		702659 screw, for machines without carriage controlled totals
D	702295 $\frac{1}{4}$ No. 2		71366 bushing nut
E	72572 No. 1	AJ	1-72714A No. 1 includes AK, minus balance position
F	72567	AK	72110 No. 5
G	1-702766	AL	702288 $\frac{1}{2}$
H	1-702707 No. 2 includes I	AM	702288 $\frac{1}{4}$
I	72110 No. 1	AN	702227 $\frac{1}{4}$ A
J	1-705159 No. 2	AO	702208 $\frac{1}{2}$ No. 2
K	2887 $\frac{1}{2}$	AP	709628
L	707505	AQ	72578 with 3 connections
M	702227		72542 with 2 connections
N	73659	AR	702295 $\frac{1}{4}$ A
O	702148 No. 3	AS	1-702714 No. 28 includes I
P	1-702761 includes I	AT	1-72714 No. 29 includes I
Q	99802 No. 2	AU	72293 $\frac{1}{4}$
R	514 Ftc. 146	AV	702289 $\frac{1}{4}$
S	1-702762	AW	702584 screw, used with link AU
T	702148 $\frac{1}{2}$	AX	72324 bushing nut, used with link AU
U	75618		72572 No. 1 screw, used without link AU
V	1-75332 includes U	AY	72714 No. 1
W	702295 $\frac{1}{4}$ No. 2	AZ	51B-72171 No. 1
X	1-705159 No. 2	BA	1A-702171 No. 13 link assembly for reg. total position
Y	1-702732 includes I	BB	31D-72171 No. 1
Z	1-702714A No. 6	BC	72700 No. 10 add C.F. wire
AA	71366	BD	702227 $\frac{1}{4}$ A
AB	75631	BE	702208 $\frac{1}{2}$
AC	1-708A Ftc. 146 includes I		
AD	702148 $\frac{1}{2}$		
AE	702295 $\frac{1}{4}$ A		
AF	9050 $\frac{1}{4}$		
AG	545 Ftc. 217		

CARRIAGE TABULATION—INDEXED FROM POWER SHAFT DURING CARRIAGE CONTROLLED BLANK MACHINE OPERATION, SERIES M 800 (Plate 19-3A)



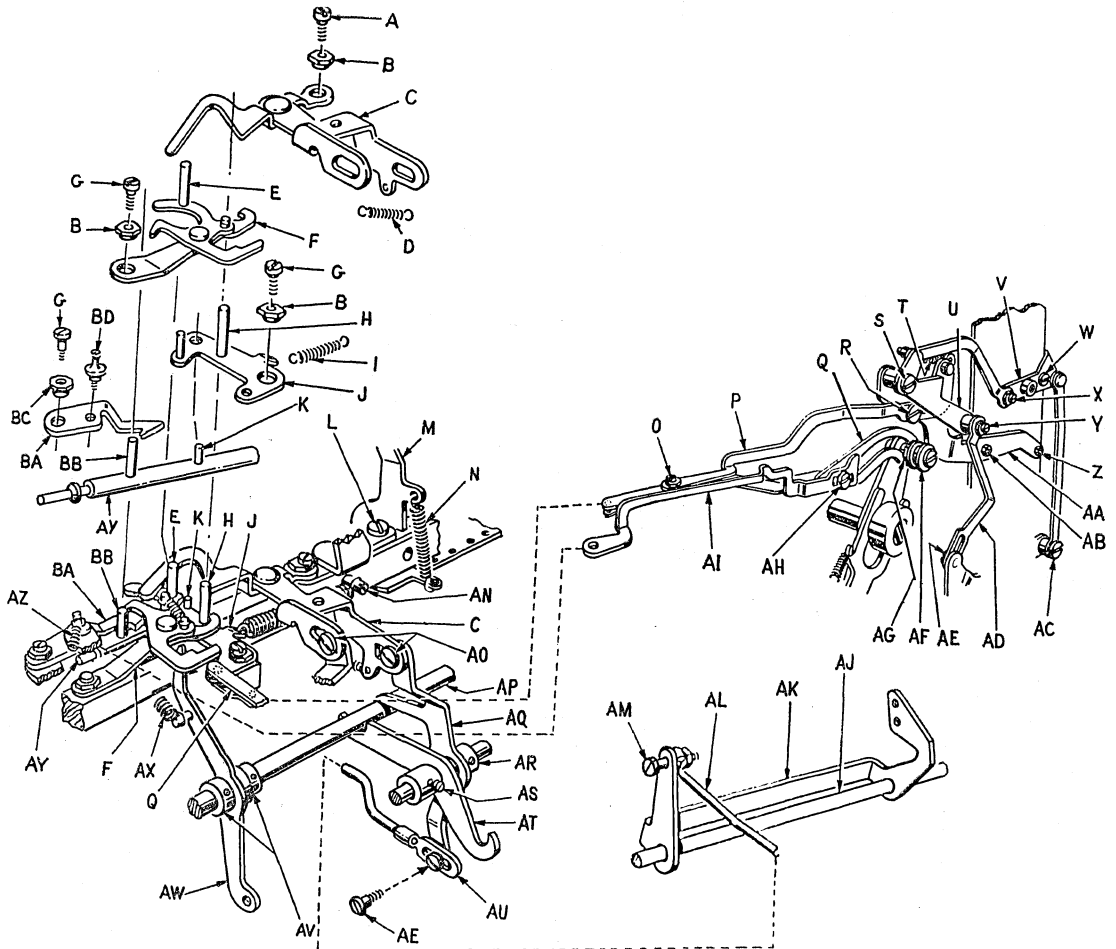
SYMBOLS (Plate 19-3A)

A 11-701143
B 70512 screw
C 79503 screw
D 702291 1/4 A No. 4
E 1-72714A No. 12 includes 72110 No. 5 turnbuckle
F 1-702288 3/4 A tabulation indexing link
G 1-702289 1/4 A No. 4
H 702221 3/4 washer
I 21 No. 15 clip
J 1-702291 3/4 B
K 79511 screw
L 709607 screw
M 20 No. 119
N 702347
O 702611
P 1-702207 1/2 No. 2
Q 1-702204 1/2 No. 2

Q 1-702714A No. 6 includes 72110 No. 1 turnbuckle
R 1-705159 No. 2
S 10784
T 72542
U 1-702732 includes 72110 No. 1 turnbuckle and 49 3/4 nut
V 75631 screw
W 71366 nut
X 1-75332 includes 75618 set screw
Y 702295 1/4 A
Z 83800A
AA 702037 1/2
AB 72581 screw
AC 72307 eccentric
AD 1A-702132 No. 2
AE 702623 post
AF 46 3/4 nut

AD 10180
AE 11-702201 1/2 No. 2 includes AG
AF 3489 3/4
AG 702201 3/4 No. 2 use 545 Fte. 217 screws 2 req.
AH 1A-702202
AI 681 1/4 spring
AJ 21 No. 9 clip
AK 702637 2 req.
AL 44805 spring
AM 702208 1/2 No. 2
AN 21 No. 2 clip 2 req.
AO 1-702288 3/4 A No. 2 non-tabulation indexing link
AP 1-72714A No. 1 includes 72110 No. 5 turnbuckle and 49 3/4 nut
AQ 701143 1/2

**CARRIAGE TABULATION—INDEXED FROM POWER RESULT KEY
SECTION—DISABLED DURING FIRST AND SECOND CYCLES OF
MINUS BALANCE OPERATION—SERIES M 800 MACHINES
(Plate 19-4)**

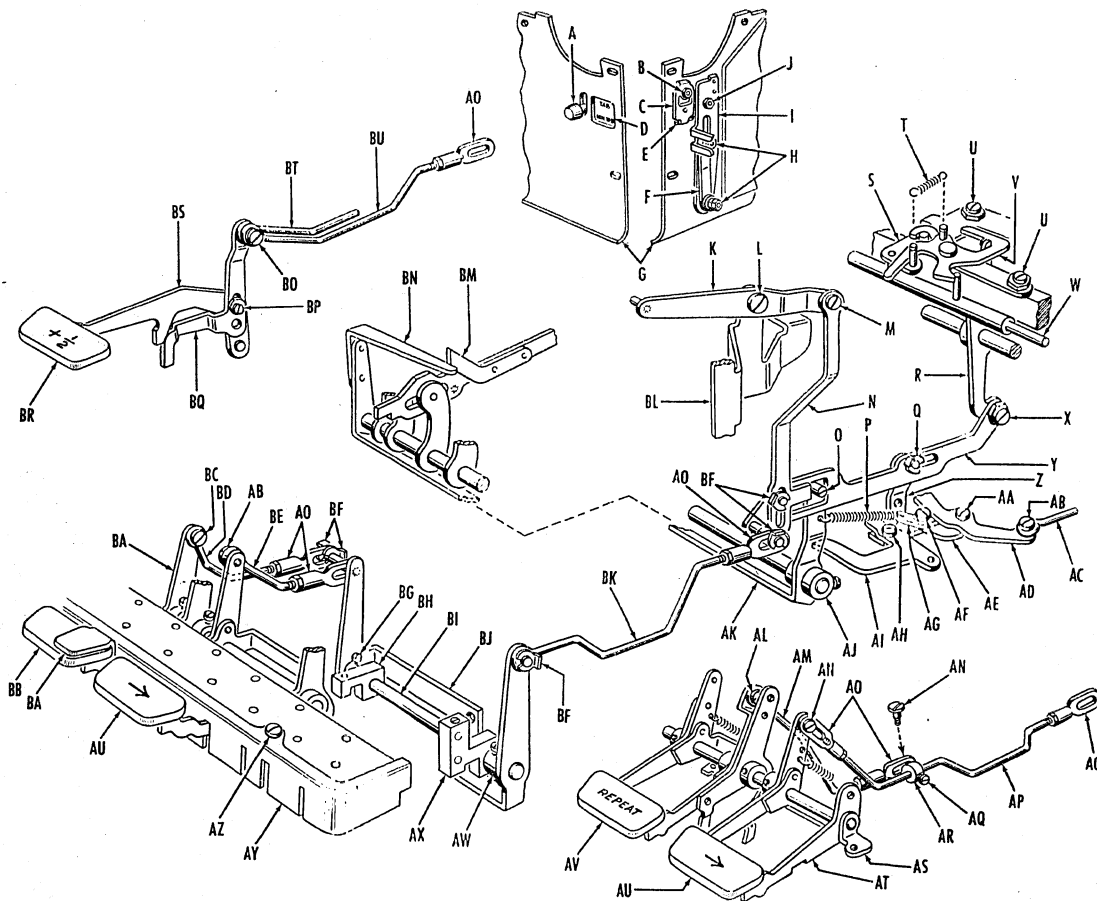


SYMBOLS (Plate 19-4)

A	70512	X	72573 screw	AM	514 Fte. 146 screw
B	71361		705367 eccentric		72324 nut
C	1-705119 1/4 No. 2	Y	74502 screw	AN	1062 1/2
D	79819		71361 eccentric	AO	709628
E	Included in F	Z	79610 screw	AP	61-705014 includes AV, AW
F	1-705107 1/4 includes E		46 1/4 nut	AQ	1-705149 1/2 No. 2
G	79543	AA	1-704263	AR	1-71321 collar, includes
H	Included in J	AB	74528 screw		75660 set screw
I	3880 1/2		49 nut	AS	70512 set screw
J	1-705108 1/4 includes H	AC	72502 1/2	AT	1-705145 1/2
K	Included in AY	AD	123 Fte. 141 No. 2	AU	72110 No. 1
L	2854 1/16	AE	75638	AV	1-75332 collars, includes
M	1-75197A	AF	8054 1/4 screw		75618 set screw
N	705828	AG	71394A roller	AW	1-705159 No. 2
O	79543 screw	AH	71524B hexagon post		1-705159Z No. 2 slotted blank for re-
P	705367 eccentric	AI	705102 1/2		pairs
Q	1-705101 1/2	AJ	3-702037 No. 4 carriage	AX	1080 1/4
R	1-705105 No. 2		controlled totals	AY	1-75015B No. 2 includes K, BB
S	10056		13-702037 No. 4 with-	AZ	76812
T	72624		out carriage con-	BA	705103 1/2
U	3282 spring		trolled totals	BB	Included in AY
V	1-704261	AK	Included in AJ	BC	705367
W	1-704113C No. 2	AL	1-702785 includes AU	BD	72514 No. 2
	74500				

CARRIAGE TABULATION AND NON-TABULATION FROM TOTAL AND CLEAR MULTIPLIER KEYS, CONTROLLED FROM FRONT PANEL, SERIES M 200 AND M 800 (Plate 19-4A)

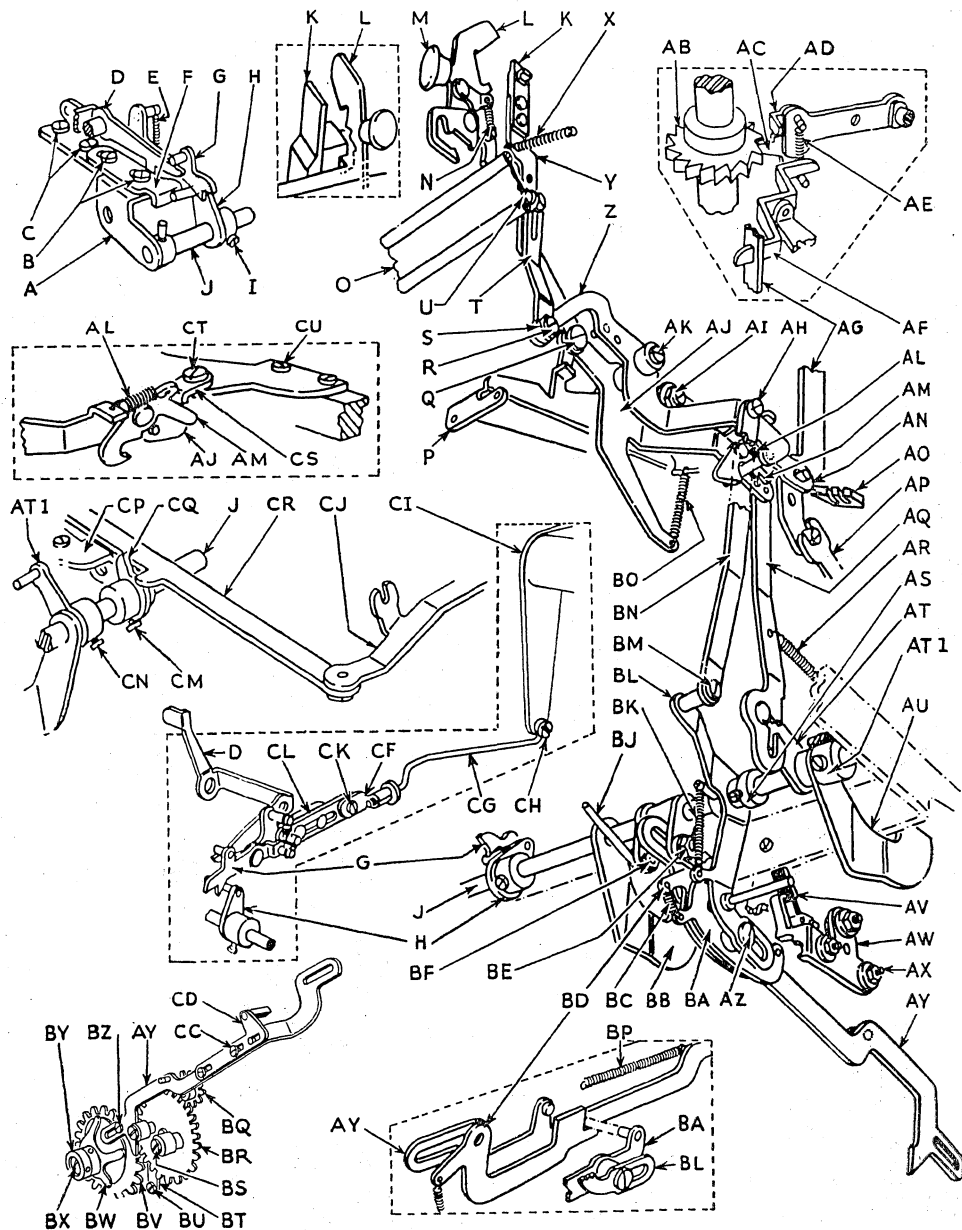
NOTE: This construction began with machine Serial No. M7859D.



SYMBOLS (Plate 19-4A)

A	1A-705582 includes 705916A keytop	Z	1-702148 No. 4	AY	702213½A No. 2
B	46¼ nut	AA	79552	AZ	74587
C	705102¾ clamp	AB	72572 No. 1	BA	702119A No. 2
D	705920 No. 2 (TAB) cardboard	AC	1-702714½ No. 10	BB	2A-702125 No. 4 Plain (-6)
E	705915 clear plastic	AD	702226	BC	72324
F	705103¼	AE	702227	BD	1-702796 includes AO
G	See Front Panel Controls, Key-board Symbol List, for all styles	AF	73659	BE	1-702793A includes AO
H	46 nut, 12020 1/16 washer	AG	20 No. 116 spring anchor	BF	21 No. 7 clip
I	705102¼AR	AH	72567	BG	1-73337 collar, includes 75618 set screw
J	49 nut, 1097 1/16 washer	AI	702148½	BH	901AL Fte. 138
K	1-705128½ No. 2	AJ	1-75332 includes 75618 set screw	BI	1A Fte. 138 shaft only
L	705508½	AK	702295¼ No. 2 for M 200		1A-1A Fte. 138 with mult. to C.F., sub-transfer bar (Pos. No. 111)
M	76580		702295¼A for M 800		11A-1A Fte. 138 without mult. to C.F. sub-transfer bar (Pos. No. 111)
N	702150½	AL	75631 screw	BJ	1-702157A No. 27
O	702514½ for M 200	AM	1-708B Fte. 146	BK	1-702794A includes AO
P	702515½ for M 800		1-702798 sterling only, use 72542 screw, 21 No. 20 clip	BL	1-705120¼A
Q	99802 No. 2	AN	79552	BM	702227½A
R	21 No. 8 clip	AO	72110 No. 1	BN	702208½
S	1-705159 No. 2	AP	1-702732A includes two AO	BO	514 Fte. 146
T	1-705108¼ for M 200 & M 800	AQ	72573	BP	705367 eccentric, 703592 screw
U	2887½	AR	1-72315 No. 1 includes AQ	BQ	72124B No. 1
V	71361 eccentric, 79543 screw	AS	140 Fte. 146	BR	2A-702125 No. 6 " + 1/2"
W	1-75107B for M 200	AT	1-702117½ No. 2	BS	1-702117B No. 3
X	1-705107¼ for M 800 & M 222	AU	2A-702125 No. 4 → (-3)	BT	72706
Y	1-75105B No. 2	AV	2A-702125 No. 4 Repeat (-5)	BU	1-702762A includes AO
	701573 screw, 203495 eccentric	AW	1-7140¼ collar, includes 550¼ set screw		
	1-702149½	AX	1A-901AR Fte. 138		

SELECTIVE SKIP TABULATION MECHANISM (Plate 20)



SYMBOLS (Plate 20)

A 1-702122L No. 2 includes E, G, CL
 B 73563
 C 73611
 D 702197
 E 283A
 F 702122½
 G 1-702140 use 253½ rivet
 H 1-702141
 I 51550
 J 1A-702037 No. 3 (1B-702037 No. 3, 705285A) includes BL
 K 1-705211 No. 1 tab tip, use 79558 rivets

L 1-703291A No. 1
 M 7291
 N 9285½
 O 1-703036 Style 22, 30
 P 1-705130
 Q 705557
 R 73611
 S 75342 Eccentric
 T 1-705148C includes U
 U 2841½B*
 V 77879
 X 1-705197B No. 4 includes K
 Y 1-705131A
 Z

Symbols continued on back

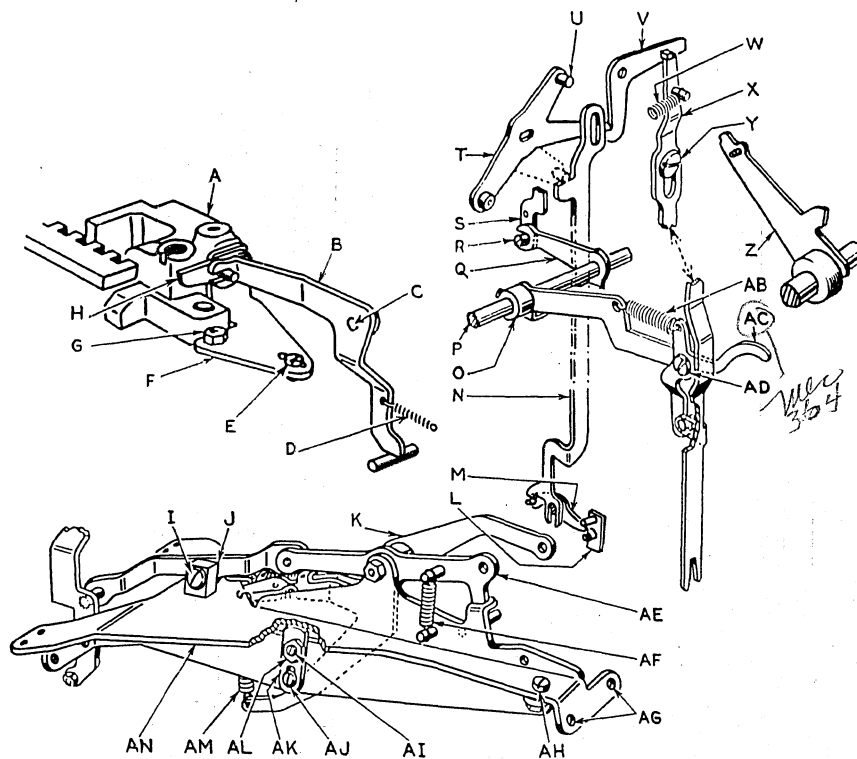
SYMBOLS (Plate 20)—Continued

AB 705229* assembled 1-705009
 AC 1-705169
 AD 705167 (1-705022A) use 74502 screw
 AE 2887½
 AF 705168 early
 705168A (705168B, 1-705136B) use
 76528 screw
 AG 1-705197 No. 3
 AH 705556
 AI 73611 use 79362 eccentric
 AJ 1-705119A includes AM
 AK 4452½
 AL 3984 (12085½) Spring
 AM 705120
 AN 1-705228A
 AO 705192 No. 1 use screws 73611
 AP 1-705117 use 705554 screw, 46 nut
 AQ 705285 (1B-702037 No. 3 or 11B-
 702037 No. 3 or 21A-702037 No. 3,
 705285A)
 AR 72814
 AS 1-75332 use 75618 screw
 AT 1-705134 (1B-702037 No. 3 or 11B-
 702037 No. 3 or 21A-702037 No. 3,
 705285A)

AT1 1-702138
 AU 702247 No. 1 use 72617 screws
 AV 1-701164 Contact point, use 46¼ nut
 AW 1-701162 includes AV, AX
 AX 1-701556 lower contact points, use
 46¼ nut
 AY 1-701225C includes CC, CD
 AZ 9259½ early
 71553 Screw, 103360 eccentric, later
 BA 1-701231 includes BD
 BB 1-702247A No. 2 use 72617 screw
 BC 71803
 BD 701232*
 BE 701342 early
 701569 later, use 701356 nut
 BF 72572 No. 1
 BJ 702714½ No. 36
 BK 10983
 BL 1-702132A
 BM 76500
 BN 705282
 BO 69805A No. 1
 BP 701802
 BQ 1-701118* assembled 11-701009A
 BR 1-701113 No. 2*

BS 105502 Screw, 701354 roller
 BT 701229A
 BU 73612
 BV 71112
 BW 701117
 BX 71517
 BY 71515
 BZ 74529
 CC 952¾
 CD 1-701225½
 CF 702110 No. 2 (72110 No. 2)
 CG 1-702715 No. 1
 CH 72324
 CI 1-71137 No. 2
 CJ 1-705121 (1-705121A)
 CK 79503
 CL 1-702139
 CM 51550
 CN 51550
 CP 702198 use 73611 screw
 CQ 1-702131 No. 2
 CR 702223A No. 3
 CS 705130½ (1-705130½A, 72567)
 CT 106500
 CU 73611

SELECTIVE SKIP TABULATION DETAIL AND CENTER SUPPORT (Plate 21)



SYMBOLS (Plate 21)

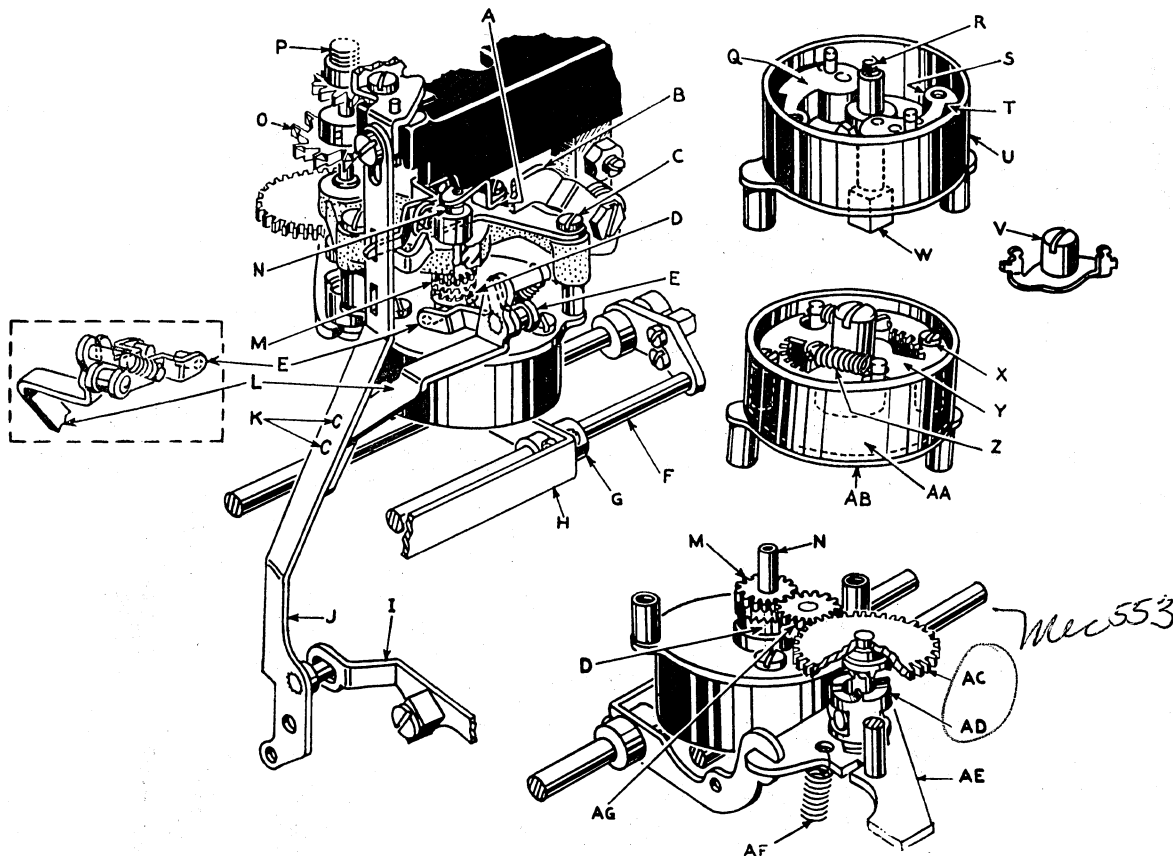
A 1-705673 No. 4
 B 1-705241
 C 709510A
 D 480¼
 E 7357½
 F 1-705172½
 G 47 Nut, 75655 screw
 H Included in F
 I 9052½
 J 705547
 K 1-705131A
 L 1-701903A
 M 1-702135 on 1-702230 No. 3

N 701228A
 O 1-75332
 P 11-705014
 Q 1-705117
 R 705554 Screw, 46 nut
 S 1-705197 No. 3
 T 1-709126 No. 2
 U 79539
 V 1-709127 No. 2
 W 71806
 X 1-702152D
 Y 702535A
 Z 1-701150A No. 2

AB 71806
 AC 705284A
 AD 74529
 AE 1-705119A
 AF 60801
 AG 300521
 AH 74523 Screw, 46 nut
 AI 73611
 AJ 75608
 AK 705286 (705286A)
 AL 72307 Eccentric
 AM 2881½
 AN 1-705130

SEE EXPLANATION ON INSIDE OF FRONT COVER

ADJUSTABLE GOVERNOR FOR CARRIAGES WITH SKIP TAB (Plate 22)



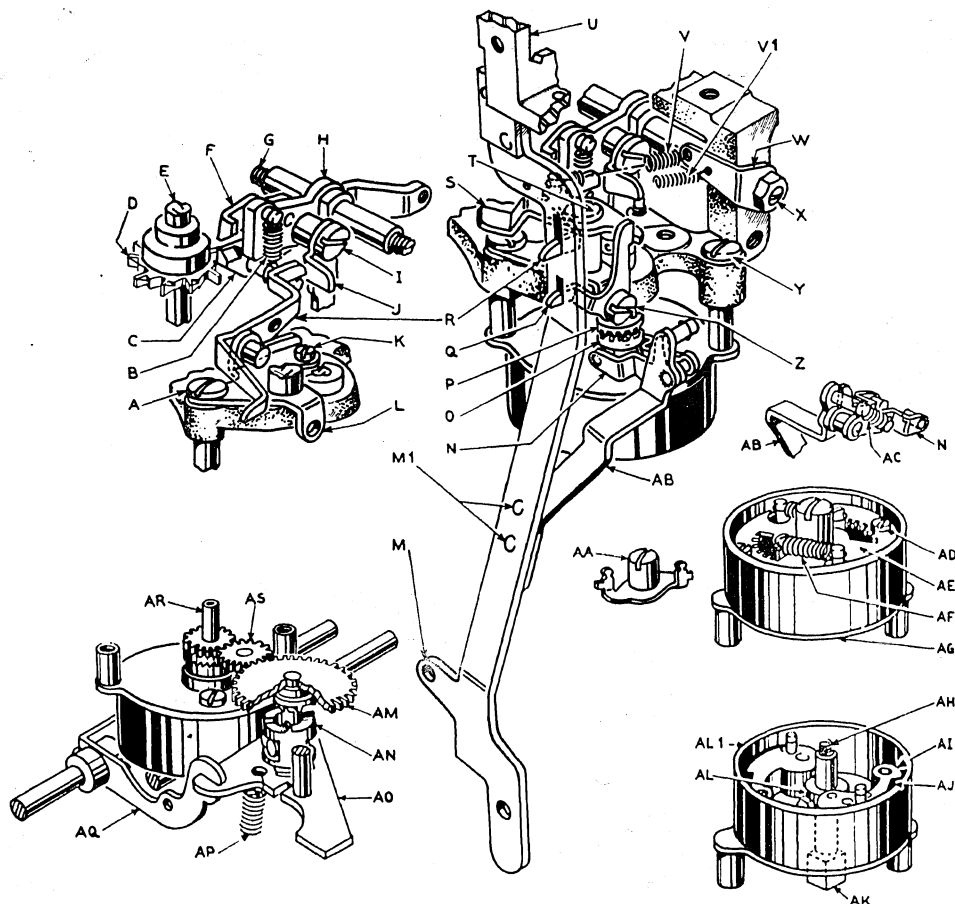
SYMBOLS (Plate 22) ✓

Mec 349

2-705674D No. 1 (12A-705674E No. 1, 1-705260A, 1-705008B, 47½, 1-705292A) assembled casting and governor
 A 109 Env. 1965 use screw 70512
 B 705267A
 C 72614
 D 705352 (1-705292A, 705352A, 1-705578B)
 E 1-705292 (1-705292A, 705352A, 1-705578B) use spring 83822
 F 75004
 G 1-75377 (1-28345), Screw 75660
 H 705203 No. 3 wide base construction
 I 75203 No. 2 (705203 No. 3, 1-75222B) narrow base construction
 J 1-705228A
 K 1-705197 No. 3 use screw 4863
 L 74533
 M 1-705297
 N 705263½*
 O 1-705578 (1-705578B, 705352A, 1-705292A, 3819½, 1097½, 46) includes M, use pin 99513
 P 1-75331* included in assembly P
 P 1A-705009 (1B-705009) see plate 21, power symbol list

Q 1-705675
 R 705809 Spring
 S 1-705675
 T 12098B Fibre shoe for Q and S
 U 1-705262B (1A-705262B, 1-705260A)
 1-705261B (12A-705674E No. 1, 1-705292A, 1-705260A) complete governor assembly, includes Q, R, S, T, V, W, X, Y, Z, AA, AB
 V 1-705262½
 W 1-705527B (705527C, 705576A, 705189A)
 X 74502
 Y 705261B
 Z 72815 (3981)
 AA 1-705261½ (1A-705261½, 705527C, 705189A) use screw 705576A
 AB 1-705261½ (12A-705674E No. 1, 1-705292A, 1-705260A)
 AC 1-705260 use screw 705523A
 AD 1-705353
 AE 705171 No. 2* included in 11-705023, wide base construction, included in 11-75023A, narrow base construction
 AF 307805 Spring eyelet 20 No. 84
 AG 705308 (705308A, 705524A) use screw 705524

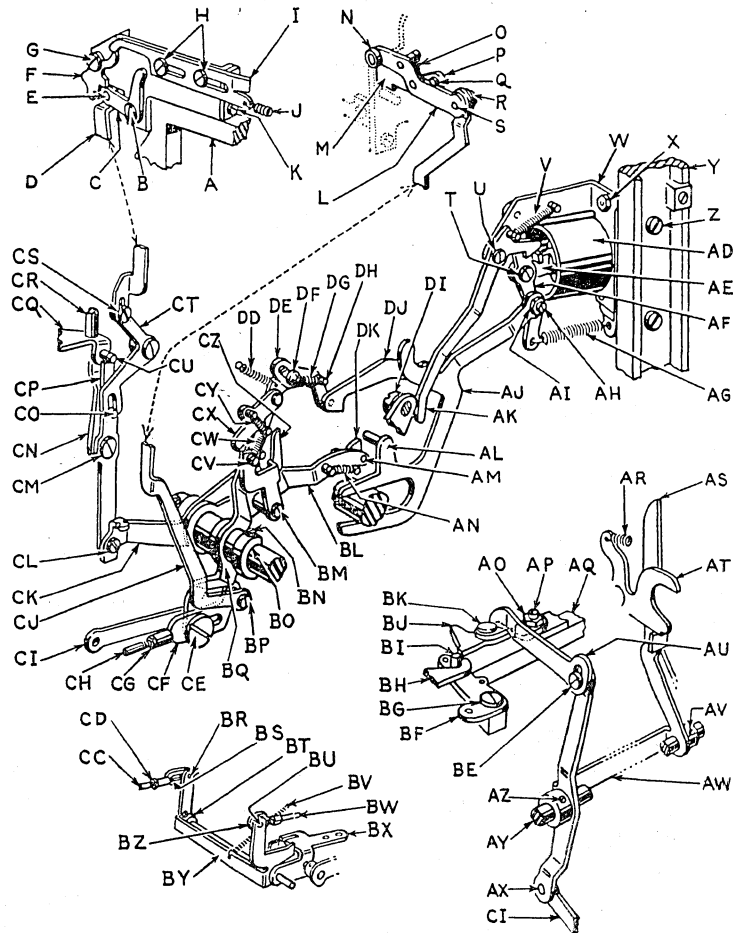
ADJUSTABLE GOVERNOR FOR CARRIAGES WITHOUT SKIP TAB (Plate 23)



SYMBOLS (Plate 23) ✓

A	74531	screw 76528	AG	1-705261 $\frac{1}{4}$ (12A-705674E No. 1,
B	2887 $\frac{1}{2}$	1-705164 No. 2		1-705292A, 1-705260A)
C	1-705169 use screw 705569	705575	AH	705809
D	1-75331* (1B-705000)	12-705674D No. 1 (12A-705674E No.	AI	1-705675
E	1A-705009 (1B-705009) see plate 21,	1, 70512, 1-705265B, 1-75381,	AJ	12088B Fiber shoe for AI
F	power symbol list	1-705164 No. 2, 76528, 705575,	AK	1-705527E (705527C, 705576A,
G	705167 (1-705022A) use screw 74502	705168B, 1-705136B, 72502 $\frac{1}{2}$, 1-		705189A)
H	1-705022 (1-705022A, 75655A) as-	705260A, 1-705292A) complete as-	AL	1-705261 $\frac{1}{4}$ (1A-705261 $\frac{1}{4}$, 705527C,
I	sembled includes C, F, G, H, I, J	ssembly, includes attached parts ex-		705189A) use screw 705576A
J	1-705166*	cept E, M, AC, AM, AN, AO, AF,	AL1	1-705261B (12A-705674E No. 1,
K	705518 Screw, 2841 $\frac{1}{4}$ B collar	AQ		1-705292A, 1-705260A) assembled
L	705154 (705154A)	V		governor includes AA, AD, AE, AF,
M	1-705265A (1A-705265 No. 2)	V1		AG, AH, AI, AJ, AK, AL
M1	74533	300802	AM	1-705260 use 705523A screw
N	1-705292 (1-705292A, 705352A,	W		1-705353
O	1-705578B)	X		AO 11-705023
P	705352 (1-705292A, 705352A,	Y		AP 307805 Spring eyelet 20 No. 84
R	1-705578B)	Z		AQ 705203 No. 3
	1-705578B)	AA		AR 1-705578 (1-705578B, 705352A, 1-
	1-705578B)	AB		705292A, 3819 $\frac{1}{4}$, 1097 $\frac{1}{4}$, 46) use
	1-705578B)	AC		pin 99513
	1-705578B)	AD		AS 705308 (705308A, 705524A) use screw
	1-705578B)	AE		705524
	1-705578B)	AF		

BALANCE KEY TO SPACE AND RETURN CARRIAGE (Plate 24)



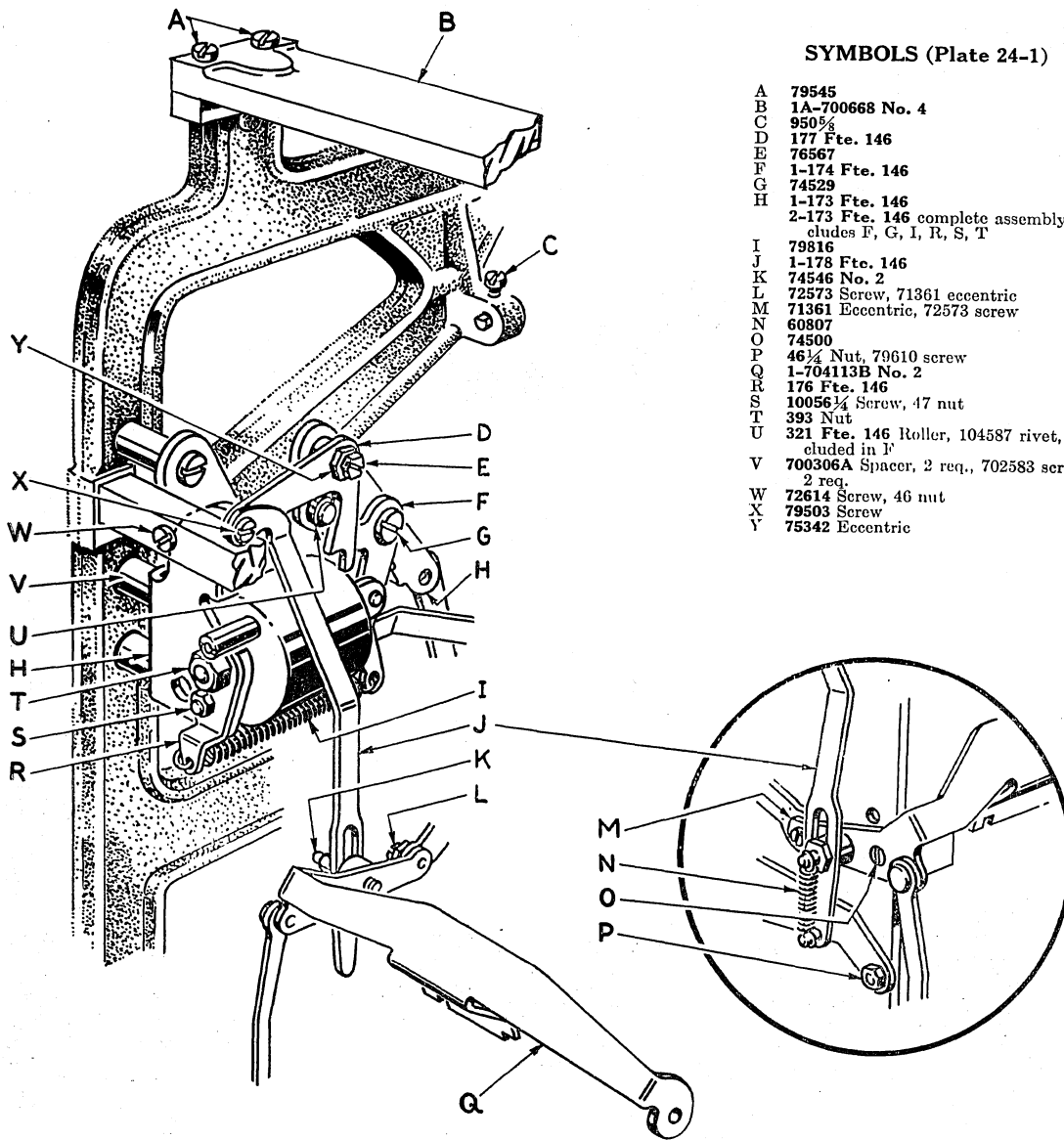
SYMBOLS (Plate 24)

- | | | |
|--|---|---|
| A 75671 No. 1 Casting | AK 1-166 Fte. 146 | BX 702122R |
| 1B-75671 No. 1 complete, includes A to K | AL Included in AJ | BY 101A Env. 781 |
| B 75634 No. 2 | AM Included in BL | BZ 72110 No. 3 |
| C Included in D | AN 7781A | CC 1-700 No. 2 Env. 781 |
| D 1-163 Fte. 146 includes C and E | AO 71361 Eccentric | CD 49% |
| E Included in D | AP 70512 | CE 517A Fte. 146 |
| F 1-75238A uses spring 89801 | AQ 1-75901B Env. 781 | CF 1-158A Fte. 146 Env. 781 |
| G 75578 | AR 71803 | CG 49% |
| H 75637 | AS 1-75149 No. 3 | CH 1-703 Env. 781 |
| I 75142 | AT 1-75146 uses screw 77517 No. 1 | CJ 114 Env. 781 |
| J 75817 | AU Included in BJ | CJ 116 No. 1 Env. 781 for register return |
| K 72573 Screws, 705259 1/4 end plates | AV 1-71321 | 116 No. 2 Env. 781 not register return |
| L 1-104 Fte. 144 No. 5 Env. 781 | AW 113A Env. 781 for bal. key to space | CK Included in BL |
| M 1-709250 Env. 781 | 113A No. 4 Env. 781 for bal. key not to space | CL 79552 |
| N 709334 included in L | AX 79503 | CM 702574 No. 1 |
| O 71803 | AY 75030 | CN 1-130B Fte. 146 |
| P 500 Fte. 144 screw for M | AZ 1-71321 | CO Included in CP |
| Q Included in M | BE 71546 | CP 1-133B Fte. 146 |
| R 72307 Eccentric | BF 1-75108 Env. 781 (1-705108 1/4) | CQ 1A-6 Fte. 146 |
| S 73612 | BG 75634 | 1-6Z Fte. 146 |
| T 74529 | BH 1-75107B | CR 75023A* included in CQ |
| U 79626 | BI Included in BF | CS 72591 |
| V 71805 | BJ 1-111A Env. 781 includes AU, BK | CT 1-164 Fte. 146 |
| W 1-173 Fte. 146 | BK Included in BJ | CU Included in CQ |
| 2-173 Fte. 146 includes W and AD to AG | BL 1-135A No. 1 Fte. 146 includes AM, CK | CV Included in CZ |
| X 72614 Screw, 46 nut | BM 523 Fte. 146 | CW 44808 |
| Y 1-666R Fte. 146 (1-70666R No. 1) | BN 74530 | CX Included in BQ |
| Z 73561 | BO 1-317 Fte. 146 | CY 3489 1/4 |
| AD 1-319 Fte. 146 (1A-319 Fte. 146, 21-310 Fte. 146, 1-173 Fte. 146) | BP 79503 | CZ 1-172 Fte. 146 |
| AE 1-175 Fte. 146 | BQ 1-170 Fte. 146 includes CX | DD 480 1/4 |
| AF 174 Fte. 146 | BR 79503 | DE 1-169 Fte. 146 |
| AG 79816 | BS 72110 No. 1 | DF 706508 Screw, 49 nut |
| AH 70512 | BT 1-28345 | DG 489 |
| AI 104380 | BU 79503 | DH Included in DE |
| AJ 1-167 Fte. 146 includes AL, DE, DH, DJ | BV 79816 | DI 522 Fte. 146 (522A Fte. 146, 71558A, 1-71812 No. 2) screw, 315 fte. 146 washer |
| | BW 1-703 Env. 781 | DJ 1-168 Fte. 146 |
| | | DK 1-131A Fte. 146 |

MOTOR BAR TO SPACE AND RETURN CARRIAGE—IMPROVED CLASS 78, NEW WIDE BASE (Plate 24-1)

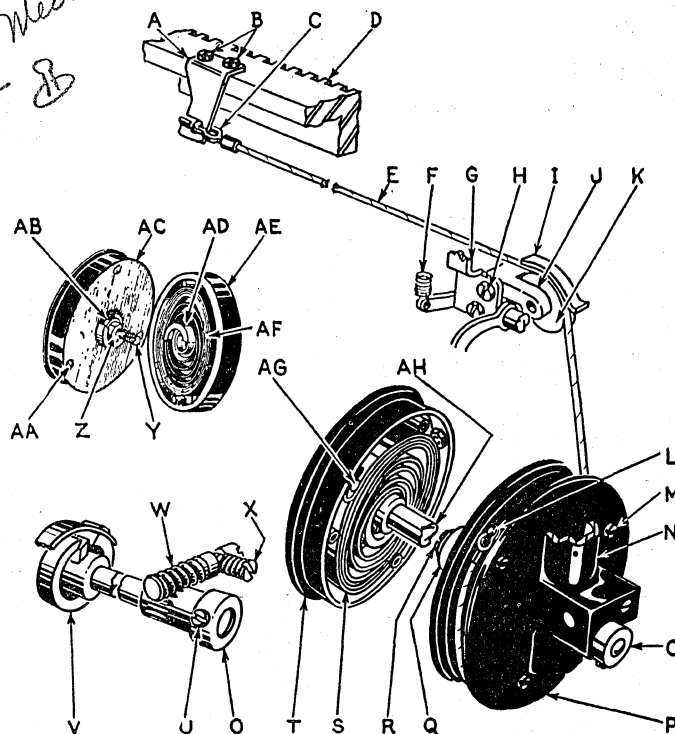
SYMBOLS (Plate 24-1)

A	79545
B	1A-700668 No. 4
C	950 $\frac{3}{8}$
D	177 Ftc. 146
E	76567
F	1-174 Ftc. 146
G	74529
H	1-173 Ftc. 146
I	2-173 Ftc. 146 complete assembly in- cludes F, G, I, R, S, T
J	79816
K	1-178 Ftc. 146
L	74546 No. 2
M	72573 Screw, 71361 eccentric
N	71361 Eccentric, 72573 screw
O	60807
P	74500
Q	46 $\frac{1}{2}$ Nut, 79610 screw
R	1-704113B No. 2
S	176 Ftc. 146
T	10056 $\frac{1}{2}$ Screw, 47 nut
U	393 Nut
V	321 Ftc. 146 Roller, 104587 rivet, in- cluded in I
W	700306A Spacer, 2 req., 702583 screw, 2 req.
X	72614 Screw, 46 nut
Y	79503 Screw
Z	75342 Eccentric



DRUM SPRING ASSEMBLY, SINGLE AND DOUBLE (Plate 25)

*Screw to hold
drawband - Mee 315
705656 1/2 B*



SYMBOLS (Plate 25)

- A 73219
- B 703219 sel. col. tab
- C 73548
- D Included in E
- E 1A-73965 Style 12, 15, 18
- F 1-703965 Style 22, 30
- G 1-705952A Style 18 over-all length 31 1/8", for 12", 15", 18" cgs.
- H 1-705952A Style 30 over-all length 41 1/8", for 22", 30" cgs.
- I 75818
- J 75139 with key position 42 to select outer margin
- K 1-705139 1/2 with key position 42 to select inner margin
- L 70512
- M 75138 narrow base
- N 705138 No. 1 wide and new wide base
- O 705138 No. 2 sel. col. tab.
- P 70512 screw, 2 req.
- Q 1-75670 without improved cge. return spacing mech. } narrow base
- R 1-75670B with improved cge. } return spacing mech.
- S 1-705670 without improved cge. return spacing mech., wide base
- T 1-705670A with improved cge. return spacing mech., and key position 42 to select outer margin, wide and new wide base
- U 1A-705670A with improved cge. return spacing mech. and key position 42 to select inner margin, new wide base and Series M
- V 11-705670 with key position 42 to select outer margin } selective column tabulation
- W 11A-705670 with key position 42 to select inner margin }
- X 75444
- Y 705444 No. 2 sel. col. tab
- Z 3662 3/4 No. 1 pin for pulley

N Assembled typewriter leg, with spring barrel

For all narrow base machines before Serial No. A555712

Use 21-75666CL No. 2

- 1-75116 1/2, 2 req.
- 705503 1/2, 2 req.
- 1-705670 without improved carriage return spacing mechanism
- 1-705670A with improved carriage return spacing mechanism
- 1-703967 No. 3 Style 12, 18
- 1-703967 No. 7 Style 22
- 75667AL
- 1-75952A Style 18 for 12", 18" carriages
- 1-705952A Style 30 for 22", 30" carriages
- 1-75700A No. 3

For all wide base machines before Serial No. A555712

Use 21-75666CL No. 2

- 1-705116A
- 1-75952A Style 18 for 12", 18" carriages
- 1-705952A Style 30 for 22", 30" carriages
- 1-75700A No. 3

For all Class 77 except selective column tabulation machines before Serial No. A555712

Use 21-75666CL No. 2

- 1-705116A
- 1-75952A Style 18 for 12", 18" carriages
- 1-705952A Style 30 for 22", 30" carriages
- 1-75700A No. 3

For Class 77 selective column tabulation machines before Serial No. A555712

Use 1-705666BL No. 7

- 1-705116A
- 1-705952A Style 30 for 22", 30" carriages
- 1-75700A No. 3

For all narrow base machines after Serial No. A555712

Use 21-75666CL No. 2

- 1-705670A
- 1-703967 No. 3 Style 12, 18
- 1-703967 No. 7 Style 22

For wide base machines between Serial No. A555712 and A696950, also Class 77, except selective column tabulation between Serial No. A555712 and M6885D

Use 21-75666CL No. 2

For Class 77 with selective column tabulation machines between Serial No. A555712 and M-6885D

Use 1-705666BL No. 7

For new wide base machines between Serial No. A696950 and M-6783D (M200), M6885D (M800)

Use 1-705666AL No. 2

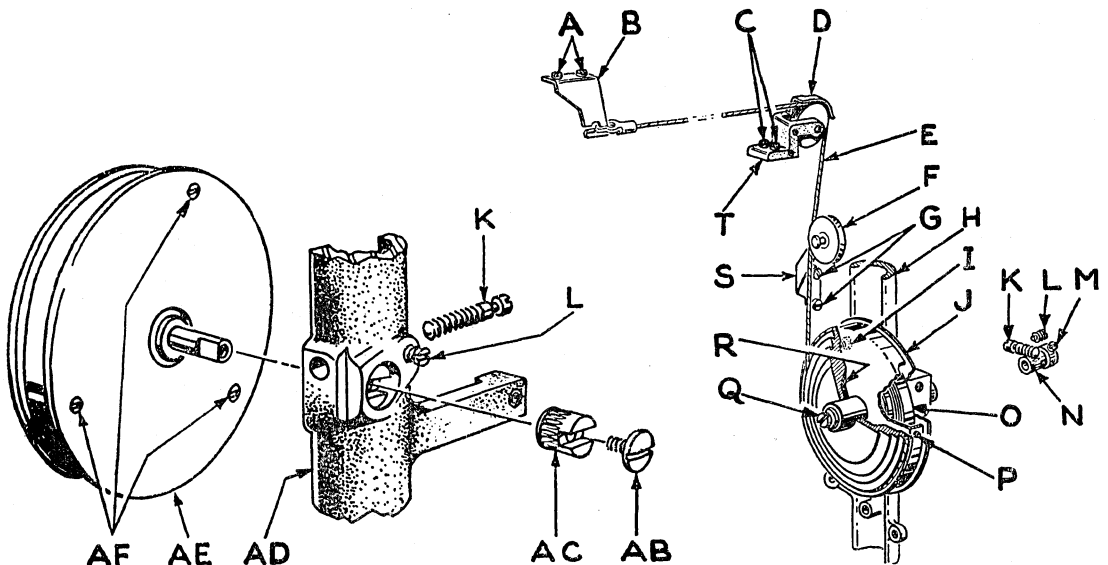
For machines beginning with Serial No. M6783D (M200), M6885D (M800)

1-705666AL No. 2

SYMBOLS (Plate 25)—Continued

O P Q R S For machines beginning with Serial No. M6885D (M700 without selective column tabulation) 1-705666BL No. 7 For machines beginning with Serial No. M6885D (M700 with selective column tabulation) 21-75666CL No. 2 75400 75194A included in AH 75309 No. 1 71517 Drum spring	For wide base machines between Serial No. A-555712 and A696950, also Class 77 (including selective column tabulation) machines between Serial No. A555712 and M6885D Use 12A-75003A For new wide base machines between Serial No. A696950 and M6783D (M200), M6885D (M800) Use 12B-705003 No. 4	For all wide base and Class 77, except selective column tabulation, machines before Serial No. A555712 Use 21-75666CL No. 2 1-705116A 1-75952A Style 18 for 12", 18", carriages 1-705952A Style 30 for 22", 30" carriages 1-75700A No. 3 For Class 77 selective column tabulation machines, before Serial No. A555712
For all narrow base machines before Serial No. A555712 Use 21-75666CL No. 2 1-75116 1/2 705503 1/2, 2 req. 1-705670 without improved carriage return spacing mechanism 1-705670A with improved carriage return spacing mechanism 1-703967 No. 3 Style 12, 18 1-703967 No. 7 Style 22 75667AL 1-75952A Style 18 for 12", 18" carriages 1-705952A Style 30 for 22", 30" carriages 1-75700A No. 3	For machines beginning with Serial No. M6783D (M200), M6885D (M-800 and M700 including selective column tabulation) 83 No. 14A 1-75269 includes L, AG, included in AH 75606 1-75305 for single spring barrel Use complete typewriter leg assembly, see N, for double spring barrel 75599 75598 Complete spring barrel assembly	Use 1-705666BL No. 7 1-705116A 1-705952A Style 30 for 22", 30" carriages 1-75700A No. 3 For wide base machines between Serial No. A-555712 and A696950. Also Class 77 including selective column tabulation machines, between Serial No. A555712 and M6885D Use 12A-75003A
For all narrow base machines after Serial No. A555712 Use 12A-75003A 1-705670A 1-703967 No. 3 Style 12, 18 1-703967 No. 7 Style 22 For all wide base and Class 77, except selective column tabulation, machines before Serial No. A555712 Use 21-75666CL No. 2 1-705116A 1-75952A Style 18 for 12", 18" carriages 1-705952A Style 30 for 22", 30" carriages 1-75700A No. 3	For all narrow base machines before Serial No. A555712 Use 21-75666CL No. 2 1-75116 1/2 705503 1/2, 2 req. 1-705670 without improved carriage return spacing mechanism 1-705670A with improved carriage return spacing mechanism 1-703967 No. 3 Style 12, 18 1-703967 No. 7 Style 22 75667AL 1-75952A Style 18 for 12", 18" carriages 1-705952A Style 30 for 22", 30" carriages 1-75700A No. 3 For all narrow base machines after Serial No. A555712 Use 12A-75003A 1-705670A 1-703967 No. 3 Style 12, 18 1-703967 No. 7 Style 22	Use 12B-705003 No. 4 For machines beginning with Serial No. M6885D (M700, including selective column tabulation) 12A-75003A For machines beginning with Serial No. M6783D (M200), M6885D (M-800) 12B-705003 No. 4 Use complete typewriter leg assembly, see N, for replacement of ball bearing retainer 705520 lock nut for retainer
For Class 77 selective column tabulation machines, before Serial No. A555712 Use 1-705666BL No. 7 1-705116A 1-705952A Style 30 for 22", 30" carriages 1-75700A No. 3	For all narrow base machines after Serial No. A555712 Use 12A-75003A 1-705670A 1-703967 No. 3 Style 12, 18 1-703967 No. 7 Style 22	AA 77515 AB 75999 ball bearings AC AD } Use complete typewriter leg assembly, see N, for replacement AE } bly, see N, for replacement AF See S, for replacement AG Use complete typewriter leg assembly, see N, for replacement AH Complete spring barrel assembly, see Y, for replacement

SPRING BARREL ASSEMBLY WITH SPIRAL REWIND FOR CARRIAGE DRAWBAND (Plate 25-1)



SYMBOLS (Plate 25-1)

A 73548
B 73219
C 703219 scl. col. tab.
D 72567
E 75138 narrow base
705138 No. 1 wide and new wide base
705138 No. 2 scl. col. tab.
70512 screw, 2 req.
F 1-75952A Style 18 over-all length
31 ³/₁₆" for 12", 15", 18" carriages
1-705952A Style 30 over-all length
41 ³/₁₆" for 22", 30" carriages
G Included in S
705503 ¹/₂

H Assembled typewriter leg, with spring
barrel, see N, Plate 25
I 74502 screws for cover R
J Assembled spring barrel, see Y, Plate
25
K 75599
L 75598
M 75606
N 75400
O Drum spring, see S, Plate 25
P 75656A anchor screw
49 ¹/₄ nut
Q 71517 screw
73309 No. 1 retainers

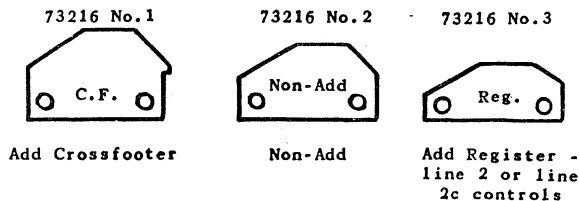
R 75999 ball bearings
S 1-75975 plastic cover
1-75116 ¹/₂ narrow base } includes F
1-705116A wide and new wide base
T Assembled casting, see J, Plate 25
AB 12051 ¹/₈
AC 705400 ¹/₂
AD Assembled typewriter leg, with spring
barrel, see N, Plate 25
AE Assembled spring barrel, see Y, Plate
25
AF 705573

Rec 447 for Nos 1, 2, +3

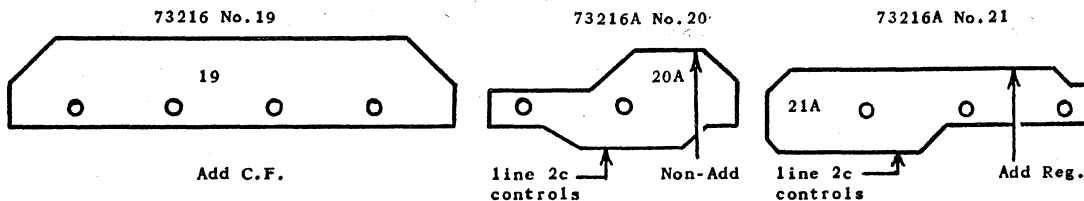
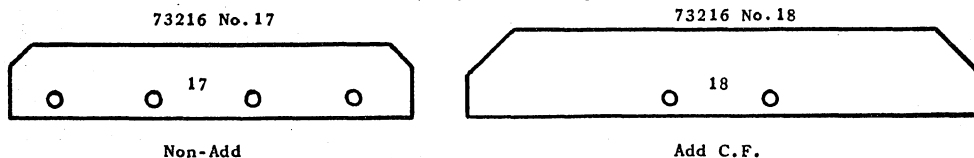
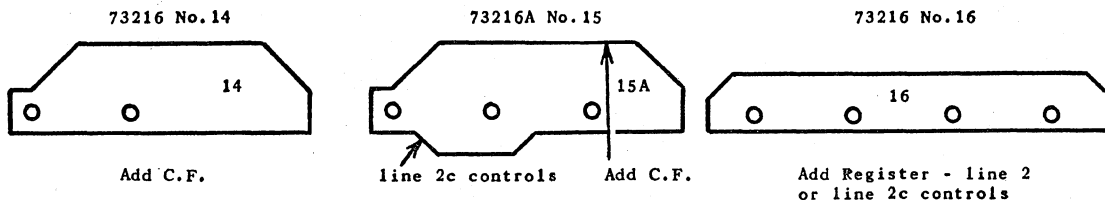
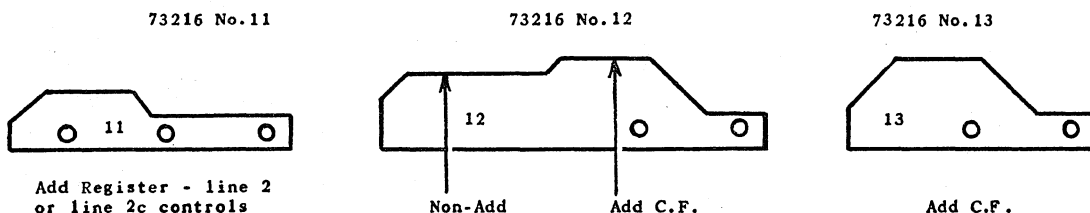
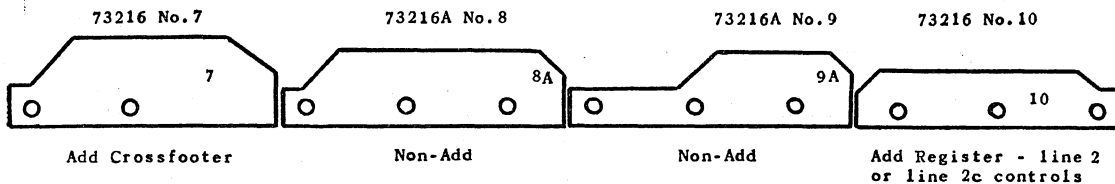
SERIES M MACHINES—CARRIAGES

CARRIAGE CONTROL RAILS (Plate 26)

* Note: All symbols containing the letter A, except 73216A Nos. 8, 9, and 30 have cleared holes and are used in conjunction with a 73216 No. 16 rail which should be ground to conform to the A symbol rail. See Plate 26-3 for details of assembly.



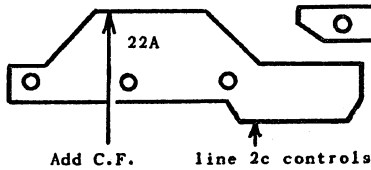
73216 No. 4, No. 5 and No. 6 same as 73216 No. 2, No. 1, No. 3 respectively, except holes are not tapped so as to be able to attach to margin release block or to be used in combination with rails in lines 1 and/or 2c.



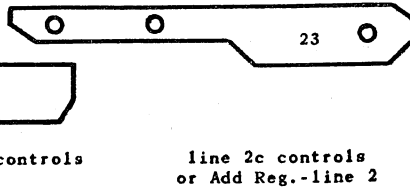
(OVER)

(Plate 26)—Continued

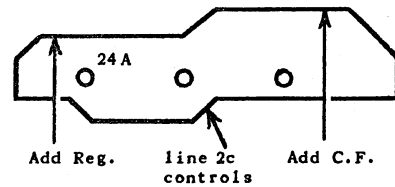
73216A No. 22



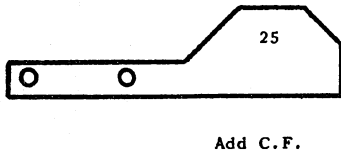
73216 No. 23



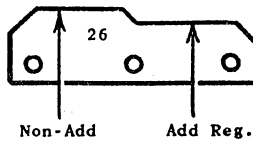
73216A No. 24



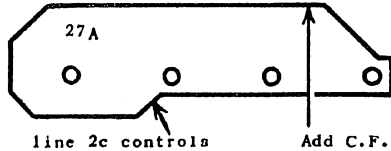
73216 No. 25



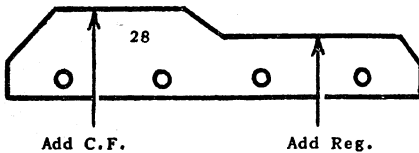
73216 No. 26



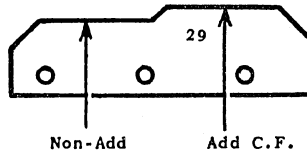
73216A No. 27



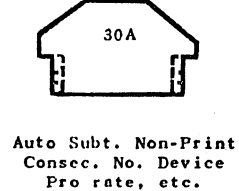
73216 No. 28



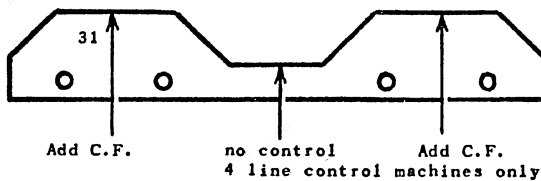
73216 No. 29



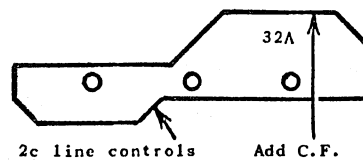
73216A No. 30



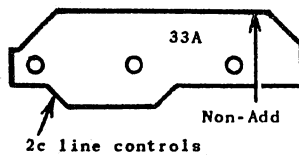
73216 No. 31



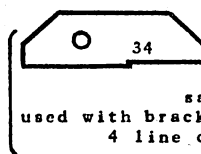
73216A No. 32



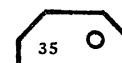
73216A No. 33



73216 No. 34



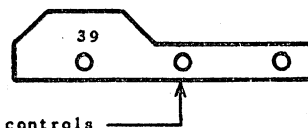
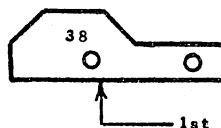
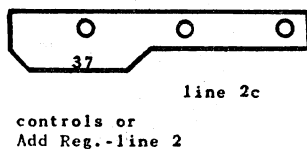
73216 No. 35



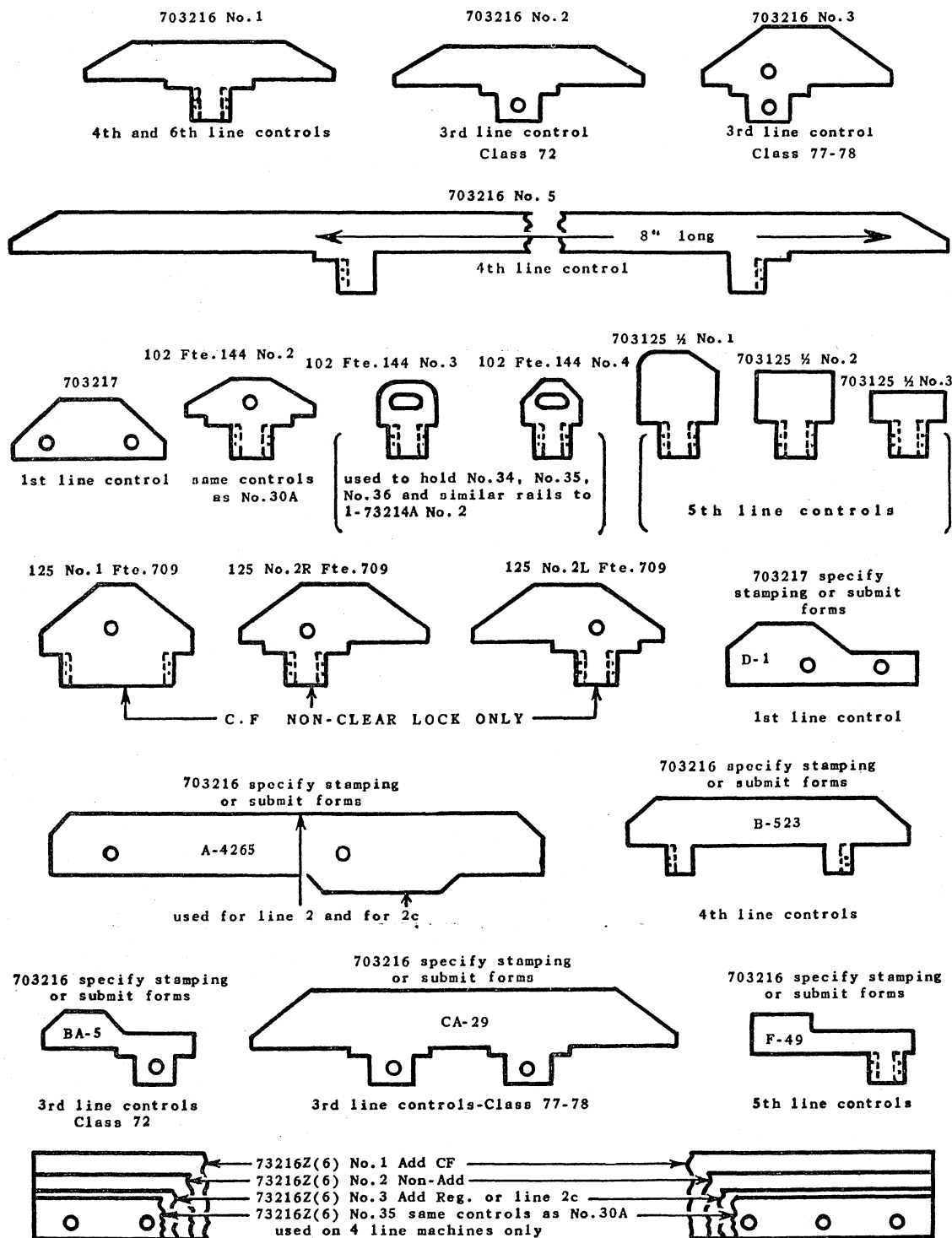
73216 No. 36



same controls as No. 30A
used with bracket 102 Fte. 144 Nos. 3 or 4 on
4 line control machines only



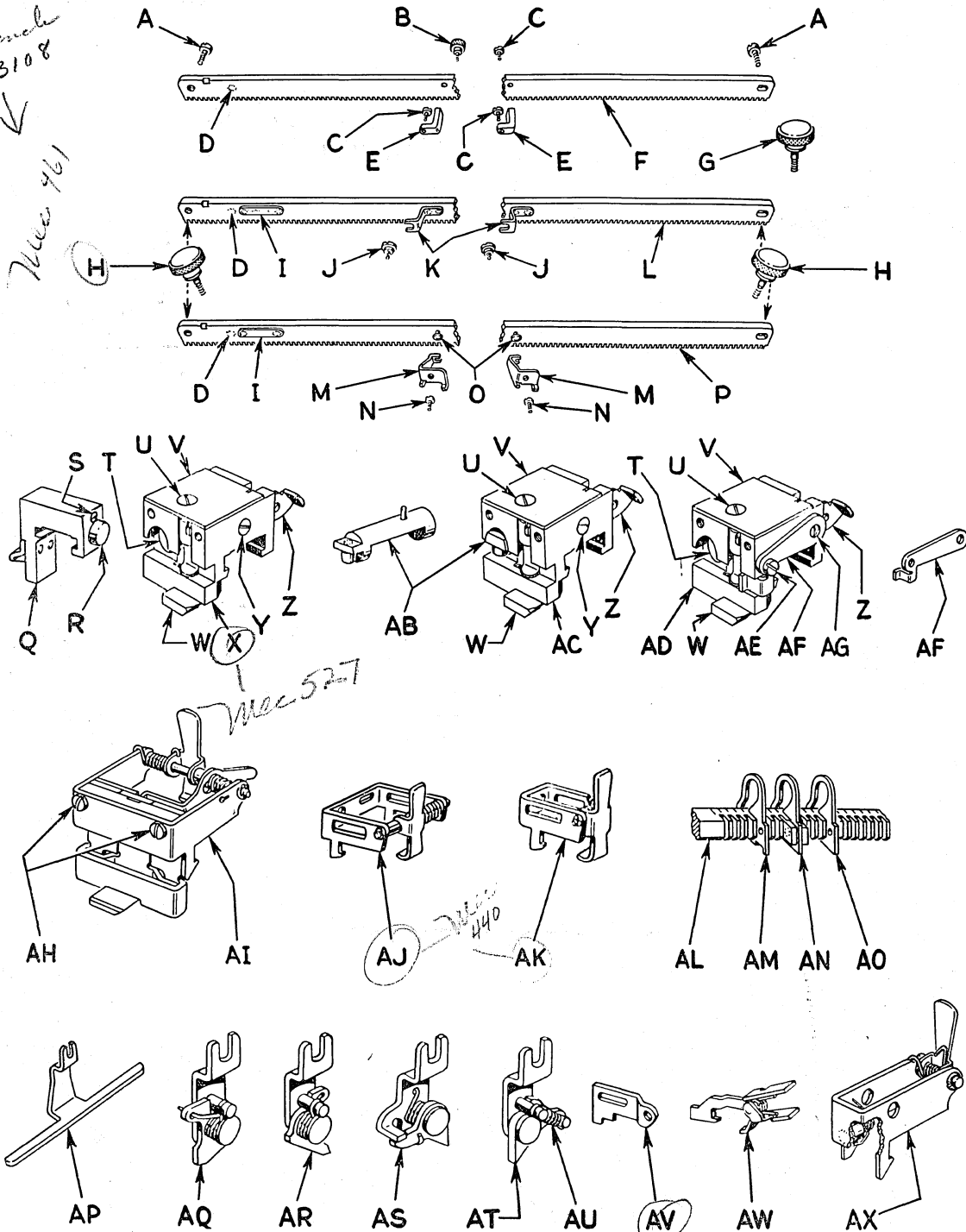
(Plate 26)—Continued



EMERGENCY RAIL - CUT AS REQUIRED

CONTROL BARS AND FITTINGS (Plate 26-1)

*New screw (slotted)
503B F to 717
w/ver. 703108
New 461*

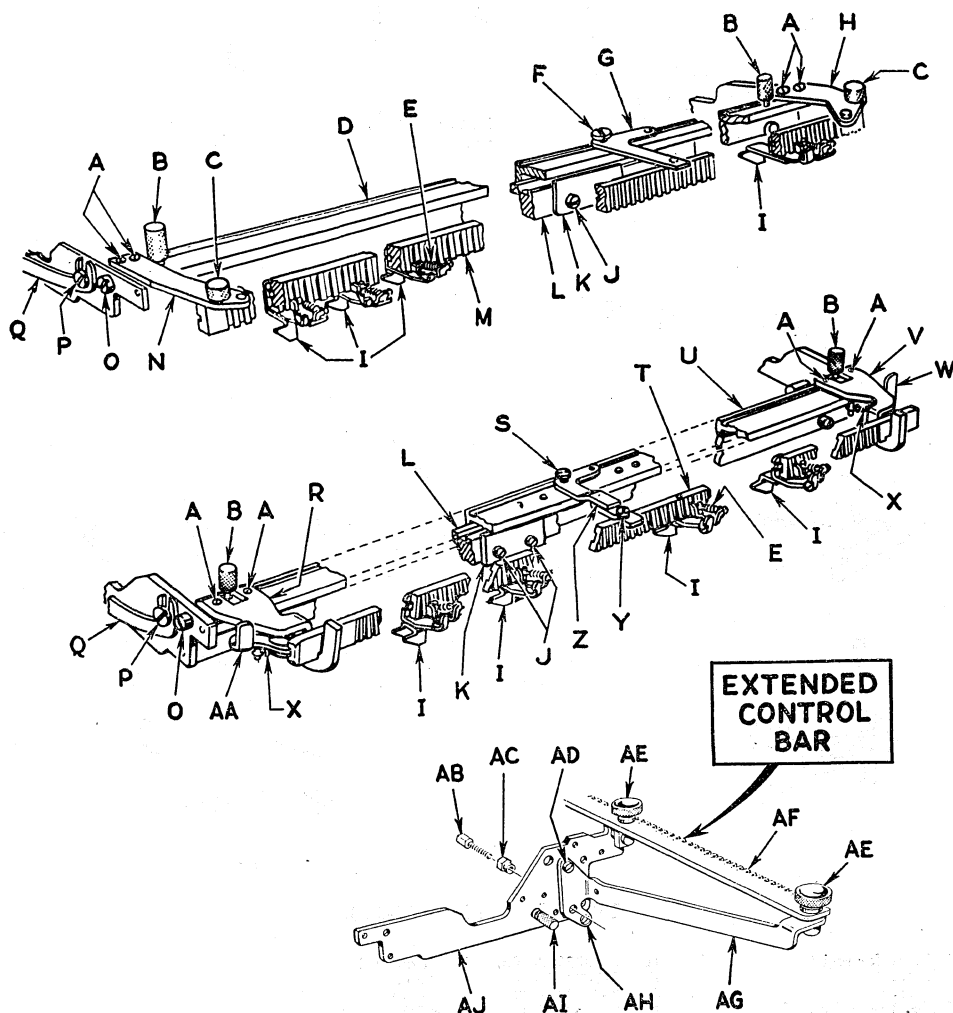


Mec 527

Mec 440

Mec 440

CONTROL BARS AND FITTINGS (Plate 26-1A)



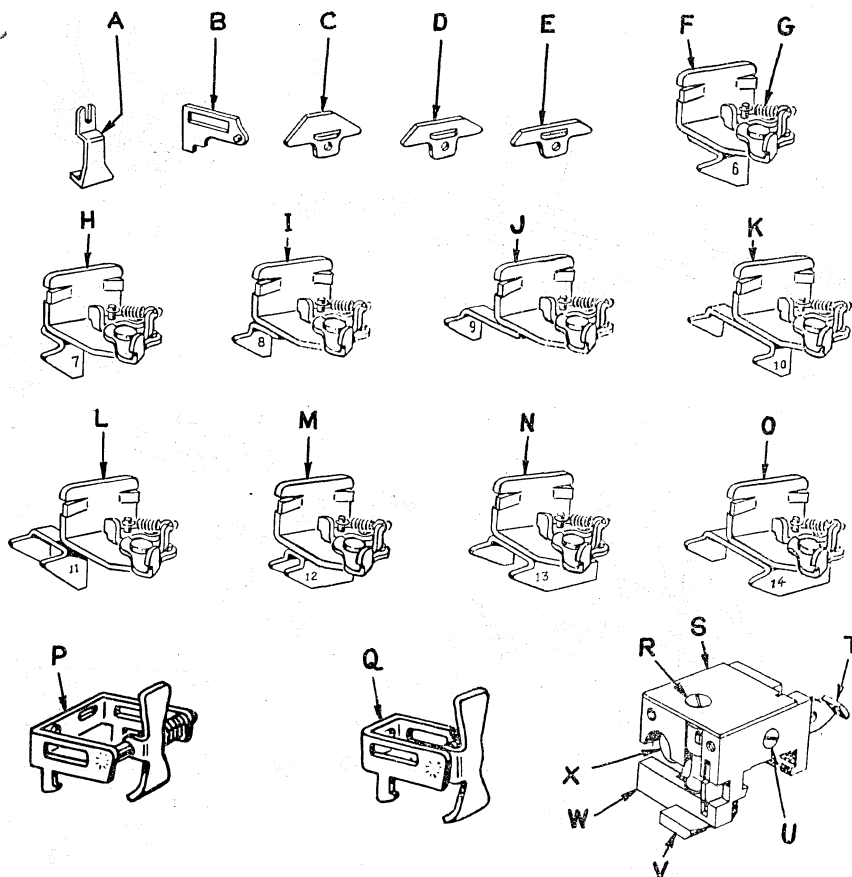
SYMBOLS (Plate 26-1A)

A 703589 screws
 B 703583 No. 4
 C 703583 No. 3
 D 1-703966 No. 4 Style 18, 22, 30
 E 703809 spring
 F 703508 screw
 G 1-703183
 H 703157R
 I Refer to Plate 26-1B
 J 73548
 K 703195 1/4
 L 703967 No. 8 Style 22 for 12", 18", 22" carriages
 M 703967 No. 8 Style 30 for 30" carriages
 N 703966 1/2 Style 18, 22, 30
 O 703157L
 P 73561
 Q 73566
 R 703224 No. 2

R 1-703157AL includes AA
 S 703508 screw for brace in center position
 T 74587 screw for brace in either right or left position
 U 703502 1/4 guide screw in center position without brace
 V 703966 1/2A Style 12, 18, 22, 30 control bar only
 W 1Z-703966 1/2A Style 12, 18, 22, 30 complete assembled control bar, specify machine style and number
 X 1-73966 No. 3 Style 12
 Y 1-703966A No. 4 Style 18, 22, 30
 Z 1-703157AR includes W
 AA Included in R
 AB 73579
 AC 73380
 AD 71554 screw
 AE 1097 1/4 lock washer
 AF 73501B
 AG 1-73913 No. 2
 AH 1-73913D No. 2
 AI 1-73913E No. 2
 AJ 1-73913F No. 2
 AK 1-73913G No. 2
 AL 1-73913H No. 2
 AM 1-73913I No. 2
 AN 1-73913J No. 2
 AO 1-73913K No. 2
 AP 1-73913L No. 2
 AQ 1-73913M No. 2
 AR 1-73913N No. 2
 AS 1-73913O No. 2
 AT 1-73913P No. 2
 AU 1-73913Q No. 2
 AV 1-73913R No. 2
 AW 1-73913S No. 2
 AX 1-73913T No. 2
 AY 1-73913U No. 2
 AZ 1-73913V No. 2
 BA 1-73913W No. 2
 BB 1-73913X No. 2
 BC 1-73913Y No. 2
 BD 1-73913Z No. 2
 BE 1-73914 No. 1
 BF 1-73914 No. 2
 BG 1-73914 No. 3
 BH 1-73914 No. 4
 BI 1-73914 No. 5
 BJ 1-73914 No. 6
 BK 1-73914 No. 7
 BL 1-73914 No. 8
 BM 1-73914 No. 9
 BN 1-73914 No. 10
 BO 1-73914 No. 11
 BP 1-73914 No. 12
 BQ 1-73914 No. 13
 BR 1-73914 No. 14
 BS 1-73914 No. 15
 BT 1-73914 No. 16
 BU 1-73914 No. 17
 BV 1-73914 No. 18
 BW 1-73914 No. 19
 BX 1-73914 No. 20
 BY 1-73914 No. 21
 BZ 1-73914 No. 22
 CA 1-73914 No. 23
 CB 1-73914 No. 24
 CC 1-73914 No. 25
 CD 1-73914 No. 26
 CE 1-73914 No. 27
 CF 1-73914 No. 28
 CG 1-73914 No. 29
 CH 1-73914 No. 30
 CI 1-73914 No. 31
 CJ 1-73914 No. 32
 CK 1-73914 No. 33
 CL 1-73914 No. 34
 CM 1-73914 No. 35
 CN 1-73914 No. 36
 CO 1-73914 No. 37
 CP 1-73914 No. 38
 CQ 1-73914 No. 39
 CR 1-73914 No. 40
 CS 1-73914 No. 41
 CT 1-73914 No. 42
 CU 1-73914 No. 43
 CV 1-73914 No. 44
 CW 1-73914 No. 45
 CX 1-73914 No. 46
 CY 1-73914 No. 47
 CZ 1-73914 No. 48
 DA 1-73914 No. 49
 DB 1-73914 No. 50
 DC 1-73914 No. 51
 DD 1-73914 No. 52
 DE 1-73914 No. 53
 DF 1-73914 No. 54
 DG 1-73914 No. 55
 DH 1-73914 No. 56
 DI 1-73914 No. 57
 DJ 1-73914 No. 58
 DK 1-73914 No. 59
 DL 1-73914 No. 60
 DM 1-73914 No. 61
 DN 1-73914 No. 62
 DO 1-73914 No. 63
 DP 1-73914 No. 64
 DQ 1-73914 No. 65
 DR 1-73914 No. 66
 DS 1-73914 No. 67
 DT 1-73914 No. 68
 DU 1-73914 No. 69
 DV 1-73914 No. 70
 DW 1-73914 No. 71
 DX 1-73914 No. 72
 DY 1-73914 No. 73
 DZ 1-73914 No. 74
 EA 1-73914 No. 75
 EB 1-73914 No. 76
 EC 1-73914 No. 77
 ED 1-73914 No. 78
 EE 1-73914 No. 79
 EF 1-73914 No. 80
 EG 1-73914 No. 81
 EH 1-73914 No. 82
 EI 1-73914 No. 83
 EJ 1-73914 No. 84
 EK 1-73914 No. 85
 EL 1-73914 No. 86
 EM 1-73914 No. 87
 EN 1-73914 No. 88
 EO 1-73914 No. 89
 EP 1-73914 No. 90
 EQ 1-73914 No. 91
 ER 1-73914 No. 92
 ES 1-73914 No. 93
 ET 1-73914 No. 94
 EU 1-73914 No. 95
 EV 1-73914 No. 96
 EW 1-73914 No. 97
 EX 1-73914 No. 98
 EY 1-73914 No. 99
 EZ 1-73914 No. 100

AA Included in R
 AB 73579
 AC 73380
 AD 71554 screw
 AE 1097 1/4 lock washer
 AF 73501B
 AG 1-73913 No. 2
 AH 1-73913D No. 2
 AI 1-73913E No. 2
 AJ 1-73913F No. 2
 AK 1-73913G No. 2
 AL 1-73913H No. 2
 AM 1-73913I No. 2
 AN 1-73913J No. 2
 AO 1-73913K No. 2
 AP 1-73913L No. 2
 AQ 1-73913M No. 2
 AR 1-73913N No. 2
 AS 1-73913O No. 2
 AT 1-73913P No. 2
 AU 1-73913Q No. 2
 AV 1-73913R No. 2
 AW 1-73913S No. 2
 AX 1-73913T No. 2
 AY 1-73913U No. 2
 AZ 1-73913V No. 2
 BA 1-73913W No. 2
 BB 1-73913X No. 2
 BC 1-73913Y No. 2
 BD 1-73913Z No. 2
 BE 1-73914 No. 1
 BF 1-73914 No. 2
 BG 1-73914 No. 3
 BH 1-73914 No. 4
 BI 1-73914 No. 5
 BJ 1-73914 No. 6
 BK 1-73914 No. 7
 BL 1-73914 No. 8
 BM 1-73914 No. 9
 BN 1-73914 No. 10
 BO 1-73914 No. 11
 BP 1-73914 No. 12
 BQ 1-73914 No. 13
 BR 1-73914 No. 14
 BS 1-73914 No. 15
 BT 1-73914 No. 16
 BU 1-73914 No. 17
 BV 1-73914 No. 18
 BW 1-73914 No. 19
 BX 1-73914 No. 20
 BY 1-73914 No. 21
 BZ 1-73914 No. 22
 CA 1-73914 No. 23
 CB 1-73914 No. 24
 CC 1-73914 No. 25
 CD 1-73914 No. 26
 CE 1-73914 No. 27
 CF 1-73914 No. 28
 CG 1-73914 No. 29
 CH 1-73914 No. 30
 CI 1-73914 No. 31
 CJ 1-73914 No. 32
 CK 1-73914 No. 33
 CL 1-73914 No. 34
 CM 1-73914 No. 35
 CN 1-73914 No. 36
 CO 1-73914 No. 37
 CP 1-73914 No. 38
 CQ 1-73914 No. 39
 CR 1-73914 No. 40
 CS 1-73914 No. 41
 CT 1-73914 No. 42
 CU 1-73914 No. 43
 CV 1-73914 No. 44
 CW 1-73914 No. 45
 CX 1-73914 No. 46
 CY 1-73914 No. 47
 CZ 1-73914 No. 48
 DA 1-73914 No. 49
 DB 1-73914 No. 50
 DC 1-73914 No. 51
 DD 1-73914 No. 52
 DE 1-73914 No. 53
 DF 1-73914 No. 54
 DG 1-73914 No. 55
 DH 1-73914 No. 56
 DI 1-73914 No. 57
 DJ 1-73914 No. 58
 DK 1-73914 No. 59
 DL 1-73914 No. 60
 DM 1-73914 No. 61
 DN 1-73914 No. 62
 DO 1-73914 No. 63
 DP 1-73914 No. 64
 DQ 1-73914 No. 65
 DR 1-73914 No. 66
 DS 1-73914 No. 67
 DT 1-73914 No. 68
 DU 1-73914 No. 69
 DV 1-73914 No. 70
 DW 1-73914 No. 71
 DX 1-73914 No. 72
 DY 1-73914 No. 73
 DZ 1-73914 No. 74
 EA 1-73914 No. 75
 EB 1-73914 No. 76
 EC 1-73914 No. 77
 ED 1-73914 No. 78
 EE 1-73914 No. 79
 EF 1-73914 No. 80
 EG 1-73914 No. 81
 EH 1-73914 No. 82
 EI 1-73914 No. 83
 EJ 1-73914 No. 84
 EK 1-73914 No. 85
 EL 1-73914 No. 86
 EM 1-73914 No. 87
 EN 1-73914 No. 88
 EO 1-73914 No. 89
 EP 1-73914 No. 90
 EQ 1-73914 No. 91
 ER 1-73914 No. 92
 ES 1-73914 No. 93
 ET 1-73914 No. 94
 EU 1-73914 No. 95
 EV 1-73914 No. 96
 EW 1-73914 No. 97
 EX 1-73914 No. 98
 EY 1-73914 No. 99
 EZ 1-73914 No. 100

CONTROL BAR FITTINGS (Plate 26-1B)



SYMBOLS (Plate 26-1B)

A 73293 1/4 brace for register return limit
 B 73227AR No. 2
 73227AL No. 2
 C 73216A No. 1 1/2 add crossfooter
 D 73216A No. 2 1/2 non add
 E 73216A No. 3 1/2 add register—line 2
 or 2C control
 F 2-703216A No. 6 line 13 control
 G 703809

H 2-703216A No. 7 line 11 control
 I 2-703216A No. 8 line 9 control
 J 2-703216A No. 9 line 7 control
 K 2-703216A No. 10 lines 7-13 control
 L 2-703216A No. 11 lines 7-11 control
 M 2-703216 No. 12 lines 11-13 control
 N 2-703216 No. 13 lines 9-13 control
 O 2-703216 No. 14 lines 7-13 control
 P 1-73214A

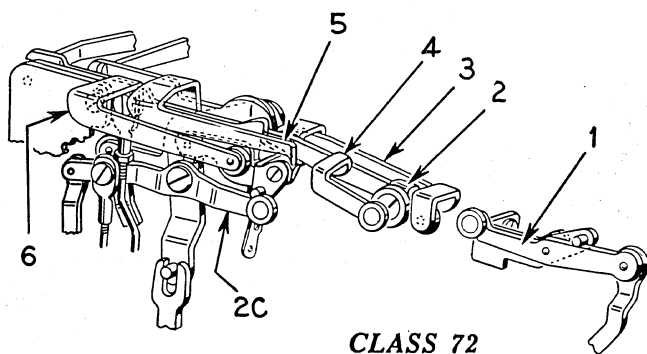
Q 1-73214B No. 2
 R 77515
 S 1-73231
 T 73229
 U 73599
 V 1-703034A No. 2
 W 1-993A Fte. 133 includes R, S, T, U,
 V, X
 X 1-73019 No. 1 plunger

SYMBOLS (Plate 26-1)

A	72617 for ege. side plates with threads	
	77513 use 47 nut; for ege. side plates without threads	
B	73521 No. 1 Short	
	73521 No. 2 Long	
C	74502	
D	73655 Stud	
E	73249	
F	1-73913 Styles 12, 15, 18	} Includes D
	1-703913 Style 22	
	1-703913 Style 30 (1-703913B Style 30, 79503 3 Req.)	
G	73501 Early, 5/16—32 thread	
H	73501B Large head	} Late, 5/32—40 thread
	503A Fte. 717 Small head	
I	73299 use 504 Fte. 717 rivets	
J	79503	
K	73249A use 73661 rivets	
L	1-73913B Styles 12, 15, 18	} Includes D, I, K
	1-703913B Styles 22, 30	
	703249	
M	75621	
N	703661	
O	1-73913C Styles 12, 18	} Includes D, I, O
P	1-703913C Styles 22, 30	
Q	1-73993 No. 3 left margin block, includes R, S	
R	1-73019 No. 1 use 73811 spring	
S	73600A Screw	
T	1-73019 No. 1 use 73811 spring, 73600A screw	
U	77515	
V	1-73231	
W	1-73034 No. 2 for machines without ege. governor or motor return register	
	1-703034 No. 2 for machines with ege. governor without motor return register	
	1-703034A No. 2 for machines with ege. governor and motor return register, and Class 75-77	
X	1-73993 No. 2 for machines without ege. governor or motor return register	} Includes T, U, V, W, Y, Z
	1-703993 No. 2 for machines with ege. governor without motor return register	
	1A-703993 No. 2 for machines with ege. governor and motor return register, and Class 75-77	
Y	73599	
Z	73229 use 73812 spring	
AB	1-35 Fte. 133 Plunger, use 73811 spring, 73600A screw	
AC	2-34 Fte. 133 Inner margin block with register trip on plunger; includes U, V, W, Y, Z, AB	
AD	1-993 Fte. 133 Inner margin block with register trip on left side; includes T, U, V, W, Z, AE, AF, AG	
AE	74502	
AF	182 Fte. 133	
AG	71611	
AH	703530 No. 1 Screws	
AI	1-703214 No. 3 Removable margin block	
AJ	1-73214	
AK	1-73214A No. 2	
AL	73011 Styles 12, 15, 18	
	703011 No. 1 Style 30	
	703011 No. 2 Style 22	
AM	73201A No. 3	
AN	1-73201A No. 2	
AO	73201A No. 1	
AP	73293A Register return limit, may be cut to fit form	
AQ	1-73294AR	
AR	1-73294AL	
AS	1-73291	
AT	1-73294 includes AU	
AU	73820 Spring	
AV	73227R No. 2	
	73227L No. 2	
AW	1-73286 No. 2 Register trip	
AX	1-703214A No. 4 Register trip for early Class 75-77	

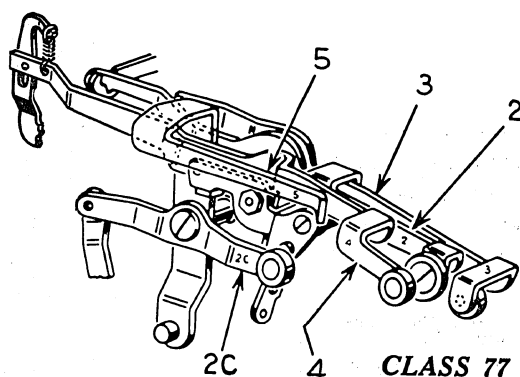
1-73214A
1-73214B No 2

CONTROL LEVER IDENTIFICATION—6 LINE CONTROL (Plate 26-2)



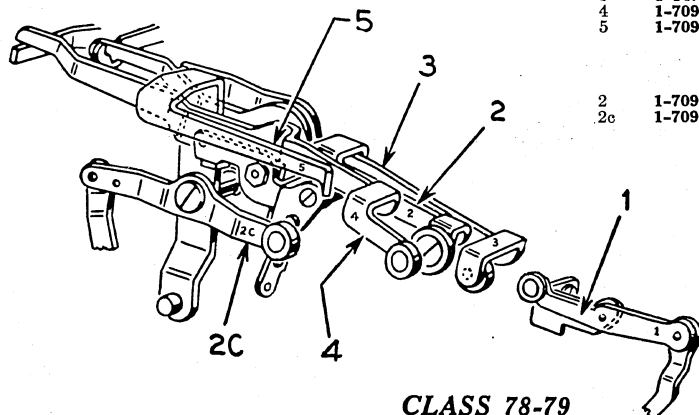
CLASS 72

Line of Control	Symbol	Function
CLASS 72		
1	1-104 Fte. 144 No. 2	Calendar Feature—Rotary
2	1-709231A	Positive Register Control
2c	11-709254 No. 2	Consecutive Count and/or Non-Extend
	1-709254 No. 2	Consecutive Count and/or Non-Extend without Four Position Printing Control
3	1-709231 No. 4	Pro-Rate Feature
4	1-709249A	Multiplier Factor to Print
5	1-709299	Without Power Result Keys, Four Position Printing Control
	1-709299 No. 2	With Power Result Keys, Four Position Printing Control
6	1-709231 No. 3	Extend Feature



CLASS 77

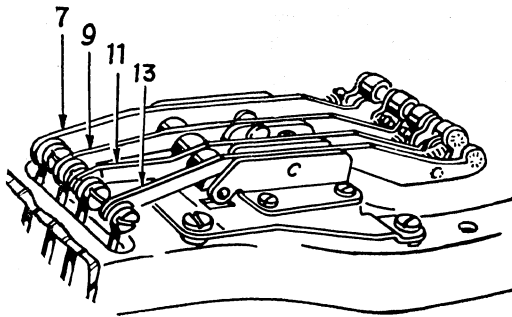
CLASS 77		
2	1-709231A	Positive Register Control
2c	11-709254 No. 2	Calendar Feature—Rotary
3	1-147 Fte. 709 No. 4	Crossfooter Non-Clear Lock
4	1-1105B Fte. 717 (1A-1105B Fte. 717, 72629)	Consecutive Count
5	1-709299	Four Position Printing Control and Register Designation



CLASS 78-79

CLASS 78		
1	1-104 Fte. 144 No. 2	Carriage Return—Carriage Controlled
2	1-709231A	Positive Register Control
2c	11-709254 No. 2	Calendar Feature—Rotary
	1-709254 No. 2	Calendar Feature—Rotary without Four Position Printing Control
3	1-147 Fte. 709 No. 4	Crossfooter Non-Clear Lock
4	1-709249A	Crossfooter Subtract
5	1-709299	Four Position Printing Control
CLASS 79		
2	1-709231A	Positive Register Control
2c	11-709254 No. 2	Calendar Feature—Rotary

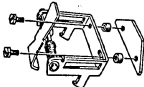
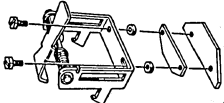
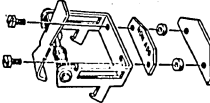
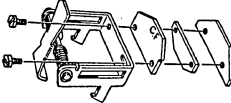
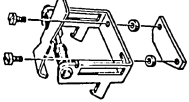
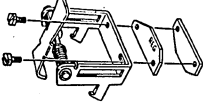
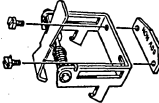
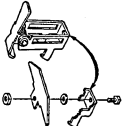
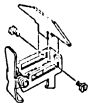
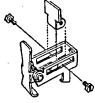
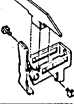
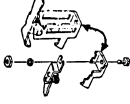
CONTROL LEVER IDENTIFICATION—7, 9, 11 AND 13 LINE CONTROL (Plate 26-2A)



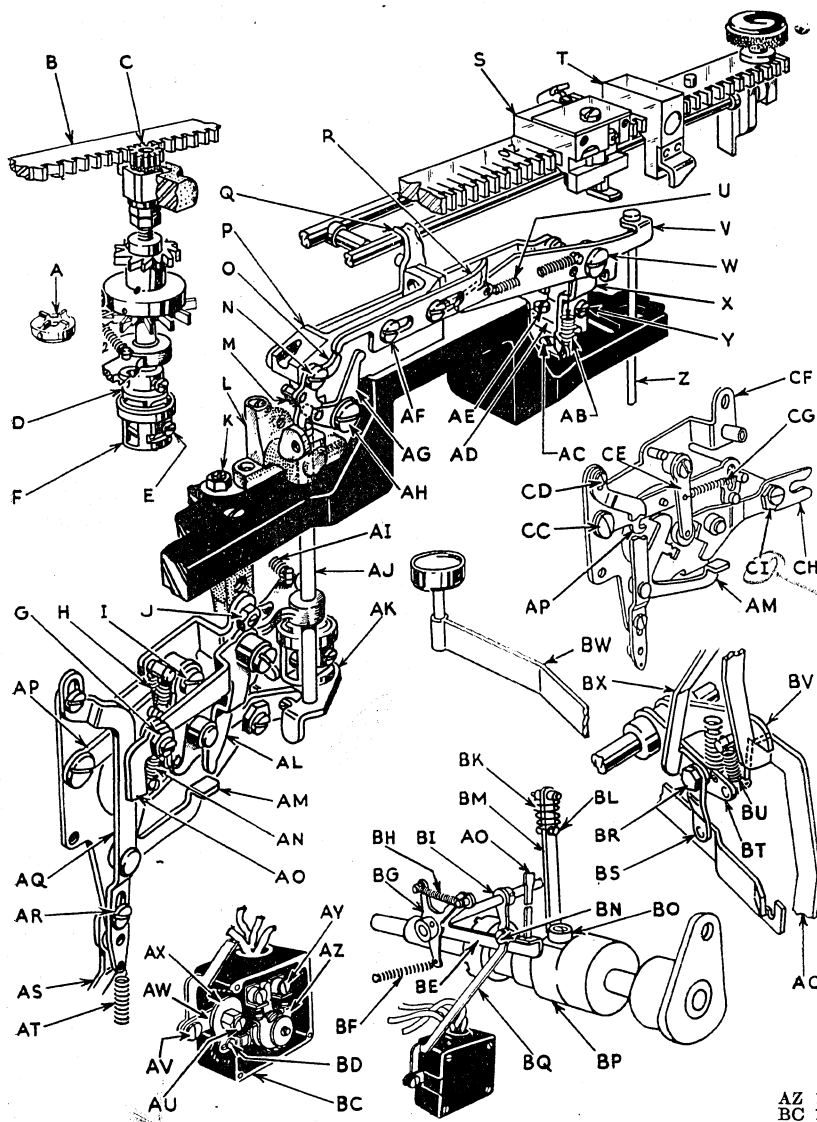
Line of Control	Symbol	Function
Class 72		
Before Machine Serial No. B197641		
7	1-705205 1/2	Product
9	1-705203 1/2	Sub-product
11	1-705203 1/2	Register total
13	1-705202 1/2	Register sub-total
Series M 200		
After Machine Serial No. B197641		
7	1-705205 1/2	First product or product
9	1-705203 1/2	Final product or minus balance
11	1-705203 1/2	Register total
13	1-705202 1/2	Sub-total index
Series M 800		
After Machine Serial No. B197800		
7	1-705205 1/2	Sub-total index
9	1-705203 1/2	Blank machine operation
11	1-705203 1/2	Balance or minus balance
13	1-705202 1/2	Register total

*See Mcc
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CONTROL RAIL ASSEMBLY CHART (Plate 26-3)

Line of Control	Control Rail	Bracket	Screws and Nuts	Spacers	Example	Remarks
1	703217	1-73214 or 1-73214A No. 2 (2)	703592 (2)	702343 (2)		
1 and 2C	703217 73216 No. 6	1-73214 or 1-73214A No. 2 (2)	703592 (2)	58340 (2)		Line 1 thru line 2 Register controls 1-73294AR, 1-73294AL, or 73293A may be used in combination with any one of these assemblies provided a bracket 1-73214A No. 2 is used. Replace screw 703592 or 9050 3/4 with screw 79624 No. 2 and washer 1097 5/8.
1 and 2	703217 73216 No. 4, 5, or 6	1-73214 or 1-73214A No. 2 (2)	703592 (2)	58340 (2)		
1, 2C, and 2	703217 73216 No. 6 73216 No. 4, 5, or 6	1-73214 or 1-73214A No. 2 (2)	703592 (2)	—		
2C	73216 No. 3	1-73214 or 1-73214A No. 2 (2)	703592 (2)	58340 (2)		Line 2C and 2 All line 2 special controls (all rails that contain the letter A in their symbols, except rails Nos. 8A, 9A and 30A) used in combination with line 2C require a rail 73216 No. 16 as a backing which should be ground to conform to the A symbol rail.
2C and 2	73216 No. 3 73216 No. 4, 5, or 6	1-73214 or 1-73214A No. 2 (2)	703592 (2)	—		
2	73216 No. 1, 2 or 3	1-73214 or 1-73214A No. 2 (2)	9050 3/4 (2)	—		
3	703216 No. 2 Class 72 703216 No. 3 Class 77-78	1-73214A No. 2 <i>1-73214 Class 72</i>	703592 49 3/4	69108		Line 3 Line 3 control rails may be used with the above combinations provided a bracket 1-73214A No. 2 is used. Replace screw 703592 or 9050 3/4 with a screw 79624 No. 2 and washer 1097 5/8. Omit washer 1097 5/8 when combination includes line 1 control. When using register controls 1-73294AR, 1-73294AL, or 73293A also, omit spacer 69108.
4	703216 No. 1	1-73214A No. 2	9050 3/4 (2)	—		Line 4 Lines 5 and 6 controls are the only controls that should be used with line 4 controls. Lines 4, 5, and 6 When rails for lines 4 and 5 or 5 and 6 are used in combination, remove the right lug from one rail and the left lug from the other to permit assembling. Lines 5 and 6 Lines 5 and 6 controls may be used in combination with any of the above controls and also with register controls 1-73294AR, 1-73294AL or 73293A. See register return for assembly.
5	703125 1/2 No. 1, 2 or 3	1-73214A No. 2	9050 3/4 (2)	—		
6	703216 No. 1	1-73214A No. 2	9050 3/4 (2)	—		
Reg. Return	1-73294AL or 1-73294AR	1-73214A No. 2	703592 49 1/8	1097 3/4		

CARRIAGE RETURN MECHANISM, TYPE 6 AND 6A MOTORS (Plate 27)



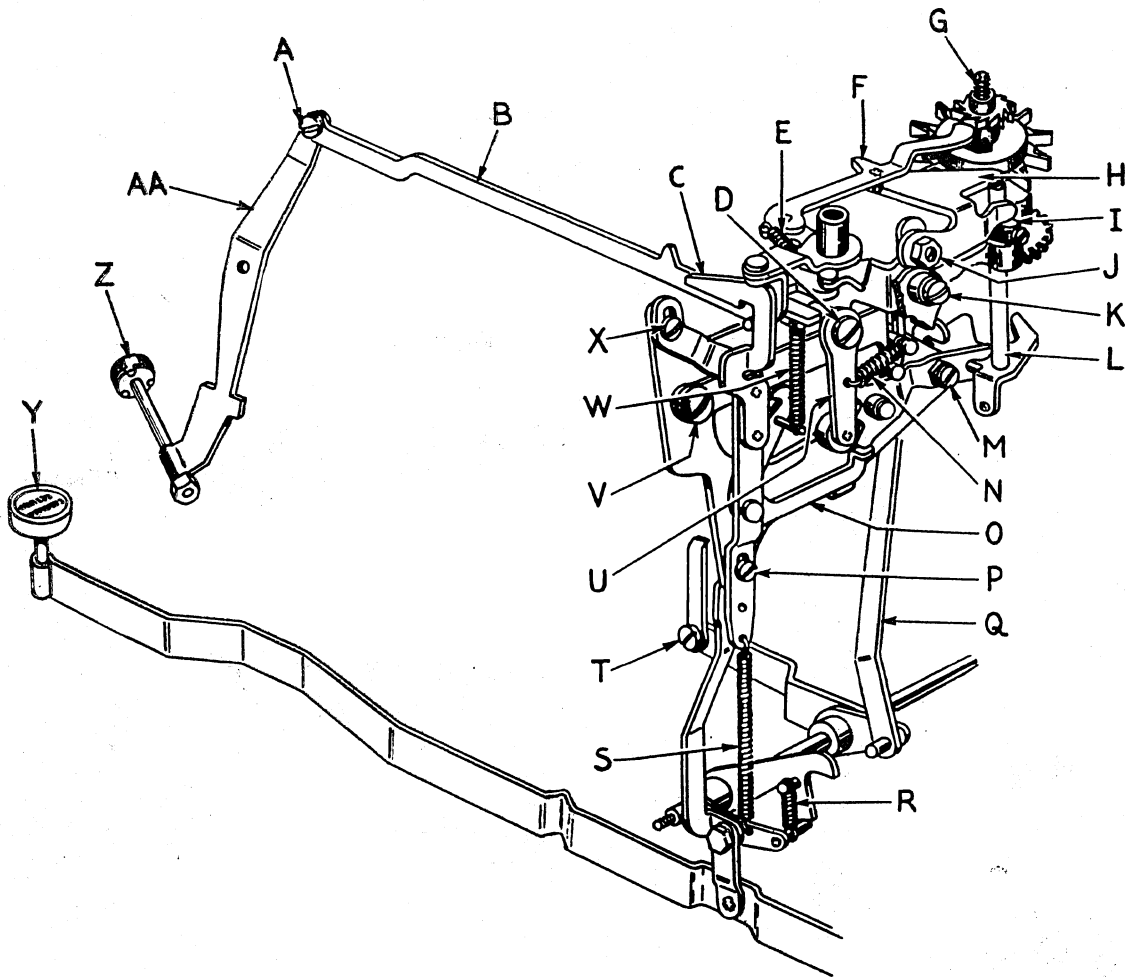
SYMBOLS (Plate 27)

A 75323 No. 2 (1-705353)
 B 1-73913A Style 12, 15, 18 (1-73913B Style 12, 15, 18)
 1-703913A Style 22, 30 (1-703913B Style 22, 30)
 C 1-75009
 D 1-75323 No. 1
 E 75616
 F 1-75353 (1-705353) includes A, E
 G 79362
 H 76806
 I 45 Nut, 76558 screw
 J 75655 Screw, 47 nut
 K 1-75673A
 L 62880 (89801)
 M 75578
 N 1-75238A
 O 75671 No. 1 assembled 1B-75671 No. 1 includes M, N, O, Q, R, AF, AG, AH
 P 1-75126B
 Q 75142
 R 1-73993 No. 2
 S 1-73993 No. 3
 T 75817
 U 1-75140
 V 75634
 W 75139
 X 70512

Z 1-75700 No. 3 (1-705702) use 49 1/4 nuts
 AB 75818
 AC 72567
 AD 1-75670B complete assembled casting
 AE 72567
 AF 75637
 AG 1-75289
 AH 75634 No. 2
 AI 10783
 AJ 1A-75023A includes AK
 AK 75171A*
 AL 1-75240 use screw 506 Fte. 209
 AM 1-75286*
 AN 76808
 AO 71173
 AP 1-75285A
 AQ 1-75283 (1A-75283, 71805) early, includes AM
 1A-75283 later
 AR 79503
 AS 75287A use 75645 screw on top
 AT 75836
 AU 7356 1/2 Screw
 AV 94523
 AW 71218*
 AX 1B-71178 includes AU, AW, AZ, BD
 AY 1A-12021 1/2 AR&AL contact points, use 12045 collars, 1097 1/2 washers and 4252 screws

AZ 1A-3842B use wire clip 21 No. 15
 BC 1B-71907 complete assembly includes AU, AV, AW, AX, AY, AZ, BD
 BD 952 3/4
 BE 1-71175
 BF 74803
 BG 1-71176* on 1-71016A
 BH 10785 1/2
 BI 1A-71174* on 1-71016A
 BK 71802A
 BL 71521B
 BM 1-71903A No. 1
 1-71903A No. 2 for Cl. 78
 1-701903A for RMR and skip tab
 BN 94523
 BO 71309A Roller, use screw 71506
 BP 1-71304A assembled drive clutch 1A-71007
 BQ 71177A
 BR 75581A use 46 nut
 BS 75245 No. 1
 BT 1-75246A
 BU 44800
 BV 1-75143
 BW 1-75110A No. 14 includes BS
 BX 75287A
 CC 75582
 CD 79503
 CE 1-75241A
 CF 1-75239A includes I, AM, AP, AQ, AR, CC, CD, CE, CH, CI
 CG 8384
 CH 1-75284A
 CI 72307 Eccentric (7357 1/2 screw)

CARRIAGE RETURN AND BACK SPACE KEY INTERLOCK SERIES M MACHINES (Plate 27-1)



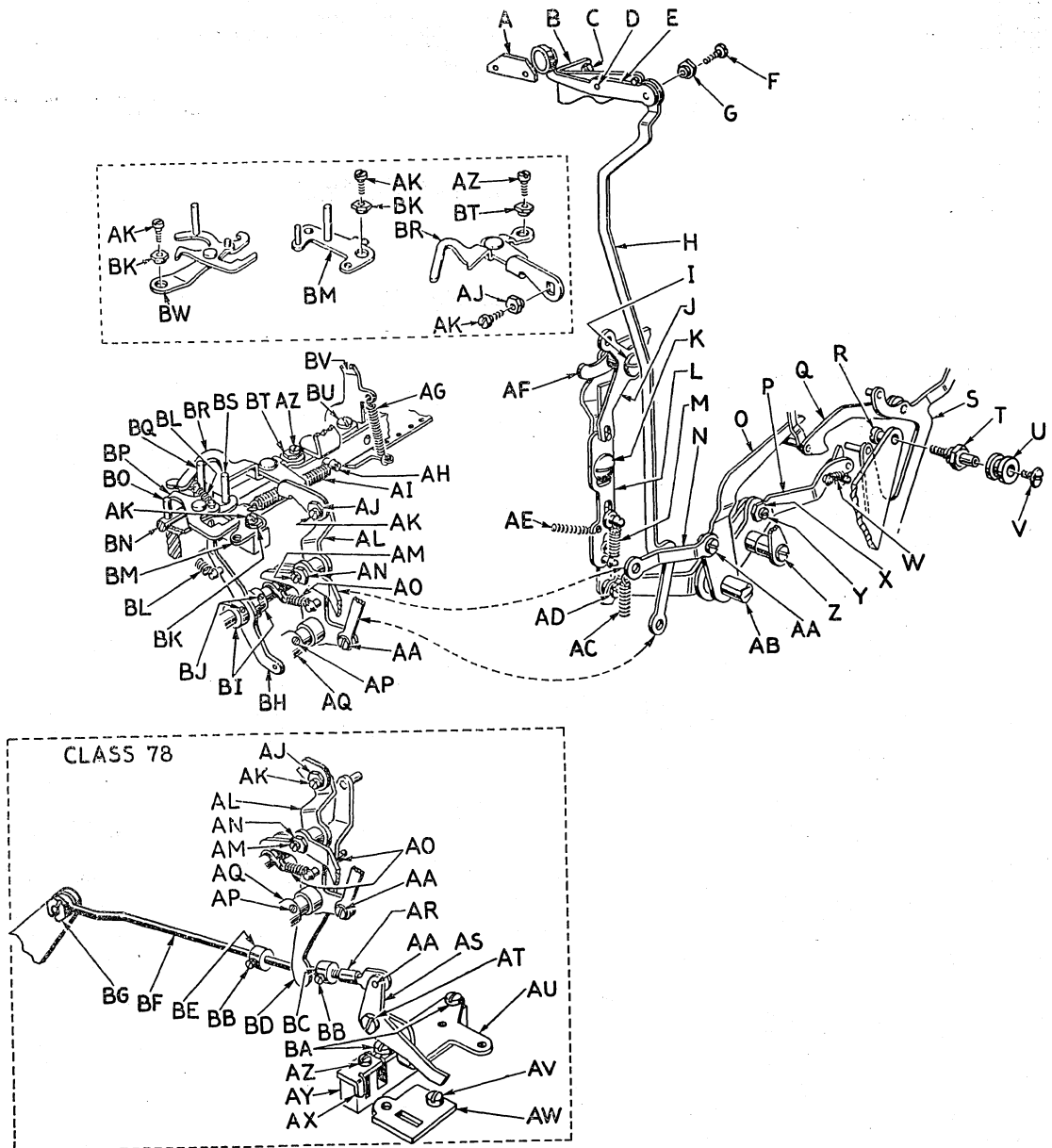
SYMBOLS (Plate 27-1)

A	75645 Screw, 49 1/4 nut	O	1-75286A use rivet 83504
B	1-75175A	P	79503
C	1A-75283 includes O	Q	75220
D	73605		75220 No. 2 for wide or narrow base
E	89800		with Style 30 ege., except Class 75-77
F	1-75182 use 73607 screw	R	44800
G	1-75009 see plate 21, power symbol list	S	75836
H	75239 1/4	T	72582 Screw, 49 nut
I	1-705906 includes 73548 screw	U	1-75241A
J	705626	V	75582
K	506 Fte. 209	W	71805
L	11A-75023A	X	79503
	11-705023	Y	1-75110A No. 14
M	7357 1/2 Screw, 72307 eccentric	Z	1-75521 No. 7, 49 1/2 nut
N	8384	AA	1-75112A No. 2 includes Z

CARRIAGE RETURN—CARRIAGE CONTROLLED—CLASSES 72 AND 78
(Plate 27-2)

Mr W R Lovejoy
Buffalo N Y Branch

10-5



SYMBOLS (Plate 27-2)

A 703217
B 1-709250 No. 2
C 73548 screw
D 500 Fte. 144 screw
E 1-104 Fte. 144 No. 2
F 73612
G 72307
H 709255A No. 4
I 703594
J 1-164 Fte. 146
K 72663
L 1-133B Fte. 146 includes M
M 81 Fte. 124 No. 2
N 701238
O 1-701237
P 1-701188½

Q Included in S
R 315 Fte. 146
S 1-167 Fte. 146 includes Q
T 71524B
U 71324A
V 8054¾
W 7781A spring
X 705367 eccentric
Y 79624 No. 2 screw
Z 523 Fte. 146
AA 75638
AB 61A-701004 No. 1 Class 78
61B-701004 No. 1 Class 78 with four
position printing control and
repeat of items
91-701004 No. 1 Class 72

includes O, P

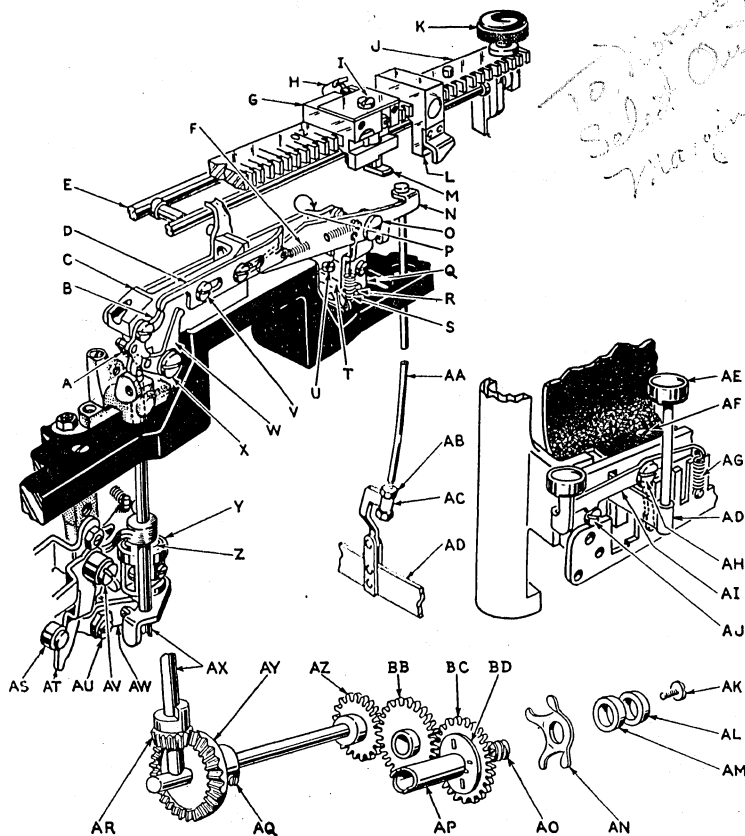
Continued on next page

SYMBOLS (Plate 27-2)—Continued

AC 74815	BA 72614 screw
AD 72576 No. 1	BB 72573
AE 71804	BC 1-72315 No. 1 includes BB
AF 72288	BD 1-705150 1/2
AG 705828	BE 1-72315 No. 1 includes BB
AH 1062 1/2 screw	BF 1-72714 No. 8 includes AR, BB, BC, BE
AI 3880 1/2	BG 72324 nut
AJ 705367 eccentric	BH 702659 screw
AK 79543 screw	BH 1-705159 No. 2
AL 1-705149 1/2	1-705159Z No. 2 slotted blank for repairs on wide base machines except selective column tabulation
AM 71553 screw	BI 1-75332 collar, includes BJ
AN 72307 eccentric	BJ 75618 set screw
AO 3486 1/2 spring	BK 71361 eccentric
AP 75660 set screw	BL 2887 1/2
AQ 1-71321 includes AP	BM 1-705108 1/4 includes BS
AR 72110 No. 3	BN 1-75015B No. 2 includes BO
AS 72111 No. 1	BO Included in BN
AT 79552	BP Included in BW
AU 702297 1/2	BQ Included in BW
AV 72581	BR 1A-705119 1/4
AW 71158	BS Included in BM
AX 72156 No. 1	BT 71361 eccentric
AY 702902B No. 2	BU 2854 1/4
AZ 70512 screw	BV 1-75197A
	BW 1-705107 1/4 includes BP, BQ

REPLACES PRINTS $\frac{2-1}{M}$ AND $\frac{2-2}{M}$

MARGIN RELEASE MECHANISM AND CARRIAGE RETURN GEAR DRIVE (Plate 28)



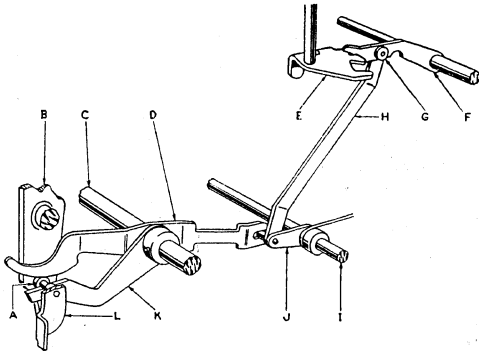
SYMBOLS (Plate 28) ✓

A 62880 (89801)
 B 1-75238A use 75578 screw
 C 75671 No. 1 assembled 1B-75671 No. 1 includes A, B, D, V, W, X
 D 75142
 E 1-73016 Style 12, 15, 18
 F 1-703016 Style 22, 30
 G 75817
 H 1-73993 No. 2 complete assembled block includes H, I, M
 I 73229 use hair spring 73812 and 73599 screw
 J 73563
 K 1-73913A Style 12, 15, 18 (1-73913B Styles 12, 15, 18)
 L 1-703913A Style 22 (1-703913B Style 22)
 M 1-703913A Style 30 (1-703913B Style 30)
 N 73501A (73501B)
 O 1-73993 No. 3
 P 1-73034 No. 2
 Q 1-75140

R 75634
 S 1-75126B use screw 75636, 49 1/4 nut
 T 75139
 U 70512
 V 75818
 W 1-75670B complete assembled casting
 X 72567
 Y 75637
 Z 1-75289
 AA 75634 No. 2
 AB 1-75353 (1-705353) includes Z
 AC 75323 No. 2 (1-705353)
 AD 1-705702
 AE 49 1/4
 AF 1-75100 No. 3*
 AG 1A-75110 No. 15 Black includes AC, AE
 AH 75521 No. 3* Stem
 AI 73611
 AJ 79804
 AK 75630
 AL 1-75184
 AM 74523

AK 71517 early
 AL 71617 later
 AM 71515
 AN 71515
 AO 71117
 AP 1A-71007
 AQ 71302 early
 AR 71302A later
 AS 550 3/4
 AT 1-71902 includes screw 550 3/4
 AU 75378 Roller in 1-75241A, use 73605 screw
 AV 1-75240
 AW 7357 1/2 Screw, 72307 eccentric
 AX 203569 (506 Fte. 209)
 AY 1-75284A
 AZ 1-71010 early, includes AR
 BA 1-701010 No. 1 later
 BB 1-71901
 BC 1-71009B
 BD 1-71113 use screw 300500 1/2
 BE 71112
 BF 71111

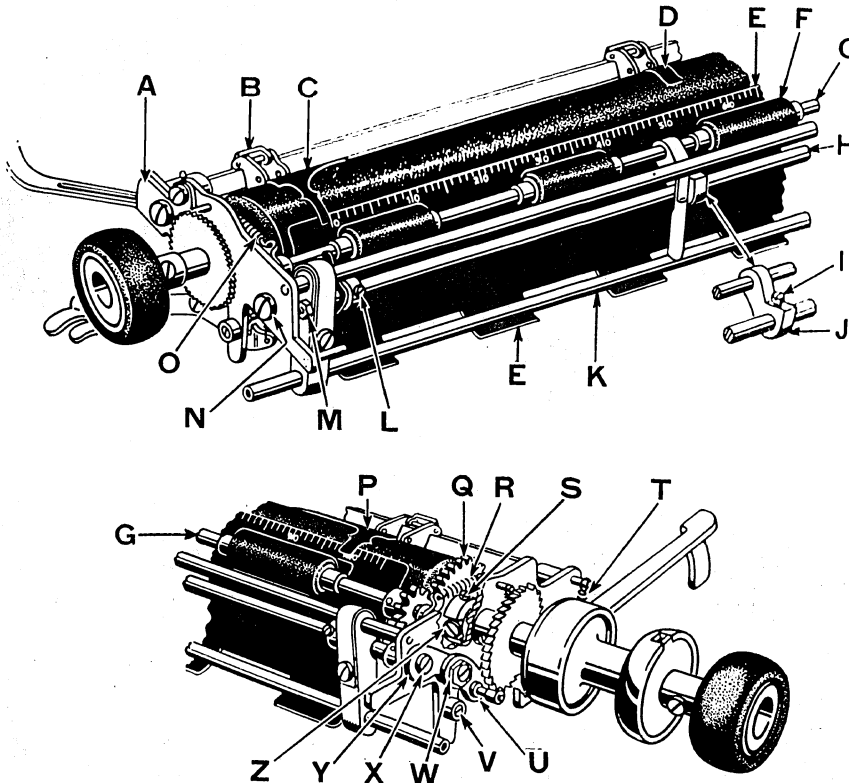
INTERLOCK TO BLOCK THE CARRIAGE RETURN KEY DURING THE MACHINE OPERATION (Plate 29)



SYMBOLS (Plate 29)

- | | |
|---|--------------------------------------|
| A | Included in L |
| B | 1-71121* |
| C | 71004* |
| D | 71139 |
| E | 1A-75023A |
| | 11-75023A for narrow base with Style |
| | 30 cge. |
| F | 1-75005 |
| G | 79503 |
| H | 75220 |
| | 75220 No. 2 for wide or narrow base |
| | with Style 30 cge. except Cl. 75 |
| | and 77 |
| I | 21B-75014 |
| J | 1-75191* |
| K | 1-71138* |
| L | 1-71122 includes A |

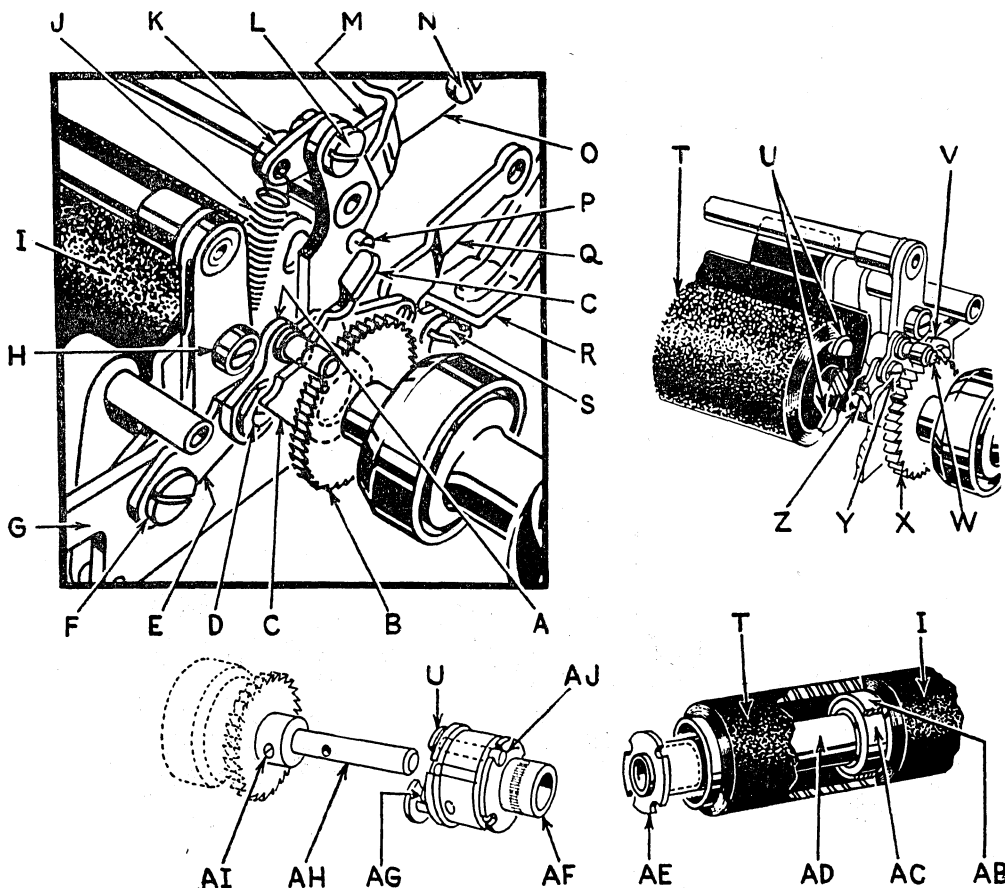
GEARED PRESSURE ROLL ASSEMBLY (Plate 30)



SYMBOLS (Plate 30) ✓

- | | | | | | |
|---|---|----|--------------------------------------|---|--------------------------------|
| A | End plate, included in: | F | 1-73319 Pressure roll, 73567 screw | N | 8054 3/4 |
| | 21-73001 No. 1 Style 12, 15, 18 | G | 1-73024 No. 2 Style 12, 15, 18 in- | O | 73816 |
| | Standard frame | | cludes F, I and J | P | 73246 No. 1 Black |
| | 11-73001 No. 2 Style 12, 15, 18 Col- | II | 1-73005 No. 3 Style 12, 15, 18— | Q | 73246A No. 1 Gray |
| | lating frame | | 28TH used with continuous billing | R | 73323 |
| B | 1-73192 No. 2 | | form fte. includes E, F, G | S | 73816 |
| C | 73246 No. 3 Black | | 11-73005 No. 3 Style 12, 15, 18 used | T | 73624 (73621) |
| | 73246A No. 3 Gray | | for collating cge. with continuous | U | 73820 |
| D | 73246 No. 4 Black | | billing form fte. includes E, F, G | V | 1-73136R uses screw 73514 |
| | 73246A No. 4 Gray | I | 75618 | W | 73603 Screw, 73335 roll |
| E | 1-73130 No. 3 Style 12, 15, 18—25 or | J | 1-73194 | X | 73340 Eccentric, 73515 screw |
| | 28 tooth for standard cge. | K | 21-73006 Style 12, 15, 18 | Y | 73568 |
| | 1-73130 No. 4 Style 12, 15, 18 for col- | L | 1-73337 includes screw 75618 | Z | 1-73253 No. 4 includes U and W |
| | lating cge. | M | 73568 Screw, 46 nut | | 72600 |

SPLIT AND NORMAL PLATEN (Plate 31)



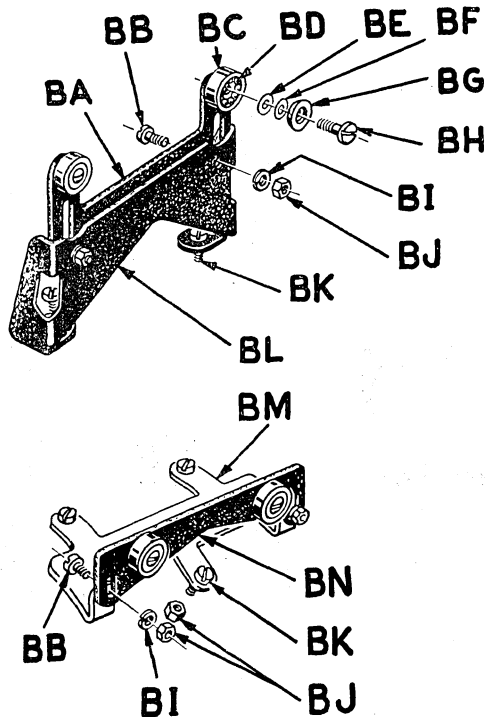
SYMBOLS (Plate 31)

A	1-73136L	Q	73114
B	1-73258L No. 2, 25, 28 tooth		1-703111A No. 2 used with pick-up
C	73262		fingers equipment
D	73340 eccentric	R	73112 No. 2
E	73515 screw	S	7357 1/2
F	1-73253 No. 5	T	1-73998 No. 3 Style 12, 15, 18 specify
G	73532		9 or 12 carbon, tooth and length
	End plate, included in assembled frame		of each split, includes I, U, AB,
	11-73001 No. 2 Style 12		AC, AG, AD, AE, AF, AJ, see
	1B-73001 No. 2 Style 15		plate 1-1 for other styles
	11-73001 No. 2 Style 18	U	Included in T
H	73335 roll	V	73340 eccentric
I	73603 screw		73515 screw
J	Left end of platen, included in T	W	1-73136R
K	10180	X	1-73258R specify 25 or 28 tooth
L	20 No. 89	Y	73514
	259 1/2 screw	Z	2850 1/4
	10335 1/4 nut	AB	Included in T
M	Pressure roll lever, included in assembly	AC	Steel bearing on AD
	1-73024 No. 1 Style 12	AD	Full length tubing, included in T
	1-73024 No. 1 Style 15	AE	Included in T
	1-73024 No. 1 Style 18	AG	Included in T
N	72656 screw	AH	703029R No. 4 see plate 1-1 for other
	49 nut		styles
O	73133 No. 2	AI	1-73356 includes screw 73621
P	73533	AJ	Plunger, included in T

- AA 203578A No. 2
 AB 203234 $\frac{1}{2}$
 AC 1-203184B No. 3
 AD 203165B No. 4
 AE 2035547A No. 3
 AF 73611 screw
 AG 1-73226L No. 10 black
 1A-73226L No. 10 gray
 AH 1-703153AL No. 10
 1-703153BL No. 6 selective column
 tubulation
 AI 2858 $\frac{1}{4}$ A
 AJ 75219
 AK 73154BR
 73154BL
 AL 73184BR
 73184BL
 AM 73186A
 AN 73649
 AO 73184 $\frac{1}{2}$ R
 73184 $\frac{1}{2}$ L
 AP 73500 $\frac{1}{2}$
 AQ 73143 $\frac{1}{2}$ black } brace
 73143 $\frac{1}{2}$ A gray }
 73611 screw
 1097 $\frac{1}{4}$ lock washer
 46 nut
 AR 72617
 AS 73381 knurled nut
 AT 1097 $\frac{1}{4}$ lock washer
 AU 703522 screw
 AV 73182 $\frac{1}{2}$ L No. 1 for $\frac{1}{8}$ " spacing
 73182 $\frac{1}{2}$ L No. 2 for $\frac{1}{8}$ " spacing
 73182 $\frac{1}{2}$ L No. 3 for $\frac{1}{4}$ " spacing
 AW 72617 screw
 1097 $\frac{1}{4}$ lock washer
 47 nut
 AX 1-703285A Style 12, 15, 18, 22, 30
 black
 1A-703285A Style 12, 18, 22, 30 gray
 AY 1-703278 No. 1 Style } complete
 3 $\frac{1}{2}$, 6, 9, 12, 15, } assembled roll
 18 black } paper holder,
 1A-703278 No. 1 } see plate 32A
 Style 3 $\frac{1}{2}$, 6, 9, 12, } for detail
 15, 18 gray } symbols
 AZ 46 nut
 BA 1097 $\frac{1}{4}$ lock washer
 BB 73648 screw

SEE EXPLANATION ON INSIDE OF FRONT COVER

BRACE FOR HIGH-BACK WITH LEDGER CHUTE AND PAPER ROLL HOLDER (Plate 32-1)



SYMBOLS (Plate 32-1)

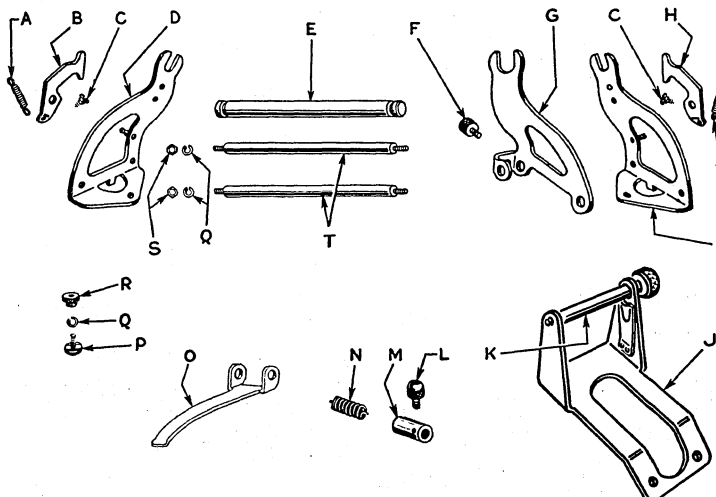
NOTE: These complete braces will replace all previous styles.

- BA 1-703290 black includes BC, BD, 1-703290A gray BE, BF, BG, BH
- BB 12051 3/8
- BC 79327
- BD 4499 steel ball
- BE 79156 No. 1 thin .006
- BF 79156 No. 2 thick .008
- BG 79328
- BH 79554
- BI 1097 3/4
- BJ 46
- BK 700513
- BL 703286 No. 2 black 703286A No. 2 gray
- BM 703286 No. 3 black for Class 77 and 703286A No. 3 gray Series M 700
- BN 1-703290 No. 2 includes for black BC, BD, Class 77 1-703290A BE, BF, and Series BG, BH M 700 No. 2 gray

ROLL PAPER HOLDERS (Plate 32A)

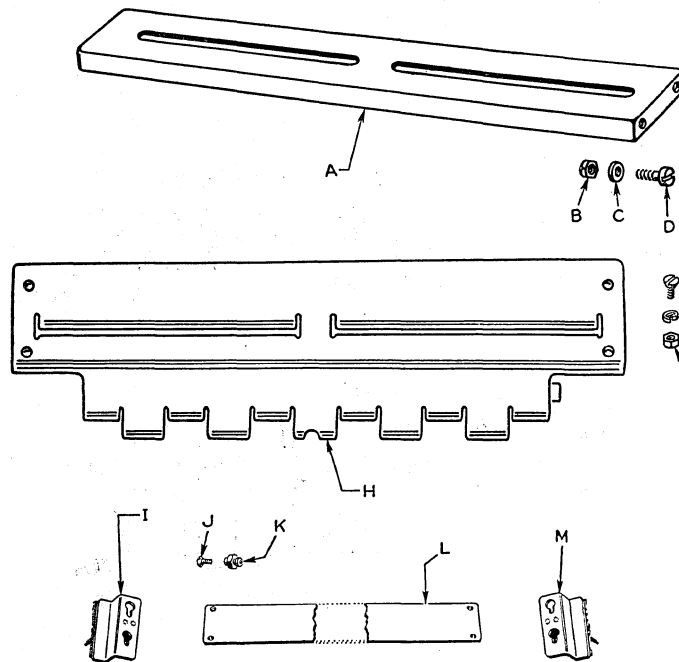
SYMBOLS (Plate 32A)

Complete assembled roll paper holder to travel with carriage.
1-703278 No. 1 Style 3 1/2, 6, 9, 12, 15, 18 black
1A-703278 No. 1 Style 3 1/2, 6, 9, 12, 15, 18 gray



- A 10085
- B 703278 1/4 L black 703278 1/4 AL gray
- C 77529 screw
- D 1A-703278L No. 1 black 1B-703278L No. 1 gray
- E 203023A Style 3 1/2 for 3 1/2" roll paper 203023A Style 6 for 6" roll paper 203023A Style 9 for 9" roll paper 203023A Style 12 for 12" roll paper 203023B Style 15 for 14 1/4" roll paper 203023B Style 18 for 17 1/4" roll paper
- F 703503 1/2
- G 1-703278 1/2 R black 1-703278 1/2 L black 1-703278 1/2 AR gray 1-703278 1/2 AL gray } includes F
- H 703278 1/4 R black 703278 1/4 AR gray
- I 1A-703278R No. 1 black 1B-703278R No. 1 gray
- J 1-73278 No. 2 black roll paper holder for top of case, includes K 1A-73278 No. 2 gray
- K 75661 screws
- L 1-73032
- M 203555 knurled screw
- N 203460
- O 203808 spring
- P 203201
- Q 703522 screw
- R 1097 3/4 lock washer
- S 73381 knurled nut
- T 46 nut 203027 Style 3 1/2 for 3 1/2" roll paper 203027 Style 6 for 6" roll paper 203027 Style 9 for 9" roll paper 203027 Style 12 for 12" roll paper 203027A No. 1 Style 15 for 14 1/4" roll paper 203027A No. 1 Style 18 for 17 1/4" roll paper

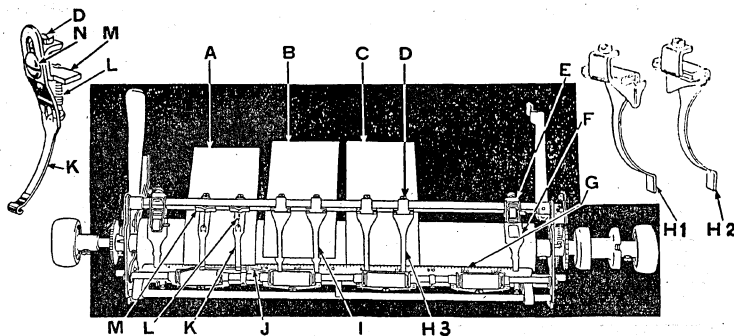
PLATE, BACK AND PAPER GUIDE STRAP, FOR CARRIAGE BACK (Plate 32B)



SYMBOLS (Plate 32B)

- | | | |
|---|---|--------------------------------|
| A | 1-703285A Style 12, 15, 18, 22, 30 black | plate for roll paper holder |
| | 1A-703285A Style 12, 18, 22, 30 gray | |
| B | 49 1/4 nut | |
| C | 1097 1/8 lock washer | |
| D | 73561 screw | |
| E | 2859 1/8 screw | |
| F | 1097 1/8 lock washer | |
| G | 46 nut | |
| H | 1-73225 No. 2 Blank Style 12, 15, 18 | black, back only |
| | 1-703225 No. 2 Blank Style 22, 30 | |
| | 11-703225 No. 2 Blank Style 22, 30 selective column tabulation | gray, back only |
| | 1B-73225 No. 2 Blank Style 12, 18 | |
| | 1B-703225 No. 2 Blank Style 22, 30 | |
| | 11B-703225 No. 2 Blank Style 22, 30 selective column tabulation | |
| I | 1-12 1/4 L Fte. 98 black | strap for snap on paper guides |
| | 1A-12 1/4 L Fte. 98 gray | |
| J | 2859 3/8 B screw | |
| K | 45 Fte. 98 nut | |
| L | 12 3/4 A Fte. 98 Style 12, 15, 18, 22 black | |
| | 12 3/4 B Fte. 98 Style 12, 18, 22 gray | |
| M | 1-12 1/4 R Fte. 98 black | |
| | 1A-12 1/4 R Fte. 98 gray | |

FORM CHUTES NO. 2A, 2B, 2C (Plate 33)



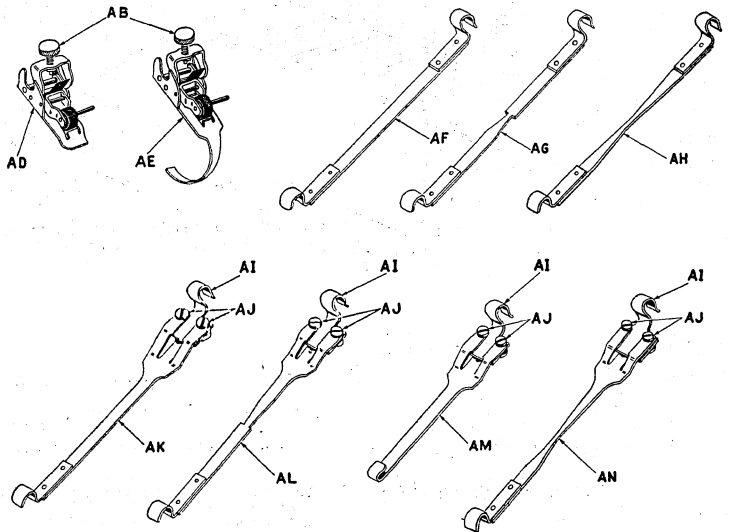
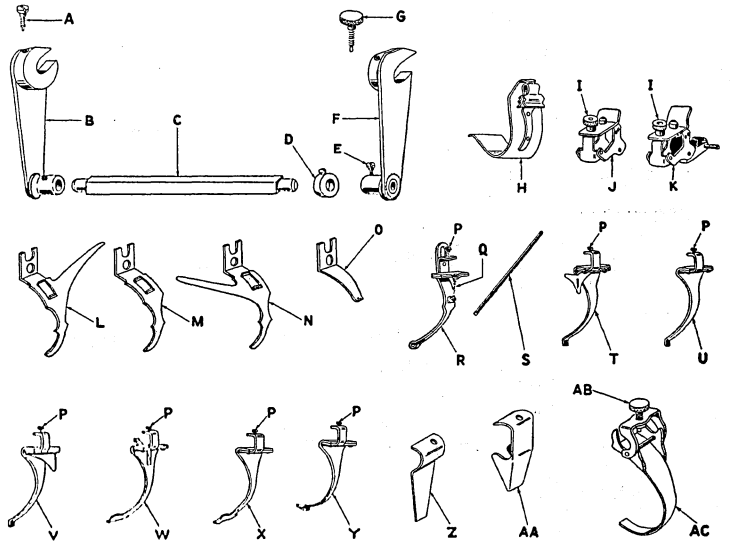
SYMBOLS (Plate 33)

- NOTE: Refer to plate 33-1 for detail parts.
- | | | | |
|----|--|---|--|
| A | Form chute No. 2B | Furnish—form showing printing line and sample print. Location of complete chute by graduations on platen shield also machine style and number | |
| B | Form chute No. 2A | | |
| C | Form chute No. 2C | | |
| D | 72592 screw for fingers | | |
| E | 1-73192 No. 1 | | |
| F | 73246 No. 2 black | | |
| | 73246A No. 2 gray | | |
| G | 1-120 Fte. 102 Style 15 black | for form chute No. 2B | Furnish —form showing printing line and sample print. Location of complete chute by graduations on platen shield also machine style and number |
| | 11A-73130 No. 2 Style 12, 18 gray | | |
| | 1-73130 No. 2 Style 15 black | for form chute No. 2A | |
| | 1A-73130 No. 2 Style 12, 18 | | |
| | 1A-703130 No. 2 Style 22, 30 | for form chute No. 2C | |
| | 1A-117 Fte. 102 Style 15 black | | |
| | 21A-73130 No. 2 Style 12, 18 | | |
| | 21-703130 No. 2 Style 22, 30 | | |
| H1 | 1-73246R No. 9 | for form chute No. 2C | |
| H2 | 1-73246L No. 9 | | |
| H3 | 1-73246 No. 9 | | |
| I | 1-73246 No. 11 Specify Printing Line—for form chute No. 2A | | |
| J | 73037 Specify Length | | |
| K | 1-73246 No. 8 includes D, L, M, N—for form chute No. 2B | | |
| L | 72810 spring | | |
| M | Included in K | | |
| N | 73504 1/2 | | |

FORM CHUTE ACCESSORIES, FINGERS AND BANDS (Plate 33-1)

SYMBOLS (Plate 33-1)

- A 703513 $\frac{1}{2}$ No. 2 for stationary form chute
 B 1-703103L No. 2
 C 703001 No. 3 Specify Length
 D 1-75332 includes, 75618 set screw
 E 4463 set screw, used for shaft C
 F 1-703103R No. 2
 G 703513 $\frac{1}{2}$ for removable form chute
 H 1-20 Fte. 98 wide $\frac{3}{4}$ " band
 I 73381 knurled nut
 J 1-73192 No. 2 includes I holders for
 K 1-73192 No. 1 includes I/L, M, N, O
 L 73246 No. 3 black
 M 73246A No. 3 gray
 N 73246 No. 2 black
 O 73246A No. 2 gray
 P 73246 No. 1 black
 Q 73246A No. 1 gray
 R 73246 No. 4 black
 S 73246A No. 4 gray
 T 72592 set screw
 U 72810 spring
 V 1-73246 No. 8 for form chute No. 2B—includes P, Q
 W 73037 Specify Length—for form chute No. 2B
 X 1-73246L No. 9 includes P for form chute
 Y 1-73246 No. 9 includes P for form chute
 Z 1-73246R No. 9 includes P for form chute
 AA 1-73246 No. 10 Specify Printing Line—for form chute No. 2A—includes P
 AB 1-73246 No. 11 Specify Printing Line—for form chute No. 2A—includes P
 AC 1-73246 No. 12 for rear feed carriage $\frac{1}{8}$ " offset
 AD 1-73246 No. 13 for front feed carriage $\frac{1}{4}$ " offset
 AE 703246
 AF 73252
 AG 73513 knurled set screw
 AH 1-73246 No. 5
 AI 1-73246 No. 6
 AJ 1-73246 No. 7
 AK 1-28 $\frac{3}{4}$ Fte. 98 No. 2 Blank, both ends for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage
 AL 1-703122 No. 2 both ends for $\frac{3}{8}$ " shaft—for 30" carriage
 AM 1-703122 No. 2 Env. 1065 one end for $\frac{1}{4}$ " shaft other end for $\frac{3}{8}$ " shaft—for 22" carriage with auxiliary pressure rolls
 AN 1-28 $\frac{3}{4}$ Fte. 98 No. 2 cut out for printing line—both ends for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage
 AO 1-29 Fte. 98 No. 2 narrow $\frac{1}{10}$ " center—both ends for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage
 AP 1-703122 No. 3 Env. 1065 narrow $\frac{1}{8}$ " center—both ends for $\frac{3}{8}$ " shaft—for 30" carriage
 AQ 29 $\frac{1}{2}$ Fte. 98 for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage
 AR 29 $\frac{1}{2}$ Fte. 98 No. 2 for $\frac{3}{8}$ " shaft—for 30" carriage
 AS 73500 $\frac{1}{2}$
 AT 1-29 $\frac{1}{4}$ Fte. 98 both ends for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage
 AU 21-29 $\frac{1}{4}$ Fte. 98 both ends for $\frac{3}{8}$ " shaft—for 30" carriage includes
 AV 1-29 $\frac{1}{4}$ Fte. 98 Env. 1065 one end for $\frac{1}{4}$ " shaft other end for $\frac{3}{8}$ " shaft—for 22" carriage with auxiliary pressure rolls
 AW 11-29 $\frac{1}{4}$ Fte. 98 cut out for printing line—both ends for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage—includes AI, AJ
 AX 1-29 $\frac{1}{4}$ Fte. 98 No. 2 for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage—includes AI, AJ
 AY 1-29 $\frac{1}{4}$ Fte. 98 No. 3 narrow $\frac{1}{10}$ " center—both ends for $\frac{1}{4}$ " shaft—for 12", 15", 18", 22" carriage—includes AI, AJ



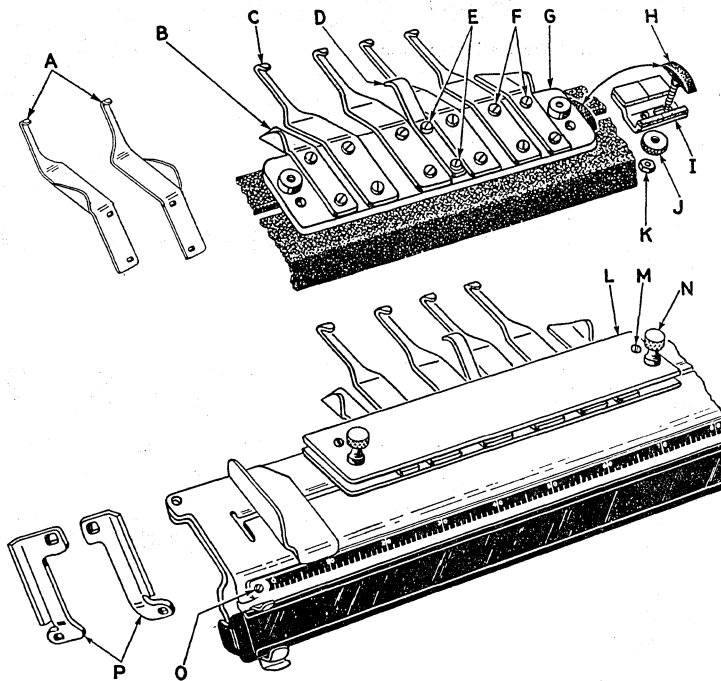
FORM CHUTE NO. 6 (Plate 34)

NOTE—All form chutes No. 6 are custom made.

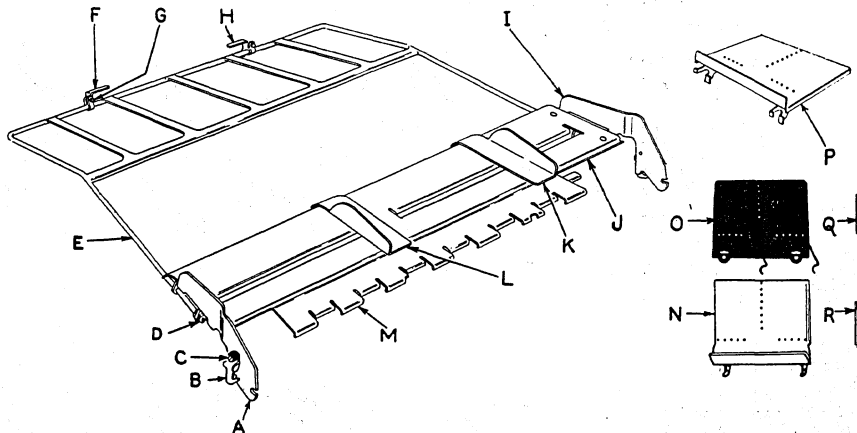
Furnish—Form showing printing line and sample print. Location of complete chute and right side of each finger by location on front scale; also machine style and number.

SYMBOLS (Plate 34)

- | | | |
|---|---|-------------------------------|
| A | 100 Env. 773 Specify Number, finger with guide | } refer to note above |
| B | 100 Env. 773 Specify Number, short guide | |
| C | 100 Env. 773 Specify Number, finger | |
| D | 107 Env. 773 | |
| E | 73563 screws | |
| F | 89576 screws | |
| G | 1-103 Env. 773 Specify Number, plate only | } refer to note above |
| | 2-103 Env. 773 Specify Number, includes A or B, C, D, E, F, G | |
| H | 73538 1/2 Env. 773 location screw, used at end of plate | |
| | 507 Env. 773 round head location screw, used under plate | |
| I | 1-73144AR Env. 773 (refer to 1-73144AL Env. 773 (note above | |
| J | 73376 | |
| K | 49 3/4 | |
| L | 46 for screw under plate | |
| | 1-104 Env. 773 Specify Number, refer to note above | |
| M | 1653 1/2 screws | |
| N | 503B Env. 773 knurled head, removable chute | |
| | 508 Env. 773 slotted head, not removable chute | |
| O | 8851 1/2 with brace | |
| | 74502 without brace | |
| P | 703289 1/4R Env. 773 | } braces used with form chute |
| | 703289 1/4L Env. 773 | |



CONTINUOUS BILL FOLD RACK AND FORM TABLE (Plate 35)

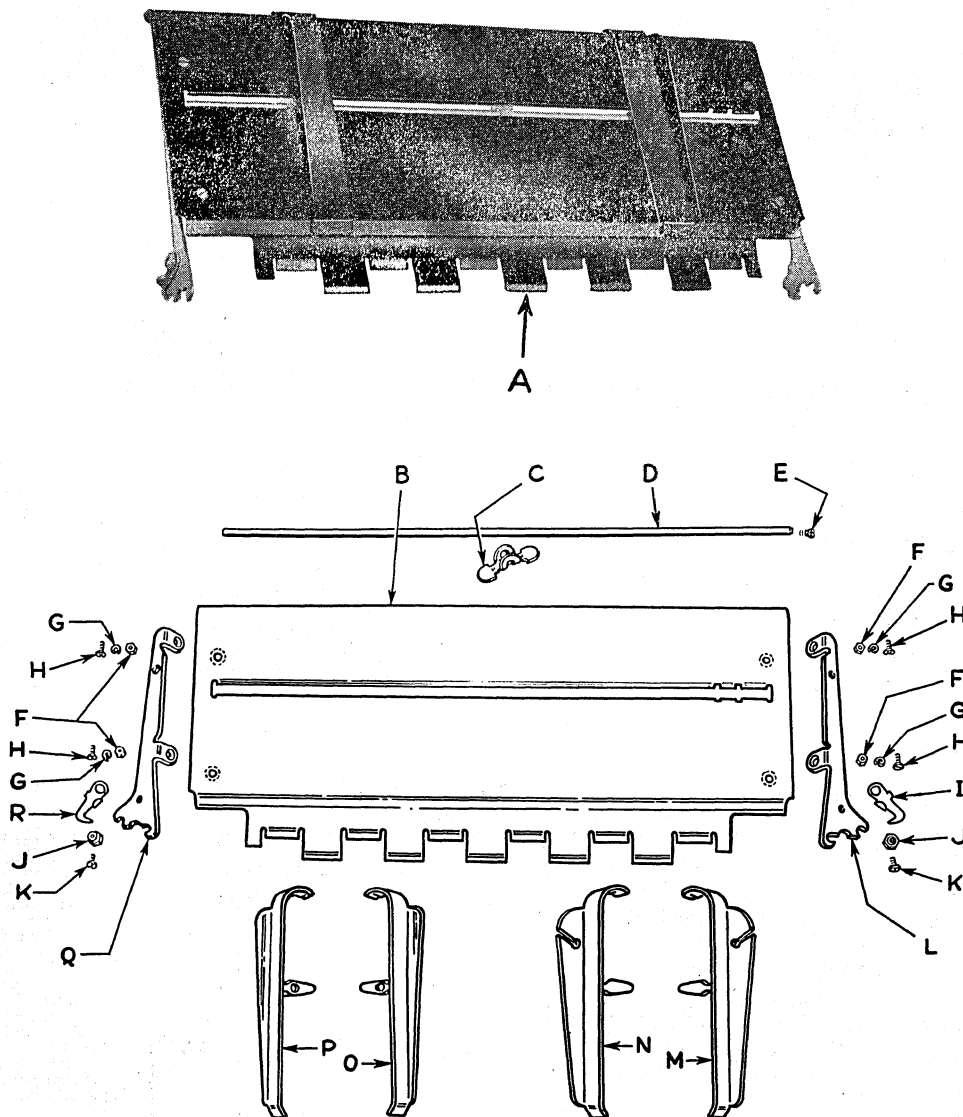


SYMBOLS (Plate 35)

- | | | | | | | |
|---|--|---|--|---|--|---|
| A | 73153AL No. 3 refer to plate 36-3 for other styles | I | 73153AR No. 3 refer to plate 36-3 for other styles | M | 1-73225 No. 2 Blank Style 12, 15, 18 black | } back only— for other styles refer to plate 32B letter H |
| B | 73236AL | | | | 1B-73225 No. 2 Blank Style 12, 18 gray | |
| C | 75342 eccentric 73611 screw | | | | N | 1-73108 No. 2 for square tube stand |
| D | 47 nut | | | | O | Not available |
| E | 1-73711 Style 12, 15, 18 black | J | 11A-73225 No. 2 Style 12, 15, 18 black | | P | 73013 No. 2 post |
| F | 73147AL | | 11B-73225 No. 2 Style 12, 18 gray | | Q | 47 nut |
| G | 73142A clamp | | | | R | 73013 No. 1 post extension |
| H | 79543 screw | K | 1-73226R No. 8 black | | | 47 nut |
| | 73147AR | | 1A-73226R No. 8 gray | | | |
| | | L | 1-73226L No. 8 black | | | |
| | | | 1A-73226L No. 8 gray | | | |
- for bracket to back
- includes A, B, C, I, J, L, M—refer to plate 36-1 for other styles
- refer to plate 36-2 for other styles

Lowrey

CARRIAGE BACK—ORIGINAL, 6 3/16" HIGH (Plate 36)



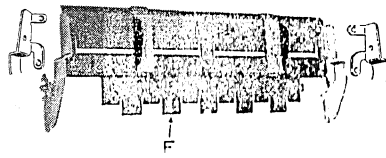
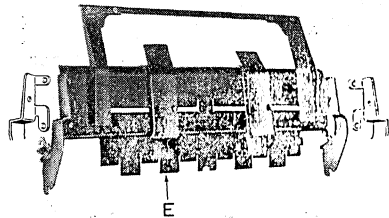
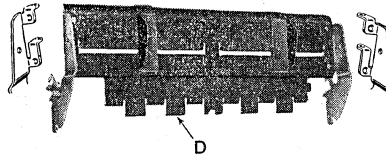
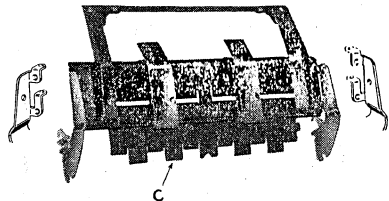
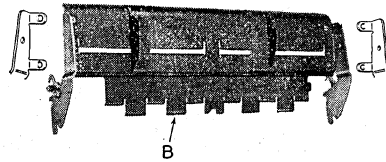
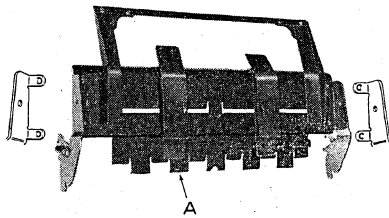
SYMBOLS (Plate 36)

- A 1-73225 No. 1 Style 12, 15, 18 complete carriage back
 B 73225 No. 1 Style 12, 15, 18 back only
 C 1-2819 1/4 A
 D 73004 Style 12, 15, 18 shaft for guides
 E 3256 screw
 F 46 nut
 G 1097 1/4 lock washer
 H 2859 1/2 B
 I 73236AR

- J 75342 eccentric
 K 73611 screw
 L 73153R No. 1
 M 1-73226R No. 2
 N 1-73226L No. 2
 O 1-73226R No. 3 low side
 P 1-73226L No. 3 low side
 Q 73153L No. 1
 R 73236AL

*Spacer
 Dec 32/*

CARRIAGE BACKS—4 $\frac{5}{8}$ " HIGH (Plate 36-1)



SYMBOLS (Plate 36-1)

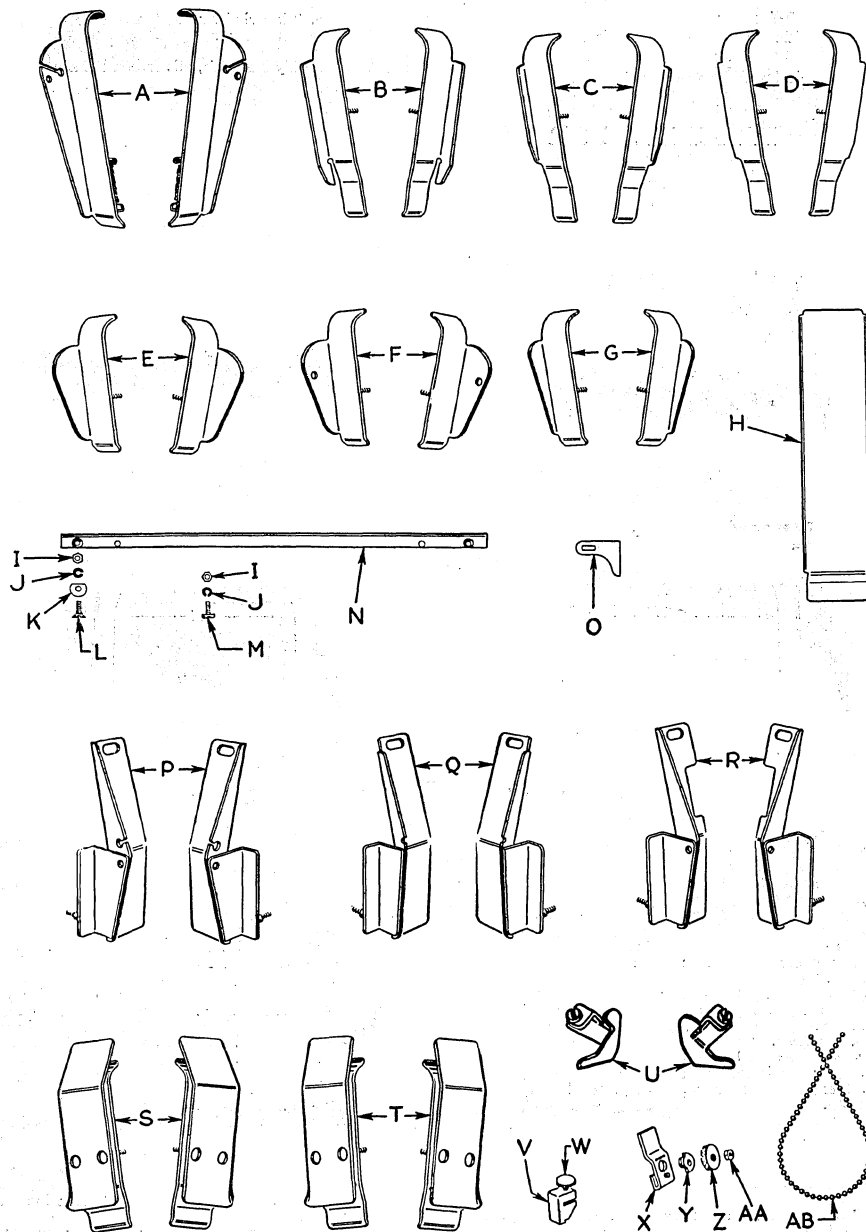
- | | |
|---|---|
| <p>A 1A-73225 No. 2 Style 12, 15, 18 } black for front feed carriage—located on rear screws of platen lock</p> <p>1A-703225 No. 2 Style 22, 30 } gray</p> <p>1B-73225 No. 2 Style 12, 18 } gray</p> <p>1B-703225 No. 2 Style 22, 30 } gray</p> <p>Use 1A-73225 No. 2 Style 12, 15, 18 } for black front feed carriage—located on swing shaft pivot screws</p> <p>1A-703225 No. 2 Style 22, 30 } 703523A 2 Req.</p> <p>703533 2 Req.</p> <p>73644 No. 2 2 Req.</p> <p>73385 No. 2 2 Req.</p> | <p>D 11A-73225 No. 2 Style 12, 15, 18 } black for rear feed carriage with continuous billing form feature—located on rear screws of platen lock</p> <p>11B-73225 No. 2 Style 12, 18 } gray</p> <p>Use 11A-73225 No. 2 Style 12, 15, 18 } for black rear feed carriage with continuous billing form feature—located on swing shaft pivot screws</p> <p>703523A 2 Req.</p> <p>703533 2 Req.</p> <p>73644 No. 2 2 Req.</p> <p>73385 No. 2 2 Req.</p> |
| <p>B 31-73225 No. 2 Style 12, 15, 18 } black for rear feed carriage—located on rear screws of platen lock</p> <p>11A-703225 No. 2 Style 22, 30 } gray</p> <p>31A-73225 No. 2 Style 12, 18 } gray</p> <p>11B-703225 No. 2 Style 22, 30 } gray</p> <p>Use 31-73225 No. 2 Style 12, 15, 18 } for black rear feed carriage—located on swing shaft pivot screws</p> <p>11A-703225 No. 2 Style 22, 30 } 703523A 2 Req.</p> <p>703533 2 Req.</p> <p>73644 No. 2 2 Req.</p> <p>73385 No. 2 2 Req.</p> | <p>E 51-703225 No. 2 Style 22, 30 } black for front feed selective column tabulation carriage—located on rear screws of platen lock</p> <p>51B-703225 No. 2 Style 22, 30 } gray</p> <p>Use 51-703225 No. 2 Style 22, 30 } for black front feed selective column tabulation carriage—located on swing shaft pivot screws</p> <p>703523A 2 Req.</p> <p>703533 2 Req.</p> <p>703644 2 Req.</p> <p>73385 No. 2 2 Req.</p> |
| <p>C 41-73225 No. 2 Style 12, 15, 18 } black for front feed carriage with continuous billing form feature—located on rear screws of platen lock</p> <p>41B-73225 No. 2 Style 12, 18 } gray</p> <p>Use 41-73225 No. 2 Style 12, 15, 18 } for black front feed carriage with continuous billing form feature—located on swing shaft pivot screws</p> <p>703523A 2 Req.</p> <p>703533 2 Req.</p> <p>73644 No. 2 2 Req.</p> <p>73385 No. 2 2 Req.</p> | <p>F 61-703225 No. 2 Style 22, 30 } black for rear feed selective column tabulation carriage—located on rear screws of platen lock</p> <p>61B-703225 No. 2 Style 22, 30 } gray</p> <p>Use 61-703225 No. 2 Style 22, 30 } for black rear feed selective column tabulation carriage—located on swing shaft pivot screws</p> <p>703523A 2 Req.</p> <p>703533 2 Req.</p> <p>703644 2 Req.</p> <p>73385 No. 2 2 Req.</p> |

SYMBOLS (Plate 36-2)

- | | |
|--|--|
| <p>A 21-73226R No. 2 } black snap-on journal guide for rear feed carriage, with $\frac{3}{8}$" high side, slot for silver bead chain and hole for square tear off shaft</p> <p>21-73226L No. 2 } gray</p> <p>21A-73226R No. 2 } gray</p> <p>21A-73226L No. 2 } gray</p> | <p>D 1-73226R No. 9 } black ledger guide for front feed carriage, flat guide without side</p> <p>1-73226L No. 9 } gray</p> <p>1A-73226R No. 9 } gray</p> <p>1A-73226L No. 9 } gray</p> |
| <p>B 1-73226R No. 4 } black ledger guide for front feed carriage, with $\frac{1}{2}$" high side</p> <p>1-73226L No. 4 } gray</p> <p>1A-73226R No. 4 } gray</p> <p>1A-73226L No. 4 } gray</p> | <p>E 1-73226R No. 8 } black journal guide for rear feed carriage, with $\frac{3}{8}$" high side</p> <p>1-73226L No. 8 } gray</p> <p>1A-73226R No. 8 } gray</p> <p>1A-73226L No. 8 } gray</p> |
| <p>C 1-73226R No. 6 } black ledger guide for front feed carriage, with $\frac{3}{8}$" high side</p> <p>1-73226L No. 6 } gray</p> <p>1A-73226R No. 6 } gray</p> <p>1A-73226L No. 6 } gray</p> | <p>F 11-73226R No. 8 } black journal guide for rear feed carriage, with $\frac{3}{8}$" high side and hole for square tear off shaft</p> <p>11-73226L No. 8 } gray</p> <p>11A-73226R No. 8 } gray</p> <p>11A-73226L No. 8 } gray</p> |

SEE EXPLANATION ON INSIDE OF FRONT COVER

GUIDES FOR CARRIAGE BACKS (Plate 36-2)



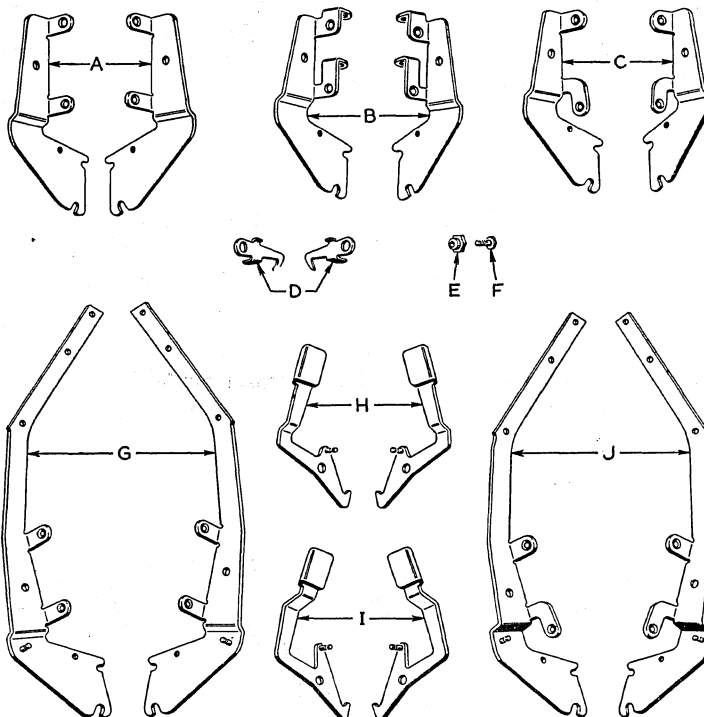
SYMBOLS (Plate 36-2)—Continued

G	1-73226R No. 12 } black } journal guide for rear feed carriage, with $\frac{1}{8}$ " high side	P	1-73226R No. 10 } black } journal guide for front feed carriage, with $\frac{1}{4}$ " high side, slot for silver bead chain and hole for square tear off shaft
H	1-73226L No. 12 } gray } center guide for front feed carriage, flat guide without side for wide form	Q	1-73226L No. 10 } black } journal guide for front feed carriage, with $\frac{1}{4}$ " high side
I	46 nut	R	1-73226R No. 15 } black } journal guide for front feed carriage, with $\frac{1}{2}$ " high side, hole for square tear off shaft and cut out to clear form chute No. 1
J	1097 $\frac{1}{4}$ lock washer	S	1-73226AR No. 5 } black } statement chute guide for front feed carriage, with $\frac{1}{2}$ " high side—bent top
K	73145 flat side washer		
L	2859 $\frac{1}{8}$ screw		
M	73611 screw		
N	73143 Style 12, 15, 18 } black } tie strip for journal guides		
O	73143A Style 12, 15, 18 } gray } brace		
	73143 $\frac{1}{2}$ black } brace		
	73143 $\frac{1}{2}$ A gray }		

SYMBOLS (Plate 36-2)—Continued

T	1-73226R No. 14	} black	statement chute guide for front
	1-73226L No. 14		
	1A-73226R No. 14		
	1A-73226L No. 14	} gray	feed carriage, with $\frac{1}{4}$ " high side—straight top
U	1-73226R No. 13		
	1-73226L No. 13		guide for square shaft on front
V	1-73669 black	} includes W	feed carriage
	1-73669A gray		
	W		73662 screw
	X		1-73144C No. 3
	Y		73388A
	Z		73376 No. 2 knurled nut
	AA		3892 $\frac{1}{4}$ leather washer
	AB		49 $\frac{1}{2}$ nut
			73940 Specify Length, silver bead chain.

BRACKETS FOR CARRIAGE BACK (Plate 36-3)

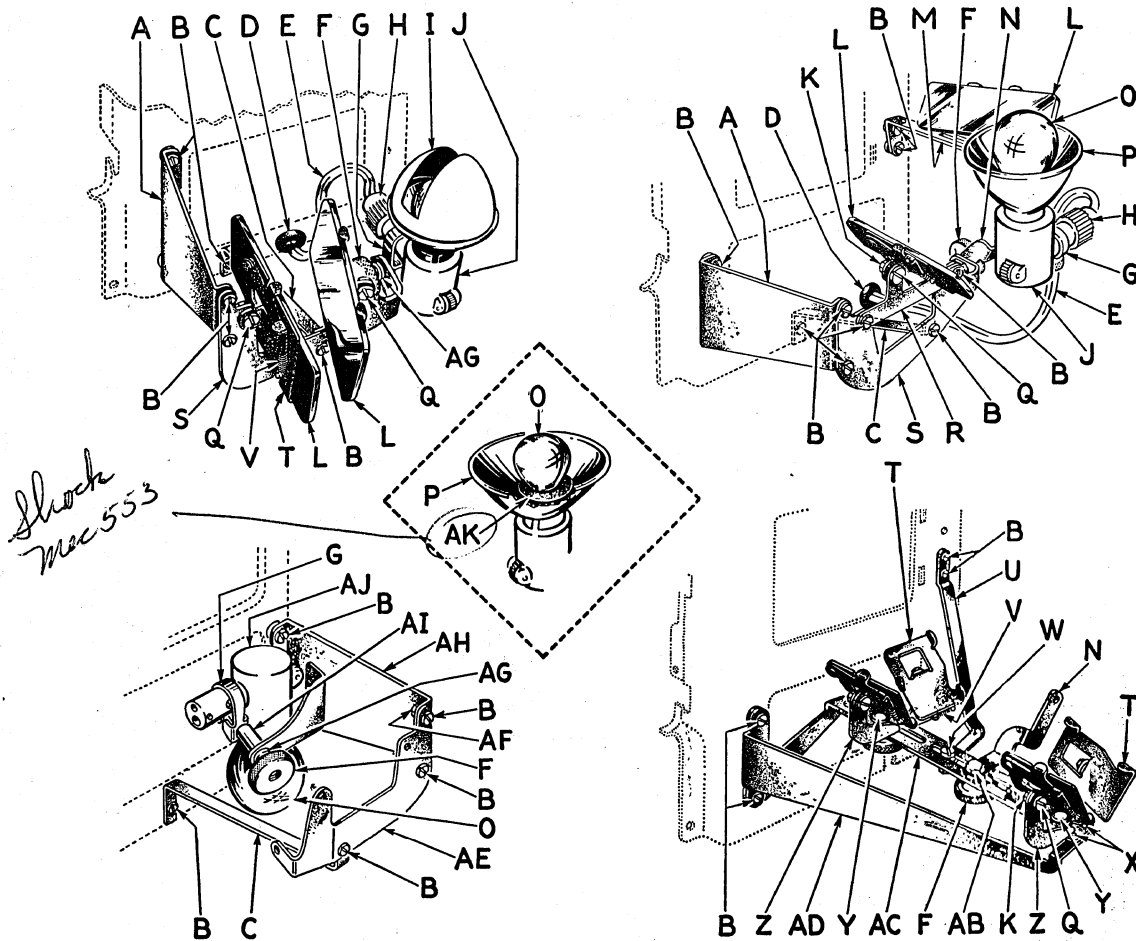


SYMBOLS (Plate 36-3)

A	703153R No. 8	for standard back, located on rear screws of platen lock	Use 1-703153AR No. 10	
	703153L No. 8		1-703153AL No. 10	
	Use 703153R No. 8		703523A 2 Req.	
	703153L No. 8		703533 2 Req.	
	703523A 2 Req.	for standard back, located on swing shaft pivot screws	73644 No. 2 2 Req.	
	703533 2 Req.		73385 No. 2 2 Req.	
	73644 No. 2 2 Req.		1-703236R No. 2 2 Req.	
	73385 No. 2 2 Req.		1-703236L No. 2 2 Req.	
B	73153AR No. 3	for continuous billing form feature back, located on rear screws of platen locks	73611 2 Req.	
	73153AL No. 3		75342 2 Req.	
	Use 73153AR No. 3		12080 $\frac{1}{16}$ 2 Req.	
	73153AL No. 3		73022 Style 12, 15, 18, 22, 30	
	703523A 2 Req.	for continuous billing form feature back, located on swing shaft pivot screws	72617 2 Req.	
	703533 2 Req.			
	73644 No. 2 2 Req.		II	1-703236R No. 2
	73385 No. 2 2 Req.			1-703236L No. 2
C	703153AR No. 7	for standard selective column tabulation carriage back, located on rear screws of platen locks	I	1-703236R No. 3 selective column tabulation
	703153AL No. 7			1-703236L No. 3 carriage
	Use 703153AR No. 7		J	1-703153BR No. 6 for back with roll paper holder and/or form chute No. 1, selective column tabulation carriage, located on rear screws of platen locks—bracket 11 $\frac{1}{4}$ " top to bottom
	703153AL No. 7			1-703153BL No. 6 for back with roll paper holder and/or form chute No. 1, selective column tabulation carriage, located on rear screws of platen locks—bracket 8 $\frac{3}{4}$ " top to bottom
	703523A 2 Req.	for standard selective column tabulation carriage back, located on swing shaft pivot screws		Use 1-703153BR No. 6
	703533 2 Req.			1-703153BL No. 6
	703644 2 Req.			703523A 2 Req.
	73385 No. 2 2 Req.			703533 2 Req.
D	73236AR			703644 2 Req.
	73236AL			73385 No. 2 2 Req.
E	75342 eccentric			1-703236R No. 3 2 Req.
F	73611 screw			1-703236L No. 3 2 Req.
G	1-703153AR No. 10	for back with roll paper holder and/or form chute No. 1, located on rear screws of platen locks—bracket 11 $\frac{1}{4}$ " top to bottom		73611 2 Req.
	1-703153AL No. 10			75342 2 Req.
	Use 1-703153AR No. 10			12080 $\frac{1}{16}$ 2 Req.
	1-703153AL No. 10			73022 Style 12, 15, 18, 22, 30
	73022 Style 12, 15, 18, 22, 30	for back with roll paper holder and/or form chute No. 1, located on rear screws of platen locks—bracket 8 $\frac{3}{4}$ " top to bottom		72617 2 Req.
	72617 2 Req.			

[illegible]

ALIGNING MIRRORS, BRACKETS AND LIGHTS—NEW WIDE BASE CLASSES 72, 78, 79 (Plate 38)



SYMBOLS (Plate 38)

A	705134 $\frac{1}{2}$ BR or BL No. 2 black	S	181AR or AL Fte. 133 gray
B	705134 $\frac{1}{2}$ CR or CL No. 2 gray	T	705160 $\frac{1}{2}$ BR black
C	73611	U	705160 $\frac{1}{2}$ CR gray
D	705135 $\frac{1}{2}$ B No. 2 black	V	1-178 Fte. 133 black
E	705135 $\frac{1}{2}$ C No. 2 gray	W	1A-178 Fte. 133 gray
F	93 $\frac{1}{4}$ No. 1 black	X	166B Fte. 133 No. 5 black
G	93 $\frac{1}{4}$ No. 10 brown } grommet	Y	166C Fte. 133 No. 5 gray
H	1-75908A No. 5 includes H	Z	12083 $\frac{1}{2}$ spring
I	200570A use 200565A screw	AB	12060 $\frac{1}{2}$ screw, use 1097 $\frac{1}{4}$ washer and 46 nut
J	200195	AC	73612 screw
K	200927B	AD	200572A screw
L	175 Fte. 133 black } use 705 Fte.	AE	186 Fte. 133 No. 2 black
M	175A Fte. 133 gray } 133 spring	AF	186A Fte. 133 No. 2 gray
N	1-200925A black } includes	AG	164B Fte. 133 No. 4 black
O	1-200925B brown } F, G, P, AG	AH	164C Fte. 133 No. 4 gray
P	46 nut	AI	165B Fte. 133 No. 3 black
Q	999 Fte. 133 No. 1 regular	AJ	165C Fte. 133 No. 3 gray
R	999 Fte. 133 No. 4 concave	AK	705160 $\frac{1}{2}$ BL black
			705160 $\frac{1}{2}$ CL gray
			46 $\frac{1}{4}$ nut
			1417 washer
			11-705134 $\frac{1}{2}$ BL No. 2 black
			11-705134 $\frac{1}{2}$ CL No. 2 gray
			705358 spacer, use 705591 screw and 200570A nut
			1A-75907 includes F, G, O, AG
			200194 $\frac{1}{2}$ fiber insulator

SERIES M MACHINES
(Type 70)
KEYBOARD

Symbol List

April 15, 1949

Issued _____

To _____

Of _____

Property of and to be returned to
**BURROUGHS ADDING
MACHINE COMPANY**
DETROIT, MICHIGAN

KEYBOARD

Mr M R Lovejoy
Buffalo N Y Branch 10-5

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

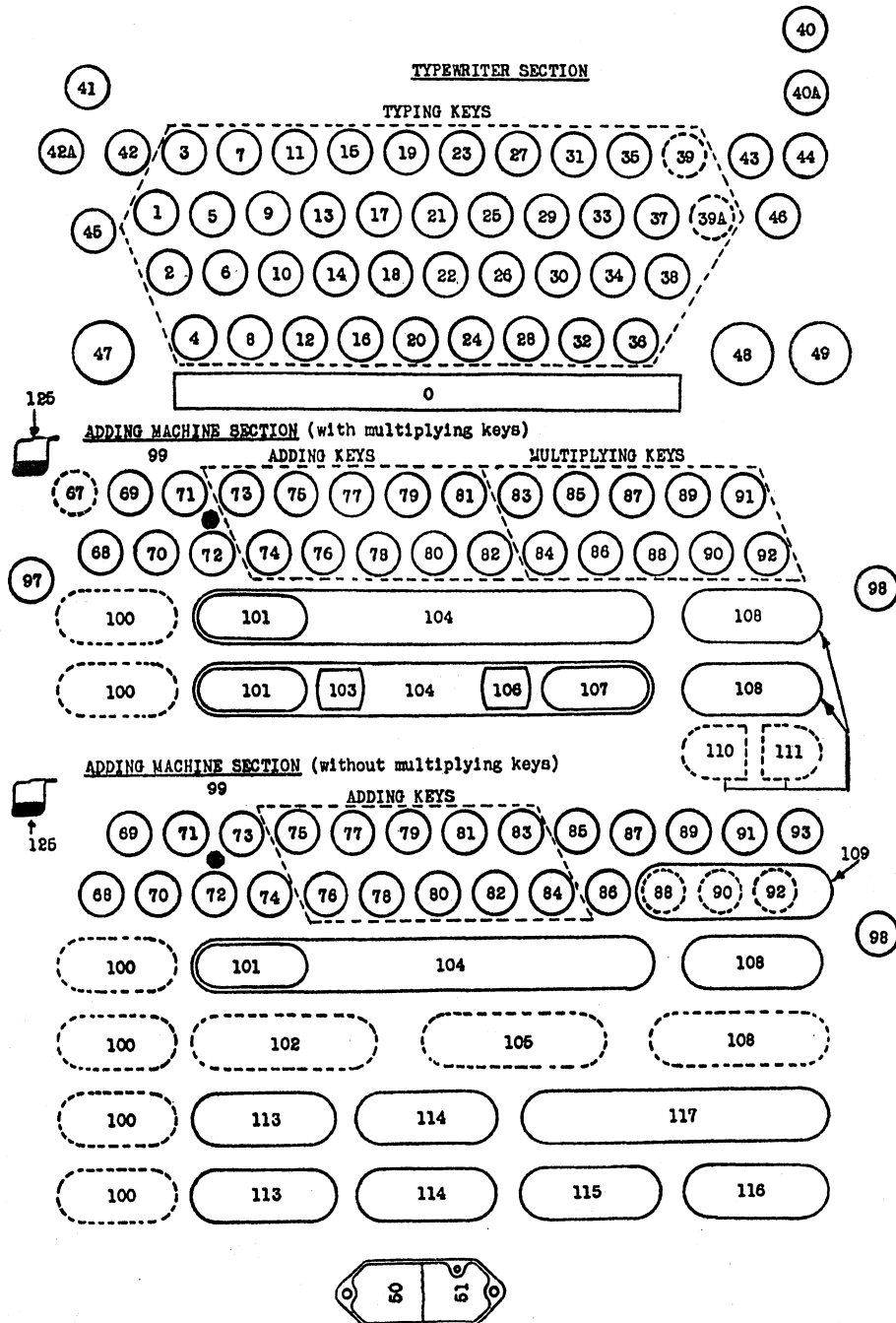
EXAMPLE: 1-8817 $\frac{1}{4}$ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817 $\frac{1}{2}$ ZL, 8828 $\frac{1}{4}$ C, 8828 $\frac{1}{2}$ B, 47 $\frac{3}{4}$, 49 $\frac{1}{4}$ —2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

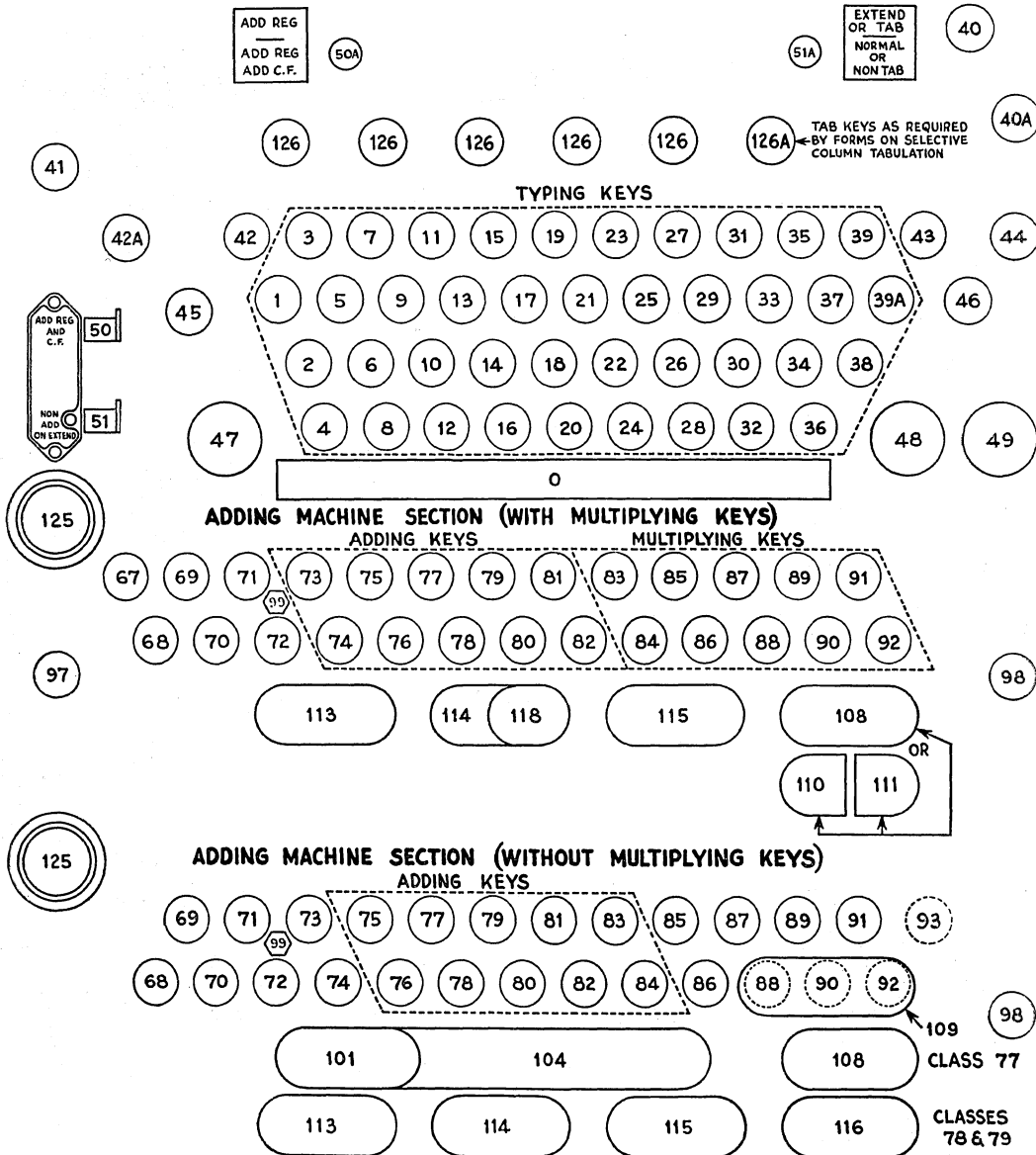
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POSITION NUMBERS FOR KEYS AND BARS TYPE 70 MACHINES (Plate A)



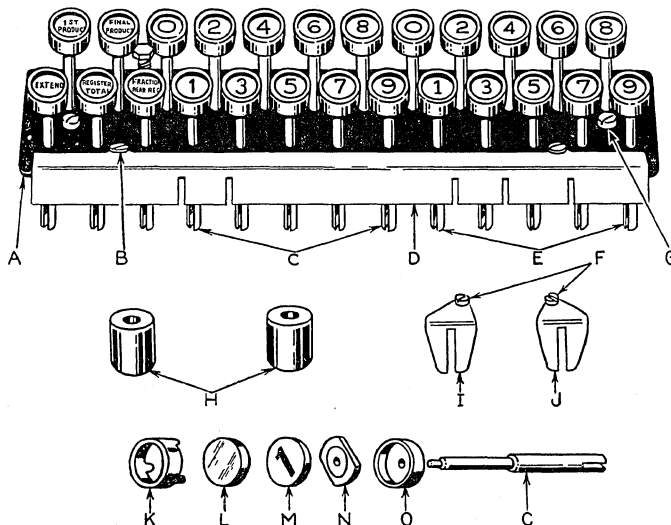
POSITION NUMBERS FOR KEYS AND BARS CLASS 77 AND NEW WIDE BASE CLASSES 72, 78 AND 79 (Plate A-1)



KEYBOARD ASSEMBLY (Plate 1)

SYMBOLS (Plate 1)

- A Complete keyboard assembly, specify style and machine No.
 1-72213 No. 1 wide and narrow base, Cl. 71, 72, 73
 1-72213 No. 2 wide and narrow base, Cl. 74
 1-72213 No. 3 wide and narrow base without reg. subt., Cl. 76
 31-72213 No. 3 wide and narrow base with reg. subt., Cl. 76
 1-72213 No. 5 wide and narrow base with reg. subt. and power result keys, Cl. 78
 31-72213 No. 5 wide and narrow base without reg. subt. with power result keys, Cl. 78
 41-72213 No. 5 wide and narrow base without reg. subt. and power result keys, Cl. 78
 1-702213 No. 3 without reg. subt., Cl. 77
 31-702213 No. 3 with reg. subt., Cl. 77
 41-702213 No. 3 Cl. 75
- B 70512
- C 72521 No. 3 for Nos. 1-3-5-7-9 } Adding keys
 72521 No. 4 for Nos. 0-2-4-6-8 }
- D 72213½
 72213½ No. 2 with ege. return space bar
 72213½ No. 3 with ege. return space bar and repeat of items bar
 72213½ No. 4 with mult. to CF transfer key
 72213½ No. 5 with repeat of items bar
 72213½A No. 6 with mult. motor bars
 72213½ No. 7 with hand tab. bar

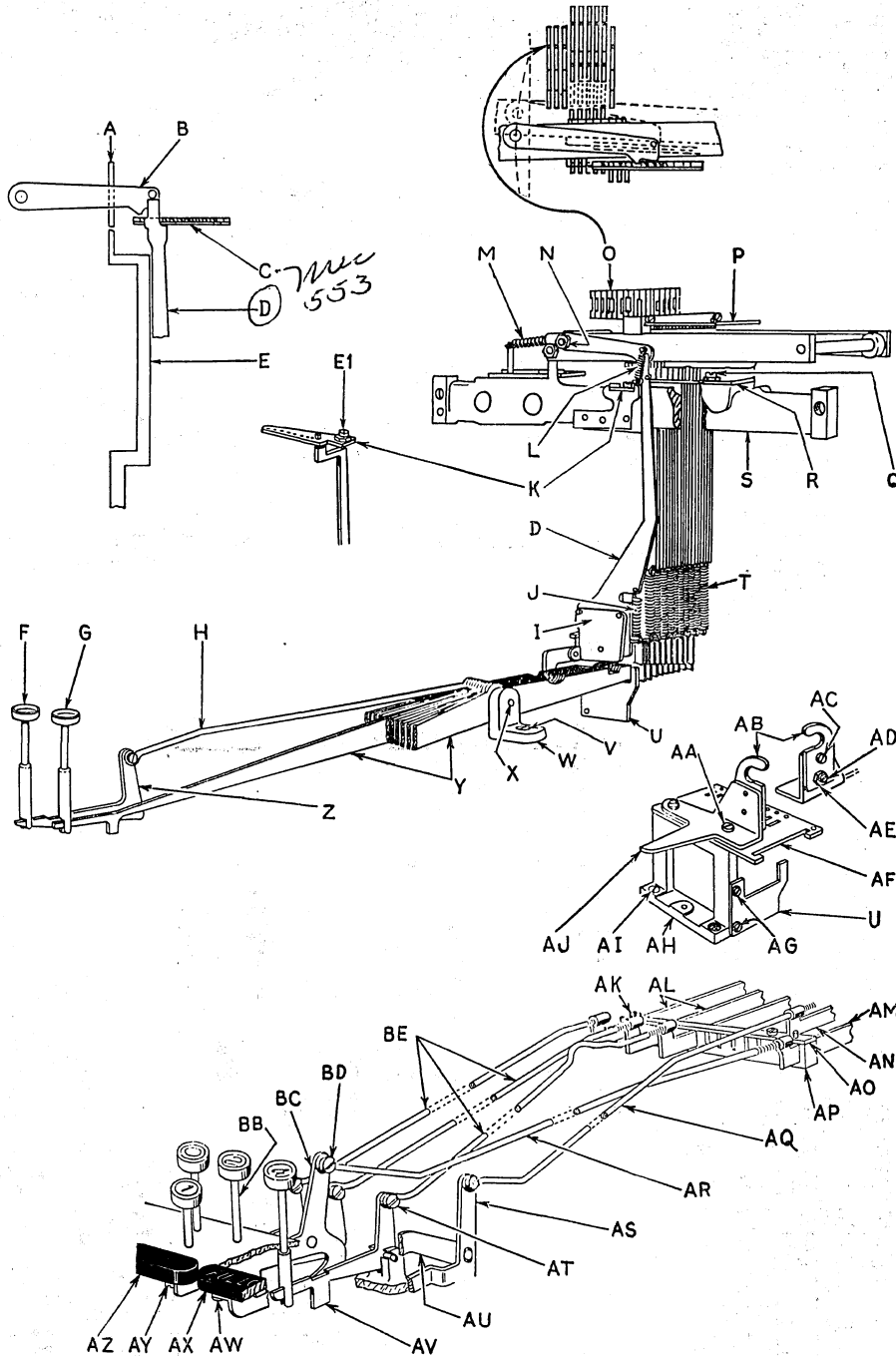


- E 702213½ Cl. 75, 77
 72521 No. 1 for Nos. 1-3-5-7-9 } Mult. keys
 72521 No. 2 for Nos. 0-2-4-6-8 }
- F 70512
 G 71567
 H 71315
 I 72206 No. 1
- J 72206 No. 2
 K 72200A No. 1
 L 72992 No. 1 glass
 M 92 No. 1 specify char. or number and color
 92½ No. 1 cellophane insert, specify color
 N 72210
 O 72199 No. 1

SYMBOLS (Plate 2)

- A 76230
 B 1-76205 No. 1 see plate 3 for other styles
 C 76907 No. 1 use 74534 screws
 D 706907A No. 1
 E 72273A No. 4* included in I
 72271 No. 1 wide and narrow base, Cl. 72
 72271 No. 1 wide base, Cl. 74, 75, 76, 77, 78
 72271 No. 2 wide and narrow base, Cl. 71
 72271 No. 2 narrow base, Cl. 74, 76, 78
 72271 No. 3 narrow base, Cl. 73
 72271 No. 8 ¼ frac., Cl. 72
 72271 No. 14 ¼ frac., Cl. 78
 72271 No. 14 with consecutive numbering device, Cl. 73
 702271 No. 3 ¾ frac., Cl. 77
 702271 No. 5 ¼ frac., Cl. 77
 702271 No. 6 used in 1st col., 1 req., Cl. 78
- E1 76567 Screw, 76311 ecc.
 71553 early
- F 72521 No. 5 frac., add CF keystem
- G 72521 No. 3 for Nos. 1-3-5-7-9 } Adding keystem
 72521 No. 4 for Nos. 0-2-4-6-8 }
- H 72708
- I 1-72274 No. 1 (1-72274 No. 2) includes D, wide and narrow base, Cl. 72, 73
 11-72274 No. 1 (11-72274 No. 2) wide and narrow base, Cl. 71, 74, 76, 78
 41A-72274 No. 1 (11-72274 No. 2) used with auto. ext., Cl. 71, 72, 73
 11-702274 No. 1 (1-702274 No. 3) Cl. 75, 77
 1-702274 No. 2 ½ frac., Cl. 75, 77
- J 72826 Spring
- K Upper guide plate for lever E
 72272A No. 1 } Wide and narrow base, Cl. 72
 72272A No. 2 } Wide and narrow base, Cl. 71, 74, 75, 76, 77, 78
 72272A No. 3 } Wide and narrow base, Cl. 73
 72272A No. 2 } Reg. des., Cl. 77
 702272 No. 2 early }
- L 76812
- M 76811 Narrow base
 79800 No. 1 Wide base
 76311 Ecc., 73611 screw
- N 76130 No. 1 or No. 6
 76202 use 76570 screws
- O 76567 No. 2 use 76311 ecc.
 76201*
- Q 1-71668B (31-71668B) see plate 42 for other styles
- R 72827
- S 72275 No. 1
- T 73561
- U 73561
- W 72671A No. 1
 X 72025 No. 1 Pin
 Y 72270 No. 1 Stamped 1-6 0, used in 0 position } Complete assembly
 72270 No. 2 Stamped 1-6 1, used in 1 position } 1-72671A
 72270 No. 3 Stamped 1-6 2, used in 2 position } No. 1, later.
 72270 No. 4 Stamped 1-6 3, used in 3 position } Complete assembly
 72270 No. 5 Stamped 1-6 4, used in 4 position } 1-72671
 72270 No. 6 Stamped 1-6 5, used in 5 position } No. 1, early.
 72270 No. 7 Stamped 1-6 6, used in 6 position } Cl. 71, 72, 73
 72270 No. 8 Stamped 1-6 7, used in 7 position }
 72270 No. 9 Stamped 1-6 8, used in 8 position }
 72270 No. 10 Stamped 1-6 9, used in 9 position }
 72270 No. 11 Stamped 4-5 0, used in 0 position } Complete assembly
 72270 No. 12 Stamped 4-5 1, used in 1 position } 11-72671A
 72270 No. 13 Stamped 4-5 2, used in 2 position } No. 1, later.
 72270 No. 14 Stamped 4-5 3, used in 3 position } Complete assembly
 72270 No. 15 Stamped 4-5 4, used in 4 position } 11-72671
 72270 No. 16 Stamped 4-5 5, used in 5 position } No. 1, early.
 72270 No. 17 Stamped 4-5 6, used in 6 position } Cl. 71, 72, 73
 72270 No. 18 Stamped 4-5 7, used in 7 position }
 72270 No. 19 Stamped 4-5 8, used in 8 position }
 72270 No. 20 Stamped 4-5 9, used in 9 position } 76, 77, 78
- Z 1-72143 No. 1
- AA 71553
 AB 72276½
 AC 72581
 AD 71553
 AE 79333 No. 1 Ecc.
 AF 72277 No. 1
 AG 71553
 AH 1A-72672 } Complete assembly, includes U, AA thru AJ
 1-72672 early } Cl. 71, 72, 73, 74, 76
 31A-72672 } For machines with auto. ext.,
 21-72672 early } Cl. 71, 72, 73
 1A-702672 Cl. 71 thru 77
 21A-702672 (1B-702672) } Cl. 78
 21-702672 early }
- AI 71518
 AJ 72276
 AK 72614 Screw
 AL 72102 No. 1 Mult. levers, complete assembly 1-72002 No. 1 includes AK, AO, AP, BE
- AM 1-72102A No. 2 } See letter H, plate 43
 1-72102A No. 6 }
- AN 72102 No. 4 Full cent lever
- AO 1-72230 No. 1
- AP 72902 No. 1 use 72902 No. 3 comb and 72584 screws in rear
- AQ 72706 Full cent wire
- AR 72707A No. 4 } Motor bar wire. See letter J, plate 43
 702707A No. 4 }

ADDING AND MULTIPLYING KEYS, AND INTERMEDIATE KEYBOARD ESCAPEMENT MECHANISM (Plate 2)

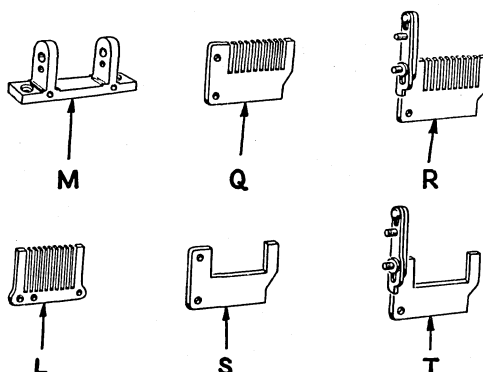


SYMBOLS (Plate 2)—Continued

AS 72124A No. 1
AT 72572 No. 1
AU 1-72117A No. 2 Full cent lever
AV 1-72243 No. 1 for Nos. 0-2-4-6-8 } Mult. key levers
1-72243 No. 2 for Nos. 1-3-5-7-9 }
AW 72592
AX 1-72125 No. 2 specify full cent
AY 957 1/2
AZ 2-72125 No. 3
BB 72521 No. 1 for Nos. 1-3-5-7-9 } Mult. keys
72521 No. 2 for Nos. 0-2-4-6-8 }

BC 1-72117R No. 1* complete assembly†1-72017, early
1-702117R* complete assembly 1-702017
BD 72588 (12356%) use 46 nut
BE 72703 No. 1 used for 0
72703 No. 2 used for 1
72703 No. 3 used for 2
72703 No. 4 used for 3
72703 No. 5 used for 4 } Mult. wires
72703 No. 6 used for 5
72703 No. 7 used for 6
72703 No. 8 used for 7
72703 No. 9 used for 8
72703 No. 10 used for 9

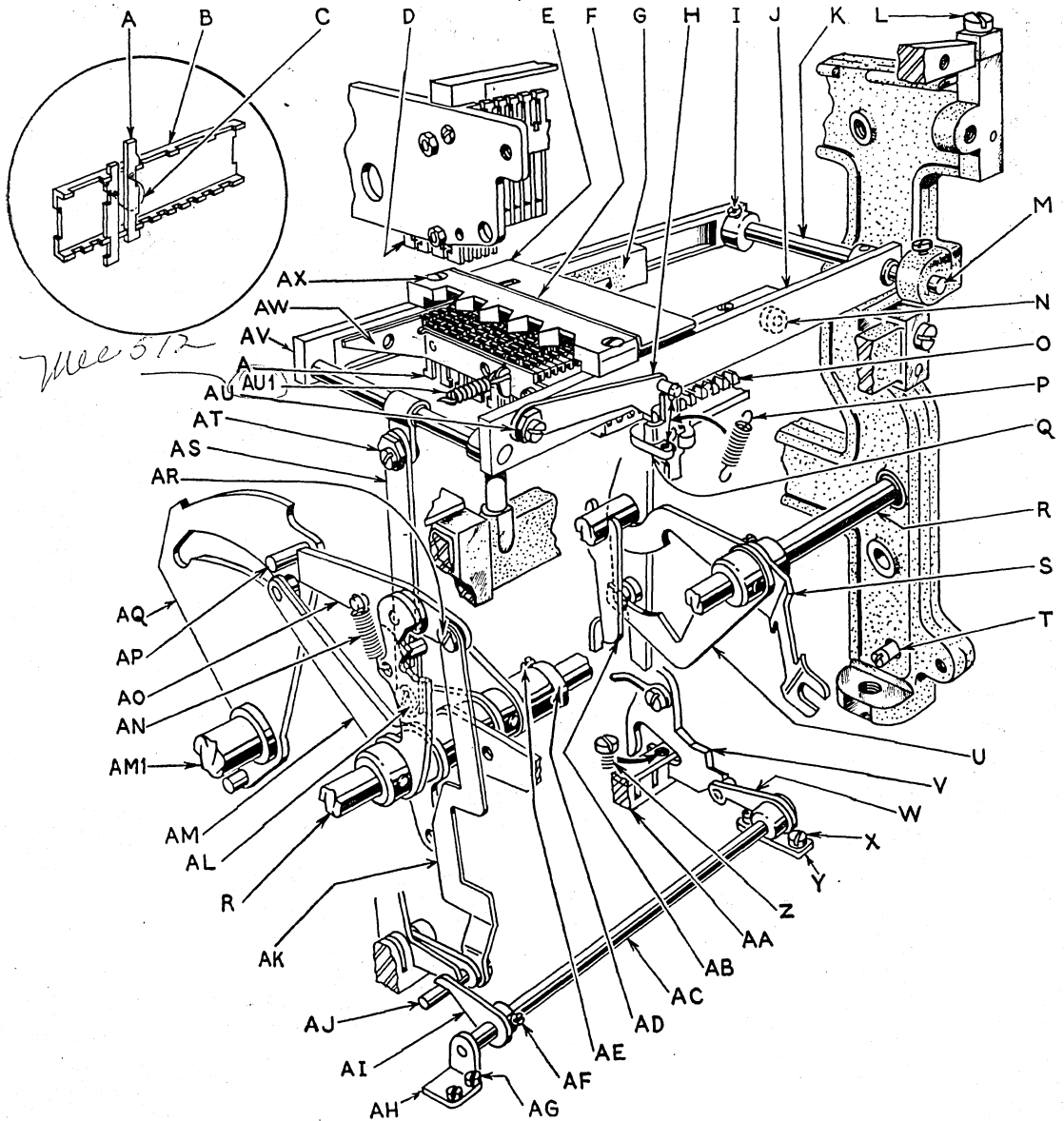
SEE EXPLANATION ON INSIDE OF FRONT COVER



SYMBOLS (Plate 2-1)

[illegible]

INTERMEDIATE KEYBOARD CONTROLS (Plate 3)



SYMBOLS (Plate 3)

A 76230 T stop
 B 76906 Plates for T stop
 C 76810 No. 1 Spring
 D 76130 No. 1 or No. 6 use 76810 No. 1 spring
 E 76202 } Use 76570 screws
 F 76908 complete assembly 1-76908 includes E, AX
 G 76665 Casting, complete assembly 1-76665 includes A, B, C, G, AW
 H 76665 Casting, complete assembly 11-76665 includes A, B, C, G, AW
 I 1-76205 No. 1
 J 1-76205 No. 4 Cl. 72
 K 1-76205 No. 5 (1/4 frac.) Cl. 73 } Used with overdraft light
 L 1-76205 No. 6 (3/8 frac.) Cl. 73
 M 1-706205A No. 1 (12 digit cap.)
 N 1-706205A No. 2 (14 digit cap.)
 O 1-706205A No. 3 (12 digit cap. with 1 bank reg. des.)
 P 1-706205A No. 4 (12 digit cap. with 2 bank reg. des.)
 Q 1-706205A No. 5 (14 digit cap. with 1 bank reg. des.)
 R 550 3/4
 S 1-76910A No. 1* included in K

K 1A-76020 } includes J
 L 1A-706020
 M 2A-76020 complete assembled intermediate keyboard section, includes A, B, C, D, E, F, G, H, I, J, K, N, AU, AV, AW, AX
 N 2A-706020 (62A-706020) complete assembled intermediate keyboard section, with 12 digit cap.
 O 12A-706020 (62A-706020) 14 digit cap.
 P 79545
 Q 70501 use 050 5/8 screw
 R 76314
 S 76907 No. 1 use 74534 screws
 T 76812
 U 70201* included in assembly 1A-76022, see plate 5 for other styles
 V 21A-71004 } Specify mach. number, complete assembled
 W 1A-701004 No. 1 } shaft, includes S, U, AD, AE, AM, AO
 X 71139 use 1-71330 collar
 Y 71539
 Z 1-71138* included in R
 AA 1-72221 No. 3
 AB 1-72221 early
 AC Continued on back

SEE EXPLANATION ON INSIDE OF FRONT COVER

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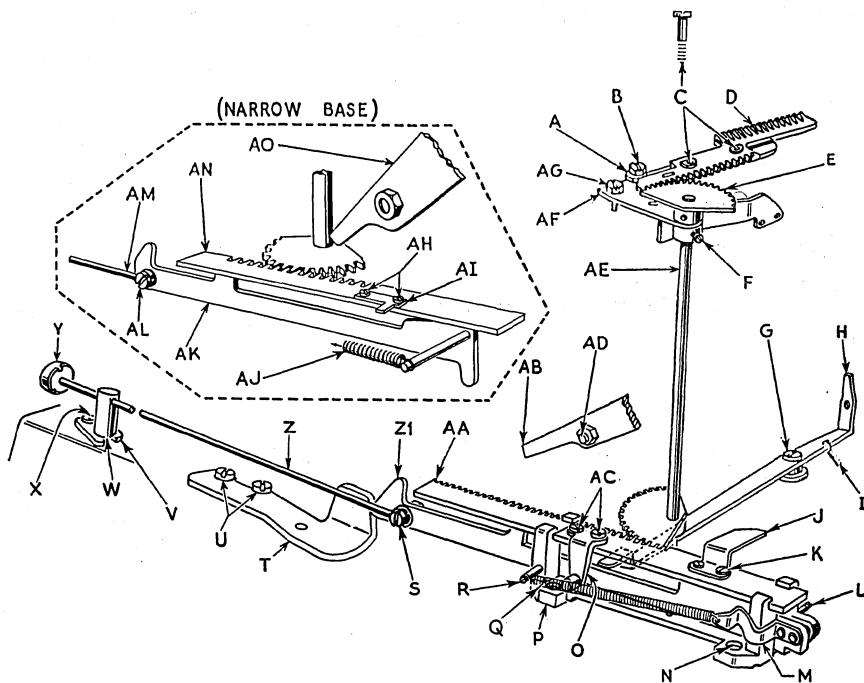
For Form 2952

SYMBOLS (Plate 3)—Continued

1-702221 No. 3
 1-702221A No. 1 early
 W 1-72149A* included in AC
 X 72567
 Y 72148 No. 1
 72148 No. 6 used with easier depression mult. keys
 Z 72614 Screw
 AA 72902 No. 1 Block, 1-72230 No. 1 strap
 AB 1-71122 use 45 nut
 AC 22A-72036A
 21-72036A early } includes W, AF, AI
 AD 1-71330
 AE 550 1/4
 AF 72573
 AG 72567
 AH 72208 No. 1
 AI 1A-72154
 AJ 72570 No. 1 (72570 No. 2)
 AK 71146
 701146
 AL 7559 1/4 Screw, 46 nut
 AM 1-701143
 1-71143 early

AM1 141B-71001 } Specify machine number. Complete assembled
 141A-71001 } shaft includes AA, AQ. See plate 17 for other
 early } styles
 AN 71806
 AO 1-71144 use 79551 screw
 AP 71526
 AQ 11A-71129
 1-71129 early } Cl. 71, 72, 73
 21-71129 Cl. 74, 75, 76
 31A-71129
 31-71129 early } Cl. 77, 78
 AR 71546
 AS 71160 No. 2 (701161 No. 1, 701559)
 701161 No. 1
 AT 74529 wide base
 75342 Ecc., 950% screw, narrow base
 AU 76311 Ecc., 73611 screw
 AU1 76811 narrow base
 79800 No. 1 wide base
 AV 1A-76911 No. 1
 AW 1-76157 (1-706157) } use 70512 screws
 1-706157
 AX 76569

ERROR KEY AND KEYBOARD RESTORING MECHANISM (Plate 5)
 (Plate 4 in Instruction Book only)



SYMBOLS (Plate 5)

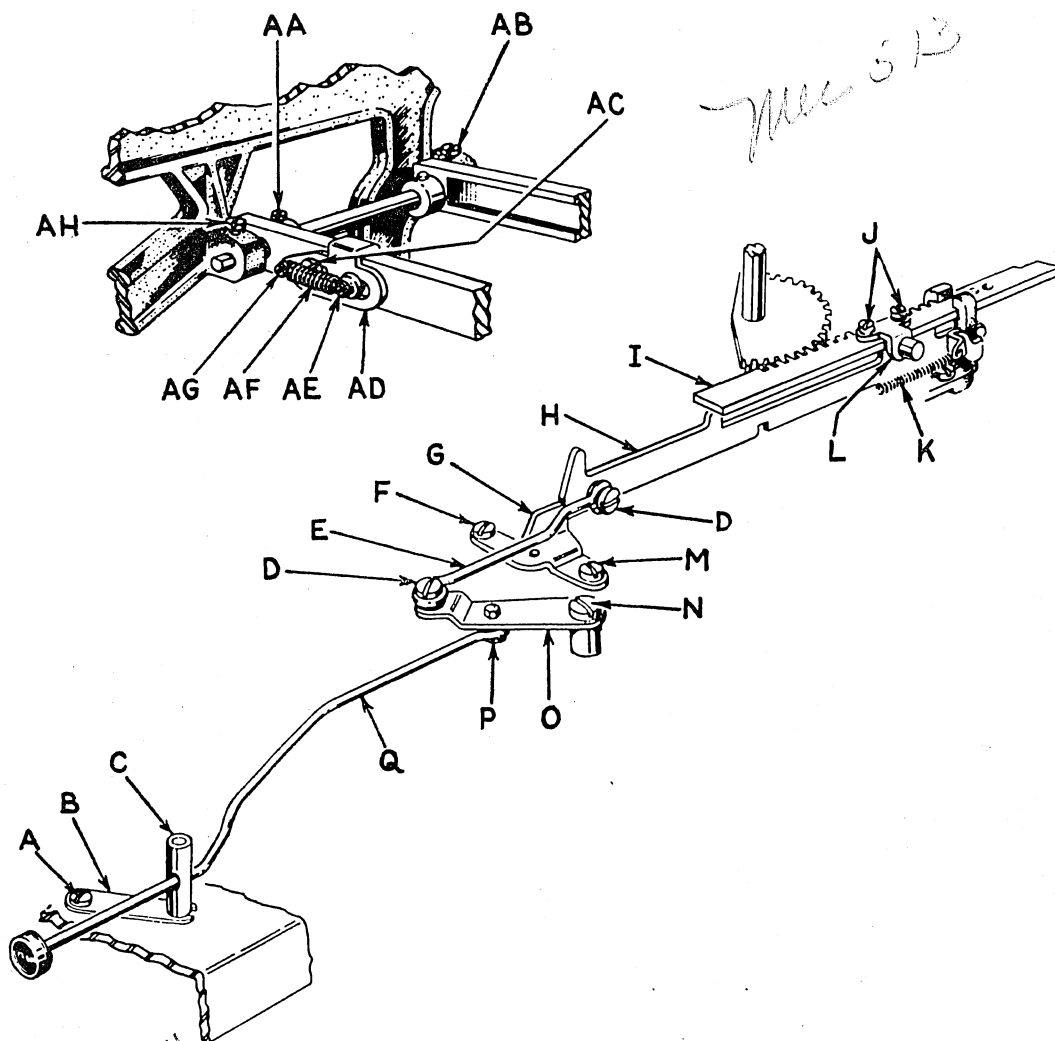
A 76311
 B 76567 No. 2
 C 74534
 D 76907 No. 1
 706907A No. 1
 E 11-706200* included in AE
 F 550 1/4 Screw, collar and screw 1-7140 3/4
 G 72624 use 3612 1/2 washer
 H 1-72280
 1-72280A No. 2 Cl. 78
 1-72280 No. 3 with easier depression
 mult. keys
 1-702280 No. 1
 1-702280A No. 2 Cl. 78
 1-702280 No. 3 with easier depression
 mult. keys
 1-702280 No. 3 Env. 1415 with auto.
 ext.
 I 3683
 J 702229 No. 2
 K 74533
 L 72608A
 M 702237A No. 1*
 N 79545 Screw
 75617 Cl. 75, 77

O 1-702229A No. 1
 P 72667 } See plate 43 for complete
 702667 } single stroke assembly
 Q 9880 wide base
 R 7061 1/4 wide base
 S 72609 narrow base
 T 2855 3/4 Screw
 72617 Screw, 47 nut, early
 72155A No. 1 narrow base, shown
 702227 wide base
 U 73659 use washer 203423 No. 4
 V 72203
 702203 No. 1 for 15 col.
 702203 No. 2 for 14 col.
 W 72616* use 72325 nut
 X 71518
 Y 72200A No. 1 Ring, 72199 No. 1 cup,
 72992 No. 1 glass, 72210 disk, 92 No.
 1 keypaper, specify character and
 color
 Z 1-702705A No. 2 } Includes W
 1-702705 early }
 Z1 1-702228B No. 1 } Includes M, Cl. 74,
 1-702228A early } 75, 76, 77, 78

1-702228B No. 2 } Includes M, Cl.
 1-702228A No. 2 } 71, 72, 73

AA 702010
 AB 1-701121A*
 AC 79543 use 1097% washer
 AD 71537 Screw, 45 nut
 AE 1A-76022
 1-76022 early } Includes E, F, AF
 1A-706022
 1-706022 early }
 AF 1-706201* included in AE
 AG 76567
 AH 70512
 AI 72229 No. 1
 AJ 72824
 AK 1-72228B No. 2 } Cl. 74,
 1-72228A No. 2 early } 76, 78
 1-72228A No. 3 Cl. 71, 72, 73
 AL 2855 3/4
 72617 Screw, 47 nut, early
 AM 1-72705A
 1-72705 early
 AN 72010
 AO 1-71121*

ERROR KEY AND INTERMEDIATE KEYBOARD RESTORING MECHANISM, IMPROVED, WIDE BASE CONSTRUCTION (Plate 5-1)

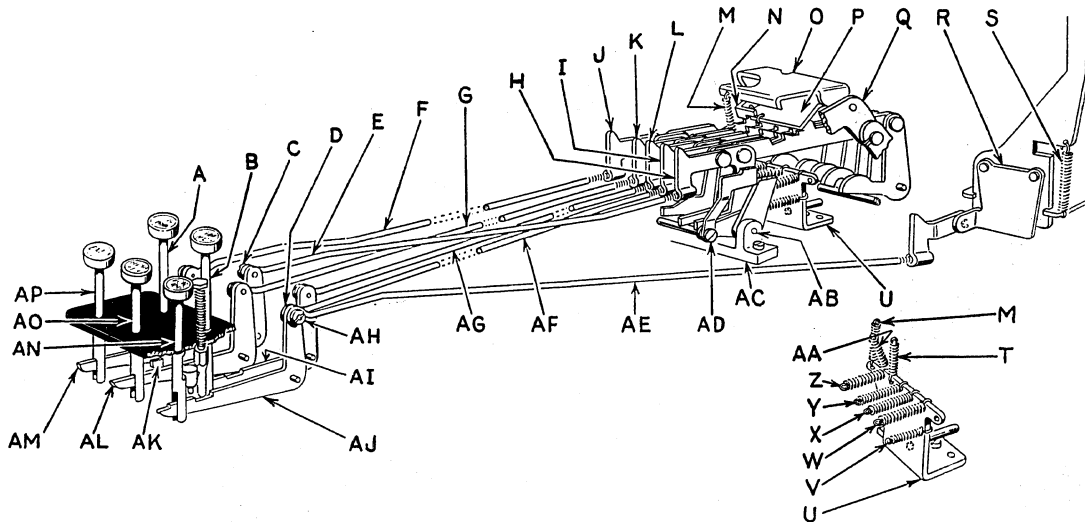


SYMBOLS (Plate 5-1)

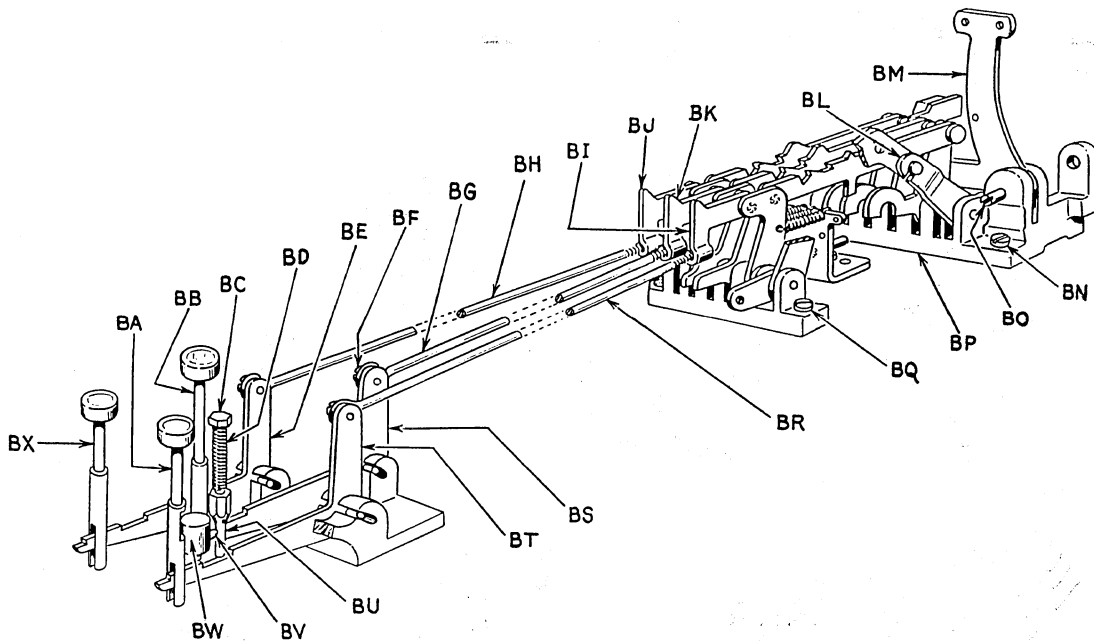
A	71518	M	72617
B	702203R No. 4	N	702598
C	702616R No. 3* included in Q, use 72325 nut	O	1-702108
D	8054 1/4	P	516 Fte. 709 use 46 3/4 nut
E	702705 1/2	Q	1-702705 No. 4
F	73659	AA	550 1/4
G	702227	AB	73607
H	1A-702228B No. 2 for Class 7200 11-702228B No. 1 for Class 7800	AC	957 1/2
I	702010	AD	1-706164
J	79543 use 1097 1/2 lock washer	AE	9253 3/16
K	9880	AF	706802
L	1-702229B No. 1	AG	450 1/2
		AH	950 1/2

RESULT SECTION ASSEMBLY (Plate 6)

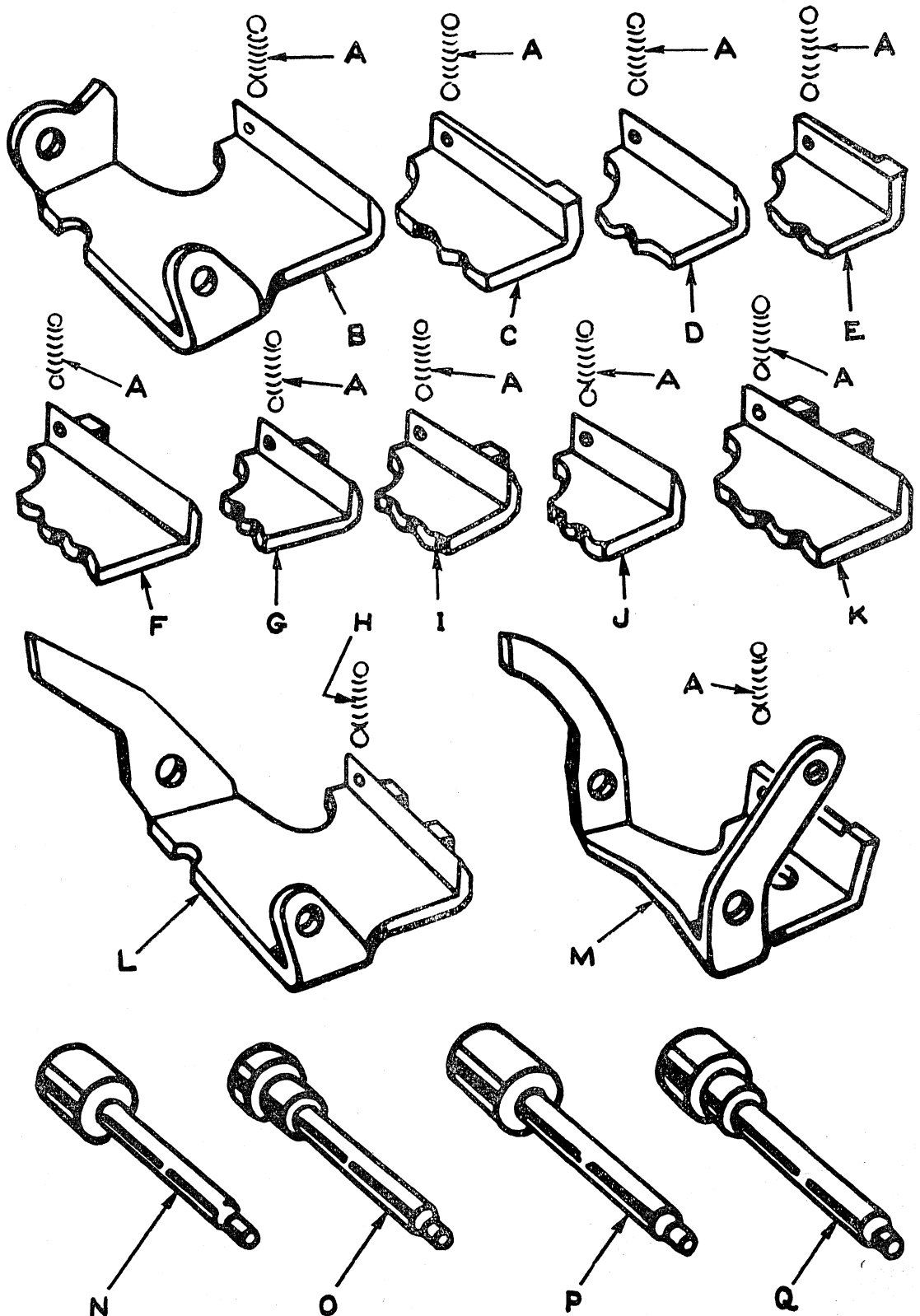
CLASSES 71, 72, 73



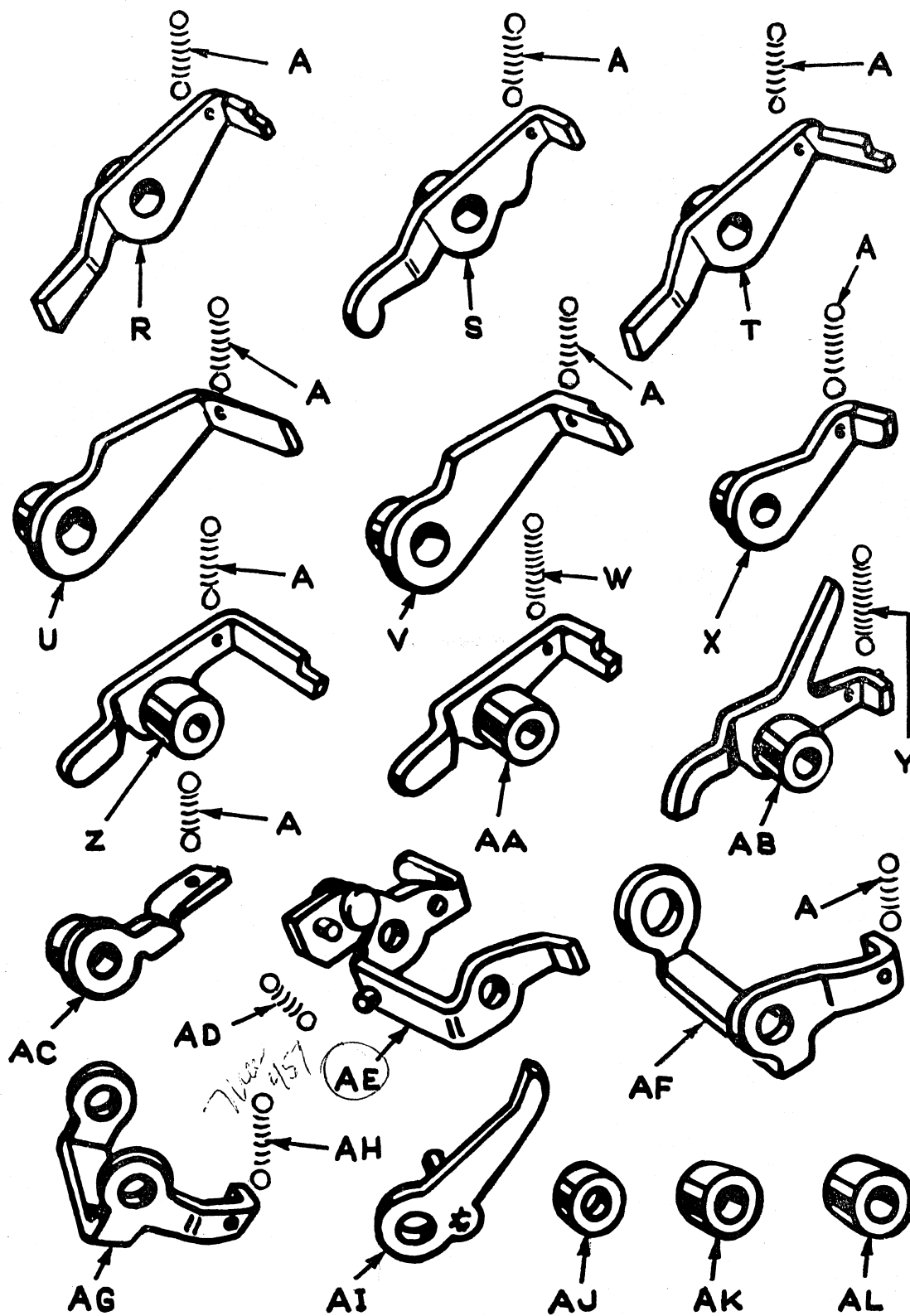
CLASSES 74 and 75



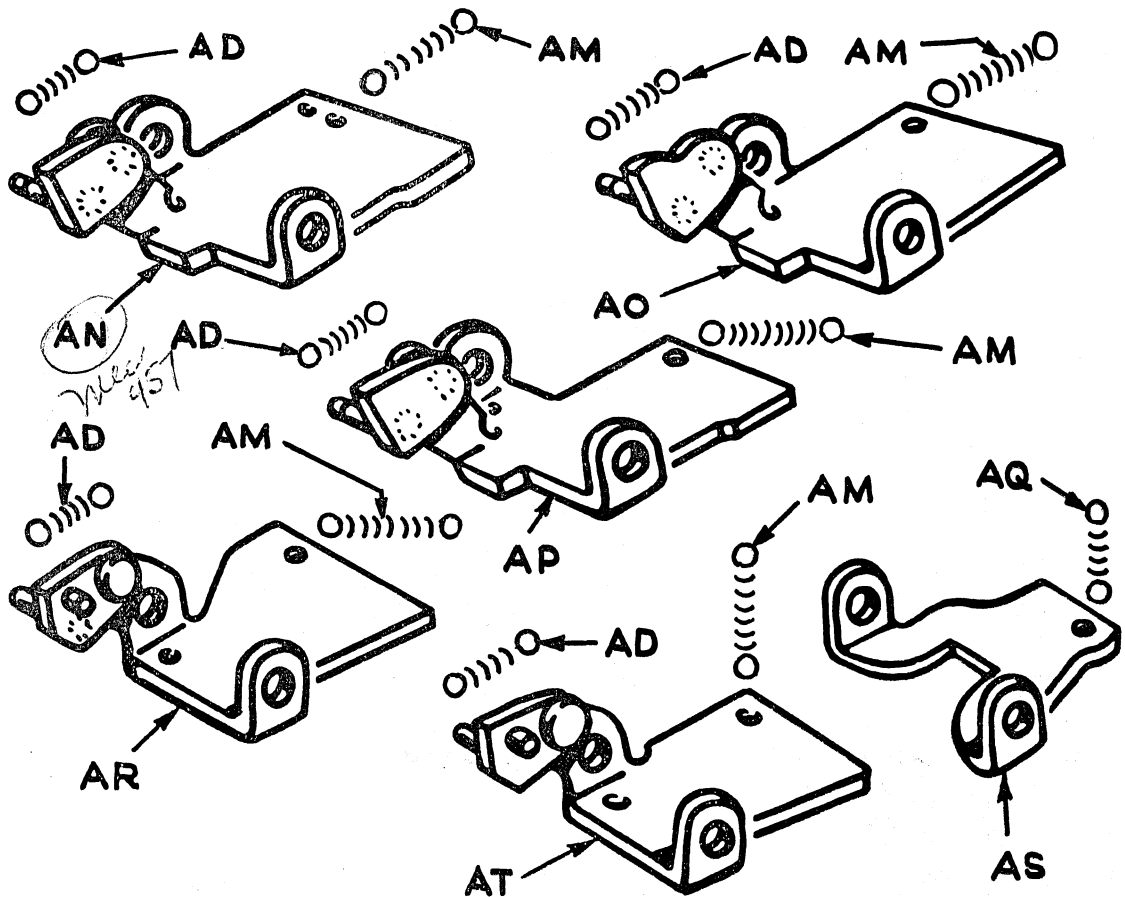
RESULT SECTION LATCHES (Plate 6-1)



RESULT SECTION LATCHES (Plate 6-1)—Cont'd



RESULT SECTION LATCHES (Plate 6-1)—Cont'd



SYMBOLS (Plate 6-1)

A 72809
B 72189 No. 1
C 72189 No. 2
D 72189 No. 4
E 72189 No. 5
F 72189 No. 6
G 72189 No. 7
H 74813
I 72189 No. 8
J 72189 No. 9
K 702189
L 702189 No. 3
M 72189 No. 3
N 72002A overall length 2"
O 72002A No. 2 overall length 2"
P 702002A overall length 2½"

Q 702002A No. 2 overall length 2½"
R 1-72190 No. 1
S 1-72190 No. 2
T 1-72190 No. 3
U 1-72190 No. 4
V 1-72190 No. 5
W 72809 without auto. extend
X 3981 with auto. extend
Y 1-72190A No. 2
Z 3981
AA 1-72190A No. 3
AB 1-72190B No. 1
AC 1-702190½
AD 1-72188¼
AE 72810
AF 1-72188½

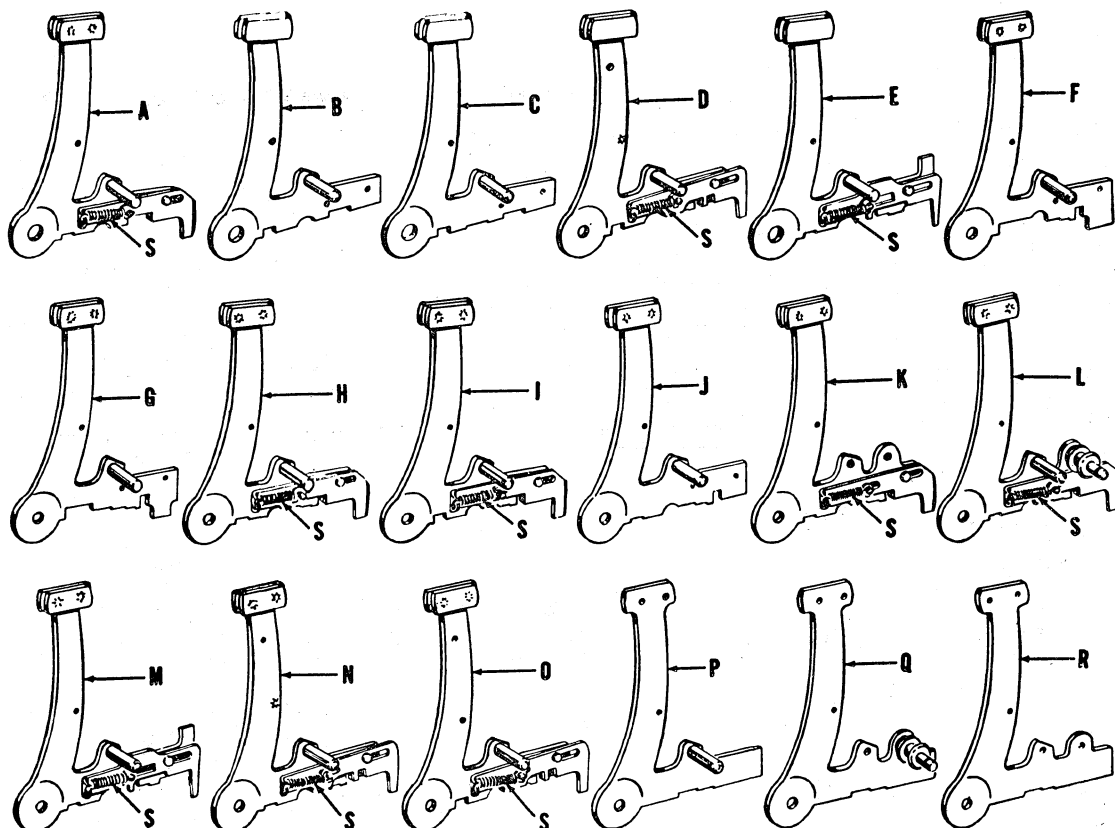
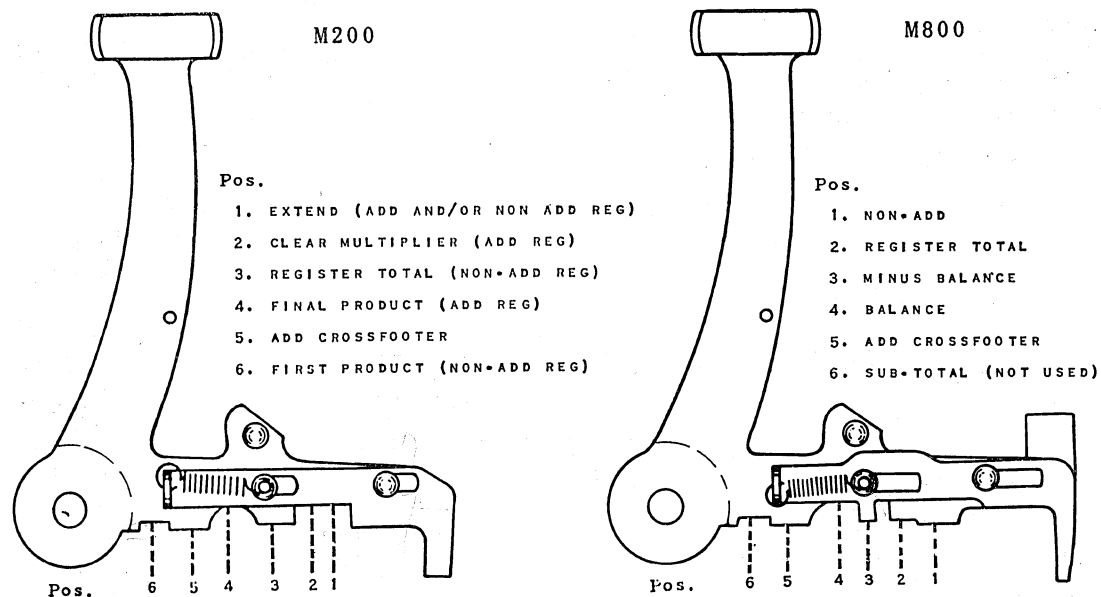
AG 72296¼
AH 72296¼A
AI 8381
AJ 1-72191½
AK 9934
AL 404334
AM 99336A Style 10
AN 72808
AO 1-72188
AP 1-72188 No. 2
AQ 1-72188 No. 3
AR 284
AS 1-72188A No. 1
AT 72188A No. 2
AU 1-72188A No. 3

RESULT SECTION LATCHES (Plate 6-1)—Cont'd
COMPLETE ASSEMBLY CHART

Class	Base	Before Machine	After Machine	For use with	Symbol	Includes (See Drawings)
72	Narrow	A278214			1-72002	A, B, N, R, AD, AM, AN
72	Narrow		A278214		41-72002A No. 2	J, O, U, Z, AD, AJ, AT
72	Narrow	A278214		Automatic extend mechanism	41-72002	A, D, N, R, AD, AM, AN
72	Narrow		A278214	Automatic extend mechanism	41A-72002	D, N, AA, AD, AJ, AR
72	Narrow	A278214		Clear mult. in 2nd position, sub-product in 5th position of the result section	31-72002	M, N, S, AF, AO
78	Narrow	A278214		Auto. Cr. Bal. and power result keys		
72	Narrow	A278214		Reg. sub-total in 2nd position and separate release lock for extend key	1-72002 No. 2	A, F, O, R, V, AD, AM, AN
72	Narrow		A278214	Reg. sub-total in 2nd position and separate release lock for extend key	1A-72002 No. 2	F, O, V, AA, AD, AJ, AR
72	Narrow	A278214		Clear subtract mult. in 2nd position and sub-product in 6th position	11-72002 No. 2	A, E, O, T, U, AD, AM, AP
72	Narrow		A278214	Clear subtract mult. in 2nd position and sub-product in 6th position	11-72002A No. 2	E, O, U, Z, AD, AJ, AT
72	Narrow	A278214		Clear subtract mult. in 2nd position and sub-product in 4th position	21-72002 No. 2	A, G, N, T, U, AD, AM, AP
72	Narrow		A278214	Clear subtract mult. in 2nd position and sub-product in 4th position	21-72002A No. 2	G, O, U, Z, AD, AJ, AT
72	Narrow	A278214		Clear subtract mult. in 2nd position and sub-product in 5th position	31-72002 No. 2	A, I, O, T, U, AD, AM, AP
72	Narrow		A278214	Clear subtract mult. in 2nd position and sub-product in 5th position	31-72002A No. 2	I, O, U, Z, AD, AJ, AT
72	Narrow		A278214	Register sub-total in 2nd position	41-72002A	F, N, AA, AD, AJ, AR
72	Wide				1-702002	A, C, P, R, AD, AM, AN
72	Wide			Consecutive numbering device and sub-total in 2nd position	41-702002 No. 2	F, Q, V, AA, AD, AJ, AR
72	Wide			Register sub-total in 2nd position	41-702002A	F, P, AA, AD, AJ, AR
72	Wide			Sub-total in 2nd position and sub-product in 4th position with or without auto. extend, without power result keys or auto. totals	51-702002A	K, P, AA, AD, AJ, AR
72	Wide			Sub-total in 2nd position and sub-product in 4th position with or without auto. extend, with power result keys and auto. totals	61-702002A	L, P, AB, AD, AJ, AR
72	Wide			Clear subtract multiplier key in 2nd position and sub-product in 6th position	1-702002A No. 2	E, Q, U, Z, AD, AJ, AT
72	Wide			Clear subtract multiplier key in 2nd position and sub-product in 4th position	21-702002A No. 2	G, Q, U, Z, AD, AJ, AT
72	Wide			Clear subtract multiplier key in 2nd position and sub-product in 5th position	31-702002A No. 2	I, Q, U, Z, AD, AJ, AT
72	Wide			Clear subtract multiplier key in 2nd position, with or without automatic extend	51-702002A No. 2	J, Q, U, Z, AD, AJ, AT
74	Narrow	A278214			11-72002	A, B, N, AD, AK, AM, AN
74	Narrow		A278214		11A-72002	B, N, AD, AL, AR
74, 75	Wide	A278214			11-702002	A, B, P, AD, AK, AM, AN
74, 75	Wide		A278214		11A-702002	B, P, AD, AL, AR
76	Narrow	A278214			21-72002	A, C, N, R, AD, AM, AN
76	Narrow		A278214		21A-72002	C, N, AA, AD, AJ, AR
76, 77	Wide				1-702002A	C, P, AA, AD, AJ, AR
78	Narrow		A278214		31-72002A	A, M, N, X, AC, AD, AE, AG, AH, AI, AQ, AS
78	Wide	A696955			31-702002	M, P, S, AF, AO
78	Wide		A696955		31-702002A	A, M, P, X, AC, AD, AE, AG, AH, AI, AQ, AS

SEE EXPLANATION ON INSIDE OF FRONT COVER

TWIN CAM CONTROL LEVERS (Plate 6-2)



SYMBOLS ON NEXT PAGE

SYMBOLS (Plate 6-2)

(Wide Base)

- A 1-702163A No. 2 Series M200 after machine M7987D, has $\frac{1}{16}$ " hole, use 72511A screw
 1-702163 No. 2 Cl. 72 and M200 before machine M7987D, has $\frac{1}{16}$ " hole, use 72511 screw
 B 1-702163A No. 3 Series M200 after machine M7987D, has $\frac{1}{16}$ " hole, use 72511A screw
 1-702163 No. 3 Cl. 72 and M200 before machine M7987D, has $\frac{1}{16}$ " hole, use 72511 screw
 C 1-702163A No. 5 Series M200 after machine M7987D, has $\frac{1}{16}$ " hole, use 72511A screw
 1-702163 No. 5 Cl. 72 and M200 before machine M7987D, has $\frac{1}{16}$ " hole, use 72511 screw
 D 1-702251A Cl. 77 and M700, has $\frac{1}{16}$ " hole, use 72511 screw
 E 1-702163A No. 7 Series M800 after machine M7847D, has $\frac{1}{16}$ " hole, use 72511A screw
 1-72163 No. 6 Cl. 78 and M800 before machine M7847D, has $\frac{1}{16}$ " hole, use 72511 screw
 F 1-702163 No. 1 Cl. 72 XX 22, option to add-crossfooter or sub-total register from key position No. 72, has $\frac{1}{16}$ " hole, use 72511 screw

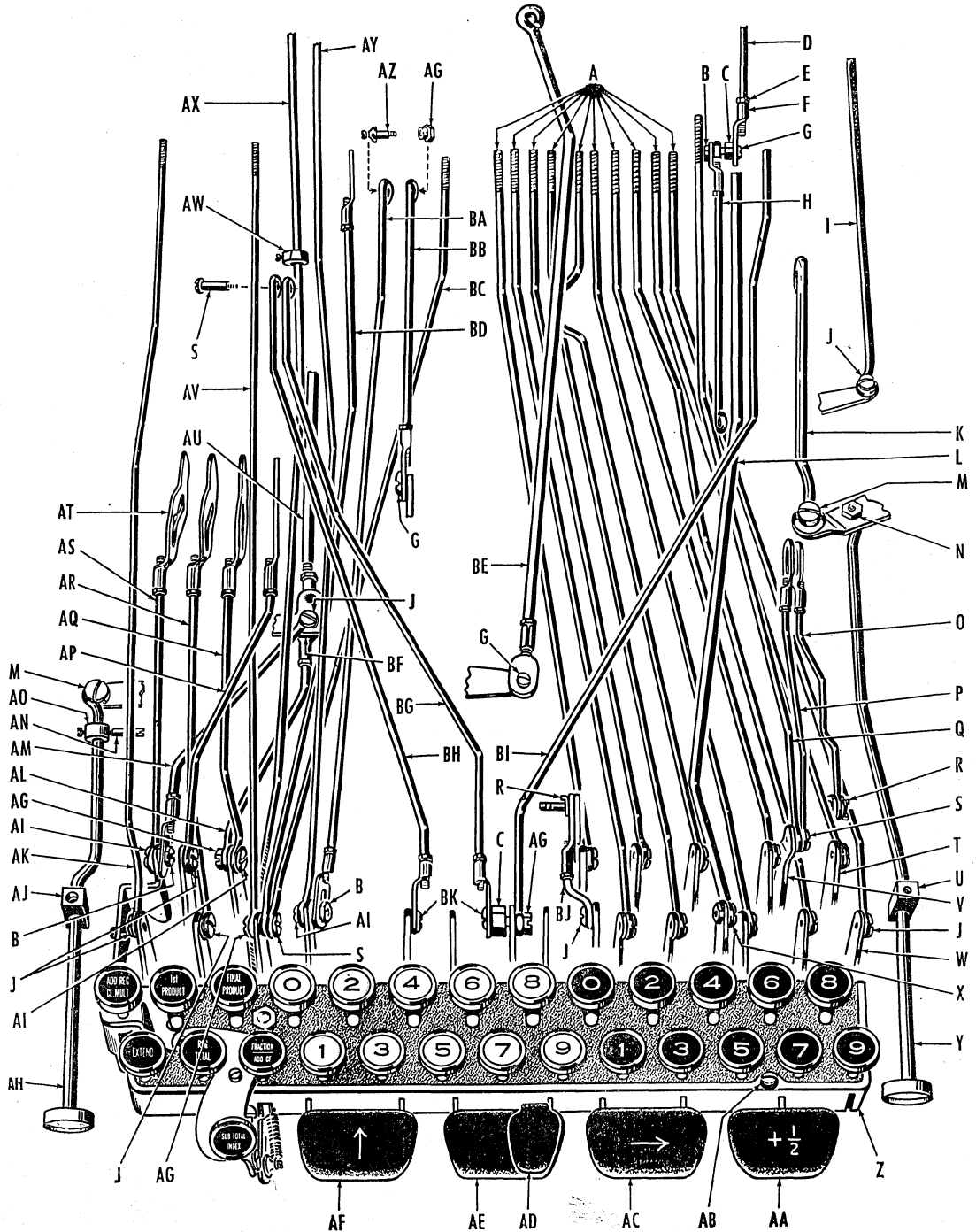
- G 1-702163 No. 4 Cl. 72 XX 25, option to add-crossfooter or sub-product from key position No. 72, has $\frac{1}{16}$ " hole, use 72511 screw

(Narrow Base)

- The following symbols has $\frac{5}{16}$ " hole, use 72511 screw
 H 11-72163 No. 3 }
 I 1-72163 No. 4 } Cl. 72
 J 21-72163 No. 3 }
 K 1-72163 No. 1 }
 L 11-72163 No. 1 }
 M 1-72163 No. 6 Cl. 78, same as wide base 78 and M800 prior to Meh. M7847D
 N 1-72163 No. 3 }
 O 11-72163 No. 4 } Cl. 76
 P 1-72163A No. 2 }
 Q 1-72163 No. 2 } Cl. 74
 R 72163 No. 2 }
 S 72820 spring

MULTIPLIER KEYS, RESULT AND CONTROL KEYS, AND MOTOR BAR WIRE ASSEMBLIES, SERIES M 200 (Plate 6-3)

Construction as of January 1956, machine No. M9163D



SYMBOLS ON BACK

SYMBOLS (Plate 6-3)

A	72703 No. 1 used for 0	U	Included in Y	AV	72700 No. 10 add C.F. wire
	72703 No. 2 used for 1	V	72124B No. 1 full cent bell crank, see BS and AX Plate 19-4A cge. symbol book for full cent lever and anchor block	AW	72351 collar, use 75616 screw
	72703 No. 3 used for 2			AX	702778 sub-tot. index wire
	72703 No. 4 used for 3			AY	1-702772 sub-pro. deduction fte. norm. wire, includes F
	72703 No. 5 used for 4 mult. wires	W	1-702243 No. 8 mult. key bell crank for No's 1-3-5-7-9	AZ	702630 spring anchor screw
	72703 No. 6 used for 5	X	200544 ½ screw, use 46 ¾ nut	BA	1-72718 auto. ext. wire from motor bar, includes F
	72703 No. 7 used for 6 Form 72703	Y	1-702705 No. 4 includes U	BB	1-702775 auto. ext. wire from power shaft, includes F
	72703 No. 8 used for 7 No. 8 wire	Z	702213 ½ A No. 2 shield	BC	72708 fraction indexing wire
	72703 No. 9 used for 8 as shown	AA	2A-702125 No. 6 " + ½ "	BD	1-702770 auto. ext. wire from add C.F. key, includes F
	72703 No. 10 used for 9	AB	74587	BE	1-702709 ½ includes 72110 No. 3 turnbuckle
B	71366 shoulder nut	AC	2A-702125 No. 4 → (—2)	BF	1A-702119 ¼ A swivel arm for non-ext. normalizing wires
C	702501 No. 1 hexagonal screw	AD	702119A No. 2	BG	1-702727 No. 2 space wire from motor bar in pos. No. 118, includes F
D	1-702763	AE	2A-702125 No. 4 Plain (—6)	BH	1-702726 No. 3 space wire from motor bar in pos. No. 113, includes F
E	49 ¾ nut	AF	2A-702125 No. 4 ↑ (—1)	BI	1-702740 cge. ret. wire from motor bar in pos. No. 118, includes F
F	72110 No. 1 turnbuckle	AG	72324 wire nut		1-702736A cge. ret. wire from motor bar in pos. No. 113
G	75638	AH	1A-702709A No. 5 includes AJ and AO		1-702 Env. 1749A non-print wire from motor bar in pos. No. 118, includes 1-702110 No. 9 turnbuckle
H	1-702766 motor clutch release wire from power shaft, includes 75110 No. 2 turnbuckle	AI	75631	BJ	1-702793A includes F
I	1-702714 ½ No. 10 includes 1-702110 No. 9 turnbuckle	AJ	Included in AII	BK	79511
J	72572 No. 1	AK	702765A extend wire		
K	702705 ½	AL	1-702779A non-ext. normalizing wire from fin. pro. key, includes F		
L	702707A No. 4 motor bar wire	AM	1-702780 non-ext. normalizing wire from cl. mult. key, includes F		
M	8054 ¾	AN	702641		
N	46 ¾ nut	AO	Included in AH		
O	516 Fte. 709 screw	AP	1-702768 first pro. wire includes AT		
P	1-702794A tab wire, includes F	AQ	1-702757 fin. pro. wire includes AT		
Q	72706 full cent to tab, includes F	AR	1-702758 reg. tot. wire, includes AT		
R	21 No. 7 clip	AS	1-702781 cl. mult. wire, includes AT		
S	514 Fte. 146 for two wires	AT	702110 No. 8		
T	72572 No. 1 for single wire	AU	1-702760B non. ext. normalizing wire, includes 72110 No. 3 turnbuckle and 702303 ½ square collar		
	1-72243 No. 16 mult. key bell crank for No's 0-2-4-6-8				

SERIES M MACHINES—KEYBOARD

SYMBOLS (Plate 6)

To Change Mar 300

A 72521 No. 2 first prod.
B 72521 No. 2 final prod.
C 72572 No. 1
D 75631
E 72700 No. 9 first prod.
F 72700 No. 11 ext.
G 72700 No. 10 reg. total
H 1A-72171 No. 3
I 1-72171 No. 3 }
 1A-72171 No. 3 } (1B-72171 No. 3) } First prod.
 1-72171 No. 1 }
 1-72171 No. 1 (1B-72171 } Cl. 72, 73 }
 1-72171 No. 1 (1-702171 } Cl. 71 } Add
 11A-72171 No. 1 } CF
 11-72171 No. 1 (1-702171 }
 No. 3) early }
J 1-72171A No. 9 } Ext.
K 1-72171 No. 6 early }
L 41-72171 No. 5 } Reg. total
 1-72171 No. 5 early }
 1A-72171 No. 12 }
 1-72171 No. 12 (1B-72171 No. 12) } Final
 early prod.
M 72809
N See plate 40 for Cl. 78 latches
 1-72190B No. 1 use 9934 collar, for all Classes
 except Cl. 78
 1-72190 No. 1 early
 1-72190A No. 3 } Sub-prod.
 1-72190 No. 3 early }
O See plate 40 for Cl. 78 latches
 72189 No. 9 } Cl. 71, 72, 73, 74, 75
 72189 No. 1 early }
 72189 No. 2 Cl. 76, 77 }
 72189 No. 4 with auto. ext., Cl. 71, 72, 73 }
 72189 No. 5 with sub-prod. in place of first prod. }
 72189 No. 6 sub-total }
 72189 No. 7 sub-prod. in place of final prod. }
 72189 No. 8 sub-prod. in place of CF add key }
P See plate 40 for Cl. 78 latches
 1-72188A No. 1 } for all Classes, wide and nar.
 1-72188 early } base, except Cl. 78
 1-72188A No. 3 } Sub. prod.
 1-72188 No. 3 early }
 Complete assembly of latches for result key linkages: See
 plate 40 for Cl. 78
 41-72002 No. 2 (41-72002A No. 2, 79545) } Cl. 71, 72, 73
 1-72002 early }
 11A-72002 } Cl. 74
 11-72002 early }
 21A-72002 } Cl. 76
 21-72002 early }
 1A-72002 No. 2 } used with reg. sub-total linkage in 2nd
 1-72002 No. 2 early } position, Cl. 71, 72, 73
 11A-72002 No. 2 (11-72002A } used with clear mult. linkage in
 No. 2, 79545) } 2nd position and sub-prod. linkage in
 11-72002 No. 2 early } link. in 6th pos., Cl. 71, 72, 73
 21A-72002 No. 2 (21-72002A } used with clear mult. linkage in
 No. 2, 79545) } 2nd pos. and sub-prod. link-
 21-72002 No. 2 early } age in 4th pos., Cl. 71, 72, 73
 31A-72002 No. 2 (31-72002A } used with clear mult. linkage in
 No. 2, 79545) } 2nd pos. and sub-prod. linkage in
 31-72002 and No. 2 early } in 5th pos., Cl. 71, 72, 73
 41A-72002 } used with auto. ext., Cl. 71, 72, 73
 41-72002 early }
 1A-702002 (1-702002A, 79545) } Cl. 76, 77
 1-702002 early }
 11A-702002 } Cl. 74, 75
 11-702002 early }
 51-702002 No. 2 (51-702002A } used with or without
 No. 2, 79545) } auto. extend, Cl. 71, 72, 73
 21-702002 early }
 1-702002 No. 2 (1-702002A No. 2, 79545) used with clear mult.
 linkage in 2nd position and sub-prod. linkage in 6th position
 Cl. 71, 72, 73
 21-702002 No. 2 (21-702002A No. 2, 79545) used with clear
 mult. linkage in 2nd position and sub-prod. linkage in final
 prod. position, Cl. 71, 72, 73

31-702002 No. 2 (31-702002A No. 2, 79545) used with clear
 mult. linkage in 2nd position and sub-prod. linkage in CF
 add position, Cl. 71, 72, 73
41-702002 No. 2 used with consecutive numbering device or
 sub-total linkage in 2nd position, Cl. 71, 72, 73

Q 1-72168
R 1-72274 No. 1 (1-72274 No. 2) see plate 2 for other styles
S 72826
T 284
U 1-72192 use 72581 screws
V 72804 for first prod.
W 72804 for add CF
X 72803 for final prod.
Y 72804 for reg. total
Z 72803 for ext.

AA 72809
AB 72005 Pin, use 72004 pin in rear
AC 72666
AD 72570 No. 1 (72570 No. 2)
AE 72708 frac.
AF 72700 No. 10 add CF
AG 72700 No. 9 final prod.
AH 72324
AI 1-72143 No. 4 final prod.
AJ 1-72143 No. 1 add CF
AK 1-72143 No. 4 first prod.
AL 1-72143 No. 2 reg. total
AM 1-72143 No. 1 ext.
AN 72521 No. 5 add CF
AO 72521 No. 1 reg. total
AP 72521 No. 1 ext.

BA 72521 No. 5 add CF
BB 72521 No. 4 CF total
BC 72585
BD 72811
BE 1-72143 No. 2 reg. total
BF 72572 No. 1
BG 72700 No. 3 CF total
BH 72700 No. 10 reg. total
BI 11-72171 No. 1 (1-702171 No. 3) add CF.
 Use spring 72804
BJ 41-72171 No. 5 Cl. 74 } Reg. total,
 1-72171 No. 5 early, Cl. 74 } use 72804
 11-702170 Cl. 75 } spring
BK 1-72171 No. 2 CF total, use 72803 spring
BL 72169
BM 1-72163A No. 2 }
 1-72163 No. 2 early } Cl. 74
 1-72163 No. 3 Cl. 76
 11-72163 No. 3 Cl. 71, 72, 73
 21-72163 No. 3 with auto. ext., Cl. 71, 72, 73
 1-72163 No. 4 with clear mult. key, Cl. 71, 72, 73
 11-72163 No. 4 used when sub-bal. key adds, Cl. 76, 77
 1-72163 No. 6 Cl. 78
 1-702251 Cl. 75, 77

BN 75617
BO 72511
BP 72665
 41A-72665 Cl. 74 } Complete assembly, includes H, I, J, K,
 61B-72665 Cl. 72, 73 } L, Q, V, W, X, Y, Z, AB, AC, BE, BM,
 71B-72665 Cl. 71 } BO, BP, with power meshing, wide and
 narrow base
 41-72665 Cl. 74 } Complete assembly, without power
 61A-72665 Cl. 72, 73 } meshing, wide or narrow base
 71A-72665 Cl. 71 }
 41A-702665 No. 1 } complete assembly, Cl. 75
 41-702665 No. 1 early }

BQ 75617
BR 72700 No. 10 add CF
BS 1-72143 No. 4 CF total
BT 1-72143 No. 1 add CF
BU 72561
BV 72563 Plunger
BW 72562 uses 72812 spring
BX 72521 No. 3 Reg. total

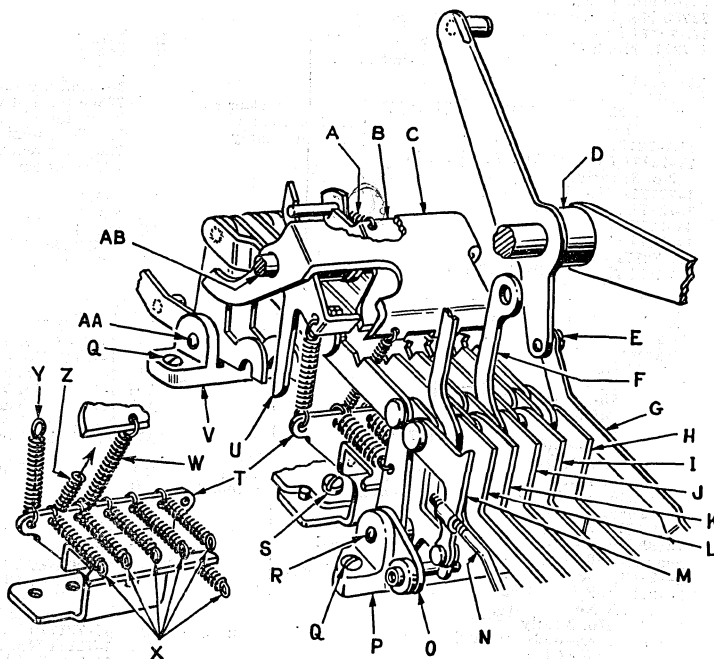
EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 67—CLASS 72

(BETWEEN MACHINE SERIAL NOS. A915672 AND B197641) (Plate 6B)

(Plate 6A in Instruction Book only)

SYMBOLS (Plate 6B)

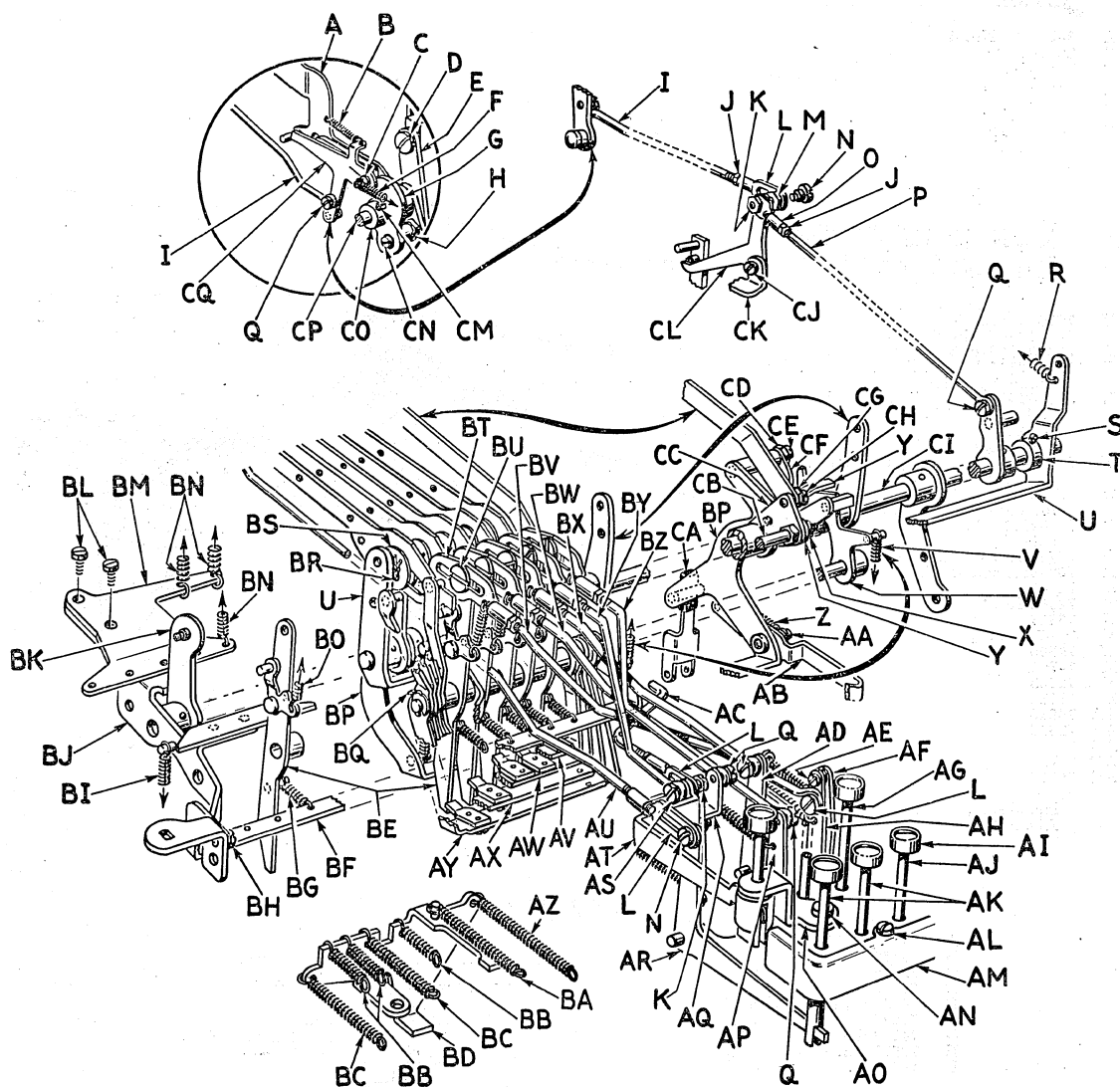
- A 205801 spring
- B 1-72188A No. 1
- C 702189 No. 3
- D 11-701143 included in assembly 91-701004 No. 1
- E 79503
- F Use 1A-72170A No. 9 link, 71361 eccentric, 79565 screw
- G 702291 1/4 No. 2
- H Use 1A-702171 No. 11 link assembly, 702227 1/4A finger, for product position
- I Use 1A-702171 No. 10 link assembly, 702227 1/4A finger, for add reg. cl. mult. position
- J Use 1A-702171 No. 9 link assembly, 702227 1/4A finger, for sub-product position
- K Use 1A-702171 No. 7 link assembly, 702227 1/4A finger, for reg. total position
- L Use 1A-702171 No. 8 link assembly, 702227 1/4A finger, for reg. sub-total position
- M 1-702171 No. 6 for extend position
- N 1-702765 extend wire
- O 1-131 Fte. 717
- P 666 Fte. 717 No. 2
- Q 75617 screw
- R 72005 pin
- S 79505
- T 11-702192 1/2
- U 1-702190 1/2
- V 72665
- W 72808
- X 72803
- Y 3981
- Z 72809
- AA 72004 pin
- AB 702002A shaft only
- 61-702002A complete assembled latch, includes A, B, C, U, AC



SYMBOLS (Plate 6C)

- | | |
|--|--|
| A 1-72111 1/4A | 92 No. 1 specify character and color, keypaper |
| B 79819 | AJ 72521 No. 5 |
| C 72635 No. 2 spring anchor screw | AK 72521 No. 1 |
| D 74526 | AL 74587 screw |
| E 74123 | AM 702213 1/4A No. 2 |
| F 10080 | AN 71517 screw |
| G 74249A | AO 1B-72123 1/2 No. 1 |
| H Use 704588 screw for right side bottom, 702589 screw and 406320 roll for left side bottom, 704300 1/2 No. 2 eccentric and 704589 screw for right and left side top | AP 1-72143 No. 1 for reg. total position |
| I 1-702763 includes J, L | AQ 1-702143 No. 8 for product position |
| J 49 3/8 nut | AR 21-72143 No. 2 for extend position |
| K 71366 shoulder nut | AS 75631 screw |
| L 72110 No. 1 | AT 1-702243 No. 15 for add reg. cl. mult. position |
| M 702501 No. 1 hex. nut | AU 1-702765 extend wire, includes L |
| N 75638 | AV 1-702201 1/2 No. 1 |
| O 72110 No. 2 | AW 1-702201 1/2 No. 2 |
| P 1-702766 includes J, O | AX 1-702201 1/2 No. 3 |
| Q 72572 No. 1 | AY 1-702201 1/2 No. 4 |
| R 99802 No. 2 | AZ 71808 |
| S 75618 | BA 89811 |
| T 1-75332 includes S | BB 72833 |
| U 702295 1/4 No. 2 | BC 3489 |
| V 83800A | BD 1-702225 1/2 |
| W 1-702204 1/2 | BE 1-702202 for reg. total, sub-product, add reg. cl. mult., and product positions |
| X 46 3/4 nut | BF 11-702202 for reg. sub-total position |
| Y 702207 1/2 | BG 3489 3/4 |
| Z 7781A | BH 952 3/4 screw |
| AA 72514 No. 2 spring anchor screw | BI 681 1/2 |
| AB 1-702203 1/2 | BJ Included in CI |
| AC 1-702760 non-extend wire, includes L | BK Included in CI |
| AD 1-702143 No. 7 for sub-product position | BL 73611 |
| AE 82521 screw | BM 702123 1/2 |
| AF 1-702143 No. 6 for reg. sub-total position | BN 44805 |
| AG 72521 No. 2 | BO 77882 |
| AH 702143 1/4L No. 2 | BP Use 32B-702037A No. 1 shaft assembly, 1-701239 broken joint connection, 1-701232 1/4A power pawl, 1-702233 1/4B power pawl link, 79543 screw and 705367 eccentric for top, and 79600 screw for bottom, of power pawl link |
| AI 72200A No. 1 ring | |
| 72199 No. 1 cup | |
| 72992 No. 1 glass | |
| 72210 disk | |

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN
POS. NO. 67—CLASS 72
(BETWEEN MACHINE SERIAL NOS. A915672 AND B197641) (Plate 6C)



SYMBOLS (Plate 6C)—Continued

BQ 21 No. 9
BR 21 No. 15 clips
BS 702221 3/4 washers
BT 702110 No. 8 turnbuckles
BU 709628 screws
BV 1-702759 reg. sub-total wire, includes BT
BW 1-702758 reg. total wire, includes BT
BX 1-702757 sub-product wire, includes BT
BY 1-702756 add reg. cl. mult. wire, includes BT
BZ 1-702768 product wire, includes BT
CA 1-701162 complete switch
CB 702623
CC 1-702292 3/4 No. 2.
CD 705367 eccentric
CE 79543 screw
CF 1-702233 1/2 A for machines before serial No. B83080, 705367 eccentric and 79543 screw to be used in top hole

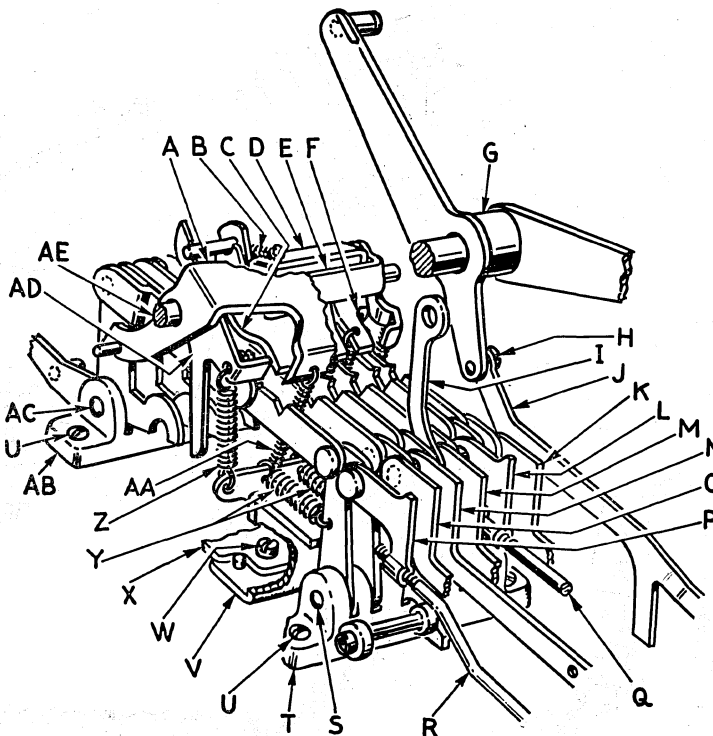
CG 72307 eccentric
CH 79510 screw
CI Use 32B-702037A No. 1 shaft assembly, 1-701239 broken joint connection, 1-701232 1/2 A power pawl, 1-702233 1/2 B power pawl link, 79543 screw and 705367 eccentric for top, and 79600 screw for bottom, of power pawl link
CJ 77529
CK 1-702230 No. 6
CL 702111 No. 2
CM 71519 set screw
CN Use 704588 screw for right side bottom, 702589 screw and 406320 roll for left bottom, 704300 1/2 No. 2 eccentric and 704589 screw for right and left side top
CO 1-74331A includes CM
CP 11D-704013 No. 1 includes G, CM, CO
CQ 1-702110 1/2

Replaces Print 203-3/M

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 67—SERIES M 200 MACHINES (Plate 6D)

SYMBOLS (Plate 6D)

- A 1-702189 No. 4
- B 205801
- C 72188A No. 2
- D 1-702188 1/2
- E 72296 1/4 A
- F 8381 spring
- G 1-702186 1/4
- G 72809 spring
- G 1-701143 included in assembly 51-701004 No. 1 for machines without four position printing
- 11-701143 included in assembly 81-701004 No. 1 for machines with four position printing and without carriage return carriage controlled and in 91-701004 No. 1 for machines with four position printing and carriage return carriage controlled
- H 79503 screw
- I 1A-72170A No. 9
- J 702291 1/4 No. 3
- K 1A-702171 No. 14 link assembly, for product position
- L 31D-72171 No. 1 link assembly, for add C.F. position
- M 1B-702171 No. 12 link assembly, for final product position
- N 1A-702171 No. 13 link assembly, for reg. total position
- O 1B-1111 Fte 133 No. 3 link assembly, for add reg. cl. mult. position
- P 1-702171 No. 6 link assembly, for extend position
- Q 72700 No. 10 add C.F. wire
- R 702765A extend wire
- S 72005
- T 72666 No. 2
- U 75617
- V 1A-702192 1/2
- W 79505
- X 1-702193 1/2
- Y 72803
- Z 8381
- AA 74813
- AB 72665
- AC 72004
- AD 1-702190 1/2 No. 2
- AE 702002A shaft only
- 51A-702002A No. 2 complete latch, includes A, B, C, D, E, F, Z, AA, AD, AE

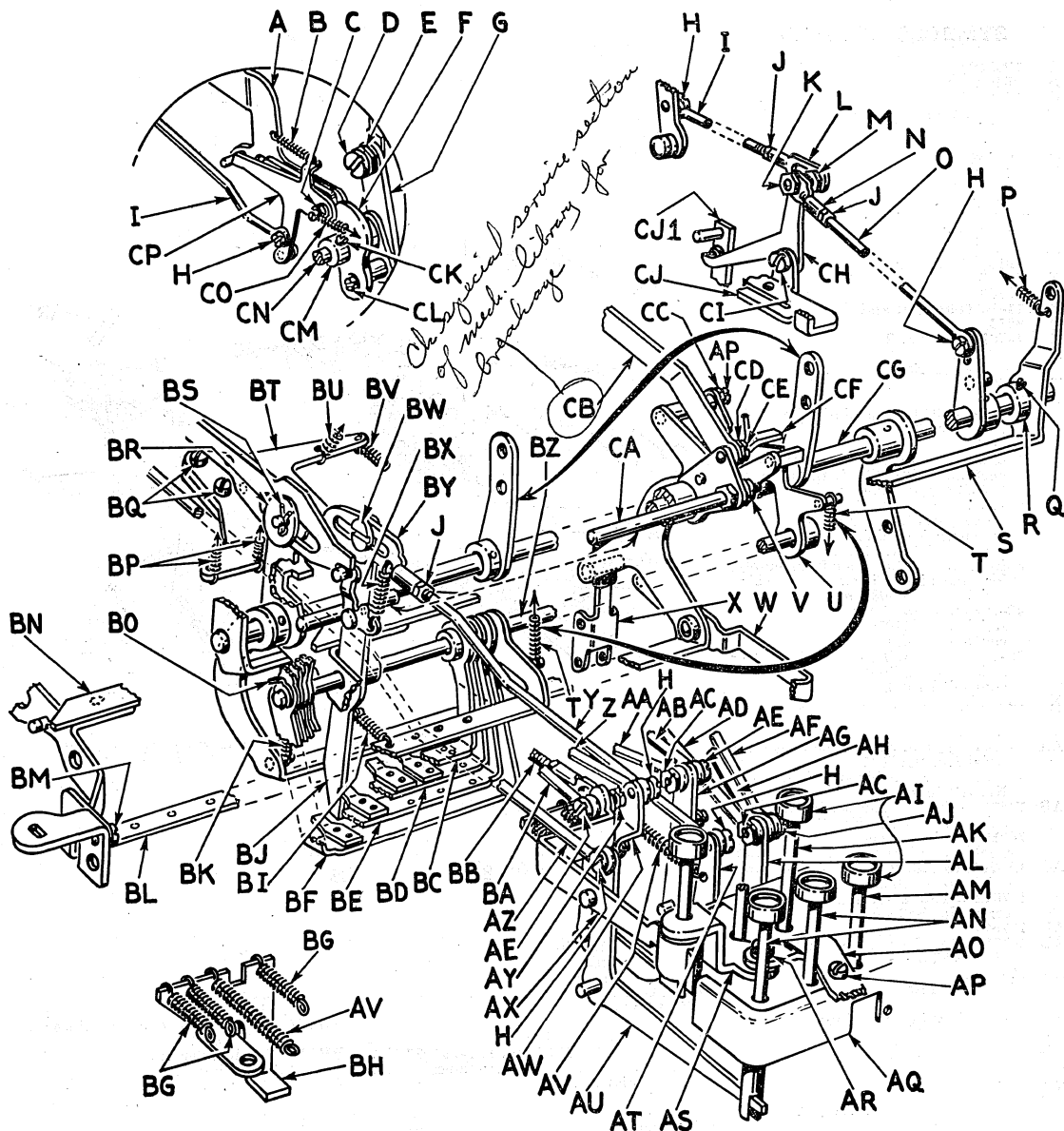


SYMBOLS (Plate 6E)

- | | |
|--|--|
| A 1-72111 1/2 A | 72210 disk |
| B 79819 | 92 No. 1 Specify Character and Color, keypaper |
| C 72635 No. 2 | AJ 75631 for 2 wires |
| D 704589 screw | 514 Fte. 146 for 3 wires |
| E 704300 1/2 No. 2 eccentric | AK 72521 No. 2 keystem |
| F 74249A | AL 1-72143 No. 1 for add C.F. position |
| G 74123 link | AM 72521 No. 5 keystem |
| H 72572 No. 1 | AN 72521 No. 1 keystem |
| I 1-702763 | AO 1-702214 bracket |
| J 49 3/4 | 44805 spring for latch on bracket |
| K 71366 nut | AP 79543 |
| L 72110 No. 1 turnbuckle, 75638 screw | AQ 702213 1/2 A No. 2 shield |
| M 702501 No. 1 hex. screw | 74587 screw for right side |
| N 72110 No. 5 | AR 700505 screw |
| O 1-702766 | AS 1B-72123 1/2 No. 1 |
| P 99802 No. 2 | AT 1-72143 No. 1 for reg. total position |
| Q 75618 set screw | AU 1-72143 No. 1 for extend position |
| R 1-75332 includes Q | AV 3489 spring for reg. total bell crank |
| S 702295 1/4 No. 2 | AW 1-702143 No. 8 for product position |
| T 83800A | AX 1-702243 No. 15 for cl. mult. position |
| U 1-702204 1/2 | AY 71366 nut |
| V 46 3/4 nut | AZ 702765A extend wire |
| W 1-702203 1/2 | BA 1-702781 cl. mult. wire |
| X 1-701162 complete switch | BB 1-702760 non extend wire |
| Y 1-702758 reg. total wire | BC 1-702201 1/2 No. 1 |
| Z 1-702768 product wire | BD 1-702201 1/2 No. 2 |
| AA 1-702779 normalizing wire | BE 1-702201 1/2 No. 3 |
| AB 1-702757 final product wire | BF 1-702201 1/2 No. 4 |
| AC 72324 nut | BG 72833 |
| AD 72700 No. 10 add C.F. wire | BH 702225 1/2 A |
| AE 75631 screw | BI 3489 3/4 |
| AF 72708 flapper wire | BJ 1-702202 for reg. total, first product and final product position |
| AG 1-702143 No. 7 for final product position | 11-702202 for add reg. cl. mult. position |
| AH 1-702770 normalizing wire | BK 681 1/4 |
| AI 72200A No. 1 ring | BL 1-702206 1/2 |
| 72199 No. 1 cup | |
| 72992 No. 1 glass | |

SEE EXPLANATION ON INSIDE OF FRONT COVER

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 67
SERIES M 200 MACHINES (Plate 6E)



SYMBOLS (Plate 6E) Continued

BM 952 3/4 screw
BN Included in CG
BO 21 No. 9 clip
BP 44805 spring
BQ 73611
BR 702221 3/4 washer
BS 21 No. 15 clip
BT 702123 1/2
BU 83800A
BV 79819
BW 709628
BX 77882
BY 702110 No. 8
BZ 702037 1/2 shaft
CA 702623
CB 702291 1/4 No. 3
CC 705367 eccentric
CD 72307 eccentric
CE 79510 screw
CF 702207 1/2

CG 42-702037A No. 1 for machines with carriage controlled totals, includes bails BC, BD, BE, BF
52-702037A No. 1 for machines without carriage controlled totals, does not include bails BC, BD, BE, BF

NOTE:

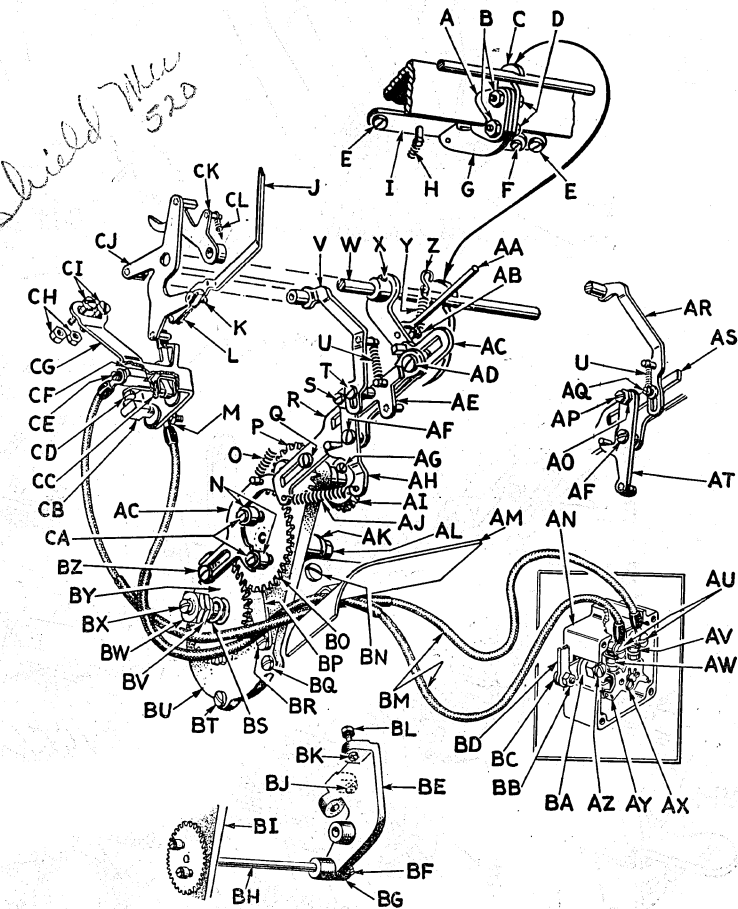
Collar 83313 1/2 is used on shaft BZ behind clip BO in the absence of bails BC, BD, BE, BF

CH 702111 No. 2
CI 702652
CJ 1-702230A No. 6
CJ1 1-71903A No. 2
CK 71519 set screw
CL 704588 screw
CM 1-74331A includes CK
CN 11D-704013 No. 1 shaft assembly
CO 10080
CP 1-702110 1/2

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 67 CLASS 72 AND SERIES M 200 MACHINES (Plate 6F)

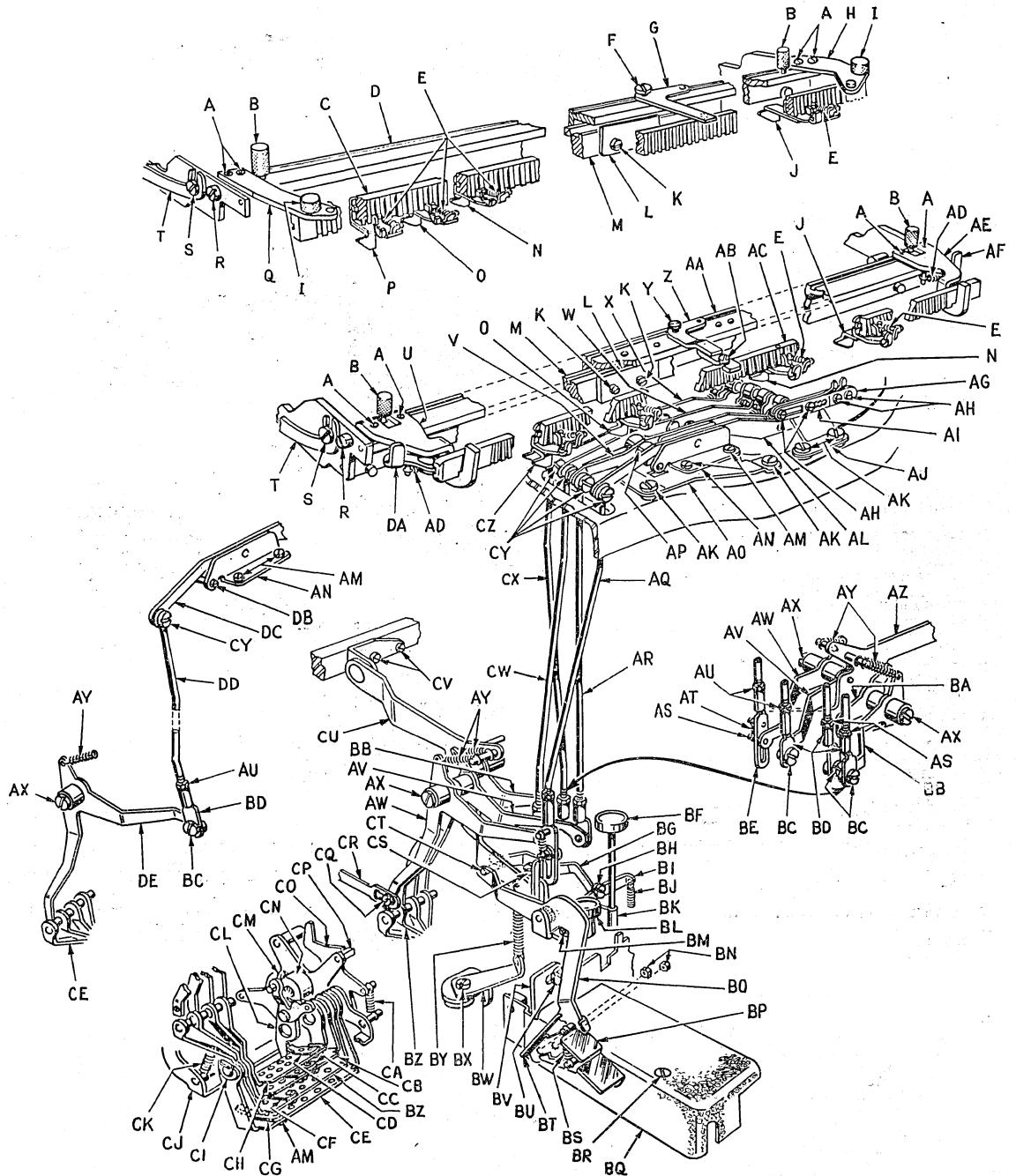
SYMBOLS (Plate 6F)

A	702229 1/2
B	45 1/4 nuts
C	702228 1/2
D	75609 screws
E	72617
F	79510
G	702232 1/2
H	701802
I	1-702220 1/2
J	1-702203 1/2
K	72514 No. 2 spring anchor screw
L	7781A spring
M	46 nut
N	7919 1/4 A washer
O	701354 rolls
P	701802
Q	11-701009A gear and shaft
R	8863
S	1-701225 1/2 No. 2
T	76567 screw
U	75342 eccentric
V	79600
W	71803
X	1-702233 1/2 B for machines after serial No. B83080
Y	Use 32B-702037A No. 1 shaft assembly, 1-701239 broken joint connection, 1-701232 1/2 A power pawl, 1-702233 1/2 B power pawl link, 79543 screw and 705367 eccentric for top, and 79600 screw for bottom, of power pawl link. For machines before serial No. B83080
Z	32B-702037A No. 1 shaft assembly, for machines between machine serial No. B83080 and B197641
AA	42-702037A No. 1 for machines after serial No. B197641 with carriage controlled totals
AB	52-702037A No. 1 for machines after serial No. B197641 without carriage controlled totals
AC	66 3/4 pin
AD	3281 1/2
AE	20 No. 86A
AF	1-702714 1/2 No. 36 for machines after serial No. B197641
AG	1-702764 for machines before serial No. B197641
AH	74575 spring anchor screw, for machines after serial No. B197641
AI	74315 spring anchor screw, for machines before serial No. B197641
AJ	1A-701225 No. 2 for machines after serial No. B83080
AK	1-701225 No. 2 for machines before serial No. B83080
AL	701571
AM	1-701232 1/2 A for machines after serial No. B83080
AN	72523 1/2
AO	550 3/4 set screw
AP	1-701239
AQ	1-71901 bevel gear, includes AG
AR	4485 Style 11
AS	74335 collar
AT	47 nut
AU	71182A
AV	11-71907 assembled switch box, includes AU, AV, AW, AX, AY, AZ, BA
AW	75342 eccentric
AX	76567 screw
AY	72509 1/2 spring anchor screw
AZ	1-702233 1/2 A for machines before serial No. B83080
BA	1-701232 1/2 for machines before serial No. B83080
BB	Use 1-701239
BC	4252 screws
BD	1097 1/2 washers
BE	12045 collars
BF	1A-12021 3/4 AL switch point
BG	1A-12021 3/4 AR switch point



AX	21 No. 15 clip
AY	1A-3842B
AZ	7356 1/2 screw
BA	1B-71178 includes AX, AY, BA
BB	46 nut
BC	94523 screw
BD	71177A
BE	Use 1A-701665B No. 1, 1-701017 No. 2, 74335, 47 for machines before serial No. B83080
BF	71519 set screw
BG	542 1/2 collar
BH	Use 1-701017 No. 2, 1A-701665B No. 1, 74335, 47 for machines before serial No. B83080
BI	Use 1A-701665B No. 1, 1-701017 No. 2, 74335, 47 for machines before serial No. B83080
BJ	71554 screw
BK	702583
BL	47 nut
BM	1-701700 No. 2
BN	71620
BO	1-701017 No. 2 gear and shaft, for machines after serial No. B83080, includes N, CA
BP	701229A
BQ	7357 1/2
BR	73611
BS	701804 spring
BT	76555
BU	1A-701665B No. 1 for machines after serial No. B83080
BV	701397 shoulder nut
BW	71515 locking nut
BX	71617A screw
BY	71112 gear
BZ	3259 1/4 A
CA	703594 screws
CB	1-701556
CC	21 No. 17 clip
CD	1-4523B No. 2
CE	4553 1/2 screw
CF	7919 1/4 A washer
CG	4556 1/2 No. 5 post
CH	1-701162 includes M, CB, CC, CD, CE, CF
CI	46 nuts
CJ	72584 screws
CK	Included in W
CL	1-702204 1/2
	83800A spring

CROSSFOOTER AND REGISTER TOTALS AND SUB-TOTALS INDEXING MECHANISM, CARRIAGE CONTROLLED—CLASS 72 AND SERIES M 200 MACHINES (Plate 6G)



SYMBOLS (Plate 6G)

A 703589
B 703583 No. 4
C 703966 1/2 Style 18, 22, 30
D 1-703966 No. 4 Style 18, 22, 30
E 703809
F 703508
G 1-703183

H 703157R
I 703583 No. 3
J 2-703216 No. 9 product, line 7 control
K 73548
L 703195 1/4
M 703967 No. 8 Style 22 for 12", 18", 22" carriages
703967 No. 8 Style 30 for 30" carriage

Replaces General Prints 204-1/M and 8-1/M

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 12-3-51

For Form 2952

SYMBOLS (Plate 6G) Continued

N	2-703216 No. 8 sub-product, line 9 control	BM	950 $\frac{5}{8}$ screw
O	2-703216 No. 7 reg. total, line 11 control	BN	46 nuts
P	2-703216 No. 6 reg. sub-total, line 13 control	BO	1-705219 $\frac{1}{2}$ includes BP, CT
Q	703157L	BP	Included in BO
R	73561	BQ	702665 $\frac{1}{2}$ AL No. 2
S	73566	BR	89568 $\frac{1}{4}$ Style 13
T	703224 No. 2	BS	12083 spring
U	1-703157AL includes DA	BT	1-702209 $\frac{1}{2}$
V	1-705203 $\frac{1}{2}$ includes W	BU	75633 screw
W	Included in V	BV	1A-705214 No. 5 without auto. date
X	Included in AO		1A-705214 No. 4 with auto. date
Y	703508 screw for brace in center position	BW	20 No. 99
	74587 screw for brace in either right or left position	BX	8451
	703502 $\frac{1}{4}$ guide screw in center position without brace	BY	10280 $\frac{1}{2}$
Z	1-703183A	BZ	1-702201 $\frac{1}{2}$ No. 3 includes CF
AA	1-73966 No. 3 Style 12	CA	83800A
	1-703966A No. 4 Style 18, 22, 30	CB	1-702201 $\frac{1}{2}$ No. 2 includes CC
AB	79552 screw	CC	702201 $\frac{1}{4}$ No. 2
AC	703966 $\frac{1}{2}$ A Style 12, 18, 22, 30 control bar only		545 Fte. 217 screws
	1Z-703966 $\frac{1}{2}$ A Style 12, 18, 22, 30 complete assembled control bar, specify machine style and number	CD	702201 $\frac{1}{4}$ No. 2
AD	74803 spring		545 Fte. 217 screws
AE	1-703157AR includes AF	CE	1-702201 $\frac{1}{2}$ No. 4 includes CG
AF	Included in AE	CF	702201 $\frac{1}{4}$ No. 1
AG	705195 $\frac{1}{2}$ No. 2		74533 screws
AH	74533	CG	702201 $\frac{1}{4}$ No. 1
AI	705195 $\frac{1}{2}$ No. 1		545 Fte. 217 screws
AJ	705195 $\frac{1}{4}$	CH	1-702201 $\frac{1}{2}$ No. 1 includes CD
AK	73611	CI	21 No. 9 clip
AL	Included in AN	CJ	Included in complete shaft assembly,
AM	545 Fte. 217		32B-702037A No. 1 for machines between serial No. B83080 and No. B197641
AN	1-705202 $\frac{1}{2}$ includes AL		42-702037A No. 1 for machines after serial No. B197641 with carriage controlled totals
AO	1-705205 $\frac{1}{2}$ includes X		52-702037A No. 1 for machines after serial No. B197641 without carriage controlled totals
AP	705502 $\frac{1}{2}$	CK	681 $\frac{1}{4}$ spring
AQ	1-705708 No. 2 includes AU, BE	CL	1-702202 for reg. total, final product, first product, positions
AR	1-705707 includes AU, BD		11-702202 for add reg. cl. mult. position
AS	74315 spring anchor screw	CM	550 $\frac{3}{4}$ screw
AT	44810 spring	CN	1-7140 $\frac{3}{4}$ includes CM
AU	49 $\frac{3}{4}$ nuts	CO	1-702204 $\frac{1}{2}$
AV	1-705211 $\frac{1}{2}$ No. 2	CP	Included in CJ
AW	1-705211 $\frac{1}{2}$ No. 3	CQ	72599
AX	71598 screw	CR	11-702216
AY	480 $\frac{1}{4}$	CS	71542 screw
AZ	1-705215 $\frac{1}{2}$	CT	Included in BO
BA	1-705212 $\frac{1}{2}$ No. 2	CU	1-705215 $\frac{1}{2}$
BB	1-705212 $\frac{1}{2}$ No. 1	CV	79543
BC	75638	CW	1-705709 includes AU, BD
BD	72110 No. 5	CX	1-705708 includes AU, BD
BE	1-702110 No. 9	CY	72572 No. 1
BF	72200A No. 1 ring	CZ	2-703216 No. 12 reg. total, sub-total index, lines 11 and 13 control
	72199 No. 1 cup		2-703216 No. 13 final product, sub-total index, lines 9 and 13 control
	72992 No. 1 glass		2-703216 No. 14 first product, sub-total index, lines 7 and 13 control
	72210 disk	DA	Included in U
BG	92 No. 1 Specify character and color, keypaper	DE	Use 705502 $\frac{1}{2}$
BH	705214 $\frac{1}{2}$	DC	Included in AN
BI	75630	DD	1-705708 includes AU, BD
BJ	1A-705184 No. 2 includes BL	DE	1-705211 $\frac{1}{2}$ No. 1
BK	79804		
BL	1B-705110 No. 3		
	72200A No. 1 ring		
	72992 No. 1 glass		
	92 No. 1 Specify character and color, keypaper		

CARRIAGE CONTROLLED TOTAL MACHINE OPERATION DELAYING MECHANISM—SERIES M 200 AND M 800 MACHINES (Plate 6H)

SYMBOLS (Plate 6H)

A	See chart 1 below
B	See chart 2 below
C	73607
D	79552
E	1-701215 1/2 A includes G
F	1-71019
G	550 3/4
H	1-72301 No. 2 includes I
I	74502
J	702206 1/4
K	1-702714 1/2 No. 36
L	3281 1/8
M	1A-701225 No. 2
N	74575 spring anchor screw
O	701571
P	1-701232 1/2 A
Q	72523 1/2
R	1-701239
S	79600
T	71803
U	1-702233 1/2 B
V	72572 No. 1
W	702148 3/4
X	72599
Y	49 3/4
Z	72110 No. 3
AA	75638
AB	1-702748 1/2 includes Y, Z
AC	1-702230A No. 6
AD	1-702788 includes Y, Z
AE	99447 nut
AF	709559 screw
AG	3683
AH	79270A
	73563 screw
	72576 No. 1

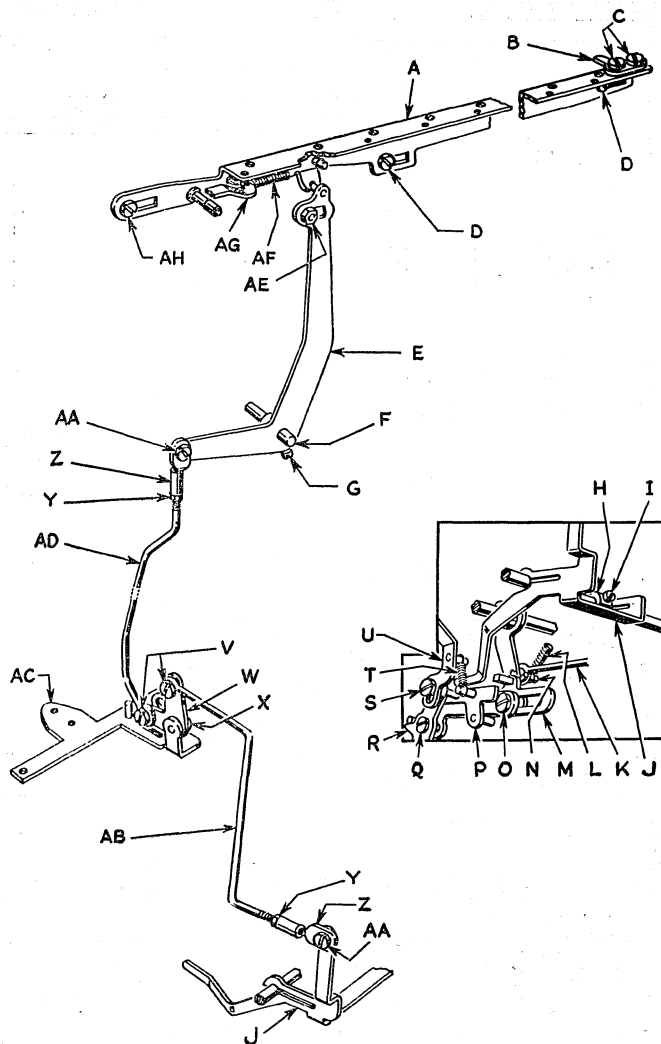


CHART NO. 1

REGISTER RETURN CONTROL SLIDE

REGISTER CAPACITY	SERIES M 200 FRACTION NON ADD NON PRINT	SERIES M 200 WITH FRACTIONS	SERIES M 200 WHOLE NUMBERS	SERIES M 800
6 X 15			21-709265 No. 9	
8 X 9		31-709265 No. 9		
8 X 10		31-709265 No. 9		
8 X 12	11-709265 No. 9	1-709265 No. 9		11-709265 No. 9
10 X 10	31-709265 No. 9			31-709265 No. 9
12 X 8	1-709265 No. 9		1-709265 No. 9	1-709265 No. 9

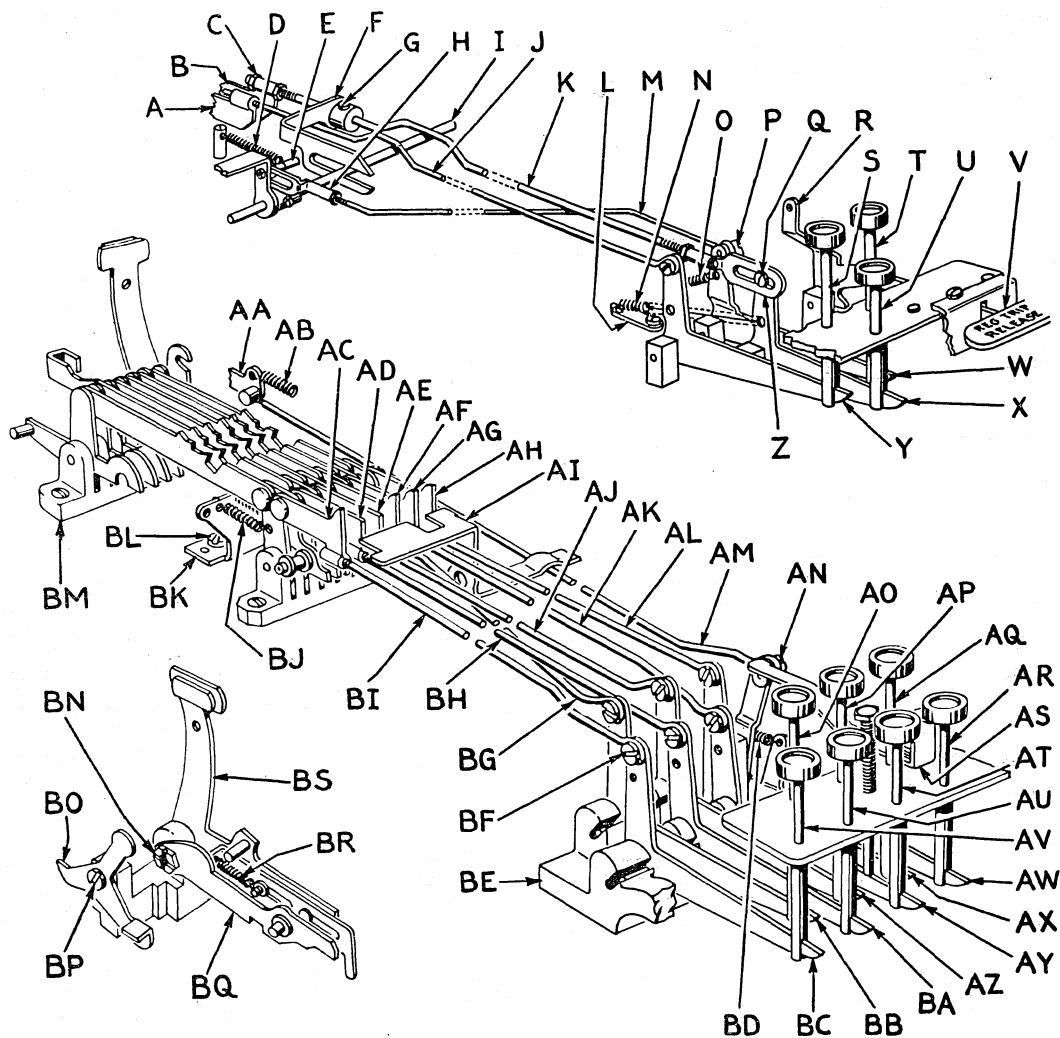
(OVER)

SYMBOLS (Plate 6H) Continued

CHART NO. 2 REGISTER RETURN STOP—NO. 1 POSITION

REGISTER CAPACITY	SERIES M 200 FRACTION NON ADD NON PRINT	SERIES M 200 WITH FRACTIONS	SERIES M 200 WHOLE NUMBERS	SERIES M 800
6 X 15 8 X 9 8 X 10 8 X 12 10 X 10 12 X 8	709272½ 709272½ 709272½	709272½ 709272½ 709272½	709272½ 709272½ No. 2	709272½ 709272½ 709272½ No. 2

RESULT SECTION ASSEMBLY, CLASSES 76, 77 (Plate 7)



SYMBOLS (Plate 7)

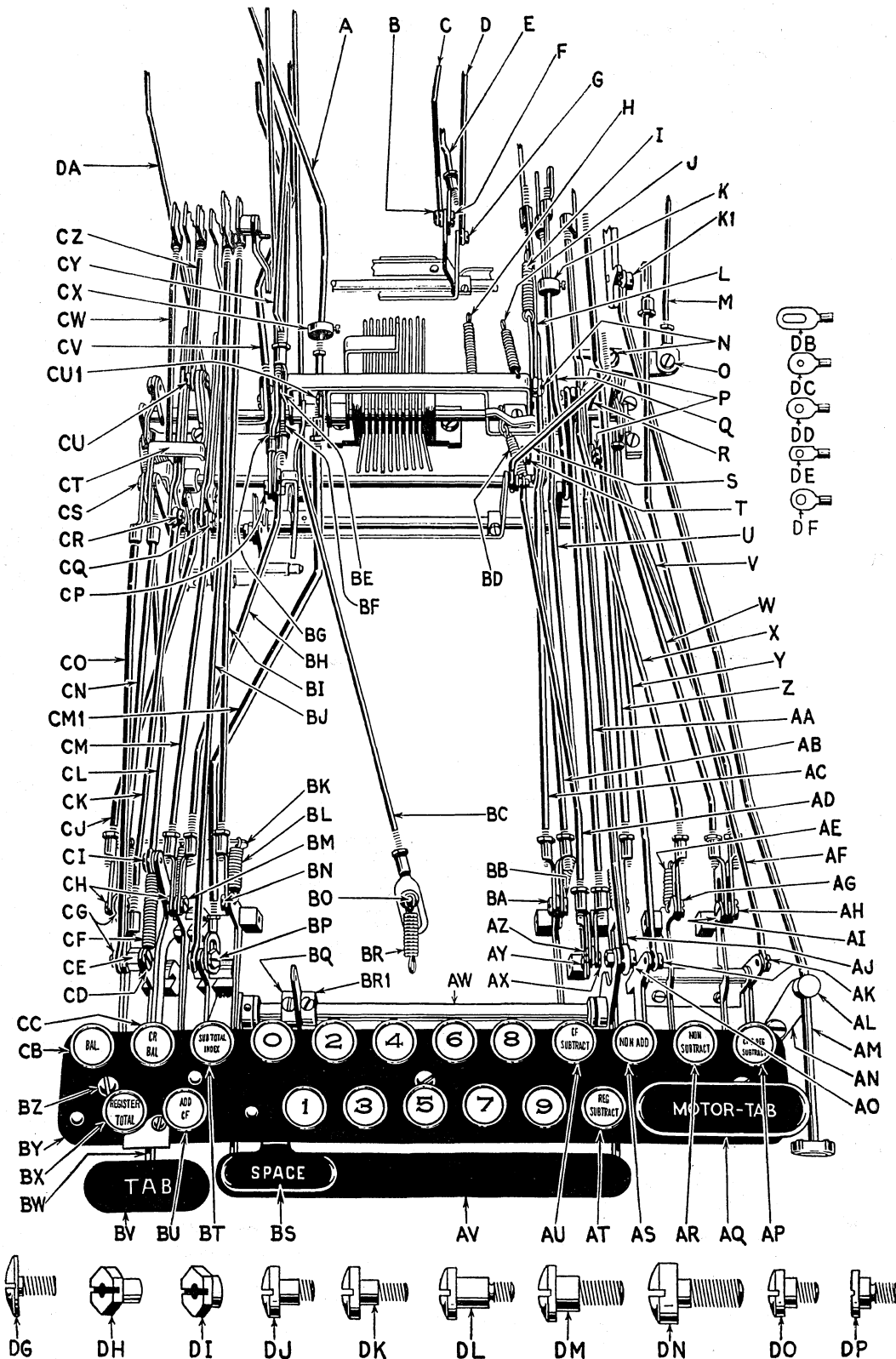
(See plate 6 for assembly of latches for result key linkages.)

A	72102 No. 9 Cl. 76			AO	72521 No. 2 Bal.
B	702102 No. 1 Cl. 77			AP	72521 No. 2 Cr. bal.
C	11-702102B No. 2			AQ	702558 Sub-bal.
D	4936			AR	72521 No. 3 Bal. key release
E	72802			AS	72138 use 75645 screw in slot
F	702581			AT	72521 No. 5 add CF
G	11-702282 No. 2 Sel. skip tab			AU	72521 No. 1 Reg. total
H	1-702282 No. 3			AV	72521 No. 1 Cr. reg.
I	72573			AW	1-72137 Bal. key release, use 72557 screw stud
J	72110 No. 1			AX	1-72143 No. 3 Sub-bal., use 79503 screw
K	75299A Sel. skip tab			AY	1-72143 No. 1 Cl. 76
L	72700 No. 2				11-702143 No. 1 Cl. 77 } Add CF
M	1-702700A No. 1			AZ	1-72143 No. 4 Cr. bal.
N	1-702700 No. 1 early			BA	1-72143 No. 2 Cl. 76
O	1-702700A No. 2				1-702143 No. 2 (1-72143 No. 2) Cl. 77 } Reg. total
P	1-702700 No. 2 early			BB	1-72143 No. 4 Bal.
Q	1-702700 No. 2			BC	1-72143 No. 1 Cl. 76
R	72244 (20 No. 102) use 79503 screw				1-702143 No. 1 (1-72143 No. 1) Cl. 77 } Cr. reg.
S	1-702706 No. 1			BD	75814
T	11-702706 No. 1 Sel. skip tab			BE	72668 Cl. 76
U	984				702668 Cl. 77
V	10782			BF	72572 No. 1
W	72572 No. 1			BG	72700 No. 9 Bal.
X	79503			BH	72700 No. 10 Reg. total
Y	702117 No. 2 use 1-702710 No. 2 reg. trip wire			BI	72700 No. 11 Cr. reg.
Z	72521 No. 2 CF subt.			BJ	72803 in all positions except add CF
	72521 No. 2 non-clear subt.				72804 in add CF position
	72521 No. 1 Reg. subt.				72803 in all positions except reg. total and sub-bal. } Wide
	1A-702125 No. 2 specify, use 72592 screws				72804 in reg. total and sub-bal. positions } base
	702243 No. 2 non-clear subt.			BK	1-72192
	702243 No. 1 Reg. subt.			BL	72581
	72243 No. 3 CF subt., use 79503 screw			BM	72665 complete assembled linkage 81-72665, includes AC, AD, AE, AF, AG, AH; used without reg. subt., Cl. 76
	72110 No. 1				72665 No. 2 complete assembly 21-72665 No. 2, used with reg. subt., Cl. 76
AA	1-702182				72665 complete assembly 21-702665 No. 1, used without reg. subt., Cl. 76, 77
AB	3683				72665 No. 2 complete assembly 31-702665 No. 1, used with reg. subt., Cl. 77
AC	1-72171 No. 6 Cr. reg.			BN	72340 Nut, 72511 screw
AD	31-72171 No. 7 } Reg.			BO	72114 No. 3 (702114 No. 4)
	11-702170 } Total				72114 No. 5 with reg. subt.
AE	1-72171 No. 4 Cr. bal.			BP	72551
AF	1-72171 No. 2 Bal.				71540 (76539) with reg. subt., Cl. 76, 77, 78
AG	11-72171 No. 1 (1-702171 No. 3) } add			BQ	1-72175 No. 2 Cl. 75, 77
	Cl. 76 } CF				1-72175A No. 3 Cl. 78
AH	1-702171 No. 3 Cl. 77				1-72175 No. 4 for machines with add CF and reg. on ext., Cl. 71, 72, 73, 76, 77
AI	11-72171 No. 3 (1-702171 No. 4) } Sub. bal.				1-72175 No. 5 with easier depression mult. keys, Cl. 71, 72, 73
AJ	702157 No. 5				1-72175 No. 6 with easier depression mult. keys, and add CF and reg. on ext., Cl. 71, 72, 73
AK	72700 No. 9 Cr. bal.			BR	72805 (72820)
AL	72700 No. 10 add CF			BS	11-72163 No. 4 } See plate 6 for other styles
AM	72700 No. 9 Sub-bal.				1-702251
AN	72700 No. 8 Bal. key release				
AO	72521 No. 2 Bal.				
AP	72521 No. 2 Cr. bal.				
AQ	702558 Sub-bal.				
AR	72521 No. 3 Bal. key release				
AS	72138 use 75645 screw in slot				
AT	72521 No. 5 add CF				
AU	72521 No. 1 Reg. total				
AV	72521 No. 1 Cr. reg.				
AW	1-72137 Bal. key release, use 72557 screw stud				
AX	1-72143 No. 3 Sub-bal., use 79503 screw				
AY	1-72143 No. 1 Cl. 76				
	11-702143 No. 1 Cl. 77 } Add CF				
AZ	1-72143 No. 4 Cr. bal.				
BA	1-72143 No. 2 Cl. 76				
	1-702143 No. 2 (1-72143 No. 2) Cl. 77 } Reg. total				
BB	1-72143 No. 4 Bal.				
BC	1-72143 No. 1 Cl. 76				
	1-702143 No. 1 (1-72143 No. 1) Cl. 77 } Cr. reg.				
BD	75814				
BE	72668 Cl. 76				
	702668 Cl. 77				
BF	72572 No. 1				
BG	72700 No. 9 Bal.				
BH	72700 No. 10 Reg. total				
BI	72700 No. 11 Cr. reg.				
BJ	72803 in all positions except add CF				
	72804 in add CF position				
	72803 in all positions except reg. total and sub-bal. } Wide				
	72804 in reg. total and sub-bal. positions } base				
BK	1-72192				
BL	72581				
BM	72665 complete assembled linkage 81-72665, includes AC, AD, AE, AF, AG, AH; used without reg. subt., Cl. 76				
	72665 No. 2 complete assembly 21-72665 No. 2, used with reg. subt., Cl. 76				
	72665 complete assembly 21-702665 No. 1, used without reg. subt., Cl. 76, 77				
	72665 No. 2 complete assembly 31-702665 No. 1, used with reg. subt., Cl. 77				
BN	72340 Nut, 72511 screw				
BO	72114 No. 3 (702114 No. 4)				
	72114 No. 5 with reg. subt.				
BP	72551				
	71540 (76539) with reg. subt., Cl. 76, 77, 78				
BQ	1-72175 No. 2 Cl. 75, 77				
	1-72175A No. 3 Cl. 78				
	1-72175 No. 4 for machines with add CF and reg. on ext., Cl. 71, 72, 73, 76, 77				
	1-72175 No. 5 with easier depression mult. keys, Cl. 71, 72, 73				
	1-72175 No. 6 with easier depression mult. keys, and add CF and reg. on ext., Cl. 71, 72, 73				
BR	72805 (72820)				
BS	11-72163 No. 4 } See plate 6 for other styles				
	1-702251				

See letter BM for complete assembly

MCC
319

RESULT SECTION ASSEMBLY, CLASS 78 (Plate 8)



SYMBOLS (Plate 8)

(See plate 40 for result key linkages and latches.)

A 1-72712 No. 10 includes CX
B 72339 (71366) bushing
C 707701 } Dr. symbol
707701 early }
D 707700A No. 1 } To operate clear
77700 early } signal
E 1-74700A No. 2 cr. reg. symbol
F 75631 screw
G 72572 No. 1 screw
H 75804 No. 3
I 83883
J 75804 No. 3
K 1-72315 No. 1 includes 72573 screw
KI 2855½
L 72617 screw, 47 nut, early
72714 No. 2 short wire, CF and reg. sub.
M 1-72714 No. 10
1-702714A No. 10
N 72572 No. 1 screw
O 79503
P 75631 screw
72324 bushing
Q 1-72714 No. 8 use 72572 No. 1 screw
R 1-72714 No. 3 short wire, use 79503 screw in front
S 1-72714 No. 6 } Use 74575 screw
1-702714 No. 6 } in front
T 72572 No. 1 screw
U 1-72714A No. 14 wide }
and narrow base } Connected
1-72714 No. 14 early } to reg. sub.
1-702714 No. 14 early } lever
V 1-72714 No. 19 } Connected to CF
1-702714 No. 19 } and reg. sub. lever
W 1-72714 No. 39 } Connected to CF
1-702714 No. 26 } and reg. sub. lever
X 1-72714 No. 41 non-sub.
Y 72714 No. 16 motor tab
Z 1-72712 No. 7 } Connected to non-
1-702712 No. 7 } add lever
AA 1-72714A No. 20 } Connected to
1-72714 No. 20 } reg. sub.
early } lever
AB 1-72712 No. 7 } Connected to CF
1-702712 No. 7 } sub. lever
AC 1-72714 No. 13 } Connected to CF
1-702714 No. 13 } sub. lever
AD 1-72714 No. 11 wide } Connected to
and narrow base } reg. sub.
1-702714 No. 11 } lever to oper-
early, wide base } ate non-add
AE 10782
AF 1-72714 No. 22
AG 79503 screw
AH 72339 (71366) bushing
AI 79511 screw
AJ 72707A No. 4 } Motor bar, see letter
702707A No. 4 } J, plate 43
AK 72572 No. 1
AL 72616* included in AM, use 72325 nut
AM 1-72705A
1-72705 early
1-702705A No. 2
1-702705 early
AN 72203 use 71518 screw
AO 72588 (12356½) screw, 46 nut
AP 72521 No. 2 keystem
AQ 12-72125 No. 1 specify, black
12A-72125 No. 1 specify, gray
AR 72521 No. 2
AS 72521 No. 2 } Keystem
AT 72521 No. 1
AU 72521 No. 2
AV 2-72125 No. 3 black } 952½ screws
2A-72125 No. 3 gray }
AW 1-72017
1-702017
AX 79511 screw
AY 72649 (707505) screw
72339 (71366) bushing, early
AZ 79503 screw
BA 72649 (707505) screw
72339 (71366) bushing, early
BB 79511 screw
BC 1-72714 No. 36
1-702714 No. 36
BD 3688 spring
20 No. 73A anchor

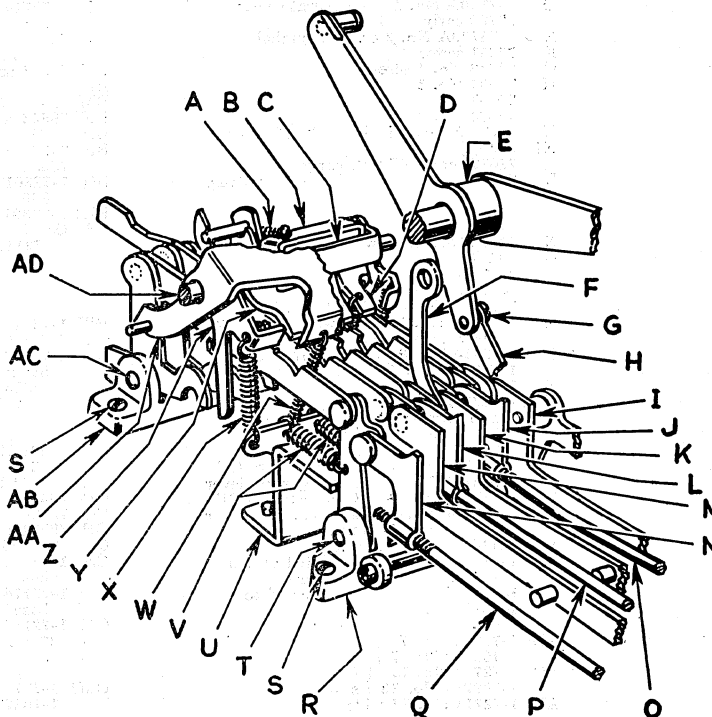
BE 79503 screw
BF 1-72714 No. 27 result key lock control, Cr. Bal.
BG 1-72714 No. 34 indexes 3rd stroke mech., Cr. Bal.
BH 1-72714 No. 32 Cr. Bal.
BI 1-72714 No. 9 } Sub-total index
1-702714 No. 9 }
BJ 72700 No. 10 } Add CF
702700 No. 10 }
BK 72287 use 73611 screws
BL 681½ (2) *7/11/35*
BM 72339 (71366) bushing
BN 79503 screw
BO 79606
BP 71366 bushing
75631 screw
BQ 1-72301 No. 2 includes 74502 screw
BR 81806
BR1 1-72301 No. 1 includes 74502 screw
BS Use 72119 No. 1 (A) black
72119A No. 1 (A) gray
BT 72521 No. 2 keystem
BU 72521 No. 1 keystem
BV 1-72125 No. 2 specify tab, use 72592 screws
BW 1-72117 No. 11
BX 72521 No. 1 keystem
BY 1-72213 No. 5 } Complete
black } assembled key-
1-72213A No. 5 } board, see plate 1
gray } for other styles
BZ 71567
CB 72521 No. 2 keystem
CC 72521 No. 2 keystem
CD 9052½
CE 702501 No. 1 *7/11/35*
CF 200825
CG 72324 bushing
CH 79511 screw
CI 72501½ screw
CJ 1-72714A No. 33 narrow }
base } Bal.
1-72714 No. 17 wide }
base }
CK 1-72714 No. 15 reg. total
CL 72714A No. 42 tab
CM 1-72714 No. 17 connected to Cr. Bal. lever
CM1 1-72714 No. 44 } Connected to
1-702714A No. 44 } add CF lever
CN 1-72714 No. 28 } Connected to bal.
1-702714 No. 28 } key lever to oper-
ate tab mech.
CO 1-72714 No. 29 connected to reg. total lever to operate tab mech.
CP 71366 bushing
75631 screw
CQ 72324 bushing, 79511 screw
CR 72572 No. 1 screw
CS 72578 screw
CT 72293½
CU 72324 bushing, 72656 screw
CU1 72649 (707505)
CV 1-72714A No. 12
1-72714 No. 12 early
CW 72714 No. 30 (702714 No. 30) } Use 72572
No. 1 screw
CX 72351 use 75616 screw
CY 1-72714 No. 21
CZ 72714 No. 1
DA 72714 No. 35 } Use 72572 No. 1
702714 No. 23 } screw
DB 72110 No. 1
DC 72110 No. 2
DD 72110 No. 3
DE 72110 No. 5
DF 72110 No. 6
DG 9052½
DH 72324
DI 72339 (71366)
DJ 72572 No. 1
DK 75631
DL 72578
DM 72588 }
(12356½) } Screws and shoulder
nuts used for wire
connections
DN 72617
DO 79503
DP 79511

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 73 —SERIES M 800 MACHINES (Plate 8-2)

(Plate 8-1 in Instruction Book only)

SYMBOLS (Plate 8-2)

A	205801
B	1-702188 1/2
C	72296 1/4 A
	8381 spring
D	1-702188 1/4
	72809 spring
E	1-701143 included in shaft assembly 61A-701004 No. 1, for machines without four position printing or repeat of items 11-701143 included in shaft assembly 71B-701004 No. 1, for machines with four position printing and repeat of items
F	11A-72170A No. 9
G	75638 screw
H	702291 1/4 No. 4
I	1A-702171 No. 17 sub-total index position
J	31D-72171 No. 1 add crossfooter posi- tion
K	1A-702171 No. 16 balance position
L	51B-72171 No. 1 minus balance posi- tion
M	1A-702171 No. 15 register total posi- tion
N	11-72171 No. 7 non-add position
O	702700 No. 10
P	1-72714A No. 1
Q	702714 No. 30
R	72666 No. 2
S	75617
T	72005
U	21-702192 1/2
V	79505 screws
W	72803
X	74813
Y	8381
	72188A No. 2
	73829 spring
Z	1-702190 1/2 No. 2
AA	1-702189 No. 4
AB	72665 No. 2
AC	72004
AD	702002A shaft only 51A-702002A No. 2 complete result latch, includes A, B, C, D, Y, Z, AA, AD



SYMBOLS (Plate 8-3)

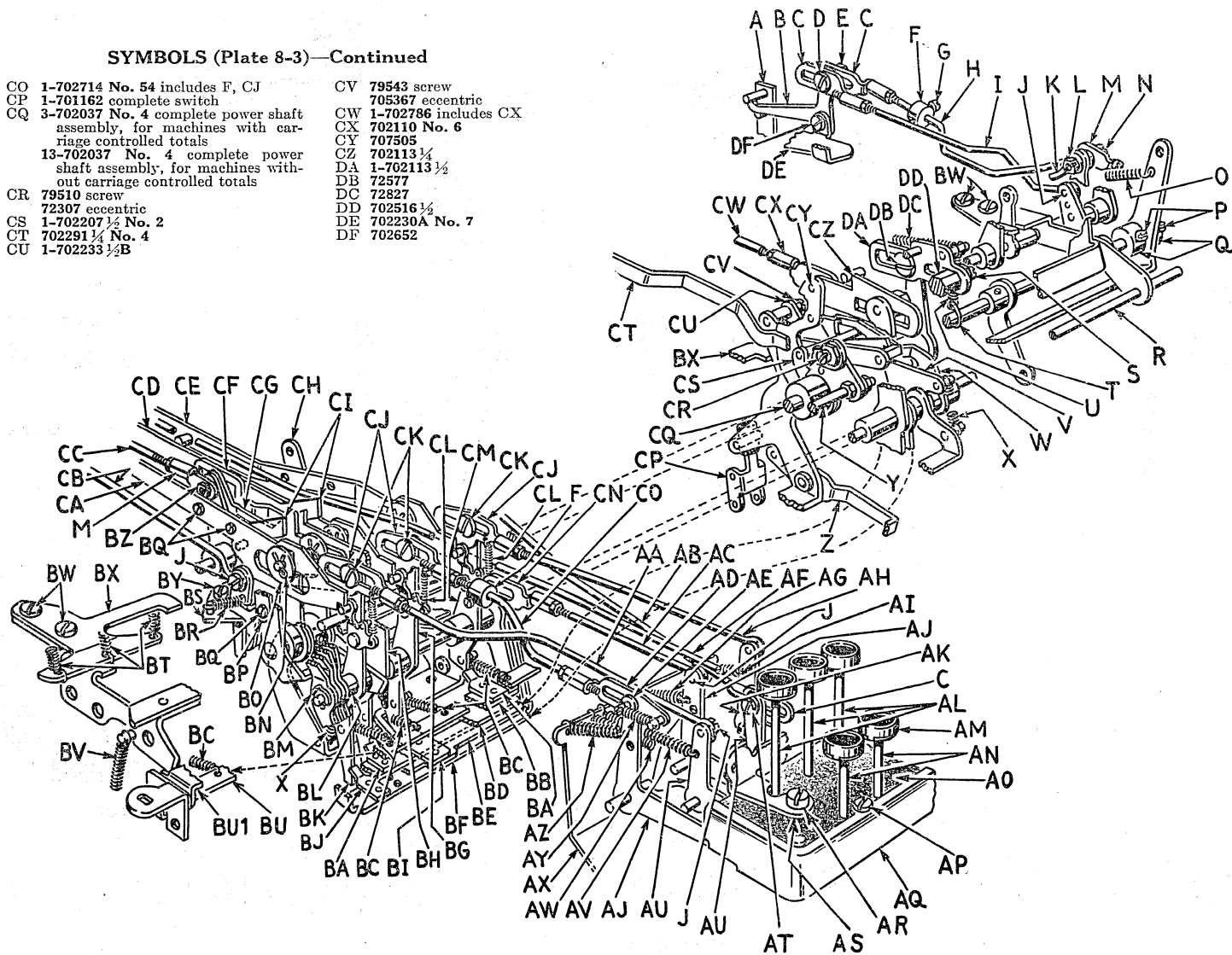
A	1-71903A No. 2	AJ	1-72143 No. 4 minus balance and balance position	BK	11-702202
B	702111 No. 2	AK	1-72143 No. 3 sub-total index position	BL	203423 No. 2
C	72110 No. 1 turnbuckle	AL	72521 No. 2	BM	21 No. 9
	49 3/4 nut	AM	72200A No. 1 ring	BN	21 No. 15
D	70507		72199 No. 1 cup	BO	702221 1/4
E	71366		72992 No. 1 glass	BP	702208 1/2
F	1-72315 No. 1 includes G		72210 disk	BQ	545 Fte. 217
G	72573		92 No. 1 Specify Character and Color, keypaper	BR	7282 1/2
H	1-702783 includes C, F, G	AN	72521 No. 1	BS	1-702253 No. 3
I	1-702714 No. 57 includes C	AO	1-72213A No. 5 complete keyboard	BT	44805
J	72572 No. 1 screw	AP	74587	BU	1-702206 1/2
K	1-702785 wire	AQ	702213 1/4 A No. 3		952 3/4 screw
L	72324 nut	AR	71517	BU1	702206 3/4
M	72110 No. 5 turnbuckle	AS	1B-72123 1/2 No. 2 bracket only 2B-72123 1/2 No. 2 complete tabulating arm assembly	BV	3284 1/2
	1-702735 No. 2 complete wire	AT	75631 screw	BW	73611
N	508 Fte. 141 screw	AU	71366 nut	BX	702123 1/2 No. 2
O	99802 No. 2	AV	1-72143 No. 1 add crossfooter and register total position	BY	702656
P	75618	AW	7780 No. 3	BZ	702610 screw, for machines with car- riage controlled totals
Q	1-75332 includes P	AX	705829		702659 screw, for machines without carriage controlled totals
R	702037 1/2	AY	72287	CA	1A-702171 No. 15 register total posi- tion
S	72367 eccentric	AZ	71803	CB	702714 No. 30 non-add position
T	709636 screw	BA	681 1/2	CC	1-72714A No. 1 includes M, minus balance position
U	20 No. 73A anchor	BB	702201 1/4 No. 2	CD	1A-702171 No. 16 balance position
V	983 spring	BC	545 Fte. 217 screws	CE	1A-702171 No. 17 sub-total index position
W	1-702204 1/2 No. 2	BD	1-702201 1/2 No. 1 includes BA	CF	702288 1/2
X	1-702202 3/4	BE	3489 3/4	CG	702288 3/4
Y	681 1/2 spring	BF	11-702201 1/2 No. 2 includes BA	CH	702289 1/4 No. 4
	702623 post	BG	1-702201 1/2 No. 5 includes BI	CI	702227 1/4 A
Z	46 3/4 nut	BH	1-702201 1/2 No. 4 includes BJ	CJ	702110 No. 8
AA	1-702203 1/2 No. 2	BI	1-702202	CK	709628
AB	1-702714 No. 55 includes CJ		21-702202	CL	77882
AC	1-702714 No. 59 includes C	BJ	702201 3/4 No. 3	CM	1-702202 No. 2
AD	1-702724 No. 2 includes CN		74533 screws	CN	72110 No. 1 turnbuckle
AE	1-702110 No. 5		702201 3/4 No. 1		75637 screw
AF	74315		545 Fte. 217 screws		
AG	702700 No. 10 add crossfooter position				
AH	89811				
AI	1-702714 No. 56 includes CJ				
	72572 No. 1 screw				
	72834				

SEE EXPLANATION ON INSIDE OF FRONT COVER

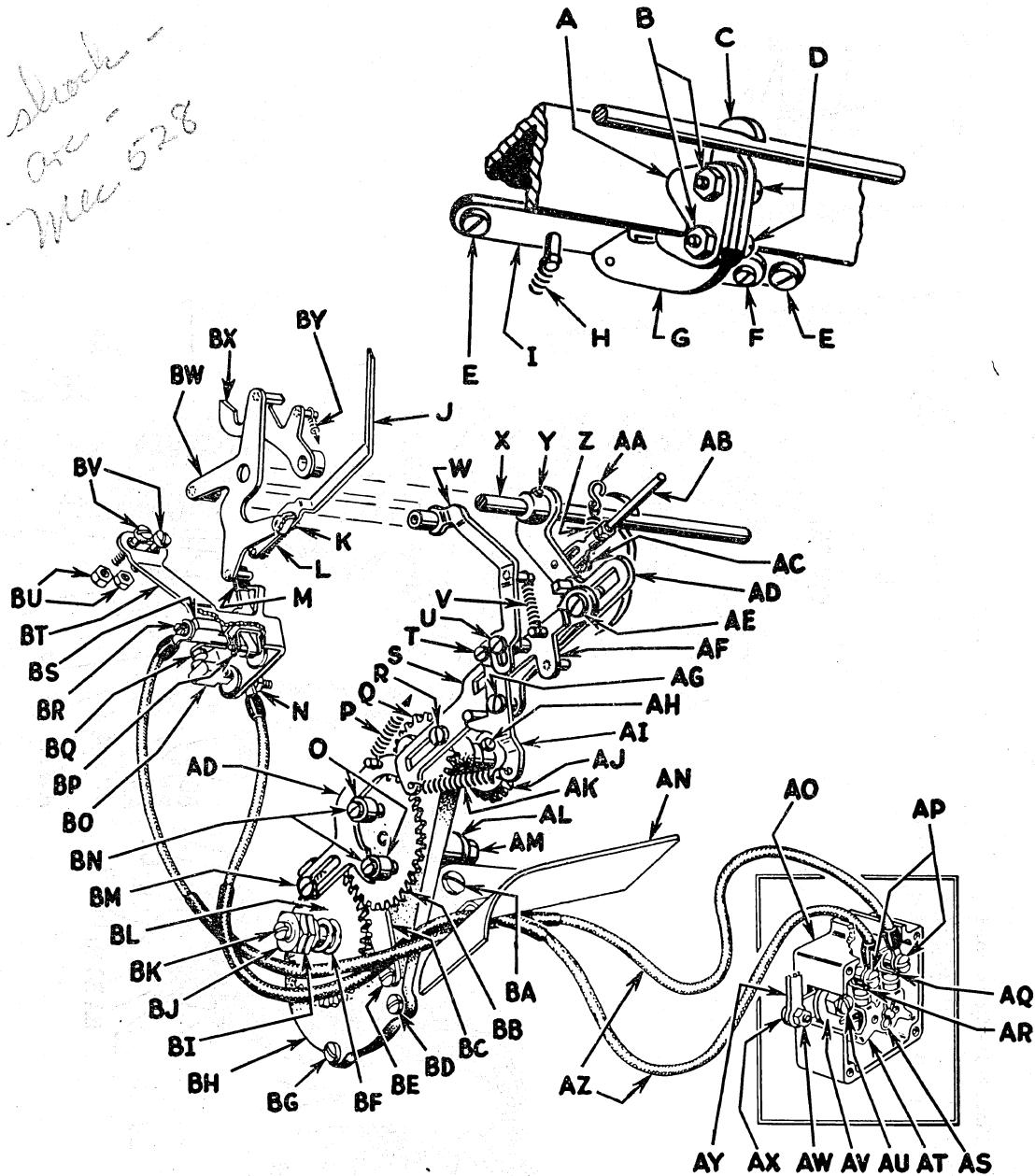
EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 73
—SERIES M 800 MACHINES (Plate 8-3)

SYMBOLS (Plate 8-3)—Continued

CO	1-702714 No. 54 includes F, CJ	CV	79543 screw
CP	1-701162 complete switch	CW	705367 eccentric
CQ	3-702037 No. 4 complete power shaft assembly, for machines with carriage controlled totals	CX	1-702786 includes CX
		CY	702110 No. 6
		CZ	707505
		DA	702113 1/4
		DB	1-702113 1/2
		DC	72577
CR	79510 screw	DD	72577
	72307 eccentric	DE	702516 1/2
CS	1-702207 1/2 No. 2	DF	702230A No. 7
CT	702291 1/4 No. 4		702652
CU	1-702233 1/2B		



EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 73
—SERIES M 800 MACHINES (Plate 8-4)



SYMBOLS (Plate 8-4)

A	702229 1/2
B	45 1/4 nuts
C	702228 1/2
D	75609 screws
E	72617
F	79510
G	702232 1/2
H	701802
I	1-702220 1/2
J	1-702203 1/2 No. 2
K	72514 No. 2 spring anchor screw
L	7781A spring
M	1-4524B
N	46 nut
O	7919 1/2 A washer
	701354 rolls

P	701802
Q	11-701009A gear and shaft
R	8863
S	1-701225 1/2 No. 2
T	76567 screw
	75342 eccentric
U	79600
V	71803
W	1-702233 1/2 B
X	3-702037 No. 4 shaft assembly, for machines with carriage controlled totals
	13-702037 No. 4 shaft assembly, for machines without carriage controlled totals
Y	66 3/4 pin

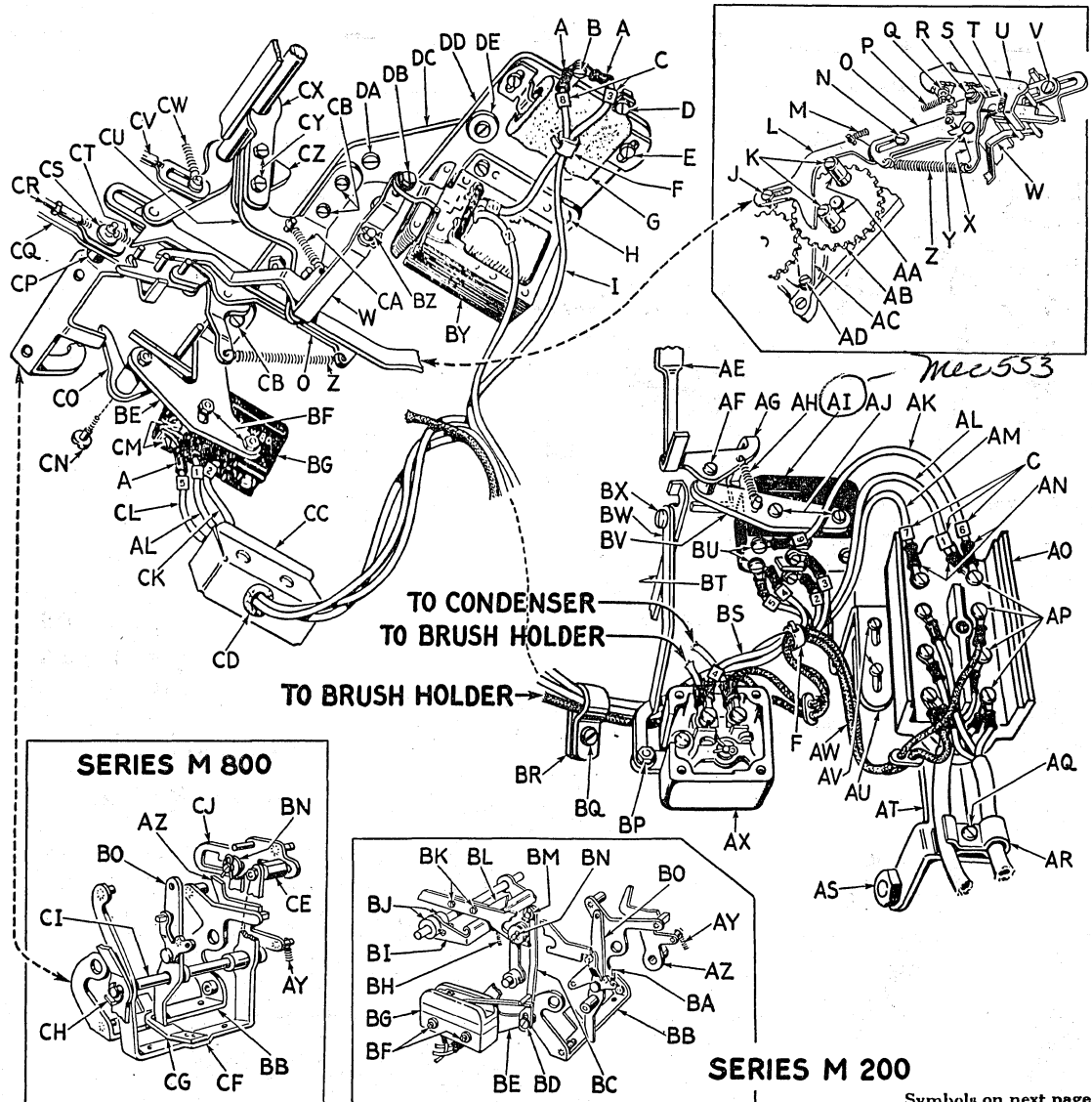
SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 8-4)—Continued

Z	3281 1/2	AO	11-71907 assembled switch box, includes AP, AQ, AR, AS, AT, AU, AV	BE	73611
AA	20 No. 86A	AP	4252 screws	BF	701804 spring
AB	1-702782		1097 1/8 washers	BG	76555
AC	74315 spring anchor screw	AQ	1A-12021 1/2 AL switch point	BH	1A-701665B No. 1
AD	1A-701225 No. 2	AR	1A-12021 1/2 AR switch point	BI	701397 shoulder nut
AE	701571	AS	21 No. 15 clip	BJ	71515 locking nut
AF	1-701232 1/2 A	AT	1A-3842B	BK	71617A screw
AG	72523 1/2	AU	7356 1/2 screw	BL	71112 gear
AH	550 3/4 set screw	AV	1B-71178 includes AS, AT, AV	BM	3259 1/2 A
AI	1-701239	AW	46 nut	BN	703594 screws
AJ	Use 1Z-71901A for machines before Serial No. M5725D (M 200) and M5789D (M 800)	AX	94523 screw	BO	1-701556
	71901A for machines after Serial No. M5725D (M 200) and M5789D (M 800)	AY	71177A	BP	21 No. 17 clip
	550 3/4 set screw	AZ	1-701700 No. 2	BQ	1Z-701164 includes M
AK	701809	BA	71616A	BR	4553 1/2 screw
AL	74335 collar	BB	1-701017 No. 2 includes O, BN		7919 1/2 A washer
AM	47 nut	BC	Use 701229B bracket	BS	4556 1/2 No. 5 post
AN	71182A		259 1/2 screw	BT	1-701162 assembled switch, includes N, BO, BP, BQ, BR, BS
			46 nut	BU	46 nuts
		BD	7357 1/2	BV	72584 screws
				BW	Included in X
				BX	1-702204 1/2 No. 2
				BY	681 1/2 spring

SOLENOID CONTROLLED RESULTS WITH CARRIAGE AND REGISTER RETURN SWITCH, SERIES M 200 AND M 800 (Plate 8-4A)

Note:—This construction began in Series M 200 with Serial No. M6412D and M 800 with Serial No. M6379D

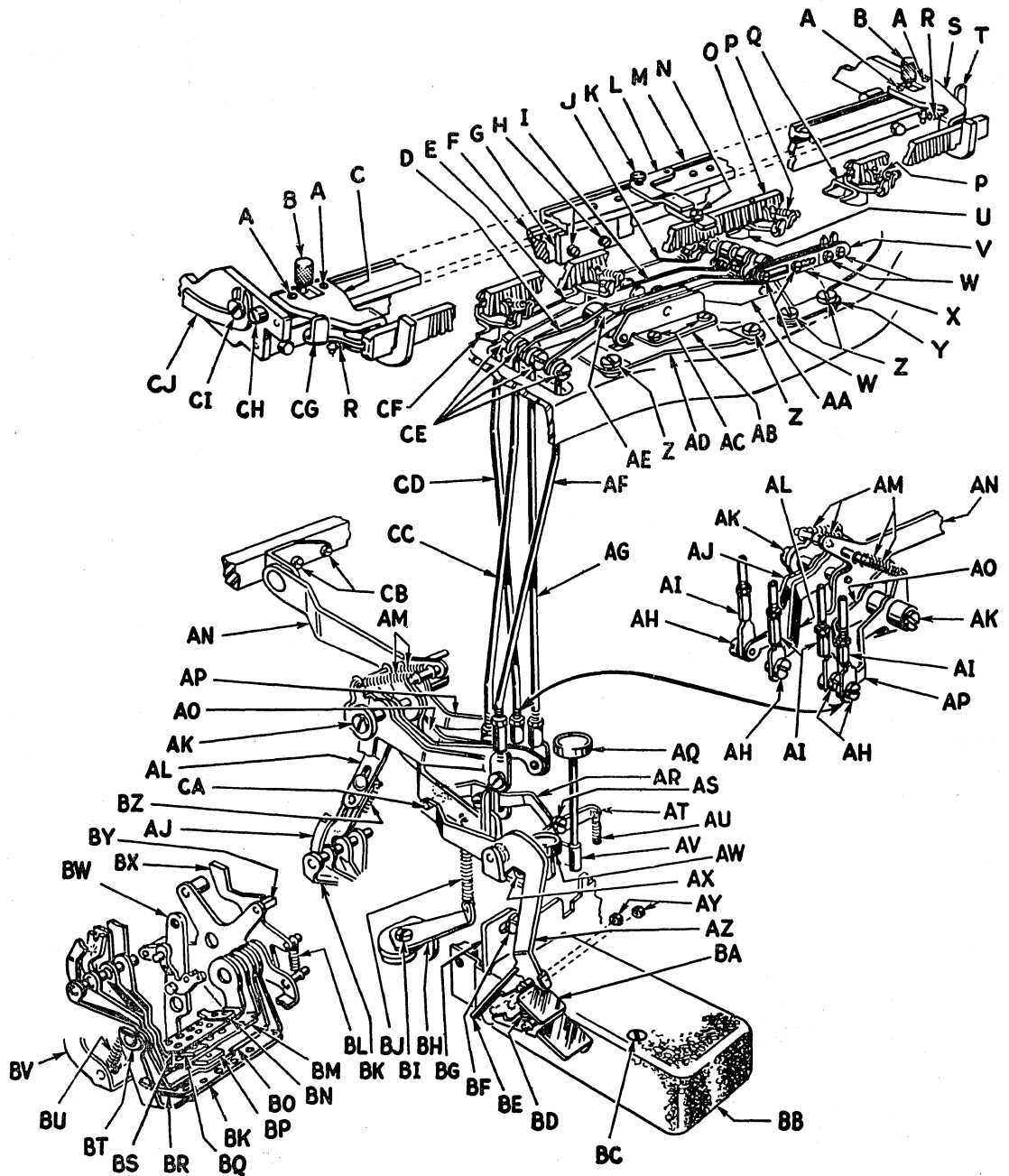


Symbols on next page

SYMBOLS (Plate 8-4A)

A	24A No. 9 terminal	BC	1-700146
B	75615 screw for connecting one or two wires to resistor	BD	10761 1/4 screw
C	49 1/4 nut		46 nut
	X93-5 label No. 1	BE	700144
	X93-6 label No. 2	BF	4450 3/4 A screw
	X93-7 label No. 3		3826 1/2 washer
	X93-8 label No. 4		46 1/4 nut
	X93-9 label No. 5	BG	X83-10 switch
	X93-10 label No. 6		200801 spring under arm
	X93-11 label No. 7	BH	44805
	X93-12 label No. 8	BI	1-700145
D	74534 screw	BJ	1-75332 collar, includes
	49 1/4 nut		75618 set screw
	74309 space collar	BK	9050 1/2
E	952 3/4 for one resistor	BL	702227 1/4 A
	1511 Ftc. 209 for two resistors	BM	21 No. 8 clip
	94529 for three resistors	BN	702221 1/4 washer
	702601 for four resistors		21 No. 15 clip
	74309 space collar, between resistors	BO	1A-702202 for register total, final product
F	X74-1		and first product position
G	X92-9 200 ohms resistance, for 105 to 125 volt DC		11A-702202 for add register clear multiplier
	1X92-6 350 ohms resistance, for 140 to 160 volt		position
	AC or DC		1A-702202 for balance and minus balance positions
	X92-10 300 ohms resistance, for 210 to 230 volt		11A-702202 for register total position
	AC or DC		1A-702202 No. 2 for subtotal position
	1X92-1 465 ohms resistance, for 140 to 160 volt		21-702202 for blank machine operation position
	AC or DC		
	1X92-14 1300 ohms resistance, for 210 to 230 volt		
	AC or DC		
H	952 3/4 screws	BP	94523 screw
	1097 3/4 lock washers		46 nut
I	1-700906 No. 3 wire, includes terminals	BQ	2855 3/4
	24A No. 6 terminals	BR	93 1/2 No. 6
	24A No. 9 terminals	BS	1-700906 No. 4 wire, includes terminals
J	9259 3/4 screw		24A No. 6 terminals
	46 nut	BT	1-71175
K	703594 screws	BU	9055 3/4 screws
L	1A-701225 No. 2		1097 1/4 washer
M	701802	BV	1-701273
N	8863	BW	71177A
O	1-701225 1/2 No. 2	BX	94523
P	205801	BY	X73-1 solenoid, for 50 to 60 cycles
Q	700562 spring anchor screw	BZ	700563 post
R	79510 other screw in bracket U		21 No. 8 clip
	76567 hexagon screw		47 nut
	75342 eccentric	CA	3284 1/2
S	1-701232 1/2 B	CB	79510
T	404809	CC	1-700144 1/2 includes CD
U	1-700142	CD	700907
V	701571	CE	702516 1/2 hexagon post
W	700143		49 1/2 nut
X	1-701239		72367 eccentric
Y	72523 1/2	CF	1-702201 1/2 No. 5 includes CG
Z	701809	CG	702201 1/2 No. 3
AA	701354 rollers		74533 screws
AB	1-701017 No. 2 includes K, AA	CH	21 No. 9 clip
AC	701229B	CI	702037 1/2
AD	73611	CJ	1-702113 1/4 A
AE	1-701173A No. 3	CK	1-700906 No. 2 wire, includes terminals
AF	201562 screw		24A No. 6 terminals
	46 nut		24A No. 9 terminals
AG	1-701274	CL	1-700906 No. 5 wire, includes terminals
AH	10784		24A No. 6 terminals
AI	X83-9		24A No. 9 terminals
AJ	4450 3/4 A screws	CM	73548
AK	1-700906 No. 6 wire, includes terminals	CN	700561 screw
	24A No. 6 terminals		46 nut
AL	1-700906 No. 1 wire, includes terminals	CO	1-700141
	24A No. 6 terminals	CP	702517 1/2 hexagon post
	24A No. 9 terminals	CQ	1-702203 1/2 No. 2
AM	Wire, included in solenoid	CR	1-702784
	Label and terminal not included	CS	704513 spring screw stud
AN	24A No. 6 terminals	CT	7781A spring
AO	11-70903	CU	1-702232 1/4 A
AP	4252 screws	CV	1-702782
	2820 1/2 washers	CW	3281 1/2
AQ	709621	CX	702228 1/2
AR	3611 3/4 2 req.	CY	12054 3/4 screws
AS	4647 2 req.		45 1/4 nuts
AT	701275	CZ	702229 1/2
AU	701272	DA	72617 2 req.
AV	952 3/4	DB	9753 1/4 screw
AW	1A-71705		1097 3/4 washer
AX	11-71907		46 1/4 nut
AY	681 1/2	DC	702220 1/4 A anchor plate only
AZ	1-702204 1/2 for M 200		1-702220 1/4 A anchor plate assembly, includes DD, DE
	1-702204 1/2 No. 2 for M 800	DD	702220 1/4
BA	77882	DE	79505 screw
BB	Included in shaft assembly		702390 bushing
	42A-702037A No. 1 with cge. controlled totals		88903 grommet
	52A-702037A No. 1 without cge. controlled totals		
	3A-702037 No. 4 with cge. controlled totals		
	13A-702037 No. 4 without cge. controlled totals		

CROSSFOOTER AND REGISTER TOTALS AND SUB-TOTALS, AND BLANK MACHINE OPERATION INDEXING MECHANISM, CARRIAGE CONTROLLED—SERIES M 800 MACHINES (Plate 8-5)



SYMBOLS (Plate 8-5)

A 703589
 B 703583 No. 4
 C 1-703157AL includes CG
 D 1-705203 1/2 includes I
 E 707800 spring
 F Use 2-703216A No. 7 for balance and minus balance, line 11 control
 G 703967 No. 8 Style 22, for 12", 18", 22" carriages
 H 703967 No. 8 Style 30, for 30" carriages
 I 703195 1/4
 J 73548
 K Included in D
 L Included in AD

M 703508 screw for brace in center position
 N 74587 screw for brace in either right or left position
 O 703502 1/4 guide screw in center position without brace
 P 1-703183A
 Q 1-73966 No. 3 Style 12
 R 1-703966A No. 4 Style 18, 22, 30
 S 79552 screw
 T 703966 1/4A Style 12, 18, 22, 30 control bar only
 U IZ-703966 1/4A Style 12, 18, 22, 30 complete assembled control bar, specify machine style and number

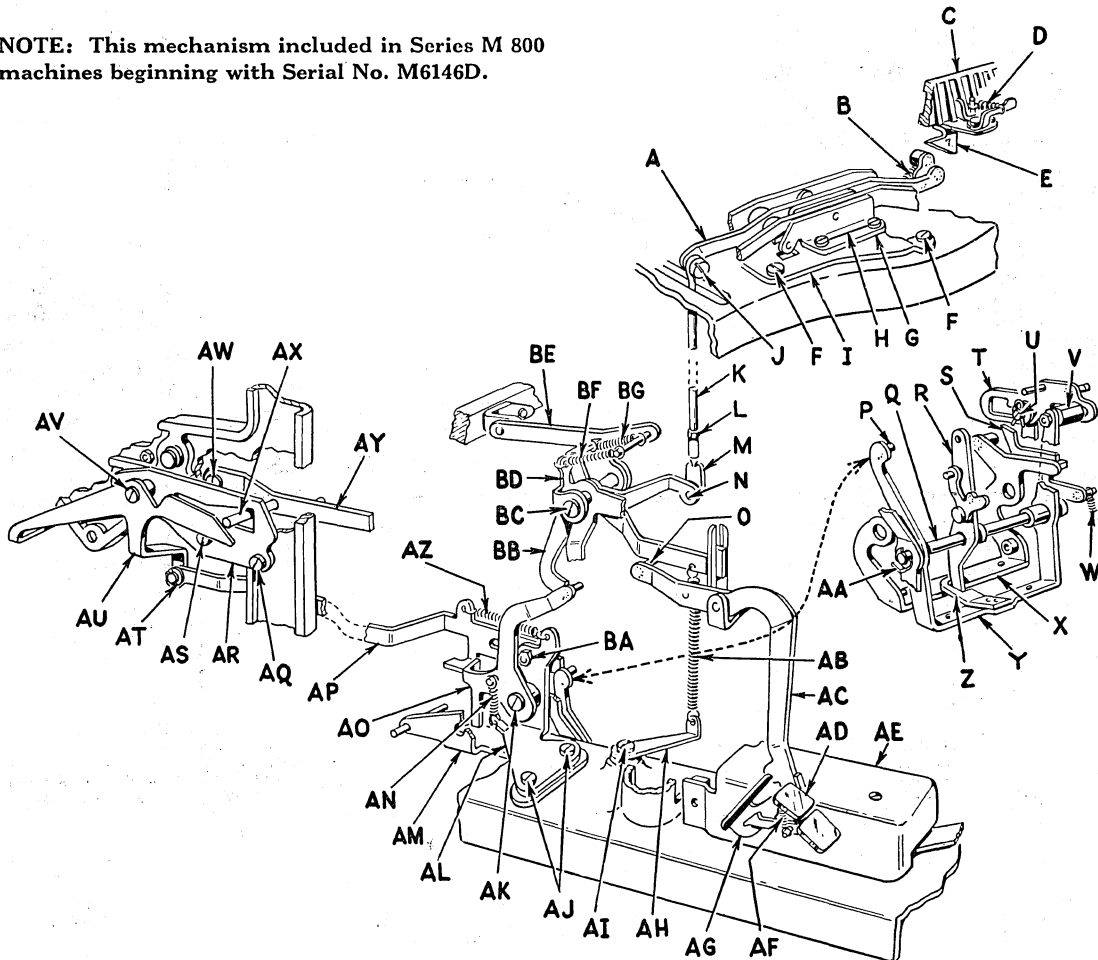
V 703809
 W Use 2-703216A No. 10 for register sub-total, lines 7 and 13 control
 X Use 2-703216A No. 11 for sub-balance and sub-minus balance, lines 7 and 11 control
 Y 74803 spring
 Z 1-703157AR includes T
 AA Included in S
 AB Use 2-703216A No. 8 for blank machine operation, line 9 control
 AC 705195 1/2 No. 2
 AD 74533 screw, used before machine Serial No. M4594D (M200) and M4085D (M800)

SYMBOLS (Plate 8-5)—Continued

75621 screw	used on machines	AN 1-705215 1/2	balance position, includes BP
49 1/4 nut	after Serial No.	AO 1-705212 1/2 No. 2	BP 702201 1/2 No. 3
705195 1/4 limit, for	M4594D (M200)	AP 1-705212 1/2 No. 1	545 Fte. 217 screws
rolls on control	and M4685D	AQ 72200A No. 1 ring	BQ 702201 1/2 No. 2
arms D, I, J, AA	(M800)	72199 No. 1 cup	545 Fte. 217 screws
X 705195 1/2 No. 1		72992 No. 1 glass	BR 702201 1/2 No. 1
Y 705195 1/2		72210 disk	545 Fte. 217 screws
Z 73611		92 No. 1 Specify Character and	BS 1-702201 1/2 No. 1 sub-total index
AA Included in AB		Color, keypaper	position, includes BN
AB 1-705202 1/2 includes AA		AR 705214 1/2	BT 21 No. 9 clip
707800 spring		AS 75630	BU 681 1/2 spring
AC 545 Fte. 217		AT 1A-705184 No. 2 includes AW	BV Included in complete shaft assembly,
AD 1-705205 1/2 includes J		AU 79804	3-702037 No. 4 for machines with
707800 spring		AV 1B-705110 No. 3 includes AQ	carriage controlled totals
AE 705502 1/2		AW 72200A No. 1 ring	13-702037 No. 4 for machines without
AF Use 1-705707 No. 2 for register total		72992 No. 1 glass	carriage controlled totals
position, includes AI		92 No. 1 Specify Character and	BW 11-702202 register total position
AG 1-705707 balance position, includes AI		Color, keypaper	21-702202 blank machine operation
AH 75638		AX 950 5/8 screw	position
AI 72110 No. 5 turnbuckle		AY 46 nuts	1-702202 balance and minus balance
AJ Use 705211 1/4A No. 5		AZ 1-705219 1/2 includes BA, CA	position
1-705211 1/4A No. 4		BA Included in AZ	1-702202 No. 2 sub-total index posi-
705812		BB 702665 1/2 BL No. 1	tion
1-705707 No. 2		BC 9355	BX 1-702204 1/2 No. 2
1-705708 No. 3		BD 12083 spring	BY Included in BV
1-702284 1/4A		BE 1-702209 1/2	BZ 16880
1-702787A		BF 75633 screw	CA Included in AZ
1-701136		BG 1A-705214 No. 6	CB 79543
AK 72501 1/4		BH 20 No. 99	CC 1-705709 blank machine operation
AL Use 1-705211 1/4A No. 4		BI 8451	position, includes AI
705211 1/4A No. 5		BJ 10280 1/2	CD 1-705706 sub-total index position,
1-705707 No. 2		BK 1-702201 1/2 No. 4 register total posi-	includes AI
1-705708 No. 3		tion, includes BR	CE 72572 No. 1 screws
705812		BL 83800A	CF Use 2-703216A No. 6 for register total,
1-702284 1/4A		BM 11-702201 1/2 No. 2 blank machine	line 13 control
1-702787A		operation position, includes BQ	CG Included in C
1-701136		BN 702201 1/2 No. 2	CH 73561
AM 480 1/4		545 Fte. 217 screws	CI 73566
		BO 1-702201 1/2 No. 5 balance and minus	CJ 703224 No. 2

CROSSFOOTER TOTALS INDEXING MECHANISM, WITH INDEXING SLIDE, CARRIAGE CONTROLLED, SERIES M 800 (Plate 8-5A)

NOTE: This mechanism included in Series M 800 machines beginning with Serial No. M6146D.



SEE EXPLANATION ON INSIDE OF FRONT COVER

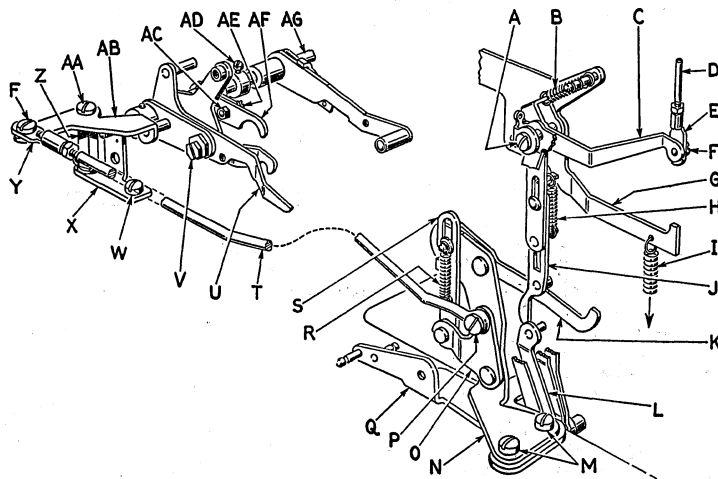
SYMBOLS (Plate 8-5A)

A	1-705203 1/2	1097 3/8 lock washer	AJ	79505
B	707800	49 1/8 nut	AK	9253 1/8 screw
C	703966 1/2 A Style 12, 18, 22, 30 control bar only	702221 3/4 retaining washer		46 1/2 nut
	12-703966 1/2 A Style 12, 18, 22, 30 complete assembled control bar, specify machine style and number	21 No. 15 clip	AL	702284 1/2 B
D	703809	V 702516 1/2 hexagon post	AM	1-702128 1/2 No. 2
E	2-703216A No. 7 balance and minus balance, line 11 control, includes D	49 1/8 nut	AN	2887 1/2
F	73611	72367 eccentric	AO	1-700132
G	1-705202 1/2	709636 screw	AP	700133
H	545 Fte. 217	W 681 1/4 spring	AQ	72617 screw, 2 req.
I	1-705205 1/2	X Included in complete assembly,	AR	1-700128 No. 2
J	72572 No. 1	3-702037 No. 4, for machines with carriage controlled totals	AS	71538
K	11-705708 No. 3 includes L, M	Y 1-702201 1/2 No. 5 includes P, Z	AT	21 No. 20 clip
L	49 3/4	Z 702201 3/4 No. 3	AU	1-700134
M	702110 No. 6	AA 21 No. 9 clip	AV	700517
N	75638 screw	AB 10280 1/2	AW	3259 1/4 A
O	Included in AC	AC 1-705219 1/2 includes O, AD	AX	Included in AY
P	Included in Y	AD Included in AC	AY	1-71135 No. 3 includes AX
Q	702037 1/2	AE 702665 1/2 BL No. 1 with carriage controlled totals	AZ	3281 1/2
R	1-702202	AF 12083 spring	BA	505 Fte. 141 screw
S	1-702204 1/2 No. 2	AG 1-702209 1/2		49 1/8 nut
T	1-702113 1/2 A	46 nuts	BB	705211 1/2 B No. 4
U	702634 screw stud	AH 20 No. 99	BC	72501 1/2
		AI 8451 screw	BD	705211 1/2 A No. 5
			BE	1-705215 1/2
			BF	480 1/4
			BG	76812

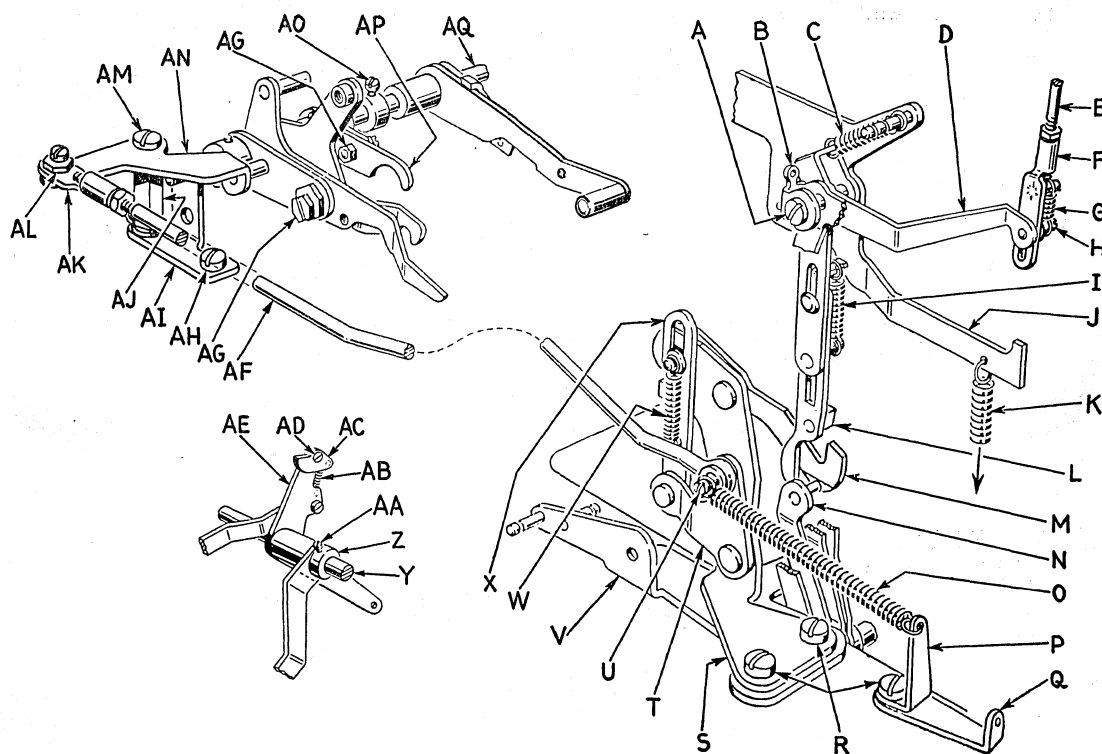
MINUS BALANCE OPERATION INDEXING MECHANISM, CARRIAGE CONTROLLED, DISABLING MECHANISM—SERIES M 800 MACHINES (Plate 8-6)

SYMBOLS (Plate 8-6)

A	72501 1/4	AD	AE	AF	AG
B	480 1/4				
C	Use 1-705211 1/2 A No. 4				
	705211 1/2 A No. 5				
	1-705707 No. 2				
	1-705708 No. 3				
	705812				
	1-702284 1/2 A				
	1-702787A				
	1-701136				
D	1-705707 includes E				
E	72110 No. 5				
F	75638 screw				
G	1-705215 1/2				
H	16880				
I	10280 1/2				
J	Included in C				
K	Included in N				
L	1-702201 1/2 No. 5				
M	60550				
N	Use 1-702284 1/2 A				
	1-702787A				
	1-705707 No. 2				
	1-705708 No. 3				
	705812				
	1-701136				
	1-705211 1/2 A No. 4				
	705211 1/2 A No. 5				
O	Included in N				
P	72501 1/4				
Q	1-702128 1/2 No. 2				
R	44805				
S	Included in N				
T	Use 1-702787A				
	1-702284 1/2 A				
	705812				
	1-705707 No. 2				
	1-705708 No. 3				
	1-705211 1/2 A No. 4				
	705211 1/2 A No. 5				
	1-701136				
		U	1-72247		
		V	76567 screw		
			72307 eccentric		
			46 nut		
		W	72567		
		X	72148 No. 3		
		Y	72110 No. 3		
		Z	702583 1/2		
		AA	9052 1/2		
				AB	1-702283 1/2
				AC	46
				AD	550 3/4
				AE	76567 screw
					72307 eccentric
				AF	72182 No. 3
				AG	1-702001 No. 2 shaft assembly, includes U, V, AC, AD, AE, AF



MINUS BALANCE OPERATION INDEXING MECHANISM, CARRIAGE
CONTROLLED, DISABLING MECHANISM—IMPROVED—SERIES M 800
MACHINES (Plate 8-7)



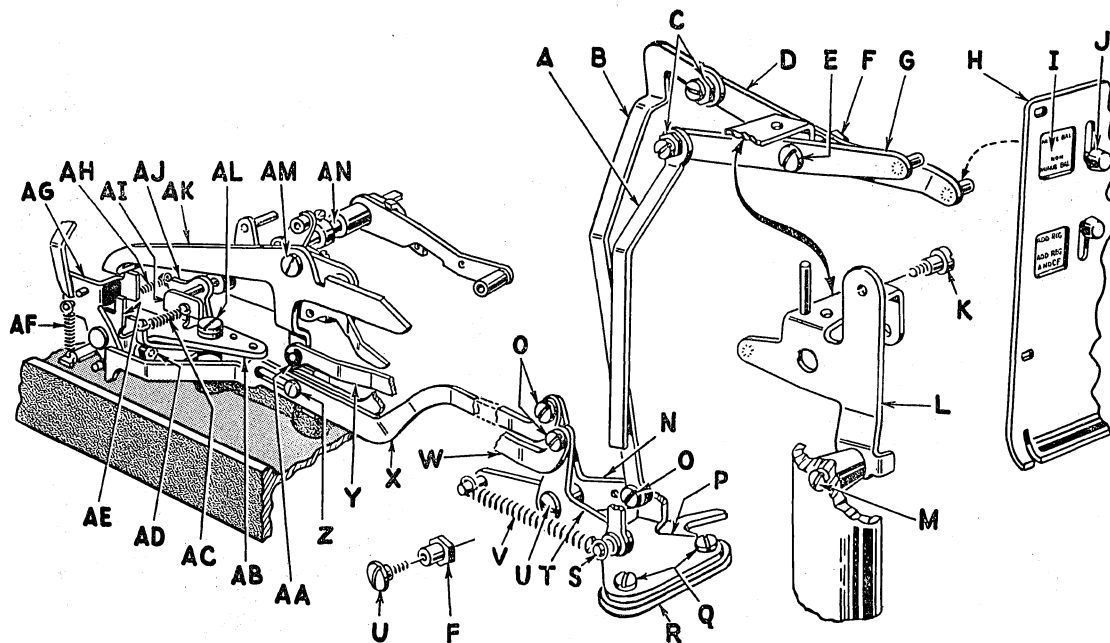
SYMBOLS (Plate 8-7)

A 72501 1/4
B 705211 1/2 A No. 5
C 3882
D 1-705211 1/2 A No. 4 includes L
E 1-705708 No. 3 includes F
F 1-705209 1/2
G 705812
H 74315 spring screw stud
I 83806B
J 1-705215 1/2
K 10280 1/2
L Included in D
M Included in S
N 1-702201 1/2 No. 5
O 75804 No. 1
P 20 No. 152
Q 20 No. 99
R 79505
S 1-702284 1/2 A includes M, T, X
T Included in S
U 74575 spring screw stud
V 1-702128 1/2 No. 2
W 44805 spring
X Included in S

Y 71C-701004 No. 1 complete shaft, includes Z, AA, AC, AD, AE
Z 1-71330 collar, includes AA
AA 705503 1/2 set screw
AB 71803 spring
AC 1-701136
AD 71542 screw
AE 31-701332 includes AC, AD
AF 1-702787A includes AK
AG 76567 screw
72307 eccentric
46 nut
AH 72567
AI 72148 No. 3
AJ 702583 1/2 post
AK 72110 No. 6
AL 705367 eccentric
79543 screw
AM 9052 1/2
AN 1-702283 1/2
AO 550 1/2
AP 72182 No. 3
AQ 1-702001 No. 2 complete shaft, includes AG, AO, AP

MINUS BALANCE OPERATION, CARRIAGE CONTROLLED, DISABLING MECHANISM WITH MANUAL CONTROL ON FRONT PANEL, SERIES M 800 (Plate 8-8)

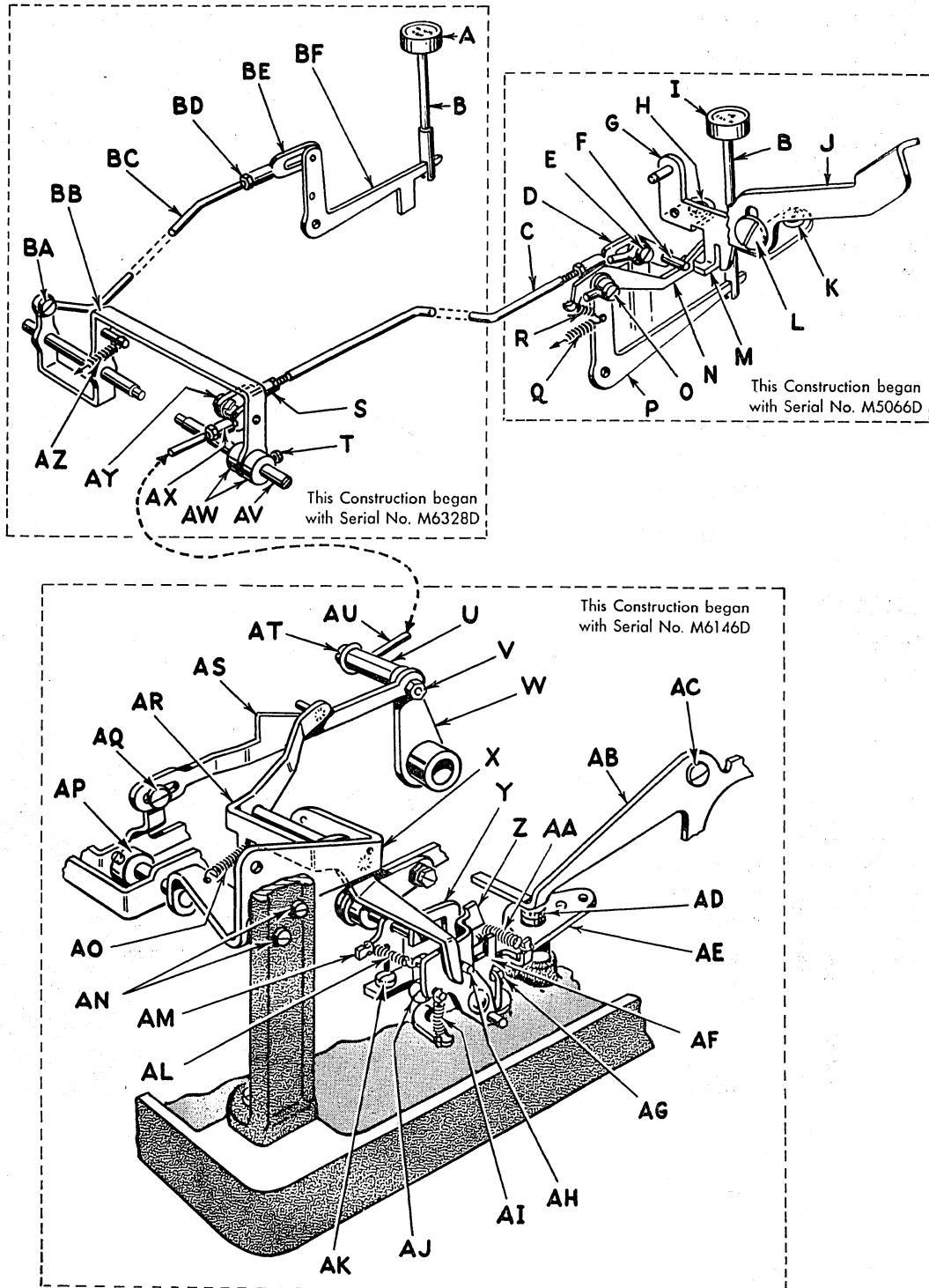
NOTE: This mechanism included in Series M 800 machines beginning with Serial No. M6146D.



SYMBOLS (Plate 8-8)

A	702201 No. 2	T	702200 No. 1
B	702200 1/4 No. 2	U	3960
C	72307 eccentric	V	984
D	73612 screw	W	702198 1/2
E	1-705121 1/2	X	700136
F	9259 3/4 screw	Y	700133
G	705369 nut	Z	72578 screw
H	1-705128 1/2		72318 space collar
I	42-705102A No. 9 panel, with controls for Auto. Tab. Pos. No. 51A, simultaneous addition Pos. No. 50A, Minus Bal. Pos. No. 50B 705920 No. 3 } Minus Bal Specify, } Non cardboard } Minus Bal 705915 clear plastic 705916A keytop	AA	21 No. 20 clip
J	79632	AB	1-700130
K	1-705120 1/4A	AC	705812
L	1511 Fte. 209	AD	46 nut
M	11-702200 No. 2	AE	700518 screw
N	79503	AF	1-700137 includes AG
O	702284 1/2B	AG	7480B
P	79505	AH	Included in AE
Q	1-702128 1/4 No. 2	AI	12083 spring
R	74315 spring screw stud	AJ	1-700129
S			72148 No. 9 bracket, use 72567 screws
		AK	1-700134
		AL	72569 screw
			201351 washer
			47 nut
		AM	700517
		AN	1-702001 No. 2 see Plate 27 for other styles

MINUS BALANCE OPERATION INDEXING SAFEGUARD WITH NON-SUBTRACT KEY DEPRESSED, SERIES M 800 (Plate 8-9)



SYMBOLS (Plate 8-9)

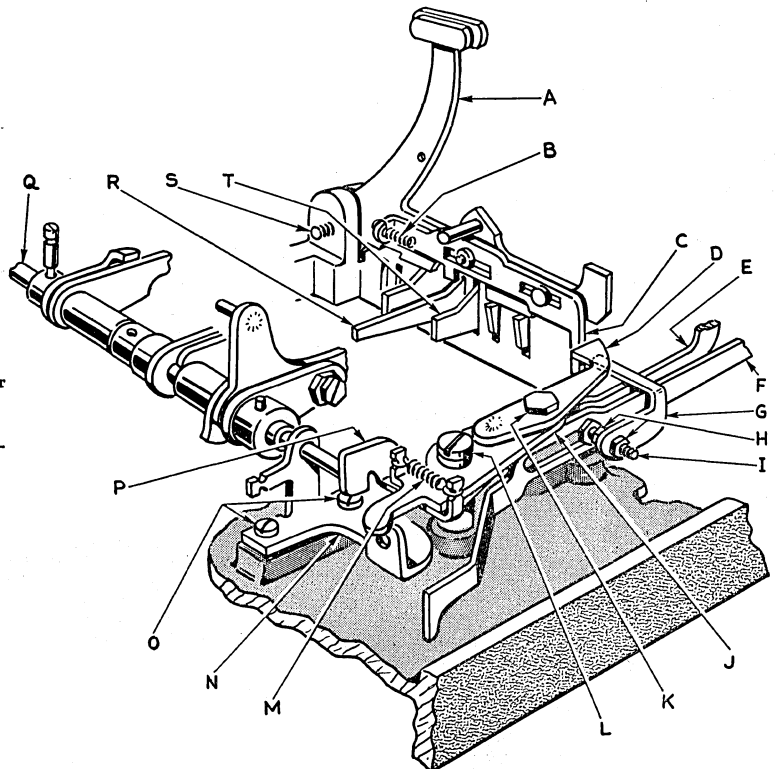
A	72200A No. 1 ring	P	1-72143 No. 4	AN	72614 screws
B	72199 No. 1 cup	Q	89811		9233 1/2 spacer
C	72992 No. 1 glass	R	7282 1/4		46 nut
D	72210 disk	S	72110 No. 3	AO	10686 1/2
E	92 No. 1 Specify Character and Color, keypaper	T	75618	AP	1-74308 No. 4 assembled collar
F	72521 No. 2	U	72659 hex. post		71519 set screw
G	1A-702714 No. 59 includes D, S	V	75346 nut		74560 screw post
H	1-72110 No. 8	W	1-71170	AQ	75638
I	75631 screw	X	1-700119A	AR	1-700131
J	71366 nut	Y	1-700129		21 No. 8 clip
K	Included in D	Z	Included in AF	AS	704240A
L	1-72123 1/2 A No. 2	AA	705812	AT	75631
M	71517 screw	AB	1-700134	AU	1-72712 No. 10 includes AX
N	72200A No. 1 ring	AC	700517	AV	71A-702003 No. 3 assembled shaft, includes T, AV, AW, BB
O	72199 No. 1 cup	AD	72569 screw	AW	1-75332 includes T
	72992 No. 1 glass		201351 washer	AX	72110 No. 3
	72210 disk	AE	47 nut	AY	21 No. 7 clips
	92 No. 1 Specify Character and Color, keypaper	AF	1-700130	AZ	75804 No. 3
J	1A-72124 1/2 A	AG	1-700137 includes Z, AH	BA	75631 screw
K	71567	AH	46 nut		72324 nut
L	72532 1/2	AI	Included in AF	BB	1-702298 3/4 A
M	Included in G	AJ	7480B	BC	1-702714 No. 41 includes BE
N	72143 1/2		700518 screw	BD	49 1/2 nut
O	75631 screw	AK	46 nut	BE	72110 No. 1
	702320 nut	AL	72567	BF	72243 No. 3
		AM	12083 spring		
			72148 No. 9		

MINUS BALANCE OPERATION—NON-TRANSFER AND TRANSFER CONTROL—
SERIES M 800 MACHINES (Plate 8-10)

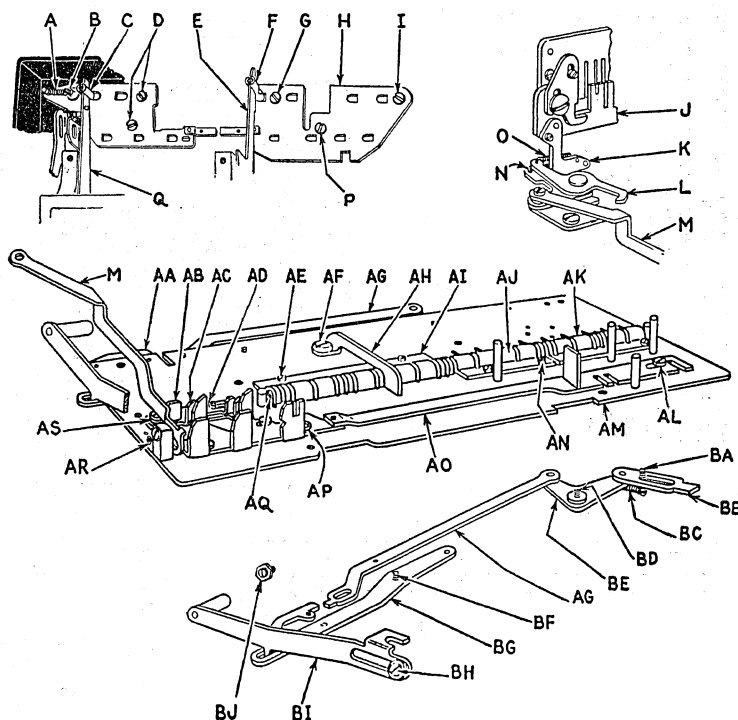
This construction began with machine Serial No. M6146D

SYMBOLS (Plate 8-10)

A	1-72163 No. 6 includes B, C
B	72820
C	Included in A
D	1-700135
E	702198 1/2
F	700136
G	700140
H	46 1/4
I	700560 screw
J	72318 spacer, for two slides
K	71223 (.050) spacers, for one slide
L	72318
M	1-700130
N	203510 1/4 A
O	72569 screw
P	201351 washer
Q	47 nut
R	705812
S	72148 No. 9 bracket
T	72567
	1-700129
	1-702001 No. 2 see Plate 27 for other styles
	1A-702171 No. 16 balance linkage
	72511 screw
	51B-72171 No. 1 minus balance linkage



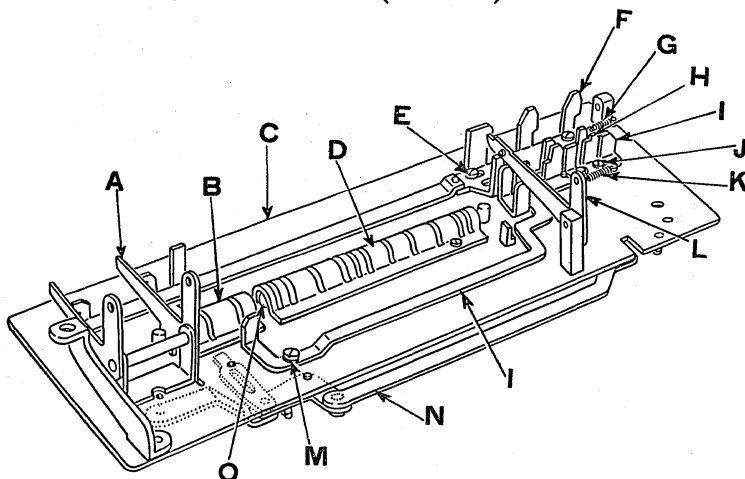
KEYBOARD PLATE AND INTERLOCKS, CLASSES 71, 72, 73, 74 (Plate 9)



SYMBOLS (Plate 9)

A	77802
B	72539 No. 2
C	72521 No. 1
D	72593
E	See Y, plate 2
F	72521 No. 3
G	72593
H	1A-72205 No. 1 Cl. 71, 72, 73, 74
	1A-72205 No. 2 not reg. subt., Cl. 76
	1A-72205 No. 4 with reg. subt., Cl. 76, 77, 78
	11-72205 No. 1 with auto. Cr. Bal. and power result keys, Cl. 78
	31-72205 No. 1 with CF subt., Cl. 78
I	72593
J	1-75214A see plate 20 for other styles
K	Use 1-705134 1/4 for black machines
L	1A-705134 1/4 gray
	72146 No. 2 use rivet 72543A, see P, plate 30, for complete assembly
M	72242
N	3688 spring
O	8381
P	72593
Q	1-72143 No. 1 ext.
AA	72130 1/4
AB	1-72118 No. 3
AC	1-72118A No. 2
AD	72820 spring
AE	72810 Cl. 74
AF	72592
AG	72542
	1-72130 (71361, 1-72130A, 74502) use 79503 screw on end, includes BB, BE
	11-72130 Cl. 74
AH	72147
AI	72116 No. 1
AJ	72116 No. 4
	72116 No. 2 Cl. 74
AK	72116 No. 3
AL	79552
	72591 Cl. 74
AM	Complete assembled lower keyboard plate, specify style and machine No.
	1B-72212 No. 1 (11-702212 No. 1)
	1-72212 No. 1 early
	1-72212 No. 2 Cl. 74
AN	72592, 3 req.
AO	11-702156A
	1-72118 No. 8 early
	1-72118 No. 1 Cl. 74
AP	71546, 3 req.
AQ	72906 ball bearing
AR	72820 spring
	72810 Cl. 74
AS	72576 No. 1 screw, 2 req.
	72591 Cl. 74
BA	72531
BB	72298 1/4 No. 2* included in AG
BC	76806
BD	73608 (72656) screw, 72139 washer
BE	72129* included in AG
BF	74529
BG	Use 1-702132 1/4
	12084 1/4 spring
BH	72582
BI	1-72144 use 79503 screw in back
BJ	71361 ecc., 74502 screw, used for AA

KEYBOARD PLATE AND INTERLOCKS, CLASS 76 (Plate 10)



SYMBOLS (Plate 10)

A	1A-72234 No. 1
B	72116 No. 2
C	Assembled lower keyboard plate, specify style and machine No.
	1A-72212 No. 3
	1-72212 No. 3 early } Without reg. subt.
	1A-72212 No. 6 } With reg. subt.
	1-72212 No. 6 early } subt.
D	72116 No. 1
E	71546
F	1-72118 No. 1
G	72810
H	72118 No. 4
I	1-72127 No. 5
	1-72127 No. 1 early
J	72589
K	72810
L	1-72143 No. 3
M	72627
N	11-72130
O	72906

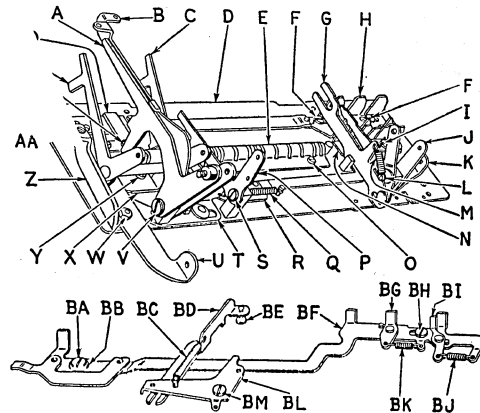
KEYBOARD PLATE AND INTERLOCKS, CLASSES 75, 77 (Plate 11)

SYMBOLS (Plate 11)

A 1-702121 No. 2
 B 702121 No. 1
 C 1-702154B* included in 1C-702009
 D Assembled lower keyboard plate, specify style and machine No.
 41-702212A No. 3 without sel. skip tab, Cl. 75
 21-702212A No. 5 with sel. skip tab, Cl. 75
 11B-702212A No. 5 } Sel. skip tab
 11A-702212A No. 5 } with reg. subt.,
 early Cl. 77
 1B-702212A No. 5 } Sel. skip tab
 1A-702212A No. 5 } without reg.
 early subt., Cl. 77
 1B-702212A No. 3 } Without reg.
 1A-702212A No. 3 } subt. and without
 early sel. skip tab, Cl. 77
 31B-702212A No. 3 } With reg. subt.
 31A-702212A No. 3 } and without sel.
 early skip tab, Cl. 77
 E 72116 No. 1
 F 71546
 G 1-72137
 H 1-702156A use 72820 spring
 I 72589
 J 1-72143 No. 3 sub-bal.
 K 702165 use 702534 hex. screw
 L 72557
 M 75814
 N 72592
 O 702243 No. 1 Reg. subt., use 984 spring
 P 702800
 Q 1-72127 No. 3 early, see letter BF, later
 R 79503
 S 1-702240*
 T 702287 use 79543 screw
 U

V 74529
 W 46 Nut, 12052 screw
 X 702234 No. 1* included in 1C-702009
 Y 72592
 Z 72236A
 AA 79552
 AB 70512
 AC 1-702150B No. 1* included in
 1C-702009
 AD 702268 No. 1
 BA 72627
 BB 72158

BC 8388
 BD 72248A
 BE 72542
 BF 1-72127 No. 5 includes BG, BI
 BG 72128*
 BH 72589
 BI 72127 1/2*
 BJ 72810
 BK 72810
 BL 1-702254 No. 1 (1-702254A No. 1,
 79506)
 BM 72501



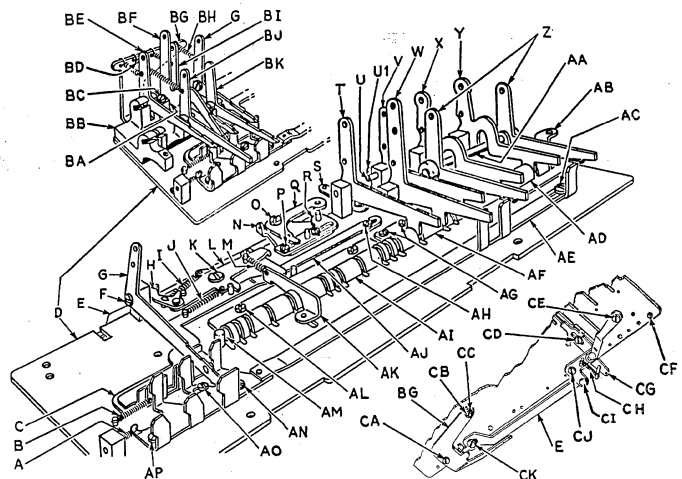
KEYBOARD PLATE AND INTERLOCKS, CLASS 78 (Plate 12)

SYMBOLS (Plate 12)

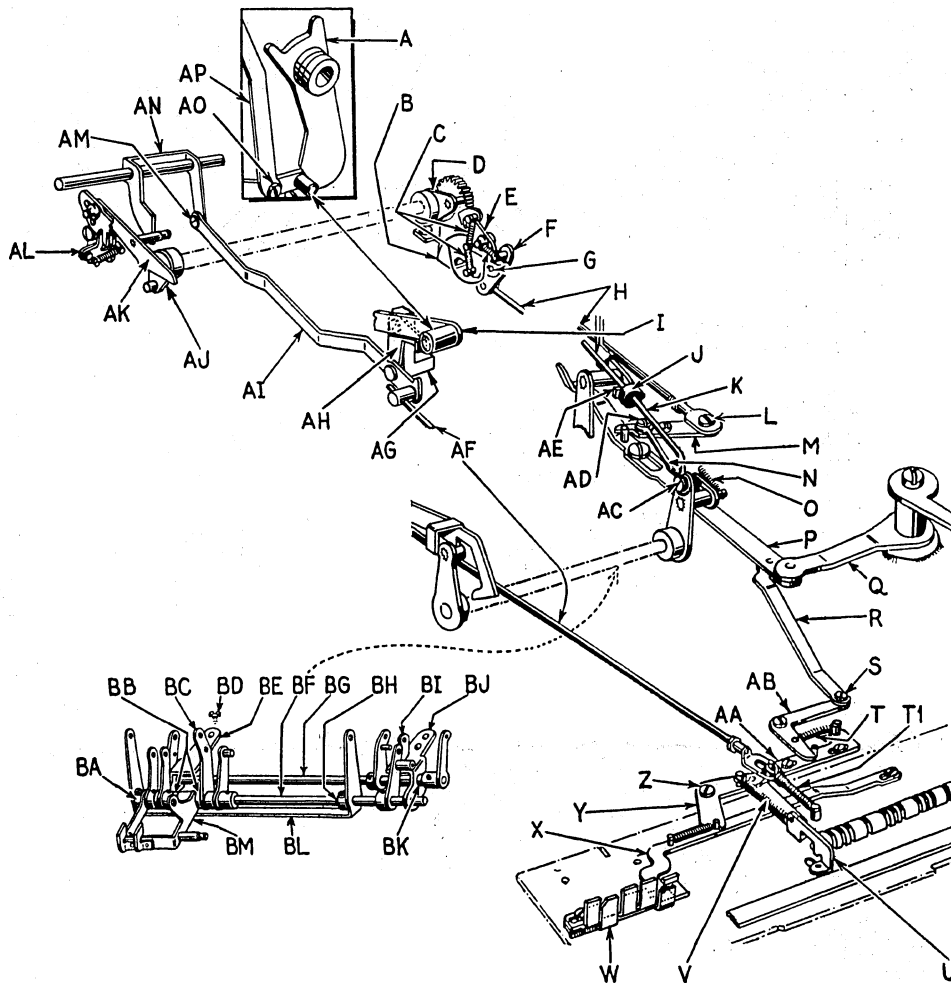
A 72810
 B 72810
 C 72118 No. 5 use 72580 screws
 D Assembled lower keyboard plate includes all parts except BA thru BK, specify style and machine No.
 1B-72212A No. 7 } With reg.
 1-72212A No. 7 } subt.
 11B-72212A No. 7 } Without
 11-72212A No. 7 } reg. subt.
 21B-72212A No. 7 } Without power
 21-72212A No. 7 } result
 early keys
 31-72212A No. 7 with tab on 2nd
 stroke and without mult. motor bars
 31A-72130 (71361, 31-72130A, 74502)
 79503
 1-72143 No. 3 sub-total index
 1-72254 1/2*
 81803
 3286 1/4
 72501
 1-72254B includes H
 8388
 72262
 72576 No. 2
 79511
 1-72267
 1-72261 use 71803 spring
 1-72244 No. 2 (1-20 No. 103) use
 2853 3/4 screws except on outside use
 950 3/4 screw and 46 1/4 nut
 72243 No. 3 CF subt., use 10782 spring
 72574
 72244 (20 No. 102)
 72243 No. 3 non-add, use 10782 spring
 72243A No. 10 reg. subt., use 72836
 spring, 79503 screw
 72243 No. 11 non-subt., use 10782
 spring
 72243 No. 9 CF and reg. subt., use
 10782 spring
 1-72150A No. 3 and No. 4* assembled
 11A-72234 No. 1 includes AA, use
 72592 screw to fasten to bottom
 plate
 AA 72009A*
 AB 72236A
 AC 72552
 72591 early

AD 72116 No. 3
 AE 21-702156A
 1-72118 No. 6
 AF 72116 No. 8
 AG 72592
 AH 72593
 AI 72116 No. 1
 AJ 1-72127 No. 4
 AK 72248A use 79552 screw
 AL 72592
 AM 72906 Ball bearing
 AN 71546
 AO 71546
 AP 71546
 BA 72323
 BB 72668
 BC 72583
 BD 7780 Spring

BE 1-72143 No. 4 bal.
 BF 1-72117A No. 3 tab
 BG 72287
 BH 72834
 BI 1-72143 No. 4 Cr. Bal.
 BJ 11-72143 No. 2 reg. total
 BK 1-72143 No. 1 add CF
 CA 79511
 CB 79505
 CC 701331
 CD 79503
 CE 79503
 CF 950 3/4 use 46 1/4 nut
 CG 1-72244 No. 2 (1-20 No. 103)
 CH 76806
 CI 83504
 CJ 73608 (72656) use 72139 washer
 CK 79503



KEYBOARD LOCK MECHANISM, CLASS 78 (Plate 13)

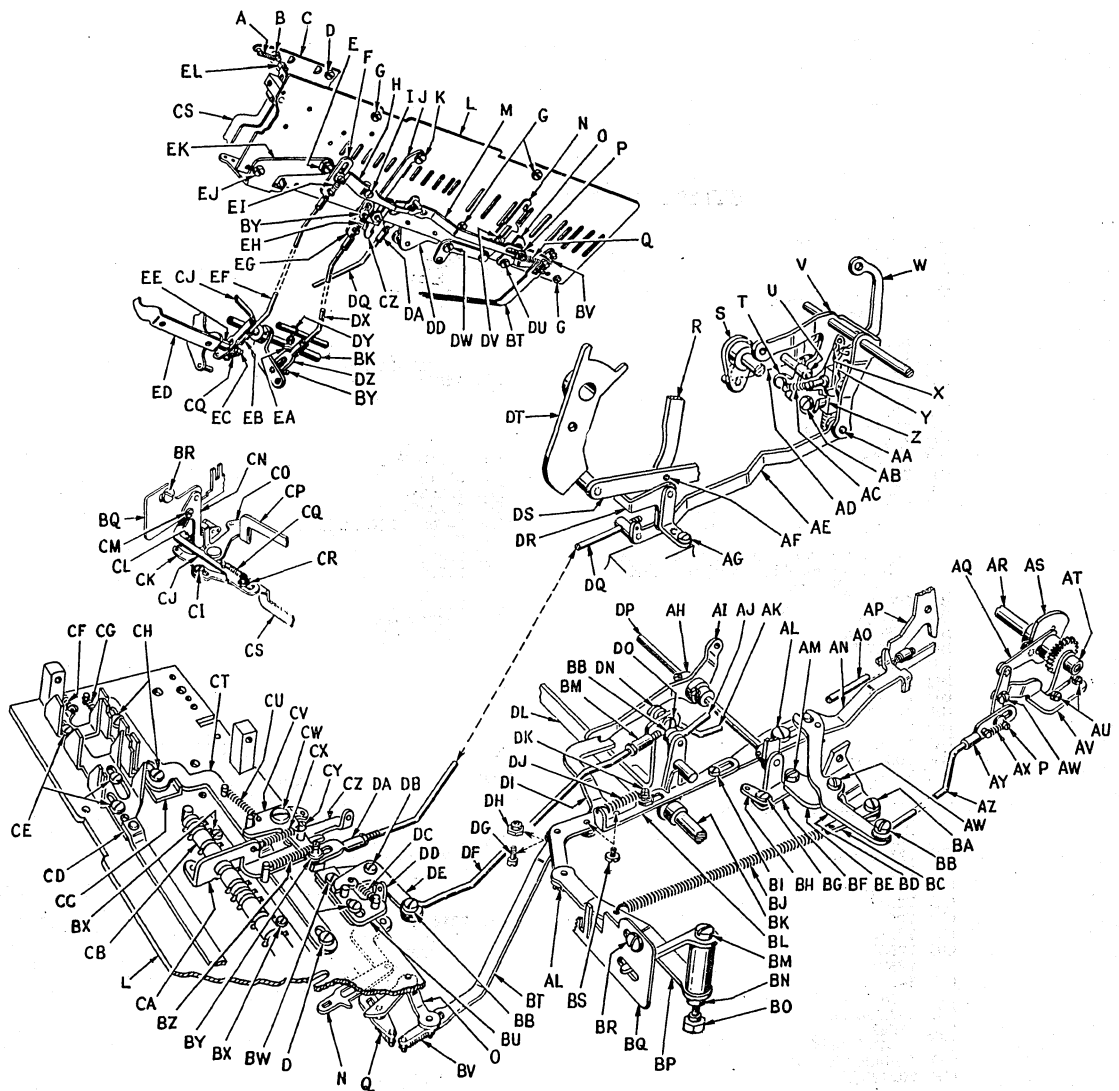


SYMBOLS (Plate 13)

A	1-71110*	V	8388	BA	1-74308 includes 12055 $\frac{5}{16}$ screw, narrow base
B	72297 $\frac{1}{4}$ complete assembly 1-72297 $\frac{1}{4}$, includes B, E, F	W	72118 No. 5		1-75332 includes 75618 screw, wide base
C	79819	X	1-72127 No. 4	BB	72378 narrow base
D	11-74192 use 72581 screw	Y	1-72254B		71371 wide base
E	1-72238 use 74315 screw	Z	72501	BC	1-72298 $\frac{1}{2}$
F	1-72263	AA	1-72261 use 79511 screw		1A-702298 $\frac{1}{2}$
G	79552 Screw	AB	1-72267	BD	73612
H	1-72714 No. 10 includes 72110 No. 3 turnbuckle, 49 $\frac{3}{4}$ nut	AC	72572 No. 1	BE	72122AL
I	1-72112 No. 4*	AD	72572 No. 1		702122AL
J	1-72315 No. 1 includes 72573 screw	AE	72296 $\frac{1}{2}$ Slide	BF	72037* complete assembly 1A-72037 No. 2 includes BA thru BM
K	72714 No. 8 complete assembly 1-72714 No. 8, includes J and turnbuckle 72110 No. 3	AF	1-72714 No. 36 } Includes 72110 No. 1 turnbuckle, 49 $\frac{3}{4}$ nut		702037 No. 1* complete assembly 1A-702037 includes BA thru BM
L	79503	AG	72503 complete assembly 11-72503 includes AG, AH, AI, narrow base	BG	72037* No. 2*
M	72237 use 75645 screw		1-702182 complete assembly 11-702182 includes AG, AH, AI, wide base	BH	1-28345 includes 75618 screw, narrow base
N	1-72714 No. 3 includes 72110 No. 1 turnbuckle	AH	72179 No. 2 use 650A rivet		1-75332 includes 75618 screw, wide base
O	8885A (72837)	AI	1-72180 No. 2 use 7552 $\frac{1}{4}$ rivet, included in AG	BI	11-72249
P	1-72283A No. 2 see plate 20 for other styles	AJ	1-74192*	BJ	72122AR
Q	1-75121A	AK	1-72165A No. 1		702122R
	1-705121A		1-72165 No. 1 early	BK	12042 $\frac{5}{16}$ Collar
R	72241	AL	1-72123 No. 1	BL	702344
S	79511	AM	79503		72295 $\frac{1}{4}$
T	2887 $\frac{1}{2}$	AN	1-74233 (1-132 Fte. 709)		702295 $\frac{1}{4}$
T1	81806	AO	71546	BM	1-72292 $\frac{1}{4}$
U	72248A	AP	1-76104		1-702292 $\frac{1}{4}$ A

SEE EXPLANATION ON INSIDE OF FRONT COVER

KEYBOARD INTERLOCKS—SERIES M 800 MACHINES (Plate 13A)



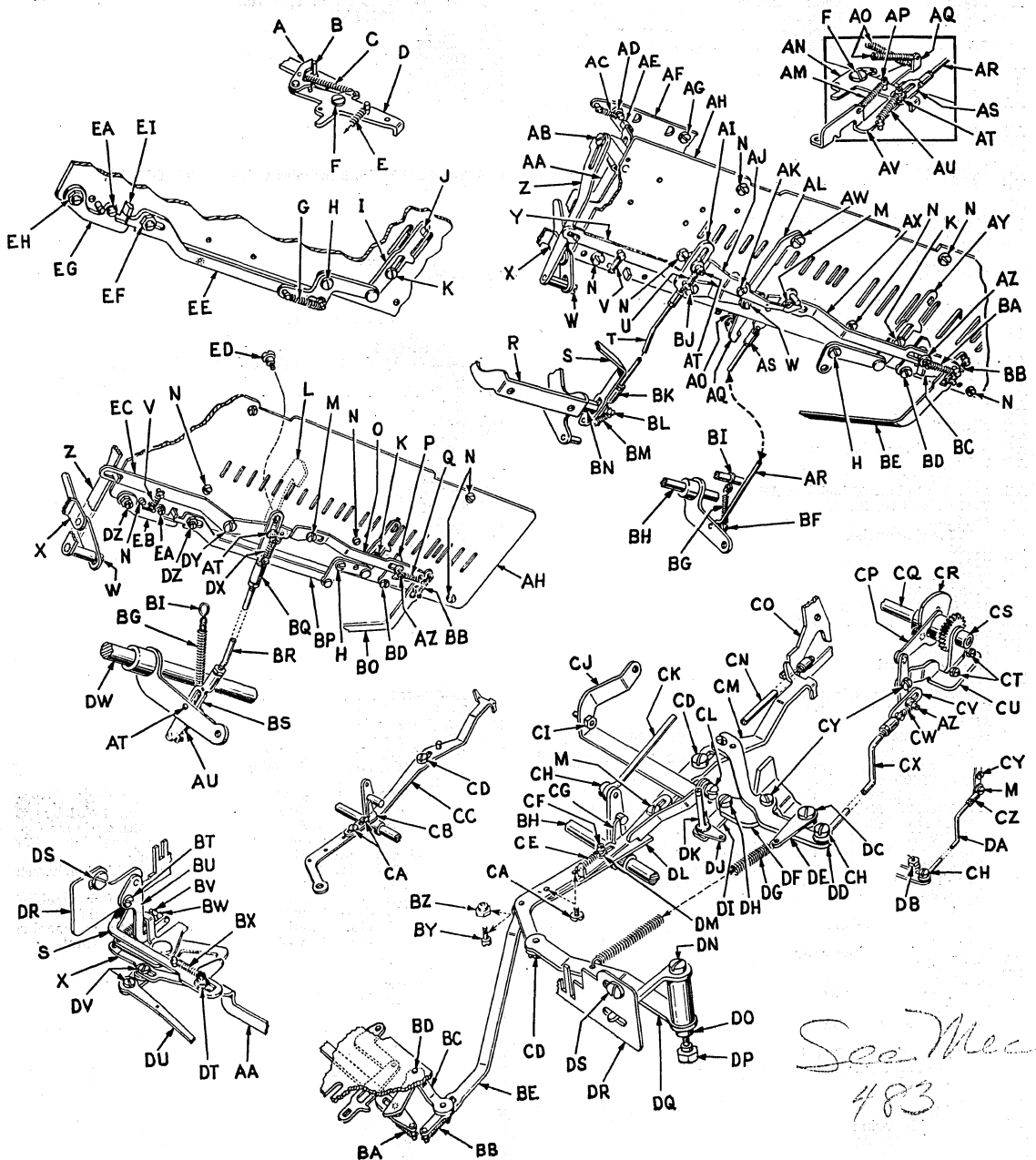
SYMBOLS (Plate 13A)

A	77802 spring	Y	72663 screw
B	72539 No. 2 spring screw stud	Z	1-72657 No. 3 post
C	11-72205 No. 1 includes EL		47 nut
D	72593	AA	79503 screw
E	701331 eccentric	AB	72507 1/2
F	73611 screw	AC	7282 1/2 spring
G	1-702110 No. 9	AD	1-72165A No. 1 includes U
H	72581	AE	77517 No. 1 screw
I	1-702146 1/4	AF	11-702182 includes AF, DR
J	702503 1/2	AG	71546 screw
K	702238 1/2	AH	73611
L	61-702212 No. 7 complete assembled	AI	1-73314 collar, includes
M	bottom plate	AM	705597 set screw
N	1-702116 1/4	AN	1-702223 1/2A No. 3
O	11-702298 1/2A No. 2	AJ	1-702714 No. 57
P	Included in BT	AK	1-702783
Q	79606 spring screw stud	AL	71520 screw
R	76806 spring	AM	73659
S	1-76104	AN	1-702223A No. 5 includes BI, BL, DJ, DK
T	Included in AR	AO	702707A No. 4
U	1-72123 No. 1	AP	1-702221 No. 3
V	Included in AD	AQ	1A-72263
W	1-132 Fte. 709	AR	11D-704013 No. 1 includes S
X	72134A No. 1	AS	1-74192 No. 2
	8082A spring		550 3/4 set screw

SYMBOLS (Plate 13A)—Continued

AT	1-74122 bracket	203495	eccentric
AU	10751 $\frac{1}{2}$	79510	screw
AV	72297 $\frac{1}{4}$ A	CQ	7781A
AW	79552	CR	71361 eccentric
AX	7287 Style 5 spring		702622 screw
AY	1-702110 No. 9	CS	1-702242
AZ	1-702714 $\frac{1}{2}$ No. 10 includes AY	CT	1-72127 No. 4
BA	72617	CU	3286 $\frac{1}{2}$
BB	72572 No. 1	CV	1-702254A No. 1
BC	20 No. 102	CW	72501
BD	702226	CX	8388
BE	702227	CY	82537
BF	702148 No. 3	CZ	72293 $\frac{3}{4}$
BG	72567	DA	72110 No. 1
BH	20 No. 89	DB	72576 No. 2
BI	75638	DC	2887 $\frac{1}{2}$
BJ	83814	DD	72262A
BK	3-702037 No. 4 power shaft assembly, for machines with carriage con- trolled totals	DE	1-72267
	13-702037 No. 4 power shaft assem- bly, for machines without carriage controlled totals	DF	1-702735 No. 2 includes DM
BL	702222 $\frac{1}{2}$ A	DG	70512
BM	7356 $\frac{1}{4}$	DH	71361
BN	75503 sleeve	DI	702222 No. 3
BO	70527 No. 1	DJ	702808
BP	1-75121A	DK	702622 screw
BQ	1A-705214 No. 6		204319 eccentric
BR	75633	DL	Included in BK
BS	74587	DM	72110 No. 5
BT	11-702223 $\frac{1}{4}$ No. 2 includes O	DN	72324
BU	1-72261	DO	508 Ftc. 141
BV	79804 spring	DP	1-702003 No. 4
BW	79511	DQ	1-702714 No. 53 includes DA
BX	72592	DR	Included in AE
BY	74315 spring screw stud	DS	Included in shaft assembly 1-702001 No. 2
BZ	83883	DT	Included in shaft assembly 21B- 701001
CA	72248A	DU	77529
CB	72116 No. 1	DV	71546
CC	72118 No. 5	DW	72656
CD	21-702156A	DX	1-702782 includes DZ, EG
CE	72627	DY	20 No. 86A
CF	72820 spring	DZ	72110 No. 1
CG	72810 spring	EA	3281 $\frac{1}{2}$
CH	72589	EB	72110 No. 3
CI	72591	EC	704513 spring screw stud
CJ	1-702203 $\frac{1}{2}$ No. 2	ED	1A-702132 No. 2
CK	1-702145 $\frac{1}{2}$ includes CO	EE	702517 $\frac{1}{2}$
CL	8381 spring	EF	1-702784 includes F, EB
CM	73548	EG	1-702110 No. 9
CN	1A-705134 $\frac{1}{4}$	EH	8384 spring
CO	Included in CK	EI	71803 spring
CP	702145 $\frac{1}{4}$	EJ	79505
		EK	72287
		EL	Included in C

KEYBOARD INTERLOCKS—FOR SERIES M 200 MACHINES, AND CLASS 72 MACHINES CONTAINING EASY DEPRESSION POWER RESULT KEYS
(Plate 13-1)



SYMBOLS (Plate 13-1)

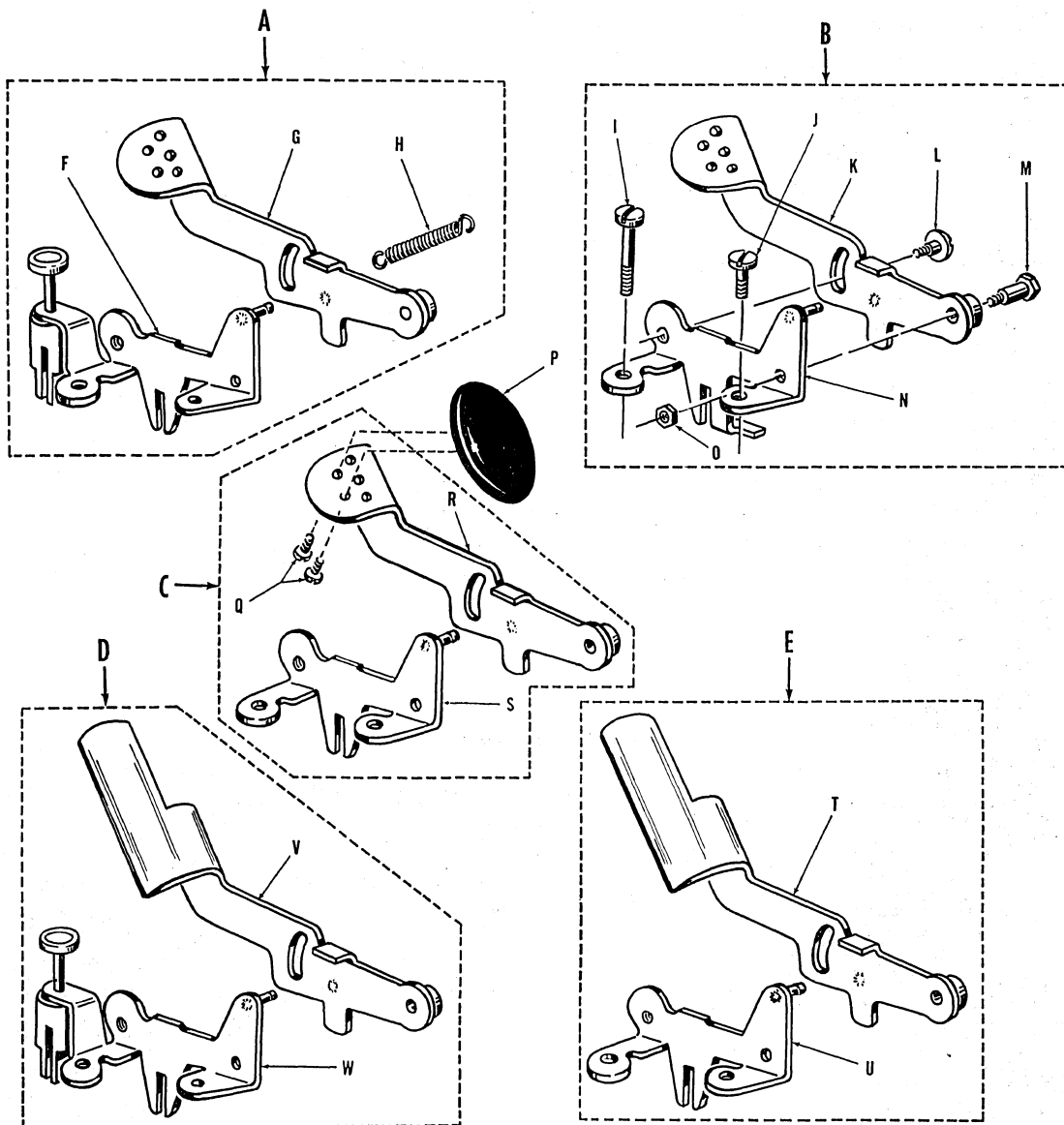
A Included in D
B Included in EE
C 81803
D 1-72254B includes A
E 89800A
F 72501
G 76806
H 72656 screw
I 72139 washer
J Included in EE

J Text only
K 71546
L 72147
M 75638
N 72581
O Use 1-702116 1/2, 1-702132 1/4 A
P Included in BO
Q 76806
R 1A-702132 No. 2
S 1-702203 1/2 No. 2

SYMBOLS (Plate 13-1) Continued

T	1-702784 includes AI, BK	BZ	71361
U	71803 spring	CA	74587
V	12084 1/4 spring	CB	Use 1-702223A No. 5, 1-702714 1/2 No. 10, 7287 Style 5, 79606, 72297 1/4A
W	79511 screw	CC	Use 1-702223A No. 5, 1-702714 1/2 No. 10, 7287 Style 5, 79606, 72297 1/4A
X	31-72145 Class 72, before machine serial No. B46251	CD	71520
	11-702246 1/2 Class 72, after machine serial No. B46251 and Series M 200 machines, without carriage controlled totals	CE	702808
	1A-702246 1/2 Series M 200 machines, with carriage controlled totals	CF	702622 spring anchor screw
Y	1-702132 1/4A	CG	702222 1/4A
Z	1-72144	CH	72572 No. 1 screw
AA	1-702242 slide	CI	702606 post
	72591 screw		46 1/4 nut
AB	72599	CJ	1-702223 1/2 No. 2 includes CI
AC	77802 spring	CK	1-702766
AD	72539 No. 2 spring anchor screw	CL	72648
AE	Included in AF	CM	1-702223A No. 5 includes CE, CF, CG, DM, M
AF	1A-72205 No. 1 includes AE	CN	702707A No. 4
AG	72593	CO	1-702221 No. 3
AH	1-702212 No. 11 Class 72, with reg. subtotal key in position No. 72	CP	1A-72263
	11-702212 No. 11 Class 72, with fraction add C.F. key in position No. 72	CQ	11D-704013 No. 1 includes CR
	11-702212A No. 11 Series M 200, with carriage controlled totals	CR	1-74192 No. 2 cam
	21-702212A No. 11 Series M 200, without carriage controlled totals	CS	550 1/4 set screw
AI	1-702110 No. 9 turnbuckle	CT	1-74122 bracket
	49 3/8 nut	CU	10751 1/2
AJ	1-702146 1/4		72297 1/4A
AK	702503 1/2	CV	1-702110 No. 9 turnbuckle
AL	702248 1/2		49 3/8 nut
AM	89800A	CW	7287 Style 5
AN	1-702254A No. 1	CX	1-702714 1/2 No. 10 includes CV
AO	72836	CY	79552
AP	82537 spring anchor screw	CZ	72110 No. 3 turnbuckle
AQ	72293 3/4		49 3/8 nut
	73514 screw	DA	1-702714A No. 10 includes CZ
AR	1-702714 1/2 No. 36 includes AS, BF	DB	47 nut
AS	72110 No. 1 turnbuckle		702583 screw
	49 3/8 nut	DC	72617
AT	74315 spring anchor screw	DD	702226
AU	81806	DE	20 No. 102
AV	72248A	DF	702227
AW	72501 1/4	DG	83814
AX	1-702116 1/4	DH	73659
AY	11-702298 1/4A No. 2	DI	702148 No. 3
AZ	79606 spring anchor screw	DJ	20 No. 89
BA	76806	DK	569 Fte. 203
BB	79804 spring	DL	702222 No. 1
BC	Included in BE	DM	204319 eccentric
BD	77529	DN	7356 3/4
BE	11-702223 1/4 No. 2 includes BC	DO	75503 sleeve
BF	74575 spring anchor screw	DP	70527 No. 1
BG	3281 1/2	DQ	1-75121A
BH	Use 32B-702037A No. 1 shaft assembly, 1-701239 broken joint connection, 1-701232 1/4A power pawl, 1-702233 1/2B power pawl link, 79543 screw and 705367 eccentric for top, and 79600 screw for bottom of power pawl link. For machines before machine serial No. B83080	DR	1A-705214 No. 4 with auto. date
	32B-702037A No. 1 shaft assembly, for machines between serial No. B83080 and B197641	DS	75633
	42-702037A No. 1 Series M 200 machines after machine serial No. B197641 with carriage controlled totals	DT	71361 eccentric
	52-703037A No. 1 Series M 200 machines after machine serial No. B197641 without carriage controlled totals	DW	702622 screw
BI	20 No. 86A	DU	1-702203BL No. 4 Class 72
BJ	71542		1-702203CL No. 4 Series M 200
BK	72110 No. 3 turnbuckle	DV	72591
	49 3/8 nut	DW	Use 32B-702037A No. 1 shaft assembly, 1-701239 broken joint connection, 1-701232 1/4A power pawl, 1-702233 1/2B power pawl link, 79543 screw and 705367 eccentric for top, and 79600 screw for bottom of power pawl link. For machines before machine serial No. B83080
BL	704513 spring anchor screw		32B-702037A No. 1 shaft assembly, for machines between serial No. B83080 and B197641
BM	7781A spring		42-702037A No. 1 Series M 200 machines after machine serial No. B197641 with carriage controlled totals
BN	702517 1/4 hexagon post		52-702037A No. 1 Series M 200 machines after machine serial No. B197641 without carriage controlled totals
BO	11-702223 1/4 No. 2 includes P	DX	16681A
BP	1A-72130A	DY	74529
BQ	1-702110 No. 9 turnbuckle	DZ	74502 screw
	49 3/8 nut		71361 eccentric
BR	1-702764 includes BQ, BS	EA	74533
BS	1-702110 No. 5 turnbuckle	EB	72130 1/4
	49 3/8 nut	EC	1-702132 1/4
BT	73548	ED	72542
BU	1A-705134 1/4	EE	31A-72130A includes B, I
BV	8381 outside spring	EF	71361 eccentric
BW	76812 inside spring		74502 screw
BX	7781A	EG	72130 1/4
BY	70512	EH	71361 eccentric
			74502 screw
		EI	Text only

PALM TABULATOR LEVERS (Plate 16-1)



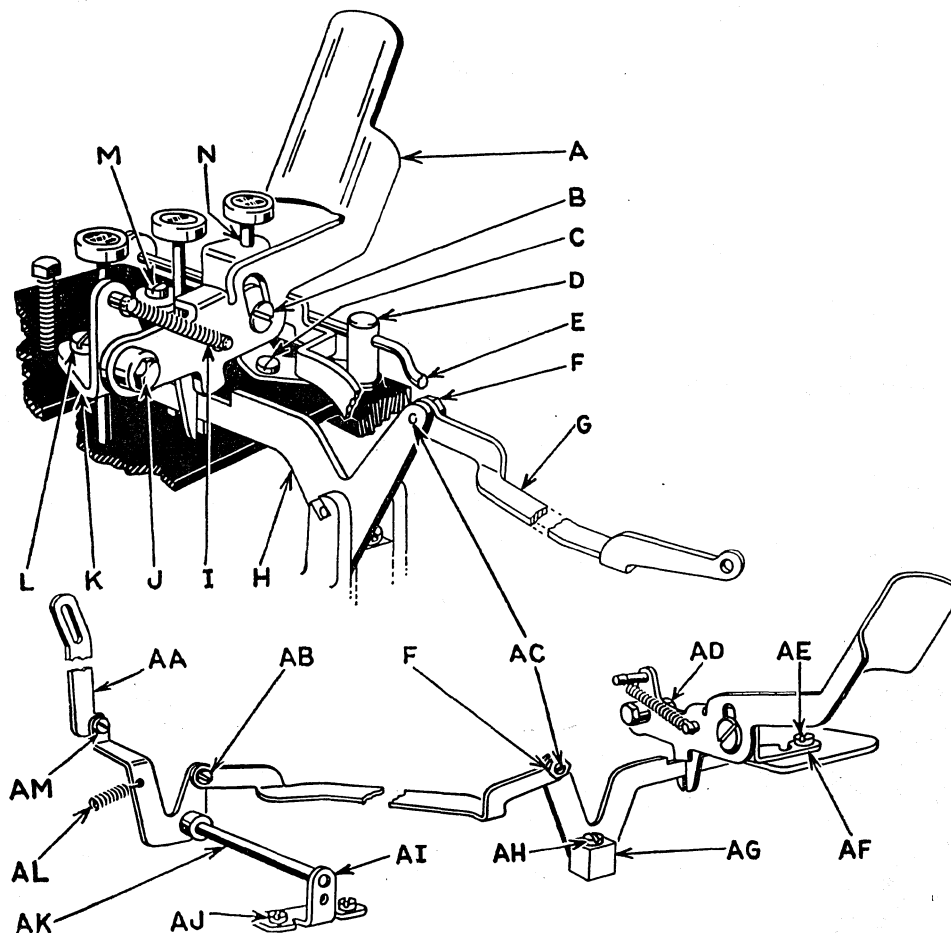
SYMBOLS (Plate 16-1)

Note: Black levers are no longer available.
Use gray levers for field replacement.

A	2B-72123½ No. 1 complete assembly, includes F, G, J, L, M, O	E	Complete assembly, use 2-73123½A No. 2, 1A-702913, 7062 2 req.	P	1-702913 Black 1A-702913 Gray
B	2-73123½A No. 2 complete assembly, includes J, K, L, M, N, O	F	1B-72123½ No. 1	Q	7062
C	Complete assembly, use 2-72123½A No. 2	G	1A-72124½A	R	Use 1A-72124½A
D	Complete assembly, use 2B-72123½ No. 1, 1A-702913, 7062 2 req.	H	60804A	S	Use 1-72123½A No. 2
		I	71567	T	Use 1A-72124½A, 1A-702913, 7062 2 req.
		J	71517	U	Use 1-72123½A No. 2
		K	1A-72124½A	V	Use 1A-72124½A, 1A-702913, 7062 2 req.
		L	72532½	W	Use 1B-72123½ No. 1
		M	72533½		
		N	1-72123½A No. 2		
		O	72446		

PALM TABULATOR BAR WITH AND WITHOUT ADDED KEY (Plate 16)

(Plates 14, 15 in Instruction Book only)

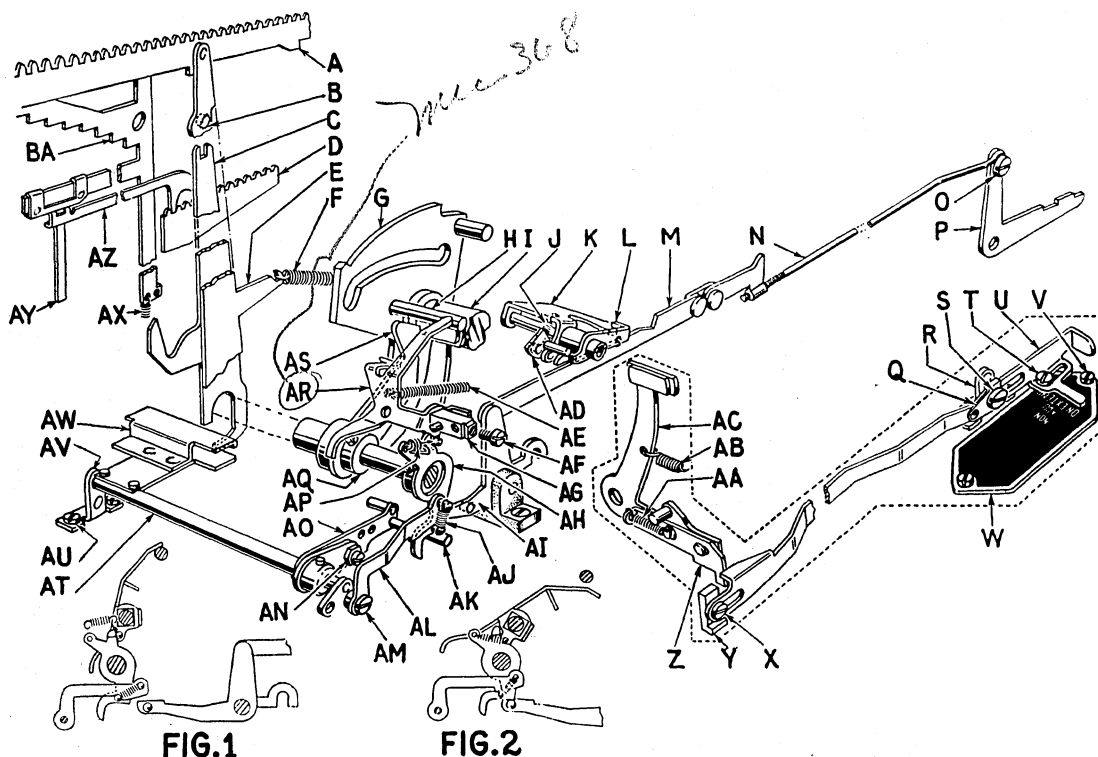


SYMBOLS (Plate 16)

A 1-72124½ (1-72124½A, 1-702913, 7062, 2 req.)
 B 72532½
 C 73610
 D 72587 use 72325 nut
 E 1-72709 includes D
 F 702367 Ecc., 72573 screw
 G 702103A
 H 72700 No. 12 Wire, used with early style bail, letter AK
 I 1-72117A No. 3
 J 60804A
 K 72533½ Screw, use 72446 nut
 L 1-72123½ No. 1
 M 2-72123½ No. 1 (2A-72123½ No. 1, 1-702913, 7062, 2 req.) complete assembled tab. bar includes A, B, I, J, K, N
 N 72521 No. 8* included in K
 AA 72194
 AB 72602 No. 2
 AC 72573
 AD 72446 Nut
 AE 71567
 AF 1-72123½ No. 2
 AG 72323
 AH 72583
 AI 72148 No. 4
 AJ 72567
 AK 1-72003A (1-72003B)
 AL 72803
 AM 71546

1-72003 early, use 72700 No. 12 wire
 1-702003A No. 1
 1-72123½ No. 2 (2A-72123½ No. 2, 1-702913, 7062, 2 req.) complete assembled tab. bar includes A, B, I, J
 1-72003B

EXTEND KEY AND KEY LOCK MECHANISM, CLASSES 71, 72, 73 (Plate 17)



SYMBOLS (Plate 17)

A 1-76111 see chart, plate 3-1 in Printing Book
 B 71552*
 C 1-74135 No. 1
 D 74114 No. 1
 E 11-71150 No. 2
 F 71809
 G 11A-71129 see plate 3 for other styles
 H 71002*
 I 141B-71001

141A-71001 early
 91A-71001 (141A-71001) Cl. 74
 61A-71001 Cl. 76
 51C-71001
 51B-71001 early } Cl. 78
 51B-71001 (51C-71001, 1A-702228B No. 2,
 1-702229B No. 1, 3415 1/4) Cl. 71, 72, 73
 11A-701001 (61A-701001, 11-702228B No. 1,
 1-702229B No. 1, 3415 1/4 for crossfooter non-
 clear lock add 1-701186A, for sterling mach.
 add 706160A) Cl. 74, 75
 41B-701001 (61A-701001, 11-702228B No. 1,
 1-702229B No. 1, 3415 1/4 for crossfooter non-
 clear lock add 1-701186A, for sterling mach.
 add 706160A) Cl. 76
 61-701001 (61A-701001, 11-702228B No. 1,
 1-702229B No. 1, 3415 1/4 for crossfooter non-
 clear lock add 1-701186A, for sterling mach.
 add 706160A) Cl. 77
 21A-701001 (21B-701001, 11-702228B No. 1,
 1-702229B No. 1, 1-701186A, 3415 1/4, for
 sterling mach. add 706160A)

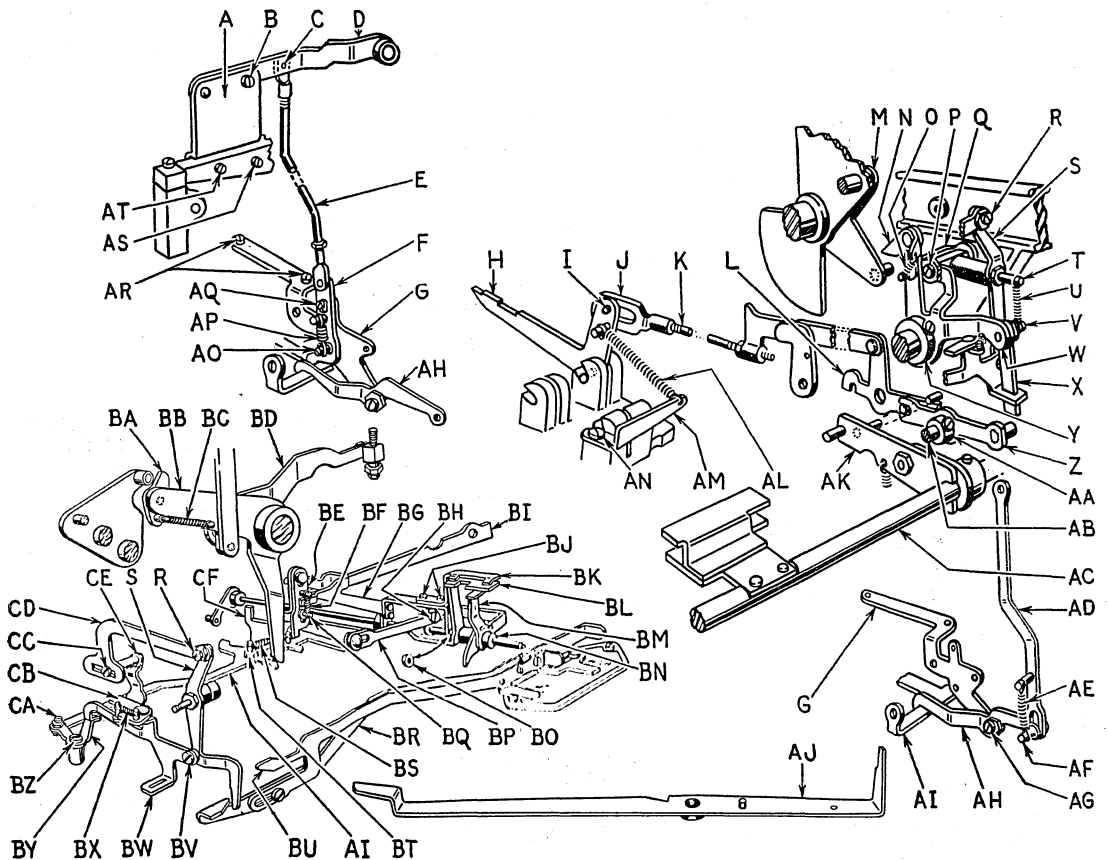
Specify
 style
 and
 machine
 number.
 Complete
 assembled
 shaft,
 includes G

J 72810
 K 72189 No. 9 } See plate 6 for other styles and
 L 1-72190B No. 1 } complete assembly
 M 72172 No. 8* included in AI
 N 72700 No. 11
 O 72572 No. 1
 P 1-72143 No. 1
 Q 72196
 R 72148 No. 4 use two 72567 screws
 S 72576 No. 1 with single slide
 T 72576 No. 2 with double slide, use 72318 collar
 U 72586
 72197
 72197 No. 2 with auto. ext.

V 79543
 W 72901 No. 1 (72901 No. 3) non-add on ext.
 72901 No. 2 (72901 No. 3) add reg. and CF
 72901 No. 3 add. reg. and CF, non-add on ext.
 72901 No. 4 (72901 No. 3) add. reg. and CF, normal, ext. or
 normal and ext.
 X 79503 with single slide
 72578 with double slide
 Y 72575 No. 1 use 47 nut
 Z 72106 No. 1* included in AC

AA 72805 (72820)
 AB 72807 No. 1
 AC 11-72163 No. 3 includes Z, AA } See plate 6 for
 21-72163 No. 3 with auto. ext. } other styles
 AD 11-72191A No. 2*
 AE 72806
 AF 7755 1/4
 AG 71590A* complete assembly 1-71590A includes AR, complete
 assembly 1-701590
 AH 1-72211 No. 2
 AI 1-72171A No. 9 includes M, AK
 1-72171 No. 6 early
 AJ 72815 (3981)
 AK 350 3/4
 AL 1-72215 No. 4
 AM 72523 1/2
 AN 72307 Ecc., 72568 screw, 46 nut
 AO 1-72182 No. 5
 1-72182 No. 1 early
 AP 73820
 AQ 1-71336 includes 550 3/4 screw
 AR 1-72214 No. 2 } included in AG, use 74587 screw
 1-72214Z
 AS 11A-71152 No. 2
 1A-701159
 AT 21-72001 No. 1 } See plate 27 for
 1-72001 No. 1 early } other styles
 AU 72567
 AV 72148 No. 3
 AW 1-72113*
 AX 74806
 AY 1A-74137 No. 1
 AZ 74117 No. 1* included in C
 BA 74151 No. 1

EXTEND MECHANISM, AUTOMATIC, CLASSES 71, 72, 73 (Plate 18)



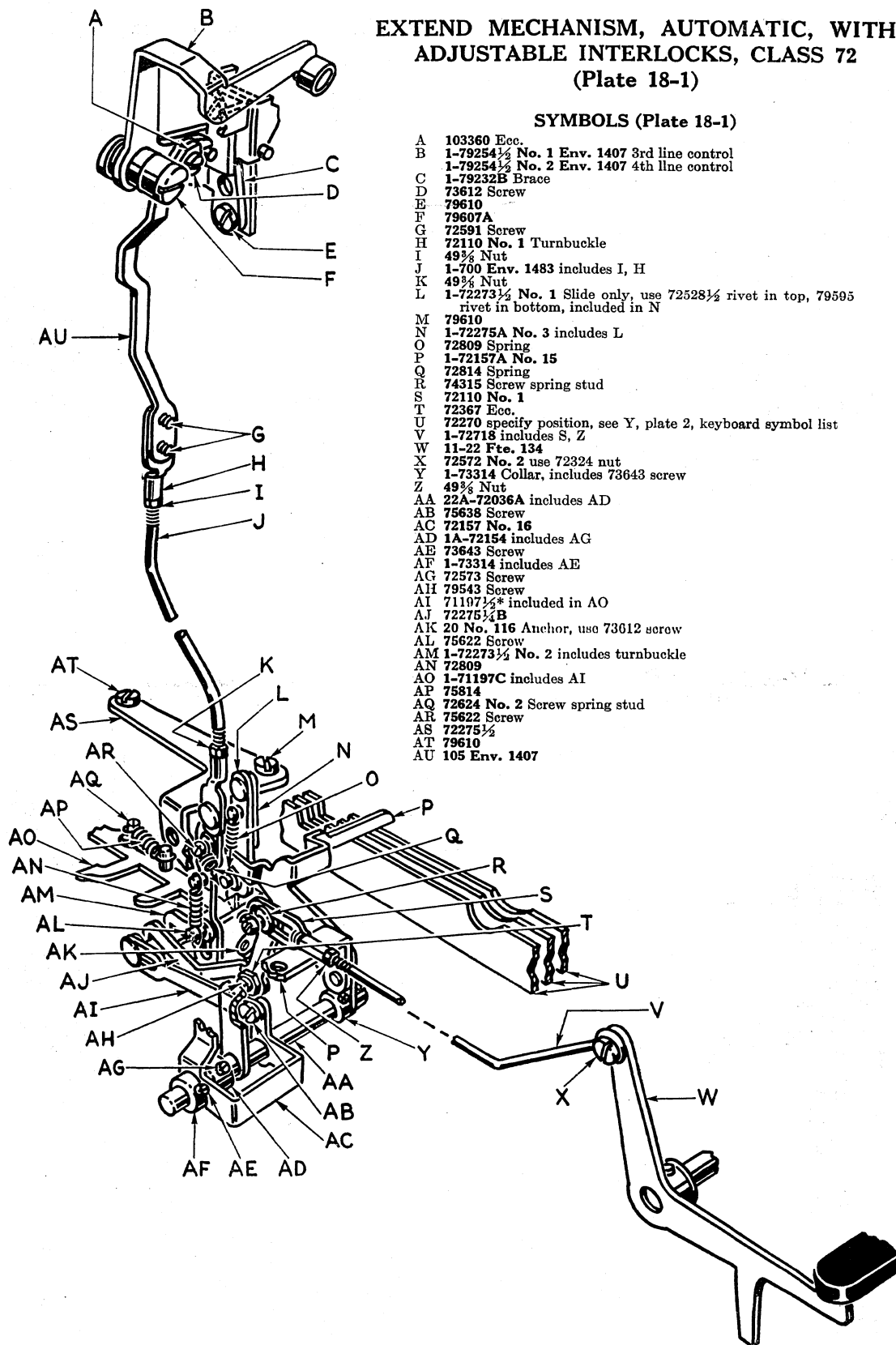
SYMBOLS (Plate 18)

A	79263* (79263A*, 79625) included in D	AB	51-72011		BC	71803
B	79552		1-702011 Env. 1415	} See plate 25 for other styles	BD	1-71140* included in BB
C	79615	AC	21-72001 No. 1	} Includes AK, see Plate 27 for other styles	BE	1-72273½ No. 1 use 72528½ rivet
D	1-79231 No. 2 includes A		1A-702001 No. 3		BF	72809
E	1-709231 No. 2 (1A-709231 No. 2, 79625)	AD	1-72275½ A		BG	1-72157A No. 15
F	1-72715 includes 72110 No. 6 turn-buckle, 49½ nut		1-702275½ Env. 1415			1-72157 No. 15 early
G	1-72273½ No. 2	AE	71807		BH	79503
H	72275½	AF	72635		BI	72270 Specify No., see plate 2, letter Y
I	21-72143 No. 1 (21-72143 No. 2, 21-72192)	AG	79543 Screw, 72367 ecc.		BJ	709607
J	1-72143 No. 1 early	AH	72275½ A		BK	72157¼ No. 1 auto. ext. from products, and reg. total
K	77529	AI	1-71197B	} Disables from add		72157¼ No. 2 auto. ext. from products
L	72110 No. 1		1-71197 early	} CF key		72157¼ No. 3 auto. ext. from reg. total
M	1-72700 No. 16 includes J		1-71197Z	} disables auto. ext. from sub. key	BL	72157 No. 4
N	1-72171A No. 9		11-71197B	} non-disabling from add CF key, special key in place of add CF key	BM	72157 No. 16
O	1-72171 No. 9 early	AJ	1-72280 No. 3		BN	1-73314 includes 73643 screw
P	1-71132 No. 2* included in 141B-71001, see plate 17 for other styles		1-702280 No. 3 Env. 1415		BO	89335
Q	71192½ use 253½ rivet	AK	1-72182 No. 5 use 72568 screw, 72307 ecc., 46 nut		BP	71197½* included in AI
R	79804	AL	3489		BQ	79595 Stud
S	74587	AM	72105½ (20 No. 111)		BR	72197 No. 2
T	1-71590A	AN	72583		BS	75814
U	1-71590 early } includes P	AO	75622		BT	72624 No. 2
V	1-701590	AP	72809		BU	72198
W	73611 Screw, 72307 ecc.	AQ	79503		BV	77529
X	1-71191A	AR	79610		BW	1-71195A
Y	71613	AS	1050½ Screw, 47¼ nut		BX	8382
Z	72826	AT	72567		BY	71196* included in BW
AA	71614 Screw, 79322 ecc.	BA	1-71136 use 71542 screw		BZ	71595
AB	1-71192A	BB	1-71137 No. 2 Cl. 76, 78		CA	74502 Screw, 71361 ecc.
AC	1-71192 early } Includes N		1-71137 No. 3 with auto. tab Cl. 71, 72, 73, 74		CB	1-71195½* included in BW
AD	71193A		11-71137 No. 3 without auto. tab., Wide and narrow base, Cl. 71, 72, 73, 74		CC	79503
AE	71193 early		1-701332 Cl. 75, 76, 77, 78		CD	71194A
AF	1-71336 includes 550½ screw		11-701332 Cl. 71, 72, 73, 74			71194 early
AG	1-72161½ A				CE	1-72114 No. 11 without clear mult. key
AH	1-72161½ early					1-1106A Fto. 133 No. 3 with clear mult. key
AI	1-73337 includes 75618 screw				CF	1-72275A No. 3 } Use 71553 screws
						72275 No. 3 early

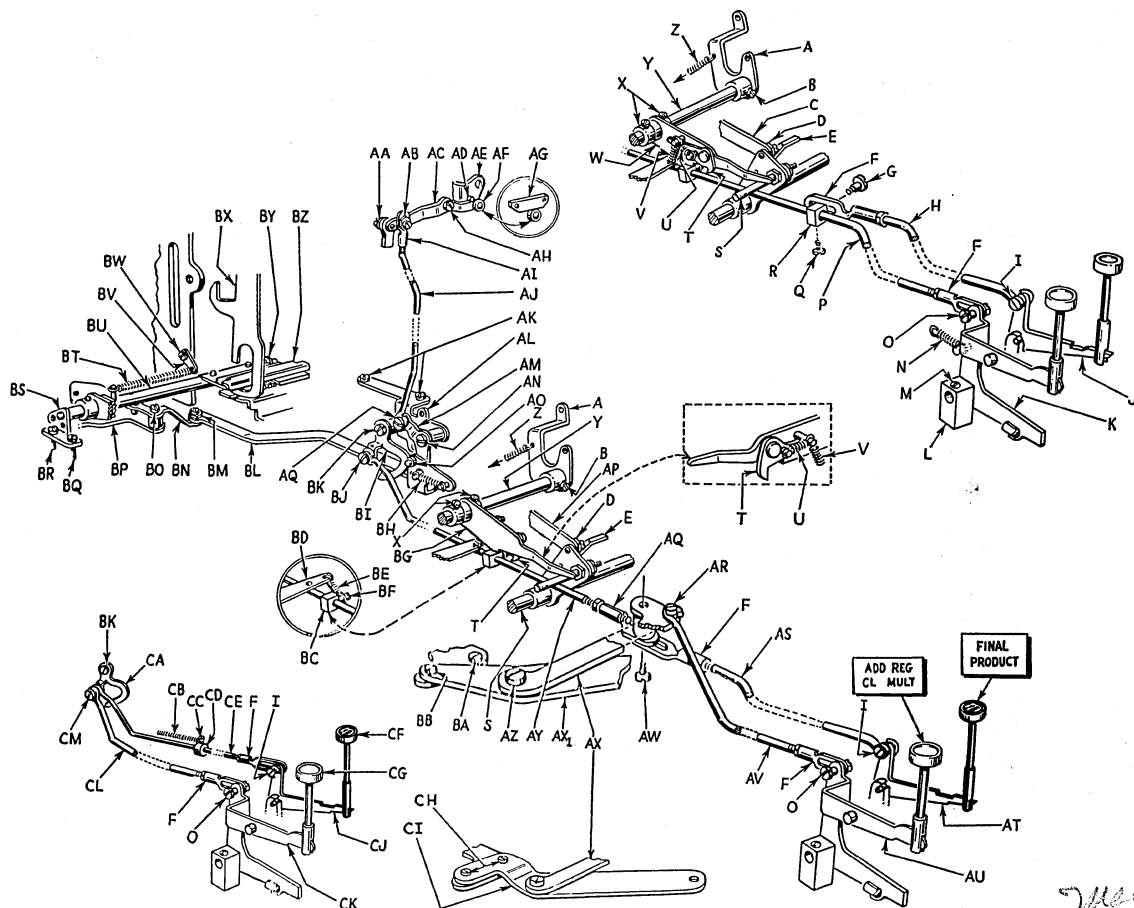
EXTEND MECHANISM, AUTOMATIC, WITH ADJUSTABLE INTERLOCKS, CLASS 72 (Plate 18-1)

SYMBOLS (Plate 18-1)

A	103360 Ecc.
B	1-79254½ No. 1 Env. 1407 3rd line control
C	1-79254½ No. 2 Env. 1407 4th line control
D	1-79232B Brace
E	73612 Screw
F	79610
G	79607A
H	72591 Screw
I	72110 No. 1 Turnbuckle
J	49½ Nut
K	1-700 Env. 1483 includes I, H
L	49½ Nut
M	1-72273½ No. 1 Slide only, use 72528½ rivet in top, 79595 rivet in bottom, included in N
N	79610
O	1-72275A No. 3 includes L
P	72809 Spring
Q	1-72157A No. 15
R	72814 Spring
S	74315 Screw spring stud
T	72110 No. 1
U	72367 Ecc.
V	72270 specify position, see Y, plate 2, keyboard symbol list
W	1-72718 includes S, Z
X	11-22 Fte. 134
Y	72572 No. 2 use 72324 nut
Z	1-73314 Collar, includes 73643 screw
AA	49½ Nut
AB	22A-72036A includes AD
AC	75638 Screw
AD	72157 No. 16
AE	1A-72154 includes AG
AF	73643 Screw
AG	1-73314 includes AE
AH	72573 Screw
AI	79543 Screw
AJ	71197½* included in AO
AK	72275½B
AL	20 No. 116 Anchor, use 73612 screw
AM	75622 Screw
AN	1-72273½ No. 2 includes turnbuckle
AO	72809
AP	1-71197C includes AI
AQ	75814
AR	72624 No. 2 Screw spring stud
AS	75622 Screw
AT	72275½
AU	79610
	105 Env. 1407



NON-EXTEND, SPECIFIED COLUMNS, CARRIAGE CONTROLLED—IMPROVED, CLASS 72 AND SERIES M 200 MACHINES (Plate 18-2)



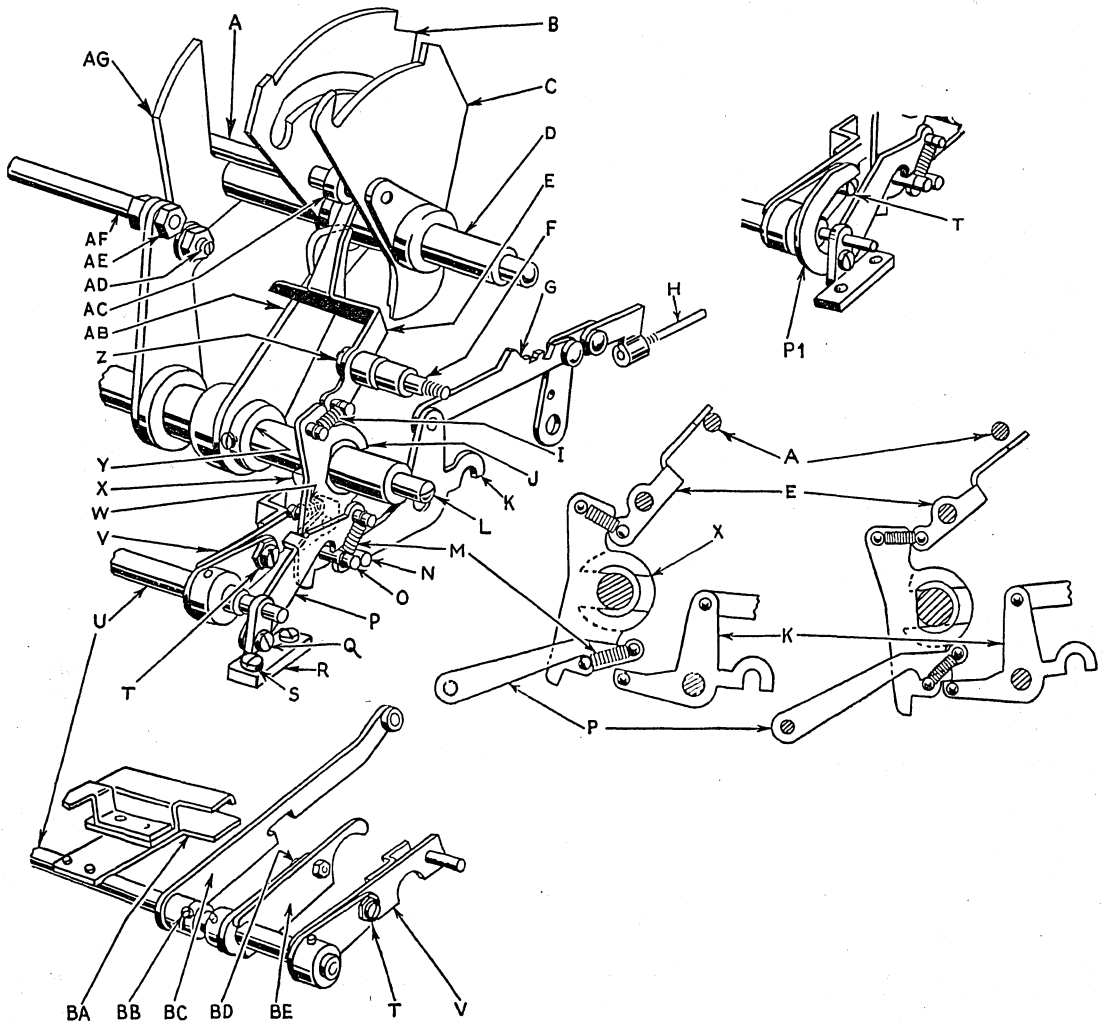
SYMBOLS (Plate 18-2)

A	1A-702193A No. 2	P	Use 1-702760A	
B	70512 set screw		1-702779A	
C	Use 702291 1/2 A No. 3		1-702780	with final product key in position No. 71
	701143 1/2		1-702119 3/4	
	70512		12051 1/6	
D	72307 eccentric		72572 No. 1	
	79510 screw		72542	for machines with power result keys and improved subtract key mechanism
E	702207 1/2		702123 1/2	
F	72110 No. 1		Use 1-702760A	
G	75638		1-702780	with sub- product key in position No. 71
H	Use 1-702760A		1-702119 3/4	
	1-702779A		12051 1/6	
	1-702780		72572 No. 1	
	1-702119 3/4	for machines with power result keys, with improved subtract key mechanism, with final product key in position No. 71	75638	
	12051 1/6		702123 1/2	
	72572 No. 1		Use 1-702760A	
	72542		1-702779A	with final product key in position No. 71
	702123 1/2		1-702780	
	Use 1-702760A		1-702119 3/4	
	1-702779A		12051 1/6	
	1-702780		72572 No. 1	
	1-702119 3/4	for machines with power result keys, with- out improved subtract key mechanism, with final product key in position No. 71	72542	
	12051 1/6		702123 1/2	
	72572 No. 1		702119 1/2	
	72542		8451	for machines with power result keys, without improved sub- tract key mechanism
	702123 1/2	Use 1-702760A		
	702119 1/2	1-702780		
	8451		1-702119 3/4	with sub- product key in position No. 71
	75631 screw		12051 1/6	
	72324 nut		72572 No. 1	
J	1-702143 No. 7 final product position		75638	
K	1-702243 No. 15 add reg. cl. mult. position		702123 1/2	
L	702902 No. 4		702119 1/2	
M	702505 1/2		8451	
N	72833	Q	72573	
O	75631 screw	R	702303 1/2	
	71366 nut			

SYMBOLS (Plate 18-2) Continued

S	702623 stud	BV	20 No. 89
T	46 3/4 nut	BW	74565
U	Included in W	BX	1-74135 No. 2
V	489 spring	BY	72148 No. 3 bracket
W	79819 spring	BZ	72567 screws
X	Use 1-702235 1/2	CA	Included in BU
Y	1-75332 collar, includes	CB	1-103A Env. 1407 before machine serial No. A696950
Z	75618 set screw	CC	1-702219 after machine serial No. A696950
AA	702003 No. 3	CD	74808 spring
AB	72803	CE	20 No. 73A anchor
AC	75342 eccentric	CC	72573 set screw
AD	73611 screw	CD	1-72310 includes CC
AE	79615 screw, before machine serial No. A696950	CE	Use 1-702760A
AF	74502 screw after machine serial No. A696950		1-702779A
AG	71361 eccentric		1-702780
AH	1-79254 before machine serial No. A696950		1-702119 3/4
AI	1-709254 No. 2 long hub 1 1/2"		12051 1/2
AJ	11-709254 No. 2 short hub 3/4" after machine serial No. A696950 for four position printing control		72572 No. 1 with final product key in position No. 71
AK	Included in AE		72542
AL	11-79232A before machine serial No. A278791		72501 1/2
AM	1-79232B before machine serial No. A278791 includes AD and A696950		20 No. 73A
AN	11-79232B after machine serial No. A696950		75804 No. 2
AO	Included in AC		Use 1-702760A
AP	73216 No. 3		1-702779A
AQ	79607A		1-702780
AR	72110 No. 6		1-702119 3/4
AS	1-700A Env. 1407 before machine serial No. A696950		74529
AT	1-702739 after machine serial No. A696950		72572 No. 1 for machines without power result keys, without improved subtract key mechanism, with final product key in position No. 71
AV	79587		72542
AW	72275 1/2		702128 3/4 Z
AX	AM Included in BL		8451 2 req.
AY	AN 702619		72501 1/2
AZ	AO Included in BL		75804 No. 2
BA	AP 702291 1/4 A No. 3		20 No. 73A
BB	AQ 72110 No. 3		CF 72200A No. 1 ring
BC	AR 72572 No. 1		72210 disk
BD	AS 1-702779A includes F		72199 No. 1 cup
BE	AT 1-702143 No. 7 final product position		72992 No. 1 glass
BF	AU 1-702243 No. 15 add reg. cl. mult. position		92 No. 1 Specify Color and Character, keypaper
BG	AV 1-702780 includes F		CG Refer to CF
BH	AW 72542 for two turnbuckles		CH 8451
BI	75638 for one turnbuckle		CI 702128 1/2 Z
BJ	AX 1-702119 3/4		CJ 1-702143 No. 4
BK	AX1 702119 1/2		CK 1-702243 No. 9
BL	AY 1-702760A includes AQ, BC, BF		CL Use 1-702760A
BM	AZ 12051 1/2		1-702779A
BN	BA 60550		1-702780
BO	BB 8451 screw		1-702119 3/4
BP	72167 1/2 washer		12051 1/2
BQ	BC 702303 1/2		72572 No. 1 in position No. 71
BR	BD 702123 1/2		72542
BS	BE 8082A		72501 1/2
BT	BF 72574		20 No. 73A
BU	BG 1-702235 1/2 includes T		75804 No. 2
	BH 81815A		20 No. 73A
	BI 1-103A Env. 1407 before machine serial No. A696950		Use 1-702760A
	1-702219 after machine serial No. A696950		1-702779A
	BJ 72501 1/2		1-702780
	BK 702561		1-702119 3/4
	BL 1A-102 Env. 1407 before machine serial No. A696950		74529
	1-702183 after machine serial No. A696950		72572 No. 1 with final product key in position No. 71
	BM 705367 eccentric		72542
	70512 screw		702128 3/4 Z
	BN 1-702185		8451 2 req.
	BO 702619		72501 1/2
	BP 1-702100 3/4		75804 No. 2
	BQ 4451 1/4 R		20 No. 73A
	BR 2850 1/4 A		Use 1-702760A
	BS 72148 No. 6		1-702779A
	BT 981 1/4 before machine serial No. A696950		1-702780
	709807 after machine serial No. A696950		1-702119 3/4
	BU 11-702001 No. 3 non-extend columns 1, 2 and 11 thru 15		74529
	1-702001 No. 5 non-extend column 1		72572 No. 1 with sub-product key in position No. 71
	11-702001 No. 5 non-extend columns 1 and 10 thru 15		75638
	31-702001 No. 5 non-extend columns 9 thru 15		702128 3/4 Z
	41-702001 No. 5 non-extend columns 8 thru 15		8451 2 req.
	51-702001 No. 5 non-extend columns 1 and 11 thru 15		72501 1/2
	11A-702001 No. 5 non-extend columns 1 and 8 thru 15		75804 No. 2
	10 thru 15		20 No. 73A
	31A-702001 No. 3 Env. 1407 non-extend columns 1 and 9 thru 15		Use 1-702760A
	1A-72001 No. 1 Env. 1407 non-extend column 1		1-702780
	11A-72001 No. 1 Env. 1407 non-extend columns 1, 2		1-702119 3/4
	31-72001 No. 1 Env. 1407 non-extend columns 1, 2, 3		74529
	21-72001 No. 1 Env. 1407 non-extend columns 1, 2, 3, 4		72572 No. 1 with sub-product key in position No. 71
			75638
			702128 3/4 Z
			8451 2 req.
			72501 1/2
			75804 No. 2
			20 No. 73A
			CM 77517

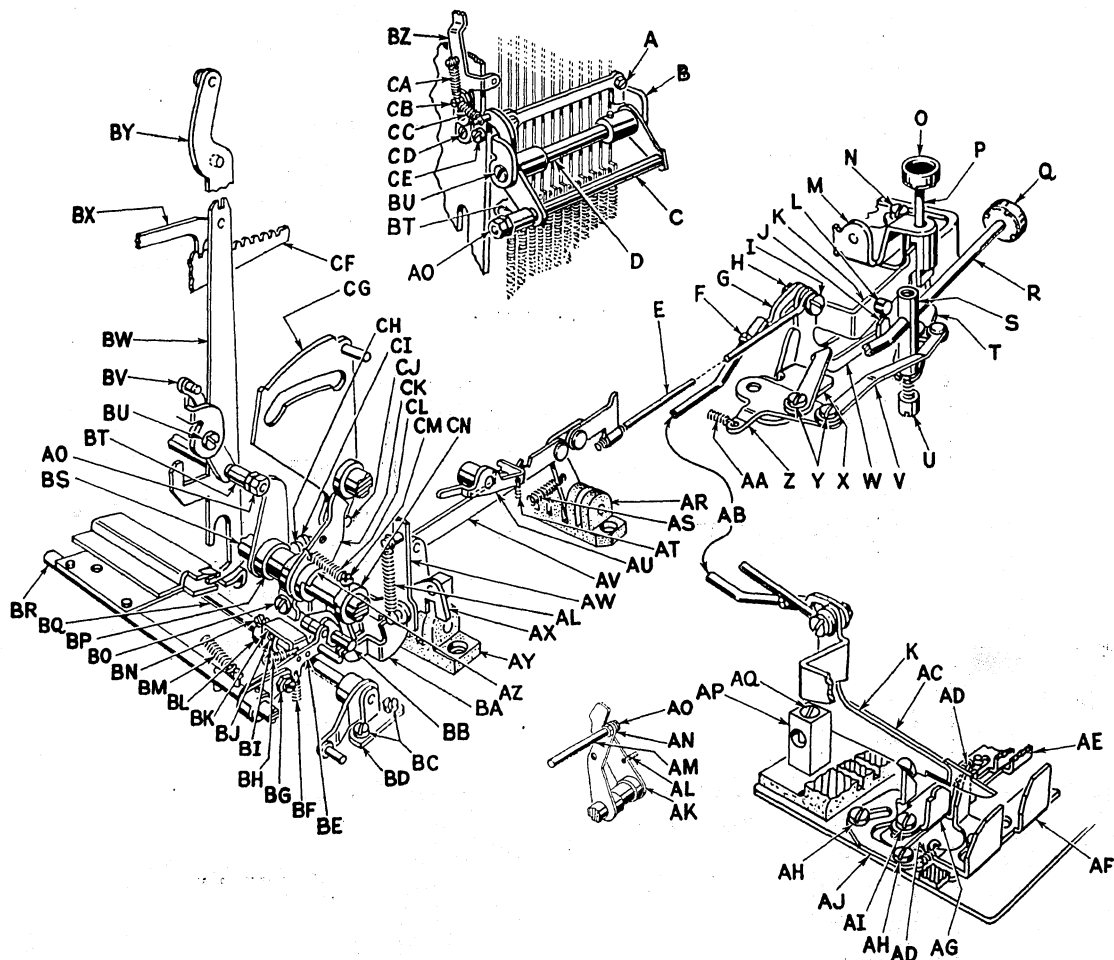
EXTEND, OR CREDIT REGISTER KEY LOCK MECHANISM, CLASSES 76, 77 (Plate 19)



SYMBOLS (Plate 19)

A	Included in D	P1	1-72215 No. 2
B	31A-71129 see plate 3 for other styles	Q	72556
C	Included in D	R	72148 No. 3
D	61A-71001	S	72567
	61-701001 (61A-701001, 11-702228B No. 1, 1-702229B No. 1, 3415 1/4, for cross-footer non-clear lock, add 1-701186A, for sterling mach. add 706160A)	T	72307 Ecc., 72568 screw, 46 nut
		U	1-72001 No. 2 } See plate 27 for other styles
		V	1-702001 No. 1 } other styles
		W	1-72182 No. 2
		X	3281 1/2 Spring
		Y	72342 Collar
		Z	1-71336 includes 550 1/4 screw
E	1-72214Z } Without reg.	AB	Included in assembly 1A-71152 for Cl. 76, 78 or assembly 1A-701159 for Cl. 75, 77
	1-702529 No. 2 } subt.	AC	1-71321 includes 75060 screw
	11-72214 } With reg.	AD	71561 Screw, 47 nut, 9028 1/2 washer, 79323 ecc.
	1-702529 No. 1 } subt.	AE	47 Nut, 9028 1/2 washer
F	72571	AF	71015 Narrow base
G	702529 No. 1		701015 Wide base
H	Included in K	AG	71127 Cam, use 71554 screw, 200313 1/2 washer, 47 1/4 nut
I	72700 No. 11	BA	Included in U
J	72816	BB	550 1/4 Screw
K	1-72211	BC	Included in U
L	1-72171 No. 6 includes G, N	BD	72307 Ecc., 72568 screw, 46 nut
M	71547 Screw	BE	72182 No. 3
N	3981		
O	Included in K		
P	72505		
	1-72215 No. 3		

CLEAR MULTIPLIER MECHANISM INDEXED FROM ADD REGISTER— CLEAR MULTIPLIER KEY POSITION NO. 67—CLASS 72 (Plate 19-1)



SYMBOLS (Plate 19-1)

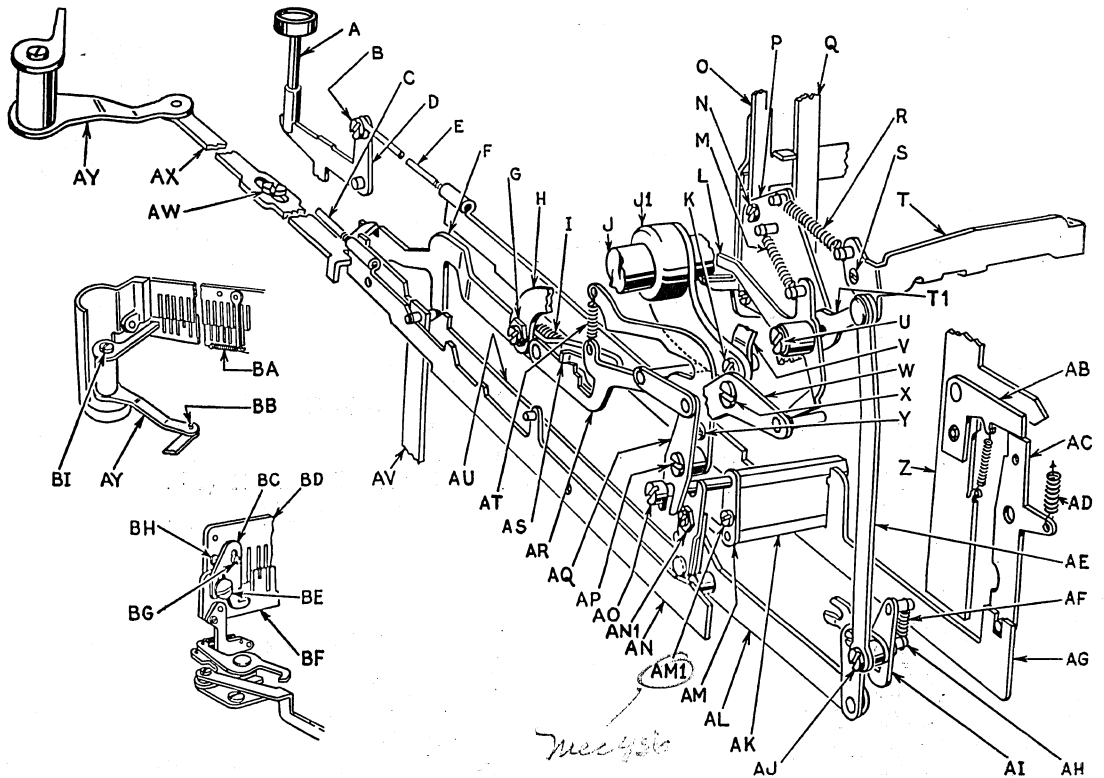
A	74535	
B	1-704101 No. 2 includes C, D, AO, BT, BU, BV	
C	704002	
D	1-704001 includes BV	
E	72700 No. 9	
F	49 3/8	
G	72110 No. 1	
H	71366 nut	
I	75631 screw	
J	Included in T	
K	1-702243 No. 9 includes L	
L	Included in K	
M	1B-72123 1/2 No. 1 without palm tab	} includes P and part of O
	2B-72123 1/2 No. 1 with palm tab	
	1-72123 1/2 No. 1 without palm tab	
	2A-72123 1/2 No. 1 with palm tab	
N	71517	
O	72200A No. 1 ring	
	72992 No. 1 glass	
	92 No. 1 Specify character and color, keypaper	
	72199 No. 1 cup	} included in M
	72210 washer	
P	72521 No. 8	
Q	72200A No. 1 ring	
	72992 No. 1 glass	
	92 No. 1 Specify character and color, keypaper	
	72199 No. 1 cup	} included in R
	72210 washer	
R	1-702709A No. 4 includes S, and part of Q	
S	702616L No. 3	
T	1-702203BL No. 4 includes J, V, use screw 75034	
U	72325	
V	Included in T	
W	72242	

Symbols continued on next page

SYMBOLS (Plate 19-1) continued

X	1-702246½ includes Z, use screw	73011	72307 eccentric
Y	72591	46 nut	
Z	Included in X	BH	3688
AA	3688	BI	75332 collar
AB	1-702738 includes F, G	BJ	75660 set screw
AC	1-702143 No. 11	BK	1-72114½ includes BB
AD	72820	RL	1-75332 includes BN
AE	1-72118A No. 2	BM	709807
AF	11-702156A use 71546 screw in left end, 79552 in right end	BN	75618 set screw
AG	1-1107 Fte. 133 No. 2	BO	72551
AH	77529	BP	1-701152 includes CK
AI	72589	BQ	21B-702011 without auto. extend
AJ	1102B Fte. 133		31-702011 with auto. extend
AK	11A-71152 No. 2	BR	1A-702001 No. 3 see plate 18-1 for other symbols
AL	72806	BS	51C-701012 with auto. extend
AM	71015		101-701012 without auto. extend
AN	9028½ washer	BT	704310 use 1097¼ lock washer, 46 nut, on right end
AO	47	BU	704537
AP	702902 No. 4	BV	Included in D
AQ	702505½	BW	1-74135 No. 2 includes BX
AR	72666 No. 2	BX	Included in BW
AS	72804	BY	1-71150A No. 1
AT	8381	BZ	1-704104
AU	1A-72190 No. 3	CA	79810 spring
AV	1-1111 Fte. 133 No. 3 includes BA	CB	74546 No. 2 screw stud
AW	1-72186 No. 2	CC	3280½ spring
	1-72186 No. 3 simultaneous addition from extend key	CD	74533
AX	1-72175 No. 5	CE	74500
AY	72665	CF	74114 No. 1
AZ	11-71336 includes set screw 550¾		704114 for improved lift arm const.
BA	Included in AV	CG	11A-71129 includes CJ
BB	Included in BK	CH	72114 No. 10
BC	72567	CI	1-177 Fte. 133
BD	72148 No. 5	CJ	Included in CG
BE	1-702182¼	CK	Included in BP
BF	3281½	CL	3284½
BG	79547 screw	CM	7064½
		CN	21-71336 includes CM

MULTIPLYING KEYS, EASY DEPRESSION, AND TYPEWRITER KEY LOCK MECHANISM (Plate 20)



SYMBOLS (Plate 20)

A 72521 No. 1 for Nos. 1-3-5-7-9
72521 No. 2 for Nos. 0-2-4-6-8
B 72572 No. 1
C 72707A No. 4 Motor bar wire, see letter J, plate 43
D 1-72243 No. 1 for Nos. 0-2-4-6-8
1-72243 No. 2 for Nos. 1-3-5-7-9
E 72703 Nos. 1 thru 10 see plate 2
F 1-72221 No. 3 } Includes Alt. See
1-702221 No. 3 } plate 3 for other
styles
G 75342 Ecc., 72522 1/2 screw
H 1-72111 1/2 A
1-72111 1/2 early
I 10782
J 141B-71001 see plate 17 for other styles
J1 1-71123*
K 76539
L 1A-74255
1-74255 No. 2 Cl. 78
M 79824
N 74500 use 76559 screw in lower hole
O 1-74150A No. 3
P 1-74253A
Q 1-74140A
1-74140 early
R 681 1/2
S 74500 No. 2 (74500)
T 1-74113A includes T1, AE, see plate 25
for other styles
T1 74254
U 74587
V 1-76145
W 1-74124A No. 1, Cl. 71, 72, 73
1-74124 No. 2, Cl. 76, 77

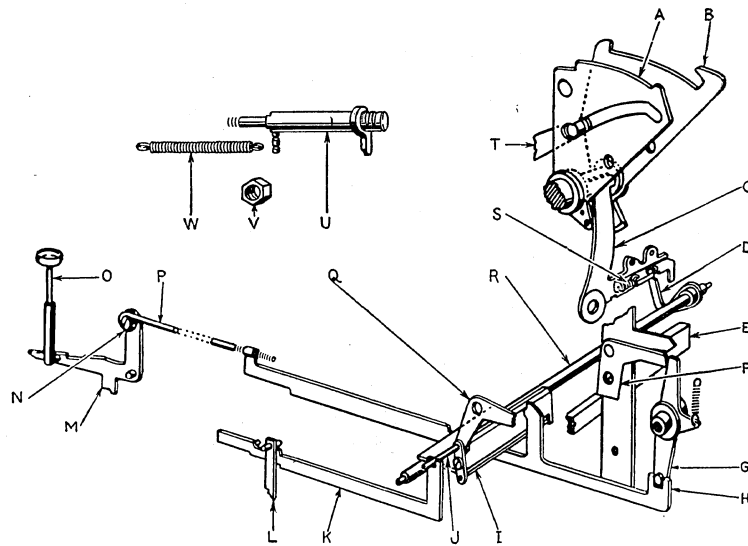
1-74124 No. 4 with reg. subt., Cl. 76
1-704124 No. 1 with or without reg.
subt., Cl. 76, 77
1-704124 No. 2, Cl. 78
1-704124 No. 3, Cl. 71, 72, 73
X 74527
Y 77514
Z 1-74107 Nos. 1 thru 18, 20
1-74107 No. 1-19 (1-74107 No. 1)
AB 74154 No. 1 or No. 2*
AC 1-74132 No. 2
AD 74803
AE 74118* included in T
AF 82813
AG 72102 No. 1
AH 72509 1/2
AI 1-74256
AJ 79503
AK 72900 No. 1
AL 11A-74119
1B-74119 Cl. 78
1B-704119
11-704119 Cl. 78
AM 72159
AM1 70512
AN 1-72102A No. 2 see letter II, plate 43
AN1 72383 Ecc., 74502 screw
AO 72509A No. 1 Cl. 71, 72, 73, wide base
and Cl. 76, 78, narrow base
72509A No. 3 Cl. 71, 72, 73, narrow
base
702509A Cl. 74, 75, 76, 77, 78, wide
base
AP 75637
AQ 1-72220B

AR 72219* included in F
AS 1-72216A
AT 7781A
8082A Cl. 78
AU 1-72102A No. 16 includes AN1
1-702102A No. 16
AV 1-71903A No. 1 see plate 43 for other
styles
AW 71520
AX 72283 No. 3
72283 early
1-72283A No. 2 Cl. 78
1-702223 No. 2 Cl. 78
702223A No. 3 } Cl. 75, 77 with
702223 No. 3 early } sel. skip tab
1-702223A No. 3 Cl. 75, 77
AY 1-75121A
1-705121A
BA 681
BB 71520
BC 75136A (705136 1/2)
BD 1-75128B
11-75128B used with 39 keys
BE 75610
BF 1-75214A
11-75214A used with 39 keys
21-75214A with four period type and
auto. date
31-75214A with four period type or
auto. date
BG 74523
BH 74523
BI 77513 Long screw, 75503 sleeve, 7356 1/4
short screw

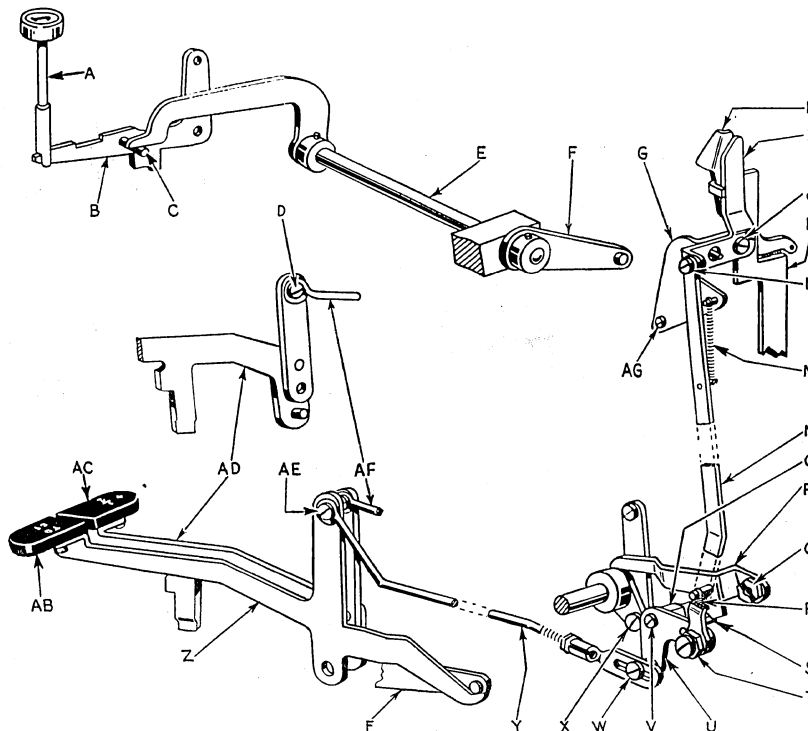
MULTIPLYING KEY MECHANISM, EARLY (Plate 21)

SYMBOLS (Plate 21)

- A 1-71129 includes B, see plate 3 for other styles
 B 1-71130*
 C 1-72163 No. 1 see plate 6 for other styles
 D 1-72161*
 E 74914 No. 1
 F 74154 No. 1* or No. 2*
 G 1-74132 No. 1
 H 72102 No. 1
 I 72900 No. 1 included in R
 J 72509
 K 1-72102 No. 3
 L 1-71903A No. 1
 M 1-72243 No. 1 used for Nos. 0-2-4-6-8
 N 1-72243 No. 2 used for Nos. 1-3-5-7-9
 O 72572 No. 1
 P 72521 No. 1 used for Nos. 1-3-5-7-9
 Q 72521 No. 2 used for Nos. 0-2-4-6-8
 R 72703 Nos. 1 thru 10, see plate 2
 S 1-74128A No. 1 use screw 74529
 T 61-72011 includes D, I, J, see plate 25 for other styles
 U 72805 Spring
 V 1-71143
 W 1-71003 No. 2
 X 1-701003 No. 2
 Y 47
 Z 701802



MULTIPLIER TO CROSSFOOTER SUB-TRANSFER BAR (Plate 22)

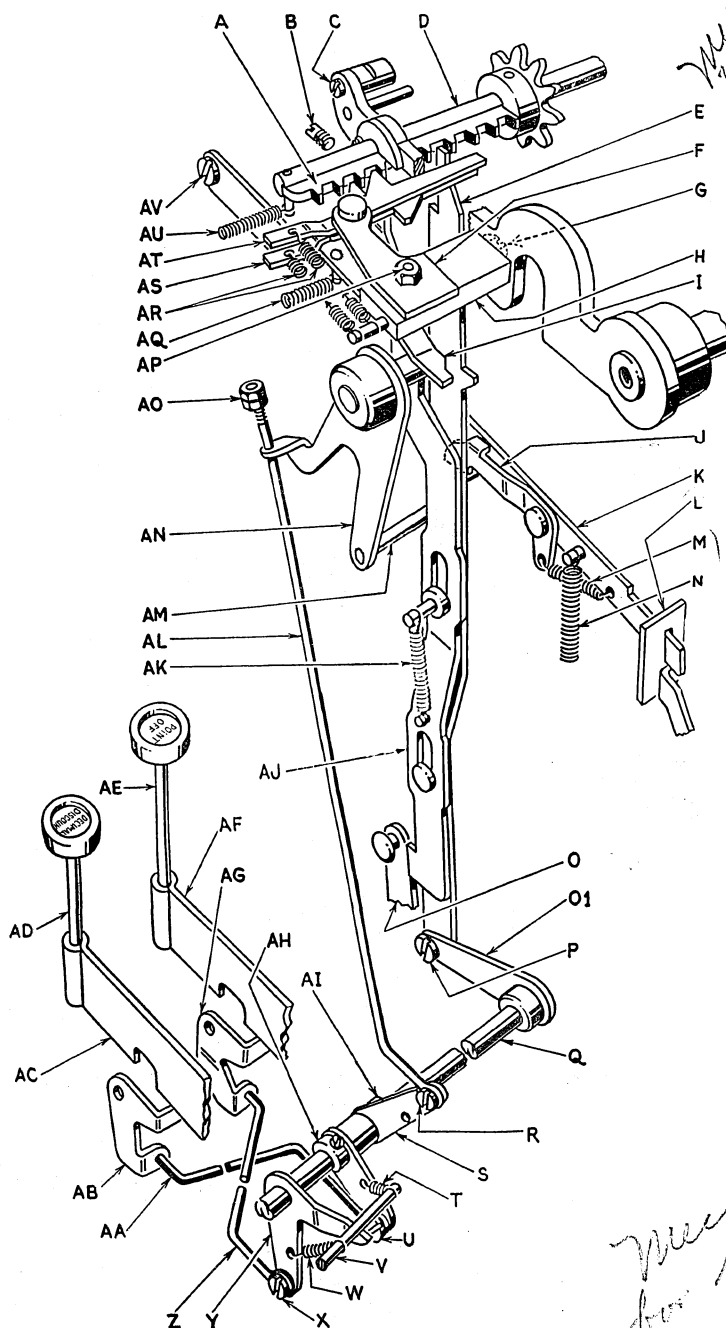


SYMBOLS (Plate 22)

- A 72521 No. 1
 B 1-121 Ftc. 138 No. 2
 C 8362*
 D 72572 No. 1
 E 1 Ftc. 138*, complete assembly 1-1 Ftc. 138, includes F
 F 1-111 Ftc. 138*
 G 1-104B Ftc. 138
 H 1-104A Ftc. 138 early
 I 100 Ftc. 138* included in K
 J 102 Ftc. 138
 K 79503
 L 1A-100 Ftc. 138 includes H
 M 72576 No. 1
 N 72814
 O 1-103 Ftc. 138
 P 503 Ftc. 138
 Q 1-116 Ftc. 138
 R 72340
 S 72809 Spring
 T 502 Ftc. 138* included in U
 U 72307 Ecc., 73612 screw
 V 1-112 Ftc. 138
 W 75648
 X 79511 use 200283 washer
 Y 74501
 Z 1-702 Ftc. 138 No. 1 } Includes narrow base
 1-702 Ftc. 138 No. 2 } 72110
 wide base } No. 1
 turnbuckle
 AB 1-118 Ftc. 138 specify, TO CF, use 72592 screws
 AC 1-118 Ftc. 138 specify, + 1/2, use 72592 screws
 AD 1-117A Ftc. 138
 AE 1-117 Ftc. 138 early
 AF 72572 No. 1
 AG 72706
 AH 504 Ftc. 138

SEE EXPLANATION ON INSIDE OF FRONT COVER

POINT OFF AND DECIMAL DISCOUNT KEY MECHANISM (Plate 23)

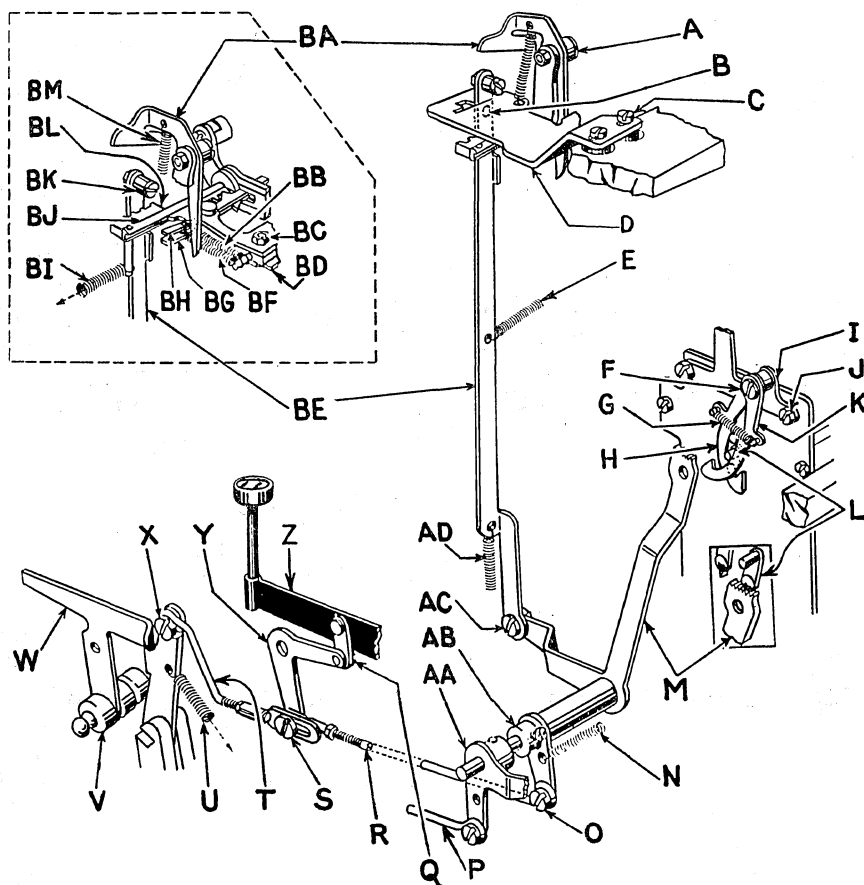


SYMBOLS (Plate 23)

A	79924
B	79582
C	79587
D	1-79009 No. 1
E	1-72226 includes AJ
F	1-79121 No. 2 includes AT
G	76567
H	1-79923 (1A-74140 No. 3, 1A-79923) complete assembly, includes F, H, I, AP, AR, AS, AT
I	1-79121 No. 1 (1A-74140 No. 3, 1A-79923)
J	76127 use 76521 rivet
K	1-76126A includes J
	1-76126Z } Cl. 76
L	11-76126A
M	1-74129 (11-704129 No. 3)
N	76806
O	1-16380B
O1	1-72201* included in 1-72006 or 1-702006, use 72826 spring
P	1-72225*
Q	75637
R	1-72007 } Assembled shaft, includes
S	1-702007 } O1, S, Y, AH, AI
T	72572 No. 1
U	72224*
V	75814
W	72572 No. 1
X	70502
Y	75814
Z	72572 No. 1
AA	1-72223*
AB	72704
AC	702704 No. 2
AD	72704
AE	702703 No. 2
AF	1-72233 No. 2 use long screw 72615
AG	1-75110 No. 17 includes AD
AH	75521 No. 3* } Use 92 No. 1 keypaper,
AI	75521 No. 4* } specify char.
AJ	1-75110 No. 16 includes AE
AK	1-72233 No. 1
AL	1-28345 includes 75618 screw
AM	1-28345 includes 75618 screw
AN	1-72227* included in E
AO	72814
AP	72702
AQ	72538*
AR	1-76151 includes 76540 screw
AS	49
AT	79581 Screw, 46 nut
AU	79822 used for 50 and 60 pinion
AV	79814 used for 30 pinion
	79815 (701806)
	79122 No. 2* included in I
	79122 No. 1* included in F
	79823 used for 50 and 60 pinion
	12088 used for 30 pinion
	76534A

*See 332
for support
Stop over failure - see 439*

DECIMAL DISCOUNT KEY TO POINT OFF TWO OR MORE PLACES (Plate 24)

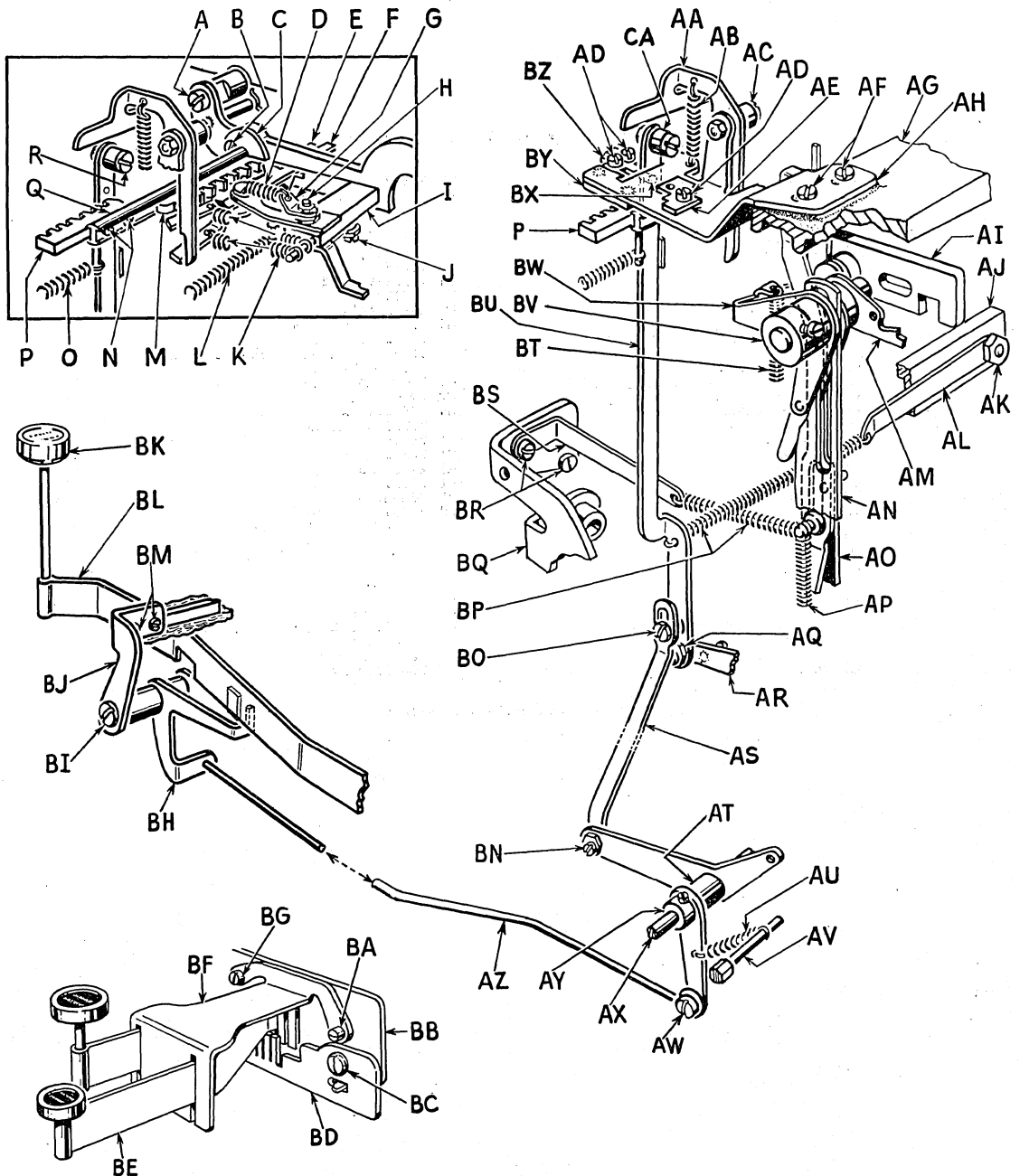


SYMBOLS (Plate 24)

A	12059 1/2 Screw, 46 nut	T	1-701 Env. 215 includes 72110 No. 1 turnbuckle, 49 1/2 nut
B	72605	U	288 3/4 (983)
C	72567 Screw, 301 Env. 374C washers	V	72116 No. 4
D	111 No. 1 Env. 374C points off two places	W	1-72117 No. 5 Env. 215
	111 No. 2 Env. 374C points off three places	X	72572 No. 1
	111 No. 3 Env. 374C points off 1 place	Y	1-111 Env. 215
	111 No. 4 Env. 374C points off four places	Z	1-109 Env. 215 complete assembly
E	74812 use 20 No. 105 anchor	AA	1-72223*
F	8863	AB	1-28345 includes 75618 screw
G	800 Fte. 145	AC	506 Env. 374C Screw, 46 nut
H	1-300145AR	AD	72827 use 1-72216A Env. 374C anchor
I	1-115A Env. 215	BA	1-101A Env. 374C
J	74505	BB	79815 (701806)
K	1-300145AL	BC	46 Nut, 79581 screw
L	1A-114 Env. 215 use 505 Env. 215 rivet	BD	1-79121 No. 1 Env. 374C (1A-74140 No. 3, 1A-79923, 1-101A Env. 374C) includes BG
M	1A-300A Env. 215 complete assembly 1-72007 No. 2 Env. 215 includes M, AA, AB	BE	1-103B Env. 374C
N	3880 1/2	BF	79815 (701806)
O	72572 No. 1	BG	79122 No. 2*
P	72704 dec. discount, use 72572 No. 1 screw	BH	79122 No. 1* assembled 1-79121 No. 2
Q	79503 Screw	BI	79823A Env. 374C
R	700 Env. 215 use 72110 No. 3 turnbuckle, 49 1/2 nut	BJ	1-79009A No. 3 Env. 374C specify machine number, complete pinion shaft assembly, includes BL
S	79503	BK	503 Env. 374C Ecc., 203401 roll, 49 1/2 nut
		BL	79924A Env. 374C
		BM	71807

SEE EXPLANATION ON INSIDE OF FRONT COVER

DECIMAL DISCOUNT MECHANISM TO POINT OFF NO, ONE, TWO OR THREE PLACES—WHEN INDEXED BY DECIMAL DISCOUNT KEY OR FULL CENT BAR (Plate 24-1)



SYMBOLS (Plate 24-1)

A 79587
B 79580 screw
C 79338 No. 1
D 986
E 1-79121A No. 1
F 1-79121 No. 2
G 20 No. 116
H 79581 screw
I 46 1/4 nut
J 709385 eccentric

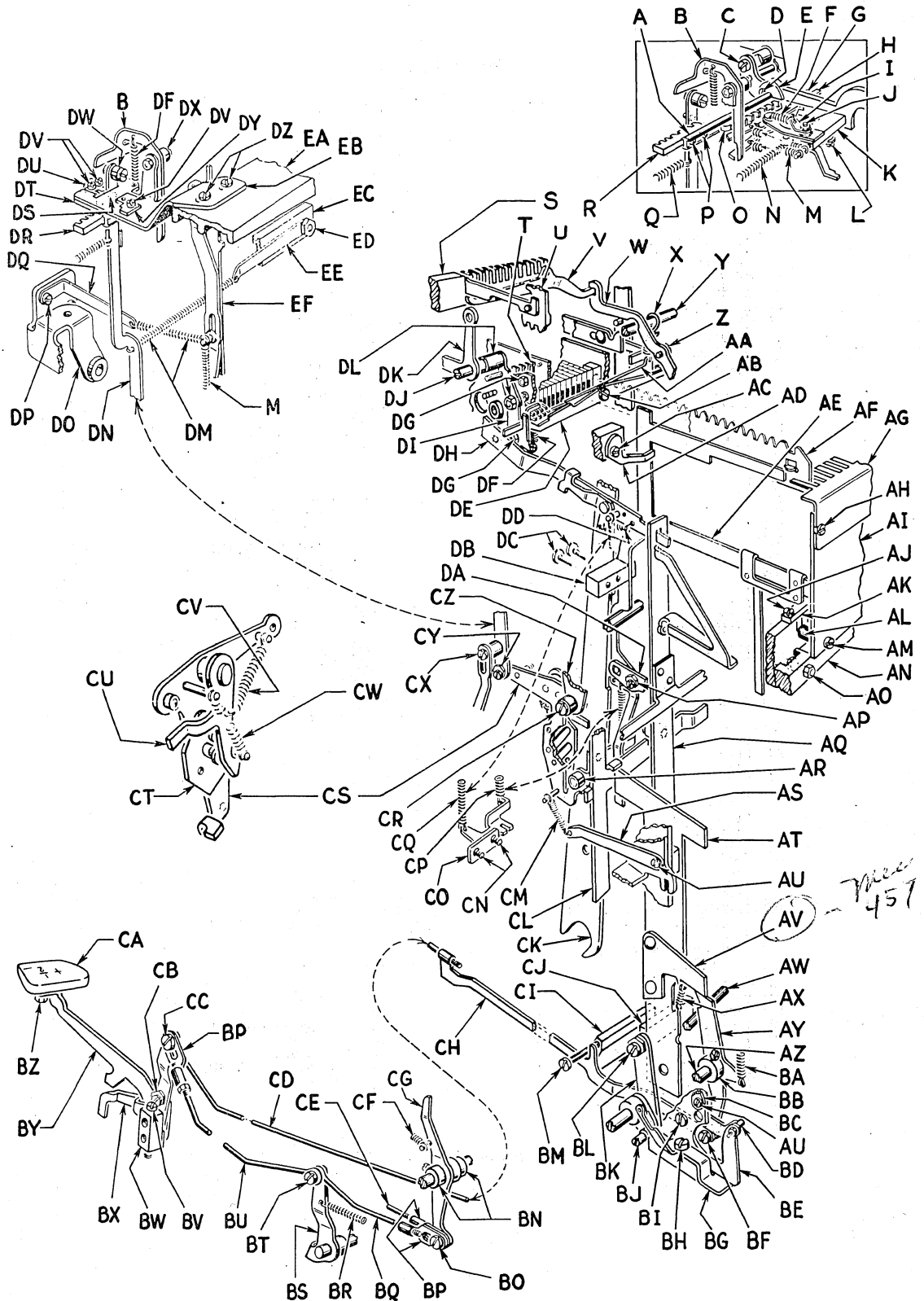
I 1A-79923 includes E, F, G, H, J, K
J 76567 screw
K 79362 eccentric
L 72814 springs
M 16380B
N 709924 No. 2
O 79582 screws
P 79582 screws
Q 3682 spring
R 709924

SYMBOLS (Plate 24-1) Continued

Q	1A-709009 No. 5 assembled pinion shaft	BA	72567
R	203401 roll	BB	1A-705128 No. 3
	704546 screw	BC	75633
	49½ nut	BD	1A-705214 No. 4
AA	1-709103	BE	1-705110A No. 17
AB	71807	BF	705128 ¼
AC	12059 ⅜ screw	BG	79565
	46 nut	BH	1-72233 No. 2
	203401 roll	BI	702602
AD	70512 screw	BJ	1-702127 ½
AE	709102 No. 2 stamped 0 and 1	BK	72200A No. 1 ring
AF	73611		72992 No. 1 glass
AG	1A-700668 No. 4		92 No. 1 specify character and color, key paper
AH	1-709100 includes AD, AE, BY, BZ	BL	1B-75110 No. 17
AI	1-76110AR No. 1	BM	79543
AJ	11-706911 No. 1	BN	70512 screw
AK	47		705367 eccentric
AL	20 No. 105	BO	75636
AM	1-76144	BP	74812
AN	1-706145	BQ	1-71212B
AO	1-72226	BR	79610
AP	72814	BS	20 No. 142
AQ	72367 eccentric	BT	71803 for ⅓ fractions
	79543 screw		71807 for 1/10 fractions
AR	1-704208	BU	1-704212 includes BX
AS	702237 ¼	BV	1-7140¾ collar, includes 550 ¾ set screw
AT	1-702237 ½	BW	1-706147 No. 2
AU	75814	BX	Included in BU
AV	701501 No. 2	BY	Included in AH
AW	72572 No. 1	BZ	709102 No. 2 stamped 2 and 3
AX	11-702007 includes AT, AY	CA	203401 roll
AY	1-8345 collar, includes 8359 set screw		49 ½ nut
AZ	702703 No. 2		704546 screw

Replaces General Print 205-1/M

FULL CENT BAR TO ADD .005 (OR .009); POINT OFF NO. ONE, TWO, OR THREE PLACES; AND TABULATE CARRIAGE (Plate 25-1)

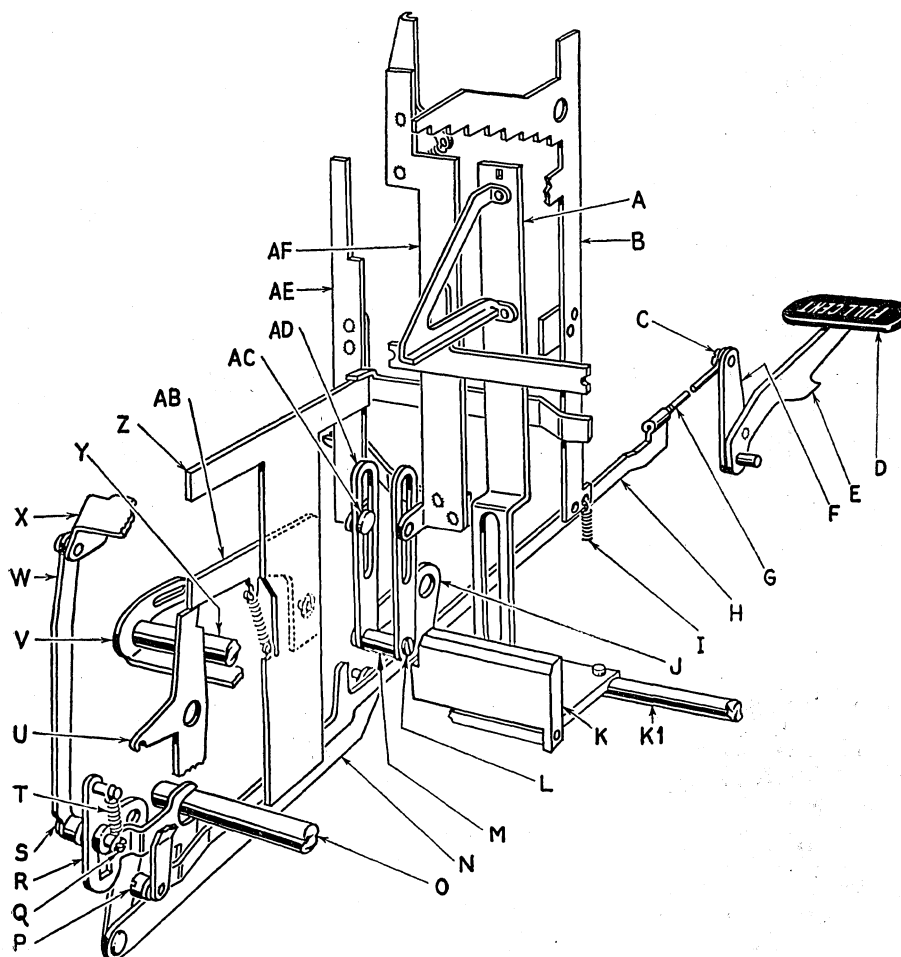


SYMBOLS (Plate 25-1)

A	1A-709009 No. 5 assembled pinion shaft	BP	72110 No. 1
B	1-709103	BQ	1-702761 includes BP
C	79587	BR	99802 No. 2
D	79580 screw	BS	702295 1/4 No. 2
E	79338 No. 1	BT	514 Fte. 146
F	986 spring	BU	1-702762 includes BP
G	1-79121A No. 1	BV	72618A
H	1-79121 No. 2	BW	1A-72903
I	20 No. 116	BX	72124B No. 1
J	79581 screw	BY	1-702117B No. 3
	709385 eccentric	BZ	49 1/4
	46 1/4 nut	CA	2A-702125 No. 6 "+ 1/2"
K	1A-79923 includes F, G, H, I, J	CB	705367 eccentric
L	76567 screw		703592 screw
	79362 eccentric	CC	508 Fte. 141
M	72814 springs	CD	72706
N	16380B	CE	1-702707 No. 2
O	709924 No. 2	CF	2887 1/4
	79582 screws	CG	1-705159 No. 2
P	79582		1-705159Z No. 2 slotted blank for repairs on wide base machines except selective column tabulation
Q	3682	CH	72102 No. 19
R	709924	CI	72900 No. 2
S	1-709912 No. 2 includes V	CJ	1-704914 No. 6
T	76130 No. 4	CK	1-701150 1/2 used in fourth position from right
U	11A-79222 No. 1	CL	1-704150 No. 6 includes AR
V	Included in S	CM	77879
W	74105A No. 1	CN	74528
X	20 No. 86A spring anchor	CO	704268 No. 2
	283A spring	CP	84813 No. 2
Y	709021 shaft	CQ	706803
Z	76575 screw	CR	73605
AA	706154 No. 11	CS	1-704208 includes CT, CU
AB	76556A	CT	Included in CS
AC	72581 screw	CU	Included in CS
AD	706165	CV	72827
AE	1A-704151 No. 5 includes AP, DA	CW	10085
AF	11-706111 No. 50 stamped "11-50W"	CX	75636
AG	704100 No. 3	CY	72367 eccentric
AH	74533		79543 screw
AI	704139 No. 2	CZ	1-704182A
AJ	79543 screw	DA	704153A
AK	704101	DB	704900
AL	74309 space collar	DC	72567
AM	72614 screw	DD	71803
AN	704000A Env. 1060B	DE	1-706154 No. 10
AO	46 nuts	DF	71807
	704531 post	DG	46
AP	71361 eccentric	DH	1-76126A
	79543 screw	DI	1-76236
AQ	21-704129 No. 3	DJ	706512
AR	Included in CL	DK	1-706231A
AS	20 No. 146	DL	200469
AT	1-74107 No. 1 includes AV, stamped 1-19	DM	74812
AU	74565 screw	DN	1-704212 includes DS
AV	Included in AT	DO	1-71212B
AW	704024 shaft	DP	79610
AX	74801 spring	DQ	20 No. 142
AY	1-704132 No. 15	DR	709924
AZ	21B-704025 No. 1 assembled shaft	DS	Included in DN
BA	74803	DT	Included in EB
BB	11-74308 No. 2 collar, includes 12055 1/8 set screw	DU	709102 No. 1 stamped 2, 3
BC	74230	DV	70512
BD	702662 post screw	DW	203401 roll
	49 3/4 nut		704546 screw
BE	1-702102B No. 16		49 1/2 nut
BF	75637 screw	DX	12059 1/8 screw
BG	74250 No. 2		203401 roll
BH	74524		46 nut
BI	74526 No. 2	DY	709102 No. 2 stamped 0, 1
BJ	704588	DZ	73611
BK	74123	EA	1A-700668 No. 4
BL	704589 screw	EB	1-709100 includes DT, DU, DV, DY
	704300 1/2 No. 2 eccentric	EC	11-706911 No. 1
BM	72509A No. 1	ED	47
BN	1-75332 collar, includes 75618 set screw	EE	20 No. 105
BO	707505	EF	1-72226

Replaces General Print 206-1/M

FULL CENT KEY MECHANISM (Plate 25)



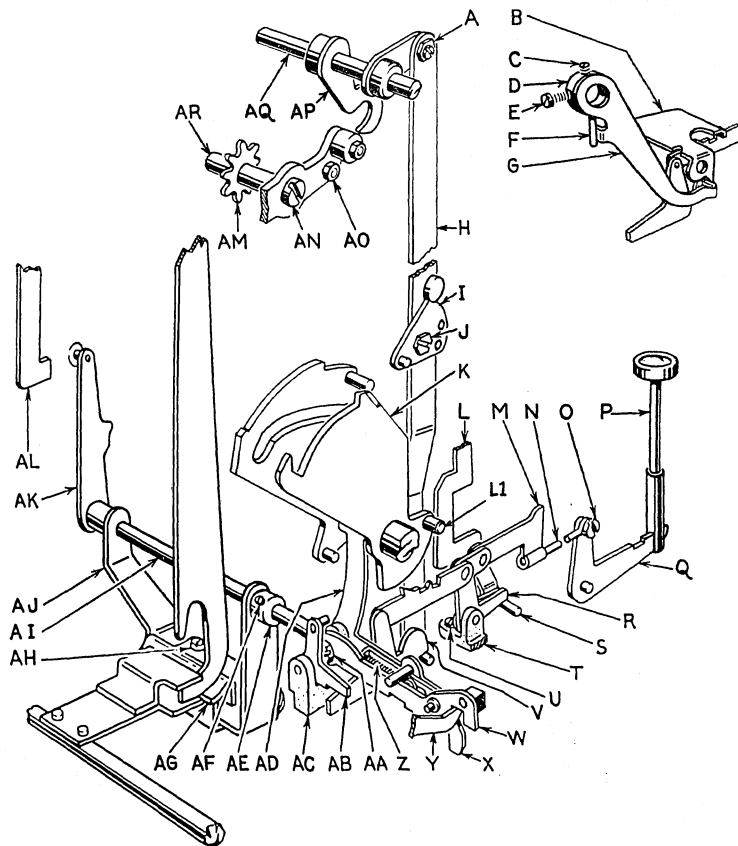
SYMBOLS (Plate 25)

- | | | | |
|----|---|----|---|
| A | 1-74129 (11-704129 No. 3) use 72576 No. 1 screw in bottom | N | 11A-74119 see plate 20 for other styles |
| B | 1-74151 No. 2 | O | 1-74044 |
| C | 72572 No. 1 | P | 74591 |
| D | 1-72125 No. 2 specify full cent, use 72592 screws | Q | 72509 1/2 |
| E | 1-72117A No. 2 | R | 1-74256 |
| F | 72124A No. 1 on 1-72903 block, use 72618 screw for block | S | 79503 |
| G | 72706 | T | 82813 (87801A) |
| H | 72102 No. 4 | U | 1-74132 No. 4 |
| I | 74806 | V | 74134 |
| J | 1-74128A No. 1 use 74529 screw | W | 74113* |
| K | 72900 No. 1 Cl. 72 | X | 1-74113A includes W
1Z-74113 early
1-74113B No. 2
1Z-74113 No. 2 early } Cl. 78
1-704113A No. 1
1Z-704113 No. 1 early
1-704113B No. 2 Cl. 78
1Z-704113 No. 2 early |
| K1 | 72900 No. 2
11-72011 includes K, Cl. 76
21A-72011 Cl. 78
51-72011 with auto. ext., Cl. 71, 72, 73
61-72011 without auto. ext., Cl. 71, 72, 73
1-702011 Cl. 76, 77
11-702011 Cl. 78
21A-702011 without auto. ext., Cl. 71, 72, 73
1-702011 Env. 1415 with auto. ext., Cl. 71, 72, 73 | Y | 74024 |
| L | 75616 | Z | 1-74107 No. 1-19 (1-74107 No. 1) includes AB |
| M | 74304 Space collar | AB | 74154 No. 1* |
| | | AC | 75541* |
| | | AD | 74163* |
| | | AE | 1-74150A No. 3 includes AC, AD |
| | | AF | 1-74140A
1-74140 early
1-74140 No. 2 Cl. 78 |

FIRST PRODUCT KEY MECHANISM (Plate 26)

SYMBOLS (Plate 26)

A	79322 Ecc., 72568 screw
B	72189 No. 9 see plate 6
C	4557A
D	1-71327 includes C, E, F
E	950%
F	71546
G	71134
H	1-71185 Cl. 78
I	11-79215 includes I, J
J	1-79217 No. 2 use 72812 spring
K	79551 No. 2 Screw, 1097 1/4 lock washer, 46 nut
L	11A-71129 see plate 3 for other styles
M	71146 use 71546 screw in top
N	71528A Stud, 81376 roller
O	71528Z Screw stud, use 46 nut
P	72173 No. 1* included in V
Q	72700 No. 9
R	72572 No. 1
S	72521 No. 2
T	1-72143 No. 4
U	72170 No. 3* included in V
V	72570 No. 1 (72570 No. 2)
W	72666
X	75617
Y	1-72171 No. 3 includes M, R
Z	1-72175 No. 5 see plate 7 for other styles
AA	72166 No. 1*
AB	11-71220
AC	72805 (72820)
AD	72340 Nut, 72511 screw
AE	1-72114 No. 2 use 72551 screw
AF	72665
AG	11-72163 No. 3 includes X, see plate 6 for other styles
AH	1-28345 includes AF
AI	75618
AJ	72120 1/4 A
AK	702120 1/4
AL	72584 narrow base
AM	73618 wide base
AN	1-72006 includes AK
AO	1-702006
AP	AJ 72120 1/4 A No. 1 includes AE, AF, AI, AK, also bracket 72120 1/4 A No. 1 and screws 7357 1/2
AR	1-702120 1/4 A No. 1 (1-702120 1/4 A No. 1, 702121 1/4, 79505, 2 req., 79362, 2 req., 71554, 2 req.)
	AK 1-72201* included in AI
	AL 1-72227* complete assembly 1-72226
	AM 79116 No. 1
	AN 79583
	AO 46
	AP 1-79219 No. 1* included in AQ
	AQ 11-79022 No. 1
	AR 1-79009 No. 1 includes AM

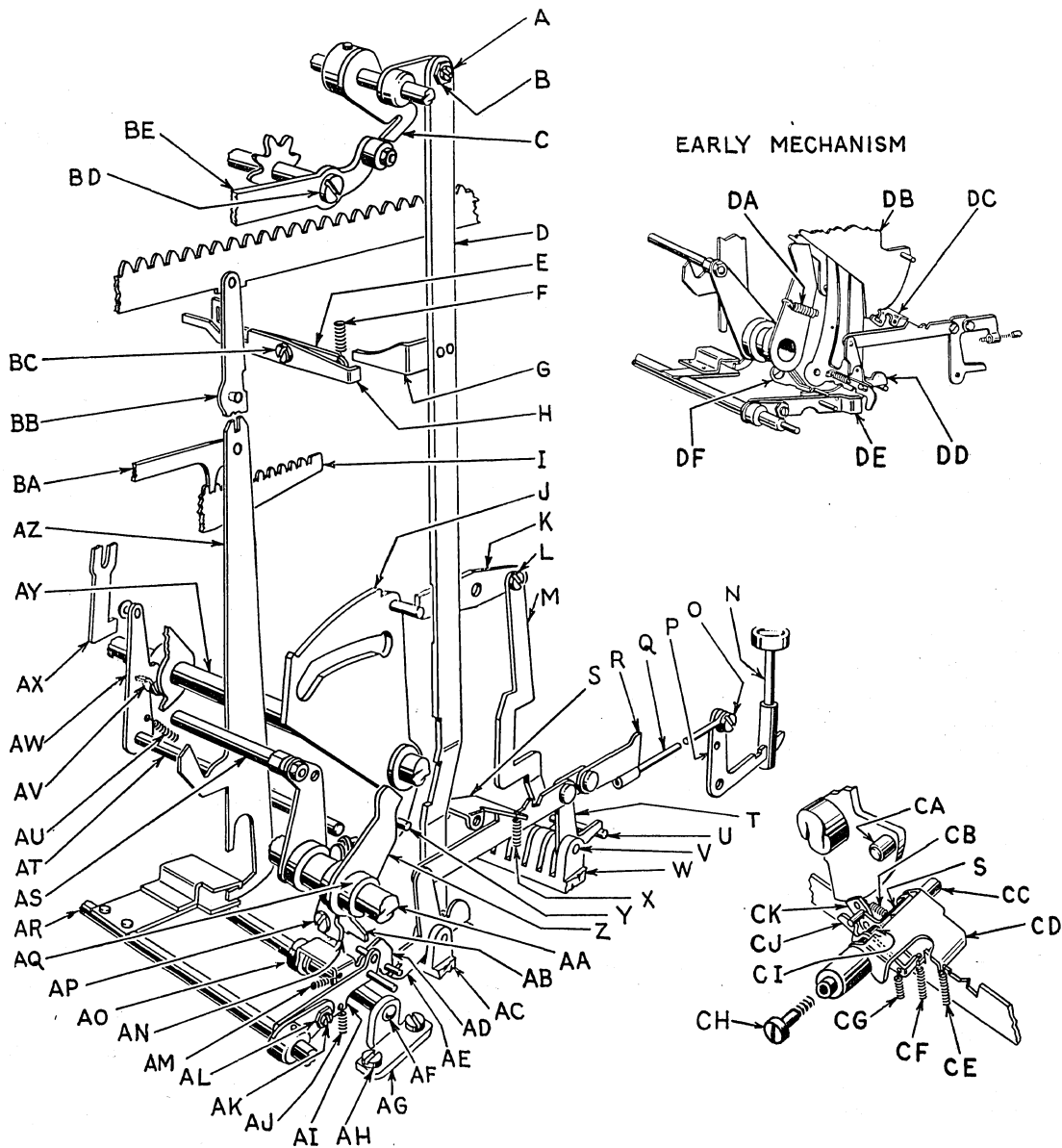


SYMBOLS (Plate 27)

A	72568	X	72809	AE	1-72171 No. 12 includes R, T
B	79322	Y	71509	AF	51-72011 with
C	1-79219 No. 1* complete assembly	Z	71509Z Screw stud, 46 nut		auto. ext. See plate 25
D	11-79022 No. 1		11A-71152 No. 2 Cl. 71, 72, 73		61-72011 without
E	11-79215		1A-701159 Cl. 75, 77		auto. ext. for other styles
F	76154 No. 1			AG	72148 No. 5
G	76808	AA	1A-71012 (1B-71012, 1-701148) Cl. 71, 72, 73	AH	72567
H	79216 No. 1*		11A-71012 Cl. 74	AI	1-72182 No. 5
I	1-76154A No. 2		21A-71012 Cl. 76		1-72182 No. 2 Cl. 76
J	74114 No. 1		31B-71012 Cl. 78	AJ	3281 1/2
K	11A-71129 } See plate 3 for		1A-701012 Cl. 76, 77	AK	72568 Screw, 46 nut
	1-71129 early } other styles		11A-701012 with reg. des. mech.	AL	72307 Ecc.
L	1-71144 use 79551 screw and 71806 spring		21A-701012 Cl. 74, 75	AM	4489
M	71546		31A-701012 Cl. 78	AN	72114 No. 3 (702114 No. 4) without reg. subt., Cl. 76, 77
N	701146		51B-701012 Cl. 71, 72, 73		72114 No. 5 with reg. subt., Cl. 76, 77, 78
O	72521 No. 2 Keystem				1-72114 No. 10 without auto. extend, Cl. 71, 72, 73
P	72572 No. 1	AB	1-72114 No. 2 Cl. 71, 72, 73		1-72114 No. 11 with auto. extend, Cl. 71, 72, 73
Q	1-72143 No. 4		1-72114A No. 7 } With reg. subt., Cl. 76, 77	AO	1-75332 includes 75618 screw
R	72700 No. 9		1-72114 No. 8 } Cl. 78	AP	72551
S	72173 No. 1* included in AE		1-72114A No. 8 early } Cl. 78	AQ	1-71336 includes 550% screw
T	1-72188A No. 1 see plate 6 for complete assembly	AC	72665	AR	21-72001 No. 1 Cl. 71,
U	72170 No. 1* included in AE	AD	1-72114 1/2		1-72001 No. 1 early / 72, 73
V	72570 No. 1 (72570 No. 2)				1-72001 No. 2 Cl. 76
W	72005				
X	72666 use 75617 screws				

SEE EXPLANATION ON INSIDE OF FRONT COVER

FINAL PRODUCT KEY MECHANISM (Plate 27)



SYMBOLS (Plate 27)—Continued

11-72001 No. 2 with reg. subt., Cl. 76
 31-72001 No. 2 Cl. 78
 41-72001 No. 2 with CF subt., ege.
 controlled, Cl. 78
 1-702001 No. 1 Cl. 76, 77
 11-702001 No. 1 with reg. subt., Cl. 77
 1-702001 No. 2 Cl. 78
 1A-702001 No. 3 Cl. 71, 72, 73
 71015 Ecc., 10240 washer, 47 nut
 AT 1-72006 includes AW
 AU 71808
 AV 71126 use 72581 screw
 AW 1-72201* included in AT
 AX 1-72227* complete assembly 1-72226
 AY 141B-71001 see plate 17 for other styles
 AZ 1-74135 No. 1

BA 74117 No. 1* included in AZ
 BB 1-71150 No. 1
 BC 76556A
 BD 79583
 BE 1-79120L*
 CA 71528A Stud, 81376 roller
 71528Z Screw stud, use 46 nut
 CB 72810
 CC 72002 No. 2
 (72002A, 79545) } With
 702002 No. 2 } short
 (72002A, 79545) } hub
 72002 (72002A, } With
 79545) } long
 702002 (72002A, } hub
 79545) }

CD 72189 No. 9 see plate 6 for complete
 assembly
 CE 72809
 CF 284
 CG 72809
 CH 71518
 CI 9934 Collar
 CJ 1-72190B No. 1
 CK 11-72191A No. 2* included in S
 DA 701802
 DB 1-71129
 DC 72189 No. 4
 DD 1-72171 No. 2 complete assembled
 linkage
 DE 1-72182 No. 1
 DF 1-72114 No. 1

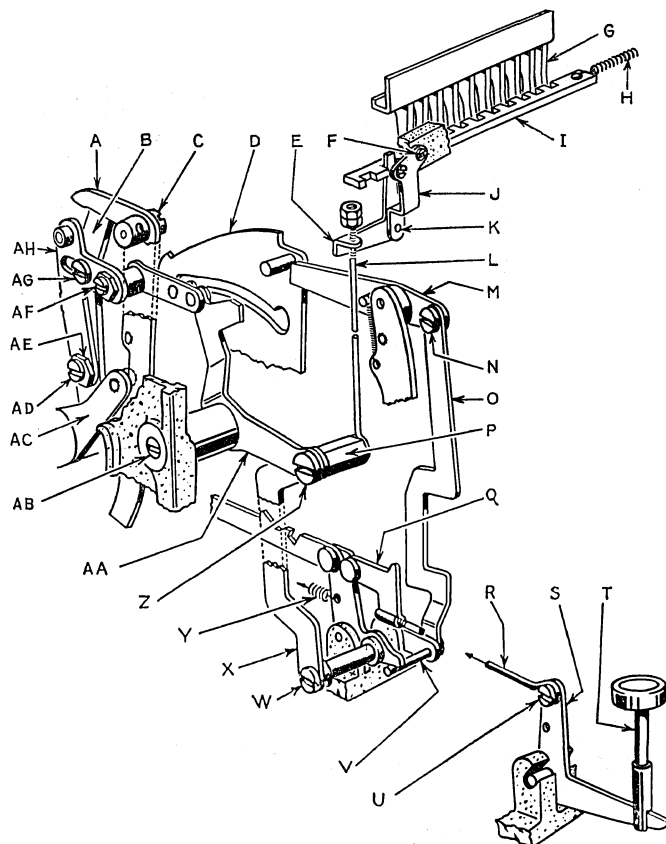
See plate
 6 for
 complete
 assemblies

SEE EXPLANATION ON INSIDE OF FRONT COVER

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For Form 2952

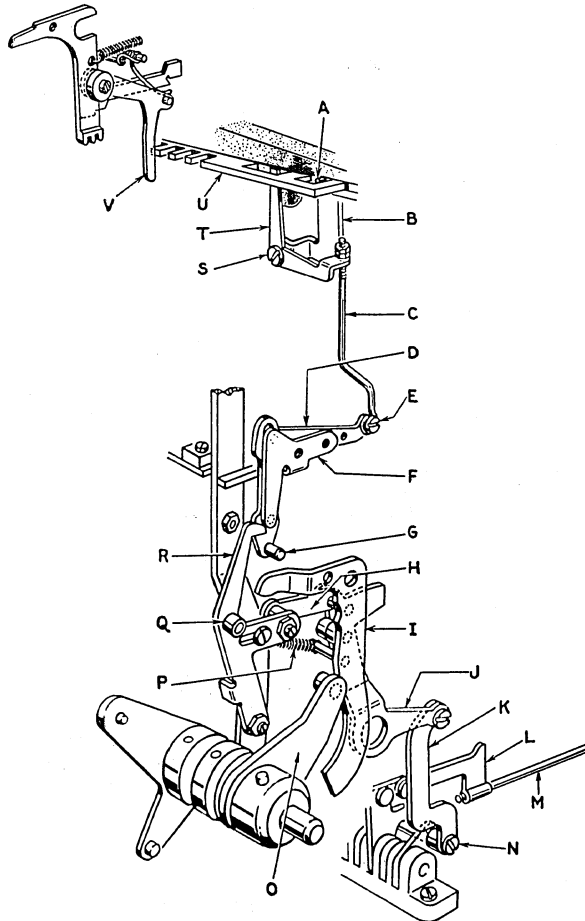
REGISTER TOTAL KEY MECHANISM (Plate 28)



SYMBOLS (Plate 28)

A	1-71187 No. 2 (1A-71187 No. 2, 71586A)	R	72700 No. 10
B	1-79223A No. 2		1-72714 No. 15 includes 72110 No. 3 turnbuckle, Cl. 78
C	71586 (71586A, 1A-71187 No. 2 for narrow base, or 1A-701187 for wide base) use 47 nut	S	1-72143 No. 2
D	11A-71129 see plate 3 for other styles	T	72521 No. 1
E	79115	U	72572 No. 1
F	75621	V	72570 No. 1 (72570 No. 2)
G	1-79209A No. 1	W	75615
H	10086	X	71188
I	1-79934 No. 1		71188 No. 2 used with reg. totals to print in red
J	70125	Y	72804
K	79503	Z	71589
L	72714 No. 10 use 72572 No. 2 screw	AA	1-71189 No. 2
M	1-71144	AB	71547
N	71546	AC	1-71133 No. 2* included in 141B-71001, see plate 17 for other styles
O	71146	AD	73611
P	71367	AE	79362
Q	41-72171 No. 5 Cl. 71, 72, 73, see plate 6 for other styles	AF	72567 Screw, 79362 ecc.
		AG	79613
		AH	1-79233 (1-79233A)

CARRY BLOCKING MECHANISM—POWER OPERATED (Plate 28-1)



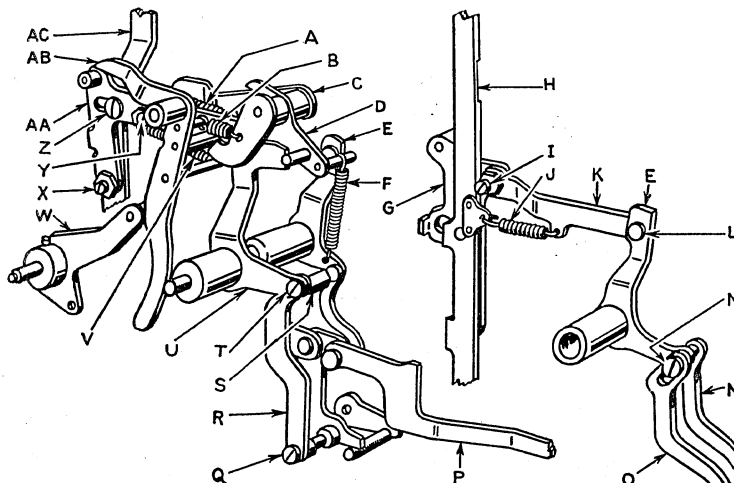
SYMBOLS (Plate 28-1)

A	70520 Stud
B	70125
C	700B Fte. 717
D	706219* included in F
E	72572 No. 1
F	1-160 Fte. 717
G	12033½ use 506 Fte. 200 rivet
H	1-71190 No. 2* included in J
I	71187 No. 2
J	1-71189 No. 2
K	71188
L	41-72171 No. 5
M	72700 No. 10
N	1-72714 No. 15 includes 72110 No. 3 turnbuckle, Class 78
O	75615
P	Description
Q	69801
R	79345 use 79601 rivet
S	1-79233A
T	79503
U	79115
V	709934
	1-79209A No. 1

SYMBOLS (Plate 29)

A	7283A Style 10
B	7286½
C	701221*
D	1-71202 (1A-71202) complete assembly
E	1A-701201 No. 2 includes C, D
F	1-701200 No. 3
G	76808
H	1-709217 use 72568 screw, 79362 ecc.
I	1-709215
J	75602 Screw, 709371 ecc.
K	75818
L	701220* included in E
M	351½*
	71597 Screw, 701391 collar, 71366 nut, Cl. 78
	72537½ Screw, 72388 and 701391 collars, 49 nut, Cl. 72
N	72286½* Included
O	72286½* in P
P	1-72292½ No. 2* complete linkage 21-72171 No. 7, Cl. 78 complete linkage 41-72171 No. 5, Cl. 72
Q	75615
R	71188
	71188 No. 2 used with reg. totals to print in red
S	71367 (702325)
T	71589
U	1-71189 No. 2
V	69801
W	1-71133 No. 2*
X	73611 Screw, 79362 ecc.
Y	72567 Screw, 79362 ecc.
Z	79613
AA	1-79233
AB	1-71187 No. 2 (1A-71187 No. 2, 71586A)
AC	21-79223A No. 2 assembled arm

BALANCE, PRODUCT AND REGISTER KEYS, POWER MESHING MECHANISM, CLASSES 72, 78 (Plate 29)



SEE EXPLANATION ON INSIDE OF FRONT COVER

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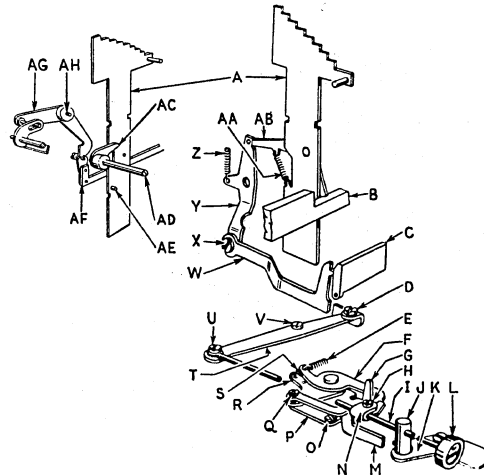
For Form 2952

SUBTRACT KEY MECHANISM, LATER (Plate 30)

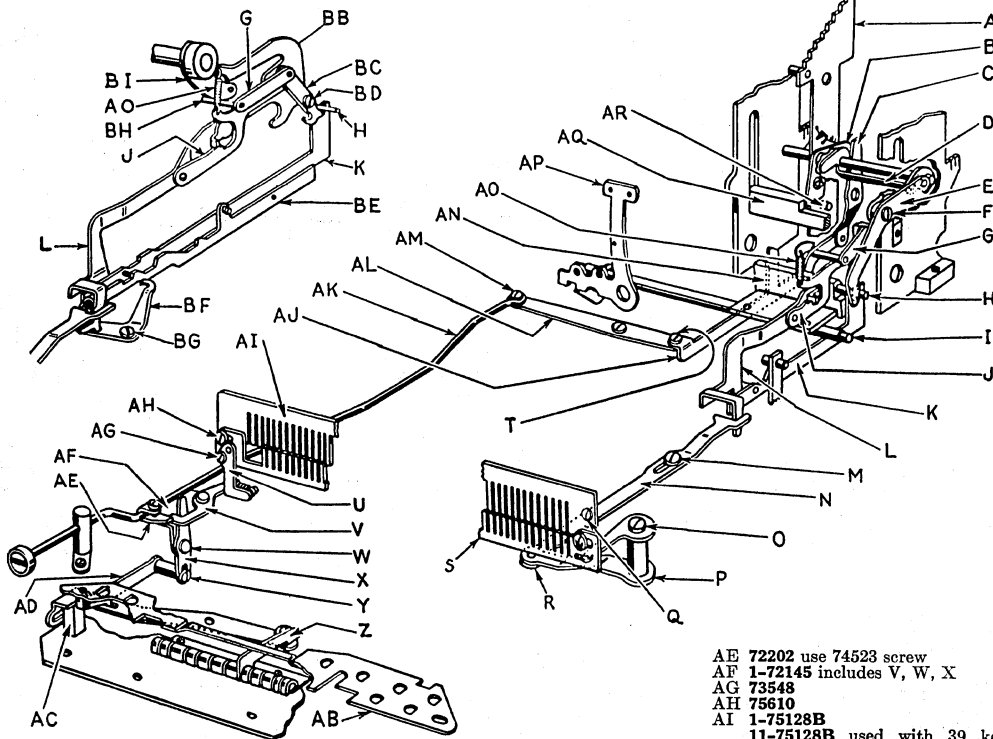
SYMBOLS (Plate 30)

- A 1-74107 No. 20
 B 74914 No. 1
 74914 No. 3 Cl. 78
 704914 No. 1
 704914 No. 3 Cl. 78
 C 72900 No. 1 narrow base, Cl. 72
 72900 No. 2 for all other styles, wide
 and narrow base
 D 9053 $\frac{3}{8}$ use 46 nut
 E 8381
 F 72146 No. 2 included in P, use 72543A
 rivet
 G 72153 included in P, use 72512 rivet
 H 83556 (74523) Screw, 46 $\frac{1}{4}$ nut
 I 1-72709 includes J
 J 72587* use 72325 nut
 K 72203 use 71518 screw
 L 72200A No. 1 Ring, 72199 No. 1 cup,
 72992 No. 1 glass, 72210 disc, 92 No.
 1 keypaper, specify character and
 color
 M 72242
 N 72202
 O 73611
 P 72145*
 Complete assembly 31-72145 includes
 F, G, P, R, Cl. 71, 72, 73

- Complete assembly
 11-72145, Cl. 76, 77,
 78
 Complete assembly
 41-72145 with CF
 non-clear lock, Cl.
 75, 77
 Q 72591
 R 21-72246 included in P
 S 3688 Spring
 T 72278
 U 72588 (12356 $\frac{3}{8}$) use
 46 nut
 V 72624
 W 72279
 X 79503
 Y 1-74132 No. 3
 Z 74803
 AA 74801
 AB 74154 No. 1* included
 in A
 AC 74134
 AD 74024
 AE 74517*
 AF 1-72102A No. 16
 1-702102A No. 16
 AG 1-74124A No. 1 see
 plate 20 for other
 styles
 AH 74527



SUBTRACT KEY AND TYPEWRITER KEY LOCK MECHANISMS, EARLY (Plate 31)



- A 1-74107 No. 20
 B 74154 No. 1* included in A
 C 1-74132 No. 3
 D 74134
 E 1-74124A No. 1 see plate 20 for other
 styles
 F 74527
 G 72217* included in BC
 H 72509
 I 61-72011 see plate 25 for other styles
 J 72210* included in L
 K 1-72102 No. 3
 L 1-72221 includes J
 M 71520
 N 72283 No. 3 see plate 20 for other
 styles
 O 7356 $\frac{3}{4}$ Screw, 75503 sleeves, 77513
 long screw

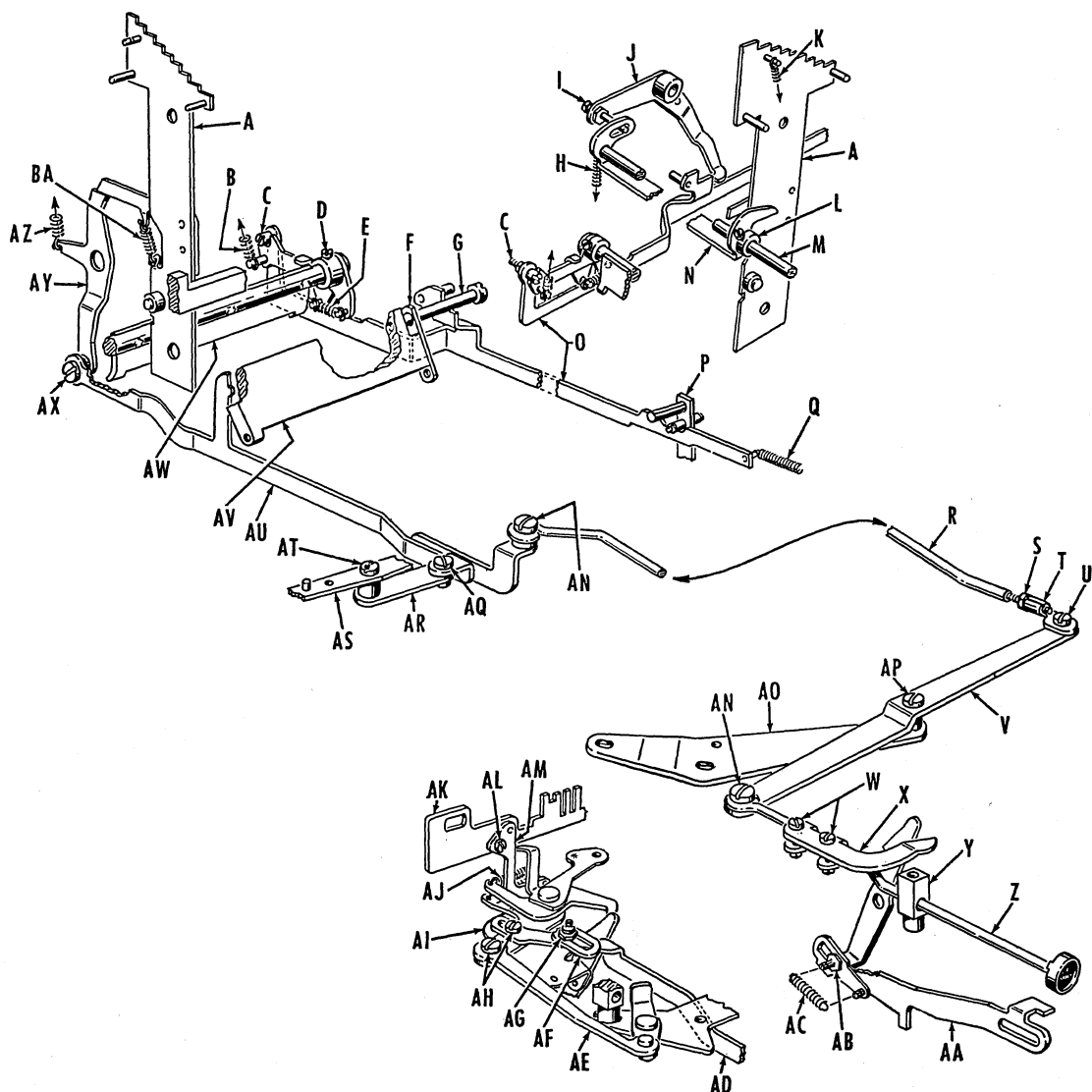
SYMBOLS (Plate 31)

- P 1-75121A
 Q 74523
 R 71520
 S 11-75214A
 T 9053 $\frac{3}{8}$ use 46 nut
 U 1-75134A (1-705134A)
 V 1-72146 included in AF, use 72543A
 rivet, 8381 spring
 W 72512
 X 72153 included in AF
 Y 79503
 Z 72147 use 72542 screw
 AB 1A-72205 No. 1 see plate 9 for other
 styles
 AC 72559
 AD 1-72144

- AE 72202 use 74523 screw
 AF 1-72145 includes V, W, X
 AG 73548
 AH 75610
 AI 1-75128B
 11-75128B used with 39 key con-
 struction
 AJ 72279
 AK 1-72709
 AL 72278 use 72624 screw
 AM 72588 (12356 $\frac{3}{8}$) use 46 nut
 AN 72900 No. 1 included in I
 AO 7781A
 AP 1-72163 No. 1 see plate 6 for other
 styles
 AQ 74914 No. 1 see plate 30 for other styles
 AR 74517* included in A
 BB 1-72216A use 77514 screw
 BC 1-72220 use 2883 $\frac{3}{4}$ spring
 BD 75637
 BE 1-72102 No. 2
 BF 72218
 BG 74529
 BH 72590*
 BI 1-71123*

SEE EXPLANATION ON INSIDE OF FRONT COVER

SUBTRACT KEY MECHANISM, EASY DEPRESSION, SERIES M 200 (Plate 30-1)



SYMBOLS (Plate 30-1)

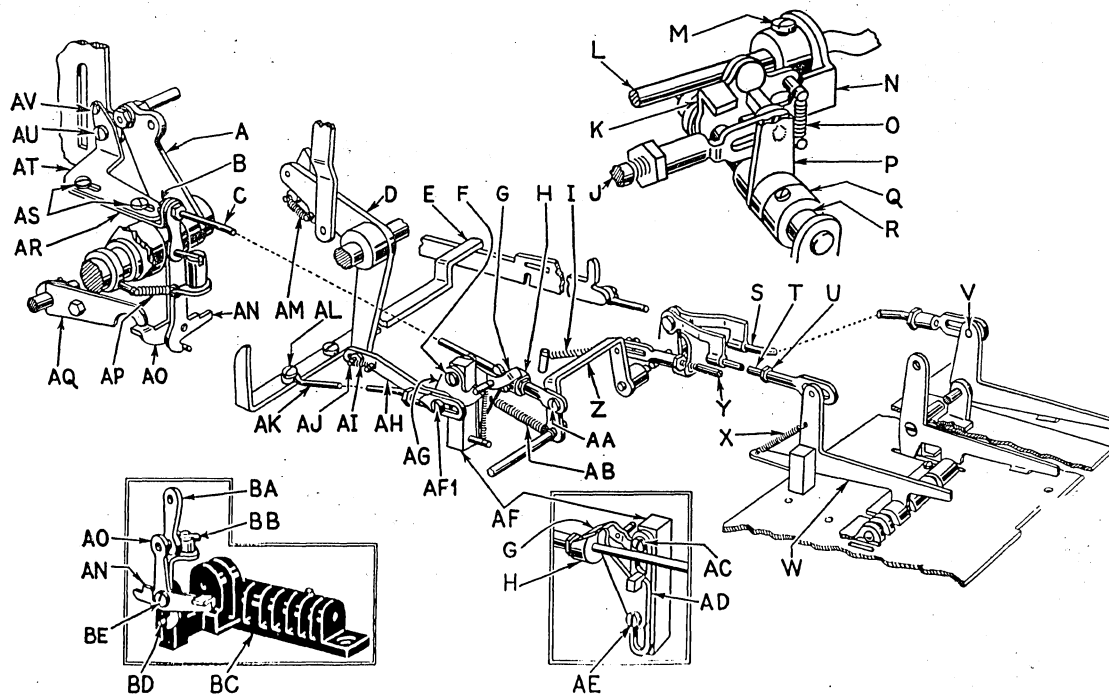
A 1-16 1/4 Fte. 134
 B 81806 spring
 C 702662 screw, use 49 3/8 nut
 D 75618 set screw
 E 16681A spring
 F 72159 plate, use 79543 screw, 1097 1/2
 lock washer
 G 72509A No. 1
 H 84819 spring
 I 1503A Fte. 717 screw, use 1097 1/2
 lock washer, 46 nut
 J 1-704124B No. 3, use 74527 screw
 K 79810 spring
 L 1-28345 collar, includes set screw
 75618
 M 704024
 N 74134 No. 2
 O 1-702102B No. 16
 P 1-71903A No. 2
 Q 77880A No. 3
 R 1-702709 1/2 includes S, T
 S 49 3/8 nut
 T 72110 No. 3
 U 75638 screw

V 1-702118 1/2
 W 12051 1/8 screws, use 46 1/4 nut
 X 702199 No. 2
 Y 702616L No. 3, use 72325 nut
 Z 1-702709A No. 5 includes Y
 AA 72144
 AB 702556 screw, use 46 1/4 nut
 AC 681
 AD 1-702242
 AE 11-702203CL No. 4
 AF 702203 1/2 No. 2
 AG 705367 eccentric
 702622 screw
 AH 72591
 AI 1B-702246 1/2 locking plate assembly,
 for machines with carriage con-
 trolled totals
 11A-702246 1/2 locking plate assembly,
 for machines without carriage
 controlled totals
 AJ 8381 outside spring
 76812 inside spring
 AK 1A-705214 No. 4

AL 73548
 AM 1A-705134 1/4
 AN 8054 1/4
 AO 702119 1/2
 AP 702589
 AQ 9053 3/8
 AR 1-702278 No. 2
 AS 1-702280 No. 4
 AT 72624
 AU 1-702279 No. 2
 AV 72900 No. 2 toggle plate only
 31-702011 assembled shaft with toggle
 plate, for machines with automatic
 extend, includes F, G
 21B-702011 assembled shaft with
 toggle plate, for machines without
 automatic extend, includes F, G
 AW 1-704044A assembled shaft, includes
 D
 AX 75637
 AY 1-704132 No. 18
 AZ 74803
 BA 74801

Replaces General Print 212-1/M

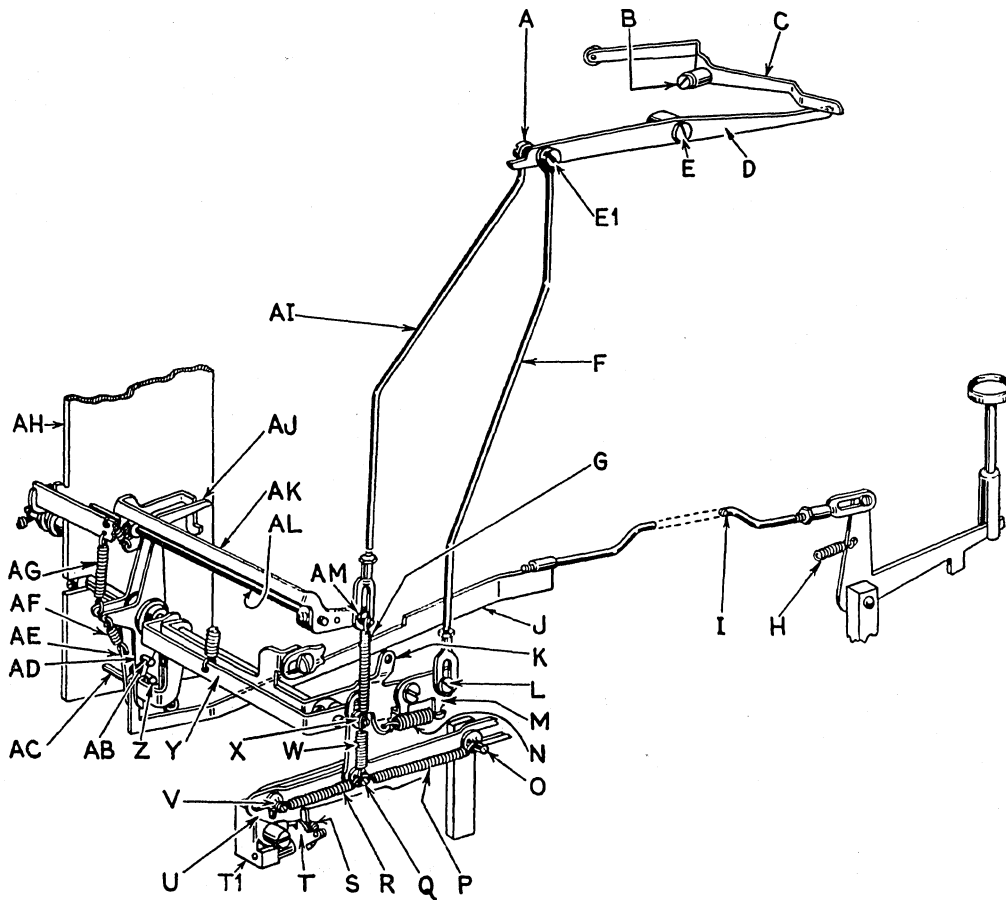
NON-CLEAR SUBTRACT KEY MECHANISM, CLASSES 76, 77 (Plate 32)



SYMBOLS (Plate 32)

A	1A-71152 No. 2	AA	79503
B	1A-701159	AB	72830
C	72352	AC	75637
D	72711 No. 4 use 72341 No. 2 turn-buckle	AD	72291
E	1-71137 No. 2 } See plate 18 for other styles	AE	72602 No. 1
F	1-72280	AF	702511 assembled 1-702511 includes F, G, AD, AE, AG, Cl. 77
G	1-702280 No. 1 } other styles	AG	72652 assembled 1-72652, Cl. 76
H	75637	AF1	72649 (707505)
I	1-72297	AG	72293
J	72351 use 75616 screw	AH	1-71164
K	75804 No. 3	AI	72810
L	702702 No. 2	AJ	75622
M	1-702284 No. 1* included in R	AK	1-72711 No. 3 } Includes 72110 No. 1 turnbuckle, 49½ nut
N	1-702700A No. 1 includes M, N, see plate 7, letter K		Cl. 76
O	72573		1-702708 No. 1 } Cl. 77
P	1-702282 No. 3 includes M	AL	72572 No. 1
Q	11-702282 No. 2 sel. skip tab	AM	71803
R	489	AN	1-72114A No. 7
S	1-702281		1-72114 No. 7 early
T	1-73314 includes 73643 screw		1-72114A No. 8
U	72003 No. 2* complete assembly 1-702003 No. 2 includes K, P, Q, R		1-72114 No. 8 early } Cl. 78
V	72711 No. 7 use 72110 No. 1 turn-buckle	AO	72114 No. 5 with reg., subt.
W	72711 No. 6 use 72110 No. 1 turn-buckle		72114 No. 3 (702114 No. 4) without reg. subt.
X	49½	AP	9088 (7285½A) Cl. 76, 77
Y	79503 Screw		77880A No. 2 Cl. 78
Z	72243 No. 3 Cl. 76 } Non-clear	AQ	72182 No. 3
	702243 No. 2 Cl. 77 } subt.	AR	72141A No. 2
	75804 No. 3	AS	72599
	72711 No. 5 use 72110 No. 1 turn-buckle, Cl. 76	AT	1-72142A
	1-702706 No. 1 includes 72110 No. 1 turnbuckle, Cl. 77	AU	72581
	1-702286 Cl. 76	AV	70512
	1-702286 No. 2 Cl. 77	BA	1-72292
		BB	72547*
		BC	72665 No. 2
		BD	72508
		BE	71540 with reg. subt.
			72551 Screw, 49½ nut, without reg. subt.

KEY AND CARRIAGE CONTROLLED CROSSFOOTER SUBTRACT, CLASS 78 (Plate 33)



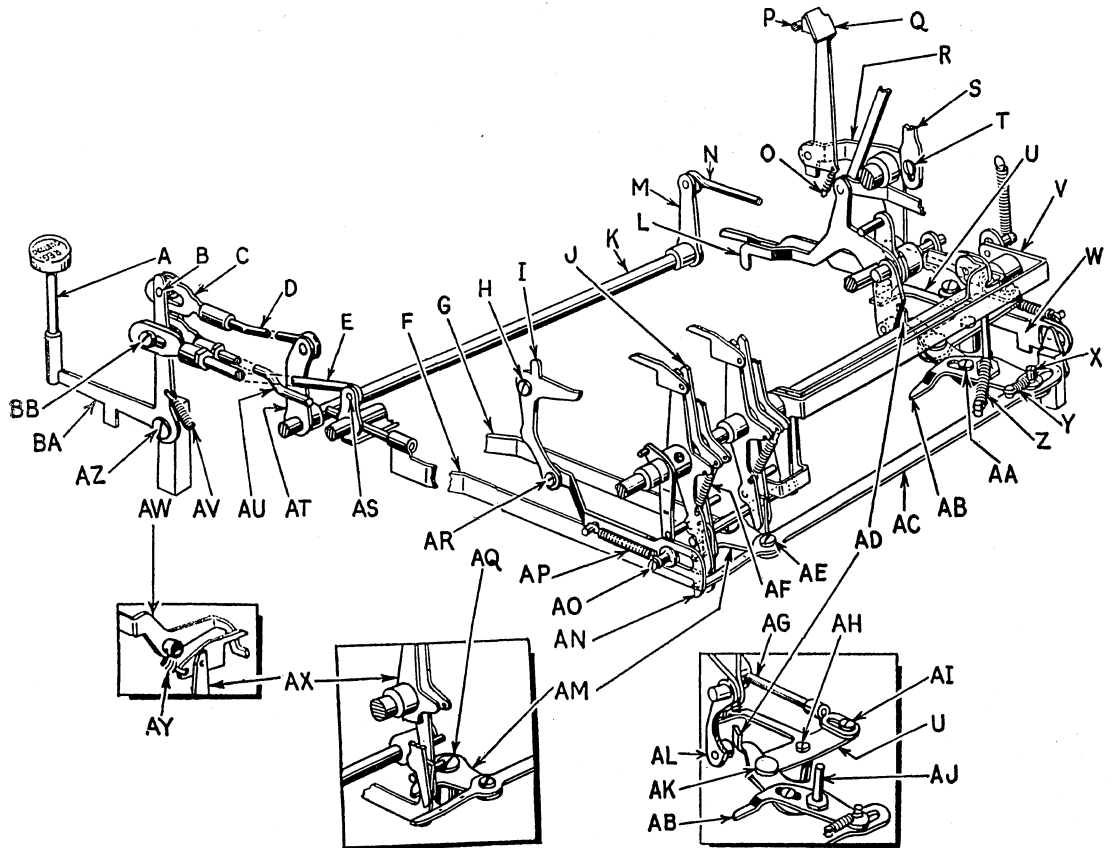
SYMBOLS (Plate 33)

A	72324	T	1-72123 No. 1 use 72507½ screw
B	1362½ use 46¼ nut	T1	72657 No. 3
C	1-79249A	U	1-72133A No. 1
D	1-709249	V	1-702133
E	1-79251A	W	74314 use 49 nut
E1	1-709251 No. 2	X	75818
F	8054¾	Y	74315 Screw
G	72572 No. 2	Z	1-74132A No. 8
H	1-72714 No. 25 includes 72110 No. 1 turnbuckle, 49¾ nut	AB	1-74132 No. 8 early
I	71806	AC	1-704132 No. 2
J	10782	AD	74582 No. 2
K	1-72714 No. 13 } Includes 72110	AE	75548
L	1-702714 No. 13 } No. 1 turnbuckle, 49¾ nut	AF	74556 No. 1 included in Y
M	72102A No. 10	AG	1-74132A No. 9
N	72102 No. 10 early	AH	1-74132 No. 9 early
O	74234	AI	1-74132 No. 11 includes Z
P	704234 (704234A, 76500, 49¼)	AJ	71806
Q	79503	AK	74813
R	74202	AL	1-74110BR No. 3
S	10785½	AM	1-72714 No. 24 includes 72110 No. 1 turnbuckle, 49¾ nut
T	74314		
T1	72814		
U	74315		
V	10082½		
W	7282¼		
X			
Y			
Z			
AB			
AC			
AD			
AE			
AF			
AG			
AH			
AI			
AJ			
AK			
AL			
AM			

SYMBOLS (Plate 33-1)

A	1-73214A No. 2	1-74326 use 75618 set screw; for ster-
B	9050 $\frac{3}{4}$	ling machines
C	703216 No. 1	BO 72584
D	1362 $\frac{1}{4}$ use 46 $\frac{1}{4}$ nut	BP 72902 No. 8
E	1-709249A	BQ 72102A No. 10
F	1-709251 No. 2	BR 1-74132A No. 9
G	8054 $\frac{3}{4}$	BS 10082 $\frac{1}{2}$
H	72572 No. 1	BT 74804
I	709260	BU 74813
J	1-704701 includes K, L	BV 1-74110BR No. 3
K	49 $\frac{3}{4}$	BW 1-74132 No. 11 includes BX
L	1-709294	1-74132 No. 13 for sterling machines
M	3489 $\frac{3}{4}$	BX 74133 No. 2* included in BW
N	74315	BY 205801
O	31A-71129	BZ 704126 No. 5
P	704205 $\frac{1}{2}$ * included in CN	CA 74183 No. 1
Q	71002	CB 79510
R	21B-701001 without repeat of items	CC 75618
	1-1 Fte. 141 No. 3 with repeat of items	CD 96305
S	75342 eccentric	CE 1A-704045A
T	73611 screw	21A-704045A
U	200825	for sterling machines } includes CC,
V	1-704703 includes AB, AD, CY, DB	CD, CF,
W	75631 screw	DN, DP
X	1-72712 No. 10	CF 1-704196A
Y	72659	CG 1-74136A No. 2
Z	75346	1-74136 No. 3 for sterling machines
AB	49 $\frac{3}{4}$	CH 74801
AC	1-71170	CI 704154 No. 4* included in CL
AD	72110 No. 3	CJ 70512
AE	72501 $\frac{1}{4}$	CK 1-704113C No. 2
AF	1-702252 No. 2	1-704113 No. 4 for sterling machines
AG	11B-72171 No. 2	CL 1-704107 No. 25 includes CI
AH	704240	CM 74500
AI	1-72247	74592 use 46 nut; for sterling machines
AJ	76567 use 46 nut	CN 1-704204 includes P, CR
AK	72307 eccentric	CO 79607A
AL	1-702001 No. 2	CP 1-704206
AM	72567	CQ 1-704207
AN	72148 No. 3	CR 1-704205* included in CN
AO	74314	CS 1-704110L No. 3
AP	72814	CT 350 $\frac{3}{4}$
AQ	72657A No. 2 use 47 nut	CU 1-28345 includes CV
AR	74315	CV 75618
AS	71806	CW 504 Fte. 138
AT	74315	CX 1-704216L
AU	10082 $\frac{1}{2}$	CY 72110 No. 1
AV	1-72123 No. 1 use 72507 $\frac{1}{2}$ screw,	CZ 75638
	7282 $\frac{1}{4}$ spring	DB 49 $\frac{3}{4}$
AW	77517 No. 1	DC 79607A
AX	1-72657 No. 3 use 47 nut	DD 700506
AY	74314 use 49 nut	DE 79585
AZ	1-72165A No. 1	DF 74526
BA	1-702133	DG 8888
BB	74191	DH 76802
BC	75638	DI 75818
BD	74244	DJ 74529
BE	1-704132 No. 2	DK 1A-704025 No. 2
BF	74524	11A-704025 No. 3
BG	74565	for sterling machines } includes BE, BJ,
BH	74230	for sterling machines } BN, BR, BW,
BI	704183 use 74523 screw	BX, DL, DM
BJ	704234A	DL 1-74308 No. 4 includes long post
BK	704914 No. 3	74560, DL
BL	73805	DM 71519 included in DL
BM	74251 use 72581 screw	DN 1-74320 includes long post 74572, DP
BN	1-74308 use 12055 $\frac{3}{4}$ set screw	DO 75638
		DP 75618 included in DN
		DQ 74115A No. 1
		74115A No. 2 for sterling machines

REGISTER SUBTRACT KEY MECHANISM, CLASS 78 (Plate 34)



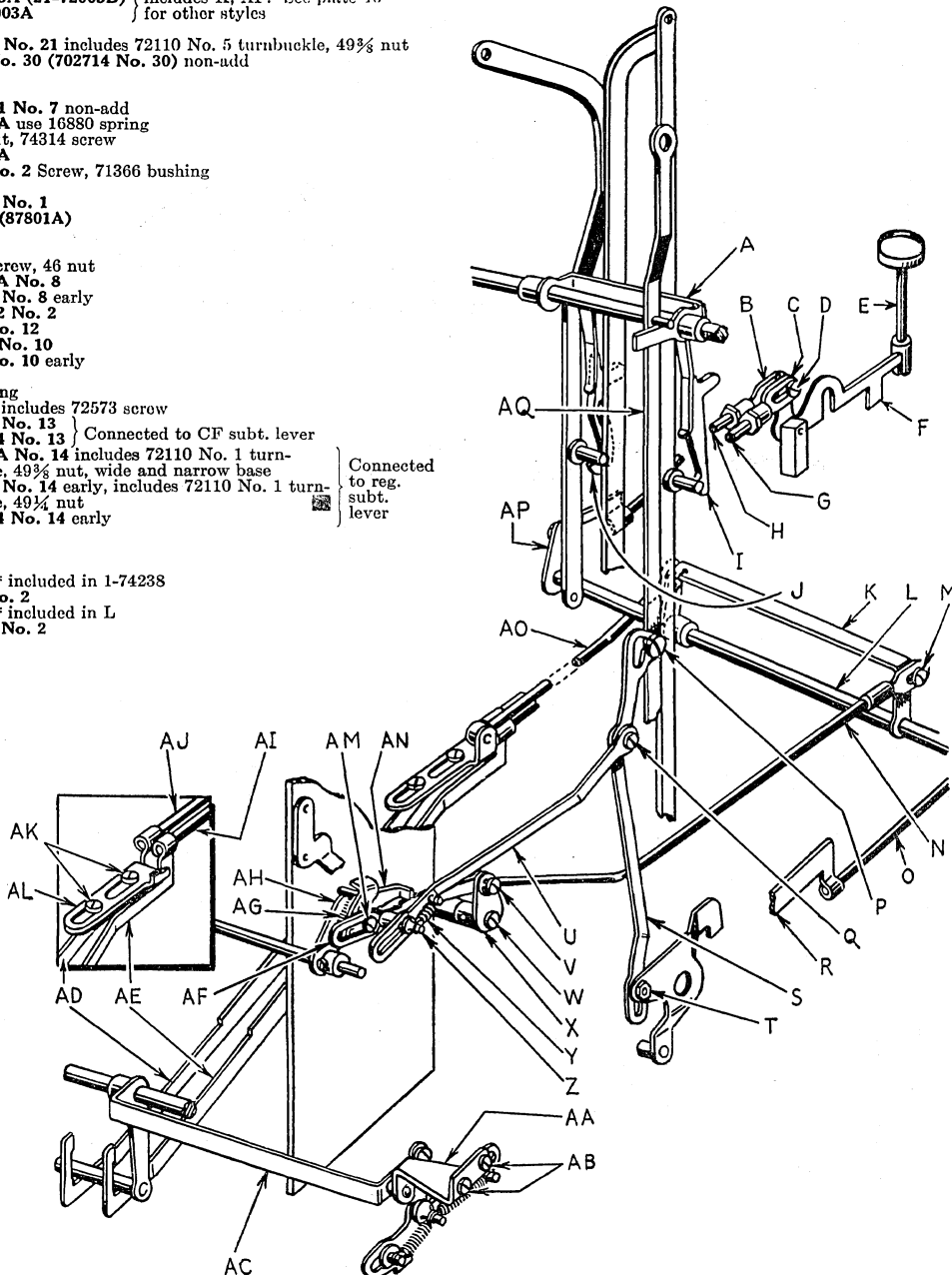
SYMBOLS (Plate 34)

A	72521 No. 1	AB	1-72264 (1-72264A, 1-72295 1/4 A for narrow base or 1-702295 1/4 A for wide base)
B	79503	AC	1-72295 1/4 (1-72295 1/4 A, 1-72264A)
C	72110 No. 1	AD	72265 included in U, use rivet 7262 1/2
D	1-72714 No. 11 includes C, wide and narrow base	AE	79503
E	1-702714 No. 11 early, wide base	AF	71806
F	1-72714A No. 20 includes 72110 No. 1 turnbuckle, 49 3/4 nut	AG	1-72714A No. 4 includes 72110 No. 3 turnbuckle, 49 3/4 nut
G	1-72714 No. 20 early	AH	72629
H	72102 No. 12	AI	79552
I	72102A No. 10	AJ	72637
J	72102 No. 10 early	AK	7262 1/2
K	71546	AL	1-74223*
L	74194	AM	1-72174 No. 1
M	1-74132A No. 9	AN	1-74207A
N	1-74132 No. 9 early	AO	72514 No. 2
O	1A-72037 No. 2	AP	7283A Style 10
P	1A-702037	AQ	72522 No. 2
Q	1-72252A	AR	79552
R	1-702252 No. 2	AS	72572 No. 2 Screw
S	1-72250* included in K	AT	1-72245* included in K
T	72714 No. 30 (702714 No. 30)	AU	1-72714A No. 14 includes 72110 No. 1 turnbuckle, 49 3/4 nut, wide and narrow base
U	3282		1-72714 No. 14 early, includes 72110 No. 1 turnbuckle, 49 1/4 nut
V	71568 Stud, uses 46 nut	AV	9088 (7285 1/4 A)
W	71162 No. 2 use 72627 screw	AW	74196 No. 2
X	1-71163A No. 2	AX	1-74132 No. 10
Y	1-72240A	AY	62880 (89801)
Z	75591 Screw, 49 1/4 nut	AZ	79503
AA	1-72290 No. 2 includes AD	BA	72243A No. 10
	1-74132A No. 8		72243 No. 10 early
	1-74132 No. 8 early		BB
	1-704132 No. 2		72649 (707505)
	1-72133A No. 1		79511 Screw, 71366 bushing, early
	1-702133		
	79606		
	79819 Spring		
	72814		
	79552		

CROSSFOOTER AND REGISTER SUBTRACT KEY MECHANISM, CLASS 78 (Plate 35)

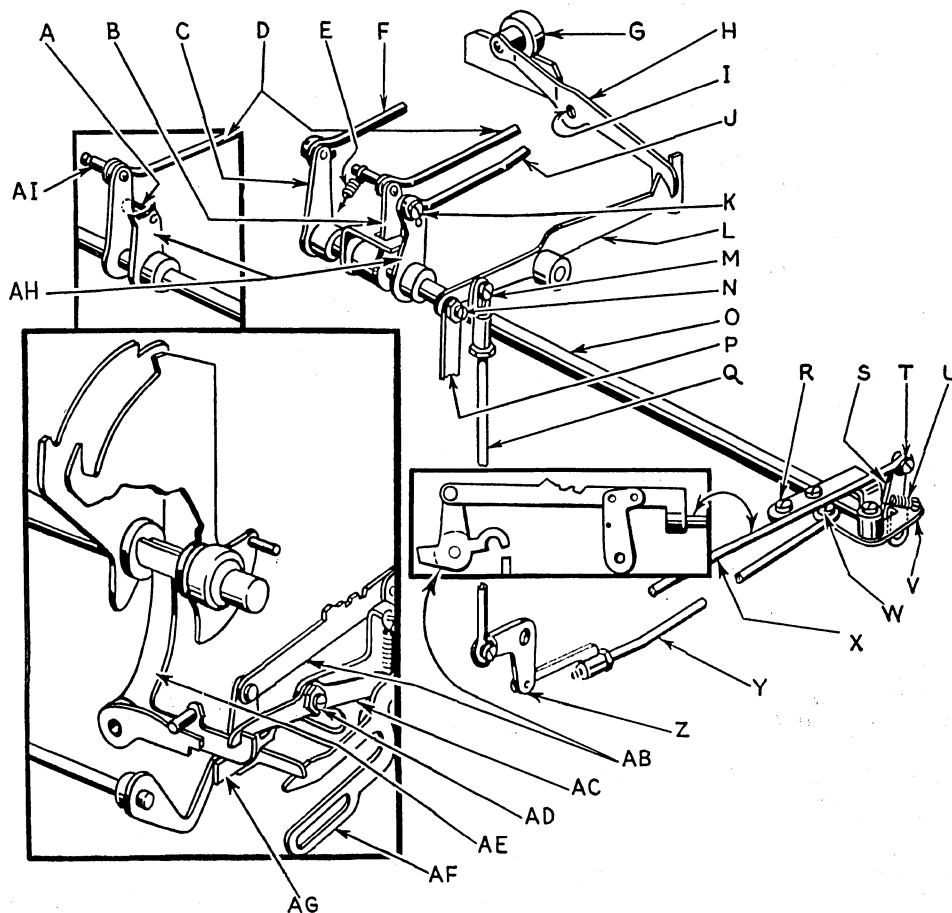
SYMBOLS (Plate 35)

- A 79212
 B 72110 No. 1 Turnbuckle, 49 $\frac{3}{8}$ nut
 C 72110 No. 1 Turnbuckle, 49 $\frac{3}{8}$ nut
 D 79511 Screw, 72324 bushing
 E 72521 No. 1
 F 72243 No. 9
 G 1-72714 No. 39 } Includes C, connected to CF & reg.
 H 1-702714 No. 26 } subt. lever
 I 1-72714 No. 19 } Includes B, connected to CF and reg.
 J 1-702714 No. 19 } subt. lever
 K 1-79224
 L 1-79211 Pawl
 M 1-72296 No. 2
 N 1-702296 No. 2
 O 21-72003A (21-72003B) } includes K, AP. See plate 40
 P 1A-702003A } for other styles
 Q 79503
 R 1-72714 No. 21 includes 72110 No. 5 turnbuckle, 49 $\frac{3}{8}$ nut
 S 72714 No. 30 (702714 No. 30) non-add
 T 72577
 U 79503
 V 11-72171 No. 7 non-add
 W 1-72240A use 16880 spring
 X 49 $\frac{3}{4}$ Nut, 74314 screw
 Y 1-72266A
 Z 72572 No. 2 Screw, 71366 bushing
 AA 9052 $\frac{1}{2}$
 AB 1-72162 No. 1
 AC 99801A (87801A)
 AD 72509 $\frac{1}{2}$
 AE 70118A
 AF 72584 Screw, 46 nut
 AG 1-74132A No. 8
 AH 1-74132 No. 8 early
 AI 1-704132 No. 2
 AJ 72102 No. 12
 AK 72102A No. 10
 AL 72102 No. 10 early
 AM 1-72178
 AN 489 Spring
 AO 1-74212 includes 72573 screw
 AP 1-72714 No. 13 } Connected to CF subt. lever
 AQ 1-702714 No. 13 }
 AR 1-72714A No. 14 includes 72110 No. 1 turn-
 AS buckle, 49 $\frac{3}{8}$ nut, wide and narrow base
 AT 1-72714 No. 14 early, includes 72110 No. 1 turn-
 AU buckle, 49 $\frac{3}{8}$ nut
 AV 1-702714 No. 14 early
 AW 75638
 AX 1-72177
 AY 75638
 AZ 1-74217* included in 1-74238
 BA 72714 No. 2
 BB 1-72195* included in L
 BC 1-72186 No. 2



SEE EXPLANATION ON INSIDE OF FRONT COVER

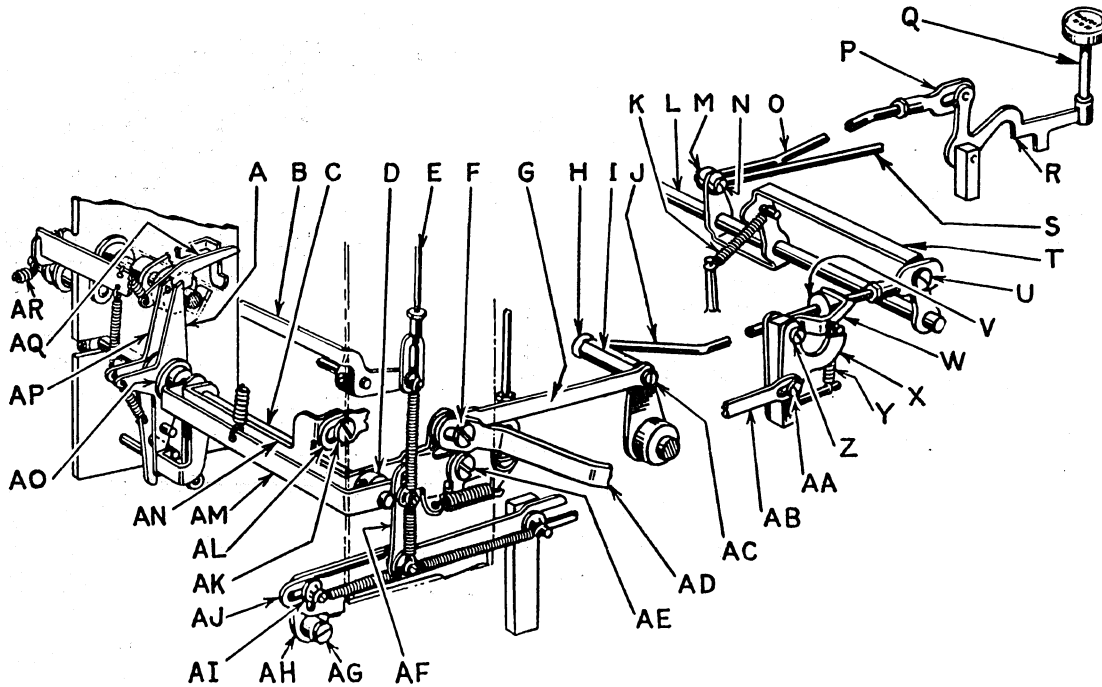
SUBTRACT MECHANISM TO DISABLE POSITIVE REGISTER CONTROL, CLASS 78 (Plate 36)



SYMBOLS (Plate 36)

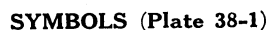
- | | | | |
|---|--|----|---|
| A | 16261* included in AH | Q | 1-72714 No. 23 includes 72110 No. 3 turnbuckle, 49% nut |
| B | 11-72249* included in O | R | 73611 |
| C | 1-72249* included in O | S | 1-72250* included in O |
| D | 1-72712 No. 7 } Includes 72110 No. 1 turnbuckle, 49% nut, | T | 72572 No. 1 |
| E | 1-702712 No. 7 } connected to CF subt. lever | U | 44805 |
| F | 81806 | V | 1-72253 use 72601 screw |
| G | 1-72714 No. 39 } Includes 72110 No. 1 turnbuckle, 49% nut, | W | 1-702253 No. 2 use 702656 screw |
| H | 1-702714 No. 26 } connected to CF and reg. subt. lever | X | 72572 No. 1 |
| I | 1-79553 use 45 nut | Y | 72714 No. 30 |
| J | 1-79231 } Includes G | Z | 72714 No. 35 } Use 49% nut |
| K | 1-709231 } | AB | 702714 No. 23 } |
| L | 79555 Screw | AC | 1-72295 use 72500 No. 2 screw |
| M | 1-72714 No. 11 } | AD | 11-72171 No. 7 assembled non-add linkage |
| N | 1-702712 No. 7 } | AE | 1-72231 No. 3 |
| O | 1-702712 No. 7 } | AF | 1-702231 No. 3 |
| P | 72572 No. 1 | AG | 73612 Screw, 72307 ecc. |
| | 11A-79234 | AH | 1-72163 No. 6 see plate 6 for other styles |
| | 1-709234 No. 2 | AI | 72198 |
| | 79503 | | 72171 No. 7* included in AB |
| | 72568 Screw, 72307 ecc. | | 1-72245* included in O |
| | 1A-72037 No. 2 } | | 79606 narrow base |
| | 1A-72037 } | | 702571 wide base |
| | 1-72186 No. 2 | | |

NON-SUBTRACT KEY MECHANISM, CLASS 78 (Plate 37)



SYMBOLS (Plate 37)

A	1-74132A No. 9	V	72351 Collar, use 75616 screw
B	1-74132 No. 9 early	W	1-72297 use 75637 screws
C	1-74196 No. 1	X	72293
D	1-704196	Y	72814
E	72038	Z	75637
F	72038	AA	72649 (707505)
G	1-74308 No. 4 includes 71519 screw	AB	1-71164
H	1-72714 No. 24 includes 72110 No. 1 turnbuckle, 49 3/8 nut	AC	75346
I	72542	AD	72176 No. 1
J	74240	AE	72582
K	72572 No. 2 Screw	AF	74191
L	72659	AG	77517 No. 1
M	1-72712 No. 10 includes V, and 72110 No. 3 turnbuckle, 49 3/8 nut	AH	1-72165A No. 1
N	75804 No. 3	AI	1-72165 No. 1 early
O	21-72003 No. 2 Split shaft } See plate 40	AJ	74314 use 49 nut
P	1-702003 No. 4	AK	1-72133A No. 1
Q	72572 No. 2	AL	1-702133
R	72324	AM	75638
S	1-72714 No. 41 non-subt., includes P and 49 3/8 nut	AN	74244
T	72110 No. 1	AO	1-74132A No. 8
U	72521 No. 2	AP	1-74132 No. 8 early
V	72243 No. 11	AQ	1-704132 No. 2
W	1-72714A No. 20 } Reg. subt., includes 72110 No. 1	AR	74234
X	1-72714 No. 20 early } turnbuckle, 49 3/8 nut		704234 (704234A, 76500, 49 1/4)
Y	1-72298 3/4		74305 Bearing
Z	1-702298 1/2		1-74132 No. 11
AA	72649 (707505)		74133 No. 2*
AB			10785 1/2

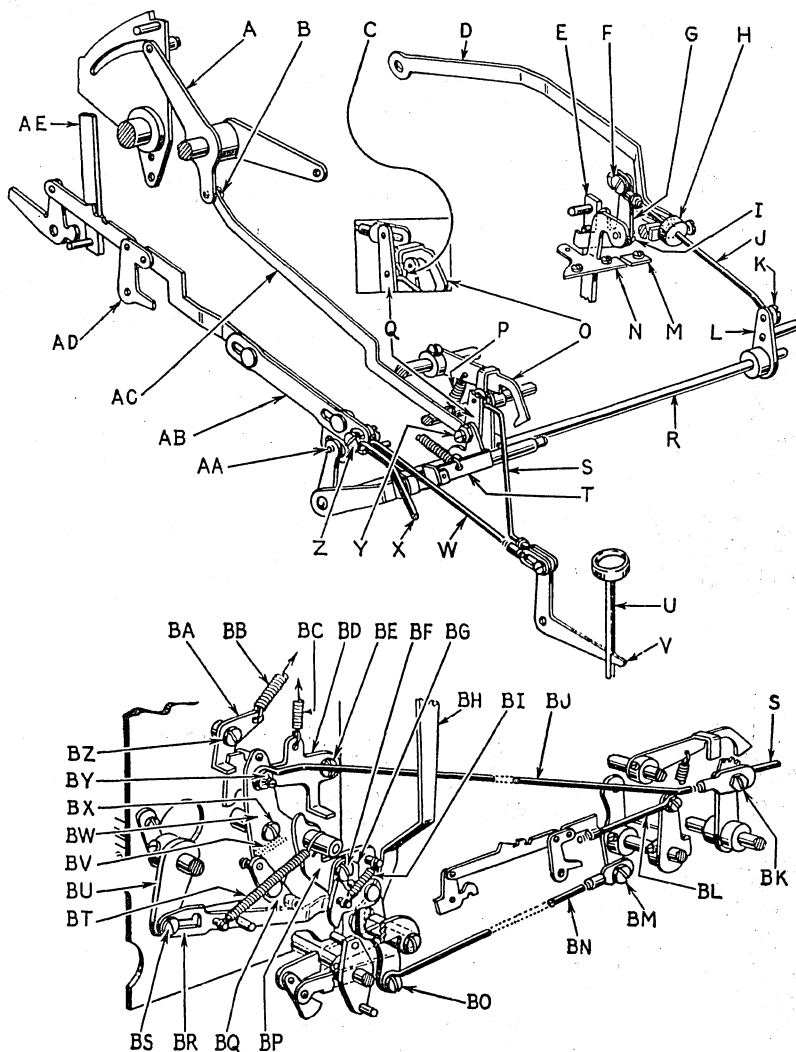


A	1-702786	includes K	H	709628
B	1-702714	No. 58 includes I	I	72110 No. 7
C	702221 $\frac{1}{2}$		J	Included in AT
D	21 No. 15		K	702110 No. 6
E	702123 $\frac{1}{2}$ No. 2		L	Included in V
F	702291 $\frac{1}{2}$ No. 4		M	702113 $\frac{1}{2}$
G	702110 No. 8		N	702516 $\frac{1}{2}$

SYMBOLS (Plate 38-1)—Continued

O	Included in AT	BU	1-72247
P	Included in AT	BV	76567 screw
Q	1-702207 ½ No. 2 includes R		46 nut
R	Included in Q	BW	72307
S	1-702233 ½ B	BX	1-702001 No. 2 includes BU, BV, BW
T	79543 screw	BY	72567
U	705367 eccentric	BZ	72148 No. 3
V	72827	CA	72151 No. 1
W	1-702113 ½ includes L	CB	702583 ½
X	72577	CC	72614 screw
	709636 screw		9233 ½ spacer
	72367 eccentric		46 nut
Y	983 spring	CD	700119
Z	702230A No. 7	CE	72551
AA	702652	CF	71803 spring
AB	1-71903A No. 2	CG	1B-704013 No. 2 complete shaft assembly, includes CH, CI
AC	702111 No. 2	CH	Included in CG
AD	70507	CI	Included in CG
AE	72110 No. 1	CJ	74587
AF	71366 nut	CK	1-74243 includes DK
AG	1-72315 No. 1 includes AH	CL	1-74221 includes DJ
AH	72573	CM	74815
AI	1-702714 No. 57 includes AE	CN	Included in CY
AJ	1-702783 includes AE, AG, AH	CO	705518 screw
AK	1-702785		49 ½ nut
AL	72324 nut	CP	1-704049 shaft assembly, includes CQ, CS
AM	72110 No. 5	CQ	1-74190
AN	508 Fte. 141 screw	CR	7287 Style 5 spring
AO	72572 No. 1	CS	550 ¾
AP	1-702735 No. 2 includes AM	CT	74579
AQ	75618 set screw	CU	74815
AR	1-75332 includes AQ	CV	74248
AS	702037 ½	CW	704183
AT	3-702037 No. 4 complete power shaft assembly, for machines with carriage controlled totals	CX	74523
	13-702037 No. 4 complete power shaft assembly, for machines without carriage controlled totals	CY	1-74219 includes CN
AU	1-702202 ¾	CZ	1-74224
AV	Included in AT	DA	1-74238
AW	1-74326 collar, includes 75618 set screw	DB	704548 spring screw stud
AX	83800A	DC	10983
AY	1-702204 ½ No. 2	DD	20 No. 117
AZ	952 ¾ screw	DE	74500
BA	702623 post	DF	72501 ¼
	46 ¾ nut	DG	1-72297 ¾ A
BB	1-702203 ½ No. 2	DH	74576
BC	Included in AT	DI	702111 ¾
BD	1-701162 assembled switch	DJ	Included in CL
BE	1-702206 ½	DK	Included in CK
	952 ¾ screw	DL	71361 eccentric
BF	1-702724 No. 2 includes DS		72573 screw
BG	1-72143 No. 4 minus balance position	DM	51B-72171 No. 1 minus balance position
BH	72200A No. 1 ring	DN	1-72714A No. 1 includes BN, minus balance position
	72199 No. 1 cup	DO	1-72143 No. 4 balance position
	72992 No. 1 glass	DP	74315 spring screw stud
	72210 disk	DQ	1-702110 No. 5
	92 No. 1 Specify Character and Color, keypaper	DR	1-702714 No. 54 includes G, DQ, DT
BI	72521 No. 2	DS	72110 No. 1
BJ	702288 ½		75637 screw
BK	Included in AT	DT	1-72315 No. 1 collar, includes 72573 set screw
BL	702288 ¾	DU	77882 spring
BM	702610 screw, for machines with carriage controlled totals	DV	3489 ¾ spring
	702659 screw, for machines without carriage controlled totals	DW	74533
	71366 nut	DX	1-702201 ½ No. 5 includes DW, DY
BN	72110 No. 5	DY	702201 ¾ No. 3
BO	702289 ¼ No. 4	DZ	1-702202
BP	79503	EA	681 ½ spring
BQ	1-72714A No. 12 includes BN	EB	21 No. 9 clip
BR	1-702111 ½	EC	44805
BS	8381	ED	73611
BT	77517 No. 1 screw	EE	702227 ½ A
			545 Fte. 217 screws
		EF	1A-702171 No. 16 balance position

CREDIT BALANCE KEY MECHANISM, CLASS 78 (Plate 38)



SYMBOLS (Plate 38)

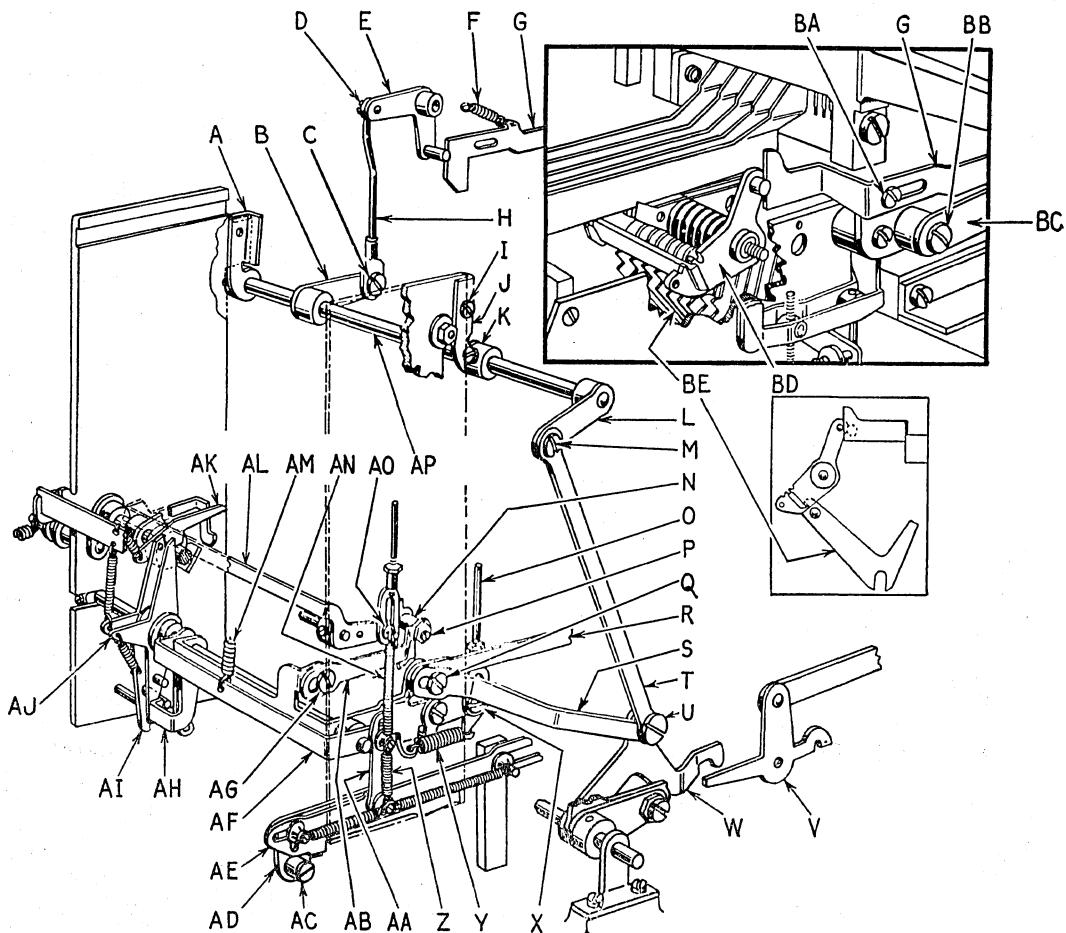
A 1-701143	T 1-722923* included in R	BD 1-74224
B 79503	U 72521 No. 2	BE 74576
C 72572 No. 2	V 1-72143 No. 4	BF 74587
D 72296 1/2 } Use 72367 ecc., 79543	W 1-72714 No. 17 includes 72110 No. 1	BG 74220* included in BR
E 1-71903A No. 2 see plate 43 for other styles	X 1-72714A No. 33 narrow base, includes 72110 No. 1, 72110 No. 3 turnbuckles and 49 3/8 nut	BH 1-72297 1/4 A
F 79503	Y 1-72714 No. 17 wide base, includes 72110 No. 1 turnbuckle, 49 3/8 nut	BI 71803
G 72111 No. 1	Z 71553 Screw, 72307 ecc.	BJ 1-72714 No. 34 includes 72110 No. 3 turnbuckle, 49 3/8 nut
H 1-72315 No. 1 includes 72573 screw	AA 75638	BK 72339 (71366)
I 72627 Screw	AB 1-72239 No. 1* included in AD	BL 72714 No. 1
J 1-72714 No. 8 includes H and 72110 No. 3 turnbuckle	AC 72291 1/4	BM 79503
K 72572 No. 1	AD 11A-72171 No. 2 complete assembled linkage includes AB, see plate 40 for other styles	BN 1-72714A No. 12 includes 72110 No. 5 turnbuckle
L 1-72260* included in R	AE 1-709215	BO 1-72714 No. 12 early
M 72156 No. 1 use 70512 screw	BA 1-74225	BP 200543 1/2
N 72297 1/2 } Use 72614	BB 81803	BQ 1-74243
O 702297 1/2 } screws	BC 10983	BR 1-74231* included in BW
P 1-72291 1/2		BS 1-74221
Q 3282 narrow base		BT 76575 use 49 1/2 nut
R 72803 Spring, 9770 clip, wide base		BU 81811 (74815)
S 1-72298 1/2* included in R		BV 1-74190 includes 550 1/4 screw
1A-72037 No. 2 } Includes L, Q, T		BW 7287 Style 5 Spring
1A-72037		BX 1-74219
1-72714 No. 32 includes 72110 No. 1 turnbuckle, 49 3/8 nut		BY 74579
		BZ 74576

SEE EXPLANATION ON INSIDE OF FRONT COVER

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For Form 2952

CREDIT BALANCE KEY MECHANISM, CLASS 78 (Plate 39)



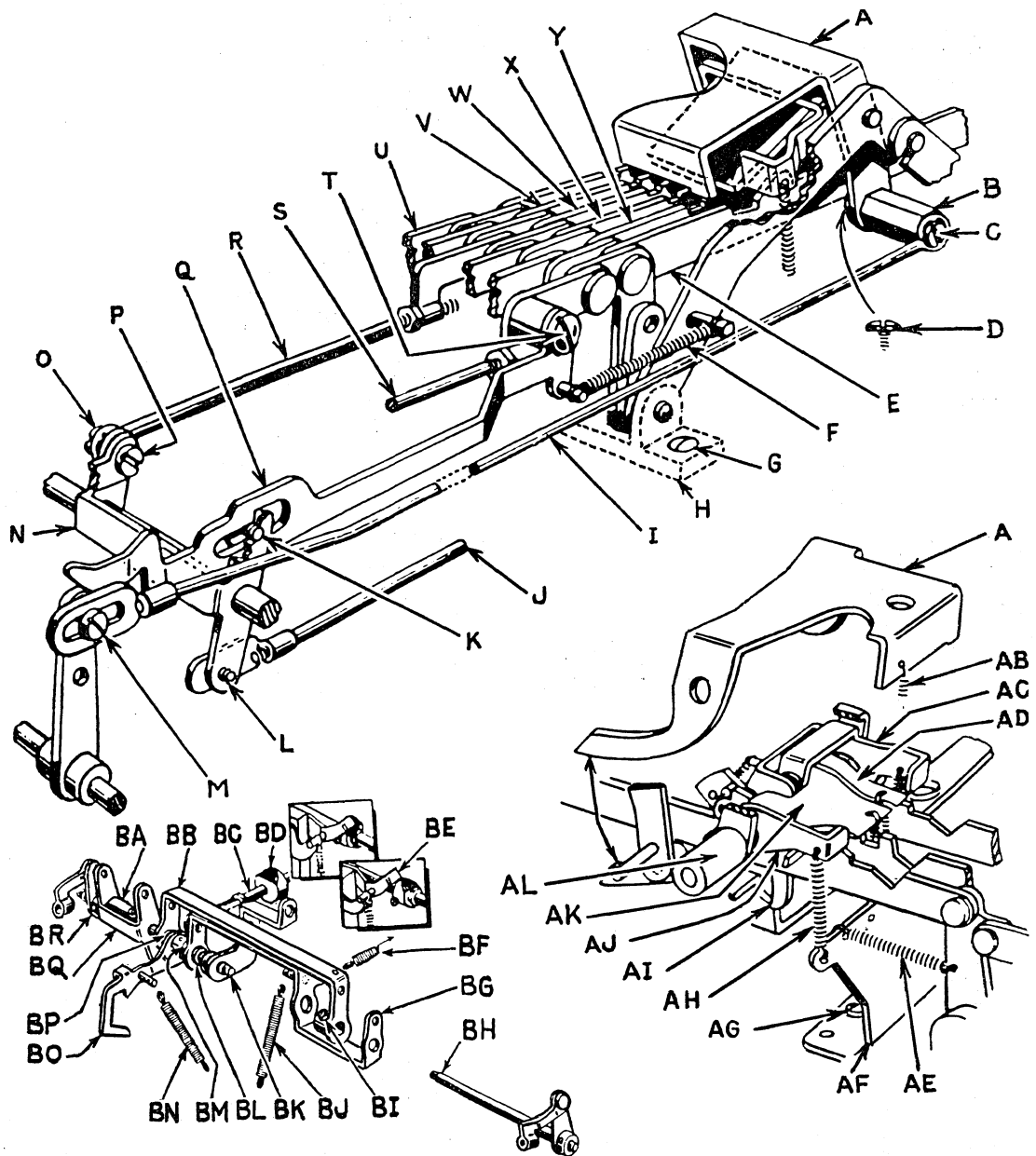
SYMBOLS (Plate 39)

A 74216R (74216R No. 2) use 74505 screw
 B 1-74214
 C 79503
 D 72572 No. 1
 E 1-76212
 F 1-76212 No. 2 used with fractions
 G 76806
 H 76128A
 I 76128 early } Use 76528 screw
 J 706128 } in rear
 K 1-74700 No. 6 includes 72110 No. 3 turnbuckle
 L 74505
 M 74216L (1-704216L, 504 Fte. 138, 73612)
 N 1-28345 includes 75618 screw
 O 1-72250* use 8050 $\frac{3}{4}$ pin
 P 79552
 Q 72501 $\frac{3}{4}$ * included in 1-74243
 R 1-72714 No. 25 includes 72110 No. 1 turnbuckle, 49 $\frac{3}{4}$ nut

P 76559 Screw, 71361 ecc.
 Q 72542
 R 74240
 S 72176 No. 1
 T 72103 No. 1
 U 72542
 V 11A-72171 No. 2 complete assembled linkage, see plate 40 for other styles
 W 1-72252A
 X 1-702252 No. 2
 Y 79503 Screw
 Z 10785 $\frac{1}{4}$
 AA 75818
 AB 74191
 AC 74244
 AD 77517 No. 1
 AE 1-72165A No. 1
 AF 1-72165 No. 1 early
 AG 1-72133A No. 1
 AH 1-702133
 AI 1-74132A No. 8
 AJ 1-74132 No. 8 early

1-704132 No. 2
 AG 75638
 AH 74234
 AI 704234 (704234A, 76500, 49 $\frac{3}{4}$)
 AJ 1-74132 No. 11 includes AK
 AK 1-74132A No. 9
 AL 1-74132 No. 9 early
 AM 74133 No. 2* included in AI
 AN 1-74196 No. 1
 AO 1-704196
 AP 73805
 BA 71806
 BB 74315
 BC 1-72038
 BD 1-702038 (1A-702038) } Includes B, K, L
 BE 71546
 BB 76534A
 BC 11-76126A
 BD 11A-77004 No. 3
 BE 1A-707004 No. 1
 BE 1-77117A No. 1

SUB-TOTAL INDEXING MECHANISM, RESULT KEY LINKAGES AND LATCHES,
CLASS 78 (Plate 40)

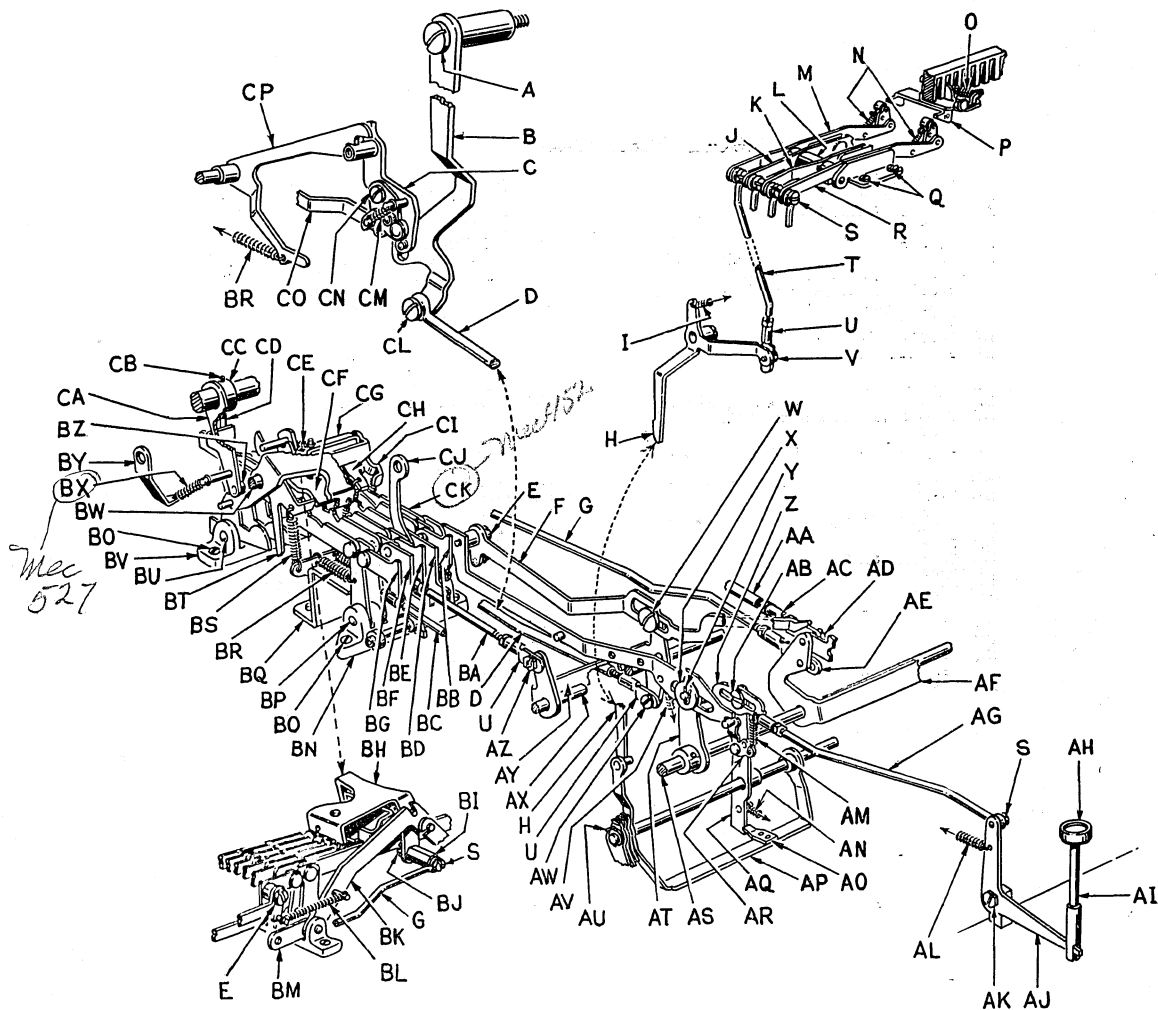


SYMBOLS (Plate 40)

A	72189 No. 3		AL	31A-72002 (31-72002A, 79545)	
B	72642			31-72002 early	
C	72572 No. 2			31A-702002 (31-702002A, 79545)	Complete trap
D	9052 1/4			31-702002 early	
E	1-72171 No. 8 sub-total index		BA	1-72366A includes 75618 screw	
F	3282		BB	1-72296 No. 2	
G	75617			1-702296 No. 2	
H	72666 use 72665 No. 2 casting on rear		BC	1-72712 No. 10 includes BD and 72110 No. 3 turnbuckle,	
I	1-72714 No. 27			49 3/4 nut	
J	1-72714A No. 12		BD	72351 Collar, use 75616 screw	
K	1-72714 No. 12 early		BE	1-72297 use 75637 screws	
L	72663		BF	75804 No. 3	
M	79503		BG	1-72298 3/4	
N	75637			1-702298 3/4	
O	72289 1/4		BH	21-72003 No. 2	
P	702289 1/4			1-702003 No. 4	
Q	72324		BI	75618	
R	72656		BJ	75804 No. 3	
S	1-72291 3/4		BK	1-72003A (1-72003B)	
	72714 No. 1			1-72003 early, use 72714A	Without reg. subt., Cl. 76
	1-702714 No. 9 } Sub-total index			No. 42 wire	
T	72506 No. 2 Screw, 72374 collar			11-72003A	
U	11-72171 No. 7 non-add	Complete assembled		11-72003 early	With reg. subt., Cl. 76
V	21-72171 No. 7 reg. total	linkage 41A-72665 No. 2		21-72003A (21-72003B)	
W	51-72171 No. 1	used with power meshing		21A-72003 early	With reg. subt., Cl. 78
X	21-72171 No. 1 early } Cr. Bal.	Complete assembled		31-72003A (31-72003B)	
Y	11A-72171 No. 2 bal.	linkage 11A-72665 No. 2		31A-72003 early	Without reg. subt., Cl. 78
	31B-72171 No. 1	used without power		51-72003A (51-72003B)	With reg. subt. and bal. key to dis-
	31A-72171 No. 1 early } Add CF	meshing		51-72003 early	able symbol and red ribbon, Cl. 78
AB	72809			1-702003A No. 1	Without reg. subt.,
AC	72296 1/4 A use 8381 spring			1-702003 No. 1 early	Cl. 76, 77
AD	1-72188 1/4 use 72809 spring			11-702003A No. 1	With reg. subt.,
AE	72803 used to restore E, U, W, X			11-702003 No. 1 early	Cl. 76, 77
	72804 used to restore V			1A-702003 No. 3	With reg. subt.,
	74803 used to restore Y			1-702003 No. 3 early	Cl. 78
AF	11A-72192			11A-702003 No. 3	Without reg. subt.,
AG	72581			11-702003 No. 3 early	Cl. 78
AH	72809		BL	1-75332 includes 75618 screw	
AI	1-72191 1/4		BM	89319	
AJ	1-72190A No. 2		BN	3282	
	1-72190 No. 2 early		BO	1-72291 1/4	
AK	72188A No. 2 use 284 spring			1-702291 1/4	
	72188 No. 2 early		BP	1-75332 Set collar includes 75618 screw	
			BQ	72289 1/4	
				702289 1/4	
			BR	1-75332 includes 75618 screw	

*To change
Mac 300*

**SUB-TOTAL INDEXING MECHANISM—KEY AND CARRIAGE CONTROLLED—
SERIES M 800 MACHINES (Plate 40A)**



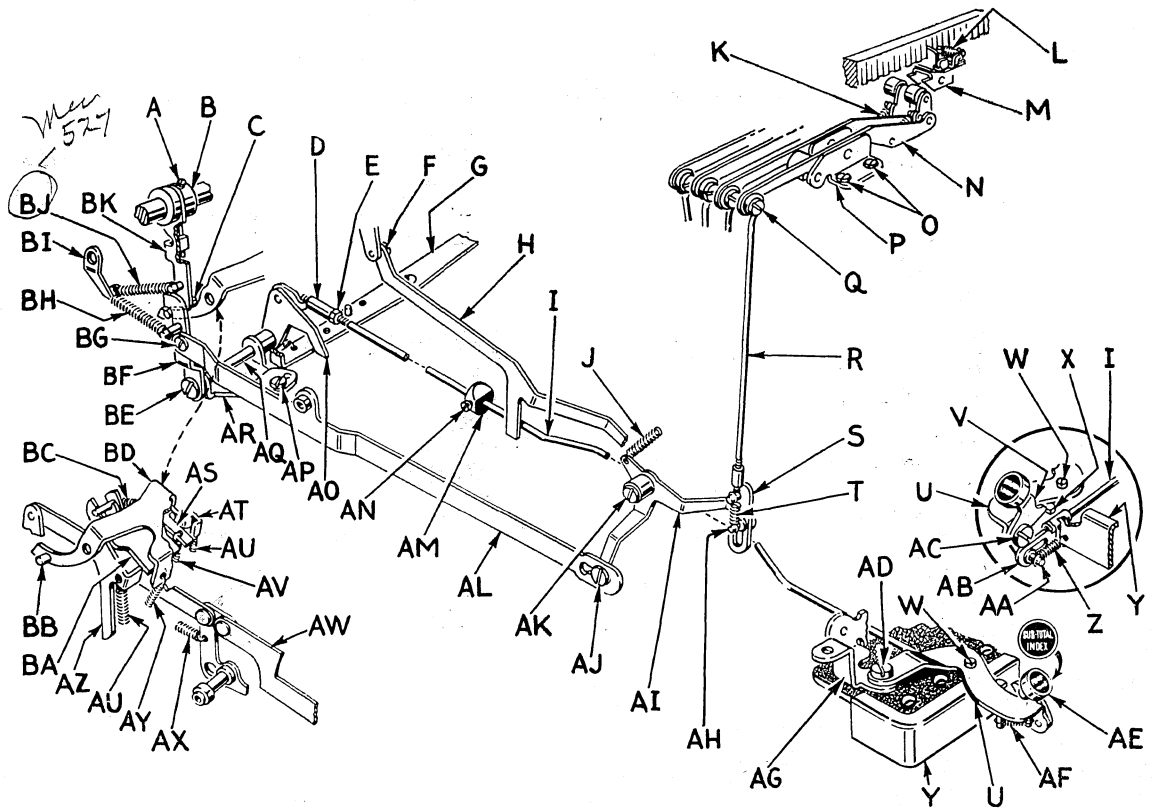
SYMBOLS (Plate 40-A)

A	72501 1/4	AD	707505
B	1-72297 3/4 A	AE	72110 No. 7
C	1-74243	AF	Included in AS
D	1-72714A No. 12 includes U	AG	1-702714 No. 56 includes Z
E	72506 No. 2 screw	AH	72200A No. 1 ring
F	72374 space collar		72199 No. 1 cup
G	1-702291 3/4		72992 No. 1 glass
H	1-702714 No. 58 includes AE		72210 disk
I	1-705212 1/2 No. 1		92 No. 1 Specify Character and Color, keypaper
J	480 1/4	AI	72521 No. 2
K	Included in K	AJ	1-72143 No. 3
L	1-705203 1/2 includes J	AK	702513 1/2
M	705502 1/2	AL	72834
N	1-705205 1/2	AM	77882
O	707800	AN	3489 3/4
P	703809 spring	AO	702201 3/4 No. 2
Q	2-703216 No. 10 register sub-total, line 7 and 13 control	AP	545 Ftc. 217 screws
R	545 Ftc. 217	AQ	1-702201 1/2 No. 1 includes AO
S	1-705202 1/4	AR	1-702202 No. 2 includes AR
T	72572 No. 1	AS	Included in AQ
U	1-705706 includes U	AT	3-702037 No. 4 complete power shaft assembly, for machines with carriage controlled totals, includes AF, AT
V	72110 No. 5	AW	13-702037 No. 4 complete power shaft assembly, for machines without carriage controlled totals, includes AF, AT
W	75638	AX	
X	72663	AY	
Y	702221 3/4	AZ	
Z	21 No. 15		
AA	702110 No. 8		
AB	1-702786 includes AC		
AC	709628		
	702110 No. 6		

SYMBOLS (Plate 40-A)—Continued

AV 44805 spring	BS 8381
AW 79503 screw	BT 1-702190 1/2 No. 2
AX 71-702003 No. 3 complete shaft, includes AY	BU 72004
AY 702289 1/4 No. 4	BV 72665 No. 2
AZ 702610 screw, for machines with carriage controlled totals	BW 702002A shaft only
702659 screw, for machines without carriage controlled totals	51A-702002A No. 2 complete latch assembly, includes BH, BS, BT, BW, CE, CF, CG, CH, CI
71366 nut	BX 3981
BA 1-72714A No. 1 includes U	BY 20 No. 101
BB 31D-72171 No. 1 add crossfooter position	BZ Included in CA
BC 702714 No. 30	CA 1-71185 includes BZ
BD 1A-702171 No. 16 balance position	CB 950 1/4 flat head set screw
BE 51B-72171 No. 1 minus balance position	4557A headless set screw
BF 1A-702171 No. 15 register total position	CC 1-71327 includes CB, CD
BG 11-72171 No. 7 non-add position	CD 71548 post
BH 1-702189 No. 4	CE 205801 spring
74813 spring	CF 72188A No. 2
BI 72642	73829 spring
BJ 9052 1/2	CG 1-702188 1/2
BK 1-72168 No. 2	CH 1-702188 1/4
BL 3282	72809 spring
BM 72167	CI 72296 1/4A
BN 72666 No. 2	8381 spring
BO 75617	CJ 11A-72170A No. 9
BP 72005	CK 1A-702171 No. 17 sub-total index position
BQ 21-702192 1/2	CL 72551
79505 screws	CM 71803
BR 72803	CN 74587
	CO 1-74221
	CP 1-74242

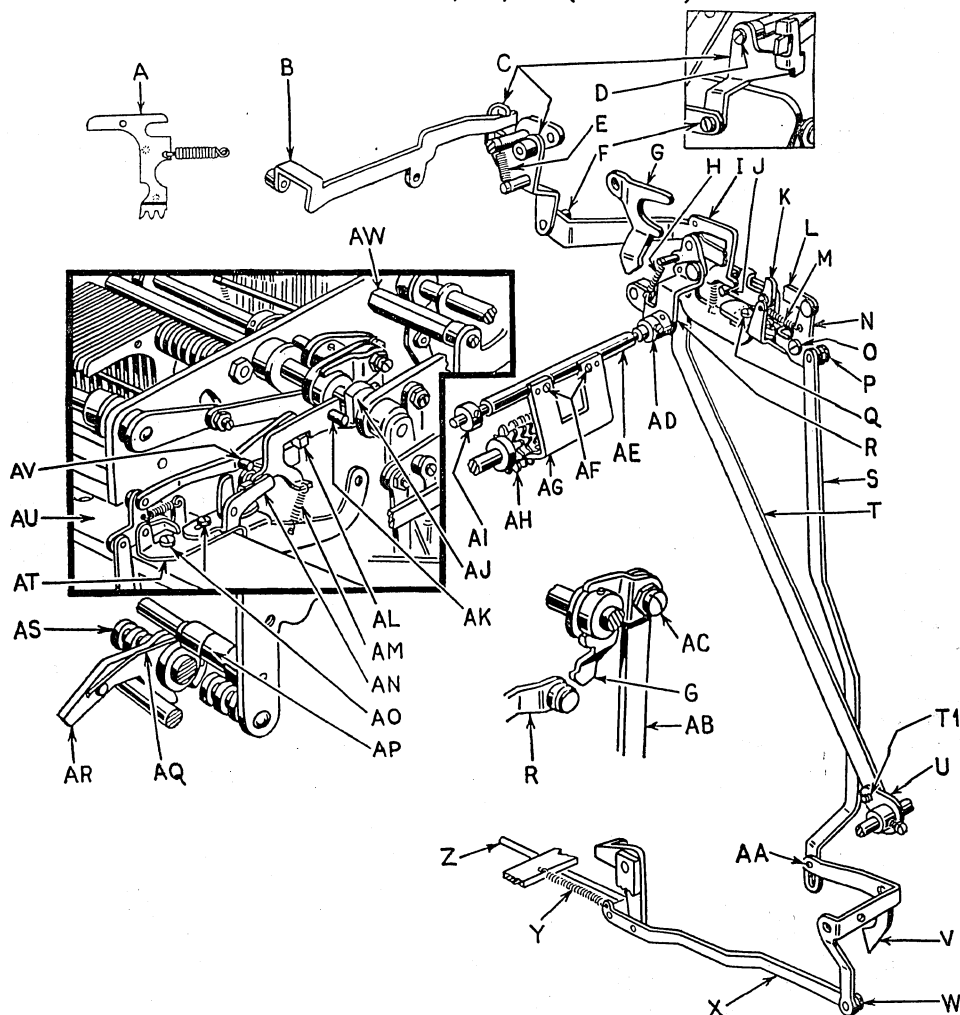
SUB-TOTAL INDEXING MECHANISM—KEY AND CARRIAGE CONTROLLED SERIES M 200 MACHINES (Plate 40-1)



SYMBOLS (Plate 40-1)

A	4557A headless set screw	AL	72200A No. 1 ring
B	950 5/8 flat head set screw	AM	72992 No. 1 glass
C	1-71327 includes A	AN	92 No. 1 specify character and color,
D	Included in BJ	AO	keypaper
E	Included in AQ	AP	44805 spring
F	49 3/4 nut	AQ	1B-72123 1/2 No. 1
G	79503 screw	AR	74315
H	1-702280 No. 4	AS	1-705211 1/2 No. 3
I	702291 1/4 No. 3	AT	72599
J	702778	AV	71598
K	480 1/4	AW	11-702216
L	707800 spring	AX	72351
M	703809 spring	AY	75616
N	2-703216 No. 12 reg. total, sub-total	AZ	Included in AQ
O	index, lines 11 and 13 control	BA	79505
P	2-703216 No. 13 final product, sub-	BB	11-702015
Q	total index, lines 9 and 13 control	BC	1-702193 1/2
R	2-703216 No. 14 first product, sub-	BD	1-702188 1/4
S	total index, lines 7 and 13 control	BE	72296 1/4A
T	Included in P	BF	8381
U	545 Fte. 217	BG	72809
V	1-705202 1/2	BH	1A-702171 No. 13
W	72572 No. 1	BI	72803
X	1-705708 No. 2	BJ	74813
Y	1-702110 No. 9	BK	1-702190 1/2 No. 2
Z	44810		1-702188A No. 2
AA	1-702214		Included in BD
AB	1-702215		205801
AC	79543		1-702189 No. 4 includes BB
AD	Included in U		9052 1/2
AE	702213 1/2A No. 2		1-702144 1/4 No. 2
AF	74587 screw for right side		75638
AG	8082A		3683
AH	72531		20 No. 101
AI	72110 No. 7		12081 1/2
AJ	71542		7281A
AK	700505		1-71185

KEYBOARD LOCKED FROM CROSSFOOTER NON-CLEAR LOCK MECHANISM, CLASSES 75, 77, 78 (Plate 41)



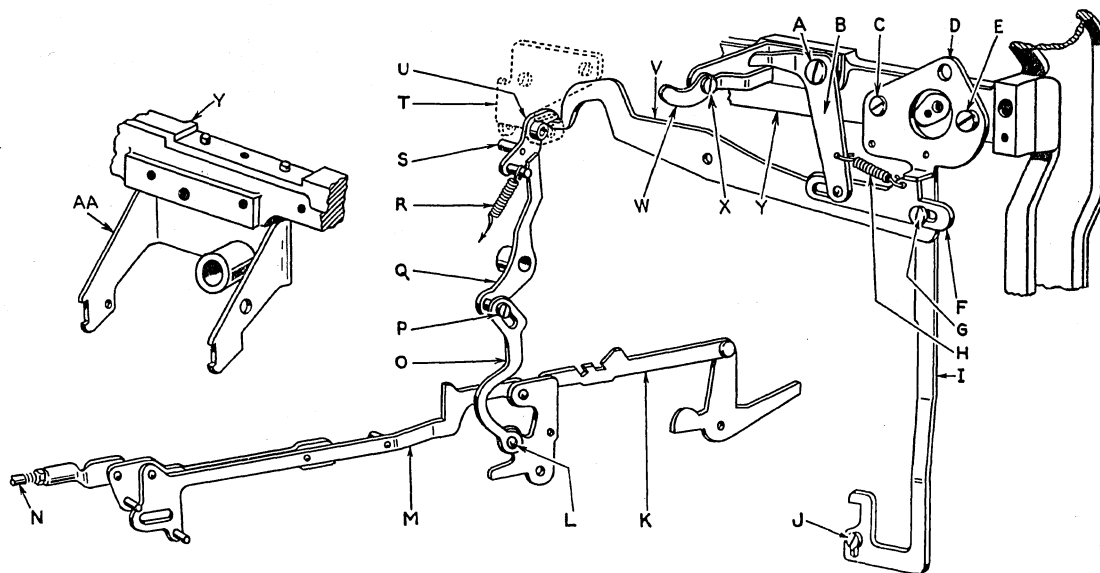
SYMBOLS (Plate 41)

- | | | | | |
|---|--|---|----|---|
| A | 1-112 Fte. 709 | | Z | 1-72714 No. 36 |
| B | 1-147 Fte. 709 (1-147 Fte. 709 No. 2) narrow base | Includes 79357 roller, 510 fte. 717 screw | AA | 72577 Screw |
| C | 1-147 Fte. 709 No. 2 wide base | | AB | 1-709215 |
| D | 1-148 Fte. 709 narrow base | | AC | 79610 Screw, 307A Fte. 709 ecc. |
| E | 1-148 Fte. 709 No. 2 wide base | | AD | 1-304 Fte. 709 includes 76570 screw |
| F | 9052 1/2 | | AE | 2A-1A Fte. 709 narrow base } Includes L, N, R, AD, AI |
| G | 71542 | | AF | 31A-1 Fte. 709 No. 3 wide base |
| H | 145 Fte. 709 narrow base | | AG | 72573 |
| I | 145 Fte. 709 No. 2 wide base | | AH | 134 Fte. 709 narrow base |
| J | 83822 | | AI | 134 Fte. 709 No. 4 wide base |
| K | 1-143 Fte. 709 No. 2 narrow base | | AJ | 113 Fte. 709 (79116 No. 8) |
| L | 1-143 Fte. 709 No. 3 wide base | | AK | 1-303 Fte. 709 includes 76570 screw |
| M | 72312* Roller, 72623* stud | | AL | 1-73337 includes 75618 screw |
| N | 1-140 Fte. 709* included in AN | | AM | 9258 1/4* included in I |
| O | 1-137 Fte. 709* included in AE | | AN | 513 Fte. 709* |
| P | 284 | | AO | 99812 |
| Q | 138 Fte. 709* included in AE | | AP | 1-139 Fte. 709 narrow base } Includes J, K |
| R | 71546 | | AQ | 1-139 Fte. 709 No. 2 wide base |
| S | 74502 Screw, 71361 ecc. | | AR | 79610 narrow base, use 76120 washers |
| T | 75608 | | AS | 4456 1/2 wide base, use 302A Fte. 709 No. 2 washers |
| U | 1-135 Fte. 709* included in AE | | AT | 76302 No. 1 } Narrow base |
| V | 133 Fte. 709 Cl. 78 | | AW | 76302 No. 2 } 5 wide base |
| W | 133 Fte. 709 No. 2 Cl. 75, 77 | | | 800 Fte. 709 |
| X | 144 Fte. 709 narrow base | | | 1-111 Fte. 709 |
| Y | 144 Fte. 709 No. 2 wide base | | | 3 Fte. 709 Comb |
| Z | 71546 | | | 141 Fte. 709 (72276B, 72101 1/4 A) for narrow base |
| | 1-142 Fte. 709 includes 71519 screw | | | 141 Fte. 709 No. 2 wide base |
| | 1-132 Fte. 709 Cl. 78, shown | | | 1A-669A Fte. 709 No. 1 narrow base, Cl. 78 |
| | 132 Fte. 709 No. 2 Cl. 75, 77 | | | 1A-669 Fte. 709 No. 2 (1A-700668 No. 3) wide base, Cl. 77 |
| | 79503 | | | 1A-669 Fte. 709 No. 3 (1A-700668 No. 4) wide base, Cl. 78 |
| | 1-72180 No. 2 complete assembly 11-72503, narrow base, | | | 81517* included in L |
| | complete assembly 11-702182, wide base | | | 505 Fte. 709 No. 2 |
| | 3683 | | | |

SEE EXPLANATION ON INSIDE OF FRONT COVER

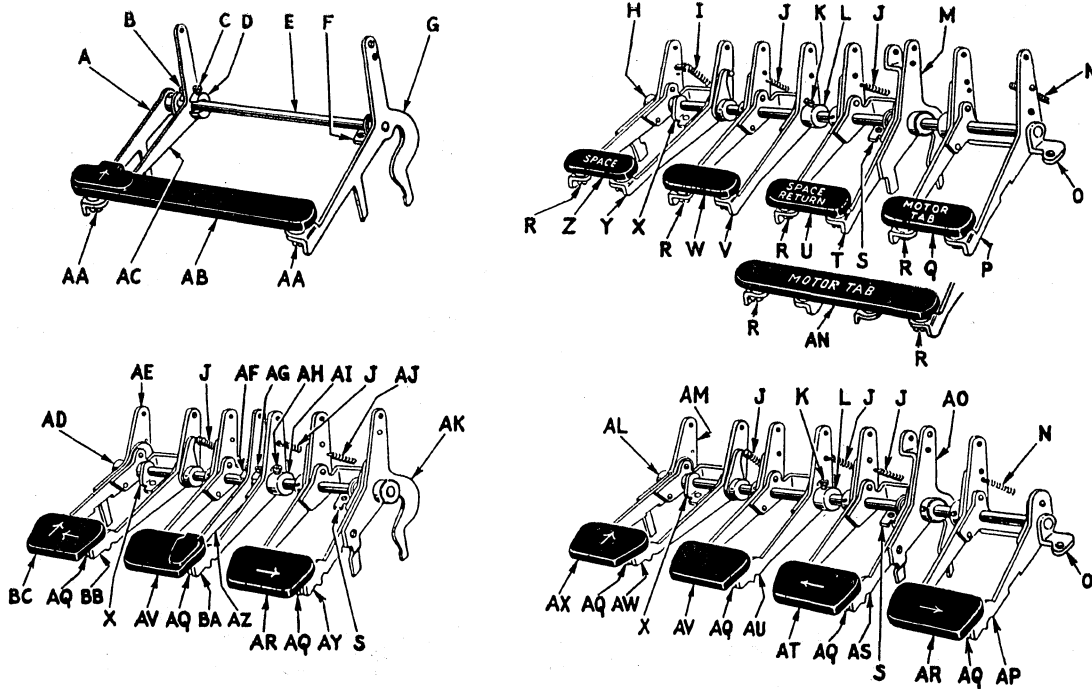
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For Form 2952



A	71605		O	72280 $\frac{1}{2}$ * included in K	
B	1-72286 No. 2 }	Includes F, H	P	71597 use 701391 collar, 71366 nut	
	11-702285		Q	1-701200 No. 3	
C	73612		R	76808	
D	1-72284 No. 2		T	1-701201 No. 2 (1A-701201 No. 2) }	Assembled plate, includ. U., use 71554 screws
	1-702284A No. 2			1-71201 early	
E	74524 use 47 nut		U	1-71202	
F	72285* included in B		V	71203 No. 2 }	Use 71598 screw
G	7559 $\frac{1}{2}$			701203 No. 3 }	
H	74804		W	72288	
I	1-72104B No. 3		X	77529	
J	72602 No. 1		Y	1-71668B (31-71668B)	
K	11A-72171 No. 2 bal., includes L, M, O			1-701668B No. 4 (11-701668C	Assembled casting, for Cl. 71, 72, 73, 74, 76
L	7563 $\frac{1}{2}$*			No. 4, 75572A No. 2)	
M	1-72292 $\frac{1}{2}$ No. 1* included in K			1-701668C No. 1 Cl. 75, 77	Use 79545 screws
N	1-72714A No. 33 narrow base, includes turnbuckles			31-71668B	
	72110 No. 1, 72110 No. 3 and 49 $\frac{3}{8}$ nut			11-701668B No. 4 } Cl. 78	
	1-72714 No. 17 wide base, includes 72110 No. 1	Bal. wire	AA	71-71154	
	turnbuckle, 49 $\frac{3}{8}$ nut				701154A No. 1 (1-701154 No. 2)

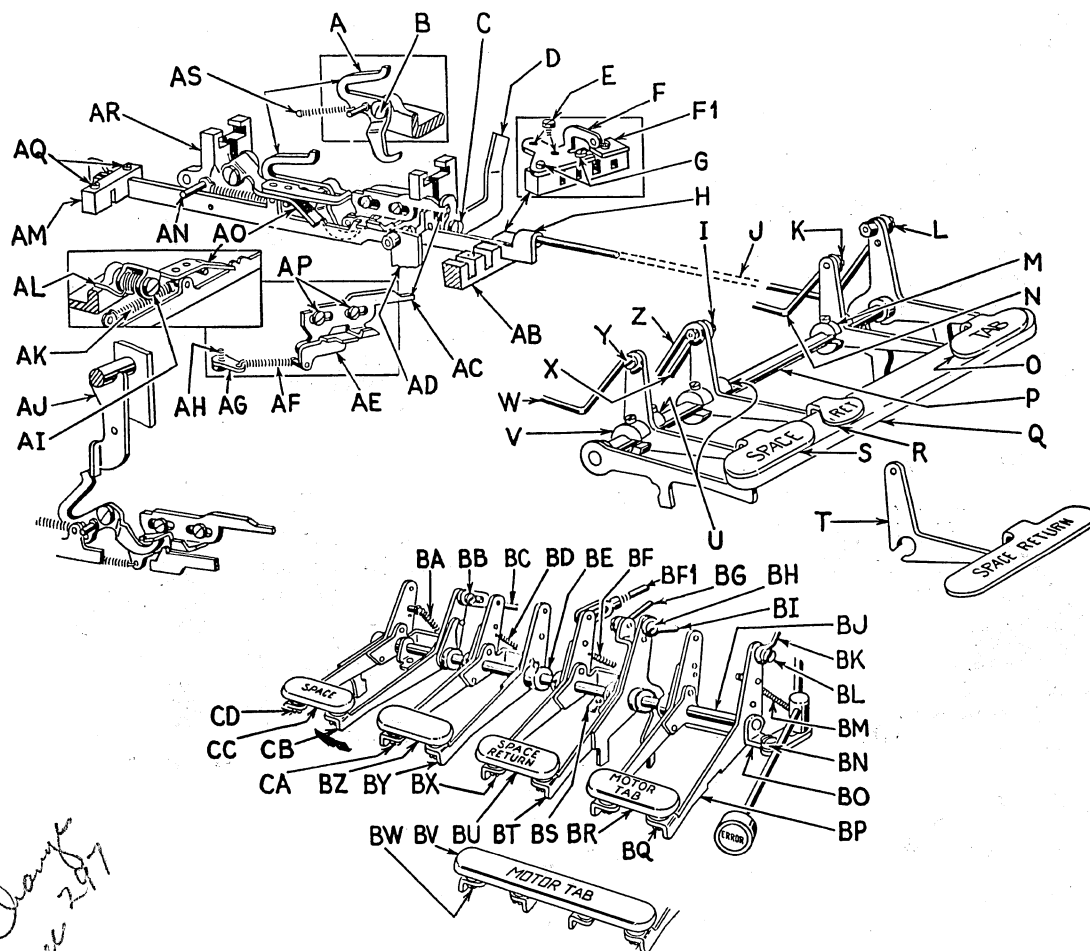
MOTOR BAR ASSEMBLIES (Plate 42-2)



SYMBOLS (Plate 42-2)

A Included in E
 B 1-72301 No. 1 collar, includes 74502 set screw
 C 74502
 D 1-72301 No. 2 includes C
 E 1-702017 shaft assembly for Cl. 75, 77, includes A, F, G
 F 72235R No. 2
 G Included in E
 H 1A-72017 No. 2 shaft assembly for Cl. 78 wide base, includes K, L, M, S, T, V, X, Y
 I 7780
 J 72836
 K 550 $\frac{3}{4}$ set screw
 L 11-72363 includes K
 M Included in H
 N 7780
 O 140 Fte. 146
 P 1-72117 $\frac{1}{2}$ No. 2
 Q 2-72125 No. 4 Motor Tab
 R 73612 screw
 S 72235R No. 2
 T 11-72117 $\frac{1}{2}$ No. 1
 U 2-72125 No. 4 Space Return
 V 1-72117 $\frac{1}{2}$ No. 1
 W 2-72125 No. 4 Plain
 X 72235L No. 2
 Y 21-72117 $\frac{1}{2}$ No. 1
 Z 2-72125 No. 4 Space
 AA 957 $\frac{1}{2}$ screw
 AB 2A-72125 No. 3 brown
 2-72125 No. 3 black
 AC 72119A No. 1 brown
 72119 No. 1 black

AD 1-702017 No. 3 shaft assembly for Cl. 72 new wide base, includes AE, AH, AI, AK, AY, BA, BB
 AE Included in AI
 AF 1-702301 $\frac{1}{2}$ No. 1 collar, includes 74502 set screw
 AG 1-702301 $\frac{1}{2}$ No. 2 collar, includes 74502 set screw
 AH 75618 set screw
 AI 1-75332 includes AH
 AJ 10782
 AK Included in AD
 AL 1-702017 No. 2 shaft assembly for Cl. 78 new wide base, includes AM, K, L, AO, AS, AU, AW
 AM Included in AL
 AN 2-72125 No. 6 Motor Tab
 AO Included in AL
 AP 1-702117 $\frac{1}{2}$ No. 2
 AQ 702625
 AR 2A-702125 No. 4 $\rightarrow$ (-2)
 AS 11-702117 $\frac{1}{2}$ No. 1
 AT 2A-702125 No. 4 $\leftarrow$ (-3)
 AU 1-702117 $\frac{1}{2}$ No. 1
 AV 2A-702125 No. 4 Plain (-6)
 AW 31-702117 $\frac{1}{2}$ No. 1
 AX 2A-702125 No. 4 $\uparrow$ (-1)
 AY 41-702117 $\frac{1}{2}$ No. 1
 AZ 702119A No. 2 brown
 702119 No. 2 black
 BA 1-702117 $\frac{1}{2}$ No. 1
 BB 31-702117 $\frac{1}{2}$ No. 1
 BC 2A-702125 No. 4 $\uparrow \rightarrow$ (-4)

[illegible]

- L **72588 (12356%) Screw, 46 nut**
M **1-72301 No. 1** includes 74502 screw
N **1-72700 No. 5**
O **1-702707 No. 2** } Includes 72110 No. 1 turnbuckle, 49% nut
P **72119 No. 4** specify tab
Q **1-702017** wide and narrow base
R **1-72017** early
Q **2-72125 No. 3** use 957½ screws
S **149A Ftc. 146** specify return
T **72119 No. 1** specify space
U **138 Ftc. 146**
V **1-72301 No. 2** includes 74502 screw
W **1-72301 No. 1** includes 74502 screw
X **1-72700 No. 7** } Includes 72110 No. 1 turnbuckle,
Y **1-702704 No. 1** } 49% nut
Z **1-714 Ftc. 146 No. 2** narrow base } Includes 72110 No. 1
Y **1-700 No. 4** Env. **1474** wide base } turnbuckle, 49% nut
Z **72572 No. 1**
AB **1-713 Ftc. 146** includes 72110 No. 1 turnbuckle, 49% nut
72902 No. 1
702902 No. 3 Cl. 72
702902B No. 2 Cl. 77, 78
AC **1-72105 (1-72105A, 1A-72107)** includes AE
1-702105 (1-702105A) Cl. 75, 77
AD **1-71903A No. 1**
1-71903A No. 2 Cl. 78
1-701903A Cl. 75, 77
AE **1-72100*** included in AC
AF **73805**
7680B Cl. 75, 77
AG **72281 (20 No. 89)**

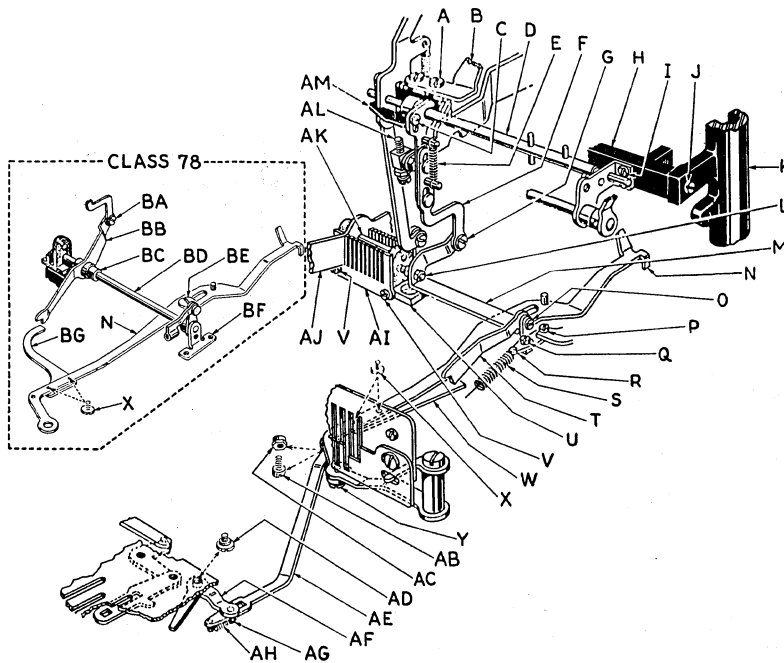
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For Form 2952

SYMBOLS (Plate 43)—Continued

AH 71517	BH 72588 (12356 $\frac{3}{8}$) screw, 46 nut
AI 72624	BI Same as J
AJ 1-71122	BJ 1A-72017 No. 2 1-72017 No. 2 (1A-72017 No. 2, 79552, 21-702156A) early Complete assembly, includes BE, BS, BT, BY, CB
AK 1-72825 includes eyelets 20 No. 12	
AL 72819 Spring	
AM 72902A No. 7	BK 1-72714 No. 51 Tab, includes 72110 No. 1 turnbuckle, 49 $\frac{3}{8}$ nut
AN 72608A	BL 72572 No. 1
72608 (9263 $\frac{1}{4}$) early	BM 7780
AO 1-72107 (1-72105A, 1A-72107)	BN 71518
1-702106A early, Cl. 75, 77	BO 140 Fte. 146
AP 76528	BP 1-72117 $\frac{1}{2}$ No. 2
AQ 72584	BQ 108623
AR 72667 use 79545 screws, complete assembly 1-72067, includes A, B, AC, AE, AF, AG, AH, AI, AL, AN, AO, AP, AR, AS	BR 2-72125 No. 4 specify motor tab
702667 use 75617 screws, complete assembly 1B-702667, Cl. 75, 77	BS 72235R&L No. 2 use 950 $\frac{3}{8}$ screw
Complete assembly 11-702667, Cl. 71, 72, 73, 74, 76, 78	BT 11-72117 $\frac{1}{2}$ No. 1
AS 3981	BU 2-72125 No. 4 specify space return
BA 7780	BV 2-72125 No. 6
BB 79511	BW 108623
BC 1-72717 space, includes 72110 No. 1 turnbuckle, 49 $\frac{3}{8}$ nut	BX 108623
BD 72836	BY 1-72117 $\frac{1}{2}$ No. 1
BE 11-72363 includes 75618 screw	BZ 2-72125 No. 4
BF 72836	CA 108623
BF1 1-706 Fte. 146 Env. 1515 (1-706A Fte. 146) space, includes 72110 No. 1 turnbuckle, 49 $\frac{3}{8}$ nut	CB 21-72117 $\frac{1}{2}$ No. 1
BG 1-714 Fte. 146 No. 2 Env. 1515 return, use 72572 No. 1 screw, includes 72110 No. 1 turnbuckle, 49 $\frac{3}{8}$ nut	CC 2-72125 No. 4 specify space
	CD 108623

KEYBOARD INTERLOCK TO RETAIN MOTOR BAR, RESULT KEY, AND TYPEWRITER KEY LOCKS DURING CARRIAGE TABULATION FROM MOTOR BAR
(NEW WIDE BASE) (Plate 43-1)

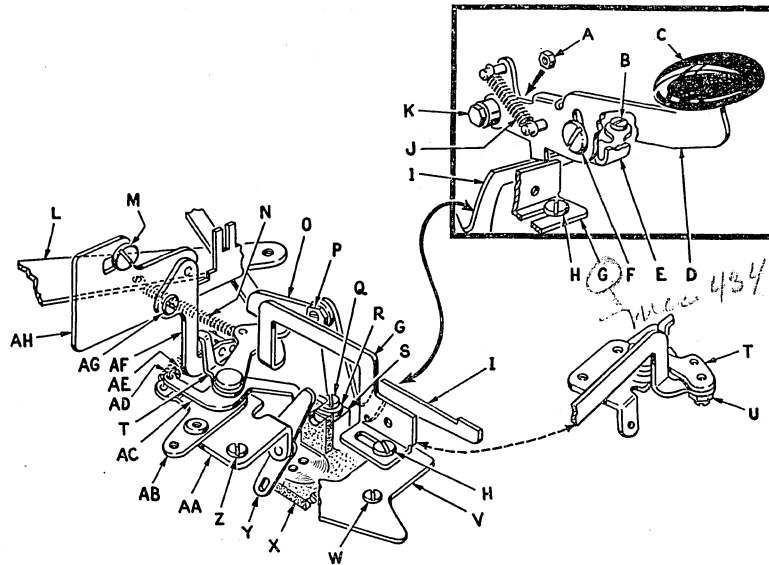


SYMBOLS (Plate 43-1)

A 2854 $\frac{3}{8}$	Q 72567 Screw	AF 702224 $\frac{1}{4}$
B 75197 $\frac{1}{4}$	R 20 No. 89 Spring anchor	AG 72530
C 71546	S 77880A No. 3	AH 79804
D 1-75015B No. 2	T 1-702223 $\frac{1}{2}$ No. 2 includes L	AI 702109 No. 1 Comb
E 89806	U 72671A No. 1 Casting only	AJ 72270A Nos. 1 thru 10, No. 1 shown
F 1-705123 $\frac{1}{2}$	1A-72671A No. 1 includes V, AI, AJ,	AK 72025 No. 1
G 79503	AK	AL 71543
H 1-705901A No. 2	V 79543	AM 705122 $\frac{1}{2}$
I 74502 Screw	W 702222 No. 1	
J 10751 $\frac{1}{2}$	X 74587	BA 79503
K 705666AR No. 2	Y 71520 Screw	BB 1-702223 $\frac{1}{2}$ No. 3
L 702606 Screw, 46 $\frac{1}{4}$ nut		BC 1-73314 Collars, 73643 screw
M 1-702223 $\frac{1}{2}$ No. 2 includes L	AB 70512	BD 1-702003 No. 4
N 1-702223B No. 3	AC 71361	BE 71520
O 72648 Screw	AD 77529	BF 72148 No. 4
P 73659 Screw	AE 1-702223 $\frac{1}{4}$ No. 2	BG 702222 No. 2

SEE EXPLANATION ON INSIDE OF FRONT COVER

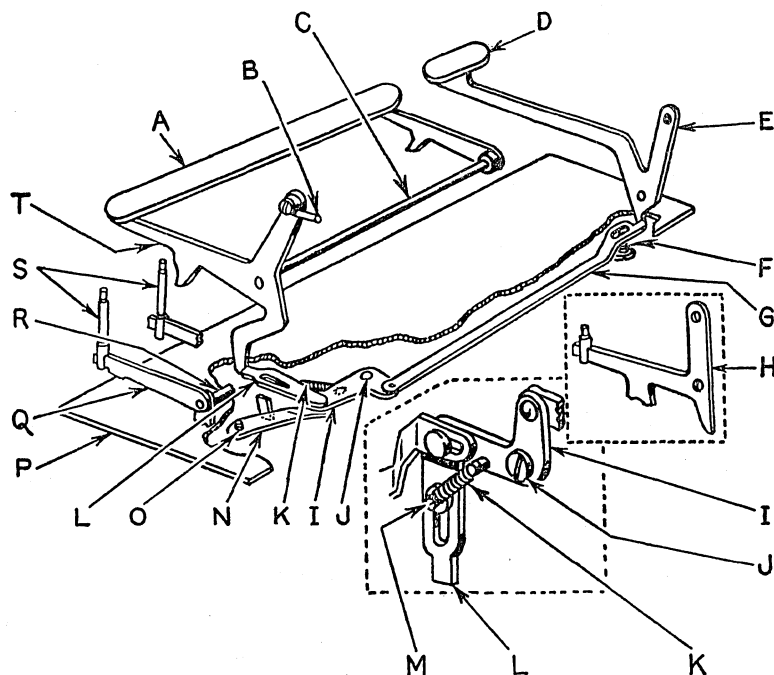
**PALM TABULATOR LOCKED DURING MACHINE OPERATION—
SERIES M 200 AND M 800 MACHINES (Plate 44-1)**



SYMBOLS (Plate 44-1)

A	72446	U	203495 eccentric
B	71517 screw	V	79510 screw
C	1-702913 black	W	1-702203CL No. 4 Series M 200
D	1A-702913 brown	X	11-702203CL No. 4 Series M 800
E	7062 screws	Y	73610
F	1A-72124 1/4 A	Z	72668 casting } Series M 800
G	2B-72123 1/2 No. 1 with added key } includes	AA	71518 } screws
H	2B-72123 1/2 No. 2 without added key } A, D, F, J, K	AB	73610 } screws
I	72532 1/4	AC	702668 No. 2 casting } Series M 200
J	702145 1/4	AD	73610 screws
K	3259 1/4 A	AE	Included in AB
L	1-72117A No. 3	AF	73611
M	60804A	AG	Included in AB
N	72533 1/2	AH	1-702145 1/2 Series M 800, includes T, Y, AA, AB
O	702119 1/2		1A-702246 1/2 Series M 200, includes T, Y, AA, AB, AC
P	75633		Included in AB
Q	705829		76812 bottom spring
R	702103A		8381 top spring
S	702367 eccentric		1A-705134 1/4
T	72573 screw		73548
U	72583 screw		1A-705214 No. 4 with auto. date only
V	702225 1/4 A spring anchor		1A-705214 No. 5 without auto. date or 4 period type
W	72323 block		1A-705214 No. 6 with auto. date and 4 period type
X	Included in AB		

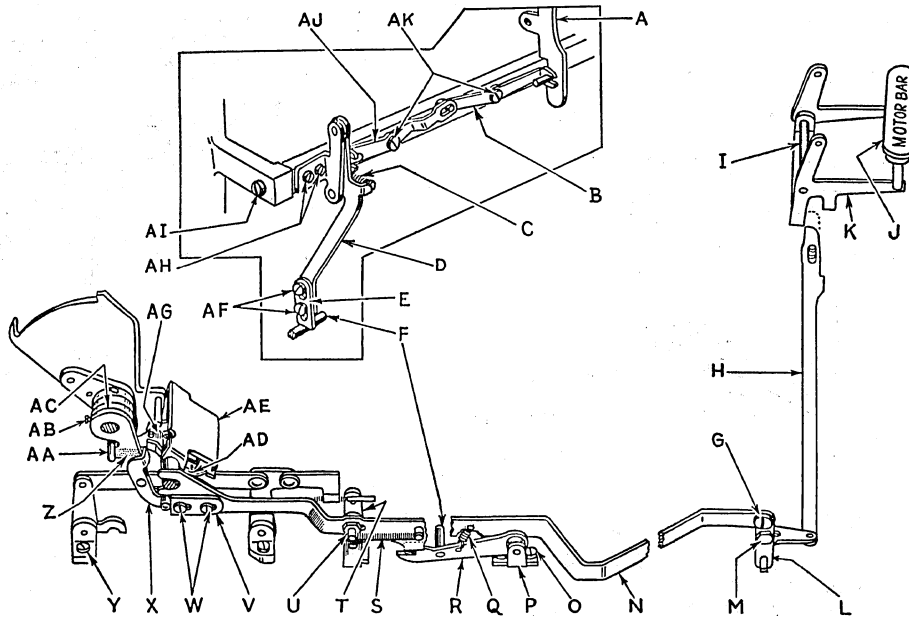
MOTOR BAR AND TABULATOR INTERLOCK (Plate 44)



SYMBOLS (Plate 44)

A	2-72125 No. 3 uno 057½ screws	K	76806
B	72707A No. 4	L	72131* included in G
C	72707 No. 4 curly } See plate 43	M	72531
D	1-72017 } Includes T	N	72152* included in G
	1-702017 }	O	79503
E	1-72125 No. 2 specify tab, use 72592	P	1-72212 No. 2
F	79503 Screw	Q	1-72150A No. 2* included in R
G	72130* complete assembly 11-72130	R	72009A* complete assembly 1A-72234
H	includes G, I, L, N		No. 1 includes H, Q, R, Cl. 74, 75,
I	1-72150A No. 1* included in R		76, 77
J	72129* included in G		Complete assembly 11A-72234 No.
K	73608 Screw, 72139 washer		1, Cl. 78
		S	72521 No. 6
		T	1-72117R No. 1* included in C

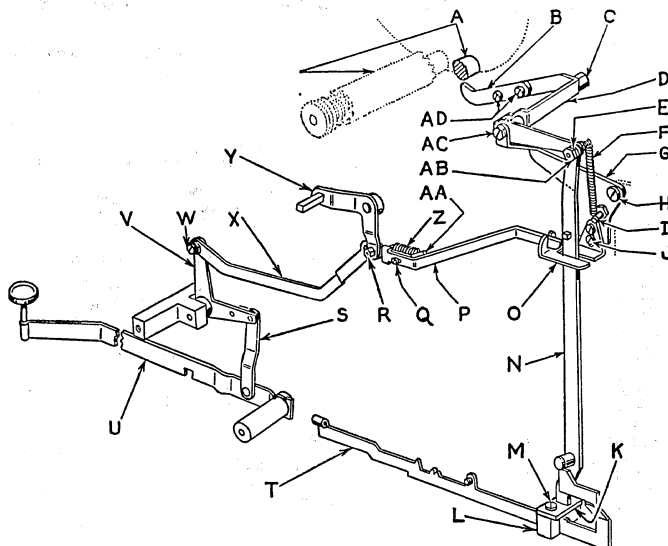
TABULATOR MOTOR BAR DELAYED FROM RESTORING, TABULATOR CONTROLLED, CLASS 77 (Plate 45)



SYMBOLS (Plate 45)

- | | | | | | |
|---|---|---|---------------------------------------|----|---|
| A | 1-75197A for Style 12, 15, 18, 30 cgs. | J | 12-72125 No. 1 specify motor bar | X | 1-701156* included in AC |
| B | 11-75197A for Style 22 cgs. | K | 1-72150A No. 1* included in I | Y | 75617 |
| C | 1-705275 | L | 702165 | Z | 8384 spring |
| D | 71803 | M | 702534 | AA | 71548 included in 1-71327 collar |
| E | 1-705272 includes E, AF | N | 1-702164 includes V, W | AB | 950% |
| F | 11-705272 with auto. date, Cl. 77 | O | 72567 | AC | 1-701155 includes X |
| G | 702172 No. 1 included in D | P | 72148 No. 4 | AD | 72809 Spring |
| H | 3484 1/2* included in R | Q | 283A | AE | 72189 No. 2 see plate 6 for complete latch assembly |
| I | 75645 | R | 1-702166 | AF | 73514 |
| J | 702168* complete assembly 1-702167, uses two 75634 screws | S | 3683 | AG | 72810 |
| K | 72009A* complete assembly 1A-72234 | T | 1-702171 No. 2 use 72581 screw | AH | 70512 |
| L | No. 1 includes K, Cl. 74, 75, 76, 77, complete assembly 11A-72234 No. 1, Cl. 78 | U | 11-702171 No. 2 total to print in red | AI | 10751 1/2 |
| M | | V | 702532 | AJ | 705274 |
| N | | W | 702172 No. 1 | AK | 72582 |
| O | | | 73514 | | |

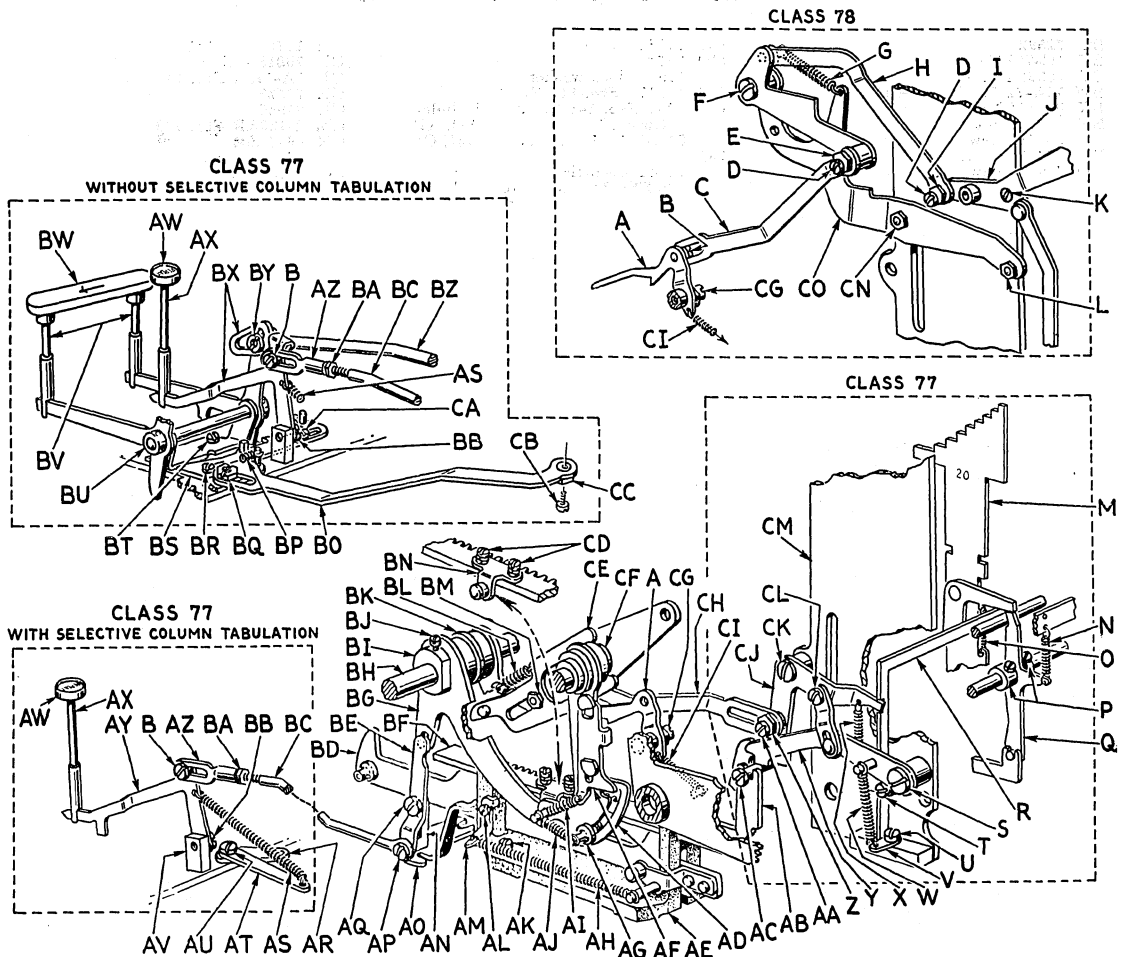
TABULATOR MOTOR BAR DELAYED FROM RESTORING, REGISTER CONTROLLED, CLASS 77 (Plate 46)



SYMBOLS (Plate 46)

- | | |
|----|---|
| A | 1A-709309A to 141A-709309A specify machine number |
| B | 709241 No. 1 |
| C | 1-709240 includes B, AD |
| D | 76311 Ecc. |
| E | 74812 |
| F | 704166 |
| G | 74523 |
| H | 704503 |
| I | 952 1/2 |
| J | 702176 No. 2 |
| K | 72614 |
| L | 1-702174 |
| M | 701217 |
| N | 74533 |
| O | 701518 Screw stud, 46 nut |
| P | 705233* included in U |
| Q | 1-702102 No. 3 |
| R | 1-705110 No. 1 includes S |
| S | 1-705235 No. 1 |
| T | 72627 |
| U | 1-701206 |
| V | 1-701219 |
| W | 2886 1/2 |
| X | 81512* |
| Y | 702540 Screw, 46 nut, 824 1/4 washer |
| Z | 76567 |
| AA | 73548 |
| AB | |
| AC | |
| AD | |

REPEAT OF ITEMS MECHANISM, IMPROVED—CLASSES 77-78 (Plate 47-1)



SYMBOLS (Plate 47-1)

Note: This improved mechanism is used in Class 77 Machines after serial number B83102, and Class 78 after serial number B97847

A	118A Fte. 141 No. 2	AC	702509A	92 No. 1 Specify Color and Char-	
B	75638	AD	Included in CF	acter, keypaper	
C	123 Fte. 141 No. 2	AE	72667	AX	72521 No. 2
D	74502 screw	AF	Included in CF	AY	702244 No. 2
E	71361 eccentric	AG	511 Fte. 141	AZ	72110 No. 1
F	72624	AH	9880	BA	49 3/4
G	3282	AI	44805	BB	76580 screw
H	1-704261	AJ	10983	BC	1-700 Fte. 141 Class 77) includes
I	71361 eccentric	AK	75617		1-706 Fte. 141 Class 78) AZ, BA
J	1-704113C No. 2	AL	72581	BD	11-702228B No. 1 Class 78
K	74500	AM	20 No. 109		1A-702228B No. 2 Class 77
L	49 nut	AN	503 Fte. 141 post	BE	1-103 Fte. 141 No. 2
M	74528 screw	AO	702218 No. 3 Env. 1763 Class 77	BF	702010
N	1-74107 No. 20		702218 No. 3 Class 78	BG	1-101B Fte. 141 No. 2 Class 77
O	74803	AP	72572 No. 1 Class 77	BH	11-101A Fte. 141 Class 78
P	74801		75638 Class 78		1C-701004 No. 1 Class 77
Q	1-74308 includes set screw 12055 3/4	AQ	74529		71B-701004 No. 1 Class 78
R	11-704132 No. 5, collar 74305	AR	20 No. 102	BI	1-304 Fte. 141 includes BJ
S	74125 No. 1	AS	7780	BJ	550 3/4
T	704533	AT	20 No. 105	BK	12134 No. 1 space washer
U	74528	AU	83630	BL	71808
V	74524	AV	702525A post	BM	301 Fte. 141
W	20 No. 104		45 1/4 nut	BN	1-137 Fte. 141
X	71805	AW	72200A No. 1 ring	BO	702223 3/4
Y	74802		72199 No. 1 cup	BP	3280 3/8
Z	1-704258 No. 2		72992 No. 1 glass	BQ	702345 nut
AA	62341 eccentric		72210 disk		74523 screw
AB	72567 screw			BR	75637 screw
	1-72102A No. 3			BS	1-702223 3/4

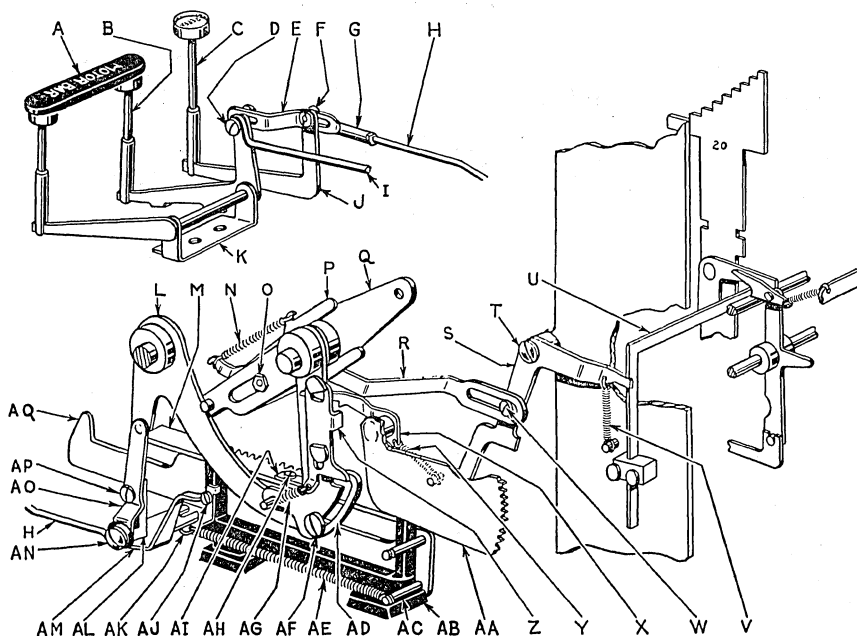
SYMBOLS (Plate 47-1)-Continued

BT 72592
 BU 1C-702009
 BV 72521 No. 6
 BW 12A-72125 No. 1 (→)
 BX 702244 No. 1
 BY 702585 nut
 74576 screw
 BZ 702714A No. 16
 CA 77529 screw
 CB 70512 screw

CC 71361 eccentric
 CD 79543 screw
 1097 $\frac{1}{2}$ lock washer
 CE 1-100A Fte. 141 No. 2
 CF 1A-1 Fte. 141 No. 3 } includes
 Class 78 } AD, AF,
 81A-701001 Class 77 } BM, CE
 CG 756 $\frac{1}{4}$ screw
 75342 eccentric
 306 Fte. 141 No. 2 space collar

CH 114B Fte. 141
 CI 75818 spring
 CJ 1A-115A Fte. 141
 CK 74527
 CL 71546
 CM 1-120AR Fte. 709
 CN 46 $\frac{1}{4}$ nut
 79610 screw
 CO 1-704263

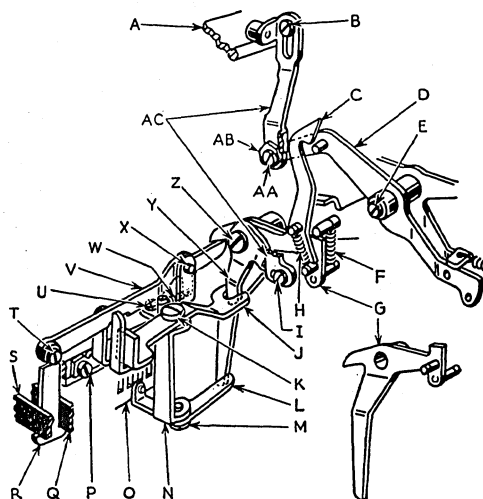
REPEAT OF ITEMS MECHANISM (Plate 47)



SYMBOLS (Plate 47)

- | | | | | | |
|---|---|----|---|----|--|
| A | 12-72125 No. 1 specify motor bar | P | 1-100 Fte. 141 | AB | 1-600 Fte. 141 complete single stroke motor bar mech. |
| B | 72521 No. 6 | Q | 1-101A Fte. 141* complete assembly | AC | 79573* |
| C | 72521 No. 4, 1-119 Fte. 141 complete assembled keyboard, specify style and machine number | | 21-1 Fte. 141 No. 1 includes O, P, Q, Z, AD, Cl. 71, 72, 73, 74 | AD | 1-102 Fte. 141 includes Z |
| D | 72572 No. 2 Screw, 72324 bushing | | Complete assembly 1B-1 Fte. 141 No. 1, Cl. 76 | AE | 72824 |
| E | 117 Fte. 141 | | Complete assembly 11A-1 Fte. 141 No. 1, Cl. 78 | AF | 505 Fte. 141 |
| F | 79503 Screw, 72324 bushing | R | 114 Fte. 141 | AG | 10983 |
| G | 72110 No. 1 | S | 1-115 Fte. 141 | AH | 70512 |
| H | 1-700 Fte. 141 includes G | T | 74529 | AI | 107 Fte. 141 |
| I | 1-702 Fte. 141 includes 72110 No. 1 turnbuckle, 49% nut | U | 74125 No. 1 | AJ | 72531 |
| J | 72243 No. 3 | V | 74802 | AK | 108 Fte. 141 (20 No. 109) Anchor |
| K | 72234 No. 1* complete assembly 1A-72234 No. 1, use two 72592 screws, Cl. 74, 75, 76, 77 Complete assembly 11A-72234 No. 1, Cl. 78 | W | 72576 No. 1 | AL | 503 Fte. 141 |
| L | 1-101 Fte. 141 | X | 118 Fte. 141 (118A Fte. 141 No. 2) use 75342 ecc., 72614 screw | AM | 72218 |
| M | 72010 | Y | 76812 | AN | 72572 No. 1 |
| N | 3683 | Z | 106 Fte. 141* included in AD | AO | 1-103 Fte. 141 (1-103 Fte. 141 No. 2) |
| O | 301 Fte. 141 | AA | 1-105 Fte. 141 Cl. 74 | AP | 74529 |
| | | | 11-105 Fte. 141 (21-71147) Cl. 71, 72, 73, 76, 78 | AQ | 1-128A Fte. 141 } Includes AC
1-128 Fte. 141 } Cl. 71, 72, 73
early
1-128A Fte. 141 No. 2 }
1-128 Fte. 141 No. 2 } Cl. 74, 76, 78
early |

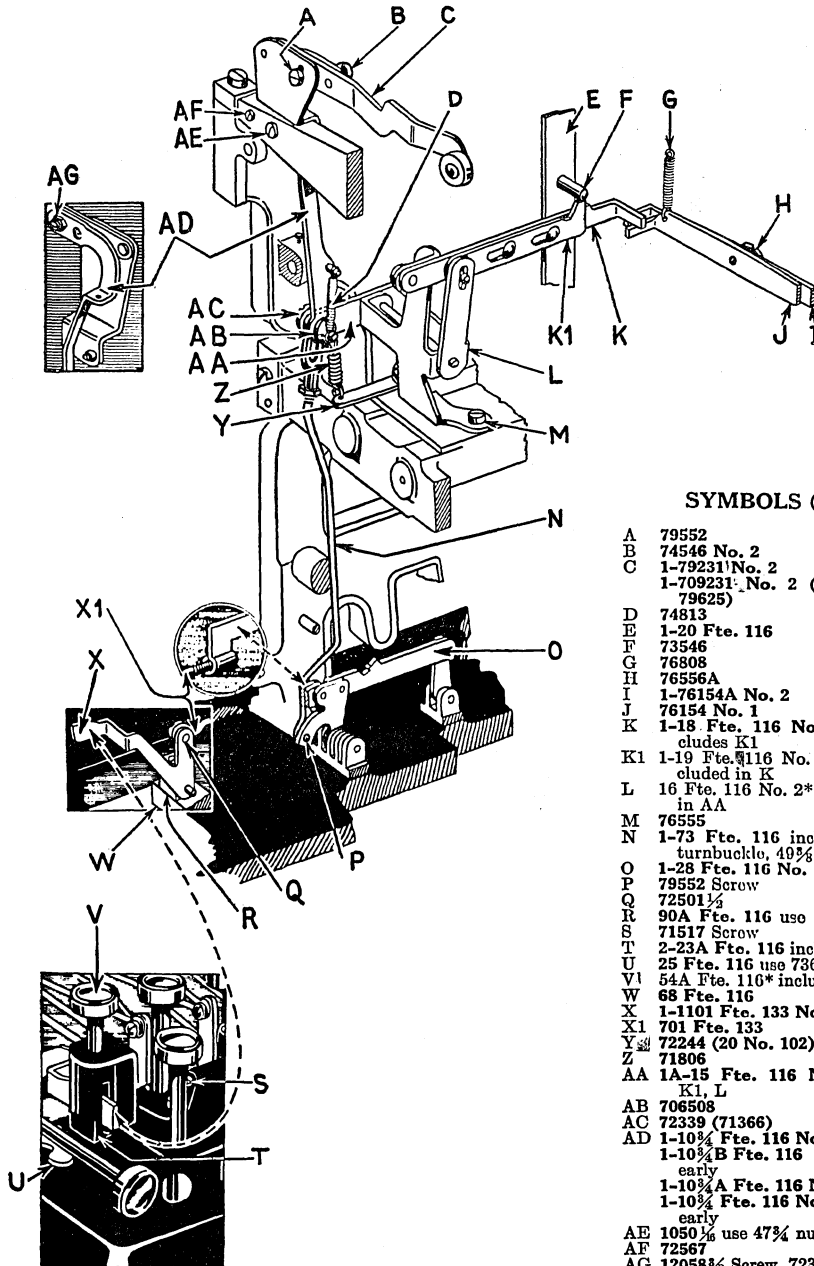
REGISTER AND CARRIAGE RETURN KEY INTERLOCK, SKIP TABULATOR, CLASS 77 (Plate 48)



SYMBOLS (Plate 48)

- | | |
|----|------------------------------|
| A | 1-703036 Style 22, 30 |
| B | 75645 |
| C | 1-705122 |
| D | 1-705131A |
| E | 4452 1/2 use 46 nut |
| F | 3981 |
| G | 1-705124 |
| H | 2887 1/2 |
| I | 79503 |
| J | 1-705182A |
| K | 74529 |
| L | 705133 use 705617 screw |
| M | 74529 |
| N | 705125 |
| O | 1-705214 No. 3 |
| P | 70512 |
| Q | 1-705110 No. 2 Cge. ret. key |
| R | 705153 |
| S | 1-705110 No. 1 Reg. ret. key |
| T | 79503 |
| U | 76559 |
| V | 705144 |
| W | 2887 1/2 Spring |
| X | 74529 |
| Y | 705181 |
| Z | 705618 |
| AA | 73611 |
| AB | 75342 |
| AC | 1-705148C |

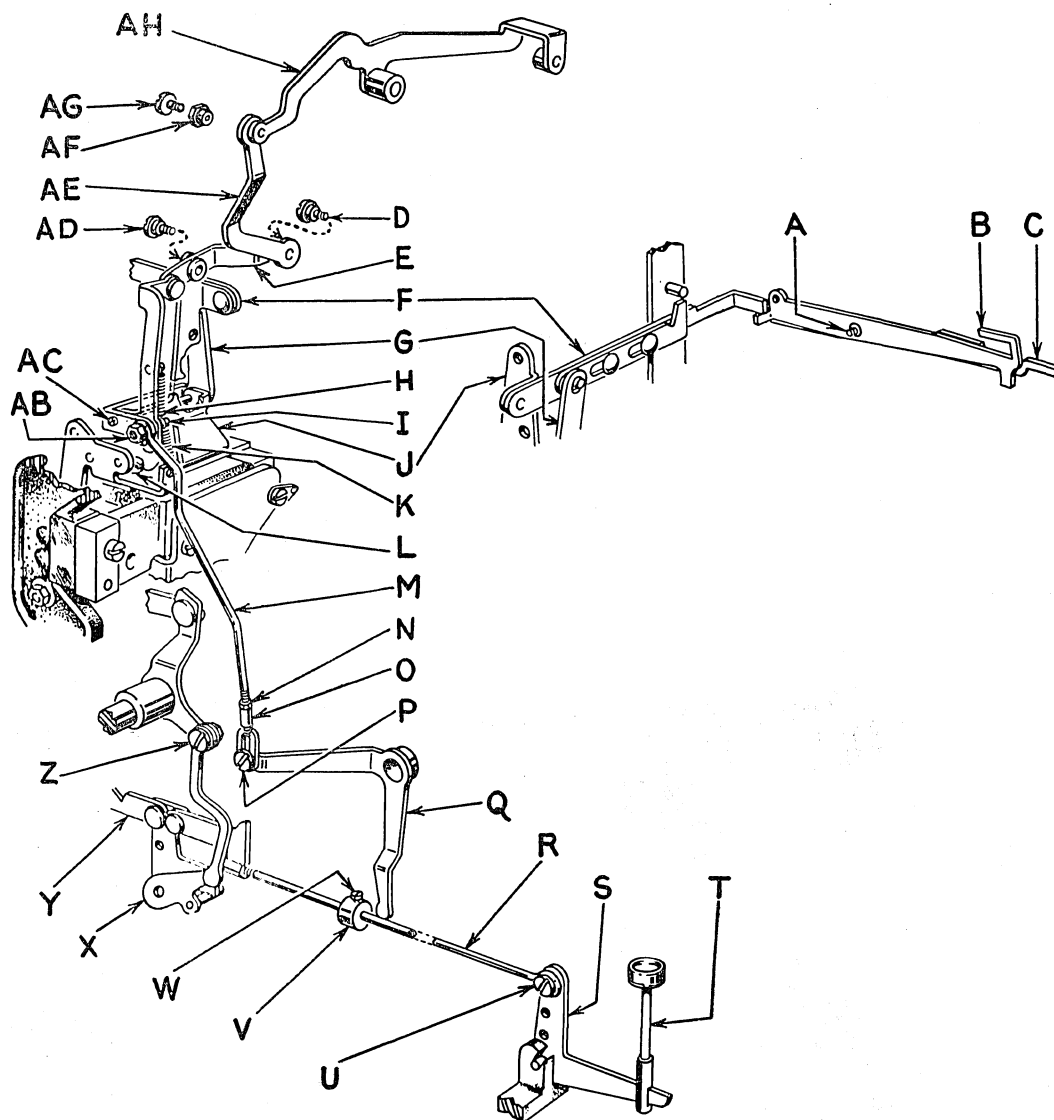
PRORATING MECHANISM WITH DISABLING KEY, CARRIAGE CONTROLLED (Plate 49)



SYMBOLS (Plate 49)

A	79552
B	74546 No. 2
C	1-79231 No. 2
	1-709231 No. 2 (1A-709231 No. 2, 79625)
D	74813
E	1-20 Fte. 116
F	73546
G	76808
H	76556A
I	1-76154A No. 2
J	76154 No. 1
K	1-18 Fte. 116 No. 2 (1-706217) includes K1
K1	1-19 Fte. 116 No. 2* (1-706218*) included in K
L	16 Fte. 116 No. 2* (706216*) included in AA
M	76555
N	1-73 Fte. 116 includes 72110 No. 1 turnbuckle, 49% nut
O	1-28 Fte. 116 No. 2
P	79552 Screw
Q	72501 1/2
R	90A Fte. 116 use 519 Fte. 213 screw
S	71517 Screw
T	2-23A Fte. 116 includes V
U	25 Fte. 116 use 73610 screw
V	54A Fte. 116* included in T
W	68 Fte. 116
X	1-1101 Fte. 133 No. 2
X1	701 Fte. 133
Y	72244 (20 No. 102)
Z	71806
AA	1A-15 Fte. 116 No. 2 includes K, K1, L
AB	706508
AC	72339 (71366)
AD	1-10 1/4 Fte. 116 No. 3
	1-10 1/4 B Fte. 116
	early
	1-10 1/4 A Fte. 116 No. 2
	1-10 1/4 Fte. 116 No. 2
	early
AE	1050 1/4 use 47 3/4 nut
AF	72567
AG	12058 3/8 Screw, 72307 ecc.

PRORATING MECHANISM—CARRIAGE CONTROLLED—DISABLED FROM FINAL PRODUCT KEY (Plate 49-1)



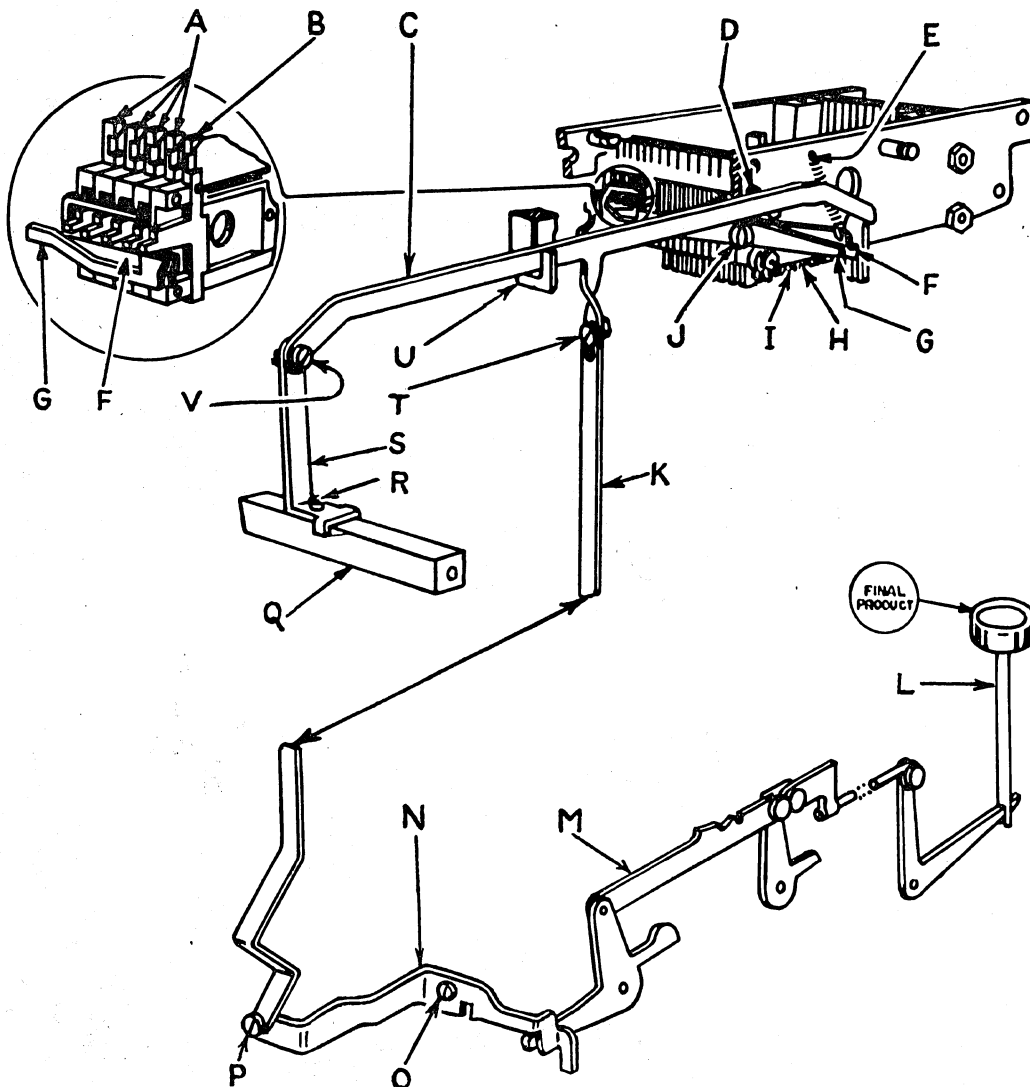
SYMBOLS (Plate 49-1)

A 76556A Screw
B 706154 No. 8
C 1-706154A No. 9
D 79503
E 1-706212
F 1-706217* included in J
G 706216
H 73805 Spring
I 706508 Spring stud screw
J 706215 No. 2* assembly 1-706215 No.2 includes G, F

K 71803 Spring
L 75617 Screw, 2 req.
M 1-705704
N 49% Nut
O 72110 No. 1
P 75638
Q 1-705118 1/2
R 72700 No. 9
S 1-72143 No. 4
T 72521 No. 2
U 72572 No. 1

V 1-72315 No. 1 includes W
W 72573
X 1-72170A No. 9
Y 1B-72171 No. 12
Z 70507 Screw, use 40 1/2 nut
AB 72324 Nut
AC 706510 Pivot screw
AD 79552
AE 706214
AF 75342 Eccentric
AG 73611
AH 1-709231 No. 4

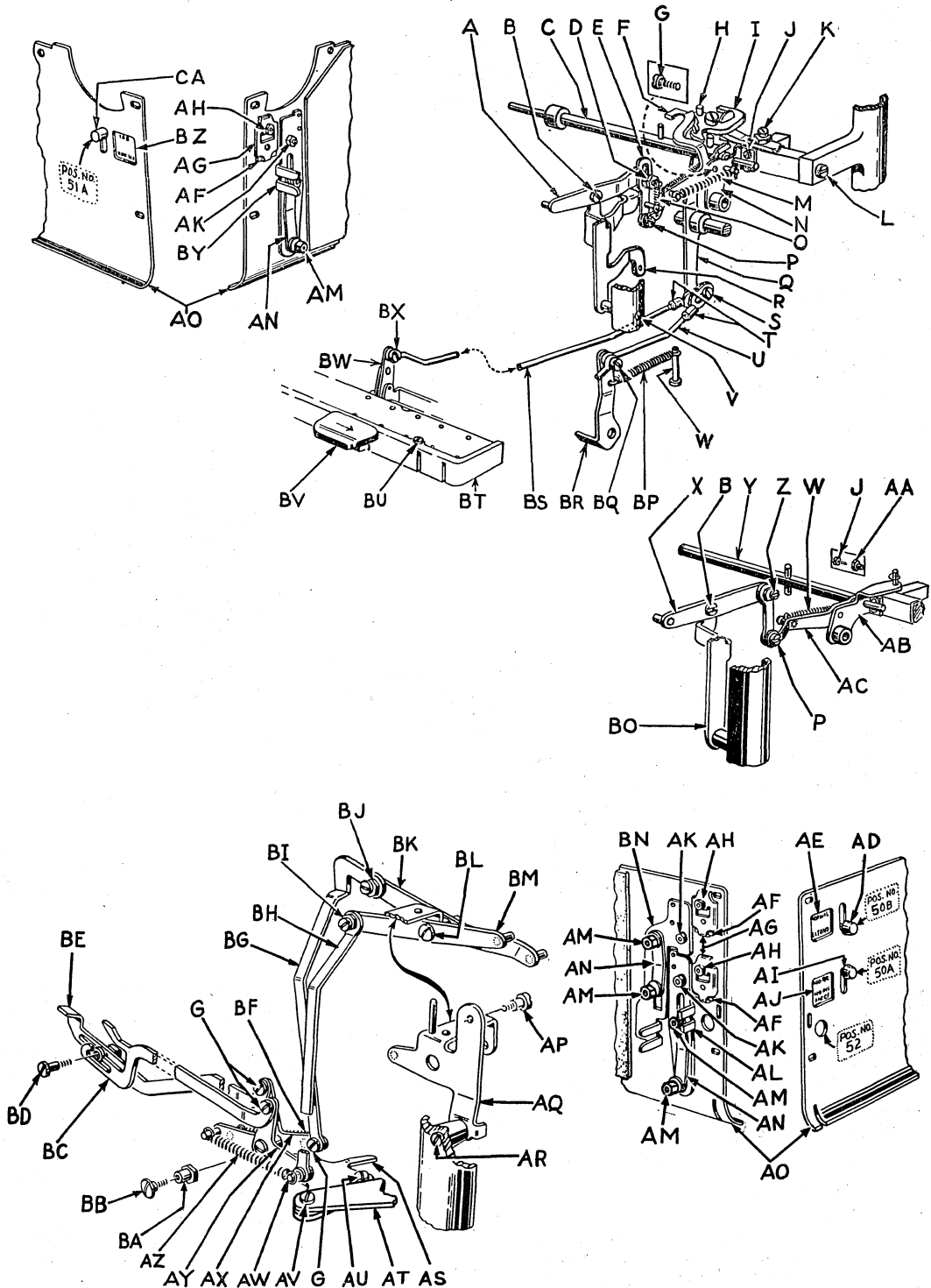
PRORATING MECHANISM, KEY CONTROLLED (Plate 50)



SYMBOLS (Plate 50)

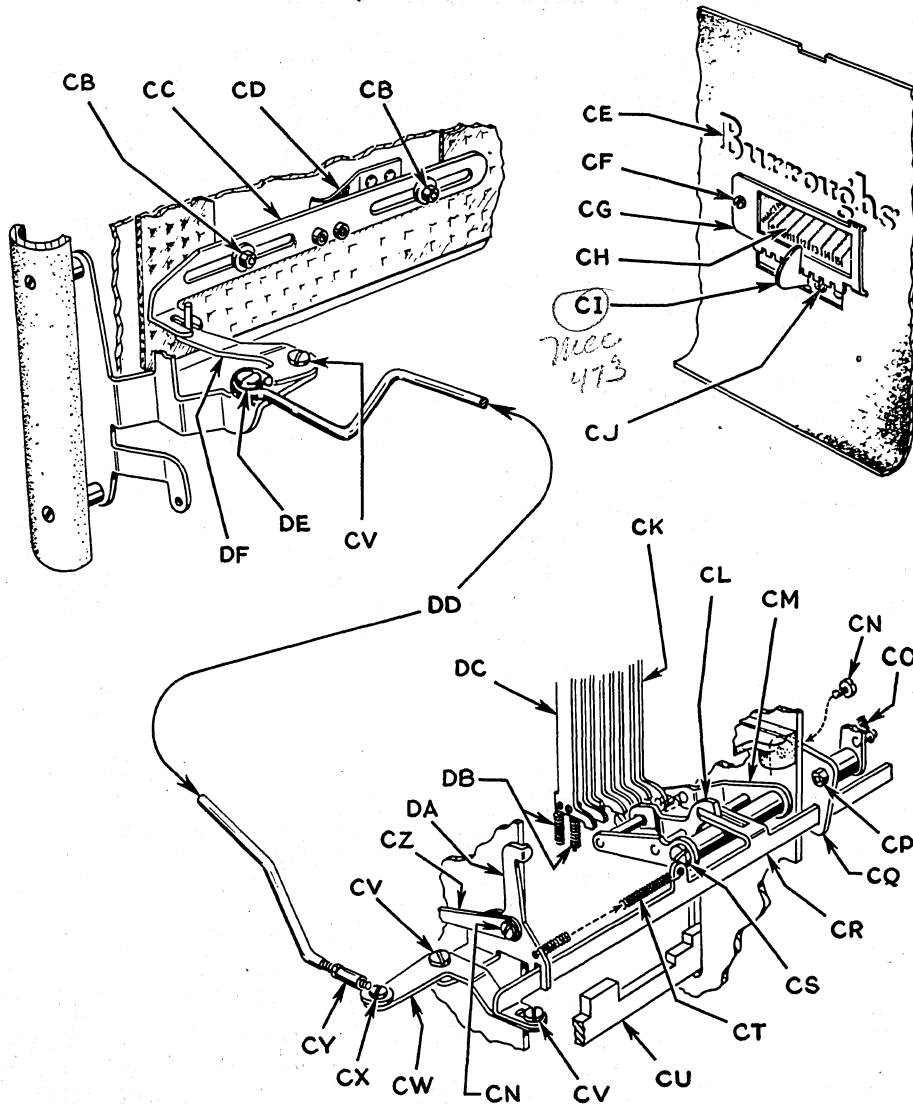
A	76130 No. 5	N	1A-72171 No. 12 with power meshing
B	1-76132 No. 4	O	13½ Fte. 116
C	10 Fte. 116 No. 3	P	1-11 Fte. 116 early
D	76559 Screw	Q	59 Fte. 116
E	76808	R	75645 use 49½ nut
F	76154 No. 1	S	74000 No. 2 narrow base
G	1-76154A No. 2	T	1 Fte. 116 No. 2 (704000A Env. 1060B)
H	76130 No. 6	U	71553
I	76130 No. 1	V	13 Fte. 116
J	76556A		7559½ Screw, 46 nut
K	12 Fte. 116 No. 3		14 Fte. 116 No. 2 use 72318 collar, 71567 screw
L	72521 No. 2		99539A Screw, 46 nut
M	1-72171 No. 12 (1B-72171 No. 12)		
	1-72171 No. 2 early		

FRONT PANEL CONTROLS (Plate 51)



Symbols on Back

(Plate 51) Continued



SYMBOLS (Plate 51)

A	1-705128 1/2 No. 2	Z	74523 screw
B	705508 1/2		79333 No. 1 eccentric
C	1-75015B No. 2 includes H	AA	71361
D	75342 eccentric	AB	1-75217AR
E	71614 spring screw stud	AC	Use 1-705237 1/2 A, 79503, 1-75217BR, 1-705128 1/2 No. 2
F	1-705136 1/2	AD	1A-705582 includes, 705916A keytop
G	1-705237 1/2 A	AE	705920 No. 5 (NORMAL EXTEND)
H	79503	AF	705915 clear plastic
I	Included in C	AG	705102 1/4
J	1-75107B	AH	46 1/4 nut
K	74502 screw	AI	1A-705582 includes, 705916A keytop
L	79543 screw	AJ	705920 No. 1 (ADD REG AND CF), (ADD REG AND CF)
M	71361 eccentric	AK	49 nut
N	10751 1/2	AL	1097 1/8 washer
O	1080 1/2 spring	AM	705102 1/4 AL
P	1-75217BR	AN	46 nut
Q	10180 spring	AO	12020 1/4 washer
R	76580		705103 1/4
S	1-705159 No. 2		
T	1-705159Z No. 2 slotted for repairs on wide base machines except selective column tabulation		
U	1-705129 1/2		
V	707505		
W	72110 No. 1		
X	1-702761 includes T		
Y	2859 1/2 B		
	569 Fte. 203		
	1-705128 1/4		
	Use 1-75015B No. 2		

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 51) Continued

2-705102 No. 3 black	Class 78 and Series M 800—controls for auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A	BD 72578 for double slide
2A-705102 No. 3 gray		BE 702197 ½ No. 2
12-705102 No. 3 black	Class 72 and Series M 200—controls for auto. extend pos. No. 51A, simultaneous addition pos. No. 50A	BF 9583 spring
12A-705102 No. 3 gray		BG 702200 ½ No. 2
22-705102 No. 3 black	Class 72 and Series M 200—controls for manual extend pos. No. 51A, simultaneous addition pos. No. 50A	BH 702201 No. 2
22A-705102 No. 3 gray		BI 72307 eccentric
12-705102 No. 7 black	Class 72 and Series M 200—controls for auto. extend pos. No. 51A, simultaneous addition pos. No. 50A, multiplier factor normalizing mechanism pos. No. 52	BJ 73612 screw
12A-705102 No. 7 gray		BJ 72307 eccentric
22-705102 No. 7 black	Class 72 and Series M 200—controls for manual extend pos. No. 51A, simultaneous addition pos. No. 50A, multiplier factor normalizing mechanism pos. No. 52	BK 73612 screw
22A-705102 No. 7 gray		BK 1-705121 ½
2-705102 No. 9 gray, Class 72 and Series M 200—controls for auto. extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A, multiplier factor normalizing mechanism pos. No. 52	Class 72 and Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A	BL 9259 ¾
12-705102 No. 9 gray, Class 72 and Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A, multiplier factor normalizing mechanism pos. No. 52		BM 1-705128 ½
2-705102A No. 9 gray, Class 72 and Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A	Class 72 and Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A, multiplier factor normalizing mechanism pos. No. 52	BN 705102 ¼ L No. 2
12-705102A No. 9 gray, Class 72 and Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A		BO Use 1-705129 ½
2-705102A No. 10 gray, Series M 200—controls for auto. extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	Class 72 and Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	BP 99802 No. 2
12-705102A No. 10 gray, Series M 200—controls for manual extend pos. No. 50B, auto. tab. pos. No. 51A, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel		BQ 514 Fte. 146
2-705102 No. 11 gray, Class 72—controls for auto. extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	BR 702295 ¼ No. 2
12-705102 No. 11 gray, Class 72—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel		BS 1-702707 No. 2 includes T
AP 79632	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	BT 702213 ¼ A No. 2
AQ 1-705120 ¼ A		BU 74587
AR 1511 Fte. 209	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	BV 2A-702125 No. 4 (→) —2
AS 1-702128 ½ No. 2		BV 702625 nuts
AT 702119 ½	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	BW 41-702117 ½ No. 1
AU 60550		BX 72572 No. 1
AV 8451 screw	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	BY 705102 ¼ AR
AW 74315 spring screw stud		BZ 705920 No. 2 (TAB NON TAB)
AX 1-702200 No. 2	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CA 1A-705582 includes, 705916A keytop
AY 702200 No. 1		CB 46 nut
AZ 984	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CC 705371 washer
BA 705369		CD 1-705159 ½
BB 3960	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CE Included in AO
BC 702198 ½		CE 91 ½ No. 25
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CF 22 No. 3 speed nuts
		CF 7562 screw
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CG 705155 ½
		CH 705915 ½ clear plastic
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CI 705921 for cols. 9 thru 15
		CJ 705921 No. 2 for cols. 10 thru 15
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CK 705921 No. 3 for cols. 11 thru 15
		CL 705921 No. 4 for cols. 12 thru 15
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CM 705158 ½
		CN 73612 screw
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CO 1A-704151AL No. 4
		CP Included in CM
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CQ 1B-704305A includes CL
		CR 74565
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CV 76806 spring
		CW 46 nut
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CX 704522 screw
		CY 1-704136
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	CZ 704218
		DA 704519A screw
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DB 47 nut
		DC 780 ¾
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DD 1-704914 No. 6
		DE 74529
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DF 704220
		DG 76580
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DH 72110 No. 6
		DI 20 No. 146
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DJ 704219
		DK 74806
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DL 704151R No. 4
		DM 1-705710 includes CY
	Class 72 and Series M 200—controls for manual extend pos. No. 50B, simultaneous addition pos. No. 50A, extend column for multiplier factor selected from front panel	DN 71540
		DO 1-705156 ½

paper insert

SERIES M MACHINES
Type 70
PRINTING

Symbol List

May 16, 1949

Issued _____
To _____
Of _____

Property of and to be returned to
BURROUGHS ADDING
MACHINE COMPANY
DETROIT, MICHIGAN

PRINTING

Mr M R Lovejoy
Buffalo N Y Branch
10-5

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

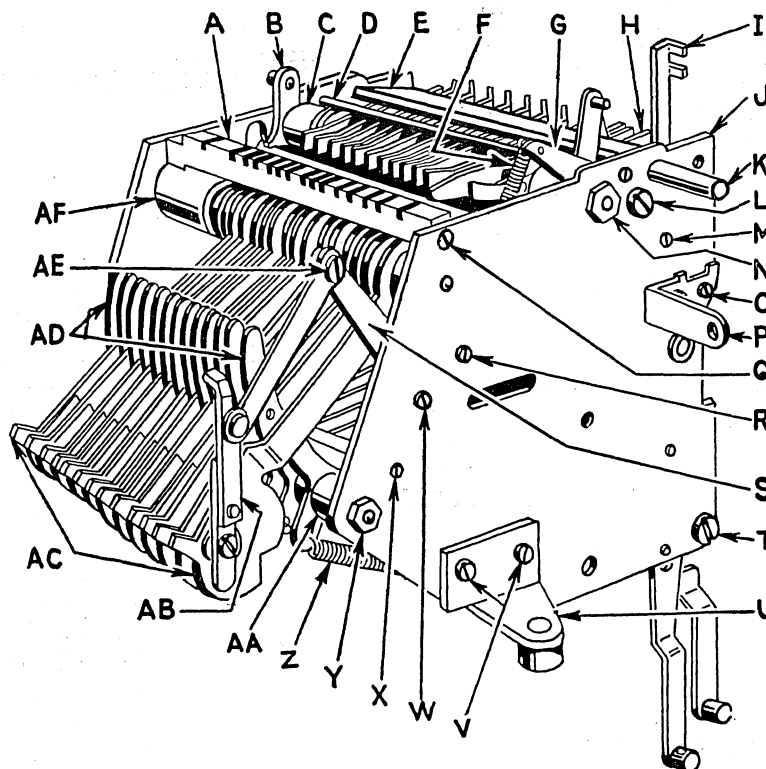
EXAMPLE: 1-8817 $\frac{1}{4}$ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817 $\frac{1}{2}$ ZL, 8828 $\frac{1}{4}$ C, 8828 $\frac{1}{2}$ B, 47 $\frac{3}{4}$, 49 $\frac{1}{4}$ —2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

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Rotary Calendar Mechanism, Carriage Controlled—Improved, New Wide Base	24-1
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HAMMER ASSEMBLY, FRONT (Plate 1)



SYMBOLS (Plate 1)

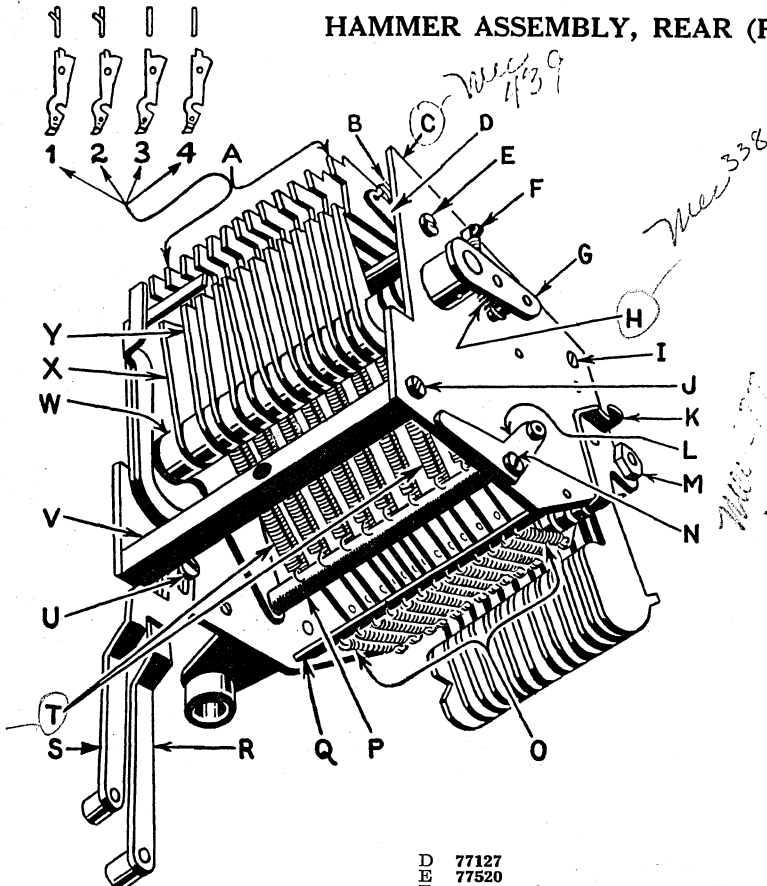
A	77903A No. 1 (1/10 Frac., Cl. 72) for Brazil, Cl. 74, 76, 78	11A-707110R No. 1 Cl. 72
	77903A No. 2 (3/4 Frac.) Cl. 72	21-707110R No. 1 with single or two bar reg. des., Cl. 75, 77
	77903A No. 3 (whole numbers, Cl. 72) Cl. 74, 76, 78	21-707110R No. 1 Env. 1060A (1-707110R No. 3) four position printing control
	77903 No. 7 without wide spaces between rack bars	
	77903 No. 8 (3/4 Frac., Cl. 72) 1/10 Frac. for Brazil, Cl. 72	K 707501
	77903 No. 10 (1/10 Frac.) Cl. 72 } With space between	L 77517 No. 1 (1/10 Frac.) Cl. 72
	77903 No. 11 whole numbers, Cl. 72 } dollars and cents only	M 77517 No. 2 (3/4 Frac.) use 77301 collar, Cl. 72
	707903 No. 1 (whole numbers, Cl. 72) Cl. 74, 75, 76, 77, 78	N 77012 No. 1
	707903 No. 2 with two bar reg. des., Cl. 75, 77	707009
	707903 No. 3 with single bar reg. des., Cl. 75, 77 (1/10 Frac., Cl. 72, 77) for Brazil, Cl. 78	47
	707903 No. 9 whole numbers, Cl. 72 } With rack bar starting	O 73548
	707903 No. 10 (1/10 Frac.) Cl. 72 } in col. 1, see note on	P 707138
	707903 No. 11 (1/2 Frac.) Cl. 72 } rack bar chart, Plate 3-1	Q 77515
B	1-77111A No. 3* included in C	R 72573
C	11-77004 No. 1 (1/10 Frac., Cl. 72) whole numbers for Brazil, Cl. 72	S 77124
	11-77004A No. 2 (3/4 Frac.) Cl. 72	1-707124 (1/2 Frac.)
	11A-77004 No. 3 (whole numbers, Cl. 72) Cl. 74, 76, 78	106 Env. 1060A (707149) four position printing control, wide and narrow base
	21A-77004 No. 7 without wide spaces between rack bars	T 76555
	11-77004 No. 8 (3/4 Frac., Cl. 72) 1/10 Frac. for Brazil, Cl. 72	U 1-77126
	1A-77004 No. 9 for Brazil, Cl. 76, 78	1-77126A No. 2 for reg. ret.
	1-77004 No. 10 (1/10 Frac.) Cl. 72 } With space between	1-77126 Env. 1060A (1-707126 No. 2) four position printing control without ege. controlled reg. ret.
	1-77004 No. 11 Cl. 74, 76, 78 } dollars and cents only	1-77126A No. 2 Env. 1060A (1-707126 No. 1) four position printing control with ege. controlled reg. ret.
	1A-707004 No. 1 regular	
	1A-707004 No. 2 with two bar reg. des., Cl. 75, 77	V 3256 1/4
	1-707004 No. 3 with single bar reg. des., Cl. 75, 77, for Brazil, Cl. 78	W 72573
	1-707004 No. 9 whole numbers, } With rack bar starting in col. 1, see note on rack bar chart, Plate 3-1	X 77012 No. 1
	1-707004 No. 10 (1/10 Frac.) Cl. 72	707009
	1-707004 No. 11 (1/2 Frac.) Cl. 72	47 3/4
D	77012 No. 1	Y 77881
	707009	AA 77002 No. 1 (1/10 Frac.) Cl. 72
E	77125 No. 1 } Use 77801	77002 No. 2 (3/4 Frac.) Cl. 72
	707125 } spring	77002 No. 2 (3/4 Frac. with .125 brokerage type) Cl. 72
F	77882	77002 No. 3 whole numbers, Cl. 72, without bal. symbol, Cl. 74, 76, 78
G	1-77111 No. 5	77002 No. 3 with bal. symbol, Cl. 74, 76, 78
H	77118 No. 4 see chart, Plate 2-1	77002 No. 7 without wide spaces between rack bars
I	77123 No. 1 (1/10 Frac.) Cl. 72	77002 No. 8 for Brazil, Cl. 72
	77123 No. 2 (3/4 Frac.) Cl. 72	77002 No. 8 (3/4 Frac. with .125 brokerage type only) Cl. 72
J	1-77110R all styles except whole numbers, Cl. 72	77002 No. 8 (3/4 Frac.) Cl. 72
	21-77110R whole numbers, Cl. 72	77002 No. 9 for Brazil without bal. symbol, Cl. 76, 78
	1A-77110R No. 2 wide and narrow base, Cl. 78	77002 No. 9 for Brazil with bal. symbol, Cl. 76, 78
	1A-77110R No. 2 Env. 1060A four position printing control	77002 No. 10 (1/10 Frac.) Cl. 72 } With space between
	1-707110R No. 1 Cl. 74, 75, 76, 77	77002 No. 11 (whole numbers, Cl. 72) Cl. 74, 76, 78 } dollars and cents only

(Continued on back)

SYMBOLS (Plate 1)—Continued

- 707002 No. 1 without reg. des. with bal. symbol, 12 cap.
 707002 No. 1 without reg. des. or bal. symbol, 14 cap.
 707002 No. 1 without reg. des. with bal. symbol, 14 cap.
 707002 No. 2 with two bar reg. des. without bal. symbol, 12 cap., Cl. 75, 77
 707002 No. 2 with two bar reg. des. with bal. symbol, 12 cap., Cl. 75, 77
 707002 No. 2 with two bar reg. des. without bal. symbol, 14 cap., Cl. 75, 77
 707002 No. 2 with two bar reg. des. with bal. symbol, 14 cap., Cl. 75, 77
 707002 No. 3 (1/10 Frac. without bal. symbol, Cl. 72, 77) for Brazil, Cl. 78
 707002 No. 3 (1/10 Frac. with bal. symbol, Cl. 72, 77) for Brazil, Cl. 78
 707002 No. 5 with single bar reg. des. without bal. symbol, Cl. 75, 77
 707002 No. 9 whole numbers, Cl. 72
 707002 No. 10 (1/10 Frac.) Cl. 72
 707002 No. 11 (3/8 Frac.) Cl. 72
 707002 No. 11 (3/8 Frac. with .125 brokerage type) Cl. 72
- AB 1-77218 specify symbol, Cl. 76, 77
 1-77218 No. 3 specify symbol, two char., Cl. 78
 1-77218 No. 4 specify symbol, single char., Cl. 78
- AC 1-77115 regular
 11-77115 Heavy hammers
- 1-77115 No. 2 Symbol hammer, used with heavy hammers and springs
 1-77115 No. 3 Symbol hammer, used with Frac.
 21A-77115 Symbol hammer, Cl. 76, 78
 51-77115 used with .125 brokerage type, Cl. 72
 1-707115 No. 1 Symbol hammer, Cl. 75, 76, 77, 78
 1-707115 No. 2 with single bar reg. des.
- AD 77116 regular
 77116 No. 2 for symbol
- AE 77529
 AF 77001 No. 1 (1/10 Frac.) Cl. 72
 77001 No. 2 (3/8 Frac.) Cl. 72
 77001 No. 3 (whole numbers, Cl. 72), Cl. 74, 76, 78
 77001 No. 7 without wide spaces between the rack bars
 77001 No. 8 (1/4 Frac., Cl. 72) 1/10 Frac. for Brazil, Cl. 72
 77001 No. 9 for Brazil, with or without bal. symbol, Cl. 76, 78
 77001 No. 10 (1/10 Frac.) Cl. 72
 77001 No. 11 (whole numbers, Cl. 72) } With space between dollars and cents only
 Cl. 74, 76, 78
 707001 No. 1 (whole numbers, Cl. 72) Cl. 74, 75, 76, 77, 78
 707001 No. 2 with two bar reg. des., Cl. 75, 77
 707001 No. 3 (1/10 Frac., Cl. 72, 77) for Brazil, Cl. 78
 707001 No. 4 (3/8 Frac.) Cl. 77
 707001 No. 5 with single bar reg. des., Cl. 75, 77
 707001 No. 9 whole numbers, } With rack bar starting in col. 1, see note on rack bar chart, Plate 3-1
 Cl. 72
 707001 No. 10 (1/10 Frac.) Cl. 72
 707001 No. 11 (3/8 Frac.) Cl. 72

HAMMER ASSEMBLY, REAR (Plate 2)



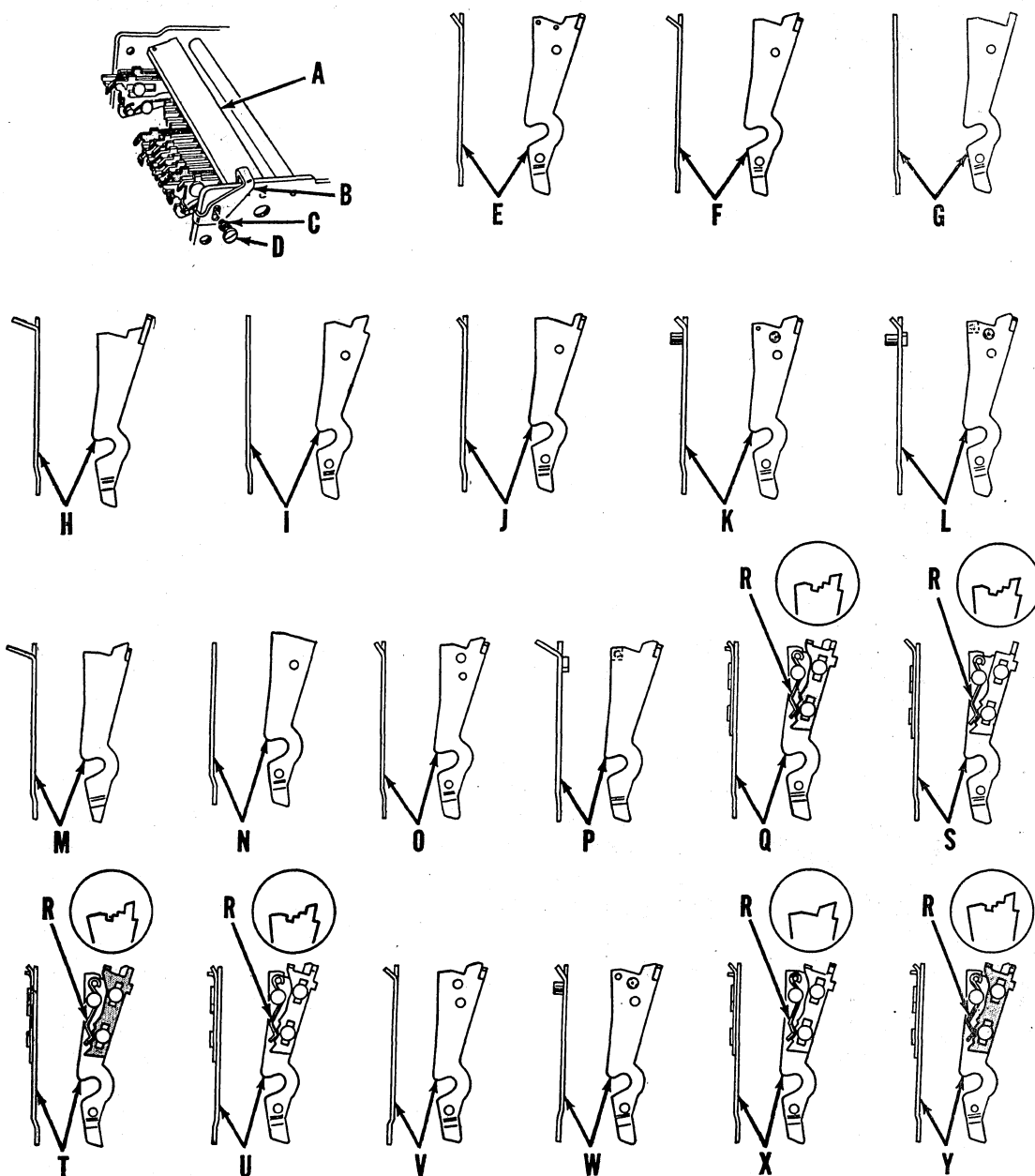
SYMBOLS (Plate 2)

- A1 77118 No. 2
 A2 77118 No. 3
 A3 77118 No. 4
 A4 77118 No. 7
 B 77802
 C 1-77110AL
 1-707110L No. 1 (11-77110AL)
 1-707110L Env. 1060A four position printing control
- see chart, plate 2-1
- see plate 1 for right side
- D 77127
 E 77520
 F 77130 anchor, use 47 nut
 G 1-77129* included in W
 H 77879 spring
 I 77515
 J 79544
 K 77105
 L 1-77136
 M 4734
 N 77529
 O 77881
 P 77121 No. 1 cl. 72
 77121 No. 2 cl. 74, 76, 78
 707121 No. 1 cl. 75, 76, 77, 78
 707121 No. 2 two bar reg. des.
 707121 No. 3 (1/10 frac.) cl. 75, 77
- Q 707121 No. 4 (3/8 frac.), cl. 75, 77
 707121 No. 5 single bar reg. des.
 707121 No. 9 whole numbers, cl. 72
 707121 No. 10 (1/10 frac.) cl. 72
 707121 No. 11 (3/8 frac.), cl. 72
 77120 No. 1
 707120 No. 1 cl. 75, 76, 77, 78
 707120 No. 2 two bar reg. des.
 707120 No. 3 (1/10 frac.) cl. 75, 77
 707120 No. 4 (3/8 frac.) cl. 75, 77
 707120 No. 5 single bar reg. des.
 707120 No. 9 whole numbers, cl. 72
 707120 No. 10 (1/10 frac.) cl. 72
 707120 No. 11 (3/8 frac.) cl. 72
- R 1-707128A No. 1 with two bar reg. des.
 1-707128A No. 3 regular
 11-707128A No. 4 (1-707128A No. 10) with single bar reg. des.
 21-707128A No. 4 with 3/8 frac. wide and narrow base, cl. 72
 1-707128A No. 5 cr. bal. symbol with 3/8 frac.
 1-707128A No. 8 cr. bal. symbol
 77880A specify no., see chart, plate 3-2
 77529 for one link
 707505 for two links
 77901 No. 1
 707901
- S 1-707128A No. 5 cr. bal. symbol with 3/8 frac.
 1-707128A No. 8 cr. bal. symbol
 77880A specify no., see chart, plate 3-2
 77529 for one link
 707505 for two links
 77901 No. 1
 707901
- T 1A-77000 No. 1 (1/10 frac.) cl. 72
 1A-77000 No. 2 (3/8 frac.) cl. 72
 1A-77000 No. 3 (whole numbers, cl. 72) cl. 74, 76, 78
 1-77000 No. 7 without wide spaces between rack bars
 1-77000 No. 8 (1/4 frac., cl. 72) 1/10 frac. for Brazil, cl. 72
 1-77000 No. 9 whole numbers for Brazil, cl. 72, for Brazil, cl. 76, 78
 1-77000 No. 10 (1/10 frac.) cl. 72
 1-77000 No. 11 (whole numbers, cl. 72) cl. 74, 76, 78
 1-707000 No. 1 regular
 1-707000 No. 2 two bar reg. des.
 1-707000 No. 3 (1/10 frac., cl. 77) for Brazil, cl. 78
 1-707000 No. 4 (3/8 frac.) cl. 77
 1-707000 No. 5 single bar reg. des.
 1-707000 No. 9 whole numbers, cl. 72
 1-707000 No. 10 (1/10 frac.) cl. 72
 1-707000 No. 11 (3/8 frac.) cl. 72
- U 21-77117A No. 1 symbol, without reg. des.
 1-707117A No. 1 two bar reg. des.
 1-707117A No. 2 two bar reg. des. and bal. symbol
 1-77117A No. 1 regular, 5 req. for narrow base, 7 req. for wide base
 11-77117A No. 1 regular, 5 req. for narrow base, 7 req. for wide base
- V 77901 No. 1
 707901
- W 1A-77000 No. 1 (1/10 frac.) cl. 72
 1A-77000 No. 2 (3/8 frac.) cl. 72
 1A-77000 No. 3 (whole numbers, cl. 72) cl. 74, 76, 78
 1-77000 No. 7 without wide spaces between rack bars
 1-77000 No. 8 (1/4 frac., cl. 72) 1/10 frac. for Brazil, cl. 72
 1-77000 No. 9 whole numbers for Brazil, cl. 72, for Brazil, cl. 76, 78
 1-77000 No. 10 (1/10 frac.) cl. 72
 1-77000 No. 11 (whole numbers, cl. 72) cl. 74, 76, 78
 1-707000 No. 1 regular
 1-707000 No. 2 two bar reg. des.
 1-707000 No. 3 (1/10 frac., cl. 77) for Brazil, cl. 78
 1-707000 No. 4 (3/8 frac.) cl. 77
 1-707000 No. 5 single bar reg. des.
 1-707000 No. 9 whole numbers, cl. 72
 1-707000 No. 10 (1/10 frac.) cl. 72
 1-707000 No. 11 (3/8 frac.) cl. 72
- X 21-77117A No. 1 symbol, without reg. des.
 1-707117A No. 1 two bar reg. des.
 1-707117A No. 2 two bar reg. des. and bal. symbol
 1-77117A No. 1 regular, 5 req. for narrow base, 7 req. for wide base
 11-77117A No. 1 regular, 5 req. for narrow base, 7 req. for wide base
- Y 1-77117A No. 1 regular, 5 req. for narrow base, 7 req. for wide base
 11-77117A No. 1 regular, 5 req. for narrow base, 7 req. for wide base

SEE EXPLANATION ON INSIDE OF FRONT COVER

HAMMER DRIVER LATCHES, SERIES M200, M700 & M800 (Plate 2A)

Standard Hammer Driver Latches are listed below. When ordering hammer driver latches not listed specify: Full space punctuation, column, and machine style and number.



SYMBOLS (Plate 2A)

See Hammer Driver Latch Chart (Plate 2B) for standard arrangements

- A 707125
- B 707118 1/2
- C 1097 3/4 lock washer
- D 60550
- E 77118 No. 2 Front offset .020° right
Rear tail offset .110° left
- F 77118 No. 3 Front offset .020° right
Rear tail offset .150° left
- G 77118 No. 4 Front offset .020° right

- H 77118 No. 5 Front offset .020° right
Rear tail offset .303° left
- I 77118 No. 7 Front offset .020° right
- J 77118 No. 14 Front offset .020° right
Rear tail offset .110° left
- K 1-707118 No. 1 Front offset .020° right
Rear tail offset .110° left
- L 11-707118 No. 1 Front offset .020° right
Rear tail offset .110° left
- M 707118 No. 2 Front offset .020° right
Rear tail offset .303° left
- N 707118 No. 3 Front offset .020° right

REPLACES GENERAL PRINT 401-1/M

SYMBOLS (Plate 2A) Continued

O	707118 No. 4	Front offset .020" right Rear tail offset .150" left	11-707118 No. 9	Front offset .005" left Rear upper tail offset .110" left Rear lower tail offset .100" left	
P	1-707118 No. 6	Front offset .020" right Rear offset .303" left	V	707118 No. 10	Front offset .005" left Rear tail offset .150" left
Q	1-707118 No. 8	Front offset .020" right Rear upper tail offset .110" left Rear lower tail offset .110" left	W	1-707118 No. 11	Front offset .005" left Rear tail offset .110" left
R	707801 spring		X	1-707118 No. 12	Front offset .020" right Rear upper tail offset .110" left Rear lower tail offset .110" left
S	11-707118 No. 8	Front offset .020" right Rear tail offset .156" left	Y	1-707118 No. 13	Front offset .045" right Rear upper tail offset .110" left Rear lower tail offset .110" left
T	21-707118 No. 8	Front offset .020" right Rear upper tail offset .110" left Rear lower tail offset .100" left		11-707118 No. 13	Front offset .045" right Rear upper tail offset .110" left Rear lower tail offset .100" left
U	1-707118 No. 9	Front offset .005" left Rear upper tail offset .110" left Rear lower tail offset .110" left			

SYMBOLS NEXT PAGE

REPLACES GENERAL PRINT 404-1/M

COLUMNS 15 TO 8 INCLUSIVE

Machine Style and Standard Punctuation	Column 15	Column 14	Column 13	Column 12	Column 11	Column 10	Column 9	Column 8
M213								
999,999,999.999				77118 No. 7	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2
M215								
999.99/9,999,999.999	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	77118 No. 3	77118 No. 2
M216								
999.99/9/999,999.999	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	1-707118 No. 8	77118 No. 2
M222								
99 999 99/999 999 99	1-707118 No. 8	1-707118 No. 9	21-707118 No. 8	21-707118 No. 8	1-707118 No. 9	21-707118 No. 8	21-707118 No. 8	1-707118 No. 8
M225								
9,999,999,999.99			77118 No. 7	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2
M226 & M227								
99,999,999.99					77118 No. 7	77118 No. 2	77118 No. 3	77118 No. 2
M231								
9,999,999.999						77118 No. 7	77118 No. 3	77118 No. 2
M233								
999,999,999,999.999	77118 No. 7	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2
M234								
9,999,999,999.99½		77118 No. 7	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2
M235								
999 99/9/999 999 999	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	1-707118 No. 9	77118 No. 2
M236								
999 99/9 999 999 999	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	1-707118 No. 8	21-707118 No. 8	21-707118 No. 8	77118 No. 3	77118 No. 2
M237								
99 99/99/99/9 999 999	1-707118 No. 9	1-707118 No. 9	21-707118 No. 8	1-707118 No. 9	21-707118 No. 8	21-707118 No. 8	1-707118 No. 9	1-707118 No. 9
M706, M707, M725 & M726								
9,999,999,999.9915	77118 No. 7	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3
M802								
999,999,999,999.99	77118 No. 7	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2
M803, M806 & M807								
99,999,999.99					77118 No. 7	77118 No. 2	77118 No. 3	77118 No. 2
M805								
9,999,999,999.99			77118 No. 7	77118 No. 3	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2

HAMMER DRIVER LATCH CHART (Plate 2B)
See Hammer Driver Latches (Plate 2A) for Individual Latches

SERIES M MACHINES—PRINTING

HAMMER DRIVER LATCH CHART (Plate 2B) Continued
See Hammer Driver Latches (Plate 2A) for Individual Latches

COLUMNS 7 TO 1 INCLUSIVE							
Machine Style and Standard Punctuation	Column 7	Column 6	Column 5	Column 4	Column 3	Column 2	Column 1
M213							
999,999,999.999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M215							
999.99/9,999,999.999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M216							
999.99/9/999,999.999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M222							
99 999 99/999 999 99	77118 No. 2	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12
M225							
9,999,999,999.99	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M226 & M227							
99,999,999.99	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M231							
9,999,999.999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M233							
999,999,999,999.999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M234							
9,999,999,999.99 1/4	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4	
M235							
999 99/9/999 999 999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M236							
999 99/9 999 999 999	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M237							
99 99/99/99/9 999 999	21-707118 No. 8	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M706, M707, M725 & M726							
9,999,999,999.9915	77118 No. 2	77118 No. 2	707118 No. 4	11-707118 No. 1	707118 No. 3	707118 No. 2	77118 No. 4
M802							
999,999,999,999.99	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M803, M806 & M807							
99,999,999.99	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4
M805							
9,999,999,999.99	77118 No. 2	77118 No. 3	77118 No. 2	77118 No. 2	11-707118 No. 8	1-707118 No. 12	77118 No. 4

Replaces General Print 404-1/M

COUPLER CHART (Plate 2-1)

Listed below are the positions of couplers most commonly used:

CLASS 72

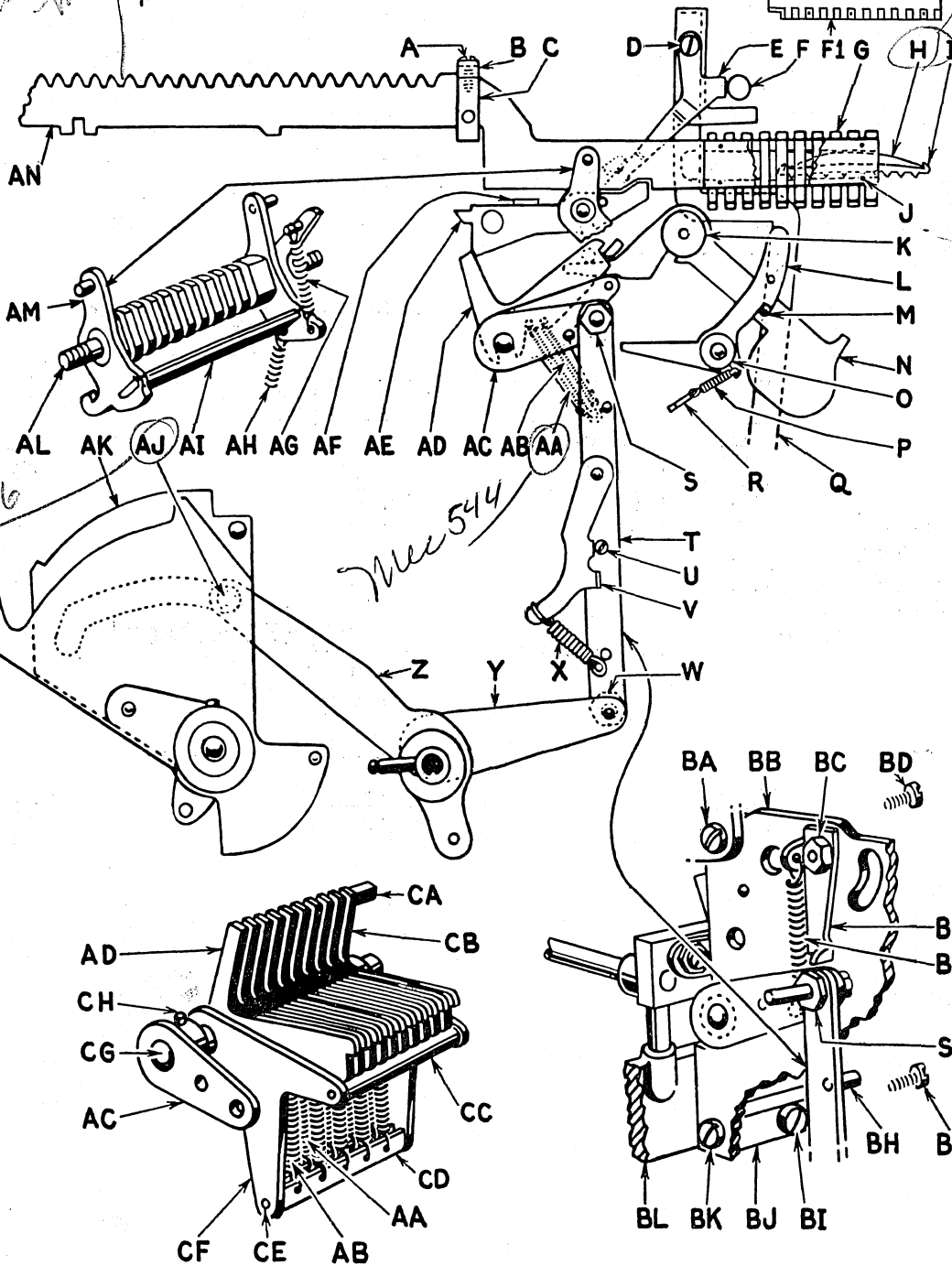
(1/10 FRAC.) NARROW BASE		(1/10 FRAC.) WIDE BASE	
Couplers	Cols.	Couplers	Cols.
77118 No. 4	1 Frac.	77118 No. 4	1 Frac.
77118 No. 2	2, 4, 5, 7, 8	77118 No. 2	2, 4, 5, 7, 8, 10, 11, 13
77118 No. 3	3, 6, 9	77118 No. 3	3, 6, 9, 12
77118 No. 7	10	77118 No. 7	14

CLASS 77

WITHOUT REG. DES. CIPHER BEFORE UNITS OF CENTS		WITH SINGLE BAR REG. DES. CIPHER BEFORE UNITS OF CENTS		WITH DOUBLE BAR REG. DES. CIPHER BEFORE UNITS OF CENTS	
Couplers	Cols.	Couplers	Cols.	Couplers	Cols.
77118 No. 4	Symbol	77118 No. 4	Symbol	77118 No. 4	Symbol
21-707118 No. 1	2	707118 No. 5	2	707118 No. 2	2
707118 No. 4	3	21-707118 No. 1	3	707118 No. 3	3
77118 No. 2	4, 5, 7, 8, 10, 11	707118 No. 4	4	11-707118 No. 1	4
77118 No. 3	6, 9, 12	77118 No. 2	5, 6, 8, 9, 11, 12	707118 No. 4	5
77118 No. 7	13	77118 No. 3	7, 10	77118 No. 2	6, 7, 9, 10, 12
		77118 No. 7	13	77118 No. 3	8, 11
				77118 No. 7	13

CLASS 78

NARROW BASE CIPHER BEFORE UNITS OF CENTS		WIDE BASE CIPHER BEFORE UNITS OF CENTS	
Couplers	Cols.	Couplers	Cols.
77118 No. 4	Symbol	77118 No. 4	Symbol
21-707118 No. 1	1	21-707118 No. 1	2
707118 No. 4	2	707118 No. 4	3
77118 No. 2	3, 4, 6, 7, 9	77118 No. 2	4, 5, 7, 8, 10, 11
77118 No. 3	5, 8	77118 No. 3	6, 9, 12
77118 No. 7	10	77118 No. 7	13



SYMBOLS (Plate 3)

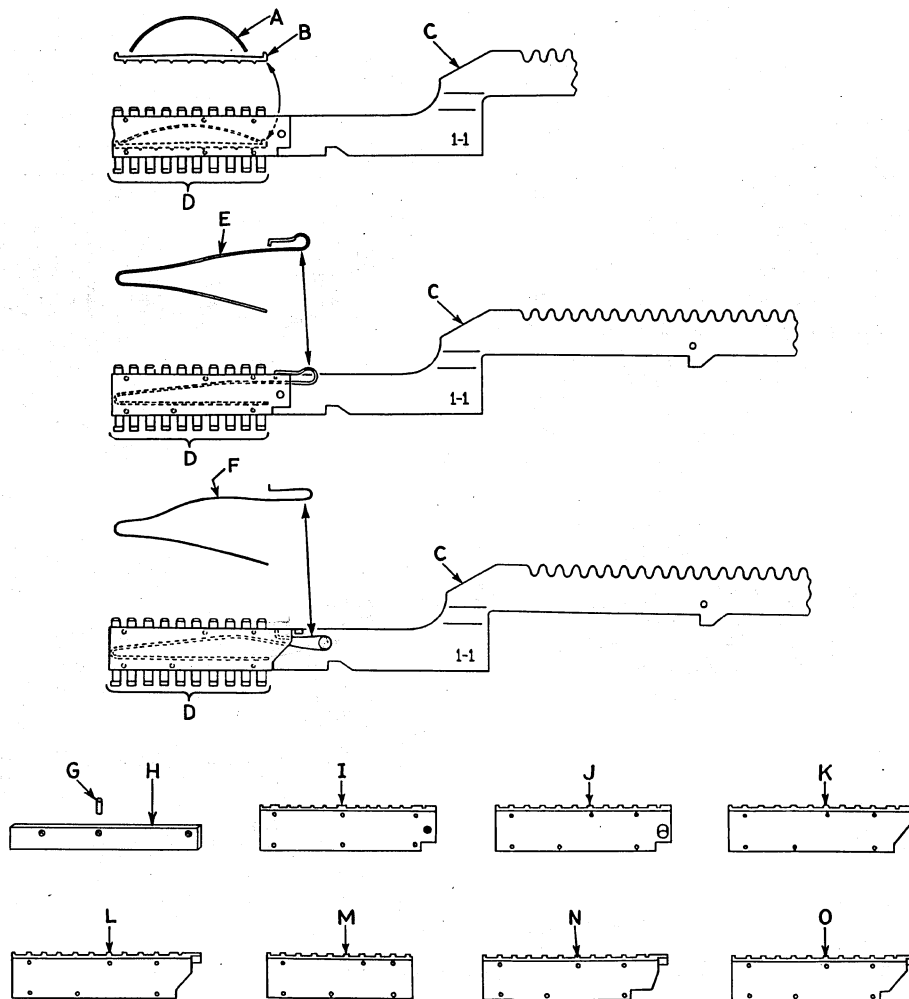
A	79565	AE	77118 No. 2 see chart, plate 2-1
B	76927 No. 1	AF	77125 No. 1 } use 77801
	706927 No. 1 (14 cap.)		707125 } spring
	706927 No. 2 (12 cap.)	AG	77882
C	1-76921 No. 1	AH	12084 1/4
	1-706921	AI	Included in AL
D	75638	AJ	71334 No. 2 roller, 71532 No. 2 stud
E	75145	AK	11A-71129 see keyboard book, plate 3
F	11-73006 Style 12, 15, 18		for other styles
FI	See plate 3A letter I	AL	11-77004 No. 1 see plate 1 for other
G	See plate 3B		styles
H	76882 No. 2	AM	Included in AL
	706800 for reg. des. rack bar	AN	See plate 3C, 3-1, 3-1A
I	76122 No. 1	BA	77514 narrow base
J	76519 stud		71517 wide base
	76519 No. 2 stud, for frac. and broker-	BB	1-77110AL see plate 2 for other styles
	age type	BC	47
K	77001 No. 1 see plate 1 for other styles	BD	10751 1/4 screw for right side of hammer
L	77116 regular		section
	77116 No. 2 for symbol	BE	77130
M	Included in N	BF	707802
N	1-77115 regular, see plate 1 for other	BG	76555 screw for right side of hammer
	styles		section
O	77002 No. 1 see plate 1 for other styles	BH	Included in T
P	77881	BI	77513
Q	1-75197A	BJ	77901 No. 1
R	77120 No. 1 see plate 2 for other styles		707901
S	77512A screw, 46 nut	BK	79544
T	1-77122 No. 2 narrow base	BL	1-71668B (31-71668B) see keyboard
			book, plate 42 for other styles
	1-77122 No. 3 wide base } includes	CA	Included in CB
			U, V, X
U	77525 screw	CB	1-77117A No. 2 (1/10 frac.)
	84353 threaded collar		11-77117A No. 2 (1/4 frac.) } cl. 72
V	77103 included in T, use 77527 rivet		1-77117A No. 3 (1/8 frac.)
W	72568 screw, 79309 ecc.	CC	77010 No. 1
X	489		707010
Y	Included in Z	CD	77121 No. 1 } See plate 2 for
Z	1-701143		707121 No. 1 } other styles
	1-71143 early } includes	CE	77011 No. 1
			707011
AA	77880A No. 1	CF	Included in CG
AB	77880A No. 2	CG	1A-77000 No. 1 includes AC, CC, CE,
AC	Included in CG		CF, CH, see plate 2 for other styles
AD	1-77117A No. 1 } See	CH	51 pin
	11-77117A No. 1 } plate 2		

Large type (Perry/Kitting) 76118A No 18

SERIES M MACHINES—PRINTING

RACK BAR ASSEMBLY (Plate 3A)

1A-76111 No 64 - Rack bar - for



SYMBOLS (Plate 3A)

- A 76882 No. 2
706800 for register designation,
single bar, style No. 2
- B 76122 No. 1
- C Refer to plates 3-1, 3-1A, 3C for rack
bars
- D Refer to plate 3B for type
- E 76882A
- F 76882B
- G 76519 standard
- H 76211 1/2 No. 2 1/4 fraction brokerage type
- I 76519 1/2 No. 1 for spacer between
units of dollars and tens of cents
columns
- J 76519 1/2 No. 2 for spacer in other col-
umns
- K 76211 1/2 No. 1 used between units of
dollars and tens of cents columns

- L 76211 1/2 No. 2 used in any space to
left of units of dollars column
- M 76211 1/2 No. 4 used between fraction
bar and units of cents column in
machines with 1/4" brokerage type
- N Use 76211A No. 1 ten slot magazine
- O Use 76211A No. 1 ten slot magazine for
single bar register designation style No. 2
- P Use 76211A No. 5, 76211 1/2 No. 1,
76519 1/2 No. 13 Req., 76519 3 Req.,
between units of dollars and tens of
cents columns
- Q Use 76211A No. 5, 76211 1/2 No. 2,
76519 1/2 No. 2 3 Req., 76519
3 Req., in any space to left of units
of dollars column
- R Use 76211A No. 5, 76211 1/2 No. 4,
76519 1/2 No. 2 3 Req., 76519

- S 3 Req., between fraction bar and
units of cents column in machines
with 1/4" brokerage type
- T Use 76211A No. 1 ten slot magazine
without spacer
- U Use 76211A No. 5 ten slot magazine
with spacer
- V 76211A No. 1 ten slot magazine with-
out spacer
- W 76211A No. 5 ten slot magazine with
spacer
- X Use 76211C No. 2 nine slot magazine
- Y Use 76211C No. 4 nine slot magazine
for 1/4" brokerage type
- Z Use 76211C No. 2 nine slot magazine
- AA 76211C No. 4 nine slot magazine for
1/4" brokerage type
- AB 76211C No. 2 nine slot magazine

SEE EXPLANATION ON INSIDE OF FRONT COVER

SERIES M MACHINES—PRINTING

TYPE CHART (PLATE 3B)

CLASS 70 AND SERIES M RACK BARS

Type	Description	Offset	Style	Width of Shank	Size of Figure	Part Number
0 to 9	Plain	Central	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 1
0 to 9	Plain	.031" Right	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 1R
0 to 9	Plain	.031" Left	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 1L
1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8	1/8 Fraction	.0375" Right	06M	Frac. 1/8 - .105" Frac. 1/4 to 7/8 - .123"	Fig. .055" x .073" Overall .146"	76118 No. 2
<u>1 2 3 4 5 6 7 8 9</u>	Numerator Underscore	Central	06M	Fig. <u>1</u> - .105" Fig. <u>2</u> to 9 - .123"	Fig. .070" x .090" Overall .150"	76118 No. 3
.0 to .9	Period Left	Central	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 4
0. to 9.	Period Right	Central	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 5
0, to 9,	Comma Right	Central	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 6
,0 to ,9	Comma Left	Central	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 7
0: to 9:	Colon Right	Central	06M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .100"	76118 No. 8
0 to 9	Plain	Central	22M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .125"	76118 No. 9
.0 to .9	Period Left	Central	22M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .125"	76118 No. 10
<u>1 to 9</u>	Numerator Underscore	Central	22M	Fig. <u>1</u> - .105" Fig. <u>2</u> to 9 - .123"	Fig. .076" x .100" Overall - .130"	76118 No. 11
0 to 9	Plain Pin Point	Central	26M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .125"	76118 No. 12
0, to 9,	Comma Right	Central	26M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .125"	76118 No. 13
.0 to .9	Pin Point Period Left Pin Point	Central	26M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .125"	76118 No. 14
0 1 5 6	Plain - For 12 Pitch	Central	06M	All Fig. - .105"	.076" x .100"	76118 No. 15
10 11	Plain - For 12 Pitch	Right Fig. Central	06M	All Fig. - .123"	.076" x .100"	76118 No. 16
¼ ½ ¾	1/4 Fraction	.0375" Right	06M	Frac. 1/4 - .105" Frac. 1/2 3/4 - .123"	Fig. .055" x .058" Overall .116"	76118 No. 17
1/8 1/4 3/8 1/2 5/8 3/4 7/8	1/8 Fraction - Logo	Central	22M	Frac. 1/8 - .105" Frac. 1/4 to 7/8 - .123"	.077" x .125"	76118 No. 18
☐	Blank Type Shank - To Fill Empty Spaces 1 thru 9					76118 No. 9
0, to 9,	Comma Right	Central	22M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.076" x .125"	76118 No. 20
½	1/2 Fraction - Used With Numerator Underscore Type	.0375" Right	06M	.123"	Fig. .055" x .073" Overall - .146"	76118 No. 21
☐	Blank Type Shank - To Fill Empty Cipher Position					76118 No. 23
0 to 9	Plain	Central	09M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.058" x .090"	76118 No. 25
.0 to .9	Period Left	Central	09M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.058" x .090"	76118 No. 26
0, to 9,	Comma Right	Central	09M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.058" x .090"	76118 No. 27
0. to 9.	Period Right	Central	09M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.058" x .090"	76118 No. 28
,0 to ,9	Comma Left	Central	09M	Fig. 0 - .105" Fig. 1 to 9 - .123"	.058" x .090"	76118 No. 29
0 to 9	Italic Plain	Central		Fig. 0 - .105" Fig. 1 to 9 - .123"	.060" x .080"	706118 No. 3
0 1	Italic Plain	Central		Fig. 0 - .123" Fig. 1 - .105"	.060" x .080"	706118 No. 5
<u>0 1</u>	Numerator Underscore	Central	06M	Fig. 0 - .105" Fig. 1 - .123"	Fig. .070" x .090" Overall .150"	706118 No. 6
<u>0 1</u>	Numerator Underscore	Central	22M	Fig. 0 - .105" Fig. 1 - .123"	Fig. .076" x .100" Overall .130"	706118 No. 7

SERIES M MACHINES—PRINTING

RACK BAR CHART (PLATE 3C)

SERIES M200-M700-M800 MACHINES

Only Standard Rack Bars Listed Below.

When ordering Rack Bars not listed

specify:

Full Space Punctuation

Column where Rack Bar is to be used

Style of Type

Stamping on side of Rack Bar

Machine Style and Number

Series M200 Machines have four Rack Bars without
Type to right of column No. 1.

Series M700 and M800 Machines have no Rack Bars
without type to right of Column No. 1.

Machine Style and Space Punctuation	Col. No.	Rack Bar Part No.	Offset	Stamped	TYPE										Spring Part No.	Magazine Part No.	Rivet Part No.	Spacer Part No.	
					Part No.	Position													
						No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9					No. 10
M213 06M Type 999,999,999.99 ²	1	1-76111 No. 1	.080L	1-1	76118 No. 3	1	2	3	4		5	6	7	8	9	76882B	76211C No. 2	76519 6 Req.	
					76118 No. 21					1/2									
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	10	21-76111 No. 10	.035L	21-10	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	11	1-76111 No. 14	.020L	1-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
12	1-706111 No. 24	.005L	1-24W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M215 06M Type 999.99/9,999,999.99 ²	1	11-76111 No. 1	.080L	11-1	76118 No. 3	1	2	3	4	5	6	7	8	9	76882B	76211C No. 2	76519 6 Req.		
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	10	21-76111 No. 10	.035L	21-10	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	11	41-76111 No. 14	.020L	41-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	12	11-706111 No. 24	.005L	11-24W	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	13	11-76111 No. 16	.015L	11-16	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	14	11-76111 No. 57	.000	11-57	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	15	11-76111 No. 58	.015R	11-58	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
M216 06M Type 999.99 ² /999,999.99 ²	1	11-76111 No. 1	.080L	11-1	76118 No. 3	1	2	3	4	5	6	7	8	9	76882B	76211C No. 2	76519 6 Req.		
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	10	71-706111 No. 10	.035L	71-10 W	706118 No. 6	0	1								76882B	76211A No. 5	76519 3 Req.	76211 1/2 No. 2	
					76118 No. 3			2	3	4	5	6	7	8	9			76519 1/2 No. 2 3 Req.	
	11	41-76111 No. 14	.020L	41-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	12	11-706111 No. 24	.005L	11-24W	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	13	11-76111 No. 16	.015L	11-16	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	14	11-76111 No. 57	.000	11-57	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
15	11-76111 No. 58	.015R	11-58	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M222 06M Type 99 999 99/ 990 999 99	1	1-76111 No. 29	.080L	1-29	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	31-706111 No. 3	.090L	31-3W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req.	76211 1/2 No. 1
																	76519 1/2 No. 1 3 Req.		
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-706111 No. 6	.070L	1-6W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req.	76211 1/2 No. 2
																	76519 1/2 No. 2 3 Req.		

SEE EXPLANATION ON INSIDE OF FRONT COVER

SERIES M MACHINES—PRINTING

RACK BAR CHART (PLATE 3C) Continued

Machine Style and Space Punctuation	Col. No.	Rack Bar Part No.	Offset	Stamped	Part No.	TYPE										Spring Part No.	Magazine Part No.	Rivet Part No.	Spacer Part No.
						Position													
						No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10				
M222 06M Type 99 999 99/ 999 999 99 (Continued)	7	1-76111 No. 7	.055L	1-7	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	76211 1/2 No. 2
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-706111 No. 9	.050L	1-9W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	
	10	1-76111 No. 10	.035L	1-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	11	21-706111 No. 22	.045L	21-22W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	
	12	1-76111 No. 15	.030L	1-15	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	13	1-76111 No. 16	.015L	1-16	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	14	11-706111 No. 48	.025L	11-48W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	
15	1-76111 No. 17	.010L	1-17	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M225 06M Type 9,999,999,999.99	1	11A-76111 No. 11	Blank Rack Bar	No Type															
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	10	21-76111 No. 10	.035L	21-10	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	11	1-76111 No. 14	.020L	1-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	12	1-706111 No. 24	.005L	1-24W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	13	21-706111 No. 16	.015L	21-16W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
M226 06M Type M227 99,999,999.99	1	11A-76111 No. 11	Blank Rack Bar	No Type															
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	10	21-76111 No. 10	.035L	21-10	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	11	1-76111 No. 14	.020L	1-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
M231 06M Type 9,999,999.99 ²	1	1-76111 No. 1	.080L	1-1	76118 No. 3	1	2	3	4		6	7	8	9		76882B	76211C No. 2	76519 6 Req.	
					76118 No. 21						1/2								
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
10	21-76111 No. 10	.035L	21-10	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M233 06M Type 999,999,999,999.99 ²	1	1-76111 No. 1	.080L	1-1	76118 No. 3	1	2	3	4		6	7	8	9		76882B	76211C No. 2	76519 6 Req.	
					76118 No. 21						1/2								
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	3	11-76111 No. 3	.050L	11-3	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	4	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	7	21-76111 No. 7	.055L	21-7	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	10	21-76111 No. 10	.035L	21-10	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	11	1-76111 No. 14	.020L	1-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	12	1-706111 No. 24	.005L	1-24W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	13	21-706111 No. 16	.015L	21-16W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
	14	1-76111 No. 57	.000	1-57	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
15	1-76111 No. 58	.015R	1-58	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M234 06M Type 9,999,999,999.99 7/8	1	1-76111 No. 11	Blank Rack Bar	No Type															
	2	1-76111 No. 11	Blank Rack Bar	No Type															
	3	1-76111 No. 12	.050L	1-12	76118 No. 2	1/8	1/4	3/8		1/2	5/8	3/4	7/8			76882B	76211C No. 2	76519 6 Req.	
				76118 No. 3					4					9					

SERIES M MACHINES—PRINTING

RACK BAR CHART (PLATE 3C) Continued

Machine Style and Space Punctuation	Col. No.	Rack Bar Part No.	Offset	Stamped	TYPE										Spring Part No.	Magazine Part No.	Rivet Part No.	Spacer Part No.		
					Part No.	Position														
						No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10					
M234 06M Type 9,999,999,999,99 ⅞ (Continued)	4	1-76111 No. 10	.035L	1-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	5	11-76111 No. 14	.020L	11-14	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	1-76111 No. 15	.030L	1-15	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	8	1-76111 No. 16	.015L	1-16	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	9	31-76111 No. 9	.025L	31-9	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	1-76111 No. 17	.010L	1-17	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	11	1-706111 No. 23	.005R	1-23W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	12	21-706111 No. 24	.005L	21-24W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	13	1-706111 No. 25	.010R	1-25W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	14	1-706111 No. 44	.025R	1-44W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	15	1-706111 No. 43	.015R	1-43W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76510 6 Req.		
	M235 06M Type 999 99/9/ 999 999 99 ⁹	1	11-76111 No. 1	.080L	11-1	76118 No. 3	1	2	3	4	5	6	7	8	9		76882B	76211C No. 2	76519 6 Req.	
		2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
		3	1-76111 No. 3	.050L	1-3	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.	
4		11-706111 No. 4	.075L	11-4W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 1 3 Req.	76211 1/2 No. 1	
5		1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
6		1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
7		41-706111 No. 7	.055L	41-7W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
8		1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
9		1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
10		71-706111 No. 10	.035L	71-10W	706118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
11		41-76111 No. 14	.020L	41-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
12		61-706111 No. 24	.005L	61-24W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
13		41-706111 No. 16	.015L	41-16W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
14		11-76111 No. 57	.000	11-57	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
15		11-76111 No. 58	.015R	11-58	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M236 06M Type 999 99/9 999 999 99 ⁹	1	11-76111 No. 1	.080L	11-1	76118 No. 3	1	2	3	4	5	6	7	8	9		76882B	76211C No. 2	76519 6 Req.		
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	3	1-76111 No. 3	.050L	1-3	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	4	11-706111 No. 4	.075L	11-4W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 1 3 Req.	76211 1/2 No. 1	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	41-706111 No. 7	.055L	41-7W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	8	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	9	1-76111 No. 9	.025L	1-9	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	81-706111 No. 10	.035L	81-10W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	11	41-76111 No. 14	.020L	41-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	12	61-706111 No. 24	.005L	61-24W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	13	41-706111 No. 16	.015L	41-16W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	14	11-76111 No. 57	.000	11-57	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	15	11-76111 No. 58	.015R	11-58	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M237 06M Type 99 99/99/99/9 999 99 ⁹	1	11-76111 No. 1	.080L	11-1	76118 No. 3	1	2	3	4	5	6	7	8	9		76882B	76211C No. 2	76519 6 Req.		
	2	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	3	1-76111 No. 3	.050L	1-3	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	4	11-706111 No. 4	.075L	11-4W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 1 3 Req.	76211 1/2 No. 1	
	5	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	41-706111 No. 7	.055L	41-7W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	8	21-706111 No. 2	.065L	21-2W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	9	71-76111 No. 3	.050L	71-3	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	31-76111 No. 10	.035L	31-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	11	41-76111 No. 14	.020L	41-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	12	11-706111 No. 12	.030L	11-12W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	13	11-76111 No. 16	.015L	11-16	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	14	21-706111 No. 48	.025L	21-48W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 1/2 No. 2 3 Req.	76211 1/2 No. 2	
	15	11-76111 No. 17	.010L	11-17	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M706 06M Type	1																			
M707, M725, M726 9,999,999,999,99 ¹⁵ Style No. 1 Register Designation	2	11-706111A No. 15	.080L	11-15AW	706118 No. 3		2	3	4	5	6	7	8	9		76882B	76211A No. 1	76519 6 Req.		
					706118 No. 5	1									0					
	3	41A-706111 No. 2	.065L	41A-2W	706118 No. 3	0	1	2								76882B	76211A No. 1	76519 6 Req.		
					76118 No. 1			3	4	5	6	7	8	9						

SEE EXPLANATION ON INSIDE OF FRONT COVER

SERIES M MACHINES—PRINTING

RACK BAR CHART (PLATE 3C) Continued

Machine Style and Space Punctuation	Col. No.	Rack Bar Part No.	Offset	Stamped	TYPE										Spring Part No.	Magazine Part No.	Rivet Part No.	Spacer Part No.		
					Part No.	Position														
						No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9					No. 10	
M706 06M Type (Continued)	4	31-706111 No. 3	.090L	31-3W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 5	76519 3 Req. 76519 3/4 No. 1 3 Req.	76211 1/2 No. 1	
	5	41-706111 No. 4	.075L	41-4W	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-706111B No. 19	.099L	1-19W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	1-706111 No. 20	.085L	1-20W	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	8	1-76111 No. 38	.070L	1-38	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	9	21-706111 No. 29	.080L	21-29W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	1-76111 No. 2	.065L	1-2	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	11	1-76111 No. 3	.050L	1-3	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	12	21-706111 No. 5	.060L	21-5W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	13	1-76111 No. 6	.045L	1-6	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	14	1-76111 No. 15	.030L	1-15	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	15	21-706111 No. 8	.040L	21-8W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	M802 06M Type 999,999,999,999.99	1																		
		2	1-76111 No. 29	.080L	1-29	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1		76519 6 Req.
		3	21-76111 No. 2	.065L	21-2	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1		76519 6 Req.
4		1-76111 No. 30	.090L	1-30	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
5		1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
6		1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
7		21-76111 No. 38	.070L	21-38	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
8		1-76111 No. 7	.055L	1-7	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
9		1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
10		31-76111 No. 3	.050L	31-3	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
11		1-76111 No. 10	.035L	1-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76822B	76211A No. 1	76519 6 Req.		
12		1-76111 No. 14	.020L	1-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
13		21A-706111 No.12	.030L	21A-12W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
14		11-76111 No. 16	.015L	11-16	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
15		11-76111 No. 57	.000	11-57	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M803 06M Type M806 99,999,999.99	1																			
	2	1-76111 No. 29	.080L	1-29	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	3	21-76111 No. 2	.065L	21-2	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	4	1-76111 No. 30	.090L	1-30	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	5	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	21-76111 No. 38	.070L	21-38	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	8	1-76111 No. 7	.055L	1-7	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	9	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	31-76111 No. 3	.050L	31-3	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	11	1-76111 No. 10	.035L	1-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M805 06M Type 9,999,999,999.99	1																			
	2	1-76111 No. 29	.080L	1-29	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	3	21-76111 No. 2	.065L	21-2	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	4	1-76111 No. 30	.090L	1-30	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	5	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	21-76111 No. 38	.070L	21-38	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	8	1-76111 No. 7	.055L	1-7	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	9	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	31-76111 No. 3	.050L	31-3	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	11	1-76111 No. 10	.035L	1-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	12	1-76111 No. 14	.020L	1-14	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	13	21A-706111 No.12	.030L	21A-12W	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
M807 06M Type 99,999,999.99	1																			
	2	1-76111 No. 29	.080L	1-29	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	3	21-76111 No. 2	.065L	21-2	76118 No. 4	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	4	1-76111 No. 30	.090L	1-30	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	5	1-76111 No. 4	.075L	1-4	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	6	1-76111 No. 5	.060L	1-5	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	7	21-76111 No. 38	.070L	21-38	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	8	1-76111 No. 7	.055L	1-7	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	9	1-76111 No. 8	.040L	1-8	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	10	51-76111 No. 3	.050L	51-3	76118 No. 6	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		
	11	31-76111 No. 10	.035L	31-10	76118 No. 1	0	1	2	3	4	5	6	7	8	9	76882B	76211A No. 1	76519 6 Req.		

RACK BAR CHART

NOTE *Column 1 Rack Bar (All Classes and Styles except 75, 77 and 78 wide base) is that bar which, when may not extend all the way forward to carry type. Classes 75, 77 and 78 Wide Base, Column 1 occupies*

Style	Pinions	Space Punctuation	COL. 16	COL. 15	COL. 14	COL. 13	COL. 12	COL. 11	COL. 10
72 03 00 TO 72 06 00 Whole Numbers	30 TO 60	STANDARD 000 000 000 000 00 .125 TYPE 000 000 000 000 00 EARLY 00000000 00		76111 #61	11-76111 #57 .000 12 Cap. in Register 1-76111 #57 .000 14 Cap. in Register	11-76111 #16 .015 1-76111 #16 .015	1-76111 #15 .030	1-76111 #14 .020	1-76111 #10 .035 61-76111 #10 .035 1-76111 #58 .015R
72 05 00 to 72 10 00 72 05 00 to 72 07 00 Whole Numbers	40 TO 60	STANDARD 00 000 000 00 .125 TYPE 00 000 000 00							31-76111 #10 .035 71-76111 #10 .035
72 03 00 TO 72 06 00 1/10 FRACTIONS	30 TO 60	STANDARD 00 000 000 000 00 1/10 .125 TYPE 00 000 000 000 00 1/10 EARLY 00000000 00 1/10		76111 #61	11-76111 #57 .000 12 Cap. in Register 1-76111 #57 .000 14 Cap. in Register	11-76111 #16 .015 1-76111 #16 .015	1-705111 #24 .005	1-76111 #14 .020	1-76111 #10 .035 81-76111 #10 .035 1-76111 #58 .015R
72 05 00 to 72 10 00 72 05 00 to 72 07 00 1/10 FRACTIONS	40 TO 60	STANDARD 0 000 000 00 1/10 .125 TYPE 0 000 000 00 1/10							31-76111 #10 .035 91-76111 #10 .035
72 03 00 TO 72 06 00 1/8 FRACTIONS	30 TO 60	STANDARD 000 000 000 00 1/8 .125 TYPE 00 000 00 1/8 EARLY 00000 00 1/8		76111 #61	1-706111 #44 .025R 12 Cap. in Register 1-706111 #44 .025R 14 Cap. in Register	51-76111 #25 Eny. 3182 .010R 1-706111 #25 .010R	1-706111 #24 .005	1-706111 #23 .005R	1-76111 #17 .010 21-76111 #17 .010 1-76111 #58 .015R
72 05 00 TO 72 07 00 1/8 FRACTIONS	40 TO 60	STANDARD 00 000 00 1/8 .125 TYPE 00 000 00 1/8							11-76111 #17 .010
72 03 00 TO 72 06 00 1/4 FRACTIONS	30 TO 60	STANDARD 0 000 000 000 00 1/4 .125 TYPE 0 000 000 000 00 1/4 EARLY 000000 00 1/4		76111 #61	11-76111 #57 .000 12 Cap. in Register 1-76111 #57 .000 14 Cap. in Register	11-76111 #58 .015R 1-76111 #58 .015R	1-706111 #24 .005	1-76111 #14 .020	1-76111 #17 .010 21-76111 #17 .010 1-76111 #58 .015R
72 05 00 TO 72 08 00 1/4 FRACTIONS	40 TO 60	STANDARD 000 000 00 1/4 .125 TYPE 000 000 00 1/4 EARLY 00000000 00 1/4							11-76111 #17 .010
74 03 00 TO 74 06 00	30 TO 60	STANDARD 000,000,000,000.00 .125 TYPE 000,000,000,000.00 EARLY 00000000.00			1-76111 #57 .000	1-76111 #16 .015	21-706111 #12 .030	1-76111 #14 .020	1-76111 #10 .035 61-76111 #10 .035 1-76111 #58 .015R
74 05 00 TO 74 10 00	40 TO 60	STANDARD 000,000,000,000.00 .125 TYPE 000,000,000,000.00 EARLY 00000000.00							31-76111 #10 .035
78 03 00 TO 78 06 00 76 SAME AS 78	30 TO 60	STANDARD 000,000,000,000.00 .125 TYPE 000,000,000,000.00 EARLY 00000000.00		76111 #61	1-76111 #57 .000	1-76111 #16 .015	21-706111 #12 .030	1-76111 #14 .020	1-76111 #10 .035 61-76111 #10 .035 1-76111 #58 .015R
78 05 00 TO 78 10 00 77 10 00 to 77 20 00	40 TO 60	STANDARD 000,000,000,000.00 .125 TYPE 000,000,000,000.00 EARLY 00000000.00							31-76111 #10 .035 71-76111 #10 .035
Style #1 Reg. Des.		0,000,000,000.00/00	76111 #61	1-706111 #14 .000	1-706111 #13 .015	21-706111 #12 .030	1-706111 #11 .020	1-706111 #10 .035	21-706111 #9 .050
Style #2 Reg. Des.		00,000,000,000.00/0		21-706111 #12 .030	1-706111 #11 .020	1-706111 #10 .035	21-706111 #9 .050	1-706111 #8 .040	1-705111 #7 .055
				1-706111 #8 .040	11-706111 #7 .055	1-706111 #22 .045	1-706111 #5 .060	21-706111 #4 .075	1-705111 #2 .065

RACK BARS WITHOUT

76 03 00 78 03 50 72 03 00		0000000000 0000000000 0000000000							1-76111 #58 .015R 1-76111 #58 .015R
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CLASS OF MACHINE

71—Whole Number Biller
72—1/10 or 1/4 Fraction Biller
73—1/2 Fraction Biller
74—Typewriter—Adder
75—Typewriter—Adder—RMR
76—Bookkeeper
77—Bookkeeper—RMR
78—Bookkeeper—Auto. Subt. and Cr. Bal.

STYLE NUMBERS

First two digits on the left indicate Class of Machine.
Center two digits indicate Number of Registers.
Right two digits indicate Style of Carriage.
Odd number is Regular Cge., even number is Collating Cge.

REGISTER CAPACITY

Register capacity is determined by dividing pinion construction by the number of registers.
Example: 72 05 00 50 Pinion is an 8 Cap.
72 06 00 60 Pinion is a 10 Cap.

TYPE 70 MACHINES (Plate 3-1)

checking from the rear of the machine, occupies the 5th space in the rear guide comb (1-76919). It may or the 6th space in the rear guide comb (1-706919 No. 1). Register Designation Bars occupies the 6th and 7th spaces.

COL. 9	COL. 8	COL. 7	COL. 6	COL. 5	COL. 4	COL. 3	COL. 2	COL. 1	
1-76111 #3 .050	1-76111 #8 .040	1-76111 #7 .055	1-76111 #38 .070	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	1-76111 #2 .065	1-76111 #29 .080	OFFSET
101-76111 #3 .050	31-76111 #8 .040	51-76111 #7 .055	31-76111 #38 .070	31-76111 #5 .060	31-76111 #4 .075	21-76111 #30 .090	31-76111 #2 .065	11-76111 #29 .080	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	1-76111 #2 .065	1-76111 #29 .080	OFFSET
71-76111 #3 .050	11-76111 #8 .040	41-76111 #7 .055	1-76111 #38 .070	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	1-76111 #2 .065	1-76111 #29 .080	OFFSET
121-76111 #3 .050	31-76111 #8 .040	51-76111 #7 .055	31-76111 #38 .070	31-76111 #5 .060	31-76111 #4 .075	21-76111 #30 .090	31-76111 #2 .065	11-76111 #29 .080	OFFSET
1-76111 #9 .025	1-76111 #8 .040	1-76111 #7 .055	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #3 .050	1-76111 #2 .065	1-76111 #1 .080	OFFSET
51-76111 #9 .025	31-76111 #8 .040	61-76111 #7 .055	21-76111 #6 .045	31-76111 #5 .060	41-76111 #4 .075	81-76111 #3 .050	31-76111 #2 .065	21-76111 #1 .080	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #3 .050	1-76111 #2 .065	1-76111 #1 .080	OFFSET
11-76111 #9 .025	11-76111 #8 .040	41-76111 #7 .055	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #3 .050	1-76111 #2 .065	1-76111 #1 .080	OFFSET
61-76111 #9 .025	31-76111 #8 .040	61-76111 #7 .055	21-76111 #6 .045	31-76111 #5 .060	41-76111 #4 .075	81-76111 #3 .050	31-76111 #2 .065	21-76111 #1 .080	OFFSET
1-76111 #9 .025	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #14 .020	1-76111 #10 .035	1-76111 #12 .050	1-76111 #11 .065	1-76111 #11 .080	OFFSET
71-76111 #9 .025	21-76111 #16 .015	21-76111 #15 .030	31-76111 #6 .045	31-76111 #14 .020	61-76111 #10 .035	1-76111 #63 .060R	1-76111 #11 .065	1-76111 #11 .080	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #14 .020	1-76111 #10 .035	1-76111 #12 .050	1-76111 #11 .065	1-76111 #11 .080	OFFSET
11-76111 #9 .025	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #14 .020	1-76111 #10 .035	1-76111 #12 .050	1-76111 #11 .065	1-76111 #11 .080	OFFSET
81-76111 #9 .025	21-76111 #16 .015	21-76111 #15 .030	31-76111 #6 .045	31-76111 #14 .020	61-76111 #10 .035	1-76111 #63 .060R	1-76111 #11 .065	1-76111 #11 .080	OFFSET
1-76111 #9 .025	1-76111 #8 .040	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #10 .035	1-76111 #3 .050	1-76111 #55 .065	1-76111 #11 .080	OFFSET
51-76111 #9 .025	31-76111 #8 .040	21-76111 #15 .030	21-76111 #6 .045	31-76111 #5 .060	61-76111 #10 .035	81-76111 #3 .050	1-76111 #64 .045R	1-76111 #11 .080	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #10 .035	1-76111 #3 .050	1-76111 #55 .065	1-76111 #11 .080	OFFSET
11-76111 #9 .025	1-76111 #8 .040	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #10 .035	1-76111 #3 .050	1-76111 #55 .065	1-76111 #11 .080	OFFSET
31-76111 #3 .050	1-76111 #8 .040	1-76111 #7 .055	21-76111 #38 .070	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	11-76111 #2 .065	1-76111 #29 .080	OFFSET
91-76111 #3 .050	31-76111 #8 .040	51-76111 #7 .055	41-76111 #38 .070	31-76111 #5 .060	31-76111 #4 .075	21-76111 #30 .090	41-76111 #2 .065	11-76111 #29 .080	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	11-76111 #2 .065	1-76111 #29 .080	OFFSET
91-76111 #3 .050	11-76111 #8 .040	41-76111 #7 .055	21-76111 #38 .070	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	11-76111 #2 .065	1-76111 #29 .080	OFFSET
31-76111 #3 .050	1-76111 #8 .040	1-76111 #7 .055	21-76111 #38 .070	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	21-76111 #2 .065	1-76111 #29 .080	OFFSET
91-76111 #3 .050	31-76111 #8 .040	51-76111 #7 .055	41-76111 #38 .070	31-76111 #5 .060	31-76111 #4 .075	21-76111 #30 .090	41-76111 #2 .065	11-76111 #29 .080	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	21-76111 #2 .065	1-76111 #29 .080	OFFSET
51-76111 #3 .050	11-76111 #8 .040	41-76111 #7 .055	21-76111 #38 .070	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	21-76111 #2 .065	1-76111 #29 .080	OFFSET
111-76111 #3 .050	31-76111 #8 .040	51-76111 #7 .055	41-76111 #38 .070	31-76111 #5 .060	31-76111 #4 .075	21-76111 #30 .090	41-76111 #2 .065	11-76111 #29 .080	OFFSET
1-706111 #8 .040	1-706111 #7 .055	21-706111 #6 .070	1-706111 #5 .060	1-706111 #4 .075	1-706111 #3 .090	11-706111 #2 .065	1-706111 #1 .080		OFFSET
21-706111 #6 .070	1-706111 #5 .060	1-706111 #4 .075	1-706111 #3 .090	11-706111 #2 .065	1-706111 #1 .080	41-706111 #2 .065	11-706111 #15 .080		OFFSET
1-706111 #1 .080	21-706111 #21 .095	1-706111 #20 .085	1-706111 #19 .099	1-706111 #18 .114	11-706111 #3 .090	1-706111 #17 .104	1-706111 #16 .080		OFFSET

SPACE AND PUNCTUATION

1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	1-76111 #53 .105	1-76111 #52 .120	OFFSET
1-76111 #57 .000	1-76111 #16 .015	1-76111 #15 .030	1-76111 #6 .045	1-76111 #5 .060	1-76111 #4 .075	1-76111 #30 .090	1-76111 #53 .105	1-76111 #51 .120	OFFSET

SPECIAL RACK BARS

6 Capacity Registers use 4 Spec. Rack Bars
7 Capacity Registers use 3 Spec. Rack Bars
8 Capacity Registers use 2 Spec. Rack Bars
10 Capacity Registers Use None

SPECIAL RACK BAR SPACING

Offset type is used to make special rack spacing.
To order, use the above symbol and specify offset type,
right or left.
Rack bars are offsets to the left unless otherwise specified.

RACK BARS

Rack bars having 1/4 Type or punctuation, not listed,
use standard symbol and specify 1/4 type, punctuation
or both.

RACK BAR CHART (Plate 3-1A)

MACHINE STYLE	SPACE PUNCTUATION	COLUMN 16	COLUMN 15	COLUMN 14	COLUMN 13	COLUMN 12	COLUMN 11	COLUMN 10
72 06 13	0,000,000.000							21-76111 #10 .035L 0,
72 06 15	000.00/0,000,000.000		11-76111 #58 .015R 0	11-76111 #57 .000 0	11-76111 #16 .015L 0	11-706111 #24 .005L 0	41-76111 #14 .020L 0	21-76111 #10 .035L 0,
72 06 16	000.000/000,000.000		11-76111 #58 .015R 0	11-76111 #57 .000 0	11-76111 #16 .015L 0	11-706111 #24 .005L 0	41-76111 #14 .020L 0	21-706111 #45 .035L 0
72 07 16	000.000/000,000.000		11-76111 #58 .015R 0	11-76111 #57 .000 0	11-76111 #16 .015L 0	11-706111 #24 .005L 0	41-76111 #14 .020L 0	21-706111 #45 .035L 0
72 08 16	000.000/000,000.000		11-76111 #58 .015R 0	11-76111 #57 .000 0	11-76111 #16 .015L 0	11-706111 #24 .005L 0	41-76111 #14 .020L 0	21-706111 #45 .035L 0
72 07 22	00 000 00/ 000 000 00		1-76111 #17 .010L 0	11-706111 #48 .025L 0	1-76111 #16 .015L 0	1-76111 #15 .030L 0	21-706111 #22 .045L 0	1-76111 #10 .035L 0
72 07 22	00,000.00/ 000, 000.00		1-76111 #17 .010L 0	11-76111 #9 .025L 0	1-76111 #16 .015L 0	1-76111 #15 .030L 0	21-706111 #22 .045L 0	21-706111 #10 .035L 0
72 05 25	000,000,000,000.00		11-76111 #58 .015R 0	11-76111 #57 .000 0	21-706111 #16 .015L 0	1-706111 #24 .005L 0	1-76111 #14 .020L 0	21-76111 #10 .035L 0,
72 06 25	000,000,000,000.00		11-76111 #58 .015R 0	11-76111 #57 .000 0	11-706111 #16 .015L 0	61-706111 #24 .005L 0	1-76111 #14 .020L 0	21-76111 #10 .035L 0,
72 07 25	000,000,000,000.00		11-76111 #58 .015R 0	11-76111 #57 .000 0	11-706111 #16 .015L 0	61-706111 #24 .005L 0	41-76111 #14 .020L 0	51-76111 #10 .035L 0,
72 07 28	000 00/ 000 000 00		1-706111 #51 .010L 0	11-76111 #57 .000 0	11-76111 #16 .015L 0	11-706111 #12 .030L 0	41-76111 #14 .020L 0	91-706111 #10 .035L 0
72 04 31	0,000,000.000							21-76111 #10 .035L 0,
72 04 33	000,000,000,000.000		1-76111 #58 .015R 0	1-76111 #57 .000 0	21-706111 #16 .015L 0	1-706111 #24 .005L 0	1-76111 #14 .020L 0	21-76111 #10 .035L 0,
72 04 34	0,000,000,000.000		1-706111 #43 .015R 0	1-706111 #44 .025R 0	1-706111 #25 .010R 0	21-706111 #24 .005L 0	1-706111 #23 .005R 0	1-76111 #17 .010L 0
72 04 35	000 00/0 000 000 000		11-76111 #58 .015R 0	11-76111 #57 .000 0	41-706111 #16 .015L 0	61-706111 #24 .005L 0	41-76111 #14 .020L 0	71-706111 #10 .035L 0
72 04 35	000.00/0 000,000.000		11-76111 #58 .015R 0	11-76111 #57 .000 0	41-706111 #16 .015L 0	11-706111 #24 .005L 0	41-76111 #14 .020L 0	71-706111 #10 .035L 0
72 04 36	000 00/0 000 000 000		11-76111 #58 .015R 0	11-76111 #57 .000 0	41-706111 #16 .015L 0	61-706111 #24 .005L 0	41-76111 #14 .020L 0	81-706111 #10 .035L 0
72 04 38	00 00/ 00,00/ 0 000 000		1-706111 #51 .010L 0	21-706111 #48 .025L 0	41-706111 #16 .015L 0	11-706111 #12 .030L 0	41-76111 #14 .020L 0	31-76111 #10 .035L 0
77 xx 06	0,000,000,000.0000	76111 #61 No Type for Cr. Bal.	21-706111 #8 .040L 0	1-76111 #15 .030L 0	1-76111 #6 .045L 0	21-706111 #5 .060L 0	1-76111 #3 .050L 0	1-76111 #2 .065L 0
12 Digits								
77 xx 06	00,000,000.0000			76111 #61 No Type for Cr. Bal.	1-76111 #6 .045L 0	21-706111 #5 .060L 0	1-76111 #3 .050L 0	1-76111 #2 .065L 0
10 Digits								
77 xx 25	0,000,000,000.0000	76111 #61 No Type for Cr. Bal.	21-706111 #8 .040L 0	1-76111 #15 .030L 0	1-76111 #6 .045L 0	21-706111 #5 .060L 0	1-76111 #3 .050L 0	1-76111 #2 .065L 0
12 Digits								
77 xx 25	00,000,000.0000			76111 #61 No Type for Cr. Bal.	1-76111 #6 .045L 0	21-706111 #5 .060L 0	1-76111 #3 .050L 0	1-76111 #2 .065L 0
10 Digits								
77 xx 28	000,000,000,000.00	76111 #61 No Type for Cr. Bal.	1-76111 #57 .000 0	1-76111 #16 .015L 0	21A-706111 #12 .030L 0	1-76111 #14 .020L 0	1-76111 #10 .035L 0	31-76111 #3 .050L 0
78 05 75	000,000,000,000.00	76111 #61 No Type for Cr. Bal.	11-76111 #57 .000 0	11-76111 #16 .015L 0	21A-706111 #12 .030L 0	1-76111 #14 .020L 0	1-76111 #10 .035L 0	31-76111 #3 .050L 0
78 06 76	00,000,000.00					76111 #61 No Type for Cr. Bal.	1-76111 #10 .035L 0	31-76111 #3 .050L 0
78 06 78	00,000,000.00					76111 #61 No Type for Cr. Bal.	1-76111 #10 .035L 0	31-76111 #3 .050L 0
78 07 78	00,000,000.00					76111 #61 No Type for Cr. Bal.	31-76111 #10 .035L 0	51-76111 #3 .050L 0
78 08 78	00,000,000.00					76111 #61 No Type for Cr. Bal.	31-76111 #10 .035L 0	51-76111 #3 .050L 0
78 06 80	00,000,000.00					76111 #61 No Type for Cr. Bal.	1-76111 #10 .035L 0	31-76111 #3 .050L 0
78 08 80	00,000,000.00					76111 #61 No Type for Cr. Bal.	31-76111 #10 .035L 0	51-76111 #3 .050L 0
79 04 52	000,000,000,000.00	76111 #61 No Type for Cr. Bal.	1-76111 #57 .000 0	1-76111 #16 .015L 0	21A-706111 #12 .030L 0	1-76111 #14 .020L 0	1-76111 #10 .035L 0	31-76111 #3 .050L 0

1-76111 #8		1-76111 #7		21-76111 #38		1-76111 #5		1-76111 #4		1-76111 #30		21-76111 #2		1-76111 #29		Not Used	
.040L	0	.055L	0	.070L	0	.060L	0	.075L	0	.090L	0	.065L	0	.080L	0		

HAMMER SPRING CHART (Plate 3-2)

MACHINE CLASSIFICATION			STANDARD HAMMERS AND SPRINGS								
Class	Description	Base	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77115 in Columns	11-77115 in Columns	31-77115 in Columns	41-77115 in Columns	1-707115 No. 2 in Columns	1-77880 No. 8 in Columns
71	10 Capacity	Narrow	2-4-6-8-10	1-3-5-7-9		1 thru 10					
71	14 Capacity	Wide	3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		2 thru 15					
72	1/10 Frac.	Narrow	2-4-6-8- 10	3-5-7-9	1	2 thru 10	1				
72	1/10 Frac.—14 Capacity	Wide	3-5-7-9- 11-13-15	4-6-8- 10-12-14	2	3 thru 15	2				
72	1/4 Frac.	Narrow	4-6-8-10	2-3-5-7-9		3 thru 10	2				
72	1/4 Frac.—14 Capacity	Wide	5-7-9- 11-13-15	3-4-6-8- 10-12-14		4 thru 15	3				
73	1/8 Frac.	Narrow	4-6-8-10	5-7-9	3	4 thru 10	3				
73	1/8 Frac.—14 Capacity	Wide	5-7-9- 11-13-15	6-8-10- 12-14	4	5 thru 15	4				
74-76-78	10 Capacity	Narrow	4-8-10	1-2-3- 5-6-7	9	1 thru 10					
74-75-76-77-78	14 Capacity	Wide	5-9-11-15	2-3-4-6-7-8- 12-13-14	10	2 thru 15					
74-76-78	1/10 Frac.	Narrow	2-4-6-8	5-9-10	1-3-7	2 thru 10	1				
74-75-76-77-78	1/10 Frac.—14 Capacity	Wide	3-5-7-9- 13-15	6-10-11-12	2-4-8-14	3 thru 15	2				
74-76-78	1/4 Frac.	Narrow	6-10	2-3-4-5- 7-8-9		3 thru 10	2				
74-75-76-77-78	1/4 Frac.—14 Capacity	Wide	7-11-13	3-4-5-6-8-9- 10-14-15	12	4 thru 15	3				
74-76-78	1/8 Frac.	Narrow	4-6-8-10	7	3-5-9	4 thru 10	3				
74-75-76-77-78	1/8 Frac.—14 Capacity	Wide	5-7-9- 11-15	8-12-13-14	4-6-10	5 thru 15	4				
75-77 Reg. Des. Sty. No. 1	14 Capacity	Wide	3-7-11-13	2-4-5-6-8-9- 10-14-15	12	2 thru 15					3
75-77 Reg. Des. Sty. No. 2	14 Capacity	Wide	3-5-7-9- 13-15	2-6-10-11- 12	4-8-14	3 thru 15				2	
75-77 Reg. Des. Sty. No. 1	1/10 Frac.—14 Capacity	Wide	3-5-7-9- 11-15	2-8-12-13- 14	4-6-10	2-3-5 thru 15	4				3
75-77 Reg. Des. Sty. No. 1	1/4 Frac.—14 Capacity	Wide	3-9-13-15	2-5-6-7-8- 10-11-12	14	2-3-6 thru 15	5				3
75-77 Reg. Des. Sty. No. 1	1/8 Frac.—14 Capacity	Wide	3-7-9-11- 13	2-10-14-15	6-8-12	2-3-7 thru 15	6				3
75-77 Reg. Des. Sty. No. 2	1/10 Frac.—14 Capacity	Wide	7-11-13	2-3-4-5-6-8- 9-10-14-15	12	4 thru 15	3			2	
75-77 Reg. Des. Sty. No. 2	1/4 Frac.—14 Capacity	Wide	5-7-9- 11-15	2-8-12-13- 14	4-6-10	5 thru 15	3			2	
75-77 Reg. Des. Sty. No. 2	1/8 Frac.—14 Capacity	Wide	9-13-15	2-5-6-7-8- 10-11-12	14	6 thru 15	5			2	
74 1/2-76 1/2-78 1/2	10 Capacity	Narrow	6-8-10	1-2-3-4- 5-7-9		2 thru 10		1			
74 1/2-76 1/2-78 1/2	14 Capacity	Wide	7-9-11- 13-15	2-3-4-5-6-8- 10-12-14		3 thru 15		2			
74 1/4-76 1/4-78 1/4	10 Capacity	Narrow	2-4-6-8-10	7-9	1-3-5	3 thru 10		2	1		
74 1/4-76 1/4-78 1/4	14 Capacity	Wide	3-5-7-9- 11-13-15	8-10-12-14	2-4-6	4 thru 15		3	2		

HAMMER SPRINGS—

1-77880B No. 2 Test 1 lb. 2 3/4 oz.
1-77880B No. 4 Test 2 lb. 3 1/2 oz.
1-77880B No. 5 Test 2 lb. 11 oz. copper plate
1-77880B No. 6 Test 4 lb. 11 oz.
1-77880A No. 7 Test 8 3/4 oz.
1-77880 No. 8 Test 12 3/4 oz.
1-77880 No. 9 Test 1 lb. 8 3/4 oz. copper plate

HAMMERS—

1-77115 Regular hammers
11-77115 Heavy hammers
1-77115 No. 2 Symbol, with heavy hammers and springs
1-77115 No. 3 Symbol, when using fraction
21A-77115 Symbol, for 76 and 78 machine
51-77115 .125 type 1/8 fraction extra heavy
1-707115 No. 1 Symbol, RMR machines
1-707115 No. 2 Designator, single column
31-77115 Pence, sterling machine
41-77115 Farthing, sterling machine

HAMMER SPRING CHART (Plate 3-2) Cont'd.

HEAVY HAMMERS AND SPRINGS								HEAVY HAMMERS AND EXTRA HEAVY SPRINGS							
1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880B No. 4 in Columns	1-77115 in Columns	11-77115 in Columns	41-77115 in Columns	1-707115 No. 2 in Columns	1-77880 No. 8 in Columns	1-77880 No. 9 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	1-77115 in Columns	11-77115 in Columns	41-77115 in Columns	1-707115 No. 2 in Columns	
2-4-6-8-10	1-3-5-7-9			1 thru 10					2-4-6-8-10	1-3-5-7-9		1 thru 10			
3-5-7-9- 11-13-15	2-4-6-8- 10-12-14			2 thru 15					3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		2 thru 15			
2-4-6-8-10	3-5-7-9	1		1 thru 10					2-4-6-8-10	1-3-5-7-9		1 thru 10			
3-5-7-9- 11-13-15	4-6-8-10- 12-14	2		2 thru 15					3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		2 thru 15			
4-6-8-10	2-3-5-7-9			2 thru 10					2-4-6-8-10	3-5-7-9		2 thru 10			
5-7-9-11- 13-15	3-4-6-8- 10-12-14			3 thru 15					3-5-7-9- 11-13-15	4-6-8-10- 12-14		3 thru 15			
4-6-8-10	5-7-9	3		3 thru 10					4-6-8-10	3-5-7-9		3 thru 10			
5-7-9-11- 13-15	6-8-10-12- 14	4		4 thru 15					5-7-9-11- 13-15	4-6-8-10- 12-14		4 thru 15			
4-8-10	1-2-3- 5-6-7	9		1 thru 10					2-4-6-8-10	1-3-5-7-9		1 thru 10			
5-9-11-15	2-3-4-6-7- 8-12-13-14	10		2 thru 15					3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		2 thru 15			
2-4-6-8	5-9-10	1-3-7		1 thru 10					2-4-6-8-10	1-3-5-7-9		1 thru 10			
3-5-7-9- 13-15	6-10-11- 12	2-4-8-14		2 thru 15					3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		2 thru 15			
6-10	2-3-4-5- 7-8-9			2 thru 10					3-5-7-9	2-4-6-8- 10		2 thru 10			
7-11-13	3-4-5-6-8- 9-10-14-15	12		3 thru 15					3-5-7-9- 11-13-15	4-6-8- 10-12-14		3 thru 15			
4-6-8-10	7	3-5-9		3 thru 10					4-6-8-10	3-5-7-9		3 thru 10			
5-7-9- 11-15	8-12-13- 14	4-6-10		4 thru 15					5-7-9-11- 13-15	4-6-8- 10-12-14		4 thru 15			
2-7-11-13	4-5-6-8-9- 10-14-15	12	2-3	4 thru 15			3	2	5-7-9-11- 13-15	4-6-8- 10-12-14	2-3	4 thru 15			
2-3-5-7-9- 13-15	6-10-11- 12	4-8-14		3 thru 15		2		2	3-5-7-9- 11-13-15	4-6-8-10- 12-14		3 thru 15		2	
2-5-7-9- 11-15	8-12-13- 14	4-6-10	2-3	4 thru 15			3	2	5-7-9- 11-13-15	4-6-8-10- 12-14	2-3	4 thru 15			
2-9-13-15	5-6-7-8- 10-11-12	14	2-3	5 thru 15			3	2	5-7-9- 11-13-15	6-8-10- 12-14	2-3	5 thru 15			
2-7-9- 11-13	10-14-15	6-8-12	2-3	6 thru 15			3	2	7-9-11- 13	6-8-10- 12-15	2-3	7 thru 15			
2-7-11-13	3-4-5-6-8- 9-10-14-15	12		3 thru 15		2		2	3-5-7-9- 11-13-15	4-6-8- 10-12-14		3 thru 15		2	
2-5-7-9- 11-15	8-12-13- 14	4-6-10		4 thru 15		2		2	5-7-9-11- 13-15	4-6-8-10- 12-14		4 thru 15		2	
2-9-13-15	5-6-7-8- 10-11-12	14		5 thru 15		2		2	5-7-9-11- 13-15	6-8-10- 12-14		5 thru 15		2	
6-8-10	1-2-3-4- 5-7-9			2 thru 10	1				2-4-6-8- 10	1-3-5-7-9		2 thru 10	1		
7-9-11- 13-15	2-3-4-5-6- 8-10-12-14			3 thru 15	2				3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		3 thru 15	2		
2-4-6-8- 10	7-9	1-3-5		3 thru 10	1-2				2-4-6-8- 10	1-3-5-7-9		3 thru 15	1-2		
3-5-7-9- 11-13-15	8-10-12- 14	2-4-6		4 thru 15	2-3				3-5-7-9- 11-13-15	2-4-6-8- 10-12-14		4 thru 15	2-3		

If punctuation is placed in any column the spring tension in this column is stepped up one point, i. e., from 1-77880 No. 8 to the 1-77880B No. 2 or from 1-77880B No. 2 to the 1-77880 No. 9 except when machine is equipped with heavy hammers and extra heavy springs.

Fractions 1/10—1/4—1/8 regular hammers require the 1-77880 No. 9 spring—with heavy hammers use the 1-77880B No. 4, with extra heavy hammer springs the 1-77880B No. 5 is used in the fraction column.

Two bar designation hammers require the 1-77880 No. 8 for the upper stud and the 1-77880B No. 2 for the lower stud of the 1-77117A No. 1.

Single column designation hammer requires the 1-77880B No. 2 spring.

The 1-77880B No. 6 is an extra heavy tension spring for the .125 type 1/3 fraction.

HAMMER SPRINGS AND HAMMERS (Plate 3-3)

CLASS 72 NEW WIDE BASE, AFTER MACHINE No. A696950

		STANDARD SPRINGS AND HAMMERS								
STYLE	PUNCTUATION	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77115 in Columns	11-77115 in Columns	1-707115 No. 4 in Columns	11-707115 No. 4 in Columns	1-707115 No. 5 in Columns	1-707115 No. 6 in Columns
720613	9,999,999.992	2-4-6-8	1-5-9-10	3-7			2 thru 10	1		
720615	999.99/9,999,999.992	2-4-6-8- 14	1-5-9-10- 11-12-13-15	3-7			1 thru 15			
72xx16	999.99/2/999,999.992	2-4-6-8- 10-14	1-5-9-11- 12-13-15	3-7			1 thru 15			
720722	99 999 99/999 999 99	2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15				1 thru 10 & 12-13-15			11-14
72xx25	999,999,999,999.99CR	2-4-6-8- 12-14	1-5-9-10- 11-15	3-7-13			2 thru 15		1	
720728	9 999 99/999 999 99	2-4-6-8- 10-12-14	3-5-7-9- 11-13-15				2 thru 11 & 13-14			12-15
720431	9,999,999.992	2-4-6-8	1-5-9-10	3-7	2 thru 10	1				
720433	999,999,999,999.992	2-4-6-8- 12-14	1-5-9-10- 11-15	3-7-13	2 thru 15	1				
720434	9,999,999,999.997/8	4-6-8-10- 14	7-11-12-13	3-5-9-15	3 thru 15	3				
720435	999 99/2/999 999 992	2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15					
720436	999 99/9 999 999 992	2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15					
720438	99 99/99/99 9 999 992									

CLASS 77 AFTER MACHINE No. A696950

STYLE	PUNCTUATION	STANDARD SPRINGS AND HAMMERS					HEAVY SPRINGS AND HEAVY			
		1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880B No. 4 in Columns
771006	9,999,999,999.9910	1-3-7-11- 13	2-4-5-6-8- 9-10-14-15	12	1	2 thru 15	1-3	2-7-11-13	4-5-6-8- 9-10-14-15	12
771025	9,999,999,999.9910	1-3-7-11- 13	2-4-5-6-8- 9-10-14-15	12	1	2 thru 15	1-3	2-7-11-13	4-5-6-8- 9-10-14-15	12

CLASS 78 NEW WIDE BASE, AFTER MACHINE No. A696950

		STANDARD SPRINGS AND HAMMERS								HEAVY
STYLE	PUNCTUATION	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880A No. 7 in Columns	1-77115 in Columns	1-707115 No. 1 in Columns	11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	1-77880B No. 2 in Columns
780575	999,999,999,999.99CR	5-9-11-15	2-3-4-6-7- 8-12-13-14	10	1	2 thru 15	1			5-9-11-15
780676	99,999,999.99CR	5-9-11	2-3-4-6- 7-8	10	1	2 thru 11	1			5-9-11
78xx78	99,999,999.99CR	5-9-11	2-3-4-6- 7-8	10	1			1	2 thru 11	5-9-11
78xx80	99,999,999.99CR	5-9-11	2-3-4-6- 7-8	10	1			1	2 thru 11	5-9-11
790452	999,999,999,999.99CR	5-9-11-15	2-3-4-6-7- 8-12-13-14	10	1	2 thru 15	1			5-9-11-15

HAMMER SPRINGS AND HAMMERS (Plate 3-3)—Continued

HEAVY SPRINGS AND HEAVY HAMMERS								EXTRA HEAVY SPRINGS AND HEAVY HAMMERS							
1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880B No. 4 in Columns	11-77115 in Columns	11-707115 No. 4 in Columns	1-707115 No. 5 in Columns	11-707115 No. 6 in Columns	31-707115 No. 6 in Columns	1-77880B No. 2 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	11-77115 in Columns	11-707115 No. 4 in Columns	1-707115 No. 5 in Columns	11-707115 No. 6 in Columns	31-707115 No. 6 in Columns
2-4-6-8	1-5-9-10	3-7		1 thru 10					2-4-6-8- 10	1-3-5-7- 9		1 thru 10			
2-4-6-8- 14	1-5-9-10-11 -12-13-15	3-7		1 thru 15					2-4-6-8- 10-12-14	1-3-5-7- 9-11-13-15		1 thru 15			
2-4-6-8- 10-14	1-5-9-11- 12-13-15	3-7		1 thru 15					2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15			
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15			1 thru 10 & 12-13-15		11-14			2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 10 & 12-13-15		11-14	
1-2-4-6- 8-12-14	5-9-10- 11-15	3-7-13		2 thru 15	1			1	2-4-6-8- 10-12-14	3-5-7-9- 11-13-15		2 thru 15	1		
2-4-6-8- 10-12-14	3-5-7-9- 11-13-15			2 thru 11 & 13-14		12-15			2-4-6-8- 10-12-14	3-5-7-9- 11-13-15		2 thru 11 & 13-14		12-15	
2-4-6-8	1-5-9-10	3-7	1 thru 10						2-4-6-8- 10	1-3-5-7- 9	1 thru 10				
2-4-6-8- 12-14	1-5-9-10- 11-15	3-7-13	1 thru 15						2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 15				
4-6-8- 10-14	7-11-12- 13	3-5-9-15	3 thru 15						4-6-8- 10-12-14	3-5-7-9- 11-13-15	3 thru 15				
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15						2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 15				
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15						2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 15				
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 7 & 10-11-13				8-9-12-14- 15		2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 7 & 10-11-13				8-9-12- 14-15

HAMMERS			EXTRA HEAVY SPRINGS AND HEAVY HAMMERS							
11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	11-707115 No. 4 in Columns	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	11-707115 No. 4 in Columns	
1	2-3	4 thru 15	1-3	2	5-7-9-11- 13-15	4-6-8-10- 12-14	1	2-3	4 thru 15	
1	2-3	4 thru 15	1-3	2	5-7-9-11- 13-15	4-6-8-10- 12-14	1	2-3	4 thru 15	

SPRINGS AND HEAVY HAMMERS							EXTRA HEAVY SPRINGS AND HEAVY HAMMERS						
1-77880 No. 9 in Columns	1-77880B No. 4 in Columns	1-77880A No. 7 in Columns	11-77115 in Columns	1-707115 No. 1 in Columns	11-707115 No. 1 in Columns	11-707115 No. 4 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	1-77880A No. 7 in Columns	11-77115 in Columns	1-707115 No. 1 in Columns	11-707115 No. 1 in Columns	11-707115 No. 4 in Columns
2-3-4-6-7- 8-12-13-14	10	1	2 thru 15	1			3-5-7-9- 11-13-15	2-4-6-8- 10-12-14	1	2 thru 15	1		
2-3-4-6- 7-8	10	1	2 thru 11	1			3-5-7-9- 11	2-4-6-8- 10	1	2 thru 11	1		
2-3-4-6- 7-8	10	1			1	2 thru 11	3-5-7-9- 11	2-4-6-8- 10	1			1	2 thru 11
2-3-4-6- 7-8	10	1			1	2 thru 11	3-5-7-9- 11	2-4-6-8- 10	1			1	2 thru 11
2-3-4-6-7- 8-12-13-14	10	1	2 thru 15	1			3-5-7-9- 11-13-15	2-4-6-8- 10-12-14	1	2 thru 15	1		

HAMMER SPRINGS AND HAMMERS (Plate 3-4)

SERIES M 200

SERIES M 200

		STANDARD SPRINGS AND HAMMERS								
SERIES	PUNCTUATION	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77115 in Columns	11-77115 in Columns	1-707115 No. 4 in Columns	11-707115 No. 4 in Columns	1-707115 No. 5 in Columns	1-707115 No. 6 in Columns
M 213	999,999,999.992	2-4-6-8-12	1-5-9-10-11	3-7			2 thru 12	1		
M 215	999,99/9,999,999.992	2-4-6-8-14	1-5-9-10-11-12-13-15	3-7			1 thru 15			
M 216	999,99/2/999,999.992	2-4-6-8-10-14	1-5-9-11-12-13-15	3-7			1 thru 15			
M 222	99 999 99/999 999 99	2-4-6-8-10-12-14	1-3-5-7-9-11-13-15				1 thru 10 & 12-13-15			11-14
M 225	9,999,999,999.99CR	2-4-6-8-12	1-5-9-10-11	3-7-13			2 thru 13		1	
M 226	99,999,999.99CR	2-4-6-8	1-5-9-10-11	3-7			2 thru 11		1	
M 227	99,999,999.99CR	2-4-6-8	1-5-9-10-11	3-7			2 thru 11		1	
M 231	9,999,999.992	2-4-6-8	1-5-9-10	3-7	2 thru 10	1				
M 233	999,999,999,999.992	2-4-6-8-12-14	1-5-9-10-11-15	3-7-13	2 thru 15	1				
M 234	9,999,999,999.997/8	4-6-8-10-14	7-11-12-13	3-5-9-15	4 thru 15	3				
M 235	999 99/2/999 999 992	2-4-6-8-10-12-14	1-3-5-7-9-11-13-15		1 thru 15					
M 236	999 99/9 999 999 992	2-4-6-8-10-12-14	1-3-5-7-9-11-13-15		1 thru 15					
M 237	99 99/99/99/9 999 992									

SERIES M 700

SERIES	PUNCTUATION	STANDARD SPRINGS AND HAMMERS					HEAVY SPRINGS AND HEAVY			
		1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880B No. 4 in Columns
M 706 M 707	9,999,999,999.9915CR	1-3-7-11-13	2-4-5-6-8-9-10-14-15	12	1	2 thru 15	1-3	2-7-11-13	4-5-6-8-9-10-14-15	12
M 725 M 726	9,999,999,999.9915CR	1-3-7-11-13	2-4-5-6-8-9-10-14-15	12	1	2 thru 15	1-3	2-7-11-13	4-5-6-8-9-10-14-15	12

SERIES M 800

		STANDARD SPRINGS AND HAMMERS								
SERIES	PUNCTUATION	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880A No. 7 in Columns	1-77115 in Columns	1-707115 No. 1 in Columns	11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	1-77880B No. 2 in Columns
M 802	999,999,999,999.99CR	5-9-11-15	2-3-4-6-7-8-12-13-14	10	1	2 thru 15	1			5-9-11-15
M 803	99,999,999.99CR	5-9-11	2-3-4-6-7-8	10	1	2 thru 11	1			5-9-11
M 805	9,999,999,999.99CR	5-9-11	2-3-4-6-7-8-12-13	10	1			1	2 thru 13	5-9-11
M 806	99,999,999.99CR	5-9-11	2-3-4-6-7-8	10	1			1	2 thru 11	5-9-11
M 807	99,999,999.99CR	5-9-11	2-3-4-6-7-8	10	1			1	2 thru 11	5-9-11

HAMMER SPRINGS AND HAMMERS (Plate 3-4)—Continued

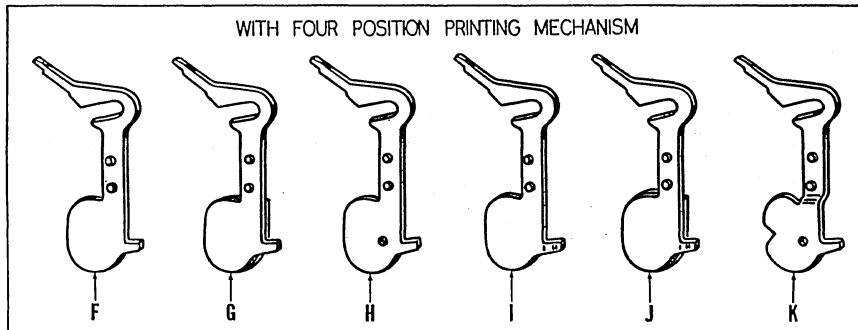
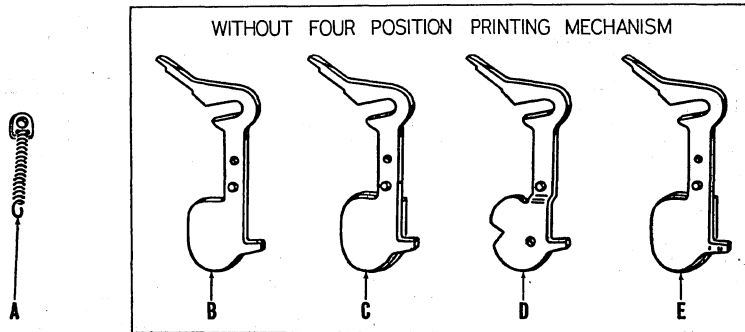
HEAVY SPRINGS AND HEAVY HAMMERS								EXTRA HEAVY SPRINGS AND HEAVY HAMMERS							
1-77880B No. 2 in Columns	1-77880 No. 9 in Columns	1-77880B No. 4 in Columns	11-77115 in Columns	11-707115 No. 4 in Columns	1-707115 No. 5 in Columns	11-707115 No. 6 in Columns	31-707115 No. 6 in Columns	1-77880B No. 2 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	11-77115 in Columns	11-707115 No. 4 in Columns	1-707115 No. 5 in Columns	11-707115 No. 6 in Columns	31-707115 No. 6 in Columns
2-4-6-8 12	1-5-9-10- 11	3-7		1 thru 12					2-4-6-8- 10-12	1-3-5-7- 9-11		1 thru 12			
2-4-6-8- 14	1-5-9-10-11 -12-13-15	3-7		1 thru 15					2-4-6-8- 10-12-14	1-3-5-7- 9-11-13-15		1 thru 15			
2-4-6-8- 10-14	1-5-9-11- 12-13-15	3-7		1 thru 15					2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15			
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15			1 thru 10 & 12-13-15		11-14			2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 10 & 12-13-15		11-14	
1-2-4-6- 8-12	5-9-10- 11	3-7-13		2 thru 13	1			1	2-4-6-8- 10-12	3-5-7-9- 11-13		2 thru 13	1		
1-2-4-6- 8	5-9-10- 11	3-7		2 thru 11	1			1	2-4-6-8- 10	3-5-7-9- 11		2 thru 11	1		
1-2-4-6- 8	5-9-10-11	3-7		2 thru 11	1			1	2-4-6-8 10	3-5-7-9- 11		2 thru 11	1		
2-4-6-8	1-5-9-10	3-7	1 thru 10						2-4-6-8- 10	1-3-5-7- 9	1 thru 10				
2-4-6-8- 12-14	1-5-9-10- 11-15	3-7-13	1 thru 15						2-4-6-8- 10	1-3-5-7-9- 11-13-15	1 thru 15				
4-6-8- 10-14	7-11-12- 13	3-5-9-15	3 thru 15						4-6-8- 10-12-14	3-5-7-9- 11-13-15	3 thru 15				
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15						2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 15				
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 15						2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 15				
2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15		1 thru 7 & 10-11-13				8-9-12-14- 15		2-4-6-8- 10-12-14	1-3-5-7-9- 11-13-15	1 thru 7 & 10-11-13				8-9-12- 14-15

HAMMERS			EXTRA HEAVY SPRINGS AND HEAVY HAMMERS							
11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	11-707115 No. 4 in Columns	1-77880 No. 8 in Columns	1-77880B No. 2 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	11-707115 No. 1 in Columns	1-707115 No. 4 in Columns	11-707115 No. 4 in Columns	
1	2-3	4 thru 15	1-3	2	5-7-9-11 13-15	4-6-8-10- 12-14	1	2-3	4 thru 15	
1	2-3	4 thru 15	1-3	2	5-7-9-11- 13-15	4-6-8-10- 12-14	1	2-3	4 thru 15	

HEAVY SPRINGS AND HEAVY HAMMERS							EXTRA HEAVY SPRINGS AND HEAVY HAMMERS						
1-77880 No. 9 in Columns	1-77880B No. 4 in Columns	1-77880A No. 7 in Columns	11-77115 in Columns	1-707115 No. 1 in Columns	11-707115 No. 1 in Columns	11-707115 No. 4 in Columns	1-77880B No. 4 in Columns	1-77880B No. 5 in Columns	1-77880A No. 7 in Columns	11-77115 in Columns	1-707115 No. 1 in Columns	11-707115 No. 1 in Columns	11-707115 No. 4 in Columns
2-3-4-6-7-8-12-13-14	10	1	2 thru 15	1			3-5-7-9-11-13-15	2-4-6-8-10-12-14	1	2 thru 15	1		
2-3-4-6-7-8	10	1	2 thru 11	1			3-5-7-9-11	2-4-6-8-10	1	2 thru 11	1		
2-3-4-6-7-8-12-13	10	1			1	2 thru 13	3-5-7-9-11-13	2-4-6-8-10-12	1			1	2 thru 13
2-3-4-6-7-8	10	1			1	2 thru 11	3-5-7-9-11	2-4-6-8-10	1			1	2 thru 11
2-3-4-6-7-8	10	1			1	2 thru 11	3-5-7-9-11	2-4-6-8-10	1			1	2 thru 11

HAMMER SPRINGS AND HAMMERS (Plate 3-5)

SERIES M 200, M 700, M 800; CLASS 72, 78 NEW WIDE BASE;
CLASS 77—AFTER MACHINE SERIAL No. A696950

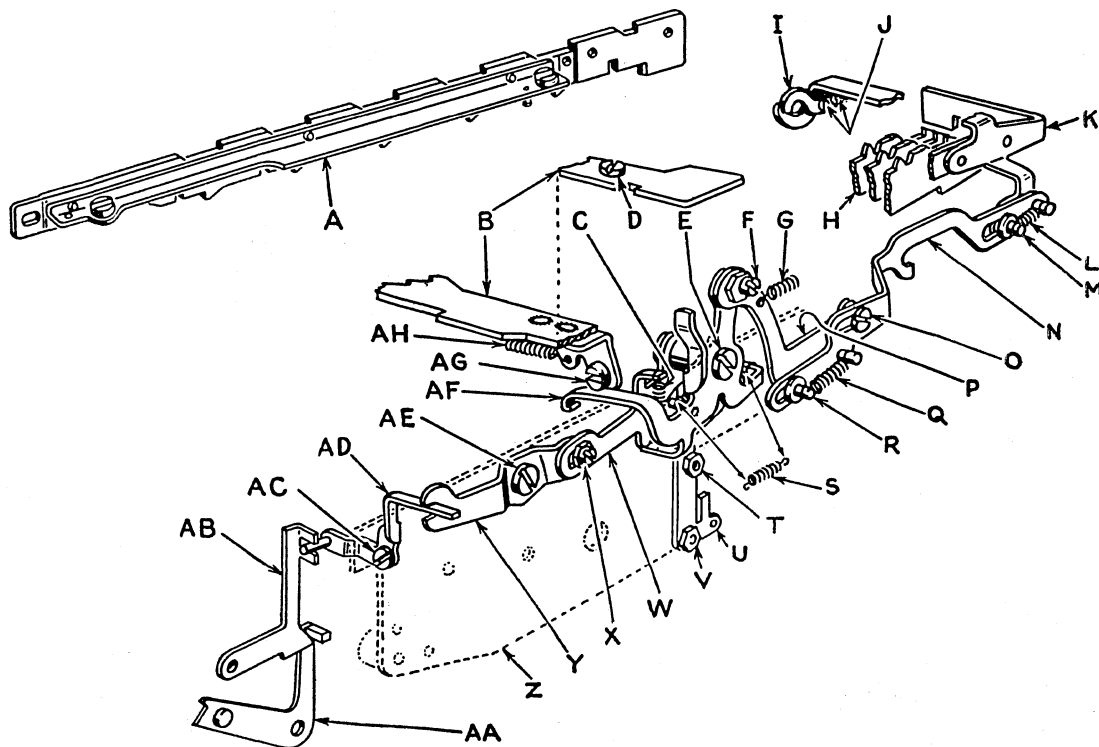


SYMBOLS (Plate 3-5)

A	Hammer Spring	Test	Wire Diameter	No. of Coils	Spring Diameter
	1-77880B No. 2	1 lb. 2 3/4 oz.	.018"	48	.140"
	1-77880B No. 4	2 lb. 3 1/2 oz.	.020"	43	.150"
	1-77880B No. 5	2 lb. 11 oz.	.022"	39	.150" copper plate
	1-77880B No. 6	4 lb. 11 oz.	.026"	36	.169"
	1-77880A No. 7	8 3/4 oz.	.014"	64	.125"
	1-77880 No. 8	12 3/4 oz.	.016"	55	.125"
	1-77880 No. 9	1 lb. 8 3/4 oz.	.018"	48	.140" copper plate
B	1-77115 standard hammer	For adding columns, Class 72, 78 and Series M 200, M 800			
		For numerator underscore type, column No. 1, Class 72 and Series M 200			
C	11-77115 heavy hammer	For adding columns, Class 72, 78 and Series M 200, M 800			
		For 1/2 fraction, column No. 1, Class 72 and Series M 200			
		For 1/4 fraction, column No. 3, Class 72 and Series M 200			
D	1-707115 No. 1 standard hammer	For symbol, column No. 1, Class 78 and Series M 800			
E	31-707115 No. 6 heavy hammer, .025' offset left, for moving type to left to change spacing, Class 72 and Series M 200				
F	1-707115 No. 4 standard hammer	For adding columns, Class 72, 77, 78 and Series M 200, M 700, M 800			
		For numerator underscore type, column No. 1, Class 72 and Series M 200			
		For register designation No. 1 (2 bar), columns 2 & 3, Class 77 and Series M 700			
G	11-707115 No. 4 heavy hammer	For adding columns, Class 72, 77, 78 and Series M 200, M 700, M 800			
		For numerator underscore type, column No. 1 & 10, Class 72 and Series M 200			
		For 1/2 fraction, column No. 1, Class 72 and Series M 200			
H	1-707115 No. 5 standard hammer	For symbol, column No. 1, Class 72 and Series M 200			
I	1-707115 No. 6 standard hammer, .025' offset left, for moving type to left to change spacing, Class 72 and Series M 200				
J	11-707115 No. 6 heavy hammer, .025' offset left, for moving type to left to change spacing, Class 72 and Series M 200				
K	11-707115 No. 1 standard hammer	For symbol, column No. 1, Class 77, 78 and Series M 700, M 800			

with
four position
printing
mechanism

FRACTION PRINTING MECHANISM, LATER (Plate 4)

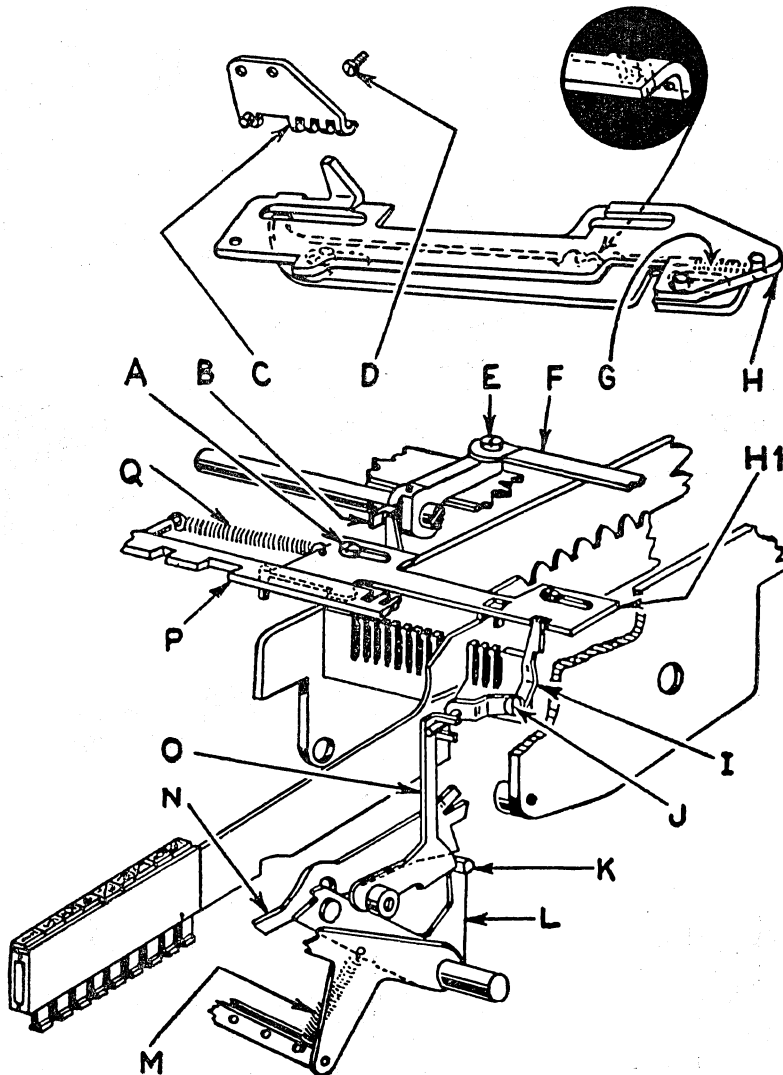


SYMBOLS (Plate 4)

A	21-79130A No. 11 (6 x 10)	60 pinion
	21-79130A No. 12 (7 x 8)	
	21-79130A No. 13 (8 x 7)	
	21-79130A No. 14 (10 x 6)	
	21-79130 No. 3 (3 x 14)	
	21-79130 No. 8 (4 x 15)	
	(3 x 12)	
	(4 x 12)	
	(5 x 12)	
B	1-79130 No. 1 used with 3 reg.	
	1-79130A No. 7 (6 x 8)	50 pinion
	1-79130A No. 8 (7 x 7)	
	1-79130A No. 9 (8 x 6)	
	1-79130A No. 10 (5 x 10)	
	1-79130A No. 11 (6 x 10)	60 pinion
	1-79130A No. 12 (7 x 8)	
	1-79130A No. 13 (8 x 7)	
	1-79130A No. 14 (10 x 6)	
	1-79130 No. 2 (3 x 12) (4 x 12) (5 x 12)	60 pinion
	CL 74, 76, 78	
	1-79130 No. 3 (3 x 14) (4 x 15)	
	CL 71, 74, 76, 78	
	1-79130 No. 4 (6 x 10) cl. 72, 74, 76, 78	
C	12083	
D	76559 used with 3 reg.	
	79505 used with 60 pinion	
E	705618	
F	350 1/4 screw, 75342 ecc.	
G	71804	
H	Rack bars, see Plate 3-1, printing symbol book	
I	173 Fte. 133	
J	73563	
K	79292 No. 1 } 1/2 frac.	
	709292 No. 1 } 1/2 frac.	

	79292 No. 2 } 1/4 frac.	
	709292 No. 2 } 1/4 frac.	
	79292 No. 3 } 1/10 frac.	
	709292 No. 3 } 1/10 frac.	
L	489	
M	706508	
N	1-76232 includes O, P, R	
O	79503	
P	76233	
Q	7480B	
R	Use 706511	
S	7286 1/2	
T	46	
U	1-76236	
V	46	
W	1-76234	
X	70512 screw, 71361 ecc.	
Y	76235	
Z	1-76110AR No. 1	
AA	1-77117A No. 2 (1/10 frac.) Cl. 72	
	1-77117A No. 3 (1/2 frac. with brokerage type) Cl. 72	
	11-77117A No. 2 (1/4 frac.) Cl. 72	
AB	77123 No. 1 (1/10 frac.)	
	77123 No. 2 (1/2 or 1/4 frac.)	
AC	Use 72656	
AD	1-76125A	
AE	76580	
AF	1-76231	
AG	1-79132R No. 2*	
AH	79800 No. 2 with 4 or more reg., 50 and 60 pinion	
	79800 No. 3 with 3 or more reg., motor reg. return, 50 pinion	
	79800 No. 4 with 3 or more reg., motor reg. return, 60 pinion	
	79800 No. 5 } with 2 or 3 reg.	
	79800 No. 1 early } with 2 or 3 reg.	

FRACTION PRINTING MECHANISM, EARLY (Plate 5)



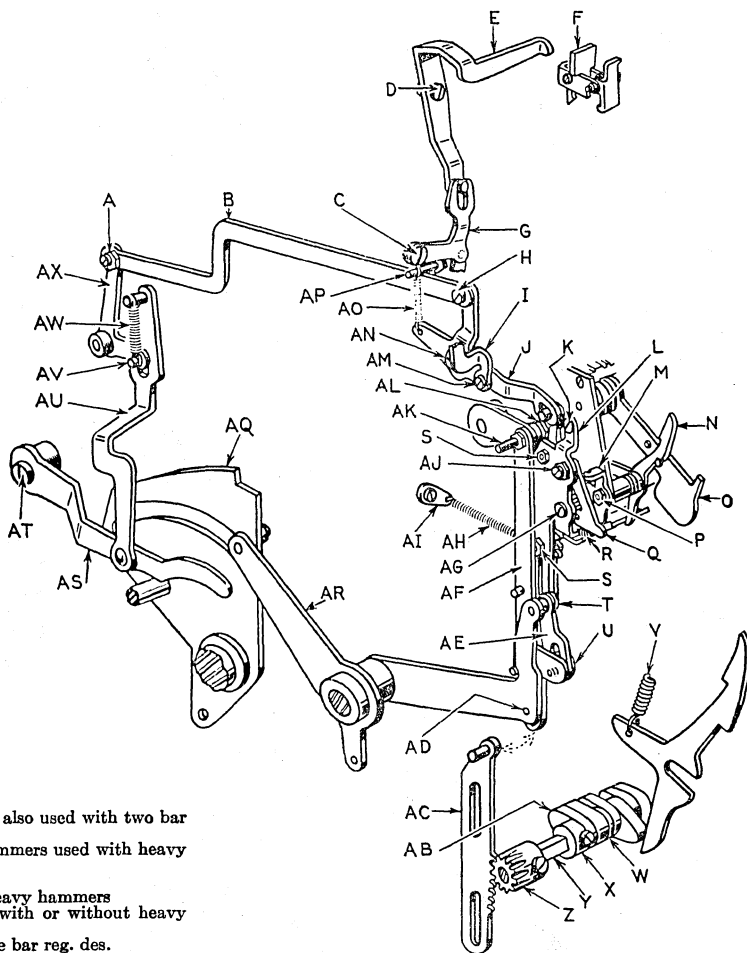
SYMBOLS (Plate 5)

A	76558		
B	79900L*		
C	1-76162 No. 1 (1 prong)		
	1-76162A No. 2 (5 prongs)		
	11-76162A No. 2 (4 prongs)		
	21-76162A No. 2 (3 prongs)		
D	79582		
E	79511		
F	1-79130 No. 1 see plate 4 for other styles		
G	75830		
H	1-76138 No. 9 (6 x 10)		
	1-76138 No. 10 (7 x 8)	reg. ret. ege. controlled,	
	1-76138 No. 11 (10 x 6)	60 pinion, cl. 72	
	1-76138 No. 12 (8 x 7)		
	1-76138 No. 13 (7 x 7) reg. ret. ege. controlled, 50 pinion,		
	cl. 72		
H1	76138 No. 1 (1/10 frac.) cl. 72		
	1-76138 No. 2 (1/8 frac.) cl. 73	5 x 10 or 6 x 10	
	76138 No. 3 (1/10 frac.) cl. 72		
	1-76138 No. 3 (1/8 frac.) cl. 73	6 x 8, 50 pinion	
	76138 No. 4 (1/10 frac.) cl. 72		
	1-76138 No. 4 (1/8 frac.) cl. 73	5 x 8, 7 x 7, 8 x 6, 50 pinion	
	76138 No. 5 (1/10 frac.) cl. 72		
	1-76138 No. 5 (1/8 frac.) cl. 73	7 x 8, 60 pinion	
	76138 No. 7 (1/10 frac.) cl. 72		
	1-76138 No. 7 (1/8 frac.) cl. 73	8 x 7, 60 pinion	
	76138 No. 8 (1/10 frac.) cl. 72		
	1-76138 No. 8 (1/8 frac.) cl. 73	10 x 6, 60 pinion	
	1-76125		
I	Use 72656		
J	77505* included in L		
K	1-77117A No. 2 (1/10 frac.)		
L	11-77117A No. 2 (1/8 frac.)	cl. 72	
	1-77117A No. 3 (1/8 frac.)		
M	77880A No. 3		
N	Hammer driver latch, see Plate 2A, 2B & 2-1		
O	77123 No. 1 (1/10 frac.) use 77517 No. 1 screw		
	77123 No. 2 (1/8 frac.) use 77517 No. 2 screw, 77301 collar		
P	1-79934 No. 1		
Q	75830		

FOUR POSITION PRINTING MECHANISM (Plate 6)

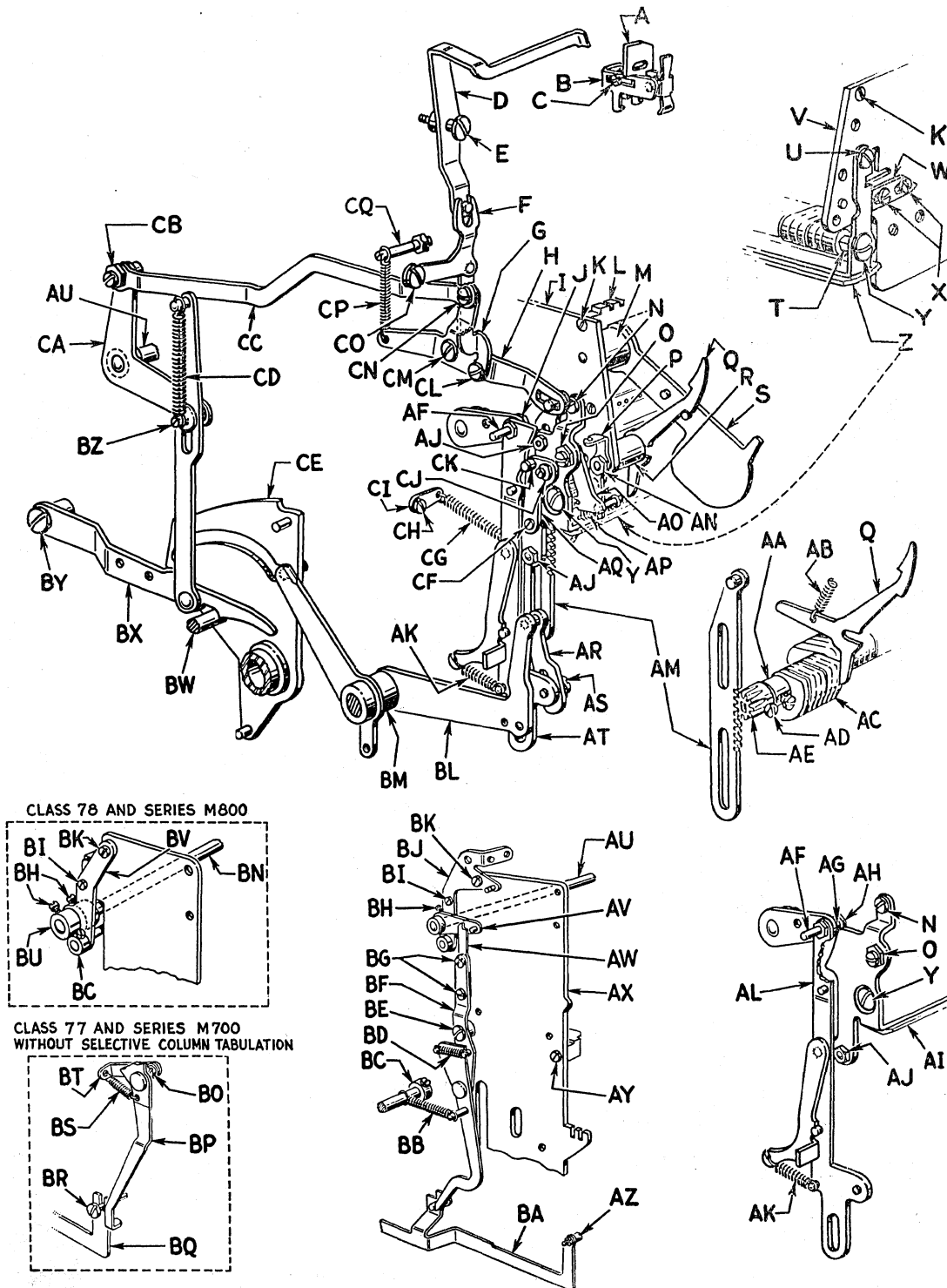
SYMBOLS (Plate 6)

- A 72367 ecc., 79565 screw, 49 nut
 B Use 704272
 C Use 9153 1/4 screw, 46 1/4 nut
 D Use 705505 1/2
 E Use 1-709299
 F 1-136A No. 2 Env. 1060A with prorate or auto. ext. in regular position
 Use 703125 1/2 No. 1 high control block
 Use 703125 1/2 No. 2 medium control block
 Use 703125 1/2 No. 3 low control block
 G 1-112 No. 1 Env. 1060A narrow base
 Use 1-709298 wide base
 H 79552
 I 709207 included in G
 J 1-103 Env. 1060A narrow base
 Use 1-707143 wide base
 K 99565
 L 1-100 Env. 1060A narrow base
 Use 1-707148B
 1A-707146
 1-707148 1/4
 1-707122B No. 2
 1-707107 No. 2
 707511 No. 2
 707519
 707803
 71361
 74502
 74533
 707303
 707514
 46
 M Use 1-707105
 N 77116 No. 1 Env. 1060A
 77116 No. 2 Env. 1060A symbol
 O Use 1-707115 No. 4 regular hammers, also used with two bar reg. des.
 1-77115 No. 2 Env. 1060A symbol hammers used with heavy hammers
 Use 11-707115 No. 4 heavy hammers
 21A-77115 Env. 1060A symbol, not heavy hammers
 1-707115 No. 1 Env. 1060A symbol, with or without heavy hammers, cl. 77
 1-707115 No. 2 Env. 1060A with single bar reg. des.
 P 47 3/4
 Q 1A-707146, 707519, 707803
 R 284
 S 46 3/4 nut, 76500 screw
 T 709607 screw
 U 72568 screw, 79362 ecc.
 V Use 72810
 W Use 707302 No. 2 .040" space washer
 Use 707302 No. 1 .025" space washer
 X Use 1X15-2
 Y 1 Env. 1060A narrow base
 Use 707005 wide base
 Z Use 1-707301 includes 73503 screw
 AB Use 707144A No. 1 high and low or medium and no block
 Use 707144 No. 2 high and medium, medium and low, low and no, or high and no block
 Use 707144 No. 3 high, medium, low or no block
 Use 707144 No. 4 high, medium and low; medium, low and no; or high, low and no block
 AC Use 1-707145
 AD 71545
 AE Use 701142 1/2
 AF 1-77122A No. 2 Env. 1060A narrow base
 Use 1-707122B No. 2, 1-707148B, 1A-707146, 707511 No. 2, 707519, 707803, 707303, 1-707107 No. 2, 1-707148 1/4, 71361, 707514, 74502, 74533, 46
 AG 71589
 AH 981 1/4
 AI Use 20 No. 89
 AJ 73611 screw, 79362 ecc.
 AK Use 1-77122A No. 3
 707514 } without 4 position printing
 707303 }
 Use 1-707122B No. 2 }
 707514 } with 4 position printing
 707303 }
 Use 12042 1/2 roller



- AL Use 707510 shoulder nut
 AM 71546
 AN Use 707508 screw
 AO 99807
 AP Use 706514
 AQ 11A-71129 see keyboard book, plate 3 for other styles
 AR Use 81A-701004 No. 1, 1-707122B No. 2, 707514, 707303
 AS Use 11-704207
 AT 1-141 Env. 1060A early } includes AU
 79585
 AU Use 11-704207 use 7550 1/2 rivet
 AV Use 704543 screw, 46 nut
 AW 60800
 AX 1-3A No. 1 Env. 1060A narrow base, Class 74-76-78 machines
 Use 1-704050 for wide base, Class 78 machines, before Serial No. B135750; Class 77 with selective column tabulation machines, before Serial No. B102390
 11-3A No. 1 Env. 1060A narrow base, Class 72 machines
 Use 1-704050 No. 2
 1-704215 } for positive normalizing of control arm and non-add control balls
 704536 }
 8082A }
 74808 }
 1-704207 No. 2 }
 1-707145 No. 2 }
 76811 }
 704801 }
 1-707143 }
 1-706124 }
 11Z-704050 } for positive normalizing of non-add control balls only
 1-704215 }
 704536 }
 8082A }
 74808 }

FOUR POSITION PRINTING CONTROL MECHANISM, CARRIAGE CONTROLLED—WITH POSITIVE NORMALIZING (Plate 6-1)



NOTE: This mechanism was included in,

Style 72 XX 22 and Series M 222 machines beginning with Serial No. A915672;
Other Class 72 and Series M 200 machines beginning with Serial No. B100107;
Class 77 and Series M 700 machines beginning with Serial No. B102390;
Class 78 and Series M 800 machines beginning with Serial No. B135750.

SYMBOLS (Plate 6-1)

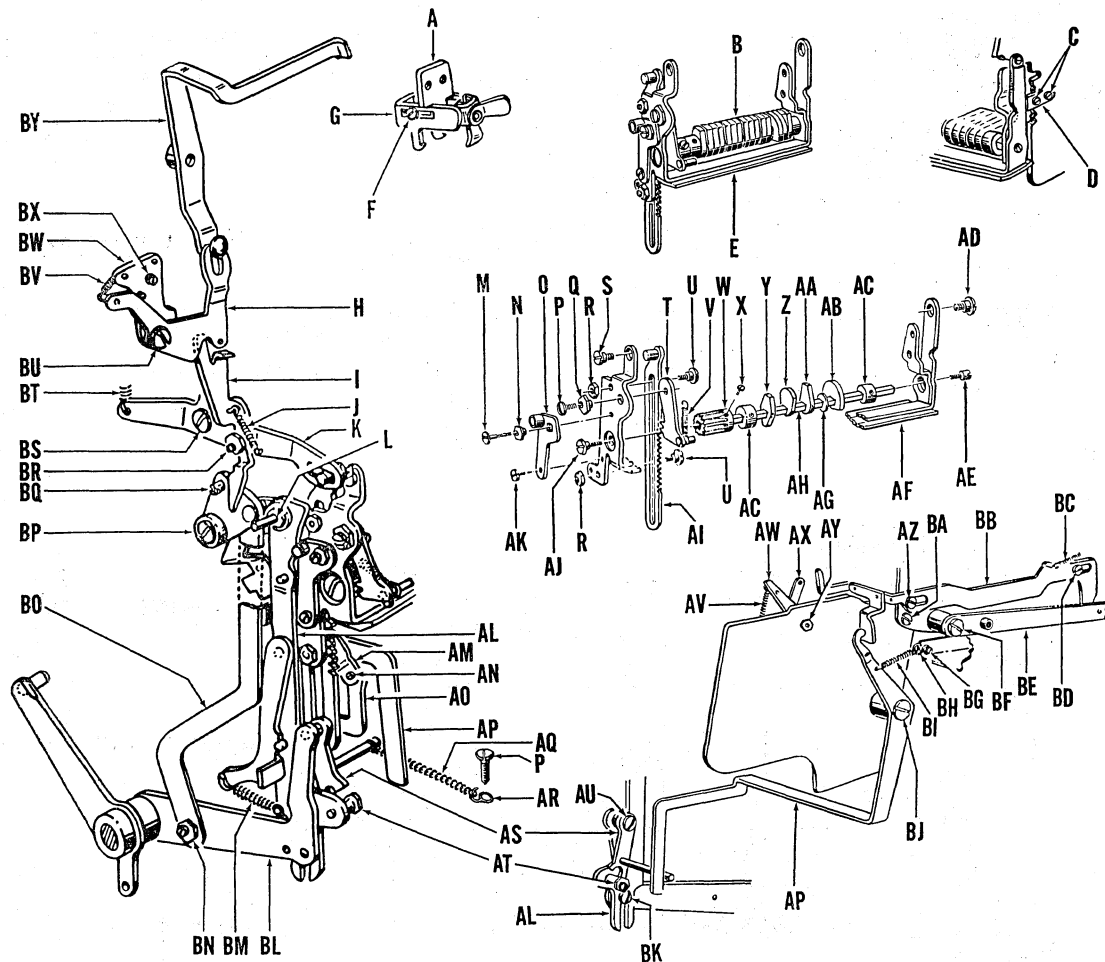
A	703125 1/2 No. 1 high	} 5th line control
	703125 1/2 No. 2 medium	
	703125 1/2 No. 3 low	
B	Use 1-73214C No. 2 bracket	
C	9050 3/4 screws	
D	1-709299 No. 2	
E	79607A with line 2C control lever	
	705505 1/2 without line 2C control lever	
F	1-709298 includes G	
G	Included in F	
H	1-707143	
I	1-707110L No. 3 side plate with long hub, 1/10" long	
	Use 1-707110L No. 3, 1-707110R No. 3,	
	1-707000A No. 10 Class 72 and Series M 200	} to replace side plates with short hub, 1/20" long
	with 1/10 fractions	
	1-707110L No. 3, 1-707110R No. 3, 1-707000	
	No. 9 Class 72 and Series M 200 with whole numbers	
	1-707110L No. 3, 1-707110R No. 3, 1-707000	
	No. 2 Class 77 and Series M 700	
	1-707110L No. 3, 1-707110R No. 3, 1-707000	
	No. 1 Class 78 and Series M 800	
VJ	46 nut	
K	75515 screw	
L	707903 No. 1 Class 78, Series M 800	
	707903 No. 2 Class 77, Series M 700	
	707903 No. 10 Class 72, Series M 200 with 1/10 fractions	
	707903 No. 13 Class 72, Series M 200 with whole numbers	
M	707001 No. 1 Class 78, Series M 800	
	707001 No. 2 Class 77, Series M 700	
	707001 No. 10 Class 72, Series M 200 with 1/10 fractions	
	707001 No. 9 Class 72, Series M 200 with whole numbers	
N	8863 screw	
O	79362 eccentric	
	73611 screw	
P	1-707105	
Q	707116	
R	707002 No. 1 Class 78, Series M 800	
	707002 No. 2 Class 77, Series M 700	
	707002 No. 10 Class 72, Series M 200 with 1/10 fractions	
	707002 No. 9 Class 72, Series M 200 with whole numbers	
S	11-707115 No. 1 formed hammer, for symbol	
	1-707115 No. 4 regular hammer	
	11-707115 No. 4 heavy hammer	
	1-707115 No. 5 regular symbol hammer	
	11-707115 No. 6 heavy hammer, tip offset left	
T	707005 square shaft	
	1Z-707005 specify machine style and serial number, assembled shaft with blocking cams and gear	
U	99565 screw	
V	1-707110R No. 3	
	11-707110R No. 3 Class 72, Series M 200 with 1/10 fractions	} side plates with long hub, 1/10" long
	Use 11-707110R No. 3, 1-707110L No. 3,	
	1-707000A No. 10 Class 72 and Series M 200	
	with 1/10 fractions	
	1-707110R No. 3, 1-707110L No. 3, 1-707000	
	No. 9 Class 72 and Series M 200 with whole numbers	
	1-707110R No. 3, 1-707110L No. 3, 1-707000	} to replace side plates with short hub, 1/20" long
	No. 2 Class 77 and Series M 700	
	1-707110R No. 3, 1-707110L No. 3, 1-707000	
	No. 1 Class 78 and Series M 800	
	707147	
W	7562	
X	707511	
Y	Use 1-707148B	
VZ	707511 No. 2	} for bail only
	707519	
	707803	
	1A-707146	
	Use 1Z-707148B for bail assembly without shaft or cams	
	Use 2Z-707148B Specify print control, complete bail assembly including shaft and cams	
AA	Use 1X15-2	
AB	707800	
AC	707144A No. 1 high and low or medium and no block	
	707144 No. 2 high and medium, medium and low, low and no, or high and no block	
	707144 No. 3 high, medium, low or no block	
	707144 No. 4 high, medium and low; medium, low and no; or high, low and no block	
AD	73563	
AE	1-707301 includes AD	
AF	Use 1-77122A No. 3	
	707514	} without 4 position printing
	707303	
	Use 1-707122B No. 2	
	707514	} with 4 position printing
	707303	
AG	12042 3/4 roll	
AH	707510 nut	
AI	Use 1-707148B, 1A-707146, 707511 No. 2, 707519, 707803, 1-707122B No. 2, 1-707107 No. 2, 1-707148 1/4, 71361, 74502, 74533, 707303, 707514, 46	
AJ	46 3/4 nut	
	707509 screw	
AK	489	
AL	Use 1-707148B, 1A-707146, 707511 No. 2, 707519, 707803, 1-707122B No. 2, 1-707107 No. 2, 1-707148 1/4, 71361, 74502, 74533, 707303, 707514, 46	
AM	1-707145 No. 2	
AN	47 3/4 nut	
AO	Use 1A-707146, 707519, 707803	
AP	284 Flexible, spring	
✓AQ	1-707148 1/4 includes CK	
AR	701142 1/4	
	709607 screw for top	
AS	72568 screw	
	79362 eccentric	
✓AT	Use 1-707122B No. 2, 707303, 707514	
AU	1-704050 No. 2 for Class 72, Series M 200, and Class 77, Series M 700 without selective column tabulation—includes AV, BH, BJ, CA	
AV	Included in AU	
AW	704215 1/4	
AX	1-704110L No. 4	} Class 72, Series M 200
	1-74110AR No. 1	
	1-704110L No. 3	} Class 77, Series M 700
	1-120AR Fte. 709	
	1-704110L No. 3	} Class 78, Series M 800
	1-74110BR No. 3	
AY	74500	
AZ	702662 screw	
	49 1/4 nut	
BA	1-702102B No. 16	
BB	74808	
BC	1-28345 collar, includes 75618 set screw	
BD	8082A	
BE	704536	
BF	1-704215 includes AW, BG	
BG	7356 1/2	
BH	550 1/4 set screw	
BI	504 Fte. 138	
BJ	1-704182A	
BK	72567	
BL	Included in BM	
BM	Use 1A-701143	} includes BL
	1-707122B No. 2	
	707514	
	707303	
BN	1A-704050 Class 78, Series M 800 and Class 77, Series M 700 with selective column tabulation	
BO	74528 screw	
	72139 spacer	
	49 1/4 nut	
BQ	11-704215 includes AW, BG	
BP	1-72102A No. 3	
BR	702509A	
BS	74808	
BT	20 No. 101	
BU	11-72363 collar, includes BH	
BV	704216R	
BW	71002	
BX	1-704207 No. 2	
BY	79585	
BZ	704543	
CA	Included in AU	
CB	72367 eccentric	
	79565 screw	
CC	704272	
CD	704801	
CE	11A-71129	
CF	74533	
CG	72807 No. 2	
CH	12050	
CI	20 No. 104	
CJ	71361 eccentric	
✓CK	74502 screw	
	Included in AQ	
CL	71546	
CM	707508	
CN	79552	
CO	9153 1/4 screw	
	46 1/4 nut	
CP	99807	
CQ	706514	

✓Parts relating to the improved printing bail and hammer firing link—adopted on,

Class 72 and Series M 200 machines beginning with serial No. B196123; Class 77 and Series M 700 machines beginning with serial No. B135000; Class 78 and Series M 800 machines beginning with serial No. B190246.

FOUR POSITION PRINTING CONTROL NORMALIZING MECHANISM PRINTING SECTION DISABLING MECHANISM SERIES M 200, M 700, M 800 (Plate 6-2)

This construction began with Machine Serial No. M 8113D, M 1732C.



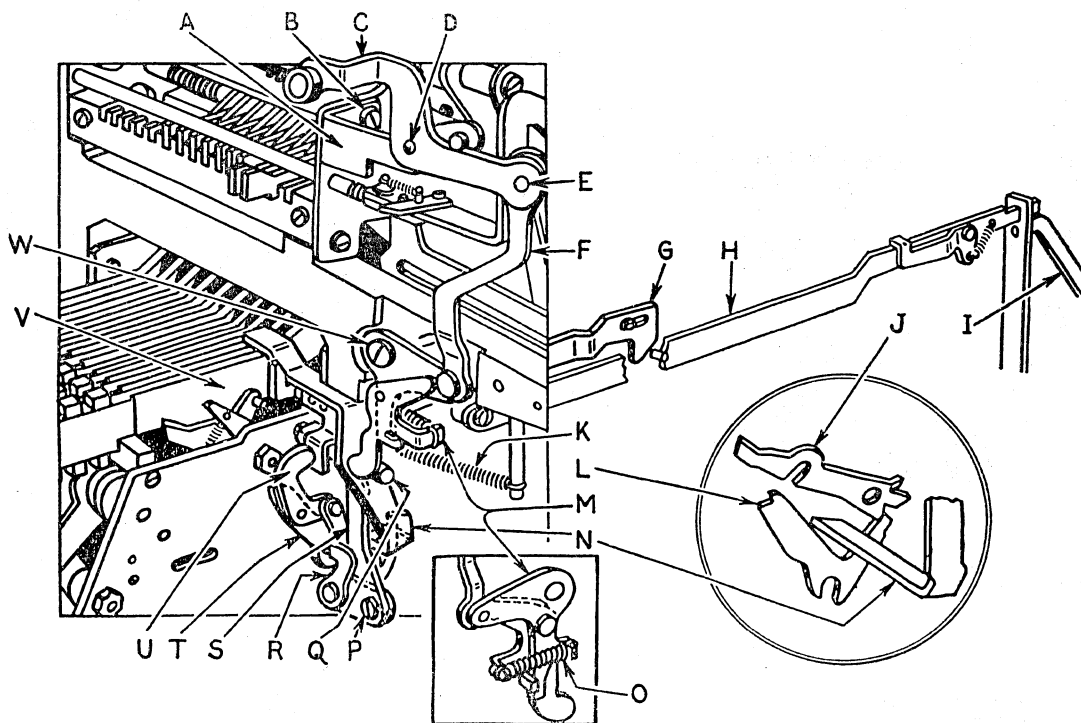
SYMBOLS (Plate 6-2)

A 703125½ No. 1 high 703125½ No. 2 medium } 5th line 703125½ No. 3 low } control B 1Z-707005 Specify Print Control, camshaft, includes W, X, Y, Z, AA, AB, AC, AG, AH C 952¾ D 707147 E 1Z-707148B bail assembly only, in- cludes M, N, O, P, Q, R, T, U, V, AF, AI, AE, AK 2Z-707148B Specify Print Control, complete bail and camshaft assem- bly, includes B, E F 9050¾ G 1-73214C No. 2 H 1-709298A Series M 200, M 800 11-709298A Series M 700 I 1-707143½ J 44808 K 1-707143	L 707303 bushing M 707514 post, 46 nut, 1097¾ washer N 707519 O 71361 P 1-707148¾ Q 73611 R 79362 S 46¾ T 8863 U 1A-707146 V 707509 W 707803 X 1-707301 includes X Y 73563 Z 707144A No. 1 AA 707144 No. 2 AB 707144 No. 3 AC 707144 No. 4 AD 1X15-2 includes spline set screw 403583 AE 99565	AE 707511 No. 2 AF 1-707148B AG 707302 No. 1 spacer .025" thick 707302 No. 2 spacer .040" thick 707302 No. 3 spacer .083" thick 707302 No. 4 spacer .125" thick AH 707005 shaft only, see B for assem- bled shaft AI 1-707145 No. 2 AJ 707511 AK 74533 AL 1-707122B No. 2 11-707122B for extra heavy hammer springs AM 1-77136 without four position print- ing, use 79503 screw 707136½ with four position printing, use 72599 screw AN 79503
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SYMBOLS (Plate 6-2)—Continued

AO	702292 1/4 without four position printing	} Series M 800	AY	47	BM	489
	702292 1/4 No. 2 with four position printing		AZ	71546	BN	71553 screw
	702292 1/4 No. 3 Series M 200		BA	73659		79362 eccentric
AP	1-707152		BB	1-126 Fte. 144	BO	1-707150
AQ	701813	} shaft assembly for hammer driver latches	BC	76806 spring	BP	537 1/2 roll
AR	20 No. 97		BD	76528		709633 screw
AS	1-701142 1/2 No. 2		BE	1-76126A Series M 200	BQ	707517 screw post
AT	72567 screw			11-76126A Series M 700, M 800		46 1/4 nut
AU	709607		BF	705505 1/2	BR	74502 screw
AV	77882		BG	72573		71361 eccentric
AW	1-77111 No. 5		BH	20 No. 86A	BS	707508
AX	1B-707004 No. 1 Series M 800		BI	76812	BT	10086 spring
	1B-707004 No. 6 Series M 800 1/4		BJ	707516	BU	9153 1/4 screw
	1B-707004 No. 7 Series M 800 1/2		BK	71545		46 1/4 nut
	1A-707004 No. 9 Series M 222		BL	Included in shaft assembly, 1D-701004 No. 1 Series M 700	BV	2887 1/2 spring
	1A-707004 No. 10 Series M 200 except M 222, M 234			61B-701004 No. 1 Series M 800 without carriage controlled totals	BW	1-700125A No. 2
	1A-707004 No. 11 Series M 234			71D-701004 No. 1 Series M 800 with carriage controlled totals	BX	75621
				81A-701004 No. 1 Series M 200 except M 222	BY	1-709299 No. 2 four position control arm
				91A-701004 No. 1 Series M 222		52519 screw and 709392 bushing for machines with line 2C control arm
						705505 1/2 screw for machines without line 2C control arm

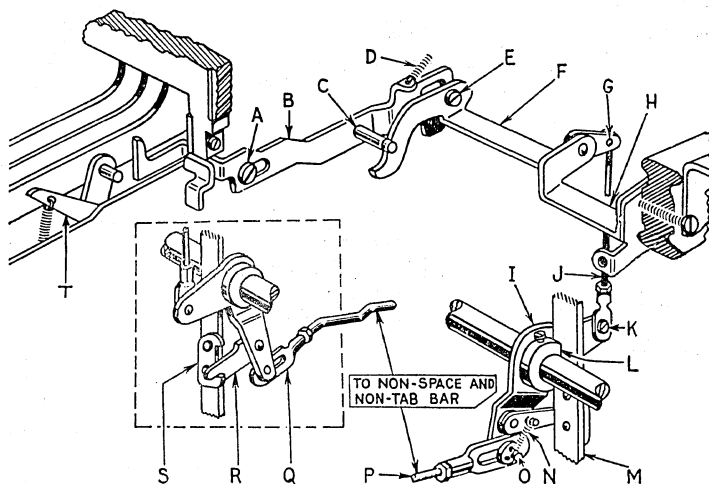
NON-ADD, NON-PRINT MECHANISM, TENS AND UNITS COLUMNS, CARRIAGE CONTROLLED (Plate 7)



SYMBOLS (Plate 7)

A	1-709250 No. 2	H	1-122 Fte. 144 No. 1 cl. 76, 78	N	1-115 Fte. 144 Style 7600 No. 1 narrow base, cl. 74, 76, 78
B	73548	I	1-122 Fte. 144 No. 2 cl. 72		1-115 Fte. 144 Style 7200 No. 1 narrow base, cl. 72, wide base
C	1-104 Fte. 144 No. 2 (1st line control)	J	11-704129 No. 3	O	73805
	1-104 Fte. 144 No. 3 (3rd line control)	K	Hammer driver latch, see Plates 2A, 2B and 2-1	P	72591
	1-104A Fte. 144 No. 4 (4th line control) cl. 77	L	72830	Q	707501*
	1-104 Fte. 144 No. 5 (4th line control)	M	1-77117A No. 1	R	138 Fte. 144 No. 1*
	1-709251A No. 1 1st line control, cl. 77		108A Fte. 144 No. 2* complete assembly 21-108A Fte. 144 No. 2 includes F, O, non-add non-print, cols. 1, 2, 3, all styles except cl. 77	S	139 Fte. 144 No. 1*
	1-709251 No. 1 early 1st line control, cl. 77		Complete assembly 31-108A Fte. 144 No. 3, non-add non-print, cols. 1, 2, 3, cl. 77	T	1-136 Fte. 144* complete assembly
	1-709251A No. 3 (3rd line control) cl. 77			U	2-136 Fte. 144 No. 1, includes R, S, T, U
D	500 Fte. 144			V	137 Fte. 144 No. 1*
E	79333A No. 2 ecc., 73612 screw			W	1-76111 specify no., see chart, plate 3-1
F	107 Fte. 144 No. 5* included in M				8851 3/4
G	1-126 Fte. 144 use 79503 screws				
	1-126 No. 2 Fte. 144 cl. 77				

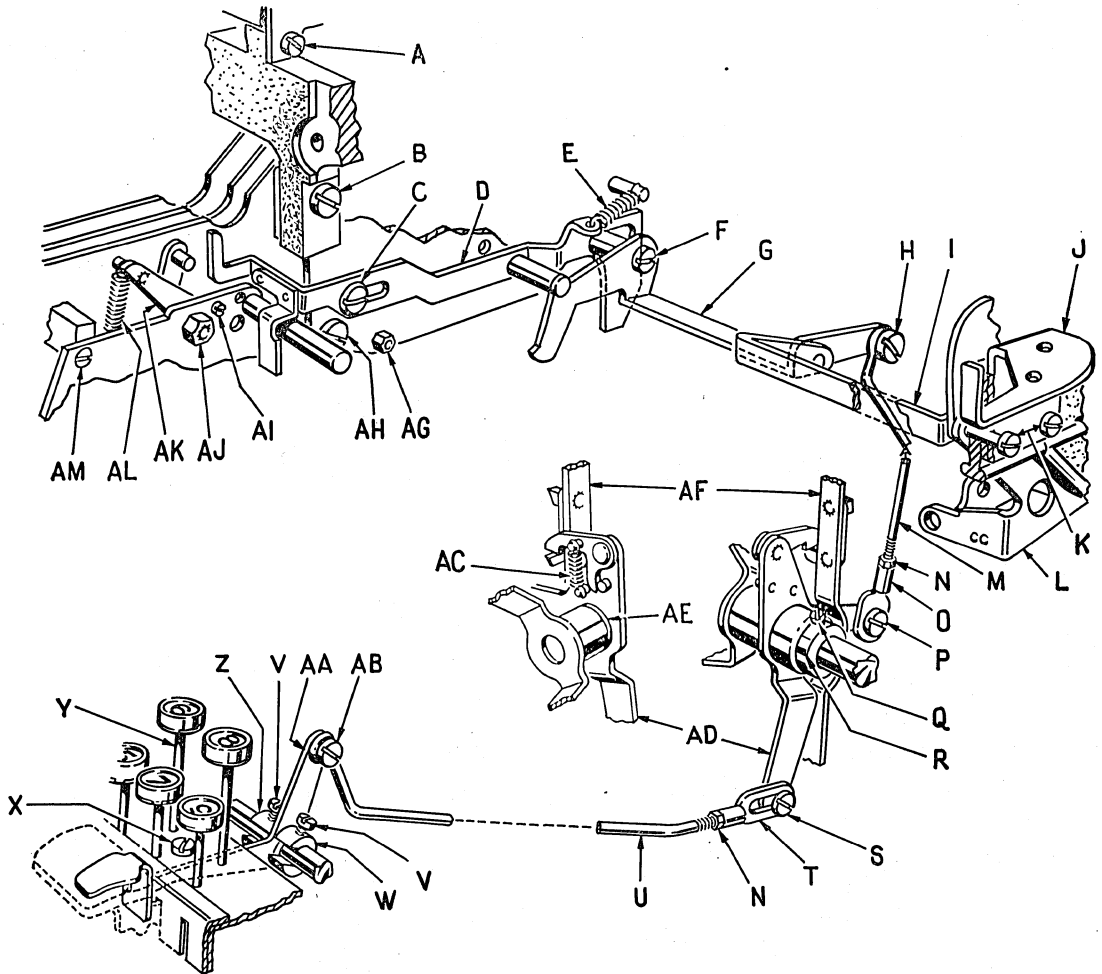
PRINTING CONTROLLED FROM MOTOR BAR (Plate 8)



SYMBOLS (Plate 8)

A	71546	1A-72104 No. 5 with 1, 2 or 3 reg. without ege. return space bar, narrow base
B	1A-131 Ftc. 144	
C	741 1/4 roller, 75 1/4 stud	
D	76806	
E	76577	
	76577 Env. 826 for printing control from motor bar and ege.	
F	76214	
	72614 Env. 826 for printing control from motor bar and ege.	
G	79503	
H	1-76215 narrow base	
	Use 1-706215 1/2 wide base	
I	1-71204 narrow base	
	1-71204 Env. 826 with 1, 2, or 3 registers and carriage return space bar, narrow base	
	Use 1-701204 1/2 wide base, without ege. return space bar	
J	1-76701 includes 72110 No. 3 turn-buckle, 49 3/8 nut	
K	72572 No. 1	
L	1-304 Ftc. 141 includes 71519 screw	
M	1-72104B No. 3 Env. 1749 without ege. return space bar or repeat of items, wide base	
	1-72104 No. 5 Env. 1749 with 1, 2 or 3 reg. with ege. return space bar, narrow base	
	1A-72104 No. 5 with 1, 2 or 3 reg. without ege. return space bar, narrow base	
	1-72104A No. 6 with 4 or more reg., and without ege. return space bar, narrow base	
	1-72104A No. 6 Env. 1749 with ege. return space bar, narrow base	
N	87801A	
O	75622 narrow base	
	79503 wide base	
P	1-703 No. 5 Env. 1749 position No. 106 narrow base, Class 72	
	1-703 No. 3B Env. 822 position No. 103 narrow base, Class 72	
	1-703 No. 4 Env. 1749 position No. 106 wide base, Class 72	
	1-703 No. 6 Env. 1749 position No. 107 narrow base, Class 72	
	1-705A Env. 822 position No. 114, narrow base, Class 78	
	1-705A Env. 1749 position No. 115, narrow base, Class 78	
Q	72110 No. 1 use 702501 1/2 screw	
R	1-71205 use 3251 1/2 rivet	
S	72104 1/4* included in M	
T	1-77111 No. 5	

PRINTING CONTROLLED FROM MOTOR BAR—WIDE BASE—CLASS 72 (Plate 8-1)



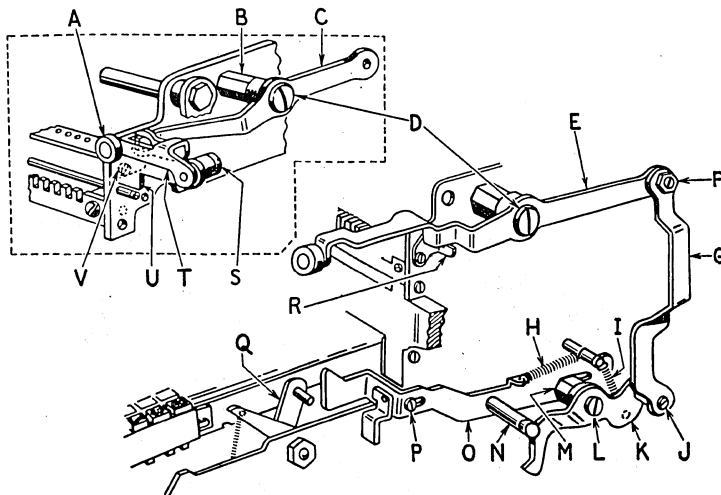
SYMBOLS (Plate 8-1)

A	79610	T	72110 No. 1
B	76555	U	1-702751 without constant factor
C	79503		1-704 Ftc. 149 with constant factor
D	1A-131 Ftc. 144		
E	76806	V	74502
F	76577	W	1-702301½ No. 1 includes V
G	76214	X	71567
H	72572 No. 1	Y	72521 No. 1 for 1-3-5-7-9 } multiplying 72521 No. 2 for 2-4-6-8 } keys 72521 No. 3 for 1-3-5-7-9 } adding 72521 No. 4 for 2-4-6-8 } keys
I	1-706215½	Z	1-702301½ No. 2 includes V
J	709118A No. 3 use for 5x12, Class 72 with fraction non-add, non-print	AA	702119 No. 2 black 702119A No. 2 brown
	709118A No. 4 use for 4x15, Class 72 and ½ fractions	AB	72501½
	709118A No. 5 use for 8x7, Class 72	AC	87801A
	709118A No. 9 use for 7x8, 5x12, Class 72	AD	1-701204½
	709118 No. 10 use for 6x10, Class 72	AE	69330 No. 2 space collar
	709118 No. 11 use for 10x6, Class 72	AF	11-72104C No. 3
K	4450¾A use 46 nut	AG	46
L	1-705127	AH	73659
M	1-706701 includes N, O	AI	707009
N	49¾	AJ	47
O	72110 No. 3	AK	1-77111 No. 5
P	75638	AL	77882
Q	550¾ set screw	AM	77515
R	1-304 Ftc. 141 includes Q		
S	75638		

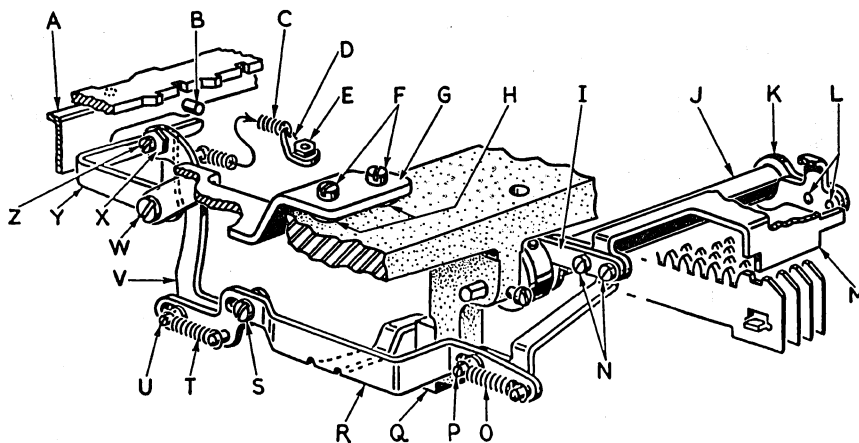
NON-PRINT, CARRIAGE CONTROLLED (Plate 9)

SYMBOLS (Plate 9)

A	709334 roller, 709548 stud
B	504A Fte. 144
C	1-100 No. 2 Env. 729
D	8054 $\frac{3}{4}$
E	1-133 Fte. 144 No. 2 (3rd line control)
F	1-133 Fte. 144 No. 3 (4th line control)
G	72307 ecc., 73612 screw
H	130A Fte. 144 all classes except cl. 78
I	130 Fte. 144 No. 2 cl. 78
J	76806
K	71807
L	79503
M	1-132B Fte. 144
N	8054 $\frac{3}{4}$
O	503 Fte. 144
P	741 $\frac{1}{4}$ roller, 754 $\frac{1}{4}$ stud
Q	1A-131 Fte. 144 includes N
R	71546
S	1-77111 No. 4*
T	151 Fte. 144 No. 2
U	500 Fte. 144
V	1-102 Env. 729 single line control
W	1-709250
X	73548



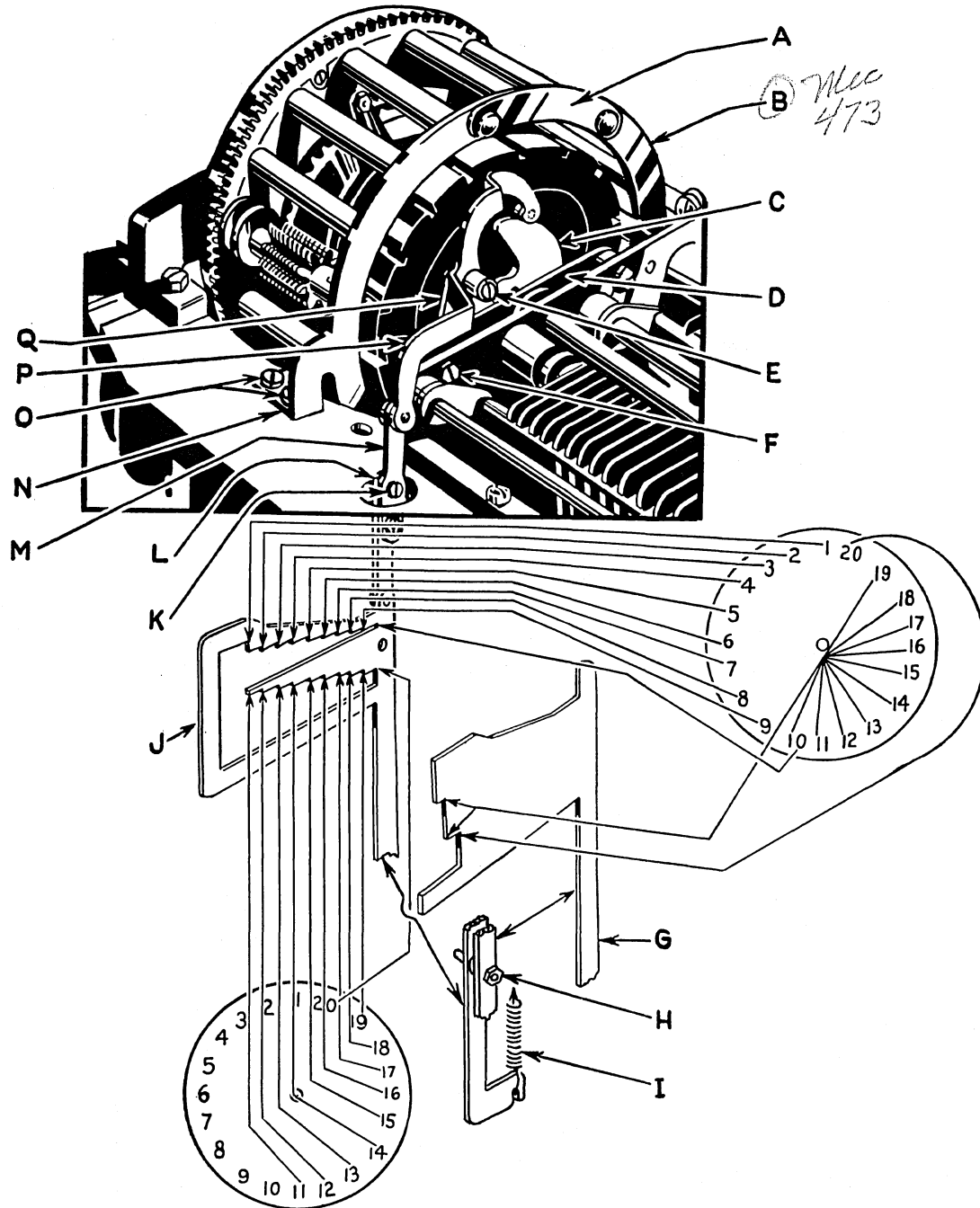
NON-PRINT LEFT SIDE OF REGISTER TOTAL IN CONJUNCTION WITH MULTIPLIER FACTOR TO PRINT—CLASS 72 (Plate 9-1)



SYMBOLS (Plate 9-1)

A	21A-709130A No. 9 for 6 x 10, 5 x 10, 4 x 10	709292 No. 10 blocks rack bars 11 thru 15
B	21A-709130A No. 10 for 7 x 8	709292 No. 11 blocks rack bars 12 thru 15
C	21A-709130A No. 11 for 8 x 7	709292 No. 12 blocks rack bars 14 and 15
D	72611* included in A	N 73563
E	986	O 489
F	20 No. 116	P 706508 spring anchor screw
G	46 $\frac{1}{4}$	Q 1-706919A No. 2 comb
H	73611 used without washer H	R 1-706232 includes S, U, V
I	72567 use with washer II	S 79503
J	706234	T 7480B
K	301 Env. 374C washer, use 72567 screw	U 72509 $\frac{1}{2}$ spring anchor screw
L	709293R	V 1-706233
M	709001 No. 2*	W 706512
N	709293L	X 75342 eccentric
O	73563 screw	Y 1-706231A
P	709292 No. 7 blocks rack bars 8 thru 15	Z 350 $\frac{1}{4}$
Q	709292 No. 8 blocks rack bars 9 thru 15	
R	709292 No. 9 blocks rack bars 10 thru 15	

REGISTER DESIGNATION INDEXING MECHANISM, STYLE NO. 1, TWO COLUMN (Plate 10)



- A 1-709139 No. 1 (1-709137 No. 2, 1-709138 No. 2, 1-709139 No. 3) included in B, use 12050 1/4 rivet
- B 1-709137 (1-709137 No. 2, 1-709138 No. 2, 1-709139 No. 3)
- C 1-709143A No. 1
- D 1-709144A
- 1-709144 No. 2 sel. skip tab., cl. 75, 77

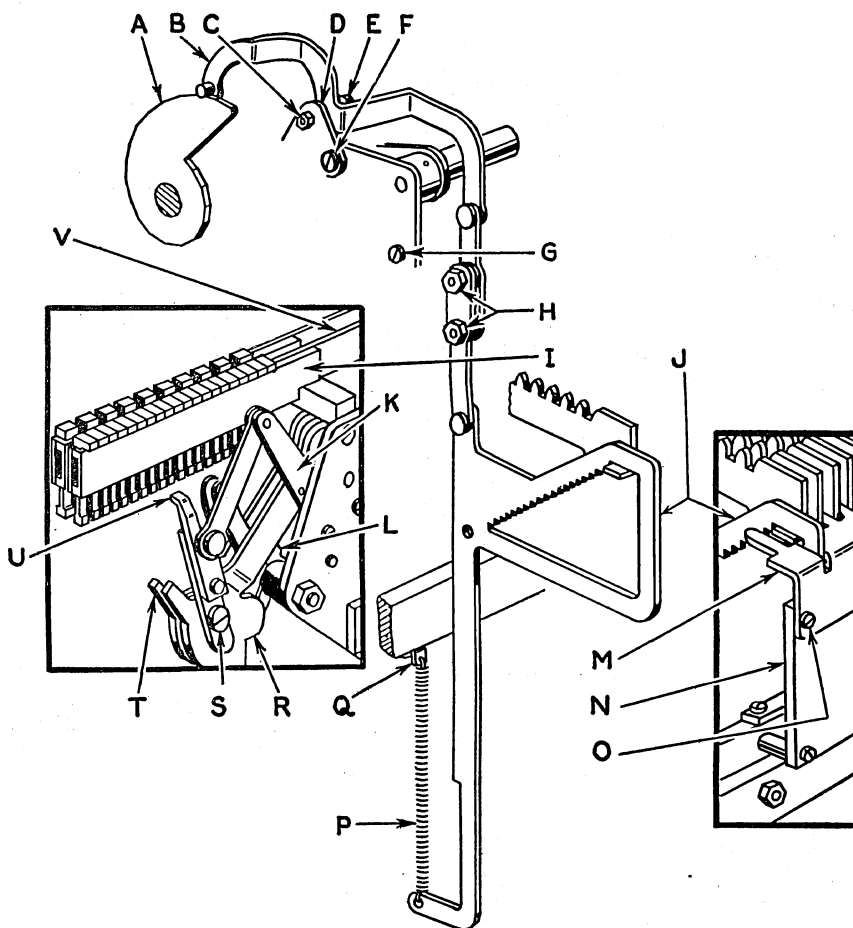
SYMBOLS (Plate 10)

- E 709621 screw, 46 nut
- F 76567
- G 704151 No. 2
- H 46 1/4 nut, 704505A screw
- I 76811
- J 1-704151 No. 1

- K 74587 screw, 75210 washer, 49 1/4 nut
- L 704169A* included in J
- M 709158* included in P
- N 1-709138 (1-709137 No. 2, 1-709138 No. 2, 1-709139 No. 3)
- O 73611
- P 1-709155
- Q 709156 use 12051 1/4 screw, 46 nut

SEE EXPLANATION ON INSIDE OF FRONT COVER

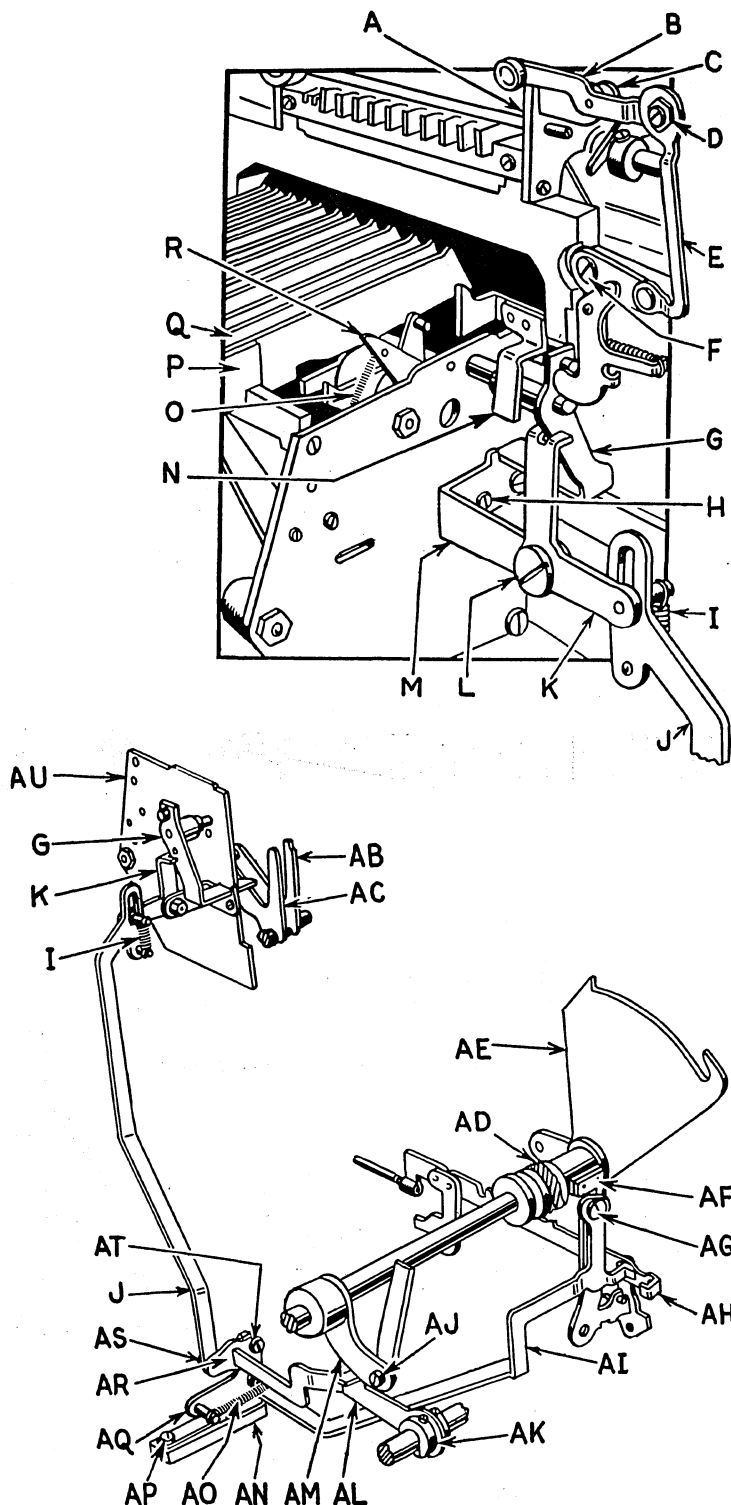
REGISTER DESIGNATION INDEXING MECHANISM, STYLE NO. 2, SINGLE COLUMN (Plate 11)



SYMBOLS (Plate 11)

A	11-709143A No. 1	M	704100A No. 2 (704100 No. 2)
B	1-709155	N	704139
C	46	O	74533
D	709156	P	76811
E	709621	Q	704168 anchor, 79543 screw
F	1651 1/4 (12051 1/8) screw, 46 nut	R	1-707115 No. 1
G	79544	S	77529
H	49 1/4 nuts, 74587 screws, 75210 washers	T	1-707115 No. 2 single bar reg. des. only
I	706211, 706800 spring on inside	U	1-77218 specify symbol, see plate 1 for other styles
J	1-704151 No. 3	V	1-706111A No. 16 single bar reg. des.
K	77124		
L	77116 No. 2		

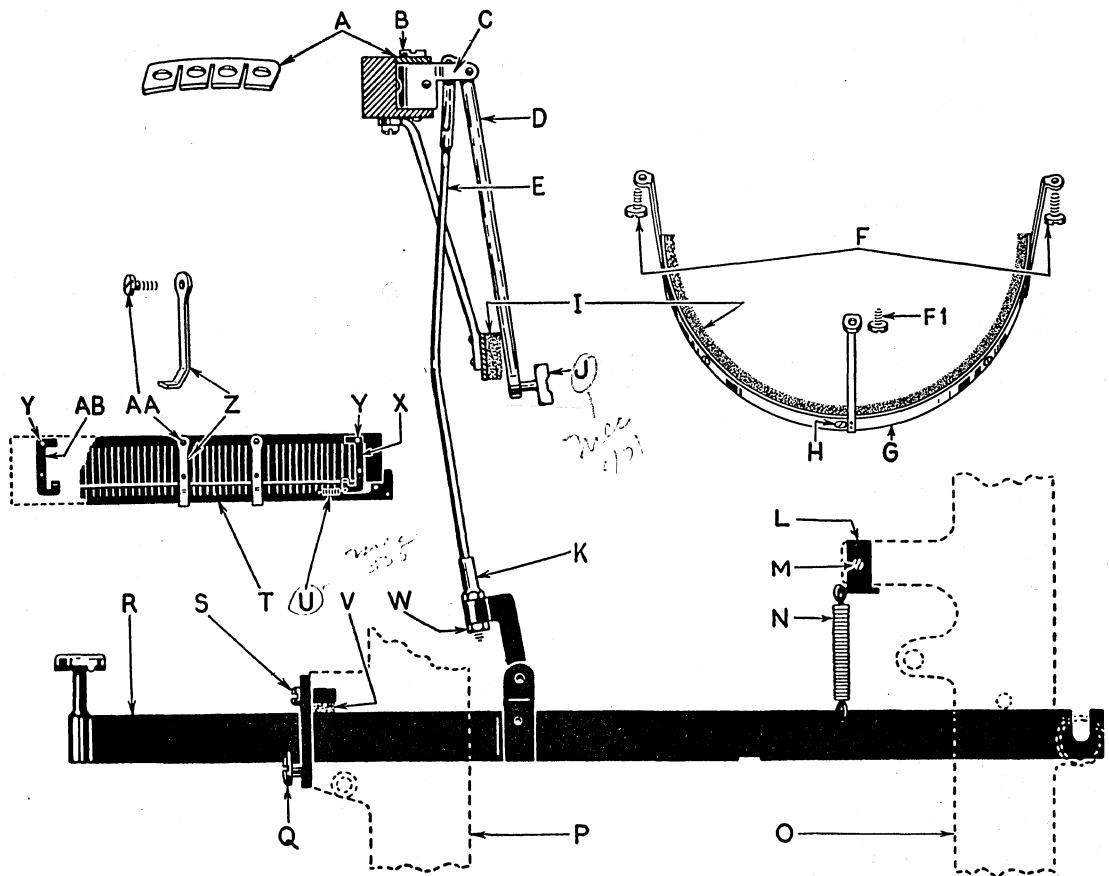
PRINTING CONTROL FOR REGISTER DESIGNATION INDEXING MECHANISM (Plate 12)



SYMBOLS (Plate 12)

- A 1-709250 use 73548 screw
- B 1-709251A No. 1 } 1st line control
- 1-709251 No. 1 early } control
- 1-709251A No. 3, 3rd line control
- 1-104A Fte. 144 No. 4, 4th line control
- C 500 Fte. 144 screw
- D 79333A No. 2 ecc., 73612 screw
- E 1-909252A } includes 681
- 1-709252 early } spring
- F 8851 3/8
- G 1-115 Fte. 144 Style 7200 No. 2 with two bar reg. des.
- 1-115 Fte. 144 Style 7600 No. 2 with single bar reg. des.
- H 73548
- I 3486 1/2
- J 1-707135A includes K
- K 707136* included in J
- L 7559 1/2 screw, 46 1/4 nut
- M 707138
- N 1-126 No. 2 Fte. 144
- O 77882
- P 11-706111A No. 15 used in 1st col. with two bar reg. des.
- 1-706111A No. 16 single bar reg. des.
- Q 41A-706111 No. 2 used in 2nd col. with two bar reg. des.
- R 1-77111 No. 5
- AB 11-77117A No. 1
- AC 1-707117A No. 1
- AD 31A-71129 includes AE
- AE 1A-71130 No. 2* included in AD
- AF 1-702251 see keyboard book, plate 6 for other styles
- AG 70507 screw, 49 1/2 nut
- AH 11-702170 complete assembled reg. total linkage
- AI 1-702252 No. 1 includes AR
- 1-1137 Fte. 717 reg. des. not to print when on block, cl. 77
- AJ 76539
- AK 1-701309 includes 550 3/4 screw
- 1-71328 collar on other side includes 950 3/4 screw
- AL 701160
- AM 1-71123*
- AN 702902B No. 2
- 702902A No. 2 early
- AO 81806
- AP 72614
- AQ 1-702230 No. 2 shown
- 1-702230 No. 3 later
- AR 702253 No. 1 use 702541 stud
- AS 72576 No. 1 screw
- AT 7559 1/2 screw, 629 washer, 46 nut
- AU 21-707110R No. 1

KEY LEVER AND TYPE BAR ASSEMBLY (Plate 14) (Plate 13 in Instruction Book only)



SYMBOLS (Plate 14)

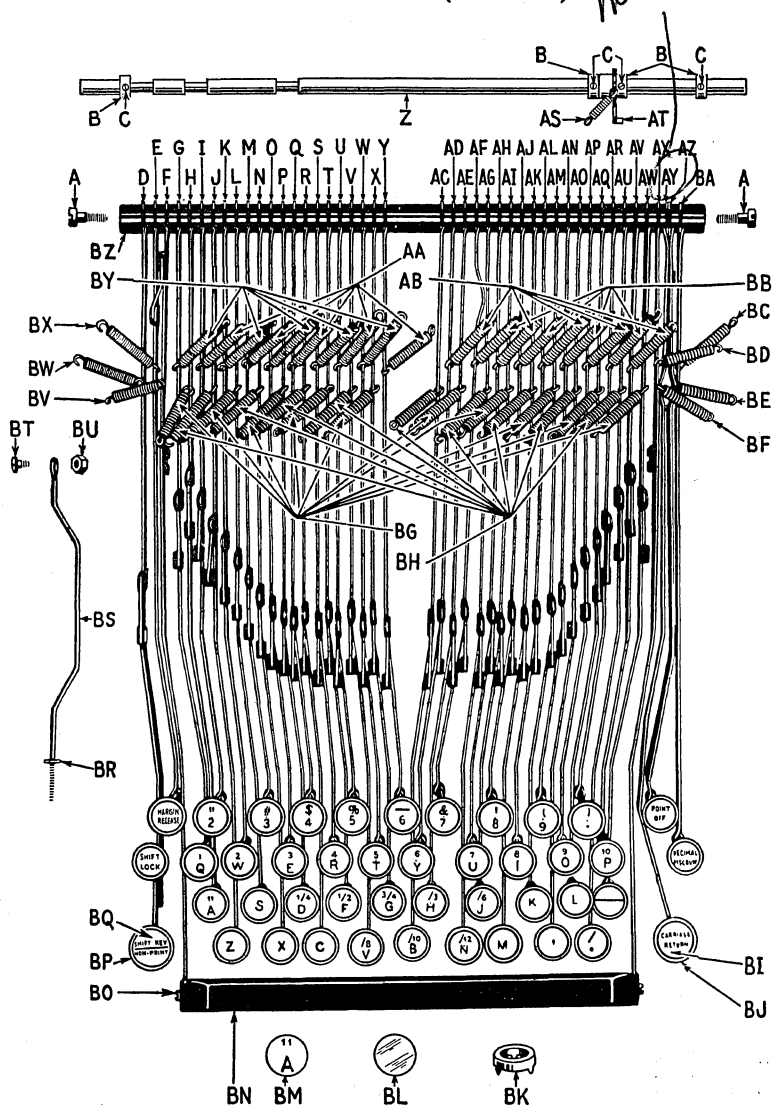
- | | | |
|---|---|--|
| <p>A 75181 No. 1 four holes
75181 No. 2 three holes
B 75603 No. 1 round head
75603 No. 2 hex. head
C 75179* included in D
D 1-75111 No. 1 for Z/. " —
1-75111 No. 2 for P
1-75111 No. 3 for W) O ± ' —
1-75111 No. 4 for S J L &
1-75111 No. 5 for 4, 5, 6, 7, 8, 9
1-75111 No. 6 for D F G H J K M
1-75111 No. 7 for 3 E R T Y U I
1-75111 No. 8 for C V B N X
1-75111 No. 9 for 2
1-75111 No. 10 for A
1-75111 No. 11 for Q
E 1-75705 No. 1 for C J K L M X D
1-75705 No. 2 for E R 3 4 I O 9 -
1-75705 No. 3 for A S Z T Y U 5 6
7 8 / . —
11-75705 No. 3 for cal. bar
21-75705 No. 3 used in position No. 39
or No. 39A
1-75705 No. 4 for B F G H V N
1-75705 No. 8 for P Q W 2
F 75602
F1 950%
G 1-75201 (1A-75201, 1-75180A, 74523,
1-75180 1/2, 2854 1/2) includes H, I
H 75600
I 75951 (75951A, 74523, 1-75180A, 1-
75180 1/2, 2854 1/2) leather</p> | <p>J 75118 No. 1 type, specify number,
char., and description
K 75449
L 1-75901B
1A-75901A early
1-705901A No. 2
M 10751 1/4
N 75804 No. 1 see plate 15 for other
numbers
O For typewriter legs on left rear, see
plate 18
75666AR No. 2 (75666R No. 5) black,
for wide and narrow base style 12,
15, 18 cges.
75666R No. 5 black, for wide and nar-
row base style 22, 30 cges.
75666AR No. 5 gray, for wide base
style 12, 15, 18, 22, 30 cges.
705666AR No. 7 black } sel. skip
705666BR No. 7 gray } tab.
666R Fte. 133 No. 3 } with twin
(705666AR No. 7) } mirror and
black } light, sel.
705666BR No. 7 gray } skip tab.
P For typewriter legs on left front, see
plate 18
75666AR No. 1 black, for style 12, 15,
18 cges.
75666AR No. 4 (75666AR No. 1)
black, for styles 22, 30 cges.</p> | <p>705666AR No. 5 black } for Style 12,
705666BR No. 5 gray } 15, 18 cges.
705666AR No. 6
(705666AR No. 5) } for style
black } 22, 30 cges.
705666BR No. 5 gray }
666AR Fte. 133 No. 1 (75666AR No.
1) black, for style 12, 15, 18 cges.,
with mirror and light, all classes
except Cl. 75, 77
666AR Fte. 133 No. 2 (75666AR No.
1) black, for style 22, 30 cges., with
mirror and light, all classes except
Cl. 75, 77
Q 75633
R 1-75110 No. 1 see plate 15 for other
styles
S 74523
T 1-75214A see keyboard book, plate 20
for other styles
U 681 all classes except Class 78
81806 Class 78 — 71100 355
1-75902A black
1-705902 No. 2 black
1A-705902 No. 2 gray
W 49 1/4
X 75129L
Y 79543 screws
Z 75130 (705130 1/4)
AA 75608 screw</p> |
|---|---|--|

TYPEWRITER KEY LEVERS ASSEMBLY (Plate 15)

NEW 544

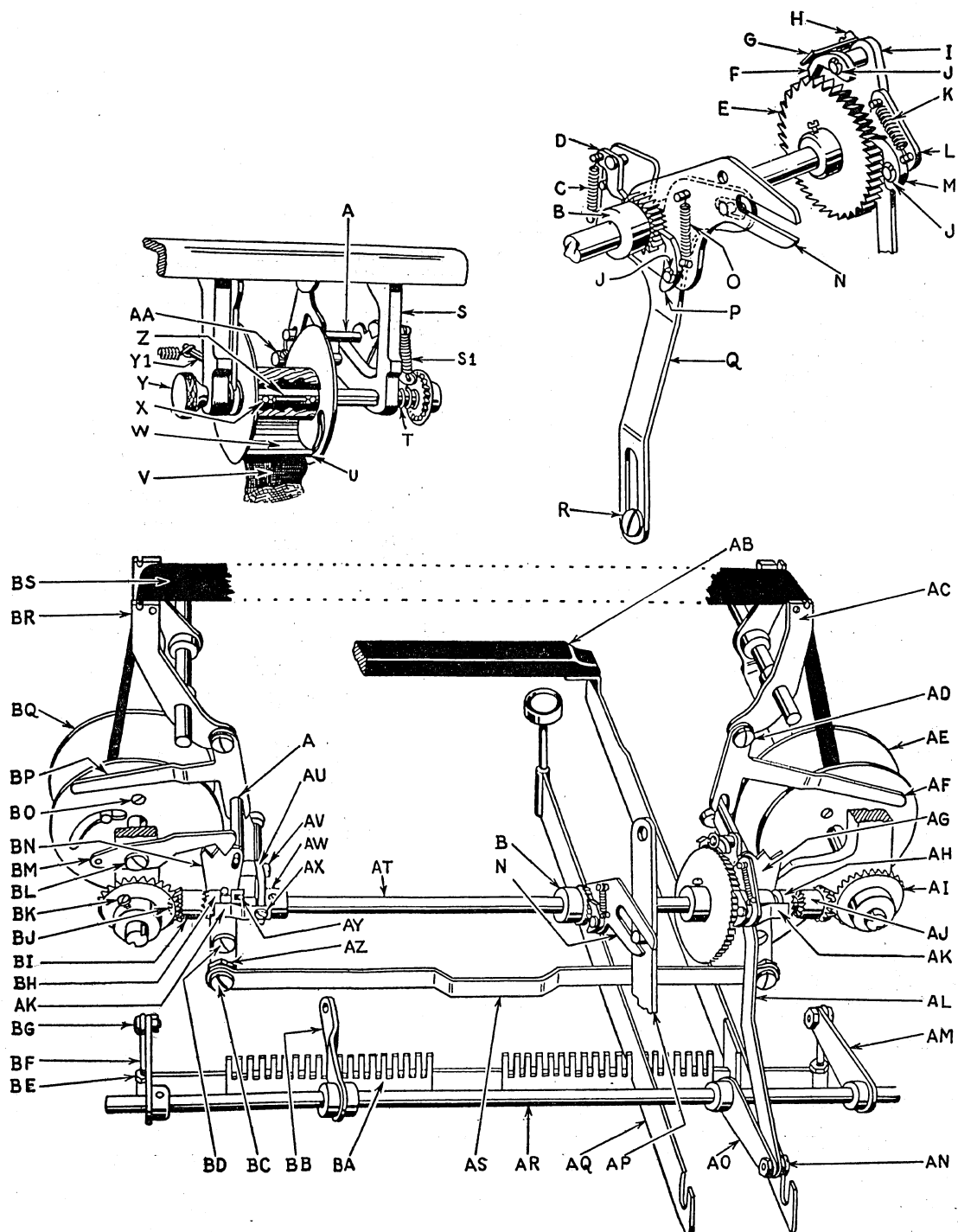
SYMBOLS (Plate 15)

- A 71554
- B 1-71321 includes C
- C 75660
- D 1-75110A No. 13 black } shift key
- E 1B-75110A No. 13 gray } margin
- F 1-75110 No. 15 black } release
- G 1-705110 No. 3 black } space bar
- H 1B-705110 No. 3 gray } 1B-705110 No. 18 black
- I 1-705110 No. 18 gray } 1-705110 No. 8 (Q) black
- J 1-75110 No. 7 (A) black } 1B-705110 No. 8 (Q) gray
- K 1B-75110 No. 7 (A) gray } 1-75110 No. 7 (A) black
- L 1-75110 No. 1 (2) black } 1B-75110 No. 7 (A) gray
- M 1B-75110 No. 1 (2) gray } 1-75110 No. 1 (2) black
- N 1-75110 No. 10 (Z) black } 1B-75110 No. 10 (Z) gray
- O 1B-75110 No. 10 (Z) gray } 1-75110 No. 5 (W) black
- P 1-75110 No. 5 (W) gray } 1B-75110 No. 5 (W) gray
- Q 1-75110 No. 7 (S) black } 1-75110 No. 7 (S) gray
- R 1B-75110 No. 7 (S) gray } 1-75110 No. 1 (3) black
- S 1-75110 No. 1 (3) gray } 1B-75110 No. 1 (3) gray
- T 1-75110 No. 10 (X) black } 1-75110 No. 10 (X) gray
- U 1B-75110 No. 10 (X) gray } 1-75110 No. 5 (E) black
- V 1-75110 No. 5 (E) gray } 1B-75110 No. 5 (E) gray
- W 1-75110 No. 7 (D) black } 1-75110 No. 7 (D) gray
- X 1B-75110 No. 7 (D) gray } 1-75110 No. 1 (4) black
- Y 1-75110 No. 1 (4) gray } 1B-75110 No. 1 (4) gray
- Z 1-75110 No. 10 (C) black } 1-75110 No. 10 (C) gray
- AA 1B-75110 No. 5 (R) black } 1-75110 No. 5 (R) gray
- AB 1B-75110 No. 5 (R) gray } 1-75110 No. 7 (F) black
- AC 1-75110 No. 7 (F) gray } 1B-75110 No. 7 (F) gray
- AD 1-75110 No. 1 (5) black } 1-75110 No. 1 (5) gray
- AE 1B-75110 No. 1 (5) gray } 1-75110 No. 10 (V) black
- AF 1-75110 No. 10 (V) black } 1B-75110 No. 10 (V) gray
- AG 1B-75110 No. 10 (V) gray } 1-75110 No. 5 (T) black
- AH 1-75110 No. 5 (T) black } 1B-75110 No. 5 (T) gray
- AI 1B-75110 No. 5 (T) gray } 1-75110 No. 7 (G) black
- AJ 1-75110 No. 7 (G) black } 1B-75110 No. 7 (G) gray
- AK 1B-75110 No. 7 (G) gray } 1-75110 No. 2 (6) black
- AL 1-75110 No. 2 (6) black } 1B-75110 No. 2 (6) gray
- AM 75030
- AN 705015
- AO 75804 No. 1
- AP 75804 No. 2
- AQ 1-75110 No. 11 (B) black
- AR 1B-75110 No. 11 (B) gray
- AS 1-75110 No. 6 (Y) black
- AT 1B-75110 No. 6 (Y) gray
- AU 1-75110 No. 9 (H) black
- AV 1B-75110 No. 9 (H) gray
- AW 1-75110 No. 4 (7) black
- AX 1B-75110 No. 4 (7) gray
- AY 1-75110 No. 11 (N) black
- AZ 1B-75110 No. 11 (N) gray
- BA 1-75110 No. 6 (U) black
- BB 1B-75110 No. 6 (U) gray
- BC 1-75110 No. 9 (J) black
- BD 1B-75110 No. 9 (J) gray
- BE 1-75110 No. 3 (8) black
- BF 1B-75110 No. 3 (8) gray
- BG 1-75110 No. 11 (M) black
- BH 1B-75110 No. 11 (M) gray
- BI 1-75110 No. 6 (I) black
- BJ 1B-75110 No. 6 (I) gray
- BK 1-75110 No. 9 (K) black
- BL 1B-75110 No. 9 (K) gray
- BM 1-75110 No. 3 (9) black
- BN 1B-75110 No. 3 (9) gray
- BO 1-75110 No. 11 (,) black
- BP 1B-75110 No. 11 (,) gray
- BQ 1-75110 No. 6 (O) black
- BR 1B-75110 No. 6 (O) gray
- BS 1-75110 No. 9 (L) black
- BT 1B-75110 No. 9 (L) gray
- BU 1-75110 No. 3 (Q) black
- BV 1B-75110 No. 3 (Q) gray
- BW 75830
- BX 1-75103 No. 1 has offset
- BY 1-75103 No. 2 shown
- BZ 1-705247
- CA 1-75110 No. 11 (/.) black
- CB 1B-75110 No. 11 (/.) gray
- CC 1-75110 No. 6 (P) black
- CD 1B-75110 No. 6 (P) gray
- CE 1-75110 No. 8 (—)



- AX 1-75110 No. 18R } (11-75110 No. 18R) } space
- AY 1-75110 No. 14 black } 11B-75110 No. 18R } bar
- AZ 1-75110 No. 16 black } 1-75110 No. 14 gray } sel. skip
- BA 1-75110 No. 17 black } 1A-705110 No. 2 black } tab. 39
- BB 75804 No. 1 } cl. 77 } ege.
- BC 75804 No. 2 } No. 12 } return
- BD 75804 No. 1 } black } keyboard
- BE 75804 No. 1 } No. 12 } construction
- BF 75804 No. 3 } black, } cl. 77
- BG 75804 No. 3 } early } point off
- BH 75804 No. 3 } } dec. disc.
- BI 72992 No. 2 glass, 92 No. 2 keypaper, } specify char. and color
- BJ 72200A No. 2 ring
- BK 72200A No. 1 ring
- BL 72992 No. 1 glass
- BM 92 No. 1 keypaper, specify char. and color
- BN 1-75225 black
- BO 79543 screw, 49 nut
- BP 72200A No. 2 ring
- BQ 72992 No. 2 glass, 92 No. 2 keypaper, } specify char. and color
- BR 49 1/2
- BS 1-75700 No. 2
- BT 72572 No. 1
- BU 49 1/2
- BV 75804 No. 1
- BW 75804 No. 3
- BX 75804 No. 1
- BY 75804 No. 2
- BZ 75000A No. 1
- CA 75000A No. 3 for 39A keyboard construction, Cl. 72
- CB 705000 (705000 No. 2)

RIBBON FEED AND REVERSE MECHANISM (Plate 16)

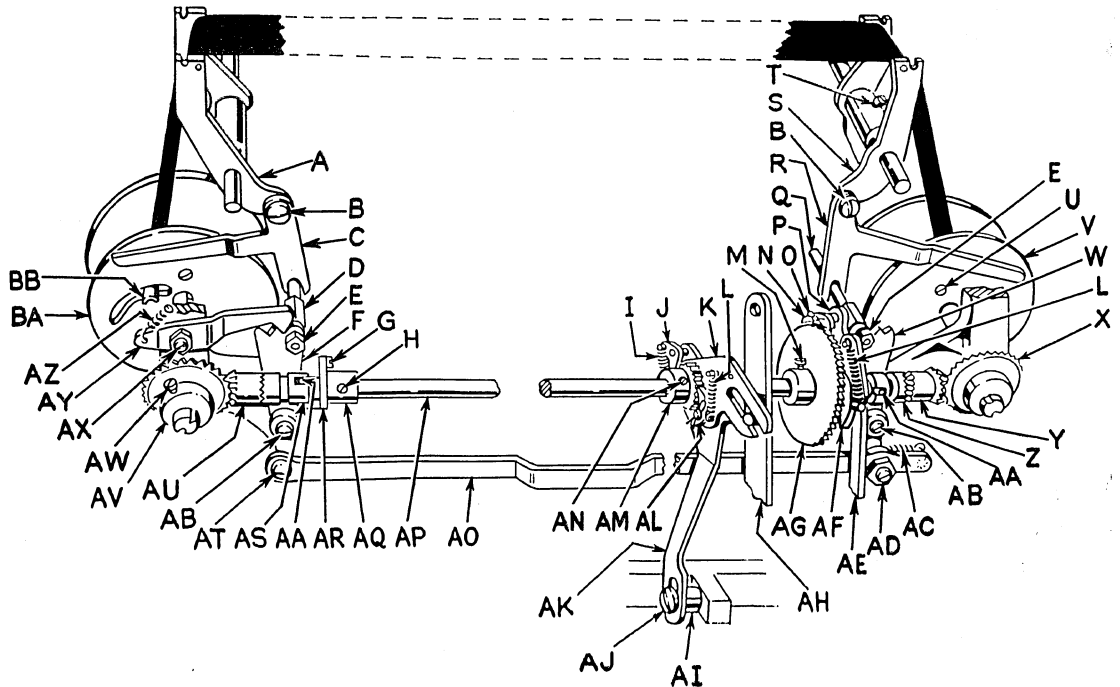


Symbols on back

SYMBOLS (Plate 16)

A	75208	AK	75280 use 75620 screw
B	1-75351 includes 72573 screw, use 1-28345 collar on other side	AL	75215* complete assembly 1-75199 no. 1, narrow base
C	3286½		Complete assembly 1-705215, wide base
D	1-705114A No. 3* included in Q	AM	1-75189* included in AR
E	1-75198 use 75621 screw	AN	75591 screw, 49 nut
F	75114 No. 2	AO	1-75189* included in AR
G	75281	AP	1-77122 No. 2 narrow base
H	75620		1-77122 No. 3 wide base
I	1-75213 No. 2 use 79543 screws	AQ	1-75110 specify no., see plate 15
J	277 wire ring	AR	21B-75014 } includes
K	75815		1B-75014 early } AM, AO, BB
L	1-75199 No. 1 includes AL		1B-705014 without skip tab, cl. 77
M	1-75114 No. 1		11-705014 with skip tab, cl. 77
N	1-75199 No. 2		31A-705014 cl. 72, 78
	1-705199A No. 2	AS	75209
	(11-705199A No. 2) }	AT	75007 complete assembled shaft 1-75007 includes B thru Q, AH, AJ, AK, AU, AV, AW, AX, AY, BH, BI, BJ
O	75815		Complete assembled shaft 1A-705007
P	1-75114 No. 1	AU	75213 No. 1
Q	1A-705123 includes D	AV	79543
R	705518 use 705355 collar	AW	1-74322 includes 75618 screw
S	1-75667AR early style shown, complete assembled bracket, includes A, S thru AA, AI, BD, BK, BL, BM, BN, BO, BP, BQ, BR, see plate 17 for later style	AX	75620
	1-75667AL used on left	AY	75585 pin
SI	75814	AZ	75345 ecc., 75346 bushing
T	75806 use 75257 washers	BA	1-75187 } includes
U	75016* (75162AR and 75162AL)		1-705187 } BE, BF
V	75992* (75162AR and 75162AL)	BB	1-75190* included in AR
W	1-75162 (75162AR and 75162AL)	BC	71517
	11-75162 (75162AR and 75162AL)	BD	73608 (72656) use 75210 washer
X	4499 ball bearings	BE	49½
Y	1-75002	BF	75700 No. 1
Y1	71507 spring } use 75810 spring screw	BG	75631 screw, 49 nut
Z	75559	BH	75324R
AA	1-75336 collar, includes 79506 screw	BI	75326R
AB	1-75225 black } use 79543 screw,	BJ	70512 screw
	1-75225A gray } 49 nut	BK	75618
	1-75225Z black, use 252½ screws	BL	75648
AC	1-75116L No. 2*	BM	75212
AD	73608 (72656)	BN	1-75113R
AE	12-75996 black (12A-75996A gray)	BO	75601 (2A-75996A, 12A-75996A, 22-75996A or 32-75996A)
AF	75115L black	BP	75115R black
	75115AL gray		75115AR gray
AG	1-75113L use 72656 screw	BQ	2-75996 black (2A-75996A gray)
AH	75324L	BR	1-75116R No. 1*
AI	1-75325 use 75618 screw	BS	Ribbon, see business machine supplies and service agreement price list
AJ	75326L		

RIBBON REVERSE MECHANISM—IMPROVED (Plate 16-1)



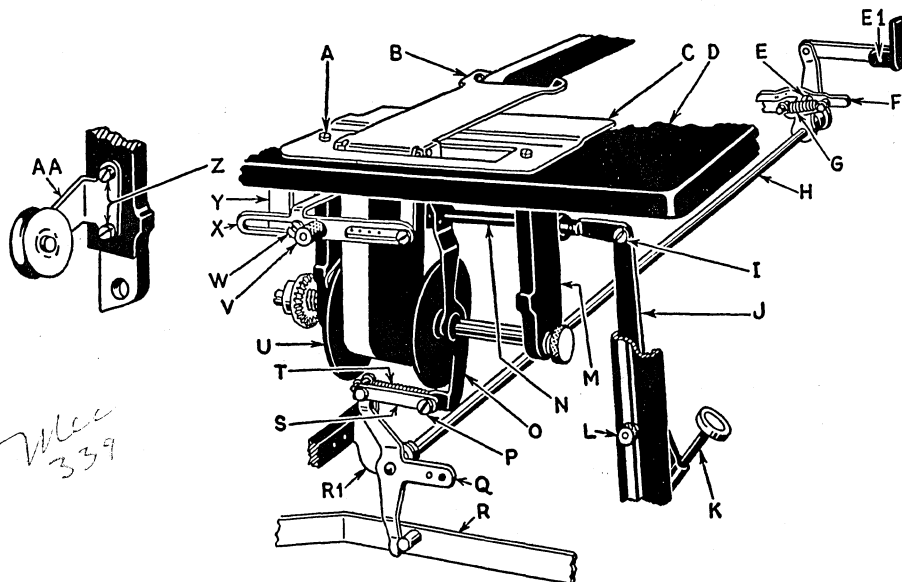
SYMBOLS (Plate 16-1)

NOTE: This improved mechanism is contained in all styles of Series M machines beginning with Serial No. B 12825.

A 1A-75116AR No. 1
 B 72656
 C 75115R No. 2
 D 705629
 E 49½ nut
 F 1-75113AR
 G 79543
 H 75618
 I 3286½
 J Included in AK
 K 11-705199A No. 2
 L 75615
 M 75621
 N 75114 No. 2
 O 21 No. 17 clip
 P 1-75213A No. 2 includes N, O
 Q 705629
 R 75115L No. 2
 S 1A-75116AL No. 1
 T 550¾
 U 75601A
 V 32-75996A includes U, BB
 W 1-75113AL
 X 1-75325 includes 73502½ set screw
 Y 75326L use 70512 screw
 Z 75324L
 AA 75585 pin

AB 74579 screw
 AC 705811
 AD 72567 screw
 AE 75342 eccentric
 AF 1-705215
 AG 1-75114 No. 1 use 21 No. 17 clip
 AH 1-75198 includes M
 AI 1-77122 No. 3
 AJ 705355
 AK 705518
 AL 1A-705123 includes J
 AM 1-75114 No. 1 use 21 No. 17 clip
 AN 1-75351 includes AN
 AO 705597
 AP 1-75209A
 AQ 11A-705007 complete ribbon feed shaft assembly
 AR 1-74322 includes H
 AS 75213A No. 1
 AT 75324R
 AU 705511½
 AV 75326R use 70512 screw
 AW 1-75325 includes AW
 AX 73502½
 AY 79543 screw
 AZ 705367 eccentric
 BA 75212A
 BB 705811
 BB 22-75996A includes U, BB
 BB 75162AR
 BB 75162AL

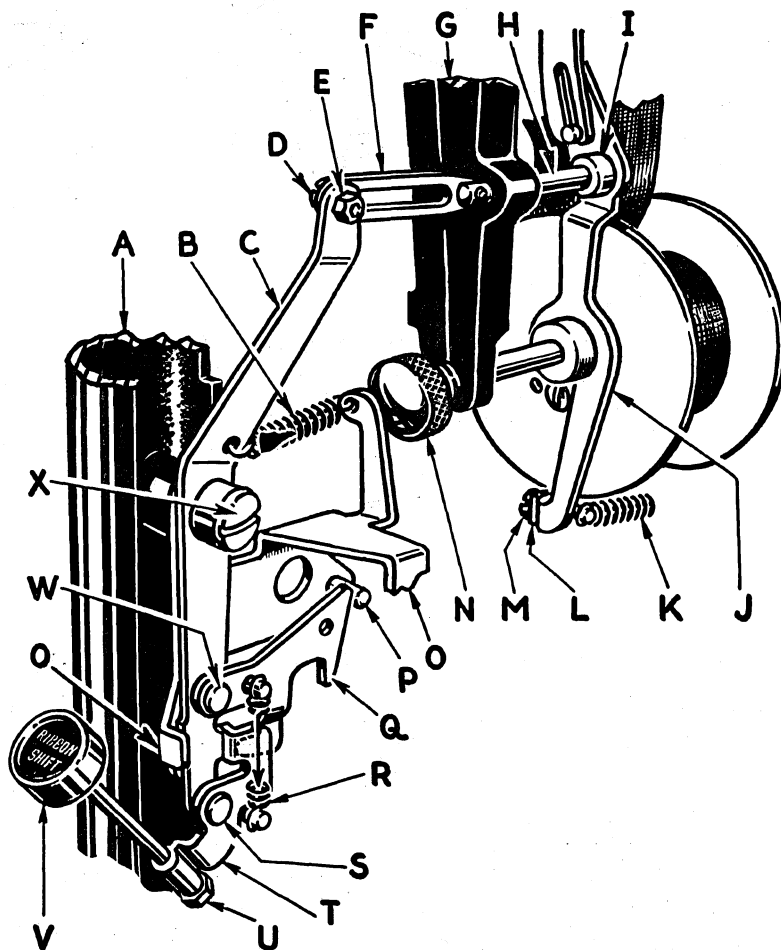
RIBBON SHIFT MECHANISM, LATER (Plate 17)



SYMBOLS (Plate 17)

A	70512	N	1A-75001 No. 2 (1B-75001 No. 2, 1A-75116AL No. 1, 550%)	use
B	1-75157A		1A-75001 No. 1 (75001A No. 1, 1A-75116AR No. 1, 550%)	52 pins
C	75211AL&AR			
D	75665A specify machine style and number	O	1-75116AL No. 1* included in N	
E	79503	P	75653	
E1	79511 screw	Q	1-75217½L* included in H	
F	1-75237A	R	1-75227A (1-75227B, 1-75232B No. 2, 79503) includes 84505 no. 1 stud, 7841 roller, see plate 19 for other styles	
G	3981	R1	1-75217AL* included in H, use 74502 screws	
H	1-75031 includes Q, R1, S	S	75217¾* included in H	
I	72593 use 49½ nut	T	981½	
J	1-75112A No. 1 black } includes K 1-705112 No. 1 black } use 73605 1A-705112 No. 1 gray } screw	U	12-75996 black (12A-75996A gray)	
K	1-75521 No. 7 keystem and cup only use 49½ nut	V	75340* included in X	
L	1-75318A*	W	75645 use 49½ nut	
M	1A-75667AL black } includes N, O, U, 1-75667BL gray } V, W, X, Y use 1A-705667AL } 75617 screws 1A-75667AR } black } used on right side, 1-75667BR } wide and narrow base gray }	X	1-75207A includes V, W, Y 1-75207 early	
		Y	75206 included in X, use 75608 screws	
		Z	2851½	
		AA	1-705116	

RIBBON SHIFT LATCHING MECHANISM, IMPROVED, New Wide Base (Plate 17-1)



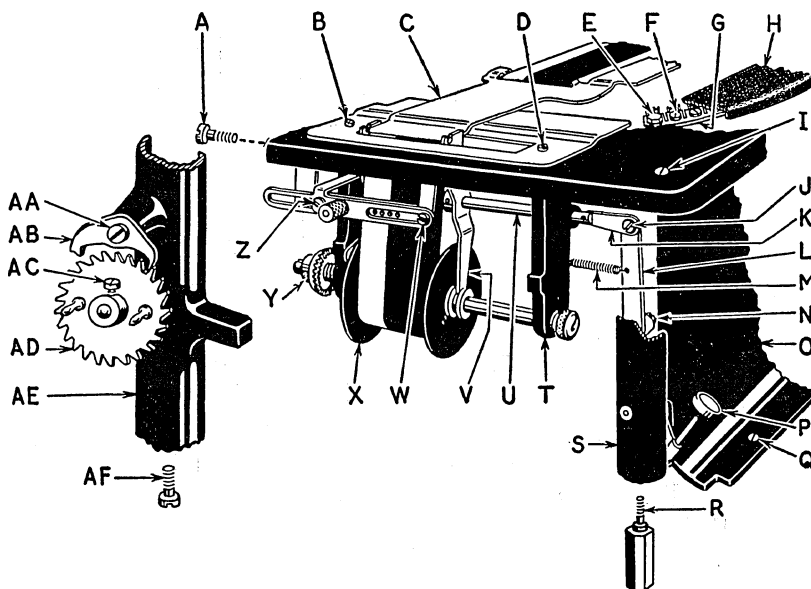
SYMBOLS (Plate 17-1)

A 705666AL No. 1 black, left front leg, classes 72, 78
 705666AR No. 1 black, right front leg, classes 72, 78
 705666AL No. 2 black, left rear leg only, complete assembled leg 1-705666AL no. 2 includes spring barrel, classes 72, 78
 705666AR No. 2 right rear leg, classes 72, 78
 21-75666L No. 1 black } left front
 21-75666AL No. 1 gray } leg, class 77
 705666AR No. 5 black } right front
 705666BR No. 5 gray } leg, class 77
 75666BL No. 2 }
 black } left rear leg,
 75666CL No. 2 } not sel. skip tab.
 gray }
 21-75666BL } left rear leg
 No. 2 black } assembly includes
 21-75666CL } spring barrel, not
 No. 2 gray } sel. skip tab.

75666R No. 5 }
 black } right rear leg,
 75666AR No. 5 } not sel. skip tab.
 gray }
 705666AL No. 7 } left rear leg,
 black } for sel. skip tab.
 705666BL No. 7 }
 gray }
 1-705666AL No. 7 } left rear leg
 black } assembly includes
 1-705666BL No. 7 } spring barrel, for
 gray } sel. skip tab.
 705666AR No. 7 }
 black } right rear leg, for
 705666BR No. 7 } sel. skip tab.
 gray }
 B 72828
 C 1-705112 No. 3 black } includes Q,
 1A-705112 No. 3 gray } S, T, U, V, W
 D 72591 screw
 E 49 1/4
 F 705231 1/2 use 70520 pin
 G 11-705667L black, includes F, H, I,
 J, use on cl. 72, 78

11-705667R black, includes F, H, I, J,
 use on cl. 72, 78
 1A-75667AL black } includes F, H, I,
 1-75667BL gray } J, use on cl. 77
 75001 No. 2
 H 1-89325 use 70566 screw
 I 1A-75116AL No. 1 } ribbon shift
 J 1A-75116AR No. 1 } arm assembly
 K 981 1/4
 L 75217 3/4* link
 M 75653 spring stud screw
 N 11-75002 shaft
 O 1-705120 1/2 (1-705120 1/2A, 83806B)
 includes P
 P 9253 1/4
 Q 1-705112 1/2
 R 79824 spring
 S 75551
 T 705112 1/2
 U 49 1/4
 V 1-705521 No. 3
 W 75551
 X 79632

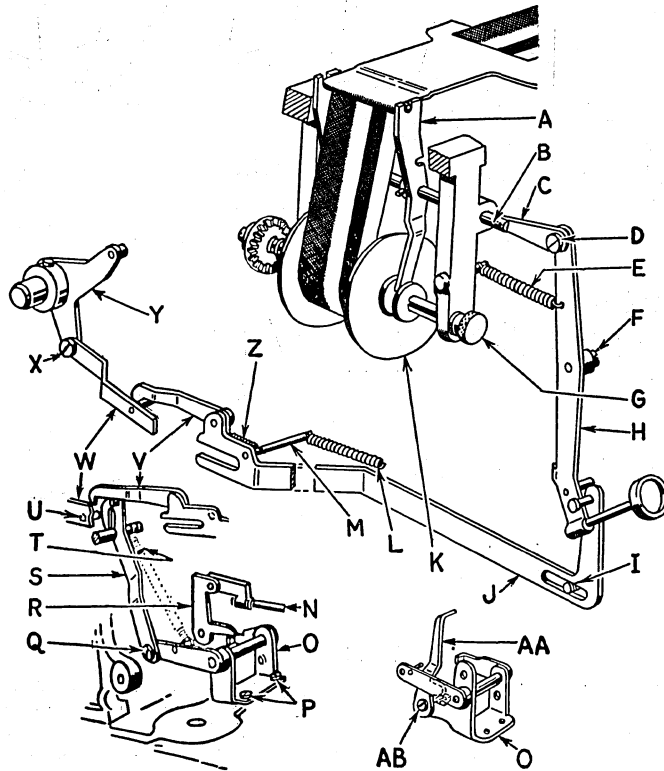
RIBBON SHIFT MECHANISM, EARLY (Plate 18)



SYMBOLS (Plate 18)

- | | | |
|----|---|---|
| A | 71518 use 9251 $\frac{1}{2}$ on right | 1-705666L No. 5 (21-75666L No. 1) |
| B | 70512 | for style 12, 15, 18 cges., not sel. skip |
| C | 1-75157 | tab. |
| D | 1-705157 | 1-705666L No. 6 (21-75666L No. 1) |
| E | 70512 | for styles 22, 30 cges., not sel. skip |
| F | 75603 No. 2 hex. head | tab. |
| G | 75603 No. 1 round head | 11-705666L No. 5 (21-75666L No. 1, |
| H | 75181 No. 1 (4 holes) | 705289A) with sel. skip tab. |
| I | 75181 No. 2 (3 holes) | 1-666L Fto. 133 No. 1 (1-75666L No. |
| J | 75200 black | 1) for style 12, 15, 18 cges. with |
| K | 75200A gray | mirror and light on left |
| L | 77513 | 1-666L Fto. 133 No. 2 (21-75666L |
| M | 75656 $\frac{1}{4}$ used in right rear leg | No. 1) for style 22 cge., with mirror |
| N | 72593 use 49 $\frac{1}{4}$ nut | and light on left |
| O | 75231 use 70520 pin | T |
| P | 1-75112A No. 1 black | 1-75667AR used on right |
| Q | 1-705112 No. 1 black | U |
| R | 1A-705112 No. 1 gray | 1-75001 No. 2 |
| S | 75819 | 1-75001 No. 1 used on } use 52 pins |
| AA | 73605 | right side |
| AB | 1-75102 $\frac{1}{2}$ wide and narrow base, ex- | V |
| AC | cept cl. 75, 77 | 1-75116L* included in U |
| AD | 1-705102A No. 1 | W |
| AE | black | 75645 screw, 49 $\frac{1}{4}$ nut |
| AF | 1A-705102A No. 1 | X |
| | gray | 12-75996 black (12A-75996A gray) |
| | 1-705102A No. 2 | included in T |
| | black | Y |
| | 1A-705102A No. 2 | 75618 screw |
| | gray | Z |
| | | 75645 screw, 49 $\frac{1}{4}$ nut |
| | | AA |
| | | 9053 $\frac{1}{2}$ |
| | | AB |
| | | 1-75193 |
| | | AC |
| | | 75606 |
| | | AD |
| | | 1-75228 |
| | | AE |
| | | For typewriter legs on right rear, see |
| | | plate 14 |
| | | 75666AL No. 2 (11Z-75666AL No. 2) |
| | | complete assembled leg, includes |
| | | spring barrel, for style 12, 15, 18 |
| | | cges. |
| | | 75666AL No. 3, complete assembled |
| | | leg 11Z-75666AL no. 2, includes |
| | | spring barrel, narrow base, style 22 |
| | | cge. |
| | | 75666AL No. 3 complete assembled leg |
| | | 11Z-75666AL no. 2, includes spring |
| | | barrel, wide base, style 22 cge. |
| | | 705666L No. 7 (1Z-705666L No. 7) |
| | | complete assembled leg, includes |
| | | spring barrel, sel. skip tab. |
| | | AF |
| | | 76555 |

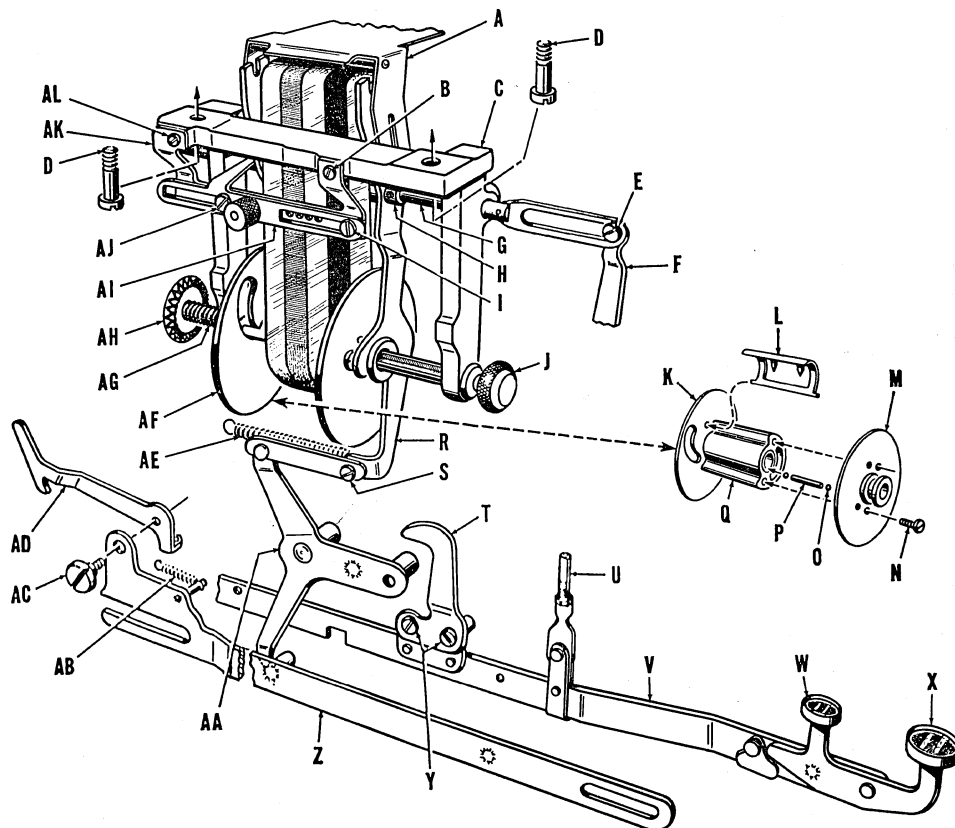
RIBBON SHIFT MECHANISM, AUTOMATIC (Plate 19)



SYMBOLS (Plate 19)

A	1-75116L No. 1* included in B	K	12-75996 black (12A-75996A gray) includes clip and tape
B	1A-75001 No. 2 (1B-75001 No. 2, 1A-75116AL No. 1, 550 $\frac{1}{4}$)	L	75816
C	1-75001 No. 2 early	M	705503
D	75231 use 70520 pin	N	72700 No. 9 cl. 76, 77 } cr. bal.
E	72593 use 49 $\frac{1}{4}$ nut	O	1-72714 No. 17 cl. 78 } cr. bal.
F	75819		1-702171 No. 2
G	73605		11-702171 No. 2 used when ribbon is shifted from reg. total and cr. bal.
H	1-75002	P	72581
	1-75112A No. 1 black	Q	71546
	1-705112 No. 1 black	R	1-72171 No. 4 cl. 76, 77 } cr. bal.
	1A-705112 No. 1 gray		51-72171 No. 1 cl. 78 } cr. bal.
I	75532 use 83208 washer	S	1-72209 cl. 76
J	1-75227A (1-75227B, 1-75232B No. 2, 79503) includes M, V		1-72209 No. 2 cl. 78
	1A-75227 early		1-72209 No. 3 reg. totals to print red, cl. 78
	21A-75227 early, used with auto. date disabled from auto. ribbon shift	T	1-702209 No. 1 cl. 77
	1-705227A No. 1 (1-705227B No. 1, 1-75232B No. 2, 79503)	U	1-702209 No. 3 cl. 78
	1-705227 No. 1 early		74806
	21-705227 No. 1 cl. 78	V	71529*
	1-705227 No. 2 used with horizontal indicator, cl. 75, 77	W	75232A No. 2 use 94543 rivet
	11-705227 No. 2 used with auto. date disabled from auto. ribbon shift, cl. 76, 77	X	1-71135 No. 2
		Y	71542
		Z	1-71133 No. 2
			62880 (89801) spring
		AA	702169
		AB	79503

RIBBON MECHANISM TO PREVENT PARTIAL IMPRINT OF UPPER CASE TYPE—SERIES M200, M700, M800 (Plate 19-1)

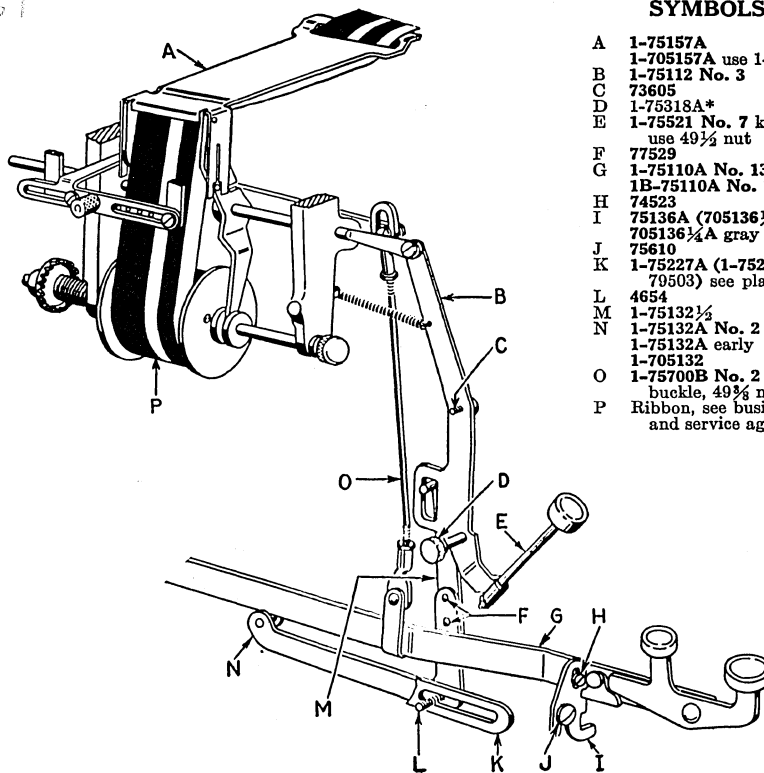


SYMBOLS (Plate 19-1)

- | | | | |
|---|---|----|---|
| A | 1-705157A left side, 3 $\frac{11}{16}$ " long | Q | 1-75996A |
| | 1-75157A right side, 4" long | R | 1A-75116AR No. 1 |
| B | 7062 | | 1A-75116AL No. 1 |
| C | 75667AR No. 2 M200, M800 | S | 75653 |
| | 75667AL No. 2 | T | 75110 $\frac{1}{4}$ |
| | 75667BR M700 | U | 1-75700B No. 2 |
| | 75667BL | V | 1B-75110A No. 13 |
| | 11B-705667R M200, M800 | W | 72200A No. 1 ring |
| | 11B-705667L | | 72992 No. 1 glass |
| | 1B-75667BR M700 | X | 92 No. 1 key paper, specify character and color |
| | 1B-75667BL | | 72200A No. 2 ring |
| D | 75617 | | 72992 No. 2 glass |
| E | 72591 screw | | 92 No. 2 keypaper, specify character and color |
| | 49 $\frac{1}{4}$ nut | Y | 73611 |
| F | 1A-705112 No. 1 M700 | Z | 1-705227B No. 1 M700 |
| | 1A-705112 No. 3 M200, M800 | | 1-705227 No. 3 M200, M800 |
| G | 1-705001 M200, M800 left side | AA | 1A-705031 $\frac{1}{2}$ M200 |
| | 1B-75001 No. 2 M700 | | 11-705031 $\frac{1}{2}$ M700 |
| | 75001A No. 1 M200, M700, M800 right side | | 21A-705031 $\frac{1}{2}$ M800 |
| H | 1-89325 collar, includes 79566 set screw | AB | 205801 |
| I | 75645 without non-smudge ribbon | AC | 75634 |
| | 72656 with non-smudge ribbon | AD | 1-75232B No. 2 |
| | 49 $\frac{1}{4}$ nut, for above | AE | 981 $\frac{1}{4}$ |
| J | 1-75002 M700 | AF | 22-75996A right spool assembly, |
| | 11-75002 M200, M800 | | 32-75996A left includes K, L, M, N, Q |
| K | 75117A No. 3 left rear or right front | AG | 75806 spring |
| L | 75162AR | AH | 1-75325A includes 73502 $\frac{1}{2}$ set screw |
| | 75162AL | AI | 1-705207 $\frac{1}{2}$ includes I, AI, AJ, AK |
| M | 11-75117A No. 1 left front or right rear | AJ | 75645 screw |
| N | 75601A | | 49 $\frac{1}{4}$ nut |
| O | 4499 steel ball | AK | 705206 $\frac{1}{2}$ |
| P | 75559 spacer for steel balls | AL | 75608 |

RIBBON MECHANISM TO PREVENT PARTIAL IMPRINT OF UPPER CASE TYPE (Plate 20)

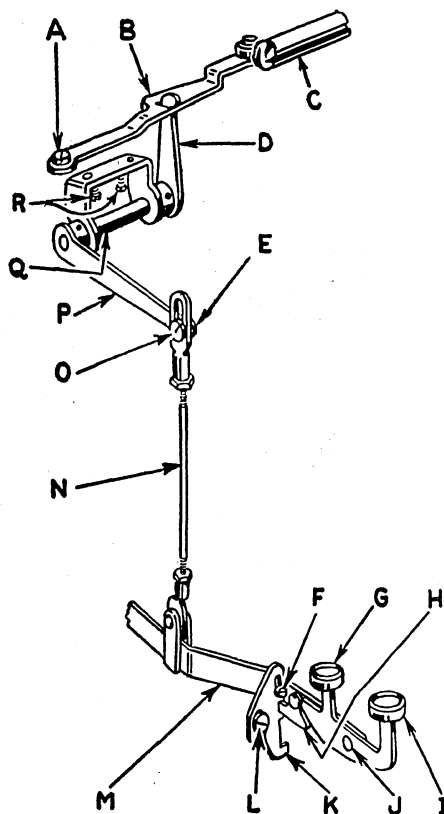
71166 339



SYMBOLS (Plate 20)

- A 1-75157A
- 1-705157A use 1-75157A on right
- B 1-75112 No. 3
- C 73605
- D 1-75318A*
- E 1-75521 No. 7 keystone and cup only, use 49½ nut
- F 77529
- G 1-75110A No. 13 black
- 1B-75110A No. 13 gray
- H 74523
- I 75136A (705136¼) black
- J 705136¼A gray
- K 75610
- L 1-75227A (1-75227B, 1-75232B No. 2, 79503) see plate 19 for other styles
- M 4654
- N 1-75132½
- 1-75132A No. 2
- 1-75132A early } includes F, M
- 1-705132
- O 1-75700B No. 2 includes 75299A turn-buckle, 49½ nuts
- P Ribbon, see business machine supplies and service agreement price list.

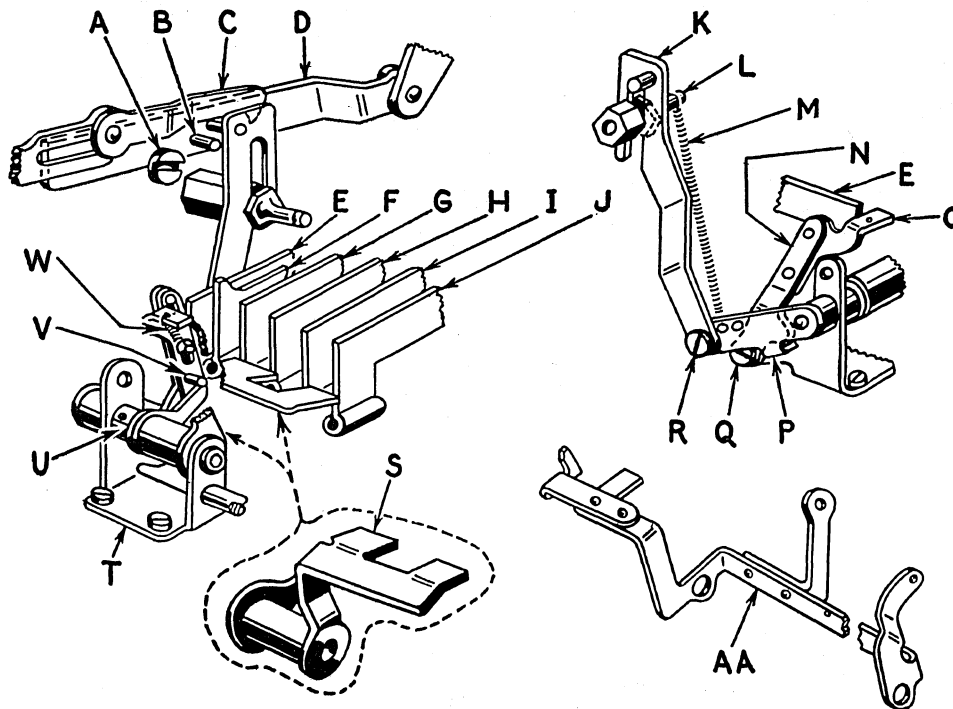
PLATEN SHIFT, NON-PRINT MECHANISM (Plate 21)



SYMBOLS (Plate 21)

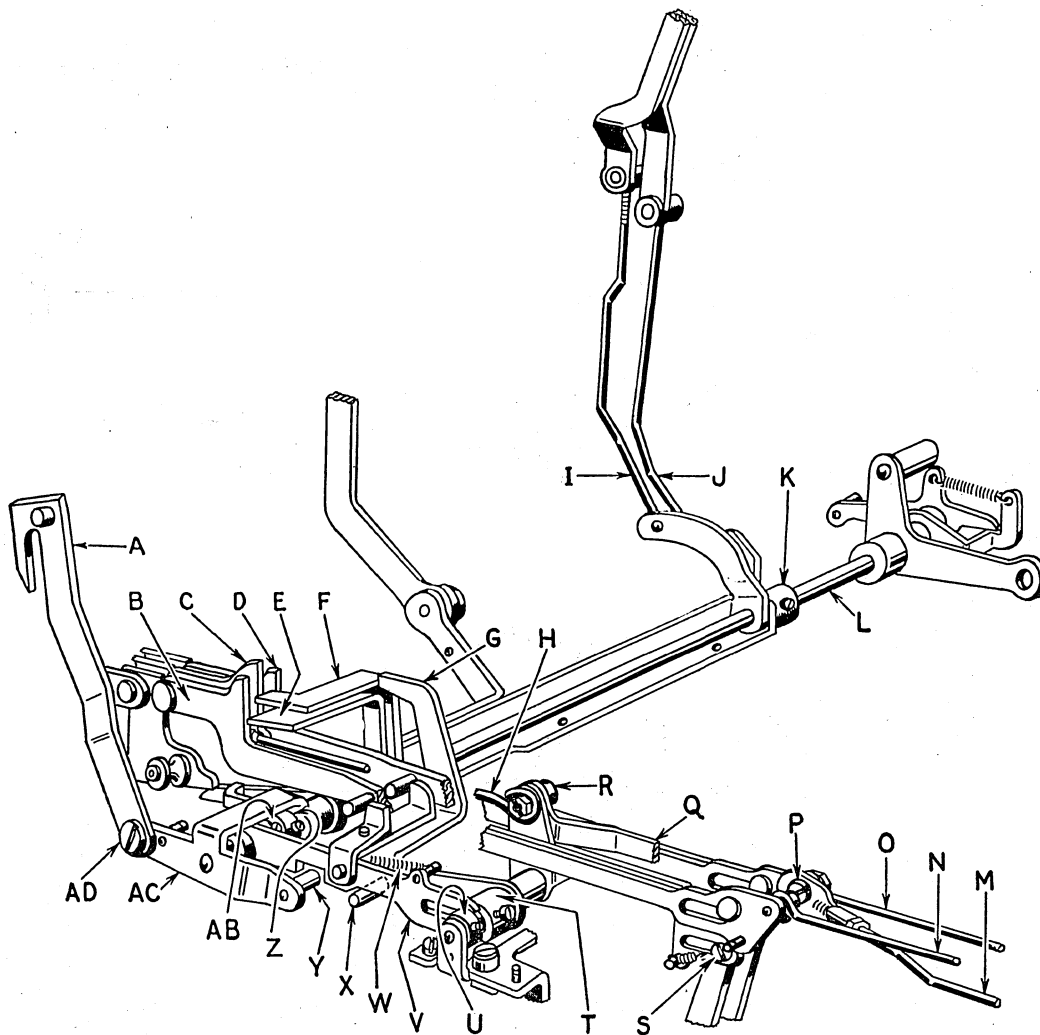
- A 4453¼
- B 1-75167
- C 73026*
- D 1-75163A* included in Q
- E 46 nut
- F 74523
- G 72200A No. 1 ring, 72902 no. 1 glass, 92 no. 1 keypaper, specify char. and color
- H 75160 use 72033 rivet
- I 72200A No. 2 ring, 72992 no. 2 glass, 92 no. 2 keypaper, specify char. and color
- J 108570 (404617)
- K 75136A (705136¼) black
- 705136¼A gray
- L 75610
- M 1-75110A No. 13 includes G, H, I, J
- N 1-75700B No. 2 includes 75299A turn-buckle, 49½ nuts
- O 259½
- P 1-75156A* included in Q
- 1-75017A (11-75017A) includes D, P
- Q 10751½ screws

RIBBON SHIFT FROM CREDIT REGISTER KEY DISABLED FROM RESULT KEYS, CLASSES 72 AND 77 (Plate 22)



SYMBOLS (Plate 22)

- | | | |
|---|---|---|
| A | 70507 | 11-103 No. 4 Env. 732* included in 61-702171 no. 2 env. 732 |
| B | 71529* included in D | |
| C | 75232A No. 2 use 94543 rivet | |
| D | 1-71135 No. 2 | |
| E | 1-72171 No. 6 cr. reg. | T |
| F | 11-702170 reg. total | 1-702171 No. 2 Env. 732 includes P, S, U, ribbon shift and/or symbol print from cr. reg. key, disabled by add CF key, reg. total to print black |
| G | 1-72171 No. 4 cr. bal. | 11-702171 No. 2 Env. 732 ribbon shift and/or symbol print from cr. reg. key, disabled by bal. key, reg. total to print black, cl. 77 |
| H | 1-72171 No. 2 bal. | 31-702171 No. 2 Env. 732 (31-702171 No. 2) ribbon shift and/or symbol print from cr. reg. key, disabled by bal. key, reg. totals to print red, cl. 77 |
| I | 1-702171 No. 3 add CF | 61-702171 No. 2 Env. 732 ribbon shift and/or symbol from cr. reg. key, disabled from bal. key and reg. total key, reg. total to print black |
| J | 11-72171 No. 3 (1-702171 No. 4) sub-bal. | 81-702171 No. 2 Env. 732 ribbon shift and/or symbol print from cr. reg. key, disabled from reg. total key, reg. total to print black, cl. 77 |
| K | 1-702209 No. 1 see plate 19 for other styles | U |
| L | 70509 (9957) | 1-89325 includes 79566 screw |
| M | 74806 | V |
| N | 1-101 Env. 732 (1-702103 $\frac{3}{4}$) ribbon shift to disable symbol | 72653* |
| O | 1-101 No. 2 Env. 732 ribbon shift not to disable symbol | W |
| P | 102 Env. 732* included in N | 8381 |
| Q | 1-105 No. 2 Env. 732* | AA |
| R | 75634 | 1A-702157 No. 3 Env. 732 to disable symbol printing from ext. key |
| S | 71546 | |
| | 1-103 Env. 732* included in 1-702171 no. 2 env. 732 | |
| | 1-103 No. 4 Env. 732* included in 11-702171 no. 2 env. 732 | |

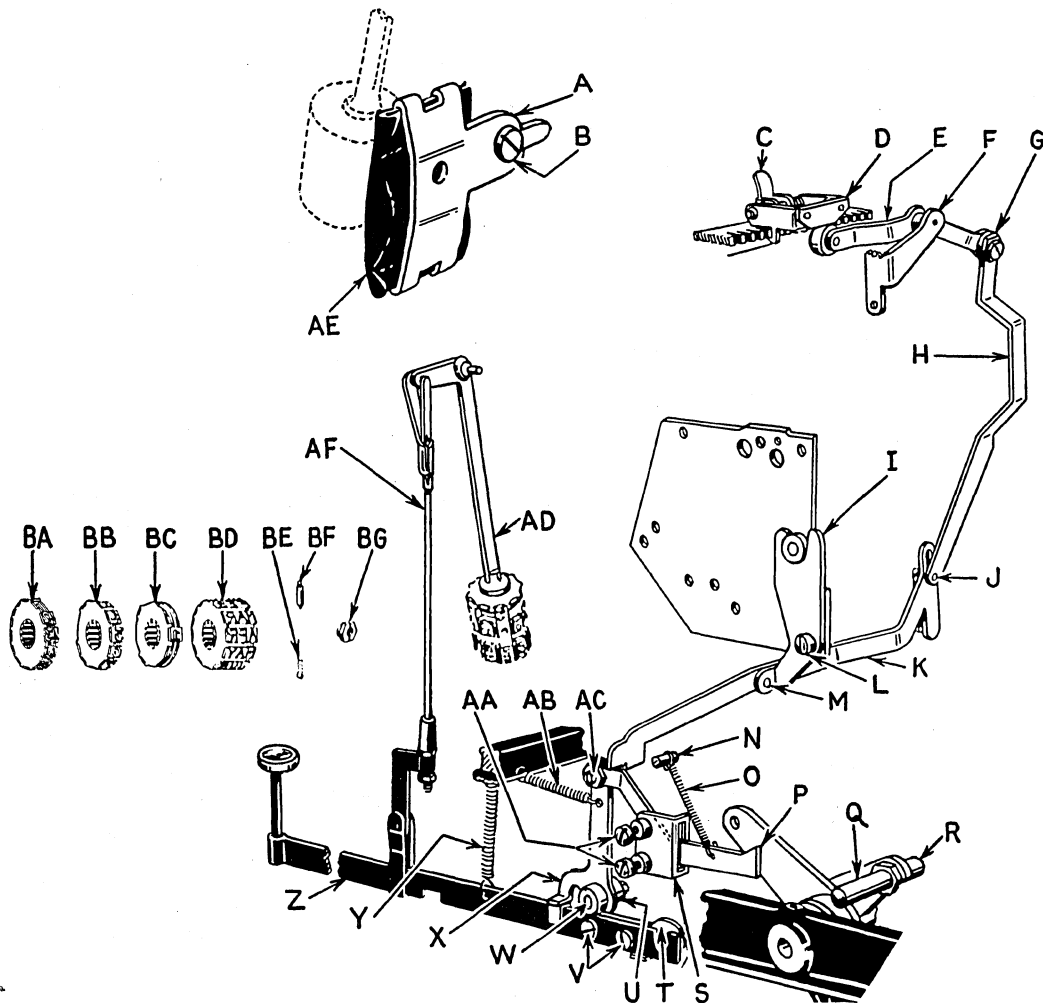


A	1-72209 No. 2 see plate 19 for other styles	S	75638	
B	21-72171 No. 7 reg. total	T	1-74308 use 12055% screw	
C	11-72171 No. 1 cr. bal.	U	1-89325 includes 79566 screw, narrow base	
D	11A-72171 No. 2 bal.		1-75332 includes 75618 screw, wide base	
E	72157 No. 10	V	11-72132 1/2 narrow base	
F	1-72157 No. 12		1-702132 1/2 Env. 805 wide base	
G	1-72134 1/2	W	72815 (3981)	
H	1-702134 1/2 Env. 805		7283A Style 10 use 20 no. 84 clip, ribbon shift not disabled	
I	72714 No. 1	X	8444* included in G	
J	707701 symbol	Y	09325* roller, included in AC	
K	1-73314 includes 73643 screw	Z	1-73314 includes 73643 screw	
L	1-72036 No. 3 complete assembly, includes E, F, K, specify style and machine no.	AB	1-72385 includes 74530 screw	
M	1-72714A No. 33 bal.	AC	1-72130 1/2 (1-72130 1/2A, 72536 1/2A, 69325, 49 1/4)	} see plate 31 for other styles
N	1-72714 No. 15 reg. total		1-162A No. 1 Fts. 133	
O	1-72714 No. 17 cr. bal.		(1-72130 1/2A, 72536 1/2A, 69325, 49 1/4) to print in red from CF sublt. and	
P	79511 screw, 72324 bushing		cr. bal.	
Q	72293 1/2			
R	72656 screw, 72324 bushing	AD	71546	

Printed in U. S. America 5-10-49

For Form 2953

ROTARY CALENDAR MECHANISM, CARRIAGE CONTROLLED (Plate 24)



SYMBOLS (Plate 24)

- | | | |
|---|--|--|
| <p>A 1-75180 No. 1 (1-75180A, 1-75180½, 2854½) includes AE
 1-75180 No. 2 (1-75180A, 1-75180½, 2854½) used with short bar AD
 11-75180 No. 1 (1-75180A, 1-75180½, 2854½) used with 39 keyboard construction, with auto. date in position no. 38
 11-75180 No. 2 (1-75180A, 1-75180½, 2854½) used with 39 keyboard construction, with short auto. date bar in position no. 38
 B 74523
 C 1-73214
 D 73216 No. 3 use 72592 screws
 E 1-79254
 1-79254 Env. 1639 for four position printing control
 F 1-79232B see plate 25 for other styles
 G 72307 ecc., 73611 screw
 H 1-79255A
 1-79255 early
 1-79255 No. 1
 I 77108 No. 2
 J 75622
 K 1-79256 } see plate 25 for
 1-709256 } other styles
 L 76555
 M 75634</p> | <p>N 79571
 O 10686½ narrow base
 79807 wide base
 P 75104 No. 1
 705248A No. 1 wide base, except cl. 78
 705248 No. 3 wide base, cl. 78
 Q 71581
 R 71355
 S 1-70117
 T 75258
 U 1-71321 collar, includes 75660 screw
 V 73548 screw, 49¼ nut
 W 75030 } shaft
 705015 }
 X 1-75103 No. 2
 1-705247
 Y 75804 No. 3
 Z 1-75110 No. 20
 AA 71553
 AB 75830
 AC 75342 ecc., 73611 screw
 AD 1-75111 No. 12, 1/10
 (1-75111 No. 12-1)
 1-75111 No. 12, 2/10
 (1-75111 No. 12-2)
 1-75111 No. 12, 3/10
 (1-75111 No. 12-3)
 1-75111 No. 12, 4/10
 (1-75111 No. 12-4)</p> | <p>2-75111A No. 12 specify length, complete assembled rotary, 4 wheel construction
 2-75111A No. 16 specify length, complete assembled rotary, foreign, 4 wheel construction
 2-75111A No. 18 specify length, complete assembled rotary, 5 wheel construction
 AE 1-75940 (1-75180A, 1-75180½, 2854½)
 AF 11-75705 No. 3
 BA 21-75311 No. 2 Specify (31-75311A No. 2)
 BB 11-75311 No. 2 Specify (11-75311A No. 2)
 BC 1-75311 No. 2 Specify (1-75311A No. 2)
 BD 1-75311 No. 1 Specify (1-75311A No. 1 Specify)
 BE 800 Fte. 217 spring
 BF 511 Fte. 217 pin
 BG 75343B No. 1 nut</p> |
|---|--|--|

hanger
only, see
instruction
book

included
in AD

SEE EXPLANATION ON INSIDE OF FRONT COVER

CALENDAR DIAL WHEEL ASSEMBLY, ROTARY (Plate 24-1A)

SAMPLE PRINT	CON- STRUC- TION	LENGTH OF BAR(†)	Stamp- ing	ASSEMBLED ROTARY CALENDAR	BAR ASSEMBLY ONLY	MONTH DIAL	TENS OF DAYS DIAL	UNITS OF DAYS DIAL	YEAR DIAL 19	YEAR DIAL 55
JAN 25 55	4 Dials	Standard	12	12-75111A No. 12 (*)	1-75111A No. 12	1-75311 No. 5(*)	1-75311 No. 6	11-75311 No. 6		21-75311 No. 6
		1/10" Short	12-1	12-75111A No. 12-1(*)	1-75111A No. 12-1					
		2/10" Short	12-2	12-75111A No. 12-2(*)	1-75111A No. 12-2					
		3/10" Short	12-3	12-75111A No. 12-3(*)	1-75111A No. 12-3					
		4/10" Short	12-4	12-75111A No. 12-4(*)	1-75111A No. 12-4					
25 JAN 55	4 Dials	Standard	16	12-75111A No. 16 (*)	1-75111A No. 16	11-75311 No. 5(*)	1-75311 No. 6	11-75311 No. 6		21-75311 No. 6
		1/10" Short	16-1	12-75111A No. 16-1(*)	1-75111A No. 16-1					
		2/10" Short	16-2	12-75111A No. 16-2(*)	1-75111A No. 16-2					
		3/10" Short	16-3	12-75111A No. 16-3(*)	1-75111A No. 16-3					
		4/10" Short	16-4	12-75111A No. 16-4(*)	1-75111A No. 16-4					
JAN 25 1955	5 Dials	Standard	18	12-75111A No. 18 (*)	1-75111A No. 18	1-75311 No. 5(*)	1-75311 No. 6	11-75311 No. 6	41-75311A No. 2	21-75311 No. 6
		1/10" Short	18-1	12-75111A No. 18-1(*)	1-75111A No. 18-1					
		2/10" Short	18-2	12-75111A No. 18-2(*)	1-75111A No. 18-2					
		3/10" Short	18-3	12-75111A No. 18-3(*)	1-75111A No. 18-3					
		4/10" Short	18-4	12-75111A No. 18-4(*)	1-75111A No. 18-4					

(†) Standard length bar prints first letter or figure in typewriter printing position. 1/10", 2/10", 3/10" or 4/10" short, prints 1/10, 2/10, 3/10 or 4/10 inches to right of typewriter printing position.

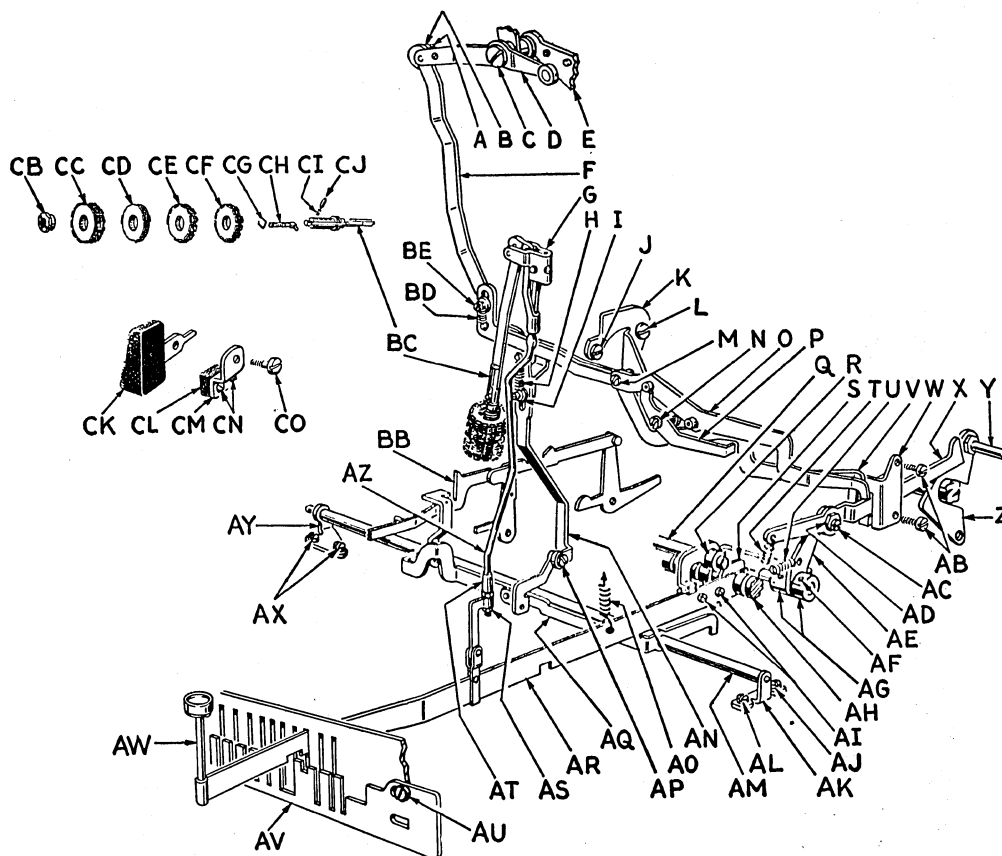
(*) Language must be specified. Available in: English, German, French, Italian and Spanish

SAMPLE PRINT	CON- STRUC- TION	LENGTH OF BAR(†)	Stamp- ing	ASSEMBLED ROTARY CALENDAR	BAR ASSEMBLY ONLY	MONTH DIAL	TENS OF DAYS DIAL	UNITS OF DAYS DIAL	YEAR DIAL 19	YEAR DIAL 55
JAN 25 55	4 Dials	Standard	12	2-75111A No. 12 (*)	1-75111A No. 12	1-75311A No. 1(*)	1-75311 No. 6	11-75311 No. 6		21-75311 No. 6
		1/10" Short	12-1	2-75111A No. 12-1(*)	1-75111A No. 12-1					
		2/10" Short	12-2	2-75111A No. 12-2(*)	1-75111A No. 12-2					
		3/10" Short	12-3	2-75111A No. 12-3(*)	1-75111A No. 12-3					
		4/10" Short	12-4	2-75111A No. 12-4(*)	1-75111A No. 12-4					
25 JAN 55	4 Dials	Standard	16	2-75111A No. 16 (*)	1-75111A No. 16	2-75311A No. 4(*)	1-75311 No. 6	11-75311 No. 6		21-75311 No. 6
		1/10" Short	16-1	2-75111A No. 16-1(*)	1-75111A No. 16-1					
		2/10" Short	16-2	2-75111A No. 16-2(*)	1-75111A No. 16-2					
		3/10" Short	16-3	2-75111A No. 16-3(*)	1-75111A No. 16-3					
		4/10" Short	16-4	2-75111A No. 16-4(*)	1-75111A No. 16-4					
JAN 25 1955	5 Dials	Standard	18	2-75111A No. 18 (*)	1-75111A No. 18	1-75311A No. 1(*)	1-75311 No. 6	11-75311 No. 6	41-75311A No. 2	21-75311 No. 6
		1/10" Short	18-1	2-75111A No. 18-1(*)	1-75111A No. 18-1					
		2/10" Short	18-2	2-75111A No. 18-2(*)	1-75111A No. 18-2					
		3/10" Short	18-3	2-75111A No. 18-3(*)	1-75111A No. 18-3					
		4/10" Short	18-4	2-75111A No. 18-4(*)	1-75111A No. 18-4					

(†) Standard length bar prints first letter or figure in typewriter printing position. 1/10", 2/10", 3/10", or 4/10" short, prints 1/10, 2/10, 3/10 or 4/10 inches to right of typewriter printing position.

(*) Language must be specified. Available in: Czechoslovakian, Dutch, Finnish, Greek, Norwegian, Portuguese, Swedish, Danish, Turkish and Roman numerals.

ROTARY CALENDAR MECHANISM, CARRIAGE CONTROLLED—IMPROVED, NEW WIDE BASE—CLASSES 77 AND 78 (Plate 24-1)



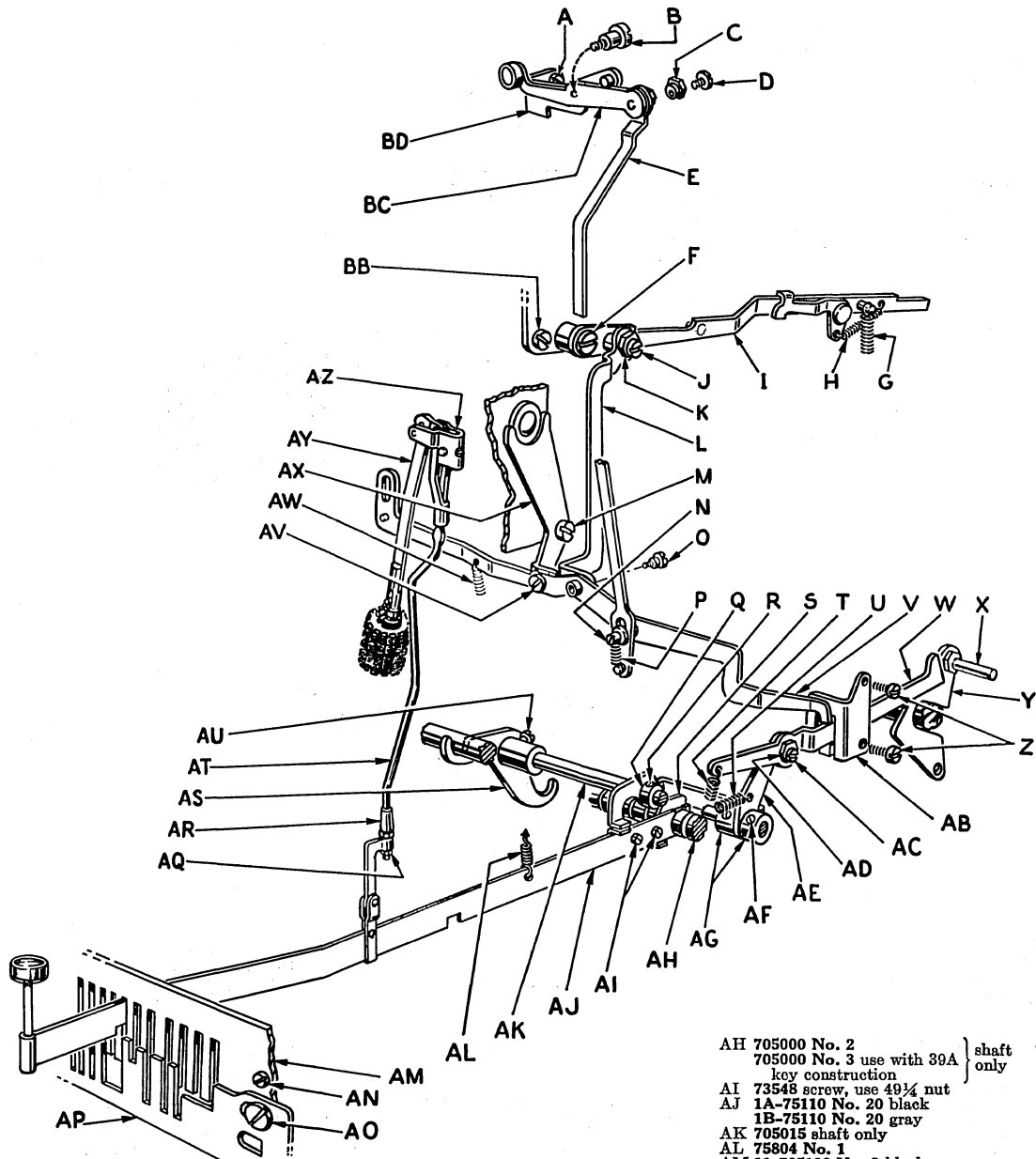
SYMBOLS (Plate 24-1)

A 73611 screw
B 72307 eccentric
C 79607A
D 11-70925A No. 2
E 11-79232B class 78
F 1-79255A class 78 wide and narrow base construction, except narrow base sterling
1-79255 No. 2 class 78 sterling
1-79255 No. 1 class 77 and 78 domestic, 77 sterling
G 75179* included in BC
H 69802 spring
I 72635 No. 2 spring stud screw
J 12055%
K 707108
L 73548
M 7517 No. 1
N 523 Fte. 146
O 1-709256 No. 3
P 1-709256%
Q 705015 shaft only
R 1-71321 collar, use 75660 screw
S 75258 blank
T 81810 use 20 no. 84 spring anchor
U 73828 use 20 no. 84 spring anchor
V 1-709256A No. 2
W 702249%
X 705248 No. 4
Y 71581 use 47 nut
Z 127 Fte. 141 use 10056% screw
AB 73569 (75615)
AC 73611

AD 75342 eccentric
AE 1-705103% No. 2
AF 75660 screw
AG 1-71321 includes AF
AH 705000 No. 2 shaft only
AI 73548 screw, use 40% nut
AJ 72567
AK 72148 No. 1
AL 72567
AM 1A-702036 No. 3 assembled shaft, includes AQ
AN 1-702158%
AO 75804 No. 1
AP 71546
AQ 1-702157A No. 4
AR 1A-75110 No. 20 black } includes
49% nut } AW
1B-75110 No. 20 gray }
AS 75449 No. 2
AT 75633
AU 1-705214 No. 4 black } class 78
1A-705214 No. 4 gray }
AW 75521 No. 2* included in AR
AX 73612
AY 72294%
AZ 1-75705A No. 7 includes AT
BB 11B-72171 No. 2 assembled linkage
BC 1-75111A No. 12 hanger only, specify length and stamping
2-75111A No. 12 specify length, complete assembled rotary, 4 wheel construction
1-75111A No. 16 hanger only, specify length and stamping

2-75111A No. 16 specify length, complete assembled rotary, 4 wheel construction, foreign
1-75111A No. 18 hanger only, specify length and stamping
2-75111A No. 18 specify length, complete assembled rotary, 5 wheel construction
BD 72816 spring
BE 75622 spring stud screw
CB 75343B No. 1 for nos. 12 and 18
75343B No. 2 for no. 16
CC 1-75311A No. 1 specify, for nos. 12 and 18
2-75311 No. 4 specify, for no. 16
CD 1-75311A No. 2
CE 11-75311A No. 2
CF 31-75311A No. 2
CG 75832 spring
CH 1-75910 No. 1 for no. 12, 4 wheel construction
1-75910 No. 2 for no. 18, 5 wheel construction
1-75910 No. 3 for no. 16, 4 wheel construction, foreign
CI 800 Fte. 217 spring
CJ 511 Fte. 217 pin
CK 1-75180A
CL 75903* included in CM
CM 1-75180% includes CL, CN
CN 75600* included in CM
CO 2854%

ROTARY CALENDAR MECHANISM, CARRIAGE CONTROLLED—IMPROVED, NEW WIDE BASE—CLASS 72 (Plate 24-2)



SYMBOLS (Plate 24-2)

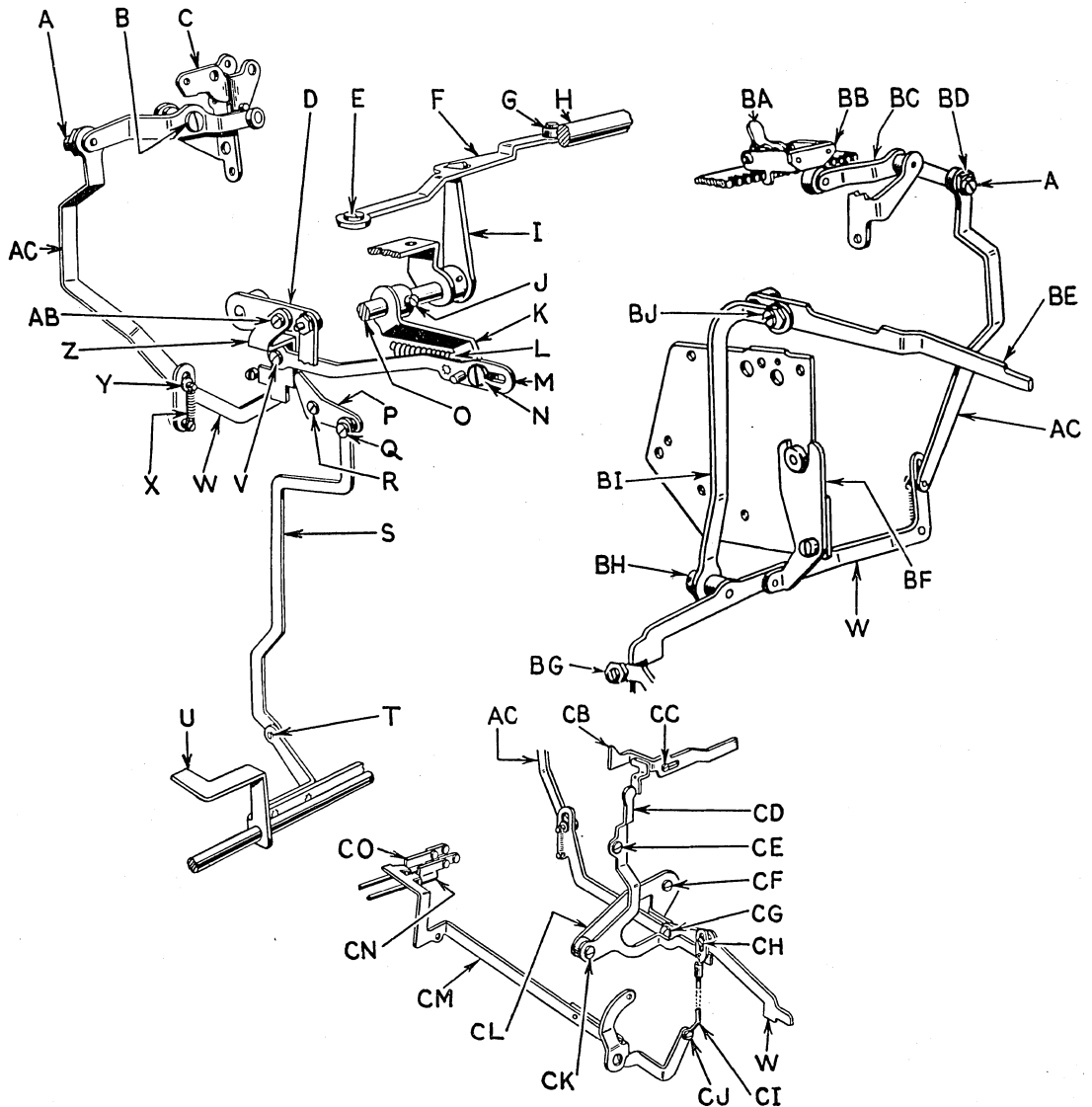
A 73548 2 req.
B 500 Ftc. 144
C 72307
D 73612
E 1-709255 No. 3
F 76534A
G 66885 No. 3
H 76806
I 1-122 Ftc. 144 No. 2
J 73611
K 75342 eccentric
L 150 Ftc. 144
M 76555
N 72531
O 72576 No. 1
P 16681A spring
Q 1-71321 collar, includes R

R 75660 screw
S 75258 blank
T 81810 spring, use 20 No. 84 spring
U 73828 spring, use 20 No. 84 spring
V 1-709256 No. 3
W 705248 No. 4
X 71581 use 47 nut
Y 127 Ftc. 141 use 10056 1/4 screw
Z 75615 No. 2
AB 702249 1/4
AC 73611
AD 75342 eccentric
AE 1-705103 1/4 No. 2
AF 75660 screw
AG 1-71321 collar, includes AF

AH 705000 No. 2
705000 No. 3 use with 39A } shaft
key construction } only
AI 73548 screw, use 49 1/4 nut
AJ 1A-75110 No. 20 black
1B-75110 No. 20 gray
AK 705015 shaft only
AL 75804 No. 1
AM 11-705128 No. 3 black
11A-705128 No. 3 gray
1-705128 No. 3 black } use with 39A
1A-705128 No. 3 gray } key const.
AN 74523
AO 75633
AP 1-705214 No. 4 black
1A-705214 No. 4 gray
AQ 49 1/4 nut
AR 75449 No. 2
AS 1-705145 1/2 includes AU
AT 1-75705A No. 7 includes AR
AU 70512 screw
AV 75634
AW 302801 (700801)
AX 77108 No. 2
AY See BC, plate 24-1
AZ 75179* included in AY
BB 73659
BC 1-104 Ftc. 144 No. 2
BD 1-709250 No. 2

SEE EXPLANATION ON INSIDE OF FRONT COVER

ROTARY CALENDAR DISABLING MECHANISM (Plate 25)



A 73611 screw, 72307 ecc.

B 79607A

C 1-79232B

11-79232A early } cl. 72

11-79232B cl. 74, 76, 78

31-79232A early, cl. 78

1-77129*

D 4453 3/4

E 1-75167

F 75300A roller, 75533B stud

G 73026*

H 1-75163A* included in O

I 12055 3/4

J 1-75294A No. 1 used with auto. date

disabled from platen shift

K 1-75294A No. 2 used with auto. date

disabled from auto. ribbon shift

1-705294

L 3688 spring

M 1-77107 (1-707107)

N 75589

O 11-75017A includes I, J, K, see plate

28 for other styles

P 1-77136

77136 Env. 1060C (707136 1/2) used

with four position printing with cal.

fte. or four period type

Q 79503

R 77529

S 72292 1/4

SYMBOLS (Plate 25)

702292 1/4

72292 1/4 Env. 1060C

narrow base

702292 1/4 Env. 1060C

(702292 1/4 No. 2)

wide base

72292 1/4 No. 1 Env. 1060C used with

four position printing control with

auto. ext., narrow base

T 79503

U 1-72157 No. 12 see plate 30 for other

styles

V 77529

W 1-79256 narrow base

1-709256 shown

1-79256 No. 2 } used to disable four

1-709256 No. 2 } period type when

72815 (3981) } platen is shifted

75622

77106 No. 3 (77106A No. 3, 104380,

79543)

AB 79552

AC 1-79255A

1-79255 early

1-709255 No. 1

BA 1-73214

BB 73216 No. 3 use 72502 screws

BC 1-79254

1-79254 Env. 1689 for four position

printing control

BD 72307 ecc.

BE 1-122 Fte. 144 No. 1 } used with non-

1-122 Fte. 144 No. 2 } print, cge.

cl. 72 } controlled

BF 77108 No. 2

BG 73611 screw, 72307 ecc.

BH 72576 No. 1

BI 150 Fte. 144 narrow base

150 Fte. 144 No. 2 wide base

150 Fte. 144 No. 3 prints auto. date

when on non-print control, cl. 75, 77

BJ 75342 ecc., 73611 screw

CB 1-126 Fte. 144 narrow base

1-126 No. 2 Fte. 144 wide base

CC 71546

CD 77109

CE 3259 1/4 A

CF 76555

CG 75634 screw

CH 79503 screw

CI 1-700 Fte. 135

CJ 72572 No. 1

CK 74529

CL 1-77108 No. 1

CM 1-72157 No. 11

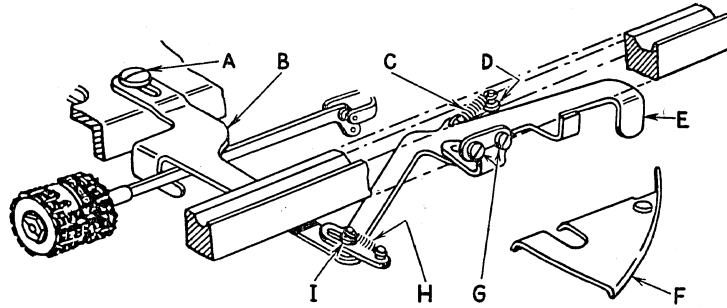
CN 1-72171 No. 4

CO 1-72171 No. 6

ROTARY CALENDAR CLAMPING LEVER FOR CHANGING DATES (Plate 26)

SYMBOLS (Plate 26)

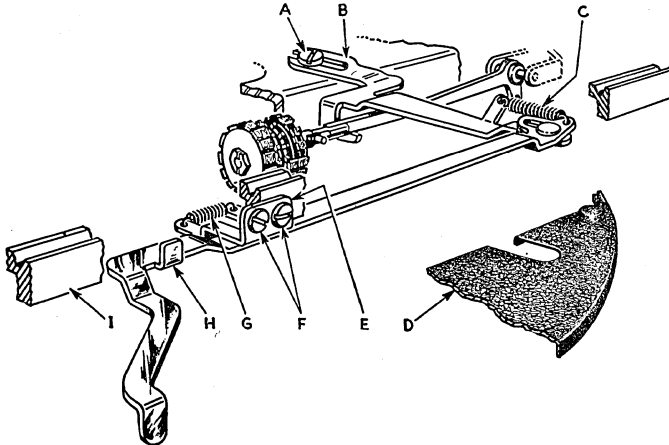
- A 75651
705651 for col. selector, cl. 77
- B 1-75262
1-75262 Env. 1078 (1-75262) for
double cal. fte.
- C 108806
- D 12062 $\frac{7}{8}$
- E 79543 for col. selector, cl. 77
1-75260A
1-75260A Env. 1078 for double cal. fte.
1-705260 $\frac{1}{2}$ A for col. selector, cl. 77
- F 75200
- G 7357 $\frac{1}{4}$
- H 72815 (3981)
- I 9054 $\frac{1}{2}$



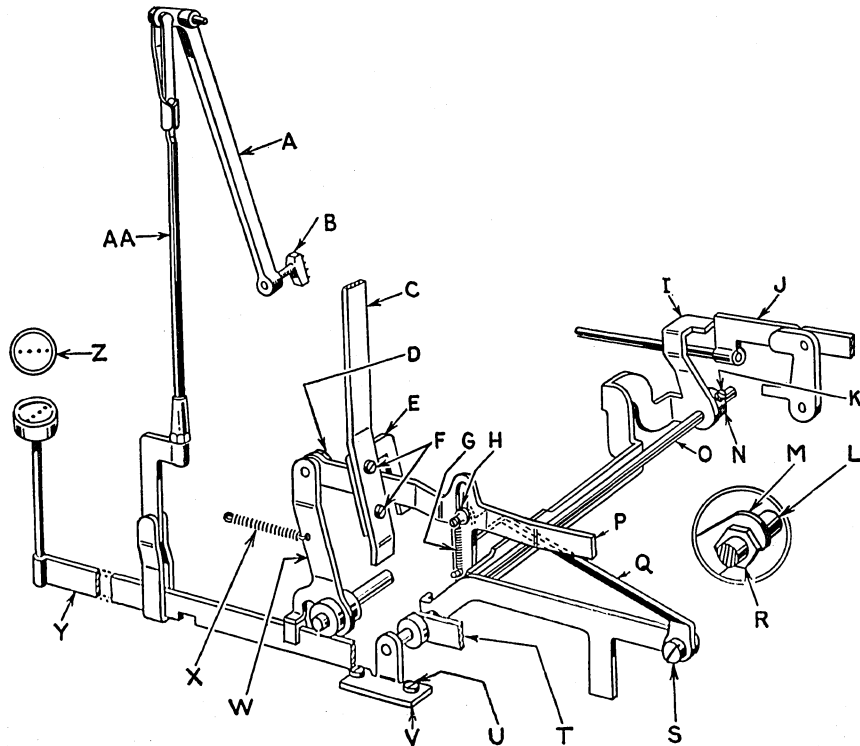
ROTARY CALENDAR CLAMPING LEVER FOR CHANGING DATES, LEFT HAND, NEW WIDE BASE (Plate 26-1)

SYMBOLS (Plate 26-1)

- A 75651
- B 705126 $\frac{1}{2}$ * included in H
- C 75814
- D 75200
- E 705125 $\frac{1}{2}$ * included in H
- F 7357 $\frac{1}{4}$
- G 8888
- H 1-705124 $\frac{1}{2}$ includes B, E
- I 703967 No. 8 Style 22, 30



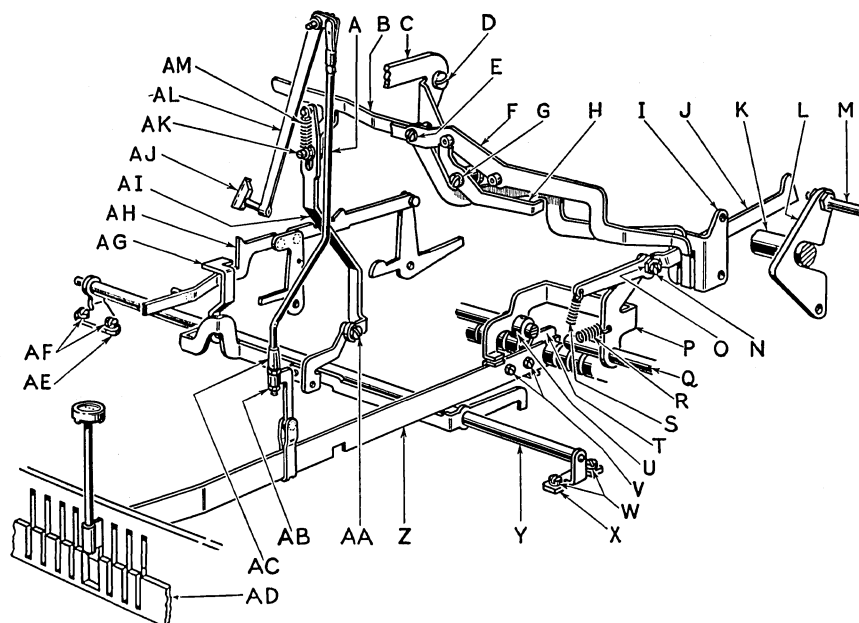
FOUR PERIOD TYPE MECHANISM (Plate 27)



SYMBOLS (Plate 27)

A	1-75111 No. 3 regular		M	71108
	1-75111 No. 13; 1/10, 2/10, 3/10, 4/10	} See instruction book, plate 14	N	1-73314 includes K
	located in position No. 35		O	82A-72036A specify machine style and number
	1-75111 No. 14; 1/10, 2/10, 3/10, 4/10		P	1-75101A No. 1
	located in position No. 38			1-75101 No. 1 (1-75101A No. 1) early
B	75118 No. 1 specify character			1-705101A
C	1A-72104 No. 1 see keyboard book, plate 43 for other styles		Q	1-72258
D	75342 ecc., 103649 screw			1-702245B No. 1
E	72257		R	71581
	702249B No. 1 with two slots, one for auto. date and the other for four period type		S	71546
F	70512		T	1-72149A*
G	10686 1/2		U	72567
H	72635 screw		V	72148 No. 1
I	72157 No. 8	} See plate 30 for	W	1-75103 No. 1 shown, with four period type in position No. 35
	702157 No. 18			1-75103 No. 2 with four period type in position No. 38
	1-72171 No. 2 cl. 76, 77			1-705247
J	11A-72171 No. 1 cl. 78	} bal., see plates 6, 7 or 40, keyboard book for other styles	X	75830
K	73643 screw		Y	1-75110 No. 21
L	71355		Z	92 No. 1 specify char. and color
			AA	1-75705 No. 2

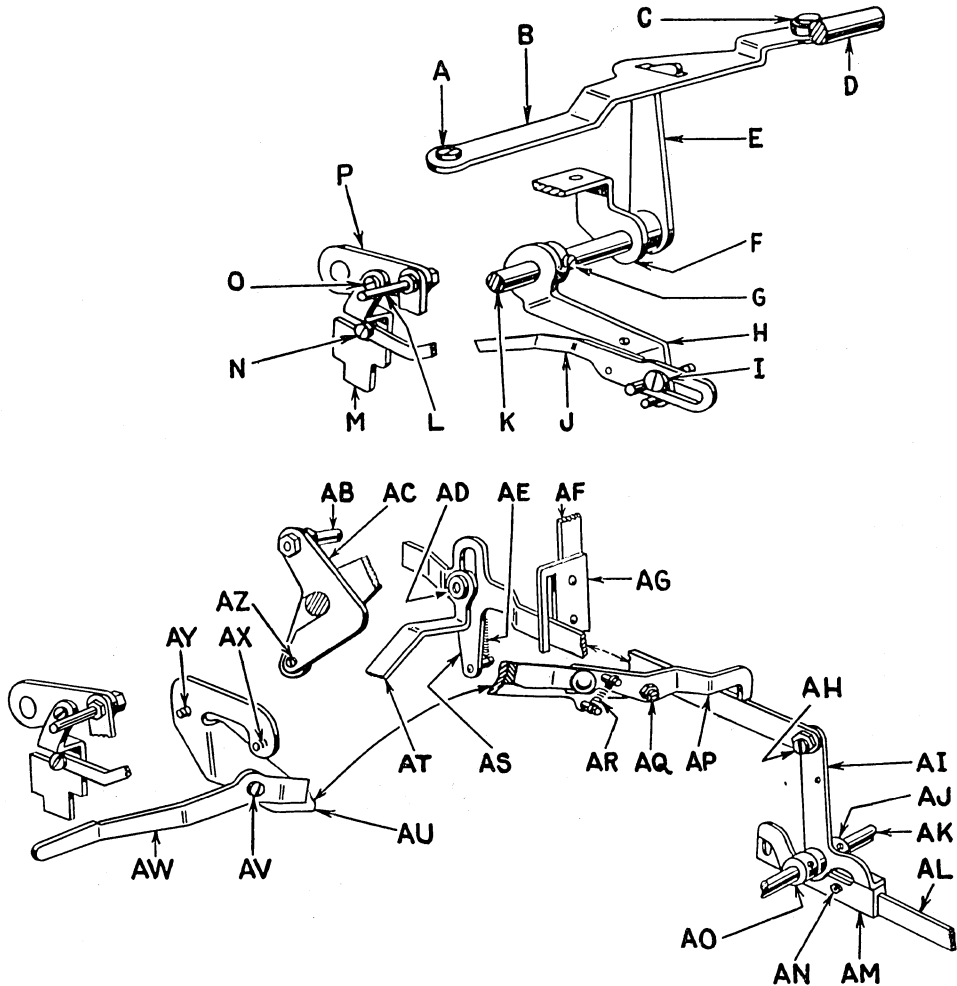
FOUR PERIOD TYPE MECHANISM, IMPROVED (Plate 27-1)



SYMBOLS (Plate 27-1)

A	1-75705A No. 7 includes AC	S	81810 use 20 No. 84 spring anchor
B	1-709256A No. 2	T	75258
C	707108	U	1-71321 collar, use 75660 screw
D	73548	V	73548 use 49 1/4 nut
E	77517 No. 1	W	72567 screws
F	1-709256 No. 3	X	72148 No. 1
G	523 Fte. 146	Y	1A-702036 No. 3 assembled shaft, in-
H	1-709256 1/4		cludes AG
I	702249 1/4 use 73659 screws	Z	1-75110 No. 21
J	705101B	AA	71546
K	21A-701001 (21B-701001, 11-702228B	AB	49 3/4 nut
	No. 1, 1-702229B No. 1, 1-701186A,	AC	75449 No. 2
	3414 1/4. For sterling machines	AD	1-705214 No. 4
	add 706160A) see plate 13-1, power	AE	72294 3/4
	symbol list supplement, for other	AF	73612
	styles	AG	1-702157A No. 4
L	127 Fte. 141 use 10056 3/4 screw	AH	11B-72171 No. 2 assembled linkage
M	71581 use 47 nut	AI	1-702158 1/2
N	73611	AJ	75118 No. 1 specify character
O	75342	AK	72635 No. 2
P	1-705103 3/4 No. 1	AL	1-75111 No. 3 regular, see plate 27 for
Q	705015		other styles
R	73828 use 20 No. 84 spring anchor	AM	69802

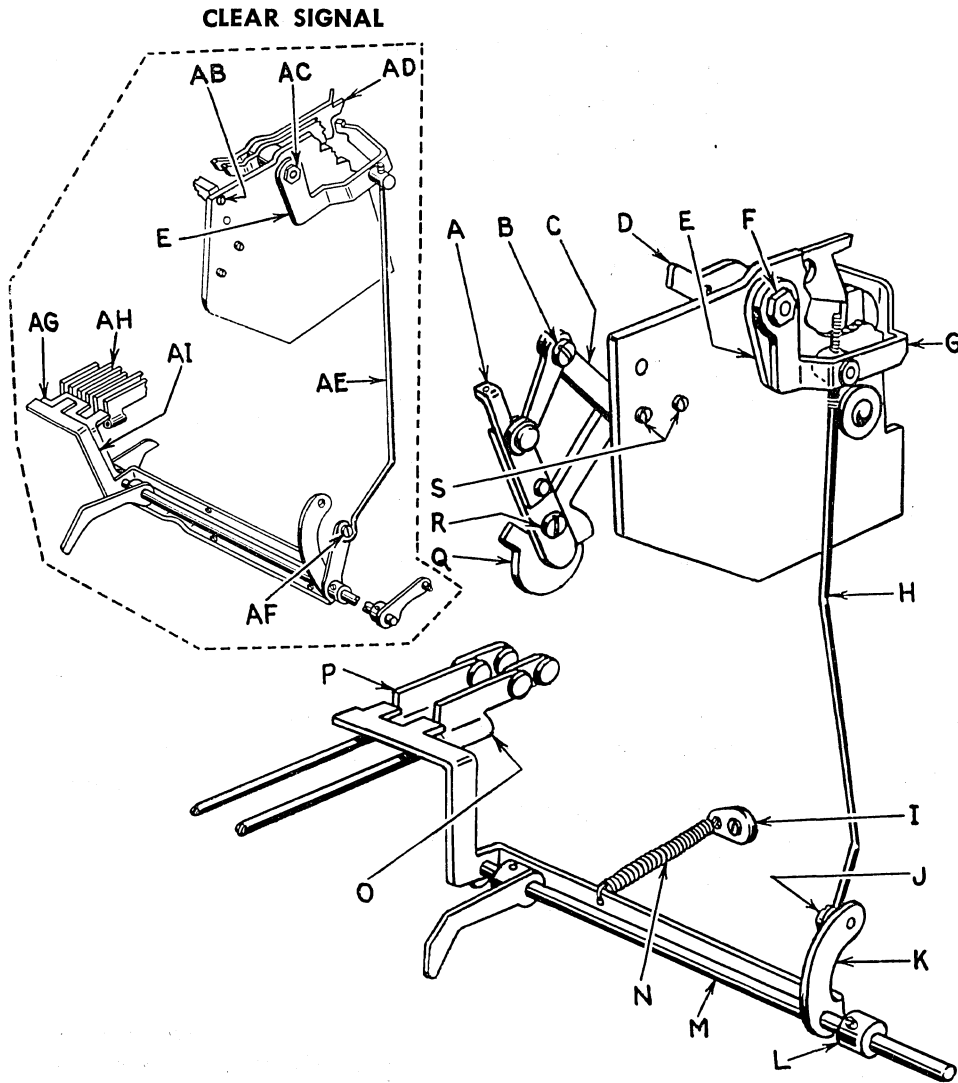
FOUR PERIOD PRINTING MECHANISM DISABLED WHEN PLATEN IS SHIFTED (Plate 28)



SYMBOLS (Plate 28)

A	4453 $\frac{3}{4}$	M	77106 No. 3 (77106A No. 3, 104380, 79543)	AK	75030
B	1-75167	N	77529	AL	705015
C	75300A roller, 75533B stud	O	79552	AM	1-75110 No. 21
D	73026*	P	1-77129*	AN	75258
E	1-75163A* included in K	AB	71581	AO	1-73548 screw, 49 $\frac{1}{4}$ nut
F	75166	AC	71108	AP	1-71321 includes 75660 screw
G	12055 $\frac{5}{8}$	AD	72635 screw	AQ	1-79256 $\frac{1}{4}$ * included in AW
H	1-75294A No. 1 used with auto. date disabled from platen shift	AE	10686 $\frac{1}{2}$	AR	71361 ecc., 70512 screw
	1-75294A No. 2 used with auto. date disabled from auto. ribbon shift	AF	1A-72104 No. 1 see keyboard book, plate 43 for other styles	AS	AR 44805
	1-705294	AG	72257 use 70512 screws	AT	1-75101A No. 1
I	75589		702249B No. 1 with two slots, one for auto. date and the other for four period type	AW	1-75101 No. 1 (1-75101A No. 1) early
J	1-77107 (1-707107)	AH	103649 screw, 75342 ecc.	AX	1-705101A
K	11-75017A shown, includes E, F, G, H	AI	1-75103 No. 1 with four period type in position no. 35	AY	1-72258
	21-75017A for all classes with ecc. controlled cal. fte. or four period type with auto. red print		1-75103 No. 2 shown, with four period type in position no. 38	AU	1-702245B No. 1
	1A-705017A to disable auto. date from red ribbon shift, cl. 76, 77	AJ	1-705247	AV	1-77108 No. 3
	21-705017A for all classes with style 30 ecc.		1-71321 includes 75660 screw		77517 No. 1 with four period type and cal. fte.
L	77512A use 46 nut				79637 with four period type
				AW	1-79256 No. 2 } includes AP, see plate 25 for other sty.
				AX	1-709256 No. 2 }
				AZ	12055 $\frac{5}{8}$
					AY 76555
					AZ 10056 $\frac{3}{4}$

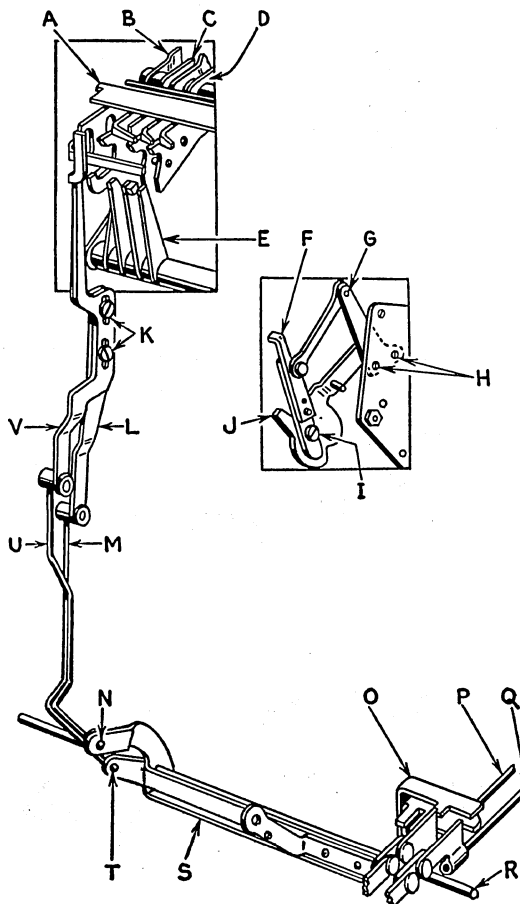
RESULT SYMBOL AND CLEAR SIGNAL MECHANISM, CLASS 76 (Plate 29)



SYMBOLS (Plate 29)

A	1-77218 specify symbol	M	41-72036A complete assembly for clear signal only	Specify style and machine number
B	77529	O	1-72171 No. 4 cr. bal.	
C	77124	P	1-72171 No. 6 cr. reg.	
D	77118 No. 4	Q	21A-77115	
E	1-77128 No. 2 whole numbers, cl. 72 cl. 74, 76, 78 1-77128 No. 4 (1/10 frac.) cl. 72, 74, 75, 76, 77, 78 1-77128 No. 5 (1/8 frac.) cl. 72 77308 No. 2 long shoulder 1-77128 No. 3 symbol 1-77128 No. 6 (1/10 frac., with both clear signal and symbol) cl. 72 1-77128 No. 7 symbol, cl. 72	R	77529	
F		S	72573	
G		AB	77515	
H		AC	79331 No. 1 short shoulder	
I		AD	77118 No. 2	
J		AE	77700	
K		AF	72572 No. 1	
L		AG	72157 No. 1	
		AH	1-72171 No. 2 bal.	
		AI	1-72157 No. 12	

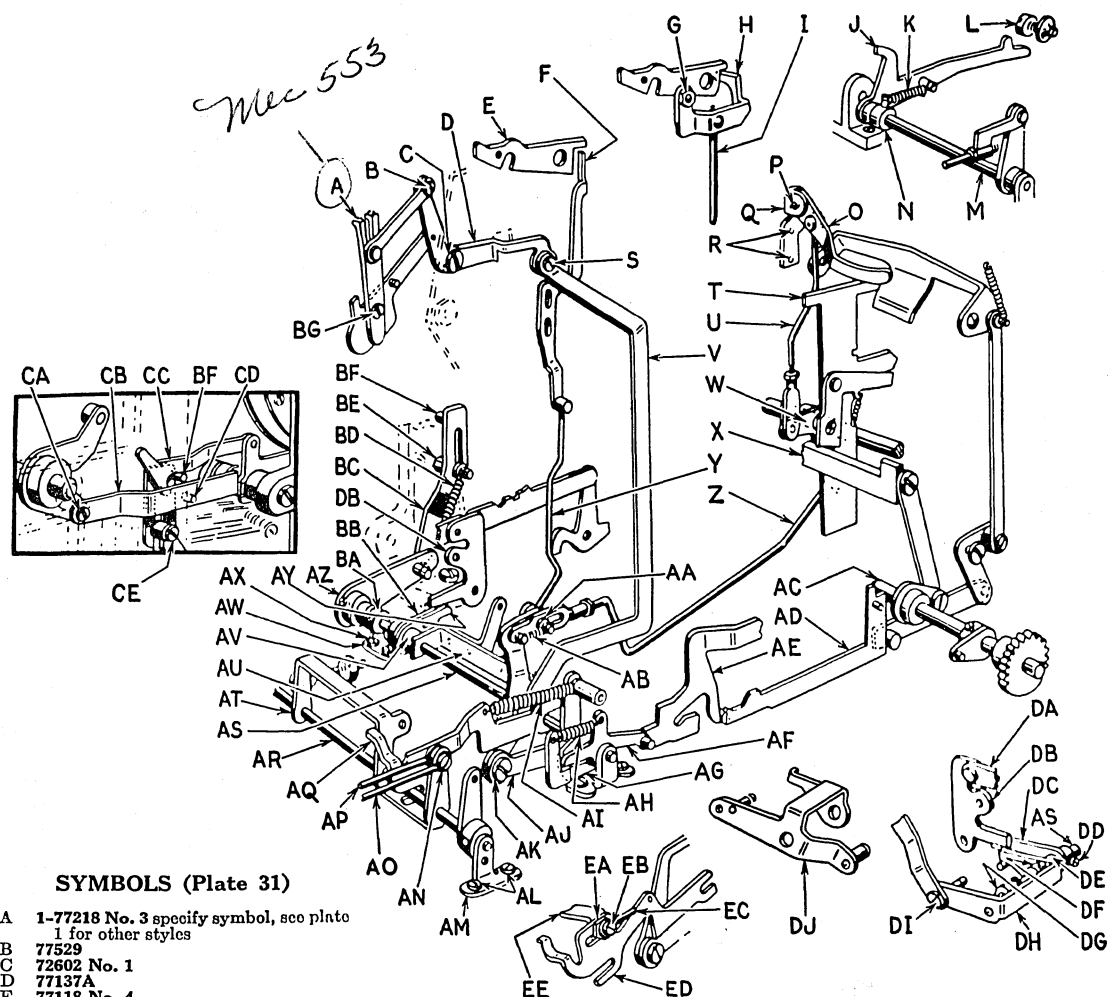
RESULT SYMBOL AND CLEAR SIGNAL MECHANISM, CLASS 77 (Plate 30)



SYMBOLS (Plate 30)

- | | | | |
|---|---|---|--|
| A | 707125 use 77801 spring | 72157 No. 1 to print clear signal from bal., cr. bal., sub-bal. or reg. total key, cl. 76 | |
| B | 77118 No. 4 symbol | 72157 No. 2 with clear signal and clear mult. keys, cl. 72 | |
| C | 707118 No. 2 } see chart, plate 2-1 for | 72157 No. 4 with clear signal only, cl. 72, 74 | |
| D | 707118 No. 4 } other styles | 72157 No. 8 with disabling device for auto. four period, cl. 70, 78 | |
| E | 1-77117A No. 1 | 72157 No. 9 with disabling device for auto. four period, cl. 71, 72, 73 | |
| F | 1-77218 specify symbol, see plate 1 for other styles | 72157 No. 10 with auto. cr. bal. and power result keys, and clear signal to print from result keys, cl. 78 | |
| G | 77529 screw | 1-72157 No. 12 with auto. cr. bal. and power result keys; operated from cr. bal. to disable cal. fte. during cr. bal. operation, cl. 78 | |
| H | 72573 | 1-72157A No. 15 with auto. extend from reg. total key, cl. 71, 72, 73 | |
| I | 77529 | 72157 No. 16 with auto. extend fte. to disable auto. extend meech., from add CF and subt. keys, cl. 71, 72, 73 | |
| J | 1-707115 No. 1 see plate 1 for other styles | P | 72700 No. 9 cr. bal. |
| K | 707505 | Q | 72700 No. 11 cr. reg. |
| L | 1-707128A No. 3 clear signal, see plate 2 for other styles | R | 1A-72036A complete assembled shaft 12A-72036A includes O, R, S, specify machine style and number |
| M | 707700A No. 1 | S | 702157 No. 16 see letter O for other styles |
| | 77700 early, long wire } wide and narrow base, } Clear | T | 72572 No. 1 |
| | 77700 No. 2 short wire } cl. 75, 77, 78 } Signal | U | 707701 |
| | 77700 early, long wire } narrow base, cl. 72, } 74, 76 | V | 77701 early, long wire } Symbol |
| N | 72572 No. 1 | | 1-707128A No. 8 cr. bal. symbol |
| O | 1A-702157 No. 2 to control cr. bal. symbol from cr. bal. or cr. reg. key, and disable the cal. fte., cl. 76, 77 | | |
| | 702157 No. 5 to print clear signal from bal., cr. bal., sub-bal. or reg. total key, cl. 76 | | |
| | 702157 No. 8 to print clear signal from result keys, cl. 78 | | |
| | 1-702157 No. 12 operated from cr. bal. mechanism to disable the cal. fte. during cr. bal. operation | | |
| | 702157 No. 16 to print symbol from result keys, sel. skip tab, cl. 75, 77 | | |
| | 702157 No. 18 to print auto. four period from bal. key, sel. skip tab, cl. 77 | | |

RED RIBBON AND RESULT SYMBOL MECHANISMS, CLASS 78 (Plate 31)



SYMBOLS (Plate 31)

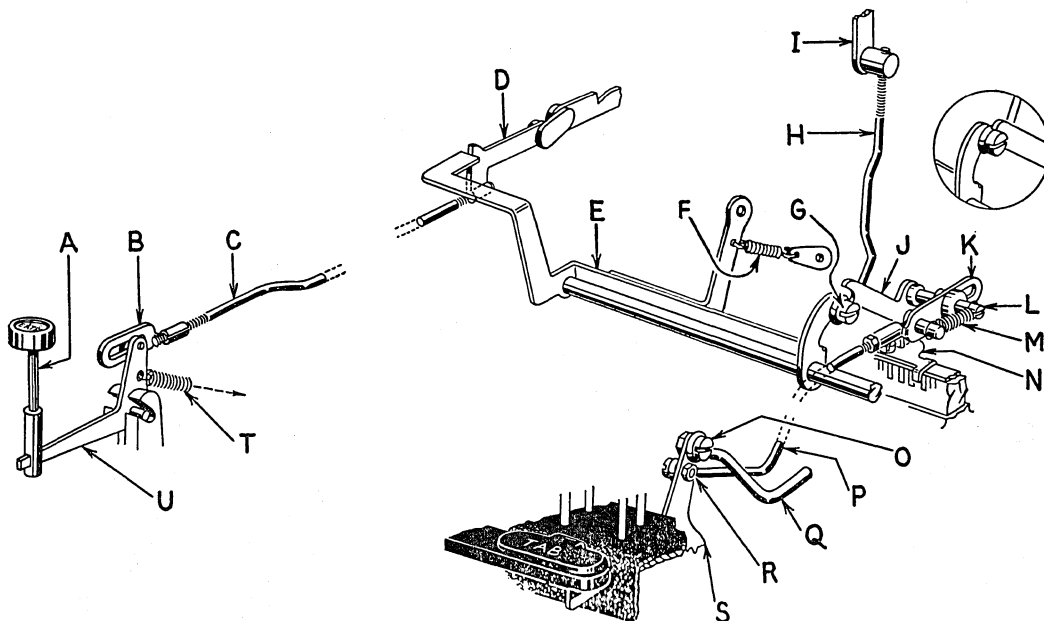
- A 1-77218 No. 3 specify symbol, see plate 1 for other styles
- B 77529
- C 72602 No. 1
- D 77137A
- E 77118 No. 4
- F 1-707128A No. 8 see plate 2 for other styles
- G 79331 No. 1 short shoulder
- H 77308 No. 2 long shoulder
- I 1-77128 No. 3 early style, bal. symbol, cl. 76, 77, 78
- J 77701 early, long wire, symbol
- K 1-72287½
- L 9086
- M 72504½
- N 21-72003 No. 2
- O 1-702003 No. 4
- P 1-72377 includes 72609 screw
- Q 1-74226
- R 76534A screw
- S 74235 brace
- T 79543 screws
- U 79552
- V 1A-74107A No. 25 (1-74107B No. 25, 74115A No. 1)
- W 1-74700A No. 5 includes 1-74239 turnbuckle
- X 72289½
- Y 1-702289½
- Z 1-74227
- AA 74914 No. 3
- AB 704914 No. 3
- AC 707701 short wire
- AD 11-74700A No. 2 includes 1-75290 turnbuckle, use 72572 No. 1 screw in rear
- AE 1-74700A No. 2 includes 72110 No. 1 turnbuckle, cr. bal. symbol to print
- AF 706508 screw, 72504½ screw on other side
- AG 72816
- AH 1B-74013 No. 2 } complete
- AI 1A-704013 No. 2 } assembled shaft
- AJ 1-72102 No. 13

- AE 1-702102 No. 5
- AF 1-72221 No. 3 } see keyboard book, plate 3 for other sty.
- AG 1-72149A No. 2
- AH 1-72296½* included in AS
- AI 83883
- AJ 1-72289½* included in AS
- AK 72599½
- AL 72567
- AM 72148 No. 4
- AN 72572 No. 2 screw, 72324 bushing
- AO 1-72714 No. 41 non-subt.
- AP 1-72714A No. 20 } reg.
- AQ 1-72714 No. 20 early } subt.
- AR 72294½A No. 2
- AS 21-72003A (21-72003B) } see keyboard book, plate 40 for other styles
- AT 1A-702003 No. 3
- AU 72036 No. 3* complete assembled shaft
- AV 1-72036 no. 3 includes AG, AJ, AU, AV, AY, AZ, BA, BB, specify machine style and number
- AW 1-72298½
- AX 1-72298½
- AY 1-72157 No. 12 } see plate 30 for
- AZ 1-702157 No. 12 } other styles
- BA 1-73314 collar, includes 705597 screw
- BB 1-72207 No. 3 includes 72573 screw
- BC 1-72209 No. 2 } see plate 19 for
- BD 1-702209 No. 3 } other styles
- BE 74806

- BE 70509 (9957)
- BF 89550*
- BG 77529 early
- CA 77510 late
- CB 71542
- CC 1-71135 No. 2
- CD 75232A No. 2 use 94543 screw
- CE 71529*
- DA 79548 screw on outside of side frame for BE
- DB 21-72171 No. 7 reg. total
- DC 72170 No. 5* included in DA
- DD 1-163 Fte. 133 No. 1 } bal. and CF subt. to print in red
- DE 1-163 Fte. 133 No. 2 } bal. and CF subt. to print in black
- DF 73643 (705597)
- DG 72309 collar
- DH 1-73314 collar, includes 705597 screw
- DI 1-73314 collar, includes 705597 screw
- DJ 1-72385 bearing, includes 74530 screw
- EA 1-162A No. 1 Fte. 133 (1-72130½A, 72536½A, 69325, 49½) cr. bal. and CF subt. to print in red
- EB 1-162 Fte. 133 No. 3 with consec. no. device, cr. bal. or special char. to print from bal. key only
- EC 71546
- ED 1-162A No. 2 Fte. 133 (1-72130½A, 72536½A, 69325, 49½) cr. bal. only to print in red
- EE 72599½ (75631, 705367)
- EA 74587
- EB 72714 No. 2 wire
- EC 72294½A (702294½)
- ED 1-72296 No. 2
- EE 1-72296 No. 2

SEE EXPLANATION ON INSIDE OF FRONT COVER

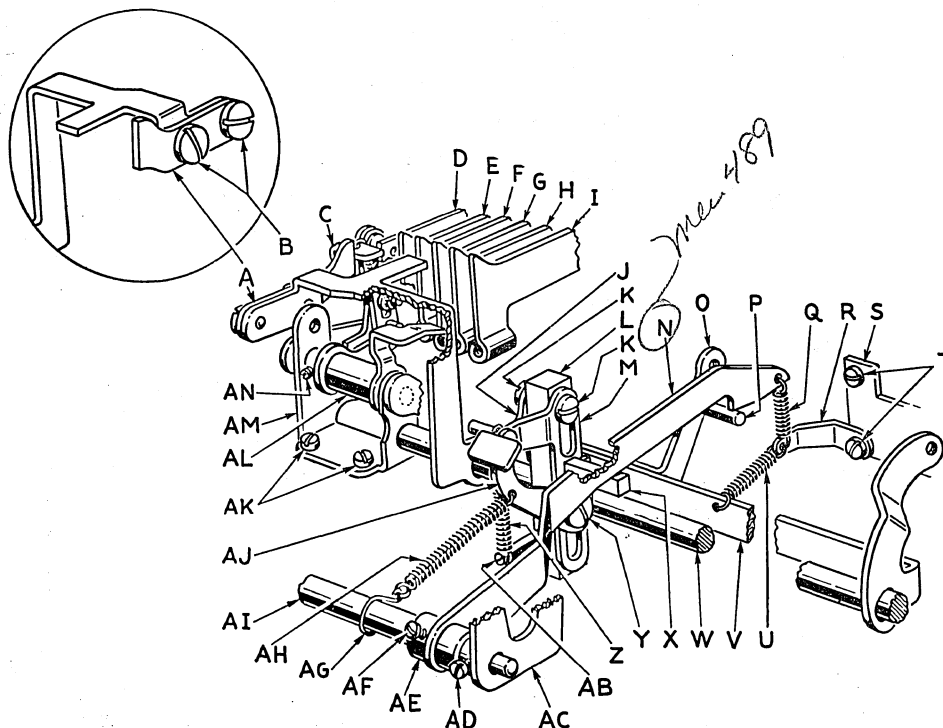
EXTEND KEY TO PRINT SYMBOL (Plate 32)



SYMBOLS (Plate 32)

A	72521 No. 1	K	1-106 Env. 1483
B	72110 No. 1	L	9058 $\frac{3}{8}$
C	1-72700 No. 16 includes B	M	79810
D	1-72171A No. 9	N	105 Env. 1483
E	1-109A Fte. 717 Env. 1078 narrow base	O	72588 (12356 $\frac{3}{8}$) screw, 46 nut
F	1A-702157 No. 2 Env. 1078 wide base	P	1-702 Env. 1483 includes K
G	72830 spring, 20 No. 89 anchor	Q	72707A No. 4
H	500 Env. 1483	R	75631 screw, 49 $\frac{1}{2}$ nut
I	707701	S	1-702017
J	1-707128A No. 8	T	3489
K	1-104 Env. 1483 use 79027 screw	U	1-72243 No. 1

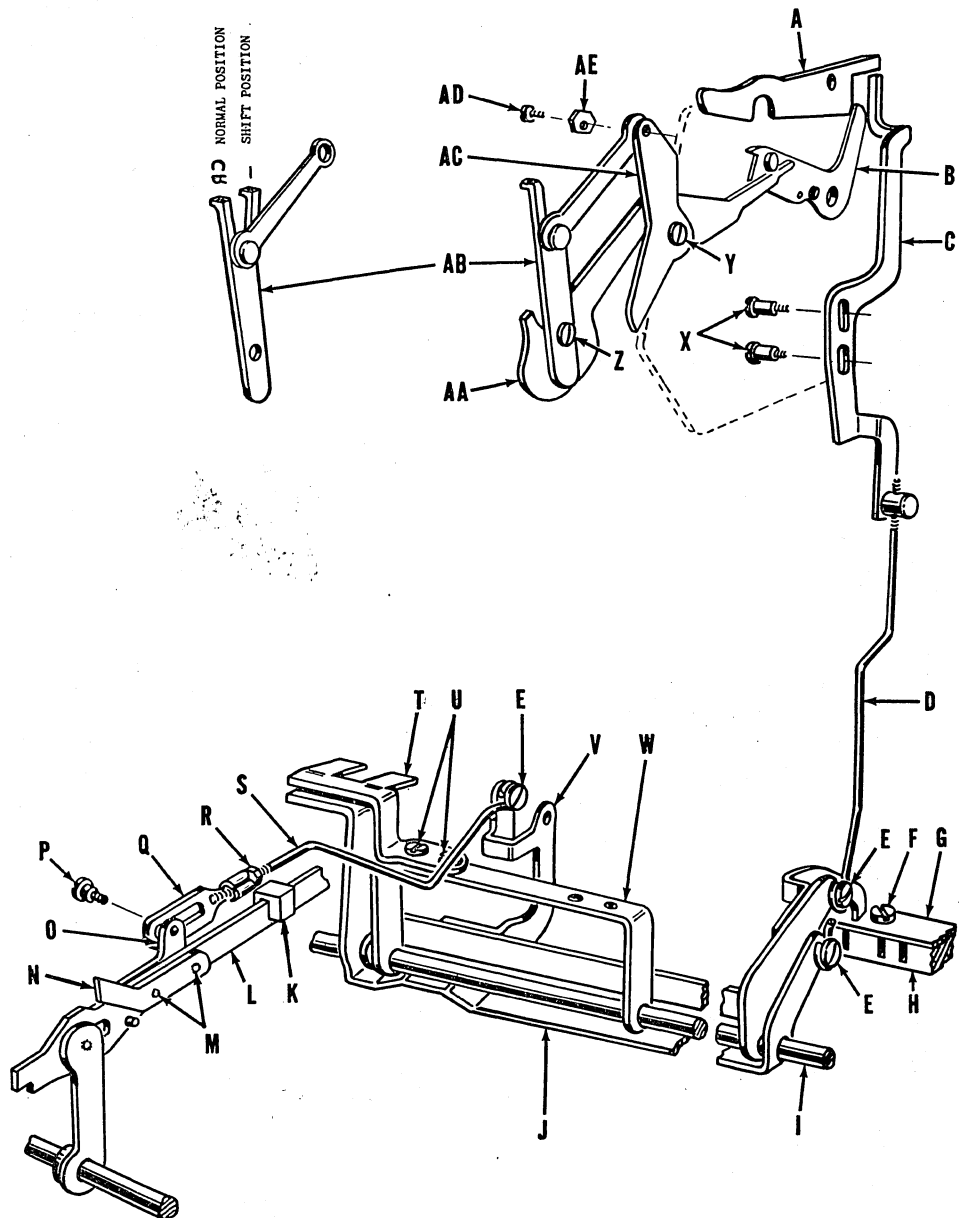
MINUS BALANCE SYMBOL TO PRINT FROM CREDIT REGISTER KEY No. 68—
INACTIVE FROM BALANCE KEY—CLASS 77 (Plate 33)



SYMBOLS (Plate 33)

A	702159½	T	71553
B	709607	U	72830
C	1-702103¾ use 75634 screw, 8381 spring	V	1-702157A No. 2 includes A, B, O, P
D	1-702171 No. 5 cr. reg.	W	22A-702036A No. 1 includes A, B, O, P, V
E	11-702170 reg. total	X	72646A* included in M
F	1-72171 No. 4 minus bal.	Y	72602 No. 1
G	1-72171 No. 2 bal.	Z	72814
H	1A-702171 No. 3 add CF	AB	70508
I	1-702171 No. 4 sub-bal.	AC	1A-702193A No. 2
J	72293	AD	70512
K	75637	AE	1-75332 includes AF
L	702511 post, use 47 nut	AF	75618
M	1-702159½	AG	20 No. 84
N	72157 No. 13* included in V	AH	84801
O	8445* included in V	AI	702003 No. 3
P	79810	AJ	72291
Q	20 No. 101	AK	72581
R	72275 No. 1	AL	1-702103¾* included in AM
S		AM	31-702171 No. 2 includes AL, AN
		AN	79566

SYMBOL TO PRINT DURING MINUS BALANCE OPERATION, SERIES M 200 (Plate 34)



SYMBOLS (Plate 34)

A	77118 No. 4	K	1-702906	W	702157A No. 19
B	21-77117A No. 1	L	1B-702171 No. 12	X	707505
C	1-707128 No. 11	M	703592	Y	72602 No. 2
D	707701 No. 3	N	702227 1/2 A	Z	77510
E	72572 No. 1	O	702227 1/2 A No. 2	AA	1-707115 No. 5
F	702505 1/2	P	75638	AB	1A-77218 No. 3 CR Normal Pos.
G	1-702230A No. 6	Q	72110 No. 7		Shift Pos.
H	702902 No. 3	R	49 3/4		Note: The shift position prong must
I	1A-702036A No. 1 shaft only	S	1-702777A No. 2 includes Q, R		be removed before installing.
J	112B-702036A No. 1 shaft assembly,	T	72157 1/4 No. 1	AC	707149
	includes I, J, V, W	U	709607	AD	70512
		V	1-702157 No. 26	AE	71361

Mr M R Lovejoy
Buffalo N Y Branch 10-5

SERIES M MACHINES

Type 70

ACCUMULATION

Symbol List

May 20, 1949

Issued _____

To _____

Of _____

Property of and to be returned to
**BURROUGHS ADDING
MACHINE COMPANY**
DETROIT 32, MICHIGAN

ACCUMULATION

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817 $\frac{1}{4}$ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817 $\frac{1}{2}$ ZL, 8828 $\frac{1}{4}$ C, 8828 $\frac{1}{2}$ B, 47 $\frac{3}{4}$, 49 $\frac{1}{4}$ —2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

FOREWORD

In this book as in previous books, namely, Carriage, Keyboard, and Printing, the symbols, series 70000 (5 digits) and 700000 (6 digits) appear. When a symbol of five digits and one of six digits are both shown under one letter, it indicates that the five digits are for narrow base machines, and the six digits are for wide base machines. As an example, see Plate 1, letter AQ.

To determine which is a narrow or wide base machine, measure the distance between the case dowl pins located at the rear, in the base of the machine.

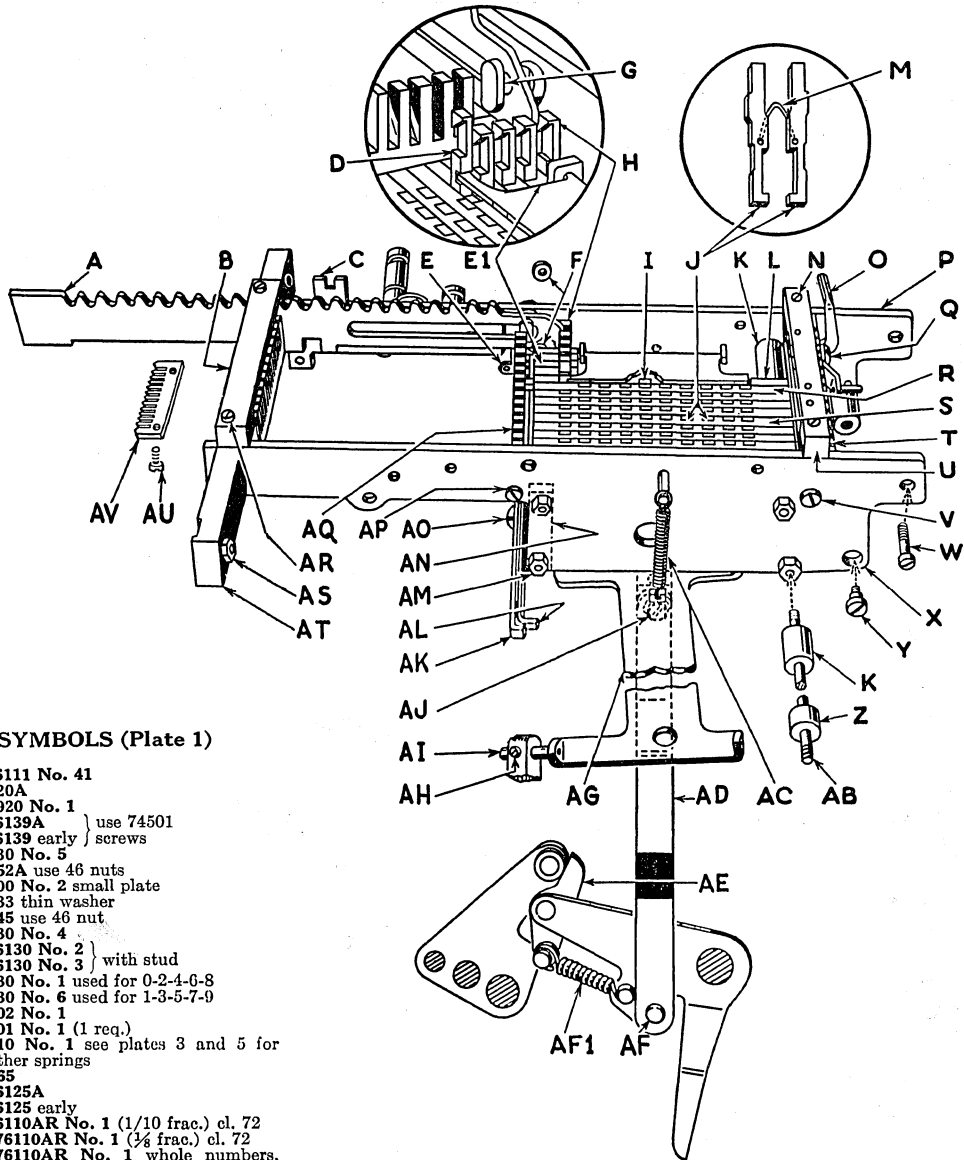
Dimension for narrow base 10 $\frac{3}{4}$ ".

Dimension for wide base 12 $\frac{1}{4}$ ".

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STOP ASSEMBLY AND RESTORING MECHANISM (Plate 1)



SYMBOLS (Plate 1)

A	1-76111 No. 41
B	76920A
C	706920 No. 1
D	1-76139A } use 74501
E	1-76139 early } screws
E1	76130 No. 5
F	76152A use 46 nuts
G	76900 No. 2 small plate
H	77133 thin washer
I	76545 use 46 nut
J	76130 No. 4
K	1-76130 No. 2 } with stud
L	1-76130 No. 3 }
M	76130 No. 1 used for 0-2-4-6-8
N	76130 No. 6 used for 1-3-5-7-9
O	76302 No. 1
P	76901 No. 1 (1 req.)
Q	76810 No. 1 see plates 3 and 5 for other springs
R	79565
S	1-76125A
T	1-76125 early
U	1-76110AR No. 1 (1/10 frac.) cl. 72
V	11-76110AR No. 1 (3/8 frac.) cl. 72
W	21-76110AR No. 1 whole numbers, cl. 72
X	31-76110AR No. 1 cl. 74
Y	41-76110AR No. 1 cl. 76, 78
Z	1-706110R No. 1 cl. 75, 77
AA	73608 (72656)
AB	1-76902 No. 1 (1 req.)
AC	76900 No. 1 (8 or more req.)
AD	1A-76921 No. 2 shown } cl. 72
AE	11A-706921
AF	1-76921 No. 1 } all styles
AG	1-706921 } except cl. 72
AH	76927 No. 1 (3 x 10) (6 x 10) cl. 71, 74, 76, 78
AI	76927A No. 2 } (3 x 10) (6 x 10)
AJ	76927 No. 2 early } cl. 72, 73
AK	1-76927A No. 2 } (8 x 7) (7 x 7)
AL	1-76927 No. 3 early } cl. 72, 73
AM	11-76927A No. 2 } (5 x 8) (6 x 8)
AN	11-76927 No. 3 } (7 x 8) cl. 72, 73
AO	21-76927A No. 2 (10 x 6) decimal bar non-adds in reg. cl. 72
AP	31-76927A No. 2 (8 x 7) decimal bar non-adds in reg. cl. 72
AQ	1-76927 No. 5 (5 x 8) (6 x 8) (7 x 8) cl. 71, 74, 76, 78
AR	11-76927 No. 5 (7 x 7) (8 x 7) cl. 71, 74, 76, 78

1-76927 No. 6 (8 x 6) (10 x 6) cl. 71, 74, 76, 78
1-76927 No. 8 (5 x 8) (6 x 8) (7 x 8) decimal bar non-adds in reg. cl. 72
706927 No. 1 (3 x 14) (4 x 14) cl. 71, 74, 75, 76, 77, 78
706927 No. 2 (3 x 12) (4 x 12) (5 x 12) cl. 71, 74, 75, 76, 77, 78
1-706927A No. 7 (3 x 12) (4 x 12) (5 x 12) cl. 72, 73
1-706927 No. 8 (6 x 10) cl. 72, 73
1-706927 No. 9 (3 x 14) (4 x 14) cl. 72, 73
V 76537
W 76555
X 1-76110L No. 1 cl. 72, 74
1-76110L No. 2 cl. 76, 78
1-706110L No. 2 cl. 75, 77
Y 77514
Z 76302 No. 2 cl. 71, 72, 73, 74, 75
76302 No. 3 cl. 76, 77, 78
AB 76012 No. 1
706012 No. 2 used in rear
76809
AC 71160A No. 1
AD 71160 No. 1 early

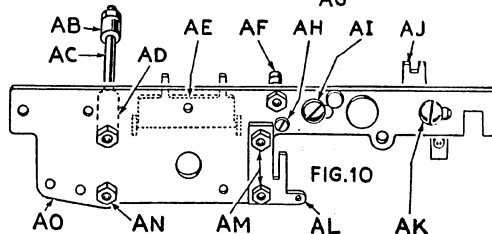
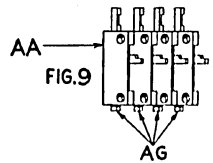
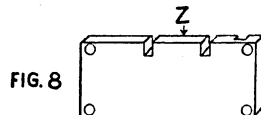
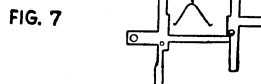
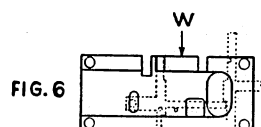
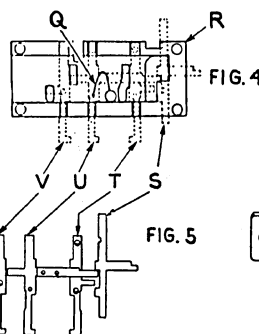
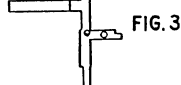
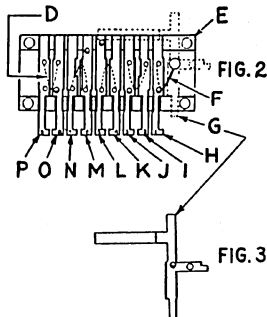
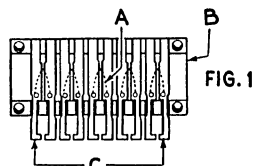
AE 1-71136 } use 71542 screw
1-701136 }
AF 74501
AF1 71803
AG 1-76114B
1-76114A early, use 83558 1/2 screw
1-706114A
AH 950 3/4
AI 70501
AJ 79610 screw, 79362 ecc.
83558 1/2 screw, use for early style AG with slot
AK 1-76154A No. 2
AL 76154 No. 1 use 76808 spring
AM 46
AN 76905 No. 1 block
AO 76556A screw
AP 76559
AQ 76926
706926
AR 74528
AS 47 nut, 71538 screw
AT 1-76919 No. 1
1-706919 No. 1
AU 76579
AV 76237 } late style guide comb, for
706237 } letter A, plate 22

STOP ASSEMBLY, $\frac{1}{8}$ FRACTION, NO. 1 (Plate 3)

(Plate 2 in Instruction Book only)

SYMBOLS (Plate 3)

A	76810 No. 1 spring
B	76900 No. 1
C	76130 No. 1 used for 0-2-4-6-8
	76130 No. 6 used for 1-3-5-7-9
D	76810 No. 3 (76810 No. 4 or 6)
E	1-76904 No. 1
F	76810 No. 4 spring
G	1-76133 No. 10
H	1-76133 No. 1
I	76133 No. 2
J	1-76133 No. 3
K	76133 No. 4
L	1-76133 No. 4
M	1-76133 No. 6
N	76133 No. 7
O	11-76133 No. 1
P	76133 No. 1
Q	76810 No. 2
R	1-76903 No. 1
S	1-76132 No. 4
T	1-76132 No. 1
U	1-76132 No. 2
V	1-76132 No. 3
W	76902 No. 2
X	76131 No. 1
Y	1-76131 No. 2
Z	76901 No. 2
AA	76900 No. 2
AB	76302 No. 2
AC	76012 No. 1
	76012 No. 2 used in rear
AD	76302 No. 1
AE	76153 No. 2* included in AO
AF	76545
AG	76130 No. 4
AH	76559
AI	74501
AJ	1-76139A
	1-76139 early
AK	74501
AL	76152A
AM	46
AN	46
AO	11-76110AR No. 1 see plate 1 for other styles

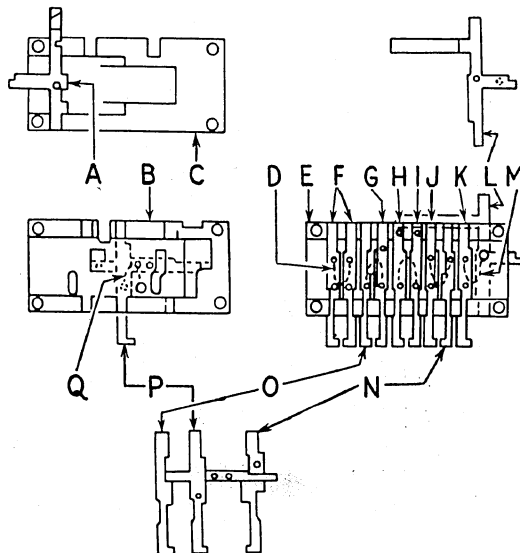


STOP ASSEMBLY, $\frac{1}{4}$ FRACTION (Plate 5)

(Plate 4 in Instruction Book only)

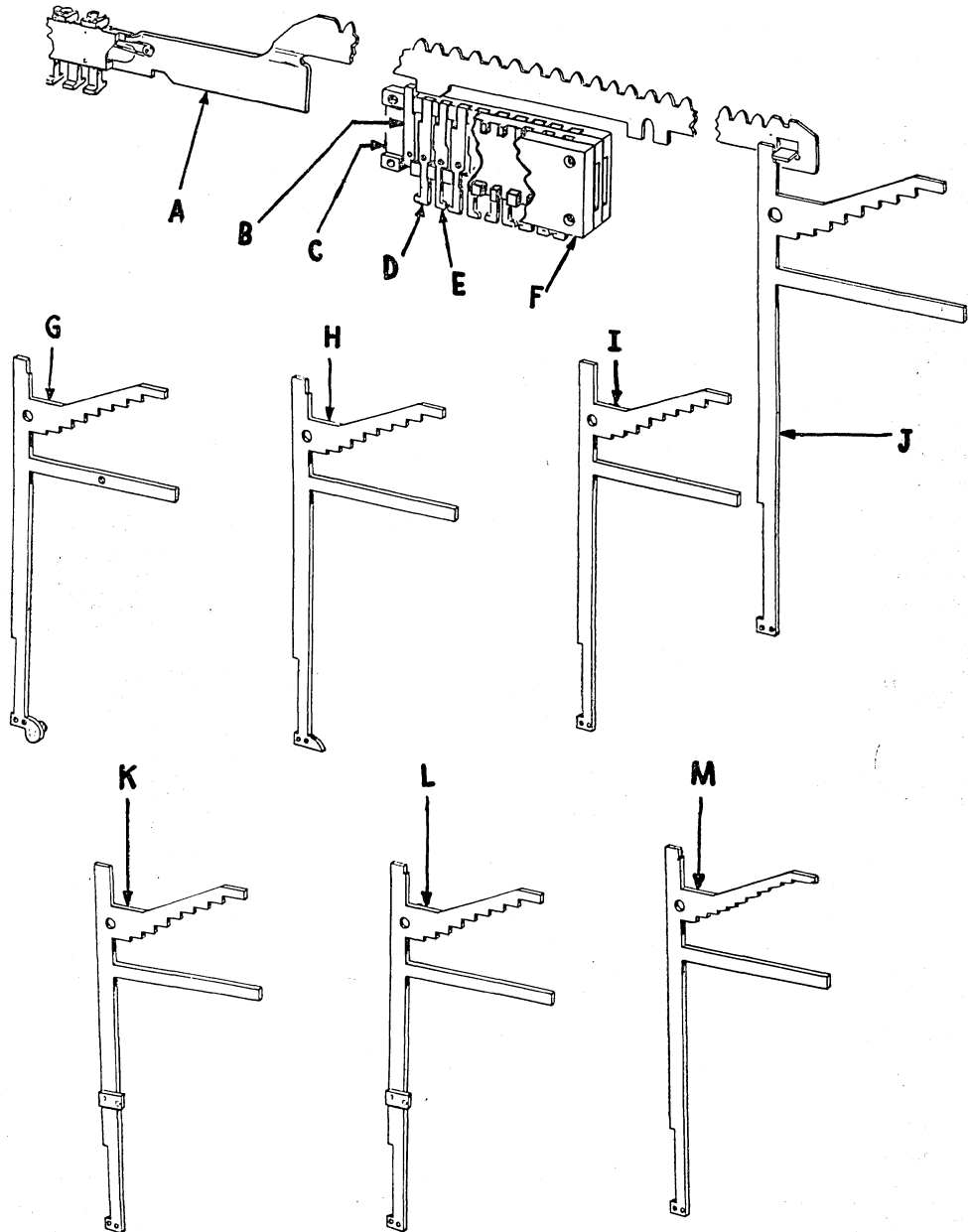
SYMBOLS (Plate 5)

A	1-76132 No. 4
B	1-76903 No. 1
C	76901 No. 6
D	76810 No. 3 (76810 No. 4 or 6)
E	1-76904 No. 1
F	76133 No. 1
G	76133 No. 6
H	1-76133 No. 4 with stud
I	76133 No. 4
J	76133 No. 3
K	76133 No. 1
L	1-76133 No. 10
M	76810 No. 4 spring
N	76133 No. 2
O	76133 No. 7
P	1-76132 No. 2
Q	76810 No. 2 spring



SEE EXPLANATION ON INSIDE OF FRONT COVER

RACK BAR STOP IN NO. 9 POSITION, PERMANENTLY INDEXED (Plate 2-1) (Plate 2 in Instruction Book Only)



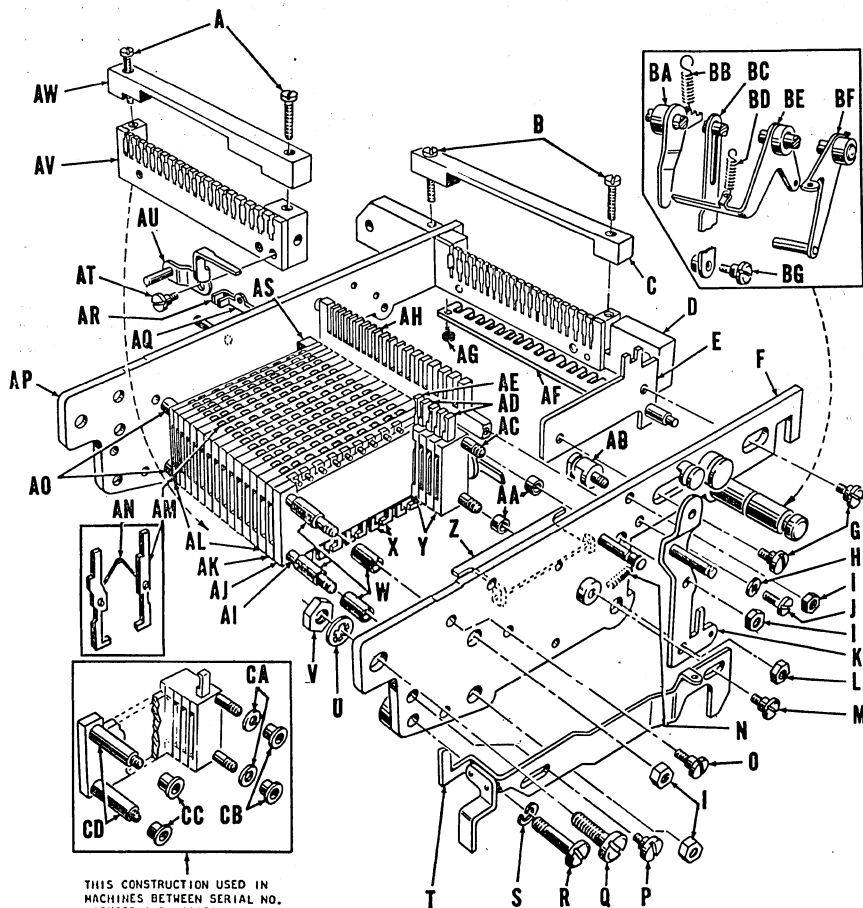
SYMBOLS (Plate 2-1)

- | | | | |
|---|---|---|---|
| A | See Rack Bar Chart in Printing Symbol List | I | 704151 No. 7 columns 1 and 2, $\frac{1}{8}$ fraction column 1, $\frac{1}{4}$ fraction |
| B | 706130 No. 2 No. 9 position, permanently indexed | J | 74151A No. 1 whole number columns, except multiplier factor columns |
| C | 76900 No. 1 .1245" thick
76900 No. 1 .125" thick
76900 No. 1 .1255" thick | K | 1-704151 No. 6
5 mills
1-113 Ftc. 133 No. 10
9 mills |
| D | 76130 No. 1 No. 0, 2, 4, 6 and 8 position | L | 1-74151A No. 2 full cent bar to add 5 in whole number column |
| E | 76130 No. 6 No. 1, 3, 5 and 7 position | M | 74151A No. 9 pence column, sterling machine |
| F | 76901 No. 3 | | |
| G | 1A-704151BL No. 4 column 16 | | |
| H | 704151AR No. 4 multiplier factor columns | | |

STOP ASSEMBLY

SERIES M200, M700, M800 (Plate 5-1)

Note: This construction began with Machine Serial No. M11121D



THIS CONSTRUCTION USED IN
MACHINES BETWEEN SERIAL NO.
M104690 AND M111210

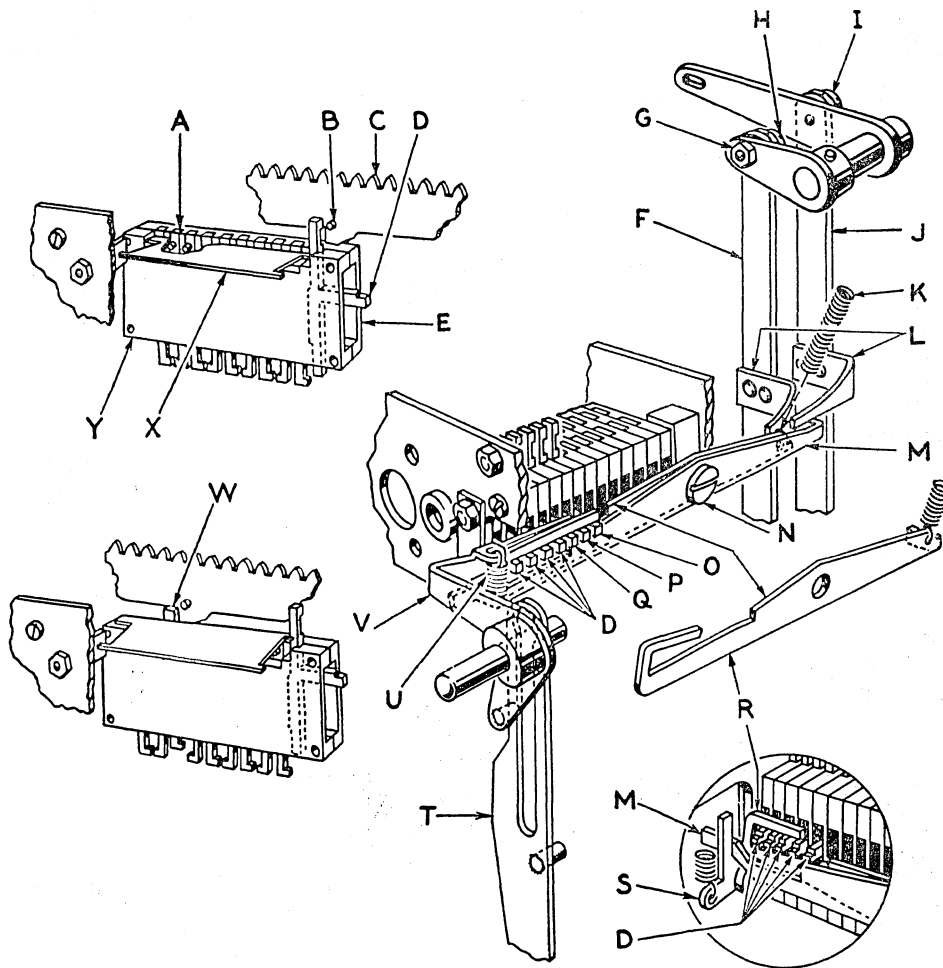
SYMBOLS (Plate 5-1)

A	706515 79565 for Series M700	P	71456
B	706515 706503 screw X275-5 lockwasher } for Series M700 49 1/2 nut	Q	71518
C	706920 No. 3	R	72583
D	706920 No. 1 for Series M700 1-706919A No. 2 1-706919 No. 3 for Style M222 1-706919 No. 1 for Series M700	S	X275-5 lockwasher
E	1-76139A 1-706139A for Series M700	T	1-126 Fte. 144 706128 Series M700
F	1-76110BR No. 1 Series M200 (1/16 fra.) 11-76110BR No. 1 Series M200 (1/8 fra.) 21-76110BR No. 1 Series M200 (whole numbers) 1-706110AR No. 1 Series M700 41-76110BR No. 1 Series M800 1-706110A No. 5 Series M700 (Sterling) 21-76110BR No. 2 Series M800 (Sterling) 1-706110AR No. 4 Style M803 1/4 (Sterling)	U	1097 1 1/16 lockwasher
G	74501 screws	V	47 nut
H	1097 1/16 lockwasher	W	PX561
I	46 nut	X	1-76130 No. 2 used for 1-3-5-7-9 1-76130 No. 3 used for 2-4-6-8
J	76559	Y	76900 No. 2
K	1-76236A	Z	76153 No. 1 included in F 76153 No. 2 for 1/8 fra.
L	46 3/4 nut	AA	706309
M	76528	AB	76545
N	76806	AC	706012 No. 1 upper and lower rear shafts
O	76537 screws for front comb 706502 for Series M700. Use 76537 for left side	AD	76130 No. 4
		AE	76130 No. 5
		AF	706237 guide comb for adding rack limit arms A, plate 22
		AG	76579 screws
		AH	706926
		AI	706012 No. 2 upper and lower front shafts
		AJ	76901 No. 1 1/10 frac. 76901 No. 2 1/8 frac. 76901 No. 3 whole numbers
		AK	1-76902 No. 1 1/10 frac. magazine plate
		AL	76900 No. 1 magazine plates
		AM	76130 No. 1 use for 0-2-4-6-8 76130 No. 6 use for 1-3-5-7-9
		AN	76810 No. 1 see plates 3 and 5 for other springs
		AO	76302 No. 2 space collar

SYMBOLS (Plate 5-1) Continued

- AP **1-706110AL No. 3** Series M200 beginning with machine Serial No. M10469D
1-706110AL No. 2 Series M700 beginning with machine Serial No. M10541D
1-76110AL No. 3 Series M800 beginning with machine Serial No. M10489D
- AQ **706154 No. 8**
706154 No. 11 full cent key to add .009 with whole number const.
- AR **1-706154A No. 9**
1-706154 No. 10 full cent key to add .009 with whole number const.
- AS **76905 No. 1** block
- AT **72656**
- AU **1-76125A**
- AV **11A-706921** for frac., includes AT and AV
1-706921 whole number const. or with frac. to NA and NP
- AW **706927C No. 12** adding cap. reg. No. 1 cols. 2 thru 13
 (9 999 999 999 99)
706927C No. 13 adding cap. reg. No. 1 cols. 2 thru 11
 (99 999 999 99)
706927C No. 14 adding cap. reg. No. 1 cols. 2 thru 9
 (999 999 99)
706927C No. 15 adding cap. reg. No. 1 cols. 2 thru 8, except M222 (99 999 99)
706927C No. 16 adding cap. reg. No. 1 cols 2 thru 7
 (9 999 99)
706927C No. 17 adding cap. reg. No. 1 cols. 1 thru 15
 (999 999 999 999 999)
 Style M222 (999 999 99)
 $\frac{1}{8}$ fractions (9 999 999 999 99 $\frac{1}{8}$)
- 706927C No. 18** adding cap. reg. No. 1 cols. 1 thru 12
 (999 999 999 999)
- 706927C No. 19** adding cap. reg. No. 1 cols. 1 thru 9
 (999 999 999)
- 706927C No. 20** adding cap. reg. No. 1 cols. 1 thru 8
 (99 999 999)
- 706927C No. 21** adding cap. reg. No. 1 cols. 1 thru 7
 (9 999 999)
- 706927C No. 22** adding cap. reg. No. 1 cols. 1 thru 10
 (9 999 999 999)
- 706927 No. 1** for Series M700
- BA **1-76144** Series M200, M800, **76306** space roller used between 1-76144 and side plate on M800
1-706150 for Series M700
- BB **76802** spring
- BC **1-76145** Series M200, M800
1-706145 Series M700
- BD **71807** spring
- BE **1-706147 No. 2**
- BF **1-76151** includes **76540** screw
- BG **76539** screw
- CA **77133**
- CB **Use 706309** for Series M200
Use PX561 2 req. for Series M700 and M800
- CC **Use PX561 2** req. for Series M200, M800, M700
Use PX561 2 req. for Series M803 $\frac{1}{4}$ Sterling
- CD **76302 No. 5**
76302 No. 1
76302 No. 4 for Sterling

FRACTION RACK BAR CONTROL (Plate 6)



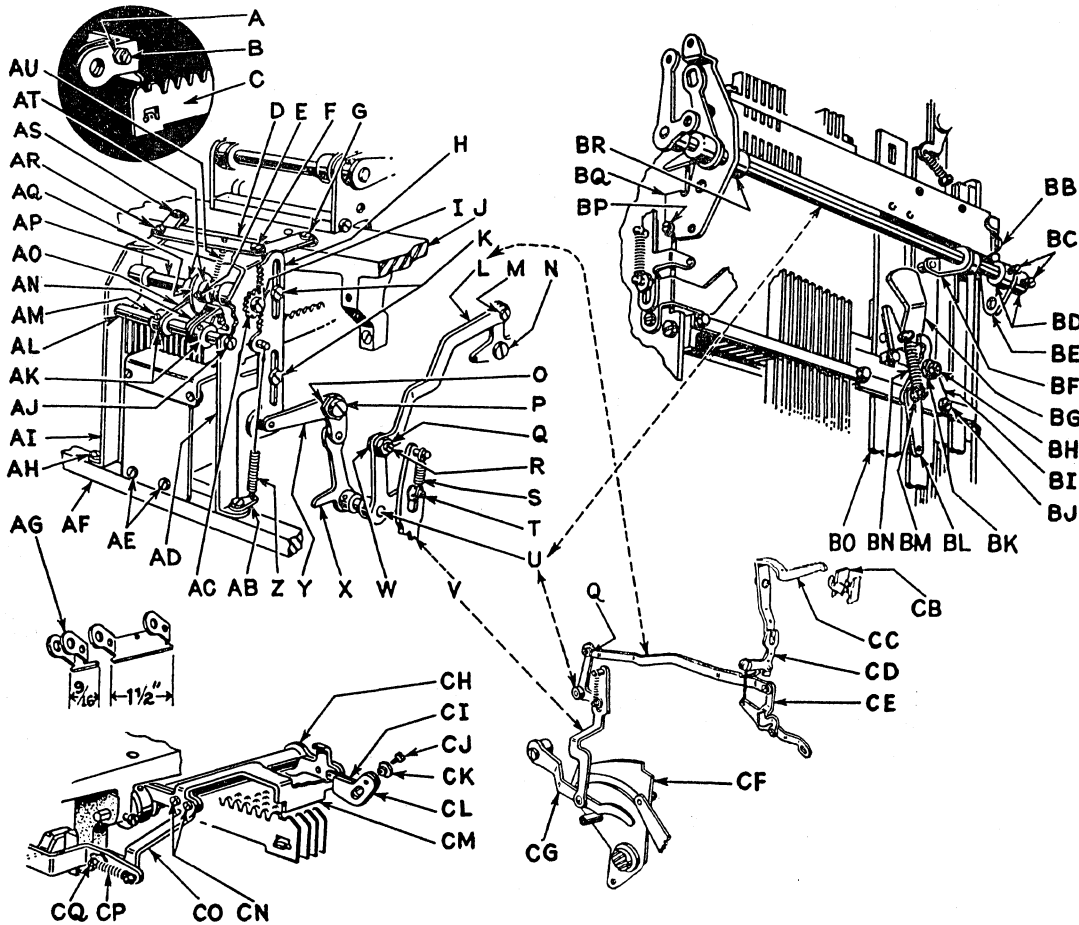
SYMBOLS (Plate 6)

SEE PLATES 1, 3 AND 5 FOR
COMPLETE STOP ASSEMBLIES

A 1-76130 No. 2 stops
B 1-76130 No. 3 stops
C 76520*
D 1-76111 specify no., see chart, plate
E 3-1 printing symbol list
F 76130 No. 4
G 1-76902 No. 1
H 1-709215 see plate 11 for other styles
I 46
J 72568 screw, 79322 ecc.
K 72568 screw, 79322 ecc.
L 1-79223A No. 2 see plate 9 for other
M styles
N 76808
O 79216 No. 1 and No. 2*
P 1-76154A No. 2 narrow base
Q 1-706154A No. 9 wide base
R 1-706154 No. 10 full cent key to add
S .009 with whole number const.

N 76556A
O 1-76131 No. 2
P 1-76132 No. 4
Q 1-76133 No. 10
R 76154 No. 1 narrow base
S 706154 No. 8 wide base
T 706154 No. 11 full cent key to add .009
U with whole number const.
V 76152A
W 1-76145 use 76539 screw
X 1-706145/in bottom
Y 71807 for 1/10 frac.
Z 71803 for 1/8 and 1/4 frac.
1-76147
1-706147 No. 1
76130 No. 1 used for } without
0-2-4-6-8 } stud
76130 No. 6 used for }
1-3-5-7-9 }
76153 No. 1*
76901 No. 1

FOUR POSITION ADD AND NON-ADD MECHANISM (Plate 6-1)



SYMBOLS (Plate 6-1)

A 71361 eccentric
 B 74502 screw
 C See plate 3-1, printing symbol list
 D 706126 wide base, Classes 72, 77, 78
 E 119A No. 2 Env. 1060B narrow base, Classes 72, 78
 F 75660 screw
 G 74587 screw
 H 73611 screw
 I Use 1-706124, 1-704050 No. 2, 1-704215, 704536, 8082A,
 J 74808, 1-704207 No. 2, 1-707145 No. 2, 76811, 704801,
 K 1-707143
 L 10751 1/2
 M 1-70668A No. 1 Env. 1060B narrow base, Class 72, 78
 N Use 1A-700668 No. 3 for wide base, Class 77
 O Use 1A-700668 No. 4 for wide base, Class 72, 78
 P 201532 upper screw, 46 nut
 Q 75633 lower screw, 46 nut
 R Use 704272
 S 79552 screw
 T Use 707508
 U 75342 eccentric
 V 73611 screw
 W 72367 eccentric
 X 79565 screw
 Y 60800 spring
 Z Use 704543 screw, 46 nut
 AA 21-3A No. 1 Env. 1060B narrow base, Class 74-76-78 machines
 AB 21-3A No. 2 Env. 1060B for wide base, Class 78 machines before Serial No. B135750; Class 77 with selective column tabulation machines before Serial No. B102390
 AC 31-3A No. 1 Env. 1060B narrow base, Class 72 machines

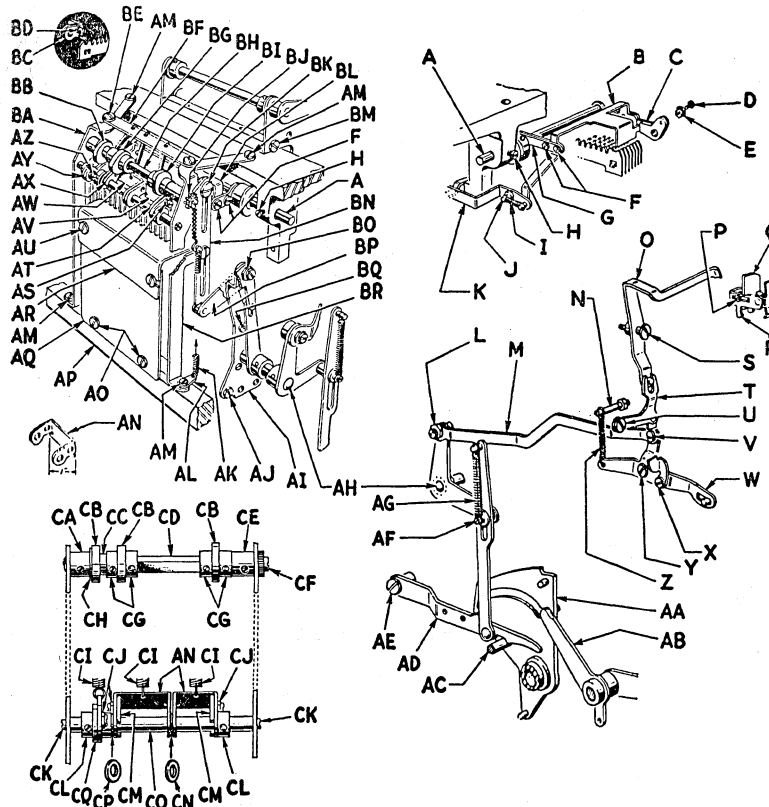
Use 1-704050 No. 2	for positive normalizing of control arm and non-add control bails	for wide base, Style 72xx22 machines before Serial No. A915672; other Class 72 machines before Serial No. B100107; Class 77 without selective column tabulation machines before Serial No. B102390
1-704215		
704536		
8082A		
74808		
1-704207 No. 2	for positive normalizing of non-add control bails only	
1-707145 No. 2		
76811		
704801		
1-707143		
1-706124	for positive normalizing of non-add control bails only	
11Z-704050		
1-704215		
704536		
8082A		
74808	Use 11-704207, use 7550 1/2 rivet	
Use 11-704207, use 7550 1/2 rivet		
49 nut		
Included in U		
Use 1-704217		
74812	20 No. 89 anchor	
AB		
AC		
AD		
AE		
AF	74000A Env. 1060B narrow base, Classes 72, 78	
AG	704000 No. 2 wide base, Classes 72, 77, 78	
AH	See AO for bails	
AI	73611 screw	
	Use 706119R	

SYMBOLS (Plate 6-1) Continued

AJ	950 $\frac{1}{2}$ screw	BO	Use 1A-704129 No. 3
AK	1-71321 includes AM	BP	350 $\frac{1}{2}$ screw
AL	2 No. 1 Env. 1060B narrow base, Cl. 72, 78 Use 706001 for wide base, Cl. 72, 77, 78	BQ	Use 1-704216L
AM	75660 screw	BR	73308*
AN	100 $\frac{1}{2}$ Env. 1060B	CB	Use 703125 $\frac{1}{2}$ No. 1 high control block 703125 $\frac{1}{2}$ No. 2 medium control block } 5th line control 703125 $\frac{1}{2}$ No. 3 low control block
AO	Use 706001, 11-706121 (one or more), 21 No. 9 (two or more)	CC	Use 1-709299 1-136A No. 2 Env. 1060A with prorate or auto. ext. in regular position
AP	4A No. 1 Env. 1060B narrow base, Cl. 72, 78 Use 706002 1-707301 for wide base, Cl. 72, 77, 78 1-706124	CD	1-112 No. 1 Env. 1060A narrow base Use 1-709298 wide base
AQ	706125 No. 1 for one position; high, medium, low or no block 706125 No. 2 for two position; high and medium, medium and low, low and no or no and high block	CE	1-103 Env. 1060A narrow base Use 1-707143 for wide base
AR	74587 screw	CF	11A-71129 see keyboard symbol list, plate 3, for other styles
AS	73611 screw	CG	Use 11-704207 includes V
AT	1-75332 collar, includes E	CH	173 Ftc. 133
AU	79807 spring	CI	Use 1-706121 No. 1 includes CJ, CK, CL
BB	74505 screw	CJ	74502 screw
BC	75618 screw	CK	71361 eccentric
BD	1-28345 includes BC	CL	Included in CI
BE	74216R No. 2	CM	See CO below
BF	Included in U	CN	73563 screw
BG	Included in BI	CO	709292 No. 7 blocks rack bars 8 to 15 709292 No. 8 blocks rack bars 9 to 15 709292 No. 9 blocks rack bars 10 to 15 709292 No. 10 blocks rack bars 11 to 15 709292 No. 11 blocks rack bars 12 to 15 709292 No. 12 blocks rack bars 14 and 15
BH	46 nut	CP	489 spring
BI	1-704268 includes BG, BH, BK, refer to U for improved part	CQ	706508 spring stud screw
BJ	74528 screw		
BK	709385 eccentric		
BL	20 No. 102		
BM	Use 704542 spring stud screw		
BN	71806		

FOUR POSITION ADD AND NON-ADD MECHANISM, CARRIAGE CONTROLLED—
WITH POSITIVE NORMALIZING (Plate 6-2)

Note: This mechanism was included in Style 72XX22 and Series M 222 machines beginning with Serial No. A915672, other Class 72 and Series M 200 machines beginning with Serial No. B100107.



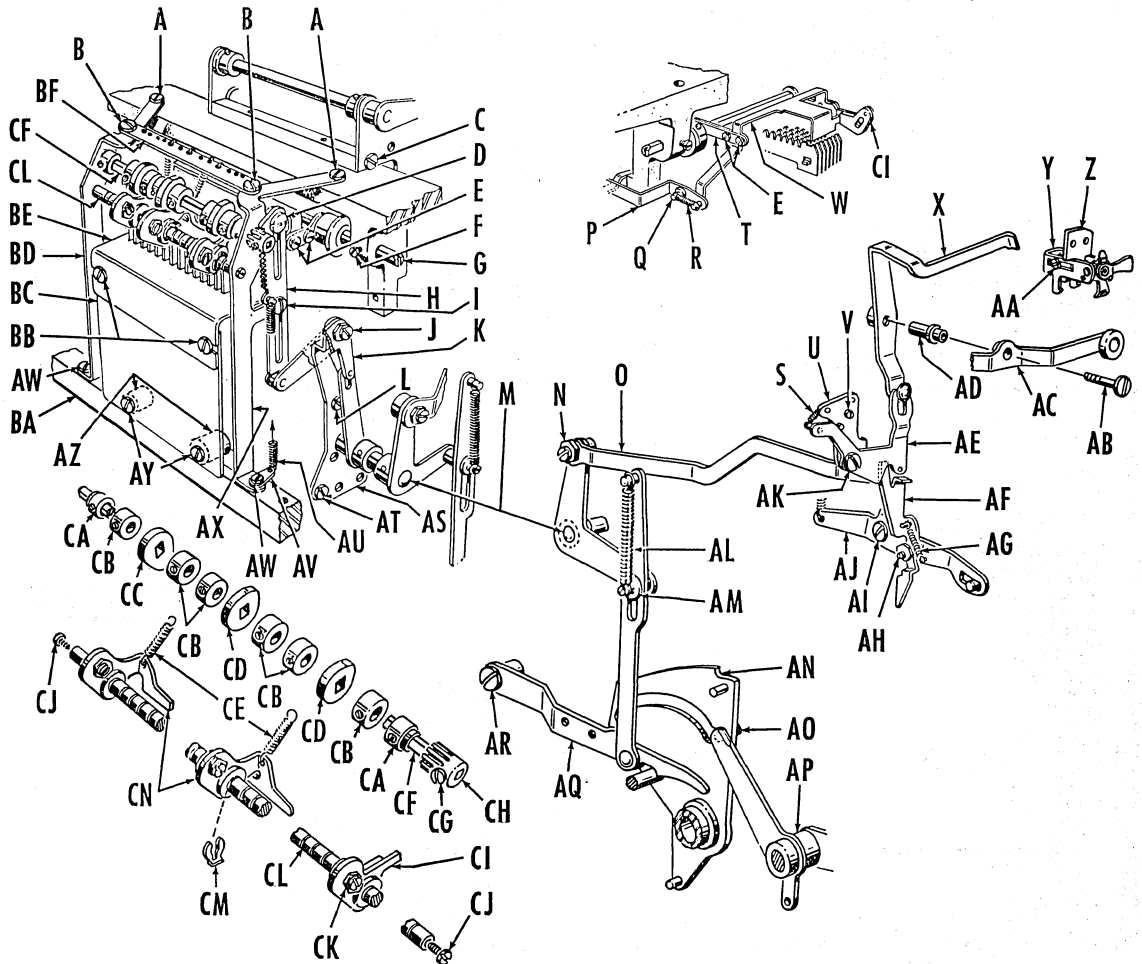
SYMBOLS ON BACK

SYMBOLS (Plate 6-2)

A	70501 pivot pin	AX	Use 706001, 1-706121 or 11-706121 (1 or more), 21 No. 9 (2 or more), trim 11-706121 to size
B	709292 No. 7 block columns 8 to 15	AY	Use 1-706121 includes AZ
	709292 No. 8 block columns 9 to 15	AZ	71361 eccentric
	709292 No. 9 block columns 10 to 15		74502 screw
	709292 No. 10 block columns 11 to 15	BA	Use 706119R
	709292 No. 11 block columns 12 to 15	BB	706125 No. 1 for one position; high, medium, low or no block
	709292 No. 12 block columns 14 and 15		706125 No. 2 for two position; high and medium, medium and low, low and no or no and high block
C	Use 1-706121, includes D and E	BC	Refer to AN for other bails
D	74502 screw	BD	71361 eccentric
E	71361 eccentric		74502 screw
F	73563 screws	BE	74587
G	709293R	BF	Use 706126
H	12052 set screw	BG	See BB for replacement parts
I	69806 spring	BH	Use 706002
J	706508 spring stud screw		1-707301 for square shaft
K	1-706232		1-706124
L	72367 eccentric	BI	See BB for replacement parts
	79565 screw	BJ	Use 706002, 1-706124, 1-707301
M	704272	BK	Use 201532 upper screw, 46 nut
N	706514		75633 lower screw, 46 nut
O	1-709299 No. 2	BL	709292A No. 1 block $\frac{1}{4}$ fractions
P	9050 $\frac{1}{4}$ screw		709292A No. 2 block $\frac{1}{4}$ fractions
Q	703125 $\frac{1}{4}$ No. 1 high		709292A No. 3 block decimal or $\frac{1}{10}$ fractions
	703125 $\frac{1}{4}$ No. 2 medium		709292 No. 4 block $\frac{1}{4}$ fractions
	703125 $\frac{1}{4}$ No. 3 low		709292 No. 5 block $\frac{1}{4}$ fractions
R	Use 1-73214C No. 2		709292 No. 6 block decimal or $\frac{1}{10}$ fractions
S	79607A with line 2C control lever	BM	79544
	705505 $\frac{1}{4}$ without line 2C control lever	BN	Use 1-706124
T	1-709298	BO	75342 eccentric
U	9153 $\frac{1}{8}$ screw		73611 screw
	46 $\frac{1}{4}$ nut	BP	Use 1-704217
V	79552 screw	BQ	504 Fte. 138 screw
W	1-707143	BR	Use 706119L
X	71546	CA	Use 1-706305
Y	707508	CB	See BB for replacement parts
Z	99807	CC	86313 No. 2
AA	11A-71129	CD	Use 706002
AB	Use 11A-701143, 1-707122B No. 2, 707514, 707303		1-707301 for square shaft
AC	71002		1-706124
AD	1-704207 No. 2	CE	Use 1-706305
AE	79585	CF	10751 $\frac{1}{2}$
AF	704543	CG	75332 collar
AG	704801		75660 set screw
AH	1-704050 No. 2 shaft assembly, includes AI	CH	127 Fte. 213
AI	1-704216L No. 2	CI	79807 spring
AJ	350 $\frac{1}{4}$	CJ	71361 eccentric
AK	76811 spring		74502 screw
AL	20 No. 89 spring anchor	CK	950 $\frac{1}{8}$ screw
AM	73611 screw	CL	1-71321 collar, includes 75660 set screw
AN	Use 706001, 11-706121 (one or more), 21 No. 9 (two or more), trim 11-706121 to size	CM	Use 706001, 1-706121 or 11-706121 (one or more), 21 No. 9 (two or more)
AO	72614	CN	300151 $\frac{1}{2}$
AP	Use 704000 No. 2	CO	Use 706001 shaft
AQ	704139 No. 2	CP	9825
AR	704100 No. 3	CQ	Use 1-706121 includes CJ
AS	71361 eccentric		
	74502 screw		
AT	Use 706001, 1-706121 or 11-706121 (one or more), 21 No. 9 (two or more)		
AU	74533 screw		
AV	Refer to AN for other bails		
AW	Refer to AN for other bails		

FOUR POSITION ADD AND NON-ADD MECHANISM, IMPROVED FOR EASY MODIFICATION, SERIES M200, M700, M800 (Plate 6-3)

NOTE: This construction began with machine Serial No. M8755D



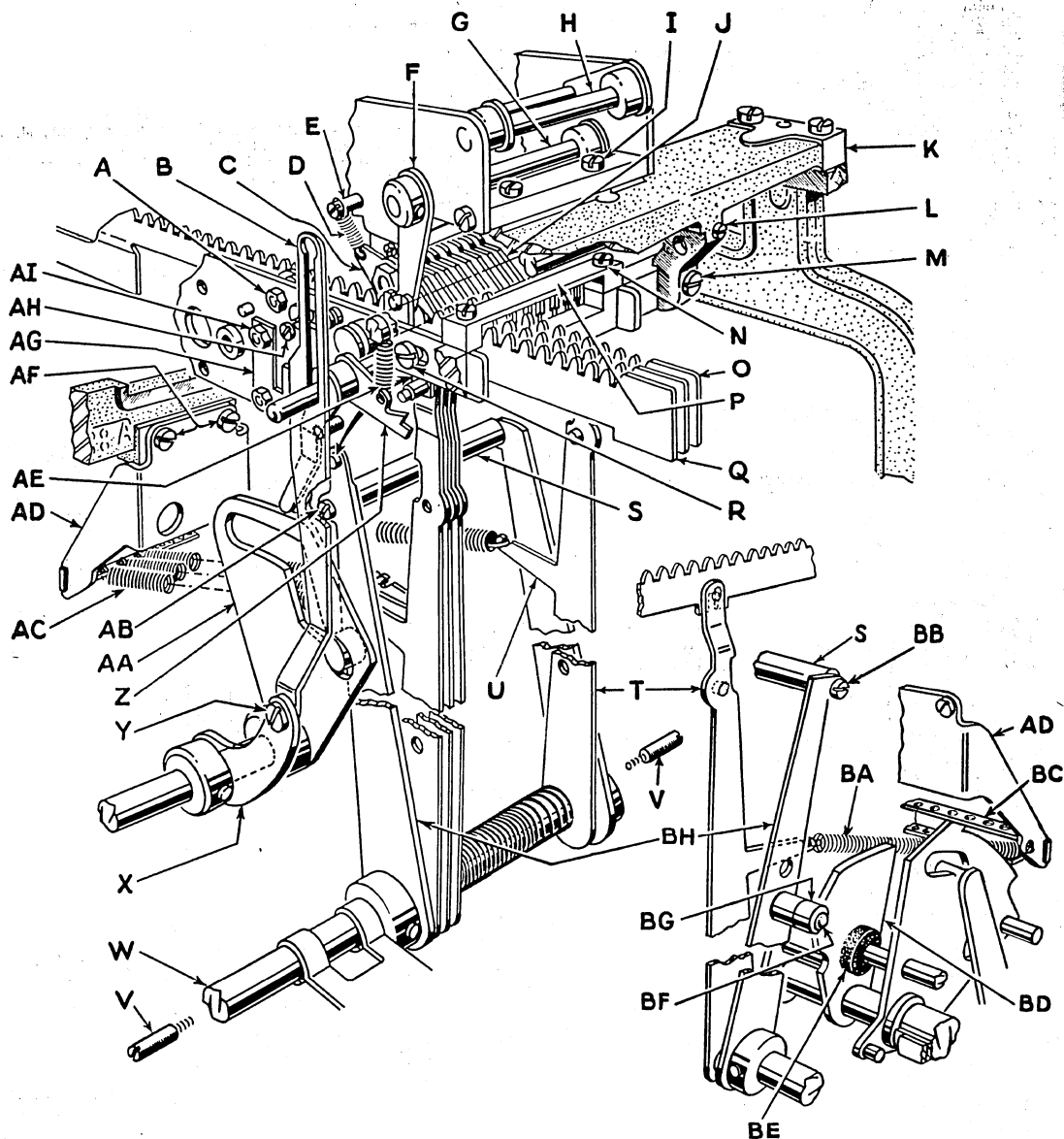
SYMBOLS (Plate 6-3)

A	73611	U	1-700125A No. 2
B	74587	V	75621
C	79544	W	709292A No. 1 blocks $\frac{1}{8}$ frac. col.
D	201532 eccentric screw		709292A No. 2 blocks $\frac{1}{4}$ frac. col.
E	46 nut		709292A No. 3 blocks $\frac{1}{10}$ decimal col.
F	73563 screws		709292 No. 7 blocks cols. 8 thru 15
G	12052 set screw		709292 No. 8 blocks cols. 9 thru 15
H	700501 $\frac{1}{2}$ eccentric pin		709292 No. 9 blocks cols. 10 thru 15
I	1-706124		709292 No. 10 blocks cols. 11 thru 15
J	75633 screw		709292 No. 11 blocks cols. 12 thru 15
K	46 nut		709292 No. 12 blocks cols. 14 and 15
L	73611 screw	X	1-709299 No. 2
M	75342 eccentric	Y	1-73214C No. 2
N	1-704217	Z	703125 $\frac{1}{2}$ No. 1 high } 5th line
O	504 Fte. 138		703125 $\frac{1}{2}$ No. 2 med. } control
P	1-704050 No. 2 shaft assembly, in-		703125 $\frac{1}{2}$ No. 3 low }
Q	cludes AS	AA	9050 $\frac{1}{4}$ screw
R	72367 eccentric	AB	52519
S	79565 screw		705505 $\frac{1}{4}$ screw for mchs. without
T	704272		control arm AC
	1-706232 for Series M222	AC	11A-709254 No. 2 Series M200 and
	1-76232 for Series M200 except M222		M800 after mch. Serial No. M8755D
	706508		and Series M700 after Serial No.
	69806 for Series M222		M10001D
	489 for Series M200 except M222	AD	709392 bushing used in conjunction
	2887 $\frac{1}{2}$		with AC
	709293R	AE	1-709298A
	709293L		11-709298A for Series M700

SYMBOLS (PLATE 6-3) Continued

AF 1-707143½	AU 76811 spring
AG 44808 spring	AV 20 No. 89 anchor
AH 74502 screw	AW 73611 screw
AI 71361 eccentric	AX 706119L
AJ 707508	AY 72614 screws
AK 1-707143	AZ 74309 spacers
AK 9153¼ screw	BA 704002 No. 2 use two 700506 screws
AK 46¼ nut	BB 74533 screws
AL 704801 spring	BC 704139 No. 2
AM 704543 spring anchor screw	BD 706119R
AN 11A-71129 for Series M200	BE 704100 No. 3
AN 31A-71129 for Series M700 and M800	BF 706126
AO 71334 No. 2 roller	CA 1-706305 includes 75660 screw
AO 71532 No. 2 stud	CB 75332 collar, use 75660 screw
AP 11A-701143 for Series M200 after mch.	CC 706125 No. 1 single position cam
No. M8055D and M800 after	CD 706125 No. 2 two position cam
M8113D	CE 79807 spring
Use 11A-701143	CF 706002 square shaft
1-707122B No. 2	CG Included in CH
707514	CH 1-707301 gear, includes 73563 screw
707303	CI 1-706121 includes CK, use two 21
46 nut	No. 9 clips
X275-5 washer	CJ 950¼ screw
AQ 1A-704207 No. 2 for Series M200 after	CK 71361 eccentric
machine Serial No. M7464D and	74502 screw
M3075E and for Series M700 and	CL 706001
M800 after M7579D. Contains	CM 21 No. 9 clip
short hub	CN 11-706121 includes CK. Use two 21
AR 8054¼ screw	No. 9 clips. Blocks 9 adding racks.
AS 1-704216L No. 2	Remove stock to suit blocking
AT 350¼	requirements

RACK BAR CONTROL (Plate 7)



SYMBOLS (Plate 7)

A	46 ¹ / ₂ nut, 76545 slotted screw	Q	1-76111 No. 41 stamped 1-41
B	1-76145		1-76111 No. 40 used in next three cols. } dummy bars
C	1-706145	R	74501
D	79220 No. 2	S	71014
E	79804		701014
F	79007 shaft	T	1-71150A No. 1 } used in 1st position, wide and narrow
G	1-79201* included in G		1-71150 No. 1 early } base, cl. 72
H	1-79015		1-71150A No. 2 } with upper anchor U, used in 3rd position,
I	1-79017		1-71150 No. 2 } wide and narrow base, cl. 72, also used for
J	1-709017		early } cl. 74, 75—5 or more req.
K	79545		1-71150A No. 3 } with lower anchor U, used in 2nd and 4th
	79220 No. 1 use 79804 springs		1-71150 No. 3 } positions, wide and narrow base, cl. 72, also
L	1A-70668 No. 1		early } used for cl. 74, 75—5 or more req.
M	1A-70668 No. 3 cl. 75, 77		11-71150A No. 2 } with upper anchor U, used in other posi-
N	1A-70668 No. 4 all wide base except cl. 75, 77		11-71150 No. 2 } tions, wide and narrow base, all styles
O	950 ¹ / ₂		early } except cl. 74, 75
P	71538 use 47 nut		11-71150A No. 3 } with lower anchor U, used in other posi-
	74528		11-71150 No. 3 } tions, wide and narrow base, all styles
	1-76111 Specify No. see chart, plate 3-1 printing symbol list		early } except cl. 74, 75
	76920A	U	Description only, see letter T
	706920 No. 1		

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 5-20-40

For Form 2954

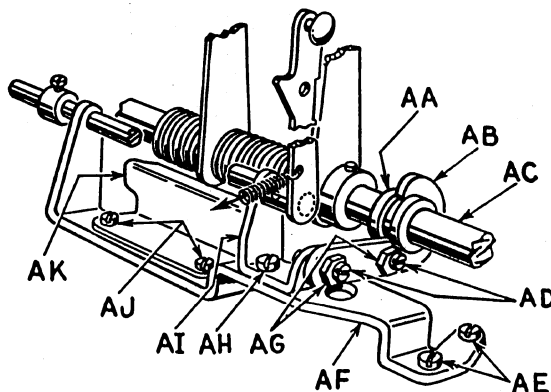
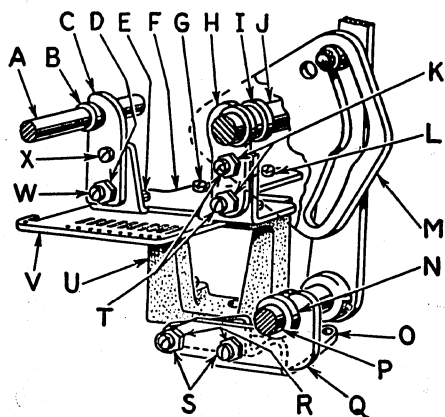
SYMBOLS (Plate 7)—Continued

V 71547
W 1A-71012 (1B-71012, 1-701148)
includes S, V, AB, BH, cl. 72
11A-71012 cl. 74
21A-71012 cl. 76
31B-71012 cl. 78
1A-701012 cl. 76, 77
11A-701012 with reg. des. mech.
21A-701012 cl. 74, 75
31A-701012 cl. 78
51B-701012 cl. 72
X 1-71123*
Y 76539
Z 1-76144
1-706150
AA 1-71124A*
AB 71553
AC 71809 upper springs
71810 No. 2 used on extreme left, cl. 78

specify machine
style and number

AD 11-71154 cl. 72, 74, 76, 78
1-701154 No. 2 cl. 76, 77, 78
AE 76802 narrow base
71806 wide base
AF 71553
AG 76152A
AH 76559
AI 46
BA 71810 lower springs
BB 71553
BC 71153 complete assembly 1-71153 includes AC, BA, cl. 72,
complete assembly 11-71153, cl. 74, 76, 78
701153 complete assembly 1-701153, cl. 76, 77, 78, complete
assembly 21-701153, cl. 72
BD 71128A*
BE 71912
BF 71550 No. 2 stud, 279 wire ring
BG 71338 roller
BH 1-71149AL* included in W

SUPPORTS FOR MAIN OPERATING SHAFTS (Plate 7-1)



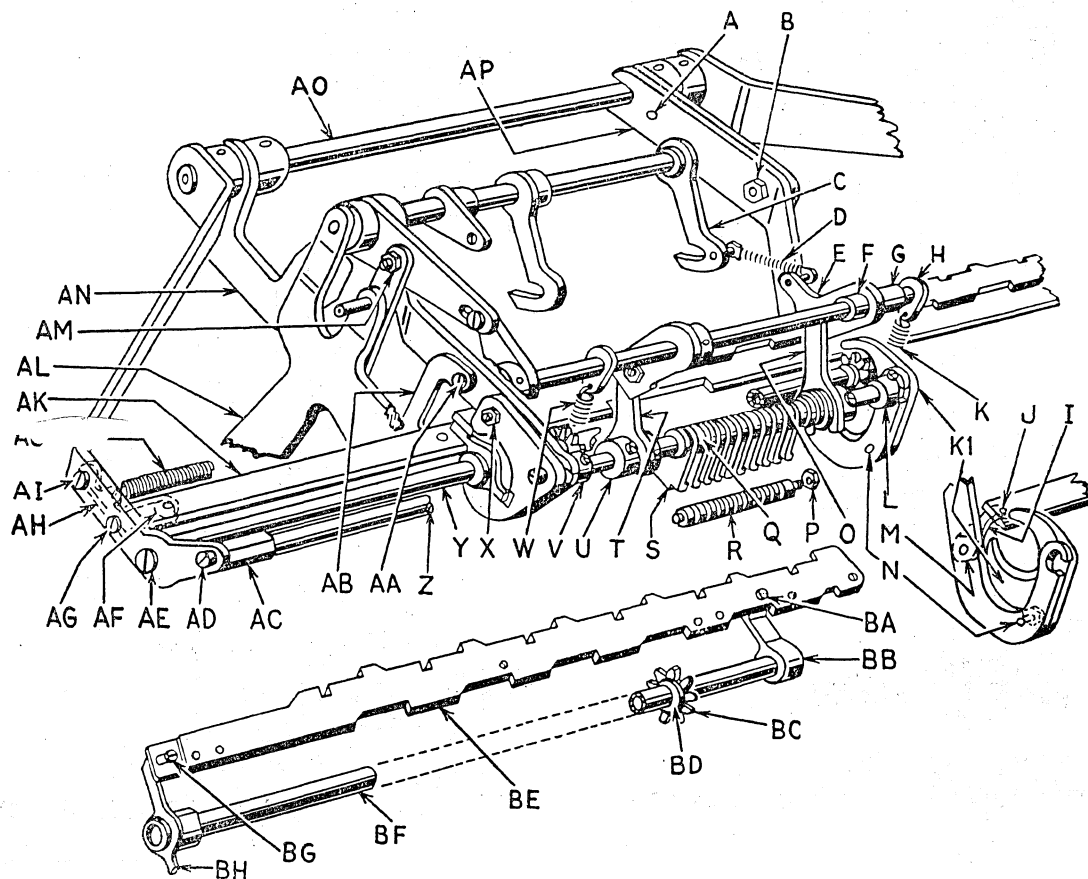
SYMBOLS (Plate 7-1)

A 51B-71004 assembled shaft, specify machine style and number
B 71391
C 72276 1/2 A
D 79333 No. 1
E 79610 screw
F 72276B
G 72581
H 72238 1/2
I 701311
J 51C-71001 assembled shaft, see power symbol list supplement,
plate 13-1, for other styles
K 79362
L 72581
M 1-71124A*
N 71392
O 72120 1/2 A No. 1 class 72
72120 1/2 A No. 2 class 78
P 31B-71012 assembled shaft, see plate 7
Q 72121 1/2 A
R 79362 ecc.
S 72568 screws

T 72568
U 72672 casting only
31D-72672 class 72
41A-72672 class 78
51A-72672 class 78 (f.s.d., f.s.d.f.)
V 72277 No. 1 regular
72277 No. 2 f.s.d., f.s.d.f.
W 71553
X 72581
AA 71392
AB 702121 1/4
AC 31A-701012 see plate 7, for other styles
AD 79505
AE 71554
AF 702120 1/2 A No. 1 for class 72
702120 1/2 A No. 2 for classes 77 and 78
AG 79362
AH 103500
AI 702120 3/8
AJ 72584
AK 702120 3/4

assembled casting
includes C, D, E, F, G,
H, K, L, T, U, V, W, X

REGISTER ASSEMBLY (Plate 8)



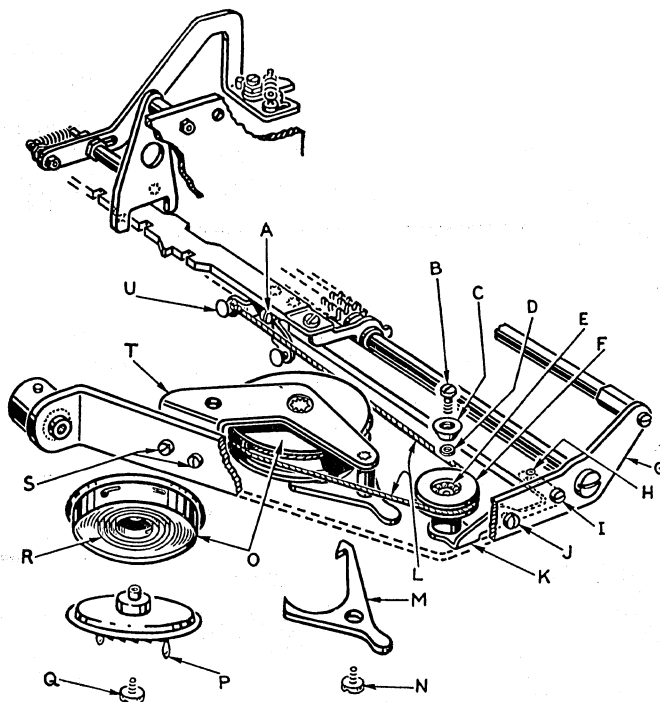
SYMBOLS (Plate 8)

A	79598	X	12051 3/8 screw, 79333 No. 1 ecc.	
B	47 nut	Y	79019 No. 6 narrow base } 60 pinion	shaft only
	71316 eccentric		709019 No. 4 wide base	
	701580 No. 2 screw		79019 No. 5 narrow base—50 pinion	
C	1-79219 No. 2 shown, cl. 72, 74, 76, 78	Z	1-79006 No. 1 includes P, Q, R, S, U; for 3 reg. or less	
	709219 No. 1 cl. 75, 77		1-79006 No. 6 Specify 5 x 10, 6 x 8, 7 x 7 or 8 x 6; 50 pinion	narrow base, 10 digit construction
D	1-79808 No. 2		1-79006 No. 7 Specify 6 x 10, 7 x 8, 8 x 7 or 10 x 6; 60 pinion	
E	1-79229 No. 3 cl. 72, 74, 76, 78		Use 1A-709006 No. 2, 79143BL, 702300 No. 2 for 3 x 12, 4 x 12, 5 x 12 capacity	
F	709228 No. 2 cl. 75, 77		Use 11A-709006 No. 2, 79143BL, 702300 No. 2 for 3 x 15, 4 x 15 capacity	Class 78 and Series M 800 wide base, 60 pinion, 15 digit construction, before machine Serial No. B240438
G	79355 collar		Use 61A-709006 No. 2 Specify 10 x 6, 8 x 7, 7 x 8 or 6 x 10, 79143BL, 702300 No. 2 for 10 x 6, 8 x 7, 7 x 8 or 6 x 10 capacity	
H	79589 screw, shown		Use 41A-709006 No. 2, 79143BL, 702300 No. 2 for 3 x 12, 4 x 12, 5 x 12 capacity	
I	709540 hex. screw, cl. 75, 77		51-709006 No. 2 for 3 x 14, 4 x 14 capacity	Class 72 and Series M 200 wide base, 60 pinion, 15 digit construction, before machine Serial No. B240438
J	20 No. 98		Use 51E-709006 No. 2, 79143BL, 702300 No. 2 for 3 x 15, 4 x 15 capacity	
K	79143R brace		Use 71A-709006 No. 2 Specify 10 x 6, 8 x 7, 7 x 8, 6 x 9, or 6 x 10, 79143BL, 702300 No. 2 for 10 x 6, 8 x 7, 7 x 8, 6 x 9 or 6 x 10 capacity	
K1	12055 3/8 screw			
L	79812A No. 2			
M	79812 No. 2 early			
N	79144R&L			
O	1-79371 includes 72573 screw			
P	8054 3/4 screw			
Q	12051 3/8 screw, 79333 No. 1 ecc.			
R	79230 No. 2 cl. 72, 74, 76, 78			
S	709230 cl. 75, 77			
T	49			
U	79315 No. 1 Style 25 (.125)			
V	79315 No. 1 Style 26 (.126)			
W	79003 No. 1			
	79109 No. 1 for 3 reg. or less			
	79109A No. 5 } 50 and 60 pinion			
	79109 No. 5 early }			
	79230 No. 2			
	1-79317A No. 3 includes 72573 screw			
	1-79371 includes, machines before Serial No. B240438			
	72573 set screw			
	1-79371 No. 2 includes, machines after Serial No. B240438			
	72573 set screw			
	79812A No. 2 } for 4 or more reg.			
	79812 No. 2 early }			
	79812 No. 1 for 3 reg. or less			

SYMBOL NUMBERS (Plate 8)—Continued

1A-709006 No. 2 for 3 x 12, 4 x 12, 5 x 12 capacity	Series M 800 60 pinion, 15 digit construction, after machine	AL 11A-79235A No. 3
11A-709006 No. 2 for 3 x 15, 4 x 15 capacity	Serial No. B240438	11-709235 No. 1
61A-709006 No. 2 Specify 10 x 6, 8 x 7, 7 x 8 or 6 x 10 capacity		AM 79322 ecc., 72568 screw
41A-709006 No. 2 for 3 x 12, 4 x 12, 5 x 12 capacity	Series M 200 60 pinion, 15 digit construction, after machine	AN 79142AL
51B-709006 No. 2 for 3 x 15, 4 x 15 capacity	Serial No. B240438	AO 11A-79000 No. 2 frame only, specify style and machine no.
71A-709006 No. 2 Specify 10 x 6, 8 x 7, 7 x 8, 6 x 9 or 6 x 10 capacity		AP 79142AR No. 2
AA 8054 $\frac{3}{4}$		BA 79505 (50 and 60 pinion)
AB 79143AL	machines before	76559 (3 reg. or less)
12055 $\frac{1}{8}$ screw on bottom	Serial No. B240438	BB 79900AR No. 2
79143BL	machines after	BC 79116 No. 1
12055 $\frac{1}{8}$ screw on bottom	Serial No. B240438	79116 No. 6 pinion without wide tooth
AC 79346		BD 79303 No. 2 (25) (.125)
AD 79512		79303 No. 2 (26) (.126)
AE 8054 $\frac{3}{4}$		79303 No. 6 (25) (.125)
AF 7356 $\frac{1}{2}$ screw		79303 No. 6 (26) (.126)
AG 79508		BE 1-79130 No. 1 used with 3 reg. or less
AH 79103A No. 1 anchor		1-79130A No. 7 (6 x 8)
AI 73611 screw, 46 nut		1-79130A No. 8 (7 x 7)
AJ 79800 No. 2 used with 4 or more reg.		1-79130A No. 9 (8 x 6)
79800 No. 3 used with 3 or more reg., motor reg. return, 50 pinion		1-79130A No. 10 (5 x 10)
79800 No. 4 used with 3 or more reg., motor reg. return, 60 pinion		1-79130A No. 11 (6 x 10)
79800 No. 5	used with 3 reg. or less	1-79130A No. 12 (7 x 8)
79800 No. 1 early		1-79130A No. 13 (8 x 7)
AK 79935 No. 1 used with 3 reg. or less		1-79130A No. 14 (10 x 6)
79935 No. 7 (5 x 10)		1-709130 No. 2 (3 x 12) (4 x 12) (5 x 12) cl. 74, 76, 78
79935 No. 8 (6 x 8)	50 pinion	1-709130 No. 3 (3 x 15) (4 x 15) cl. 72, 74, 76, 78
79935 No. 9 (7 x 7)		1-709130 No. 4 (6 x 10) cl. 72, 74, 76, 78
79935 No. 10 (8 x 6)		21-79130A No. 11 (6 x 10)
79935 No. 11 (6 x 10)		21-79130A No. 12 (7 x 8)
79935 No. 12 (7 x 8)		21-79130A No. 13 (8 x 7)
79935 No. 13 (8 x 7)	60 pinion	21-79130A No. 14 (10 x 6)
79935 No. 14 (10 x 6)		21-709130 No. 3 (3 x 14) (4 x 15)
709931 No. 3 (3 x 15) (4 x 15) cl. 74, 76, 78		21-709130 No. 8 (3 x 12) (4 x 12) (5 x 12)
709931 No. 4 (3 x 12) (4 x 12) (5 x 12) cl. 74, 76, 78		BF 79024 No. 6 hollow shaft only, complete assembled pinion shaft 1A-79024 No. 6, for 60 pinion, includes BB, BC, BD, BF, BH; specify style and machine number
709931 No. 5 (6 x 10) cl. 74, 76, 78		79024 No. 5 hollow shaft only, complete assembled pinion shaft 1A-79024 No. 5, for 50 pinion; specify style and ma- chine number
709931 No. 8 (6 x 10) cl. 72		1A-79019 No. 1 complete assembled pinion shaft
709931 No. 9 (3 x 12) (4 x 12) (5 x 12) cl. 72		1-79019 No. 1 for 30 pinion, specify style early and machine number
709931 No. 10 (3 x 14) (4 x 15) cl. 72		BG 79511
		BH 1-79146

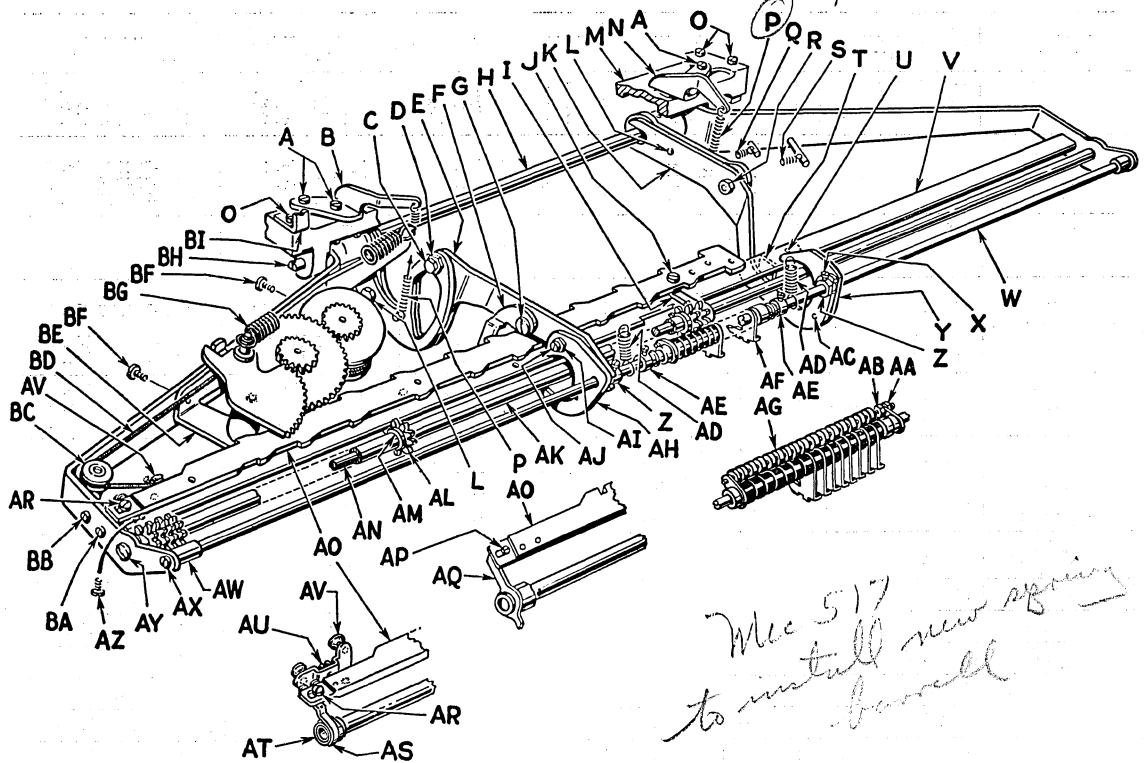
REGISTER WITH SPRING BARREL ASSEMBLY CLASSES 72 AND 78 (Plate 8-1)



SYMBOLS (Plate 8-1)

A	74533 screw
B	79554
C	79328
D	79156 No. 1 (.006)
E	79156 No. 2 (.008)
F	4499 ball bearings
G	79373
H	11A-79000 No. 2 frame only, specify machine style and number
I	7356 $\frac{1}{2}$ screw
J	79508
K	73611 screw, 46 nut
L	1-79162 includes B, C, D, E, F
M	Use 709902 No. 2
N	79165
O	8054 $\frac{3}{4}$
P	2-79163 complete spring barrel assem- bly, includes M, N, O, P, Q, R, T
Q	1-79166
R	8054 $\frac{3}{4}$
S	83 No. 9A drum spring
T	74523
U	1-79163 bracket only
	1-79277D retainer for cord

REGISTER ASSEMBLY—100 PINION CONSTRUCTION— SERIES M 200 AND M 800 MACHINES (Plate 8A)



SYMBOLS (Plate 8A)

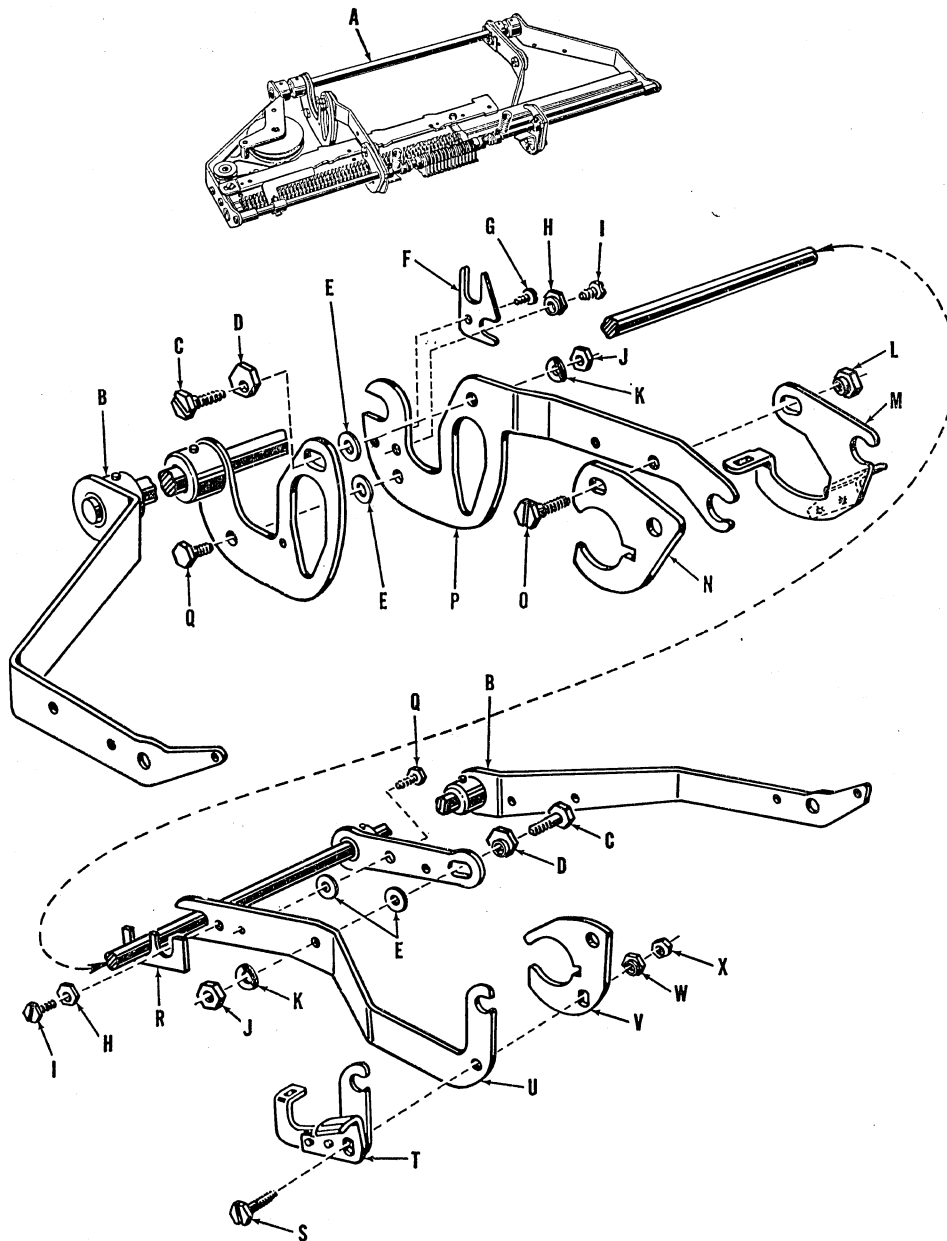
A	75602	T	79143R brace	before machine	AJ	79505 screw—before machine Serial
B	20L No. 144		8054 1/4 screw for brace to brace	Serial No. M3466D		No. B240438
C	701580 No. 2 hex. head screw		1-79143AR brace—after machine			701569 screw } after machine
	86129 washer		Serial No. M3466D			702300 No. 2 ecc. } Serial No.
	47 nut					nut } B240438
D	71316 eccentric	U	12055 1/2 screw } for brace to brace		AK	709024 No. 6 tube for pinion wheels
E	709142AL before machine Serial No.		X275-3 washer			See chart for complete tube with
	M6720D	V	See chart below			pinions
	709142AL No. 2 after machine Serial	W	See chart below		AL	79116 No. 1 pinion wheels
	No. M6720D	X	72573 set screw		AM	79303 No. 2 Style 25 spacer .125"
F	79143AL before machine Serial No.	Y	79144R			79303 No. 2 Style 26 spacer .126"
	B240438	Z	1-79371 used on right and left side—		AN	709019 No. 7 pinion shaft
	79143BL between machine Serial No.		before machine Serial No. B240438		AO	See chart below
	B240438 and M3466D		1-79371 on right } between machine		AP	79511
	1-79143BL after machine Serial No.		side } Serial No. B240438		AQ	1-79146
	M3466D		1-79371 No. 2 on } and M3466D		AR	709635
G	8054 1/4		left side		AS	1-709146 1/2
H	Instruction purpose only		1-79371 No. 2 used on right and left		AT	Use 1-79146A
I	79900AR No. 2		side—after machine Serial No.		AU	74533
J	79505		M3466D		AV	1-79277D
K	79142AR No. 2 before machine Serial	AA	49		AW	79346 for right and left
	No. M6720D	AB	47 1/4		AX	79512
	79142AR No. 3 after machine Serial	AC	79505 screw		AY	8054 1/4
	No. M6720D		79333 No. 1 eccen-		AZ	7356 1/2
L	79598 screw		tric		BA	79508
M	1A-700668 No. 4 casting, includes BH		79647 screw		BB	79610 screw
N	20R No. 144		79333 No. 1 eccen-			46 nut
O	700506		tric		BC	1-79162 before machine Serial No.
P	388 before machine Serial No. M6720D		46 nut			M9606D
	83838 left side } after machine Serial	AD	79812A No. 2			1-709190 after machine Serial No.
	8084A right side } No. M6720D	AE	1-79317A No. 3 includes set screw			M9606D
	16380B spring		72573		BD	709902 No. 1 cord 24' long
Q	47 nut	AF	79109A No. 5 before machine Serial		BE	2-709164 complete tabulating gear
R	86129 washer		No. M7292D			assembly
	71316 eccentric		709109 No. 4 after machine Serial No.		BF	2855 1/4
	701580 No. 2 screw		M7292D		BG	709808
S	79800 No. 5	AG	709003 No. 2		BH	700501 1/2 pivot pin
		AH	79144L			950 1/4 set screw
		AI	79333 No. 1 eccentric		BI	709260

(OVER)

SYMBOLS (Plate 8A) Continued

MACHINE STYLE	REGISTER CAPACITY	REGISTER PINION ASSEMBLY	REGISTER ESCAPEMENT RACK	PINION GUIDE BLADE	CARRY PAWL SHAFT ASSEMBLY
M213	(8x12) 1/10 Frac. (10x10) 1/10 Frac. (12x8) 1/10 Frac.	11-709024 No. 6 41-709024 No. 6 21-709024 No. 6	1 -709130 No. 16 1 -709130 No. 18 1A-709130 No. 15	709931 No. 19 709931 No. 23 709931 No. 21	31B-709006 No. 6 41B-709006 No. 6 21B-709006 No. 6
M213 Fractions Non-add, Non-print	(8x12) (10x10) (12x8)	Special—Order by Letter 1-709024 No. 6 1-709024 No. 6	1 -709130 No. 16 1 -709130 No. 17 1A-709130 No. 15	709931 No. 19 709931 No. 22 709931 No. 20	31B-709006 No. 6 61B-709006 No. 6 1B-709006 No. 6
M215	(8x10) 1/10 Frac. (10x10) 1/10 Frac. (12x8) 1/10 Frac.	41-709024 No. 6 41-709024 No. 6 21-709024 No. 6	1 -709130 No. 18 1 -709130 No. 18 1A-709130 No. 15	709931 No. 23 709931 No. 23 709931 No. 21	41B-709006 No. 6 41B-709006 No. 6 21B-709006 No. 6
M215 Fractions Non-add, Non-print	(8x10) (10x10) (12x8)	Special—Order by Letter Special—Order by Letter 1-709024 No. 6	1 -709130 No. 18 1 -709130 No. 18 1A-709130 No. 15	709931 No. 23 709931 No. 23 709931 No. 20	41B-709006 No. 6 41B-709006 No. 6 1B-709006 No. 6
M216	(8x9) 1/10 Frac. (10x9) 1/10 Frac. (12x8) 1/10 Frac.	41-709024 No. 6 41-709024 No. 6 21-709024 No. 6	1 -709130 No. 18 1 -709130 No. 18 1A-709130 No. 15	709931 No. 25 709931 No. 25 709931 No. 21	51B-709006 No. 6 51B-709006 No. 6 21B-709006 No. 6
M216 Fractions Non-add, Non-print	(8x9) (10x9) (12x8)	Special—Order by Letter Special—Order by Letter 1-709024 No. 6	1 -709130 No. 18 1 -709130 No. 18 1A-709130 No. 15	709931 No. 25 709931 No. 25 709931 No. 21	51B-709006 No. 6 51B-709006 No. 6 21B-709006 No. 6
M222	(12x8) (6x15)	1-709024 No. 6 1-709024 No. 6	1A-709130 No. 15 1 -709130 No. 19	709931 No. 24 709931 No. 24	71B-709006 No. 6 71B-709006 No. 6
M225	(8x12)	1-709024 No. 6	1 -709130 No. 16	709931 No. 18	11B-709006 No. 6
M226	(10x10)	1-709024 No. 6	1 -709130 No. 17	709931 No. 22	61B-709006 No. 6
M227	(12x8)	1-709024 No. 6	1A-709130 No. 15	709931 No. 20	1B-709006 No. 6
M805	(8x12)	1-709024 No. 6	1 -709130 No. 16	709931 No. 18	11B-709006 No. 6
M806	(10x10)	1-709024 No. 6	1 -709130 No. 17	709931 No. 22	61B-709006 No. 6
M807	(12x8)	1-709024 No. 6	1A-709130 No. 15	709931 No. 20	1B-709006 No. 6

REGISTER ASSEMBLY—60 PINION—SERIES M200 AND M800 MACHINES (Plate 8B)



SYMBOLS (Plate 8B)

A 2A-709000 No. 2A specify } complete
machine style and number } register
also register capacity } assembly
B 1A-709000 No. 2 frame only
C 701580 No. 2 screw
D 71316 eccentric bushing
E 7521 1/2 space washer
F 709142 1/2 L No. 2 brace
G 209510 screw

H 701331 eccentric bushing
I 709638 screw
J 47 nut
K 86129 lockwasher
L 702300 No. 2 shoulder nut
M 1-79143BL brace
N 79144L brace
O 701569 screw
P 709142AL brace

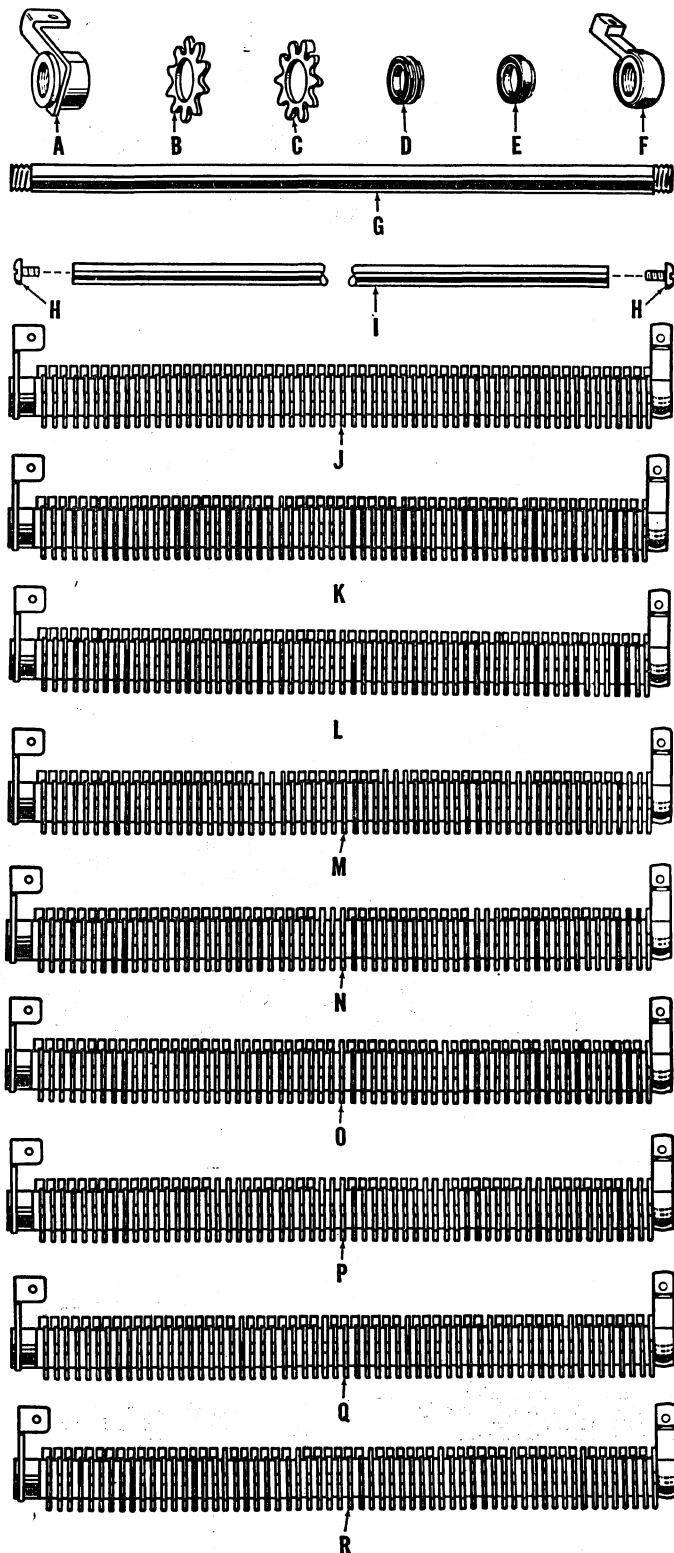
Q 79598 screw
R 709142 1/2 R No. 2 brace
S 79647 screw
T 1-79143AR brace
U 79142AR No. 2 brace
V 79144R brace
W 79333 No. 1 eccentric bushing
X 46 nut

REGISTER ASSEMBLY—60 PINION—PINION ASSEMBLY—SERIES M200 AND M800 MACHINES (Plate 8C)

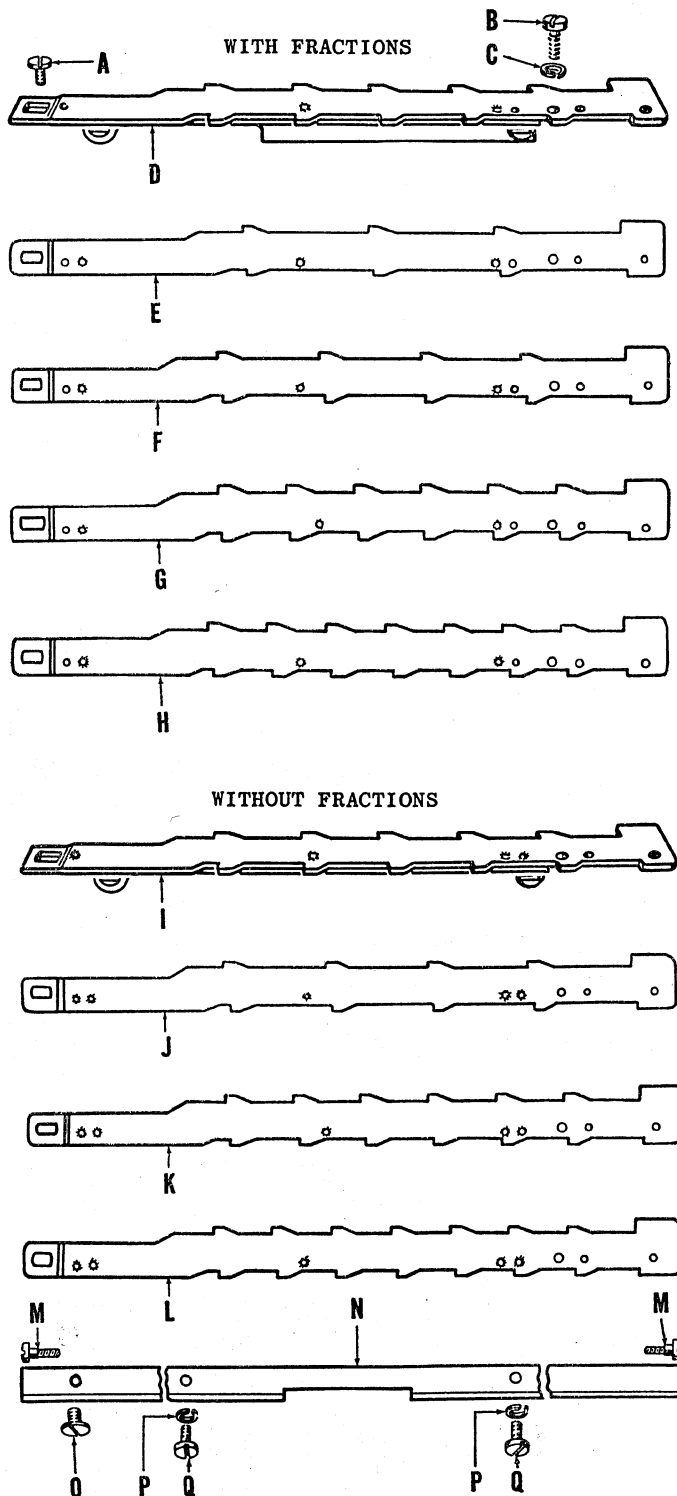
SYMBOLS (Plate 8C)

- | | |
|---|---------------------------------------|
| A | 1-79146A bracket left side |
| B | 79116 No. 6 pinion without wide tooth |
| C | 79116 No. 1 pinion with wide tooth |
| D | 79303 No. 2 (26) spacer .026" |
| E | 79303 No. 2 (25) spacer .025" |
| F | 79900AR No. 2 bracket right side |
| G | 709024 No. 6 tube |
| H | 8054 3/4 screw |
| I | 709019 No. 4 shaft |
| J | 21-709024 No. 2 Series |
| K | M800 (5x12) (6x10) |
| L | 51-709024 No. 2 Series |
| M | M200 (5x12) with 1/10 fractions |
| N | 61A-709024 No. 2 Series |
| O | M200 (4x15) with 1/10 fractions |
| P | 91-709024 No. 2 Series |
| Q | M200 (5x12) with 1/8 fractions |
| R | 101A-709024 No. 2 Series |
| | M200 (4x15) with 1/8 fractions |
| | 121-709024 No. 2 Series |
| | M200 (6x10) with 1/10 fractions |
| | 131-709024 No. 2 Series |
| | M200 (6x10) with 1/8 fractions |
| | 141-709024 No. 2 Series |
| | M200 (7x8) with 1/10 fractions |
| | 151-709024 No. 2 Series |
| | M200 (8x7) with 1/10 fractions |

pinion
assembly
—refer to
Plate 8F
for other
uses



REGISTER ASSEMBLY—60 PINION—ESCAPEMENT RACKS AND GUIDE BLADES—SERIES M200 AND M800 MACHINES (Plate 8D)



SYMBOLS (Plate 8D)

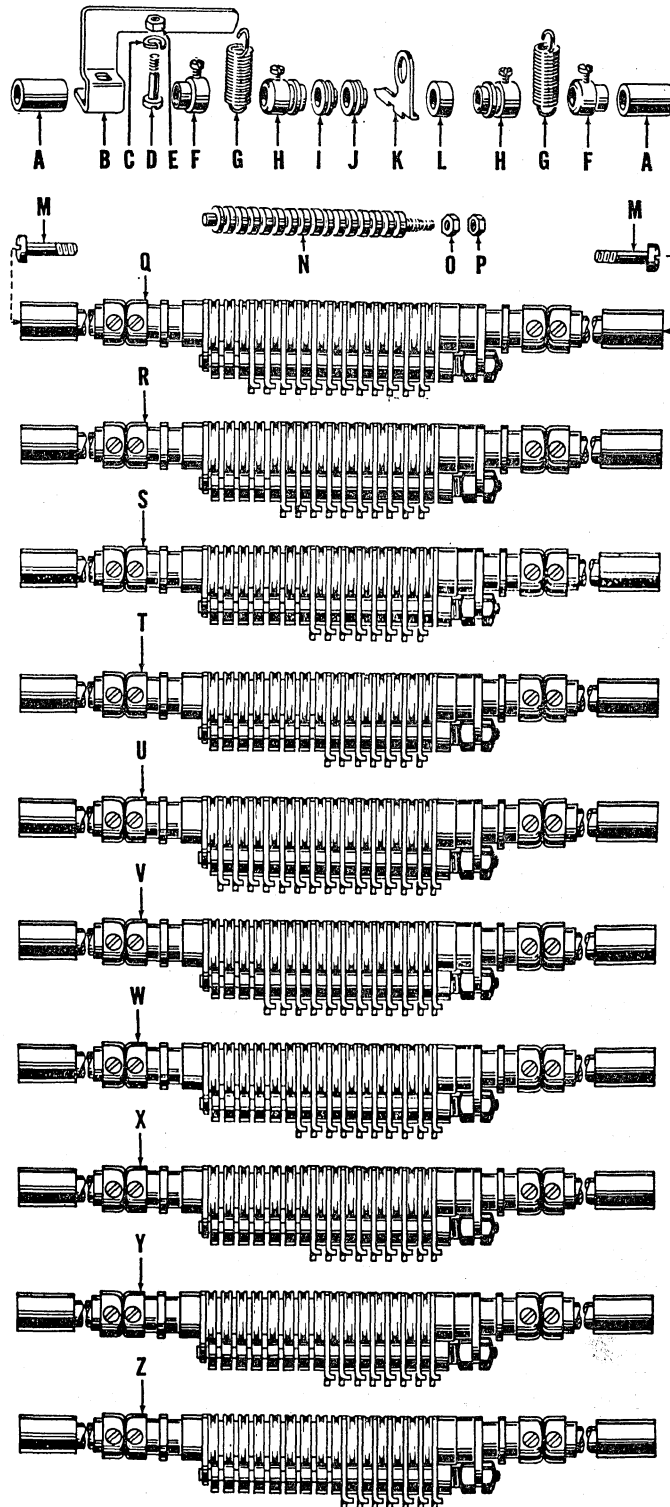
A	79511 screw	
B	79505 screw	
C	X275-5 lockwasher	
D	21A-709130A No. 9 (6x10)	escapement racks—for machines with fractions
E	21A-709130A No. 3 (4x15)	
F	21A-709130A No. 8 (5x12)	
G	21B-709130A No. 10 (7x8)	
H	21A-709130A No. 11 (8x7)	escapement racks—for machines without fractions
I	1-709130A No. 4 (6x10)	
J	1-709130A No. 2 (5x12)	
K	1-709130A No. 10 (7x8)	
L	1-709130A No. 11 (8x7)	
M	79508 screw	
N	709931 No. 4 12 capacity —M200 without fractions and M800	escapement blades
	709931 No. 5 10 capacity —M800	
	709931 No. 8 10 capacity —M200 with or without fractions	
	709931 No. 9 12 capacity —M200 with fractions	
	709931 No. 10 15 capacity —M200 with or without fractions	
	709931 No. 13 8 capacity —M200 with fractions	
	709931 No. 14 8 capacity —M200 without fractions and M800	
	709931 No. 15 7 capacity —M200 with or without fractions	
	709931 No. 16 7 capacity —M200 without fractions and M800	
	709931 No. 17 9 capacity —M200 with or without fractions	
O	7356 1/2 screw	
P	X275-3 lockwasher	
Q	12055 5/8 screw	

Note: Refer to chart, Plate 8F, for other uses of escapement racks and blades.

REGISTER ASSEMBLY—60 PINION—CARRY PAWL SHAFTS— SERIES M200 AND M800 MACHINES (Plate 8E)

SYMBOLS (Plate 8E)

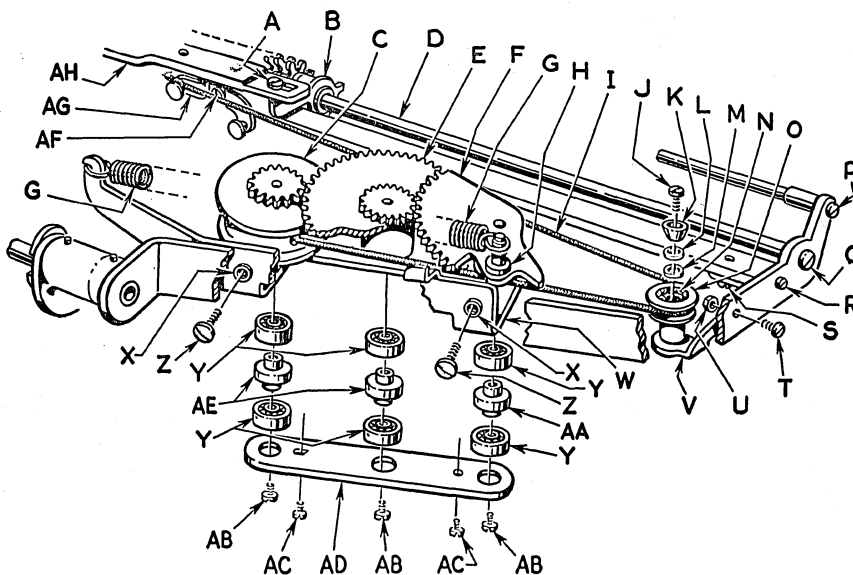
- A 79346 threaded collar
 - B 709181 register limit
 - C X275-5 lockwasher
 - D 709543 screw
 - E 46 nut
 - F 1-79371 No. 2 collar—includes 72573 set screw
 - G 79812A No. 2 spring
 - H 1-79317A No. 3 collar—includes 72573 set screw
 - I 79315 No. 1 (26) spacer .026"
 - J 79315 No. 1 (25) spacer .025"
 - K 709109 No. 4 carry pawl
 - L 709386 space collar
 - M 79512 screw
 - N 709003 No. 2 carry pawl limit shaft
 - O 47¼ nut
 - P 49 nut
 - Q 1B-709006 No. 2 (5x12) Series M200 fractions N.A.N.P. and M800
 - R 61B-709006 No. 2 (6x10) Series M200 fractions N.A.N.P. and M800
 - S 61B-709006 No. 2 (7x8) Series M200 fractions N.A.N.P. and M800
 - T 61B-709006 No. 2 (8x7) Series M200 fractions N.A.N.P. and M800
 - U 51C-709006 No. 2 (4x15) Series M200 with or without fractions
 - V 41B-709006 No. 2 (5x12) Series M200 with fractions
 - W 71B-709006 No. 2 (6x10) Series M200 with or without fractions
 - X 71B-709006 No. 2 (6x9) Series M200 with or without fractions
 - Y 71B-709006 No. 2 (7x8) Series M200 with fractions
 - Z 71B-709006 No. 2 (8x7) Series M200 with fractions
- Note: Refer to Plate 8F for other uses.



REGISTER ASSEMBLY—60 PINION—PINION ASSEMBLY, ESCAPEMENT RACK, GUIDE BLADE AND CARRY PAWL SHAFT CHART —SERIES M200 AND M800 MACHINES (Plate 8F)

MACHINE STYLE	REGISTER CAPACITY	REGISTER PINION ASSEMBLY	REGISTER ESCAPEMENT RACK	PINION GUIDE BLADE	CARRY PAWL SHAFT ASSEMBLY
M231	(4x10) 1/10 Frac. (5x10) 1/10 Frac. (6x10) 1/10 Frac. (7x8) 1/10 Frac. (8x7) 1/10 Frac.	121 -709024 No. 2 121 -709024 No. 2 121 -709024 No. 2 141 -709024 No. 2 151 -709024 No. 2	21A-709130A No. 9 21A-709130A No. 9 21A-709130A No. 9 21B-709130A No. 10 21A-709130A No. 11	709931 No. 8 709931 No. 8 709931 No. 8 709931 No. 13 709931 No. 15	71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (7x8) 71B-709006 No. 2 (8x7)
M231 Fractions Non-add, Non-print	(4x10) (5x10) (6x10) (7x8) (8x7)	Special—Order by Letter Special—Order by Letter Special—Order by Letter 21 -709024 No. 2 21 -709024 No. 2	21A-709130A No. 9 21A-709130A No. 9 21A-709130A No. 9 1 -709130A No. 10 1 -709130A No. 11	709931 No. 8 709931 No. 8 709931 No. 8 709931 No. 14 709931 No. 16	71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 61B-709006 No. 2 (7x8) 61B-709006 No. 2 (8x7)
M233	(4x15) 1/10 Frac. (5x12) 1/10 Frac. (6x10) 1/10 Frac. (7x8) 1/10 Frac. (8x7) 1/10 Frac.	61A-709024 No. 2 51 -709024 No. 2 121 -709024 No. 2 141 -709024 No. 2 151 -709024 No. 2	21A-709130A No. 3 21A-709130A No. 8 21A-709130A No. 9 21B-709130A No. 10 21A-709130A No. 11	709931A No. 10 709931 No. 9 709931 No. 8 709931 No. 13 709931 No. 15	51C-709006 No. 2 41B-709006 No. 2 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (7x8) 71B-709006 No. 2 (8x7)
M233 Fractions Non-add, Non-print	(4x15) (5x12) (6x10) (7x8) (8x7)	Special—Order by Letter 21 -709024 No. 2 21 -709024 No. 2 21 -709024 No. 2 21 -709024 No. 2	21A-709130A No. 3 1 -709130A No. 2 1 -709130A No. 4 1 -709130A No. 10 1 -709130A No. 11	709931A No. 10 709931 No. 4 709931 No. 5 709931 No. 14 709931 No. 16	51C-709006 No. 2 1B-709006 No. 2 61B-709006 No. 2 (6x10) 61B-709006 No. 2 (7x8) 61B-709006 No. 2 (8x7)
M234	(4x15) 1/8 Frac. (5x12) 1/8 Frac. (6x10) 1/8 Frac.	101A-709024 No. 2 91 -709024 No. 8 131 -709024 No. 2	21A-709130A No. 3 21A-709130A No. 8 21A-709130A No. 9	709931A No. 10 709931 No. 9 709931 No. 8	51C-709006 No. 2 41B-709006 No. 2 71B-709006 No. 2 (6x10)
M234 Fractions Non-add, Non-print	(4x15)	Special—Order by Letter	21A-709130A No. 3	709931A No. 10	51C-709006 No. 2
M235	(4x9) 1/10 Frac. (6x9) 1/10 Frac. (7x8) 1/10 Frac. (8x7) 1/10 Frac.	121 -709024 No. 2 121 -709024 No. 2 141 -709024 No. 2 151 -709024 No. 2	21A-709130A No. 9 21A-709130A No. 9 21B-709130A No. 10 21A-709130A No. 11	709931 No. 17 709931 No. 17 709931 No. 13 709931 No. 15	71B-709006 No. 2 (6x9) 71B-709006 No. 2 (6x9) 71B-709006 No. 2 (7x8) 71B-709006 No. 2 (8x7)
M235 Fractions Non-add, Non-print	(4x9) (6x9) (7x8) (8x7)	Special—Order by Letter Special—Order by Letter 21 -709024 No. 2 21 -709024 No. 2	21A-709130A No. 9 21A-709130A No. 9 1 -709130A No. 10 1 -709130A No. 11	709931 No. 17 709931 No. 17 709931 No. 14 709931 No. 16	71B-709006 No. 2 (6x9) 71B-709006 No. 2 (6x9) 61B-709006 No. 2 (7x8) 61B-709006 No. 2 (8x7)
M236	(4x10) 1/10 Frac. (5x10) 1/10 Frac. (6x10) 1/10 Frac. (7x8) 1/10 Frac. (8x7) 1/10 Frac.	121 -709024 No. 2 121 -709024 No. 2 121 -709024 No. 2 141 -709024 No. 2 151 -709024 No. 2	21A-709130A No. 9 21A-709130A No. 9 21A-709130A No. 9 21B-709130A No. 10 21A-709130A No. 11	709931 No. 8 709931 No. 8 709931 No. 8 709931 No. 13 709931 No. 15	71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (7x8) 71B-709006 No. 2 (8x7)
M236 Fractions Non-add, Non-print	(4x10) (5x10) (6x10) (7x8) (8x7)	Special—Order by Letter Special—Order by Letter Special—Order by Letter 21 -709024 No. 2 21 -709024 No. 2	21A-709130A No. 9 21A-709130A No. 9 21A-709130A No. 9 1 -709130A No. 10 1 -709130A No. 11	709931 No. 8 709931 No. 8 709931 No. 8 709931 No. 14 709931 No. 16	71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 71B-709006 No. 2 (6x10) 61B-709006 No. 2 (7x8) 61B-709006 No. 2 (8x7)
M237	(4x7) 1/10 Frac. (5x7) 1/10 Frac. (6x7) 1/10 Frac. (7x7) 1/10 Frac. (8x7) 1/10 Frac.	151 -709024 No. 2 151 -709024 No. 2 151 -709024 No. 2 151 -709024 No. 2 151 -709024 No. 2	21A-709130A No. 11 21A-709130A No. 11 21A-709130A No. 11 21A-709130A No. 11 21A-709130A No. 11	709931 No. 15 709931 No. 15 709931 No. 15 709931 No. 15 709931 No. 15	71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7)
M237 Fractions Non-add, Non-print	(4x7) (5x7) (6x7) (7x7) (8x7)	Special—Order by Letter Special—Order by Letter Special—Order by Letter Special—Order by Letter	21A-709130A No. 11 21A-709130A No. 11 21A-709130A No. 11 21A-709130A No. 11 21A-709130A No. 11	709931 No. 15 709931 No. 15 709931 No. 15 709931 No. 15 709931 No. 15	71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7) 71B-709006 No. 2 (8x7)
M802	(5x12) (6x10) (7x8) (8x7)	21 -709024 No. 2 21 -709024 No. 2 21 -709024 No. 2 21 -709024 No. 2	1 -709130A No. 2 1 -709130A No. 4 1 -709130A No. 10 1 -709130A No. 11	709931 No. 4 709931 No. 5 709931 No. 14 709931 No. 16	1B-709006 No. 2 61B-709006 No. 2 (6x10) 61B-709006 No. 2 (7x8) 61B-709006 No. 2 (8x7)
M803	(6x10) (7x8) (8x7)	21 -709024 No. 2 21 -709024 No. 2 21 -709024 No. 2	1 -709130A No. 4 1 -709130A No. 10 1 -709130A No. 11	709931 No. 5 709931 No. 14 709931 No. 16	61B-709006 No. 2 (6x10) 61B-709006 No. 2 (7x8) 61B-709006 No. 2 (8x7)

REGISTER TABULATING MECHANISM—100 PINION CONSTRUCTION— SERIES M 200 AND M 800 MACHINES (Plate 8-2)



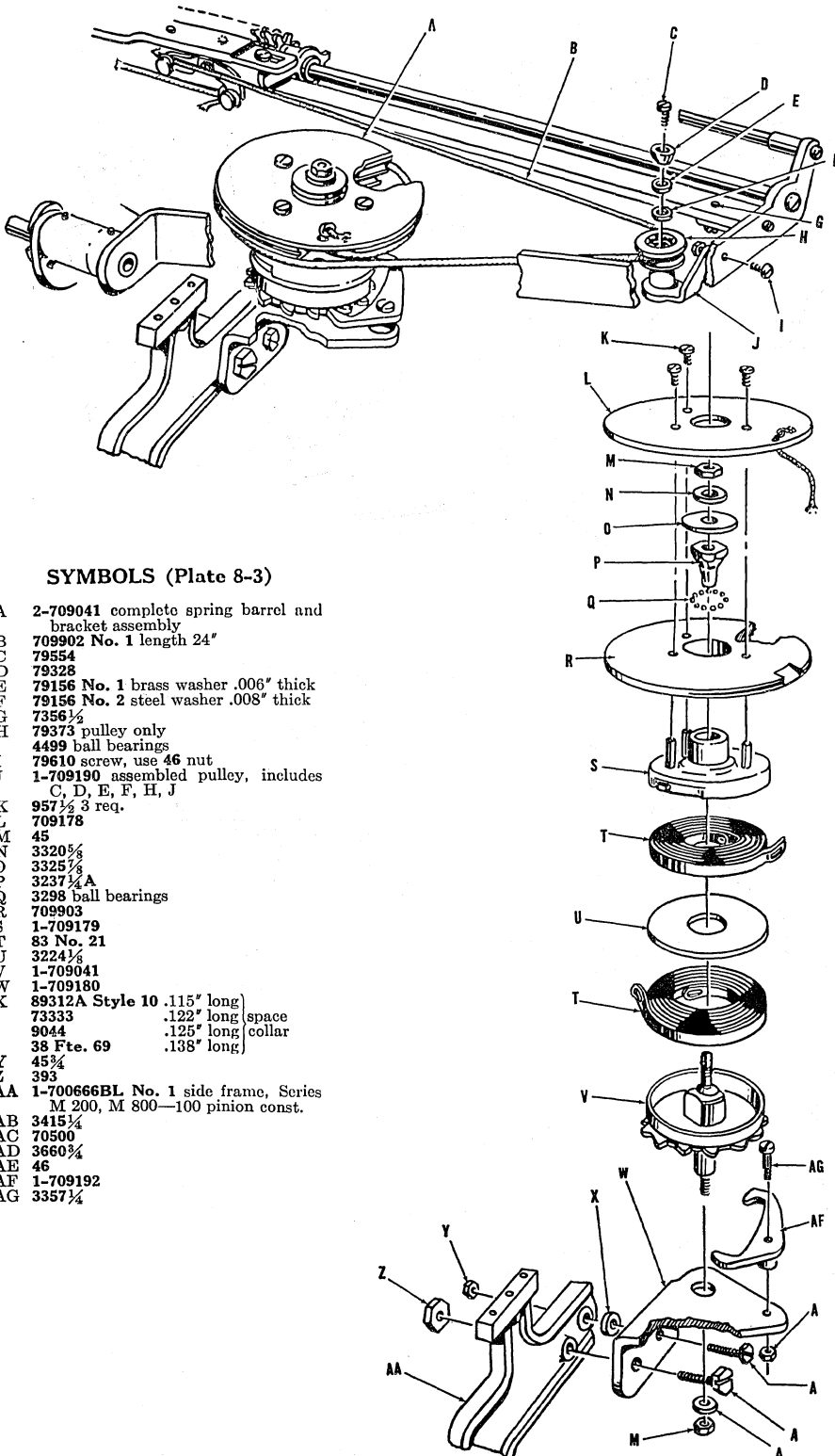
SYMBOLS (Plate 8-2)

A	79511
B	1-79146
C	1-709572 No. 1 drum and gear
D	709019 No. 7
E	1-709572 No. 2 compound gear
F	1-709165 segment gear
G	709808 power spring
H	Included in F
I	709902 No. 1 cord 24" long
J	79554
K	79328
L	79156 No. 1 space washer .006" thick
M	79156 No. 2 space washer .008" thick
N	4499 steel balls
O	79373
P	79512
Q	8054 3/4
R	79508
S	7356 1/2 screw

T	79610
U	46
V	1-79162 complete pulley assembly, includes J, K, L, M, N, O, V
W	1-709164 bracket only 2-709164 complete gear assembly, includes C, E, F, H, W, Y, AA, AB, AC, AD, AE
X	913 3/8 space washer
Y	1-60999
Z	2855 3/8
AA	709383 No. 1
AB	74587
AC	952 3/4
AD	709166
AE	709383 No. 2
AF	74533 screw
AG	1-79277D
AH	See plate 8A letter AO

REGISTER TABULATION SPRING BARREL, 100 PINION (Plate 8-3)

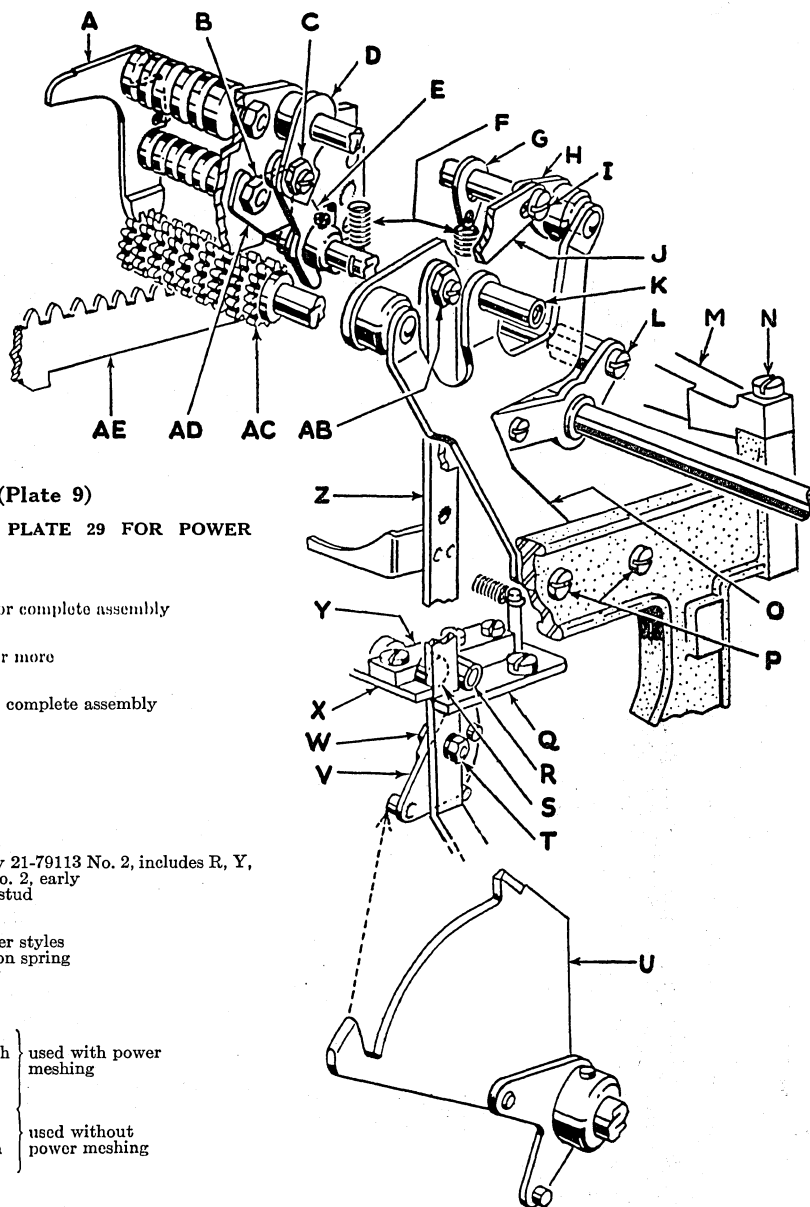
NOTE: This construction began with machine Serial No. M 6906D



SYMBOLS (Plate 8-3)

- | | |
|----|--|
| A | 2-709041 complete spring barrel and bracket assembly |
| B | 709902 No. 1 length 24" |
| C | 79554 |
| D | 79328 |
| E | 79156 No. 1 brass washer .006" thick |
| F | 79156 No. 2 steel washer .008" thick |
| G | 7356 1/2 |
| H | 79373 pulley only |
| I | 4499 ball bearings |
| J | 79610 screw, use 46 nut |
| K | 1-709190 assembled pulley, includes C, D, E, F, H, J |
| L | 957 1/2 3 req. |
| M | 709178 |
| N | 45 |
| O | 3320 5/8 |
| P | 3325 1/8 |
| Q | 3237 1/4 A |
| R | 3298 ball bearings |
| S | 709903 |
| T | 1-709179 |
| U | 83 No. 21 |
| V | 3224 1/8 |
| W | 1-709041 |
| X | 1-709180 |
| Y | 89312A Style 10 .115" long |
| Z | 73333 .122" long space |
| AA | 9044 .125" long collar |
| AB | 38 Fte. 69 .138" long |
| AC | 45 3/4 |
| AD | 393 |
| AE | 1-700666BL No. 1 side frame, Series M 200, M 800—100 pinion const. |
| AF | 3415 1/4 |
| AG | 70500 |
| | 3660 3/4 |
| | 46 |
| | 1-709192 |
| | 3357 1/4 |

REGISTER MESHING MECHANISM (Plate 9)

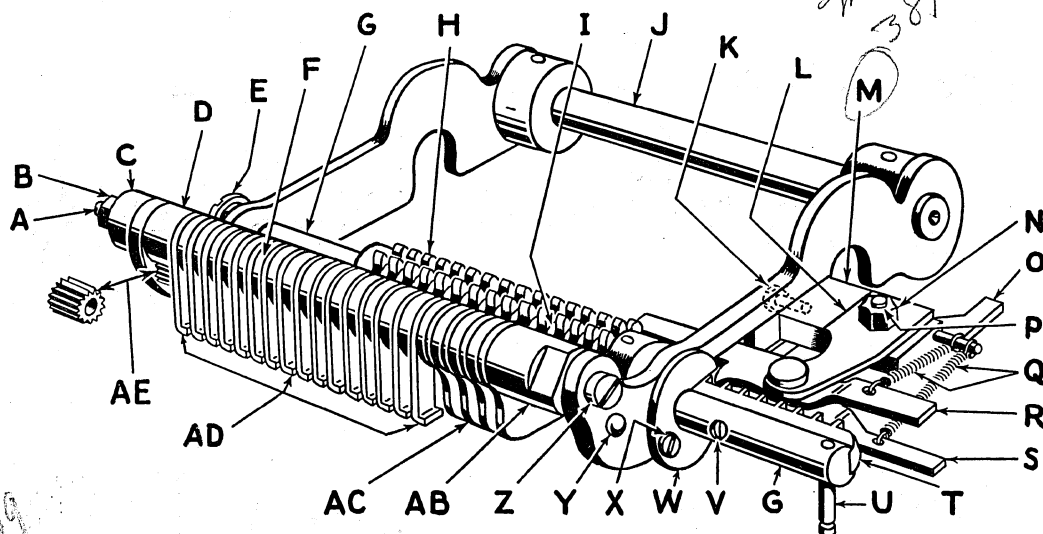


SYMBOLS (Plate 9)

- SEE KEYBOARD BOOK, PLATE 29 FOR POWER MESHING
- A 1-79222 No. 1
 - B 79331 No. 2
 - C 79333 No. 1 ecc., 7062 screw
 - D 1-79228A No. 3* see plate 14 for complete assembly
 - E 79230 No. 2
 - F 79812 No. 1 for 3 reg. or less
79812A No. 2 } for 4 reg. or more
79812 No. 2 early }
 - G 20 No. 98
 - H 1-79227 No. 1* see plate 14 for complete assembly
 - I 71545
 - J 1-79237
 - K 79612* included in O
 - L 79512
 - M 70669A No. 1
 - N 79545
 - O 11A-79235A No. 3
11-709235 No. 1
 - P 72567
 - Q 79113 No. 2 complete assembly 21-79113 No. 2, includes R, Y,
complete assembly 11-79113 No. 2, early
 - R 79374 roller, 277 ring, 79608A stud
 - S 79336 roller
 - T 46 nut, 1097 3/4 lock washer
 - U 11A-71129 see plate 11 for other styles
 - V 1-79226 No. 2 use 72812 friction spring
 - W 79551 No. 2 screw
 - X 79114 No. 2
 - Y 79114 No. 1 early
 - Z 1-79925 No. 2
- | | |
|---|------------------------------|
| 1-79223A No. 2 cl. 72, 74 | } used with power meshing |
| 11-79223A No. 2 cl. 72, 74 with simultaneous addition | |
| 21-79223A No. 2 cl. 75, 76, 77, 78 | |
| 1-79223 No. 1 cl. 72, 74 | } used without power meshing |
| 11-79223 No. 1 cl. 76 | |
| 21-79223 No. 1 cl. 72, 74, with simultaneous addition | |
- AB 79322 ecc., 72568 screw
 - AC 79116 No. 1
 - AD 79213 No. 3
 - AE 1-76111 specify no., see chart, plate 3-1 printing symbol list

*To change
Spec 300*

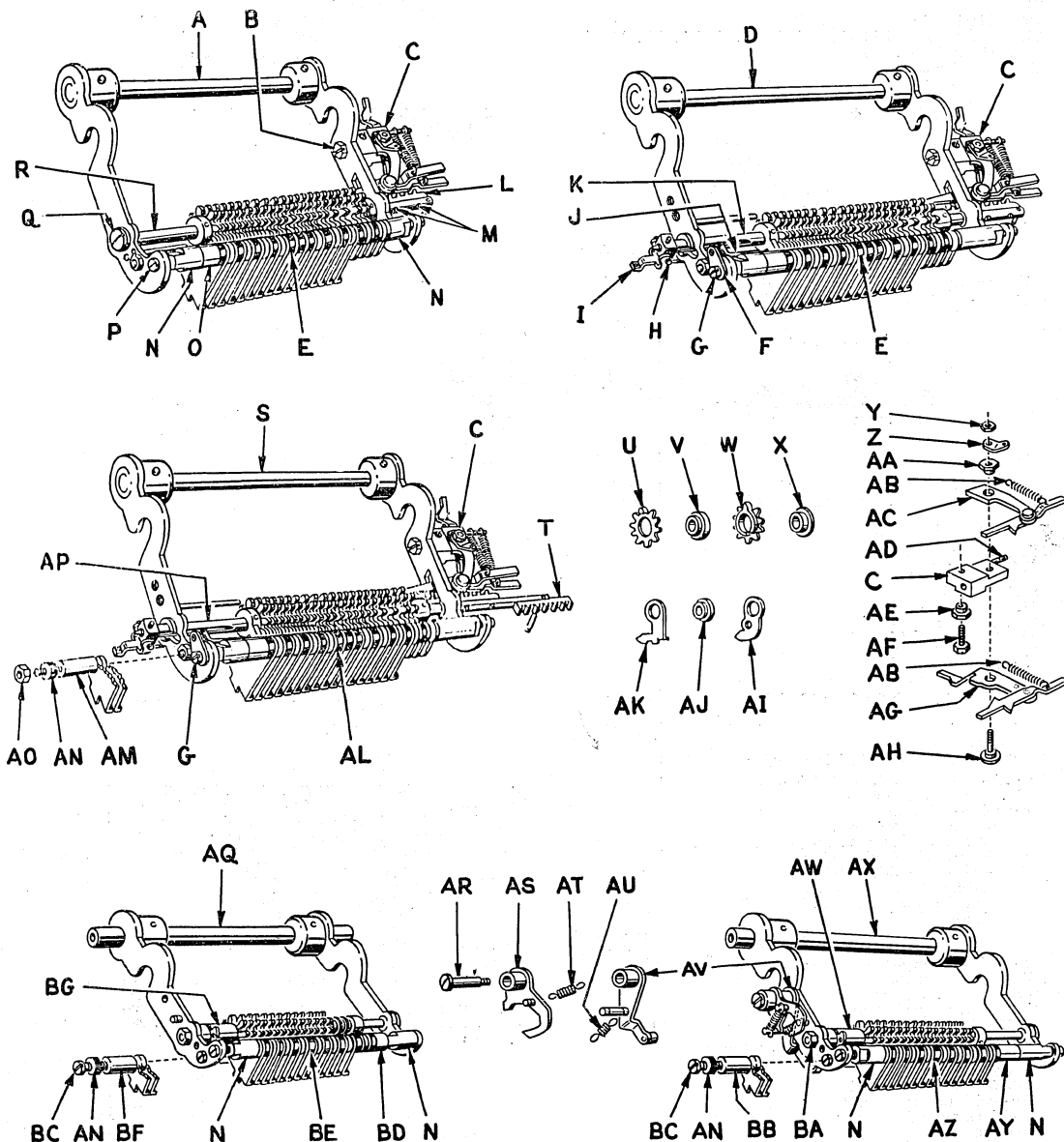
CROSSFOOTER ASSEMBLY (Plate 10)



SYMBOLS (Plate 10)

- | | |
|--|--|
| <p>A 79030 complete shaft assembly 1-79030, includes D, F, AB, AC, AD, cl. 72
 79030 complete shaft assembly 11-79030, cl. 74
 79030 complete shaft assembly 21-79030, cl. 76, 78
 79030 No. 1 complete shaft assembly 21-79030 no. 1, (12 cap.) cl. 77
 79030 No. 1 complete shaft assembly 41-79030 no. 1 (14 cap.) cl. 77
 79030 No. 1 complete shaft assembly 51-79030 no. 1 (10 cap., with two bar reg. des.) }
 79030 No. 1 complete shaft assembly 61-79030 no. 1 (12 cap., with two bar reg. des.) } cl. 77
 79030 No. 1 complete shaft assembly 71-79030 no. 1 (11 cap., with single bar reg. des.) }
 79030 No. 1 complete shaft assembly 81-79030 no. 1 (13 cap., with single bar reg. des.) }
 79030 No. 1 complete shaft assembly 111-79030 no. 1 (12 cap.) cl. 75
 79030 No. 2 complete shaft assembly 1-79030 no. 2 (12 cap.) cl. 76, 78
 79030 No. 2 complete shaft assembly 11-79030 no. 2 (14 cap.) cl. 76, 78
 79030 No. 3 complete shaft assembly 11-79030 no. 3, cl. 71, 72, 73</p> <p>B 46 nut, narrow base
 79587 screw, wide base</p> <p>C 79342</p> <p>D 79344 No. 1</p> <p>E 79583</p> <p>F 79315 No. 1 Style 25 (.125)
 79315 No. 1 Style 26 (.126)</p> <p>G 1-79009 No. 1 includes H, I, cl. 72
 1-79009 No. 2 cl. 74
 11-79009 No. 2 cl. 76, 78
 1-79009 No. 3 with overdraft light signal
 21-79009 No. 1 (12 cap.) cl. 77
 41-79009 No. 1 (14 cap.) cl. 77
 51-79009 No. 1 (10 cap., with two bar reg. des.) }
 61-79009 No. 1 (12 cap., with two bar reg. des.) } cl. 77
 71-79009 No. 1 (11 cap., with single bar reg. des.) }
 81-79009 No. 1 (13 cap., with single bar reg. des.) }
 111-79009 No. 1 (12 cap.) cl. 75
 11-79009 No. 2 cl. 71, 72, 73
 11-79009 No. 3 (12 cap.) cl. 76, 78
 21-79009 No. 3 (14 cap.) cl. 76, 78</p> | <p>H 79116 No. 1
 79116 No. 7, 1 req., used with overdraft light signal</p> <p>I 79303 No. 1 space collar</p> <p>J Complete crossfooter assemblies include A thru AE:
 1-79001A cl. 72
 11-79001A cl. 74
 21-79001A cl. 76, 78
 81-79001A with overdraft light signal
 21-79001 No. 1 (12 cap.) cl. 77
 41-79001 No. 1 (14 cap.) cl. 77
 51-79001 No. 1 (10 cap., with two bar reg. des.) }
 61-79001 No. 1 (12 cap., with two bar reg. des.) } cl. 77
 71-79001 No. 1 (11 cap., with single bar reg. des.) }
 81-79001 No. 1 (13 cap., with single bar reg. des.) }
 91-79001 No. 1 (14 cap.) cl. 75
 111-79001 No. 1 (12 cap.) cl. 75
 1-79001 No. 2 (12 cap.) cl. 76, 78
 31-79001 No. 2 (14 cap.) cl. 76, 78
 71-79001 No. 2 cl. 71, 72, 73</p> <p>K 76567</p> <p>L 1-79121 No. 2 includes R</p> <p>M 1-79923 (1A-74140 No. 3, 1A-79923) includes L, N, P, Q, R, S</p> <p>N 46</p> <p>O 1-79121 No. 1 (1A-74140 No. 3, 1A-79923)</p> <p>P 79581 screw</p> <p>Q 79815 (701806)</p> <p>R 79122 No. 1* included in L</p> <p>S 79122 No. 2* included in O</p> <p>T 79924</p> <p>U 79579</p> <p>V 79582</p> <p>W 79338 No. 1
 79338 No. 2 not cut out</p> <p>X 79580</p> <p>Y 1-79029
 1-79029 No. 1 } shaft, includes AE
 1-79029 No. 4 wide base, cl. 72 }
 79587
 79547 cl. 75, 77</p> <p>Z 79587</p> <p>AB 79344 No. 1</p> <p>AC 79109 No. 4</p> <p>AD 79109 No. 1 cl. 74, 75, 76, 77, 78
 79109A No. 5 cl. 72</p> <p>AE 79343</p> |
|--|--|

CROSSFOOTER ASSEMBLIES—FOR WIDE BASE, NEW WIDE BASE AND SERIES M MACHINES (Plate 10-1)



SYMBOLS (Plate 10-1)

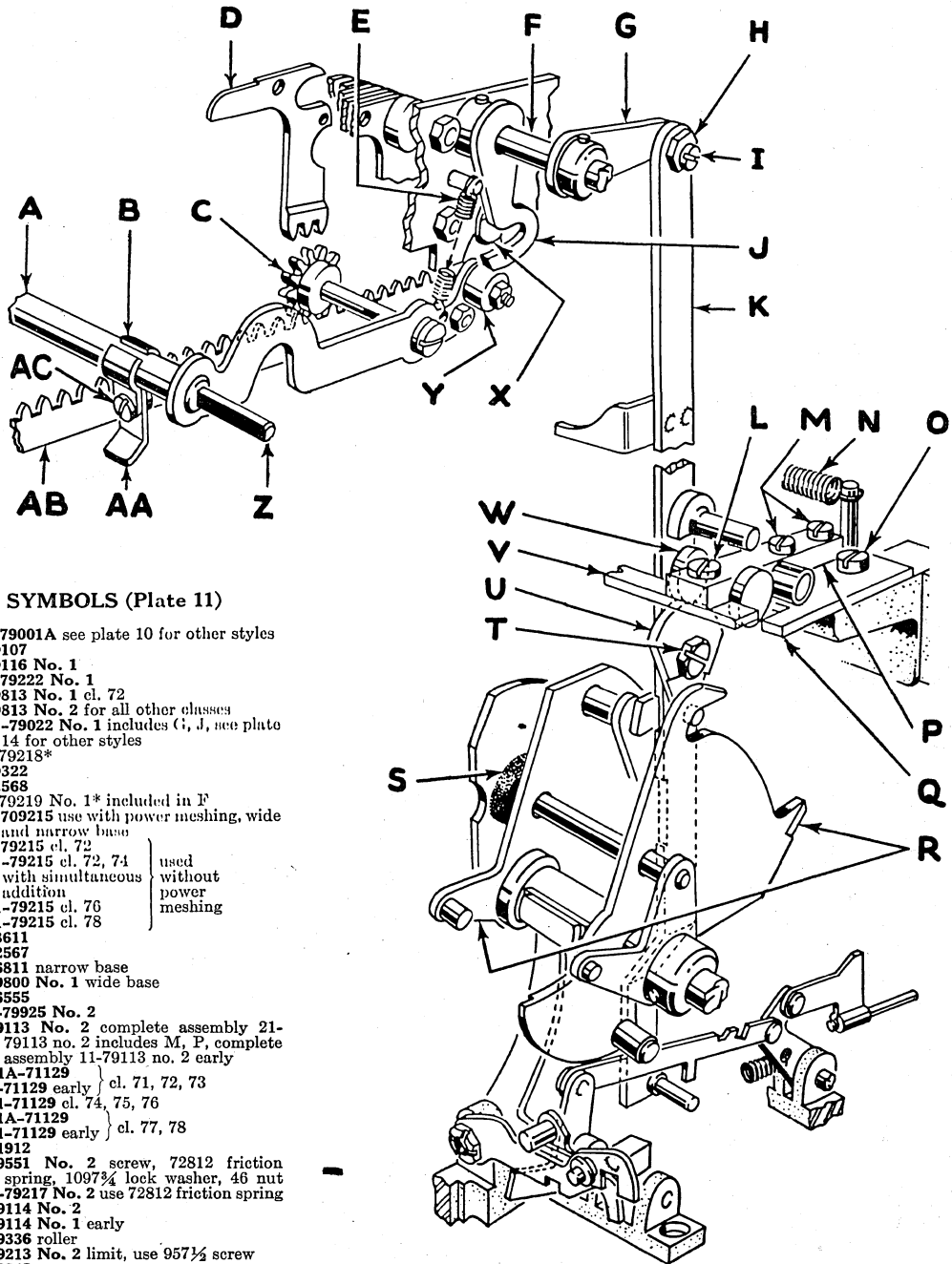
- A 12-709120 frame only
 Use 71A-709001 No. 2 and 709922 No. 3 for
 Class 72—15 digit capacity—before machine
 serial No. B135988
 71A-709001 No. 2 Class 72, Series M 200—
 15 digit capacity—after machine serial
 No. B135988
 Use 81A-709001 No. 2 and 709922 No. 3 for
 Class 72—10 digit capacity—before machine
 serial No. B134913
 81A-709001 No. 2 Class 72, Series M 200—
 10 digit capacity—after machine serial
 No. B134913
- complete
 assembled
 crossfooter

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 10-1)—Continued

AW	11-709009 No. 3 Class 76, 78—12 digit capacity—minus balance lock in extra column	assembled pinion shaft	BA	45 nut	carry pawl shaft assembly
	21-709009 No. 3 Class 76, 78, Series M 800—14 digit capacity—minus balance lock in extra column		BB	1-709029 No. 2 carry pawl limit shaft	
	151-709009 No. 3 Class 78—10 digit capacity—with or without crossfooter non clear lock—with minus balance lock in last active column		BC	79512	
	191-709009 No. 3 Class 78, Series M 800—10 digit capacity—minus balance lock in extra column		BD	709337 space collar	
	181-709009 No. 3 Class 78, Series M 800—10 digit capacity—crossfooter non clear lock—minus balance lock in extra column		BE	21-709030 No. 1 Class 77—12 digit capacity—with minus balance lock	
	211-709009 No. 3 Class 78, 79—14 digit capacity—minus balance lock in last active column			51-709030 No. 1 Class 75, 77—10 digit capacity—with register designation style No. 1—and minus balance lock—with or without crossfooter non clear lock	
	251-709009 No. 3 Series M 800—12 digit capacity—crossfooter non clear lock—minus balance lock in extra column	complete assembled crossfooter		61-709030 No. 1 Class 75, 77, Series M 700—12 digit capacity—with register designation style No. 1—and minus balance lock	assembled pinion shaft
AX	22-709120 frame only			71-709030 No. 1 Class 75, 77—11 digit capacity—with register designation style No. 2—and minus balance lock	
	1-709001 No. 2 Class 76, 78—12 digit capacity—minus balance lock in extra column			81-709030 No. 1 Class 75, 77—13 digit capacity—with register designation style No. 2—and minus balance lock	
	31-709001 No. 2 Class 76, 78, Series M 800—14 digit capacity—minus balance lock in extra column			91-709030 No. 1 Class 75—14 digit capacity	
	101-709001 No. 2 Class 78—10 digit capacity—minus balance lock in last active column			111-709030 No. 1 Class 75—12 digit capacity	
	111-709001 No. 2 Class 78—10 digit capacity—crossfooter non clear lock—minus balance lock in last active column			41-709030 No. 1 Class 77—14 digit capacity—with or without crossfooter non clear lock—with minus balance lock	
	121-709001 No. 2 Class 78, Series M 800—10 digit capacity—minus balance lock in extra column	carry pawl shaft assembly	BF	1-709029 No. 1 carry pawl limit shaft	
	131-709001 No. 2 Class 78, Series M 800—10 digit capacity—crossfooter non clear lock—minus balance lock in extra column		BG	21-709009 No. 1 Class 77—12 digit capacity—minus balance lock	
	171-709001 No. 2 Class 78, 79—14 digit capacity—minus balance lock in last active column			51-709009 No. 1 Class 75, 77—10 digit capacity—register designation style No. 1—minus balance lock	
	271-709001 No. 2 Series M 800—12 digit capacity—crossfooter non clear lock—minus balance lock in extra column			61-709009 No. 1 Class 75, 77, Series M 700—12 digit capacity—register designation style No. 1—minus balance lock	
AY	79341 No. 1 space collar			71-709009 No. 1 Class 75, 77—11 digit capacity—register designation style No. 2—minus balance lock	
AZ	1-709030 No. 2 Class 76, 78—12 digit capacity—with minus balance lock in extra column			81-709009 No. 1 Class 75, 77—13 digit capacity—register designation style No. 2—minus balance lock	
	11-709030 No. 2 Class 76, 78, Series M 800—14 digit capacity—with minus balance lock in extra column		91-709009 No. 1 Class 75—14 digit capacity		
	71-709030 No. 2 Class 78—10 digit capacity—with minus balance lock in last active column—with or without crossfooter non clear lock		111-709009 No. 1 Class 75—12 digit capacity		
	81-709030 No. 2 Class 78, Series M 800—10 digit capacity—with minus balance lock in extra column—with or without crossfooter non clear lock		21-4 Fte. 709 No. 2 Class 77—10 digit capacity—register designation style No. 1—crossfooter non clear lock—minus balance lock		
	111-709030 No. 2 Class 78, 79—14 digit capacity—with minus balance lock in last active column		11-4 Fte. 709 No. 2 Class 77—14 digit capacity—with or without crossfooter non clear lock—with minus balance lock		
	141-709030 No. 2 Series M 800—12 digit capacity—with crossfooter non clear lock—and minus balance lock in extra column				

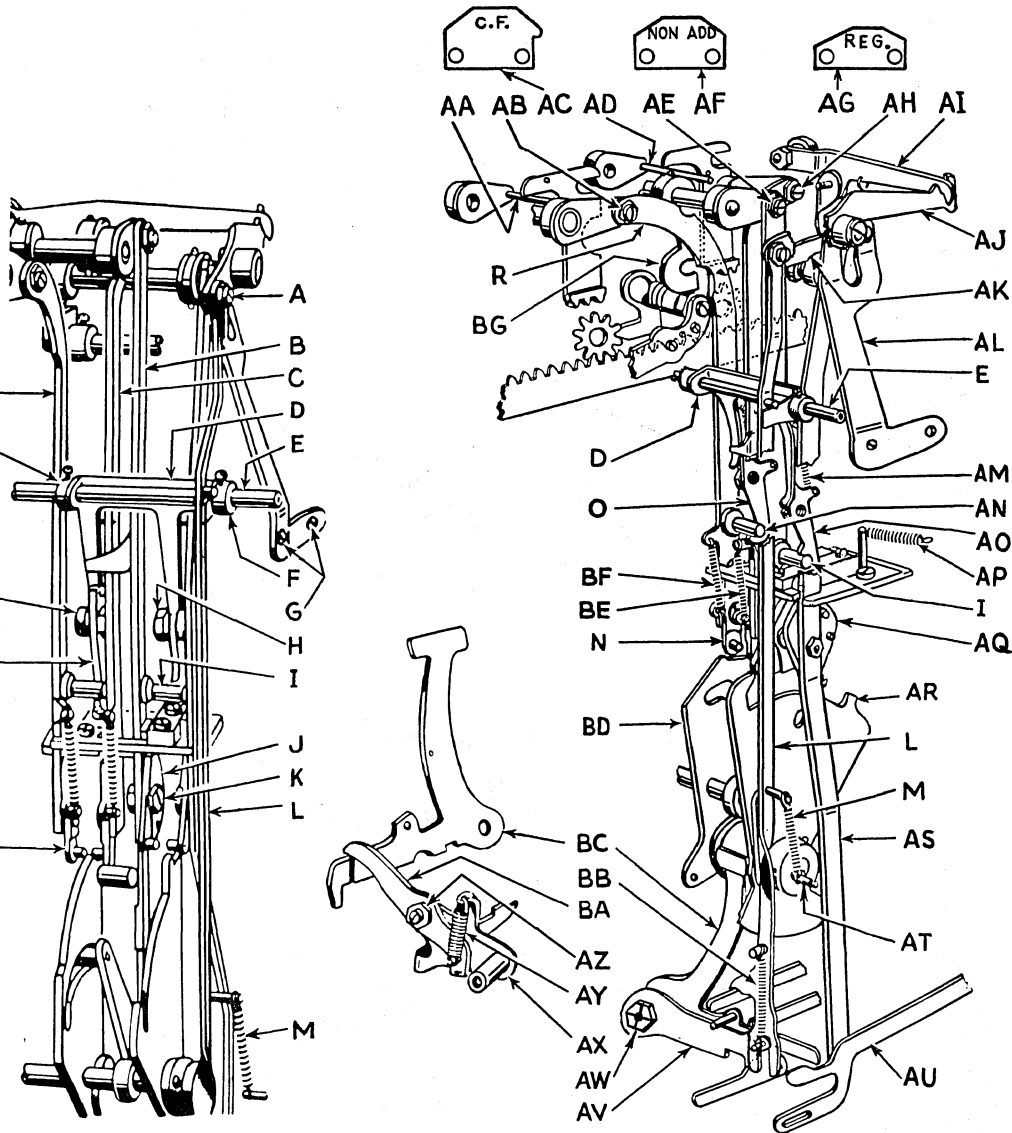
CROSSFOOTER MESHING MECHANISM (Plate 11)



SYMBOLS (Plate 11)

- A 1-79001A see plate 10 for other styles
- B 79107
- C 79116 No. 1
- D 1-79222 No. 1
- E 79813 No. 1 cl. 72
- F 79813 No. 2 for all other classes
- G 11-79022 No. 1 includes G, J, see plate 14 for other styles
- H 1-79218*
- I 79322
- J 72568
- K 1-79219 No. 1* included in F
- L 1-79215 use with power meshing, wide and narrow base
- M 1-79215 cl. 72
- N 11-79215 cl. 72, 74 with simultaneous addition
- O 21-79215 cl. 76
- P 31-79215 cl. 78
- Q 73611
- R 72567
- S 76811 narrow base
- T 79800 No. 1 wide base
- U 76555
- V 1-79925 No. 2
- W 79113 No. 2 complete assembly 21-79113 no. 2 includes M, P, complete assembly 11-79113 no. 2 early
- X 11A-71129
- Y 1-71129 early } cl. 71, 72, 73
- Z 21-71129 cl. 74, 75, 76
- AA 31A-71129
- AB 31-71129 early } cl. 77, 78
- AC 71912
- 79551 No. 2 screw, 72812 friction spring, 1097 1/4 lock washer, 46 nut
- 1-79217 No. 2 use 72812 friction spring
- 79114 No. 2
- 79114 No. 1 early
- 79336 roller
- 79213 No. 2 limit, use 957 1/2 screw
- 79342
- 70501 pivot pin, use 950 5/8 screw
- 79106
- 1-76111 specify no., see symbol list chart, plate 3-1, printing
- 73611 screw, use 46 nut

SIMULTANEOUS ADDITION MECHANISM (Plate 12)

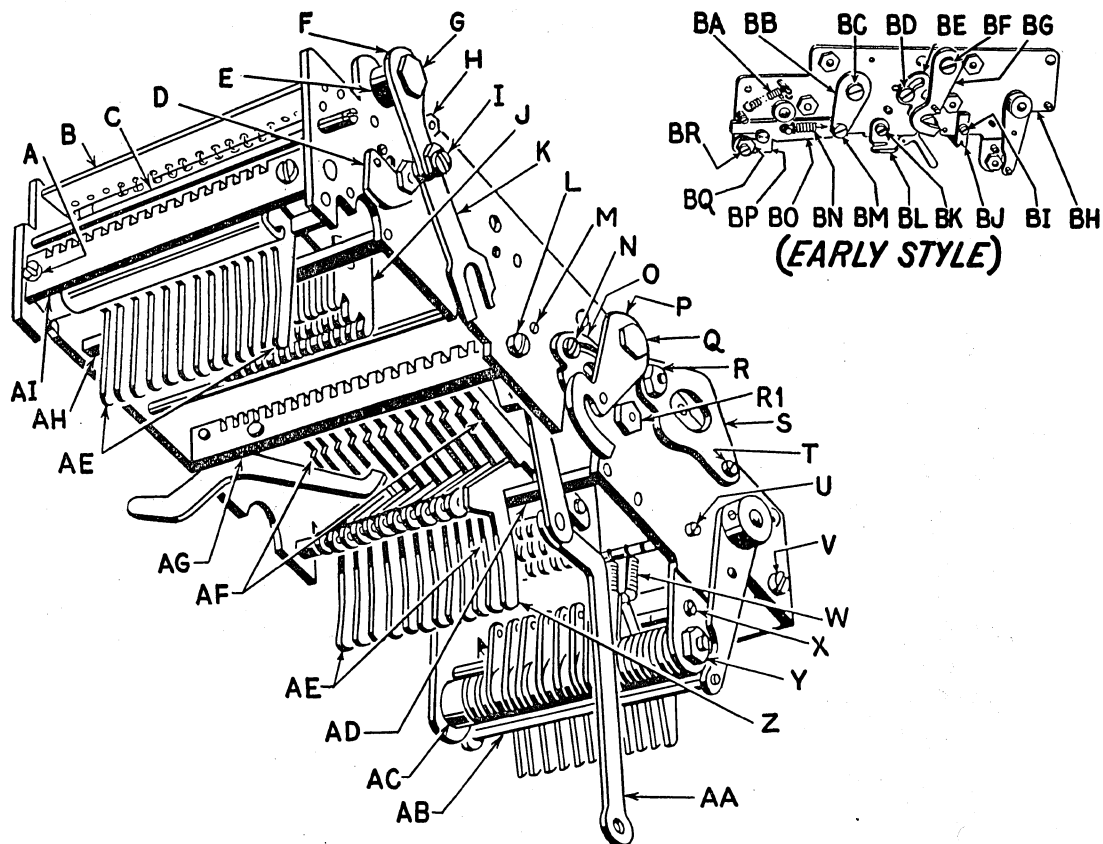


SYMBOLS (Plate 12)

- | | | |
|--|---|--|
| A 72568 screw, 72307 ecc. | AB 79322 ecc., 79548 screw, 46 nut | AT 70508 narrow base } stud in |
| B 21-79215 includes I, J, K, see plate 11 for other styles | AC 73216 No. 1 | 702531 wide base } side frame |
| C 11-79207 No. 2 } see plate 15 for | AD 79018A | AU 72198 |
| D 79212 | AE 79322 ecc., 72568 screw | AV 1-72175 No. 4 see keyboard book, plate 7 for other styles |
| E 79021 | AF 73216 No. 2 | AW 72511 screw, 72340 hex. nut |
| F 1-28345 includes 75618 screw | AG 73216 No. 3 | AX 1-72231 No. 1 } includes |
| G 72567 | AH 79322 ecc., 79548 screw, 46 nut | cl. 72, 74 |
| H 46 nut, 824 1/4 washer, 79550A screw | AI 1-79231 | 1-72231 No. 2 cl. 76 |
| I 79534* | AJ 1-79234 | 1-72231 No. 3 cl. 78 |
| J 1-79217 No. 2 use 72812 friction spring | AK 79230 No. 2 link | 1-702231 No. 2 } includes |
| K 79551 No. 2 screw, 1097 3/4 washer, 46 nut | AL 11A-79235A No. 3 | cl. 76, 77 |
| L 1-72186 No. 2 | AM 79807 | 1-702231 No. 3 cl. 78 } AY, AZ, BA, use 79548 screw, 72337 hexagon bushing |
| M 72814 | AN 79531* stud, included in R | AY 2887 |
| N 1-79208 No. 1* included in R | AO 1-79224 | AZ 72307 ecc., 73612 screw |
| O 1-79211 | AP 76811 narrow base | BA 1-72232 } included in AX |
| P 46 nut, 824 1/4 washer, 79550A screw, 47 nut | AQ 1-79226 No. 2 | BB 72806 |
| Q 1-28345 includes 75618 screw | AR 1-71130* included in BD | BC 1-72163 No. 3 see keyboard book, plate 6 for other styles |
| R 1-79207 No. 1 } includes N, AN | AS 1-79223 No. 1 includes H, AO, AQ, see plate 9 for other styles | BD 21-71129 see plate 11 for other styles |
| AA 79018A | | BE 79806A |
| | | BF 79806A |
| | | BG 1-79219 No. 1* |

SEE EXPLANATION ON INSIDE OF FRONT COVER

CARRY ASSEMBLY, RIGHT SIDE (Plate 13)



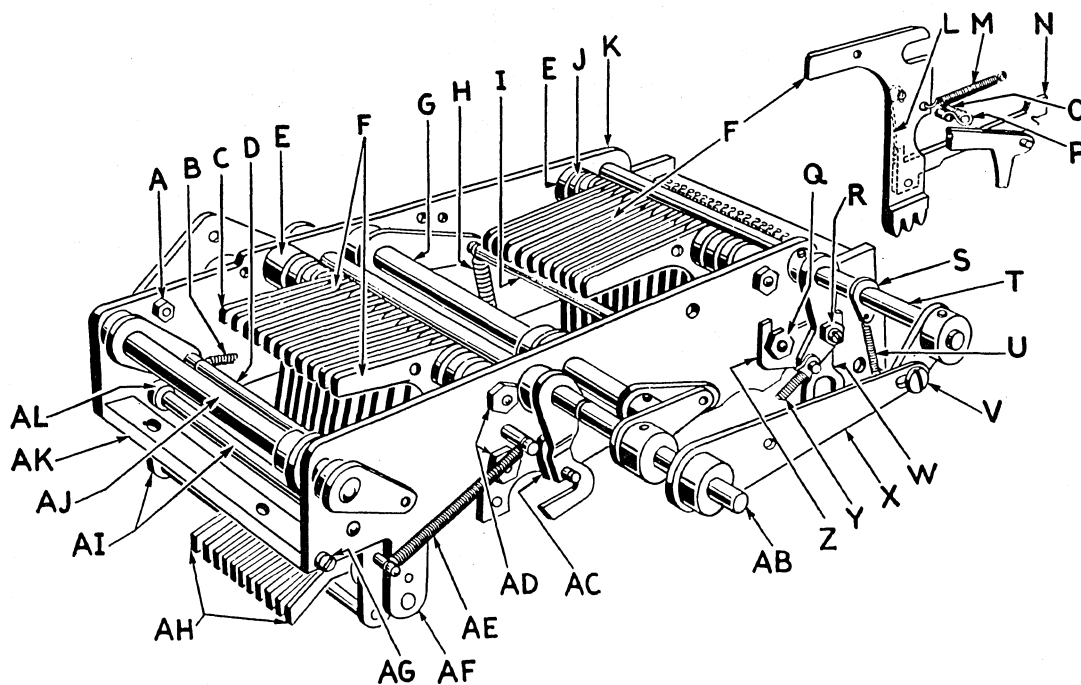
SYMBOLS (Plate 13)

A 79547
 B 79204 No. 1
 C 79005 No. 1 (79005 No. 2) cl. 75, 77
 79008 cl. 72, 74, 76, 78
 D 79213 No. 3 use 79331 No. 2 nut
 E 79355 collar
 F 709228A (709228 No. 2) shown, cl. 75, 77
 G 1-79229 No. 3 cl. 72, 74, 76, 78
 709540 shown, cl. 75, 77
 H 79331 No. 1
 I 7062 screw, 79333 no. 1 ecc.
 J 79222 No. 2 dummy carry pawl
 K 709230 shown, cl. 75, 77
 L 79230 No. 2 cl. 72, 74, 76, 78
 M 74500
 N 79005 No. 1 (79005 No. 2) shaft
 7562 cl. 75, 77
 O 957½ cl. 72, 74, 76, 78
 P 79213 No. 1
 Q 709219 No. 1 shown, cl. 75, 77
 1-79219 No. 2 cl. 72, 74, 76, 78
 R 709540 shown, cl. 75, 77
 R1 71517 screw, cl. 72, 74, 76, 78
 79331 No. 1
 47

S 709156
 T 1651¾ (12051¾) use 46 nut
 U 79004 No. 1 (79004 No. 2) cl. 74, 75, 76, 77, 78
 V 79007 cl. 72
 W 79544
 X 79804 springs
 Y 79005 No. 2
 Z 79331 No. 1
 AA 11-79209A No. 1
 11-79209 No. 1 early
 11-79245
 11-709237A cl. 76, 77, 78
 1-709237A with two bar reg. des.
 21-709237A with single bar reg. des.
 AB 79016
 709016
 AC 79014
 AD 79002
 AE 1-79209A No. 1 } use 79803
 1-79209 No. 1 early / hair spring
 AF 79221 No. 1 (24 Ftc. 134) latches
 AG 1-79912 No. 1 cl. 72, 74, 76, 78
 1-709912A } cl. 76, 77, 78
 1-709912 early } with two bar
 11-709912A } reg. des.
 11-709912 early }

21-709912A } with single bar
 21-709912 early } reg. des.
 41-709912A }
 41-709912 early } cl. 71, 72, 73
 AH 79002 square shaft
 AI 1A-79206A No. 1
 1-79206A No. 1 early
 BA 79812 No. 1
 BB 79229 No. 1 use 79325 collar on inside
 BC 71517
 BD 957½
 BE 79213 No. 1
 BF 71517
 BG 1-79219 No. 2 use 79325 collar on inside
 BH 1-79210R No. 1
 BI 79543
 BJ 79922
 BK 74500
 BL 79200A
 BM 79552
 BN 1-79808 No. 1
 BO 1-79230 No. 1
 79230 No. 1 used on left
 BP 19 Ftc. 94 brace
 BQ 72307
 BR 72567

CARRY ASSEMBLY, LEFT SIDE (Plate 14)

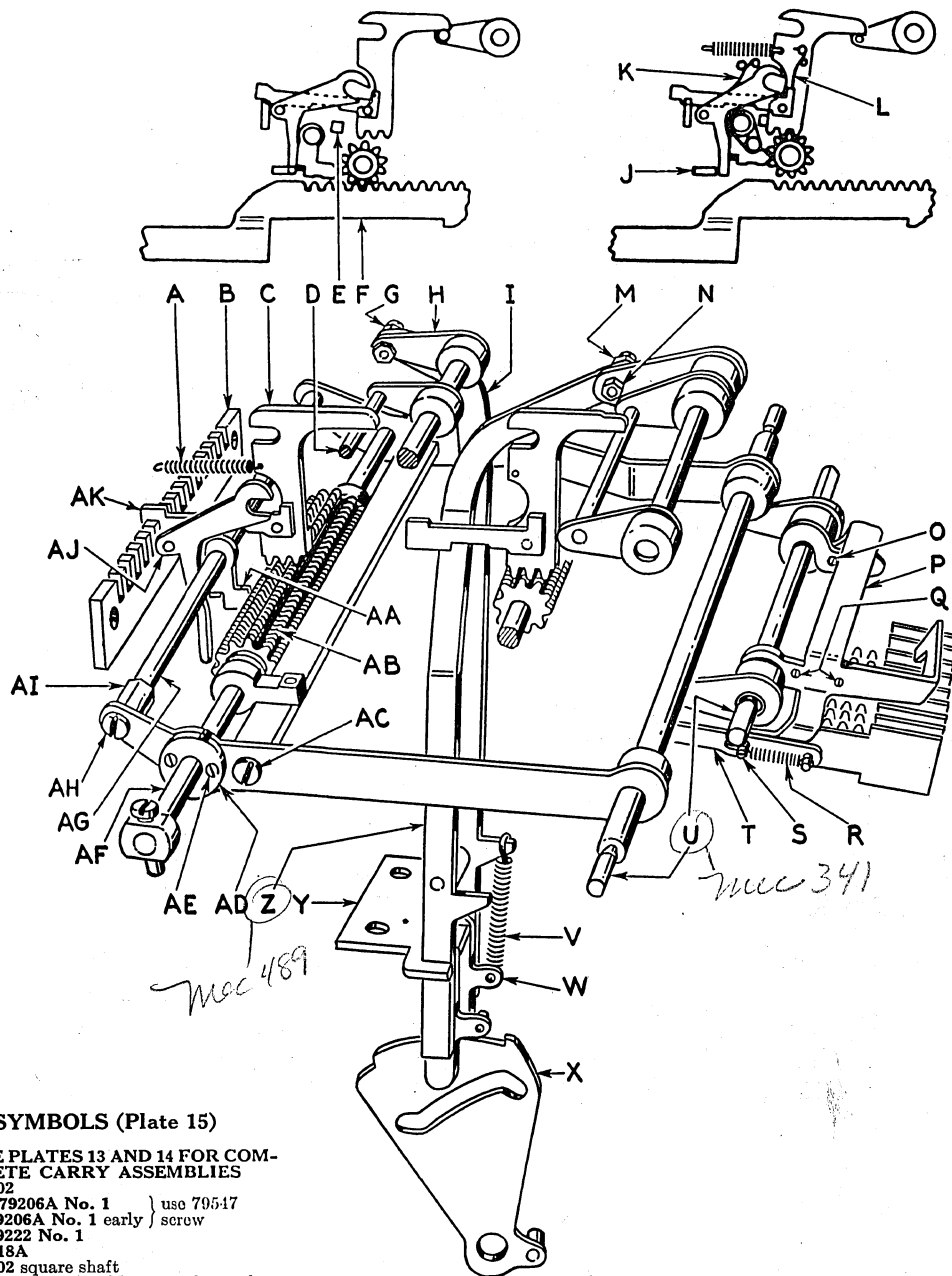


SYMBOLS (Plate 14)

A 46 nut, 12051 $\frac{1}{2}$ screw
 B 79824
 C 11-79222 No. 1
 D 79018A
 E 79012 No. 1
 F 1-79222 No. 1
 G 1-79020
 H 1-709020 } includes I
 I 79824
 J 79018A
 K 79222 No. 2 dummy carry pawl
 L 1-79210AR No. 2
 M 1-709210R No. 2
 N 79801 hair spring
 O 79802
 P 79221 No. 1 (24 Fte. 134)
 Q 79004 No. 1 shaft
 R 79803 spring
 S 79331 No. 2
 T 79333 No. 1 ecc., 7062 screw
 U 20 No. 98
 V 1A-79023 No. 2
 W 11A-709023 cl. 75, 77 } includes S
 X 21-709023 cl. 72, 74,
 Y 76, 78
 Z 79812 No. 1 for 3 reg. or less

79812A No. 2 } for 4 or
 79812 No. 2 early } more reg.
 V 71545
 W 79230 No. 2 link
 X 1-79237
 Y 1-79808 No. 2
 Z 79213 No. 3
 AB 11-79022 No. 1
 1A-709023 cl. 75, 77 } includes X
 31-709023 cl. 72, 74,
 76, 78
 AC 79213 No. 2 limit, use 957 $\frac{1}{2}$ screw
 AD 47
 AE 79805
 AF 1-79210L No. 2
 1-709210L No. 2
 AG 79544
 AH 79220 No. 1
 79220 No. 2 used on outside of side
 frame K, cl. 72
 AI 1-79015
 AJ 1-79017 } includes D
 AK 1-709017
 AL 79901A
 1-28345 collar, includes 75618 screw

CARRY AND RESETTING MECHANISM (Plate 15)



SYMBOLS (Plate 15)

SEE PLATES 13 AND 14 FOR COMPLETE CARRY ASSEMBLIES

- | | |
|---|--------------------------------------|
| A | 79802 |
| B | 1A-79206A No. 1 } use 79547 |
| | 1-79206A No. 1 early } screw |
| C | 1-79222 No. 1 |
| D | 79018A |
| E | 79002 square shaft |
| F | 1-76111 specify No., see chart plate |
| | 3-1 in printing symbol list |
| G | 79322 ecc., 79548 screw, 46 nut |
| H | 1-79203* complete assembly 1-79020, |
| | complete assembly 1-709020 |
| I | 1-79207 No. 2 |
| | 11-709207 No. 2 |
| | 11-79207 No. 2 } simultaneous |
| | 1-709207 No. 2 } addition |
| J | 79934 No. 1 |
| | 1-79934 No. 1 early |
| K | 79803 spring |
| L | 79801 hair spring |
| M | 79322 ecc., 79548 screw |
| N | 46 |
| O | 73563 |
| P | 79292 No. 1 } 1/8 frac. |
| | 709292 No. 1 } 1/8 frac. |
| | 79292 No. 2 } 1/4 frac. |
| | 709292 No. 2 } 1/4 frac. |

- | | |
|---|--|
| Q | 79292 No. 3 } 1/10 frac. |
| R | 709292 No. 3 } 1/10 frac. |
| S | 73563 |
| T | 489 |
| U | 706508 screw |
| V | 1-76232 |
| W | 79806A |
| X | 70501 pivot pin, use 950 1/4 screw |
| Y | 1-79208 No. 2* included in I |
| | 11A-71129 see plate 11 for other styles |
| Z | 79113 No. 2 see plate 11 for complete assembly |
| | 1-79207 No. 1 |
| | 1-709207 No. 1 |

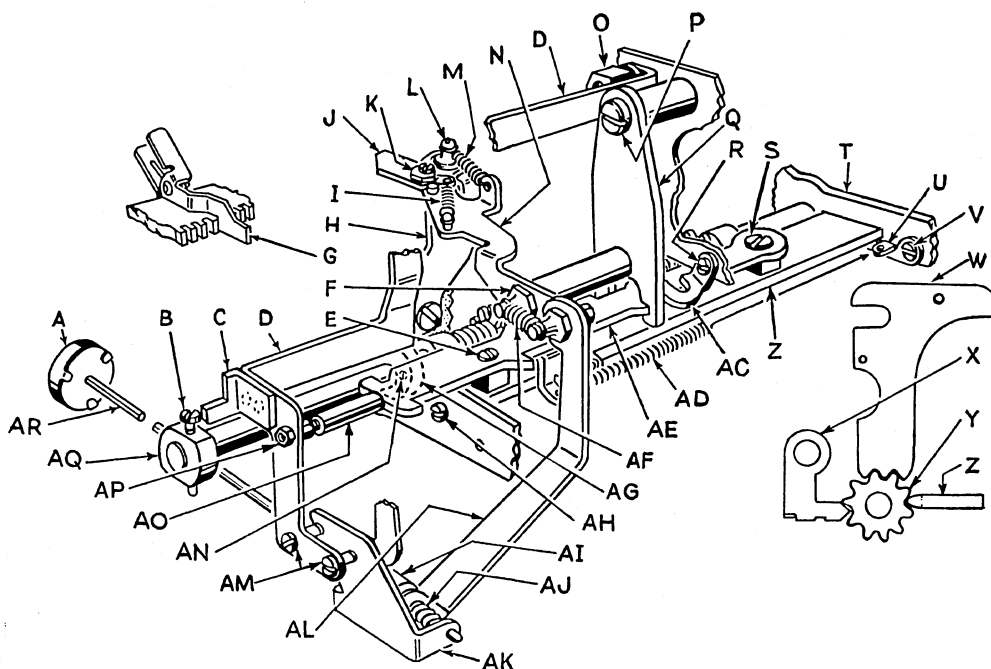
- | | |
|----|---|
| AA | 79109 No. 1 see plate 8 for other styles |
| AB | 79116 No. 1 |
| AC | 79508 |
| AD | 79306 |
| AE | 79509 |
| AF | 1A-79019 No. 1 specify machine style and number |
| AG | 1-79006 No. 1 see plate 8 for other styles |
| AH | 79512 |
| AI | 79346 |
| AJ | 1-79209A No. 1 } use 79803 |
| | 1-79209 No. 1 early } hair spring |
| AK | 79221 No. 1 (24 Fte. 134) |

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 5-20-49

For Form 2954

REGISTER ESCAPEMENT MECHANISM, THIRTY PINION (Plate 16)



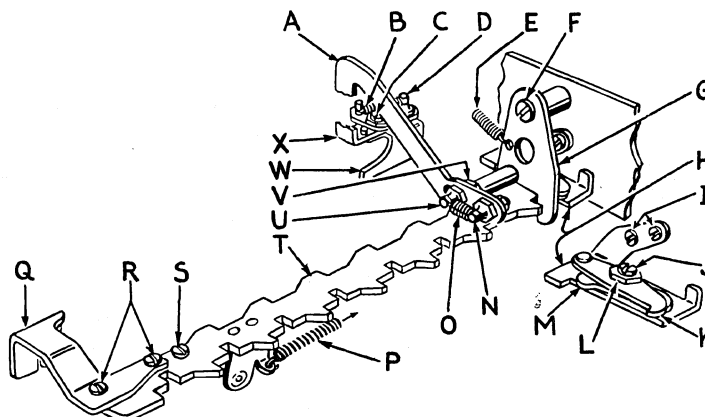
SYMBOLS (Plate 16)

A	72200 No. 1 (72200A No. 1) ring, 72992 No. 1 glass, 92 No. 1 paper, specify character	P	79541 use 46 nut	AF	2881 1/4
B	79510	Q	1-79104A No. 1	AG	79306 collar
C	79118 1/2* included in D	R	74500	AH	79508
D	1-79118A No. 1	S	79511	AI	1-75333 includes 950 3/4 screw
E	76559	T	1-79110L No. 1*	AJ	2880 3/4 spring
F	79641 screw, 79333 No. 1 ecc. on inside	U	79103A No. 1	AK	75127 No. 1
G	1-73286 No. 2	V	73611 use 46 nut	AL	75204 No. 1 for 50 and 60 pinion with- out motor reg. return
H	79112A use 79603 screws	W	1-79222 No. 1		75204 No. 2 for 30 pinion, narrow base; also for 60 pinion with motor reg. return, wide base
I	79810	X	79109 No. 1 for 3 reg. or less	AM	72614 use 46 nuts
J	79111A No. 1		79109A No. 5 } used with 50	AN	79509 screw
K	1-79111A No. 2 for 60 pinion	Y	79109 No. 5 early } and 60 pinion	AO	79569A
L	71361 ecc., 74502 screw		79116 No. 1	AP	46
M	79568	Z	79116 No. 6 pinion without wide tooth	AQ	1-79311 includes B
N	75814	AC	79935 No. 1 see plate 8 for other styles	AR	1-75024 No. 1
O	1-79108B No. 1 includes F, J, K, Q 81301A	AD	79200A		
		AE	79800 No. 5 see plate 8 for other styles		
			1-79130 No. 1 see plate 8 for other styles		

REGISTER ESCAPEMENT MECHANISM, SIXTY PINION (Plate 17)

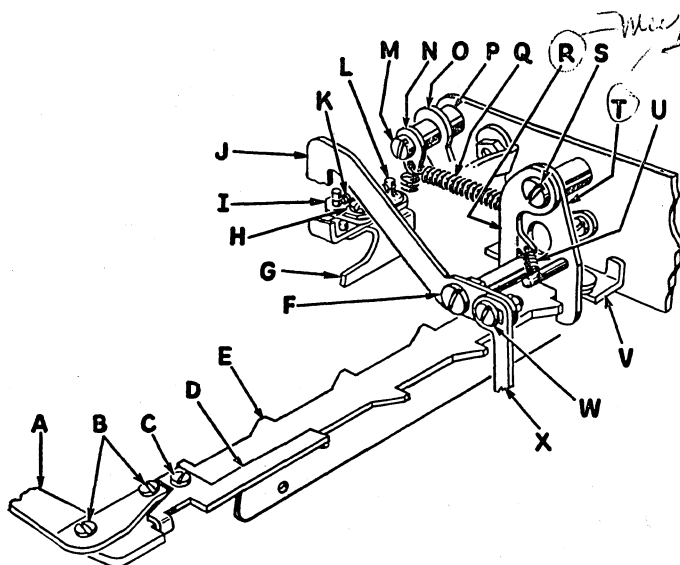
SYMBOLS (Plate 17)

A	1-79108A No. 3 } includes 60 pinion C, G, U, V, X
B	11-79108B No. 1 } 50 pinion
C	7480B spring
D	74502 screw, 71361 ecc.
E	79568
F	75814
G	79541 use 46 nut
H	1-79104B No. 3
I	1-79200A No. 2 includes J, K, L, M
J	7356 1/2
K	79505 screw, 1097 1/4 lock washer
L	79247 No. 2* included in H
M	79309 ecc.
N	79247 No. 1
O	701518 use 46 nut
P	2881 1/4
Q	79800 No. 2 see plate 8 for other styles
R	79131B No. 2
S	79131A No. 2 early
T	73612
U	79505
V	1-79130A specify No., see plate 8
W	79641 screw
X	79333 No. 1 ecc.
	1-79105A No. 13 } bracket, use
	79105 No. 13 early } 79603 screws
	1-79111A No. 2



SEE EXPLANATION ON INSIDE OF FRONT COVER

REGISTER ESCAPEMENT MECHANISM, IMPROVED (Plate 17-1)



SYMBOLS (Plate 17-1)

- A 79131B No. 2
- B 709131A No. 2 sterling
- C 73612
- D 79505
- E 79624 No. 2 sterling
- F See chart 1 and 2 below
- G See chart 3 below
- H 3455½ use 79333 No. 1 eccentric
- I 1-79105A No. 13
- J 74502 use 71361 eccentric
- K 1-79111A No. 2
- L 709108 No. 3
- M 1-709108 No. 3 includes F, H, I, J,
- N L, T
- O 7480B
- P 79568
- Q 79589
- R 20 No. 98
- S 1-79229 No. 3
- T 79355
- U 99807
- V 709108½
- W 709563 use 46 nut
- X 1-709104 No. 2
- Y 72809
- Z 1-79200A No. 2 see H, plate 17
- AA 259½ use 46 nut
- AB 705204 No. 1

REGISTER LIMIT CHART NARROW BASE CONSTRUCTION

REGISTERS CAPACITY	CLASSES 72, 78	CLASSES 78 1/4, 78 1/2
2 X 10		79264 No. 2
3 X 10	79264 No. 4	79264 No. 5
4 X 10	79264 No. 3	
5 X 10	79264	

CHART NO. 2 WIDE BASE CONSTRUCTION

REGISTER CAPACITY	CLASS 72	CLASS 78	CLASSES 78 1/4, 78 1/2	CLASS 79
2 X 10			709264 No. 11	709264 No. 10
3 X 10		709264 No. 12	709264 No. 13	
4 X 10	79264 No. 3	709264 No. 14	709264 No. 15	
5 X 10	79264	709264 No. 16	709264 No. 17	
3 X 12	709264 No. 8	709264 No. 3	709264 No. 4	
4 X 12	709264 No. 7	709264 No. 2	709264 No. 5	
3 X 14	709264 No. 9		709264 No. 6	

ESCAPEMENT BAR CHART—WIDE BASE CONSTRUCTION CHART NO. 3 NEW STYLE

REGISTERS CAPACITY	CLASS 72	CLASS 78	CLASSES 78 1/4, 78 1/2
10 X 6	21-709130A No. 12	1-709130A No. 13	
8 X 7	21-709130A No. 11	1-709130A No. 11	
7 X 8	21-709130A No. 10	1-709130A No. 10	
3, 4, 5 or 6 X 10	21-709130A No. 9	1-709130A No. 4	1-709130 No. 7
3, 4 or 5 X 12	21-709130A No. 8	1-709130A No. 2	1-709130 No. 5
3 or 4 X 14		1-709130A No. 3	1-709130 No. 6
3 or 4 X 15	21-709130A No. 3		

NOTE: The new style Wide Base, Type 70 is longer—the front extends beyond the motor bars.

SEE EXPLANATION ON INSIDE OF FRONT COVER

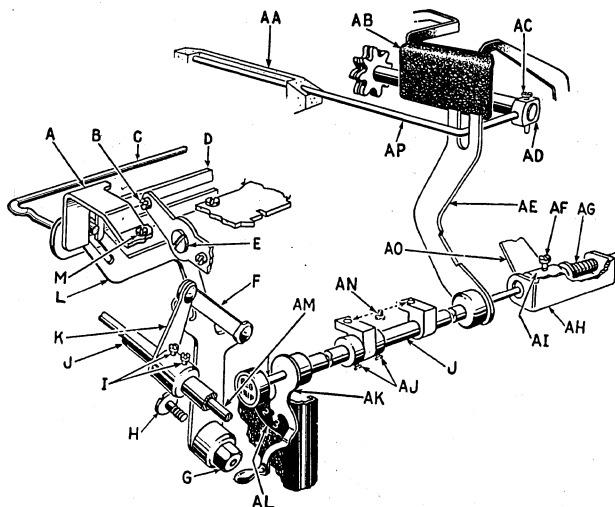
Printed in U. S. America 5-20-49

For Form 2954

REGISTER RETURN MECHANISM, MANUAL (Plate 18)

SYMBOLS (Plate 18)

- A 79131B No. 2
 B 79131A No. 2 early
 C 79512
 D 79701 No. 6 any capacity
 E 79105 No. 12 (50 pinion)
 F 1-79105A No. 13 } use 79603 screws
 G 79105 No. 13 early } 60 pinion
 H 8054 $\frac{3}{4}$
 I 79234 No. 2* included in L
 J 75572A No. 2 narrow base
 K 75572Z wide base
 L 3450 $\frac{1}{2}$ Style 9
 M 550 $\frac{3}{4}$
 N 1A-75025 No. 1
 O 1-75025 No. 1 early
 P 1-75235 No. 2* included in L
 Q 1-75205 No. 3 (50 pinion)
 R 1-75205 No. 4 (60 pinion)
 S 1-75205A No. 4 used with motor reg. return
 T 73612
 U 75671 No. 1
 V 1-70115AR No. 1 used with 3 reg.
 W 1-70115AR No. 2 used with 4 or more reg.
 X 79510
 Y 1-79311 includes AC
 Z 1-75205 No. 1* included in J
 AA 950 $\frac{1}{2}$
 AB 2880 $\frac{3}{4}$
 AC 75127 No. 1
 AD 1-75333 includes AF
 AE 75618 screws
 AF 1-75195A* included in J
 AG 1-75186A No. 1 }
 AL 75186 No. 1 early } (3 x 10) } Use 77515 screw for all late
 75186 No. 2 } sty.
 75186 No. 2 early } (2 x 10) } use 70512 screw for all early
 1-75186A No. 3 }
 75186 No. 3 early } (5 x 10) (50 pinion)
 1-75186A No. 4 }
 75186 No. 4 early } (6 x 8) (50 pinion)
 1-75186A No. 5 }
 75186 No. 5 early } (7 x 7) (50 pinion)
 1-75186A No. 6 }
 75186 No. 6 early } (8 x 6) (50 pinion)
 1-75186A No. 7 }
 75186 No. 7 early } (6 x 10) (60 pinion)
 1-75186A No. 8 }
 75186 No. 8 early } (7 x 8) (60 pinion)
 1-75186A No. 9 }
 75186 No. 9 early } (8 x 7) (60 pinion)
 1-75186A No. 10 }
 75186 No. 10 early } (10 x 6) (60 pinion)

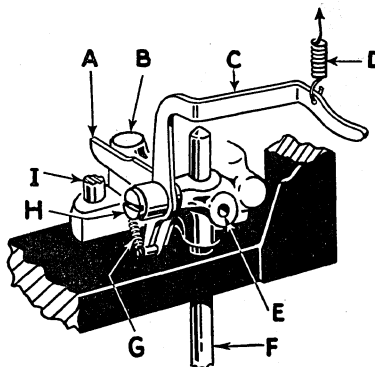


- 1-75186A No. 11 (4 x 10) 50 pinion
 1-75186A No. 12 blank, for single reg.
 1-75186A No. 13 (5 x 10) 60 pinion
 1-75186A No. 14 (4 x 10) 60 pinion
 1-705186A No. 2 }
 705186 No. 2 early } (3 x 12)
 1-705186A No. 3 }
 705186 No. 3 early } (4 x 12)
 1-705186A No. 4 }
 705186 No. 4 early } (5 x 12)
 1-705186A No. 5 }
 705186 No. 5 early } (4 x 15)
 1-705186A No. 6 }
 705186 No. 6 early } (6 x 10)
 1-705186A No. 12 (3 x 14)
 AM 1-75024 No. 1
 AN 74523
 AO 75204 No. 2 see plate 16 for other styles
 AP 79701 No. 1

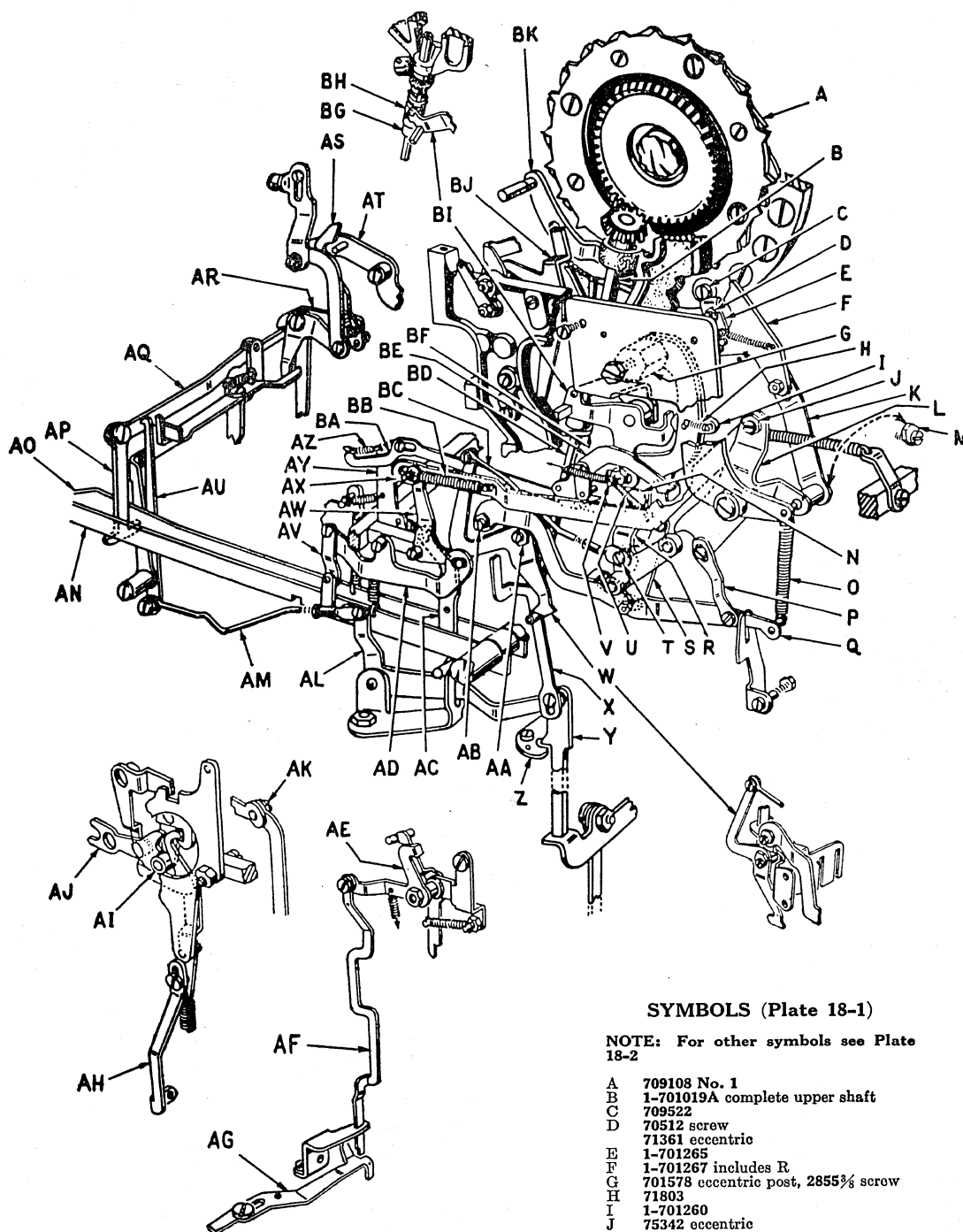
REGISTER INTERLOCK TO LOCK CARRIAGE (Plate 19)

SYMBOLS (Plate 19)

- A 1-75172
 B 1-75673A includes A, C, G, H, I
 C 1-75173 No. 1
 D 3688
 E 75561 plunger, 75824 spring
 F 1A-75023A
 G 284 flexible
 H 75644
 I 75526* included in B



**CARRIAGE AND REGISTER RETURN FROM KEY No. 48
REGISTER RETURN FROM KEY No. 49
CLASS 77 (Plate 18-1)**



SYMBOLS (Plate 18-1)

NOTE: For other symbols see Plate 18-2

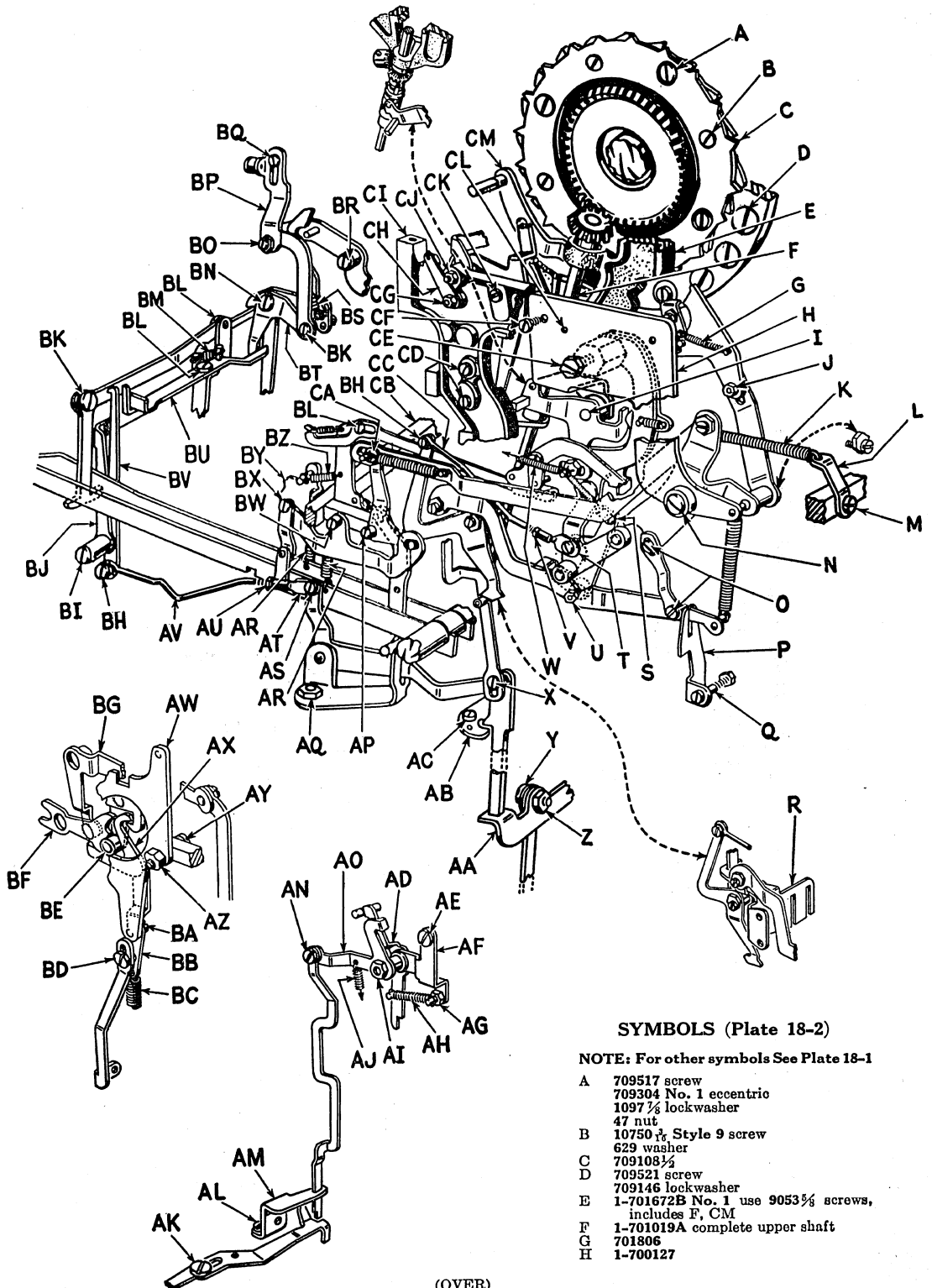
- A 709108 No. 1
- B 1-701019A complete upper shaft
- C 709522
- D 70512 screw
- E 71361 eccentric
- F 1-701265
- G 1-701267 includes R
- H 701578 eccentric post, 2855 $\frac{3}{8}$ screw
- I 71803
- J 1-701260
- K 75342 eccentric
- L 73611 screw
- M 701270
- N 1-701268

(OVER)

SYMBOLS (Plate 18-1)—Continued

M	79362 eccentric	AL	1-701172A
	72567 screw	AM	1-702773
N	701583 screw, 49 nut	AN	1A-705110 No. 1
O	982½ Style 17		Env. 2075 black } includes AV
P	701269		1-705110 No. 20 gray }
Q	1-701261	AO	1-705110 No. 19 includes AC
R	Included in F	AP	705153
S	1-701264	AQ	705144
T	701620 screw	AR	1-705124
	72324 shoulder nut	AS	1-705122
U	1-701810 spring	AT	1-705131A
V	701576 spring screw stud, 701577 eccentric, 72167½ washer	AU	702109½
W	1-702111½ No. 2	AV	Included in AN
X	1-701173 No. 4	AW	1-705181½
Y	701173 No. 5	AX	1-701271
Z	702218 No. 4 use 3284½ spring	AY	1-705235 No. 3
AA	702355 eccentric, 79512 screw	AZ	81 Fte. 124 No. 2
AB	72567 screw	BA	1-701259
	79362 eccentric	BB	701811
AC	Included in AO	BC	1-701701
AD	1-705182½	BD	1-701018A complete lower shaft, includes BG
AE	1-709132½	BE	1-701258 use 72502½ screw and 701807 spring
AF	709133C	BF	1-701205A
AG	1-702223 No. 4	BG	Included in BD
AH	75287A	BH	701316A
AI	1-75241A use 73605 screw	BI	1-701263 use 69558 set screw and 72167½ washer
AJ	1-75284A use screw 404616, eccentric 72307	BJ	1A-701204 No. 2
AK	73611 screw	BK	1-709118B No. 2 use 709501 No. 2 screw, 47¾ nut
	75342 eccentric		

CARRIAGE AND REGISTER RETURN FROM KEY No. 48
REGISTER RETURN FROM KEY No. 49
CLASS 77 (Plate 18-2)



SYMBOLS (Plate 18-2)

NOTE: For other symbols See Plate 18-1

- A 709517 screw
709304 No. 1 eccentric
1097 7/8 lockwasher
47 nut
- B 10750 1/4 Style 9 screw
629 washer
- C 709108 1/4
- D 709521 screw
709146 lockwasher
- E 1-701672B No. 1 use 9053 3/8 screws,
includes F, CM
- F 1-701019A complete upper shaft
- G 701806
- H 1-700127

(OVER)

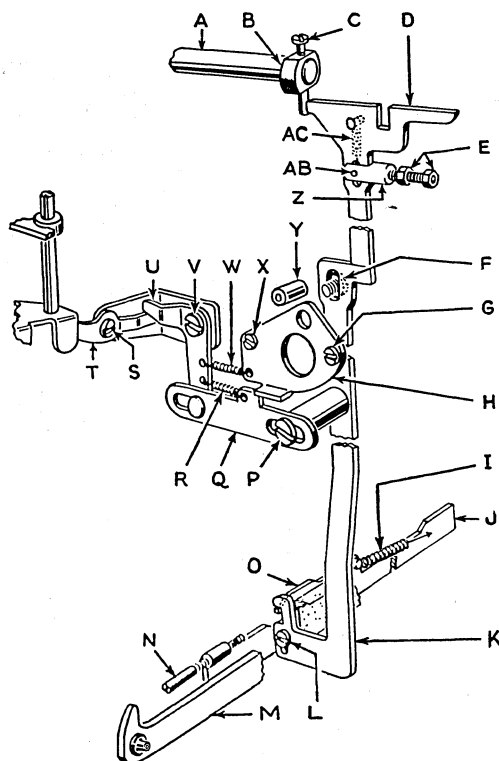
SYMBOLS (Plate 18-2)—Continued

I	701574 pivot post	AY	73595 screw
J	7354 $\frac{1}{4}$ screw	AZ	47 nut
K	46 nut	BA	79503 screw
L	709801 No. 3	BB	1-75283 No. 2 includes AX
M	20 No. 101	BC	75836
	72583 screw	BD	75645
N	46 nut	BE	1-75241A use screw 73605
	76581 screw	BF	1-75284A use screw 404616, eccentric
O	46 nut		72307
P	72576 No. 1	BG	1-75240A use 506 Fte. 209 screw
Q	701262	BH	72572 No. 1
	74524 screw	BI	77517 No. 2
R	47 nut	BJ	1-705183 No. 2
S	1-702249 $\frac{1}{4}$ No. 3	BK	79503
T	75634 screw	BL	74529 screw
U	72110 No. 3	BM	7282 $\frac{1}{4}$ spring
V	46 nut	BN	705618 screw
	701503 $\frac{1}{2}$ screw	BO	73611 screw
W	49 $\frac{1}{2}$ nut	BP	75342 eccentric
X	9282 $\frac{1}{4}$ spring	BQ	1-705148C
Y	251 $\frac{1}{8}$ screw	BR	75645
Z	46 nut		4452 $\frac{1}{2}$ screw
AA	94523 screw	BS	46 nut
AB	46 nut	BT	2887 $\frac{1}{2}$ spring
AC	1-71175	BU	705181
AD	702218 No. 4 use 3284 $\frac{1}{2}$ spring	BV	1-705182A
AE	503 Fte. 141 screw	BW	702109 $\frac{1}{2}$
AF	47 nut	BX	705652
AG	1-709131 No. 1	BY	76580
AH	72617		1-705217R No. 2 right bracket, in-
AI	1A-709132 includes AD, AI, AO		cluded in 11-705031 $\frac{1}{2}$ shaft assem-
AJ	709554		bly
AK	71806	BZ	12081 $\frac{1}{2}$
AL	709355 nut	CA	9054 $\frac{1}{2}$
AM	709541 screw	CB	1A-705901 No. 4 Class 75, 77 and
AN	702800		Series M 700
AO	71520	CC	1-701701 includes T, V
AP	72567 screw	CD	72567
AQ	1-702148	CE	701581
AR	74529	CF	71554
AS	AO 1-709132 $\frac{1}{2}$	CG	709543 screw
AT	72624 screw	CH	46 nut
AU	47 nut	CI	20 No. 102
AV	702583 screw		1-700666AR No. 1 assembled side
AW	75804 No. 3		frame, includes H, CD, CF, CL
AX	75638 screw	CJ	79543 screw
	72110 No. 3		46 nut
	49 $\frac{1}{2}$ nut	CK	72614 screw
	1-702773 includes AT, AU		701509 No. 2 bushing
	1A-75239 No. 2 includes BA, BB, BE,	CL	701517
	BF, BG	CM	1-709118B No. 2 use 709501 No. 2
	Included in BB		screw, 47 $\frac{1}{4}$ nut

REGISTER INTERLOCK, THIRTY PINION (Plate 20)

SYMBOLS (Plate 20)

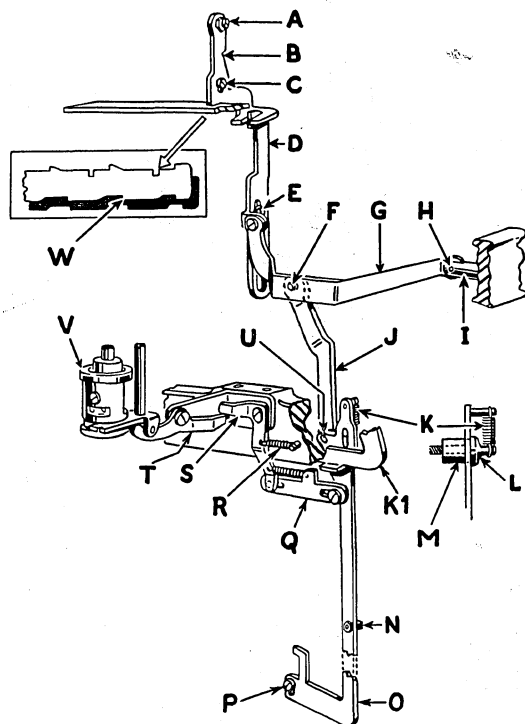
A	1A-79019 No. 1	} complete assembled pinion shaft, specify style and machine no.
B	1-79019 No. 1 early	
C	1-79311 includes C	
D	79510	
E	1-79119 No. 1 includes E, Z, AB	
F	46	
G	72603	
H	74524 use 47 nut	
I	1-72284 No. 2	
J	1-702284A No. 2	
K	1-72825	
	1-72102A No. 6	
	1-72102 No. 6 early	
	1A-72104 No. 1	} used with 30 pinion
	1-72104 No. 1 early	
	1-72104B No. 3	} used with 50 and 60 pinion
	1-72104A No. 3 early	
	1A-72104 No. 5	} used with 30 pinion and non-print motor bar
	1-72104 No. 5 early	
	1-72104A No. 6	} used with 50 and 60 pinion and non-print motor bar
	1-72104 No. 6 early	
	702104 No. 1 cl. 77	
	1-702104 No. 4 with sel. skip tab	
L	72602 No. 1	
M	1-72228A No. 3 see keyboard book, plate 5 for other styles	
N	72707A No. 4 see keyboard book, plate 43, letter J	
O	1-72105 (1-72105A, 1A-72107)	
P	7559 1/4	
Q	72285* included in U	
R	74804	
S	77529	
T	72288	
U	1-72286 No. 2	
V	11-702285	
W	71605	
X	72810	
Y	73612	
Z	72326 collar	
AB	79570	
AC	79571 screw	
	79819 spring	



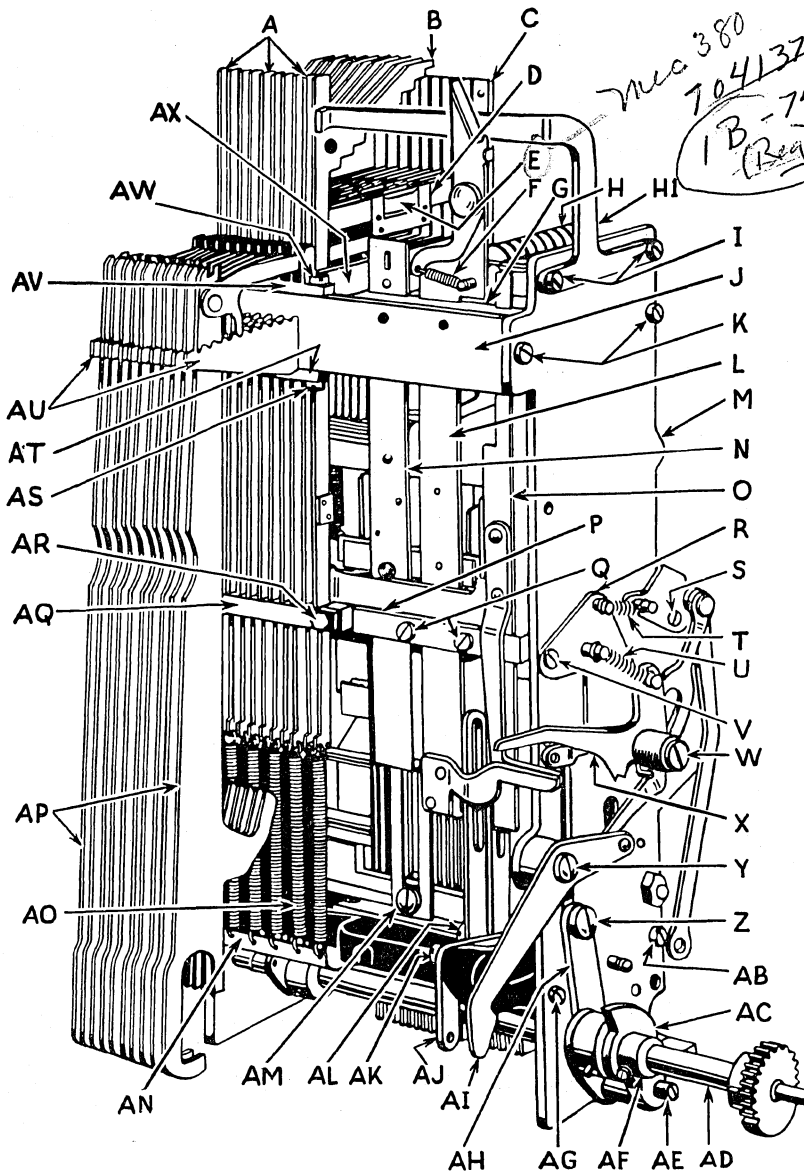
REGISTER INTERLOCK FOR FIFTY AND SIXTY PINION, AND FOR CARRIAGE RETURN AND MOTOR BAR (Plate 21)

SYMBOLS (Plate 21)

A	73611 screw, 76311 ecc.
B	79248 No. 2
C	1A-79248 No. 2 used with motor re- turned reg.
D	74500
E	1-79117A No. 2
F	79600
G	75602 screw, 75342 ecc.
H	72104 1/4
I	71564
J	71565 No. 2
K	72104 3/4
K1	79819
L	1-72284 No. 2
M	1-702284A No. 2
N	72604
O	72326 collar
P	72527 1/4
Q	1-72104B No. 3 } see plate 20
R	702104 No. 1 cl. 77 } for other styles
S	72602 No. 1
T	72285* included in S
U	72810
V	1-72286 No. 2
W	11-702285
	72288
	74529 screw
	1-705353
	1-79130A specify No., see plate 8



MULTIPLIER ASSEMBLY, FRONT VIEW (Plate 22)



SYMBOLS (Plate 22)

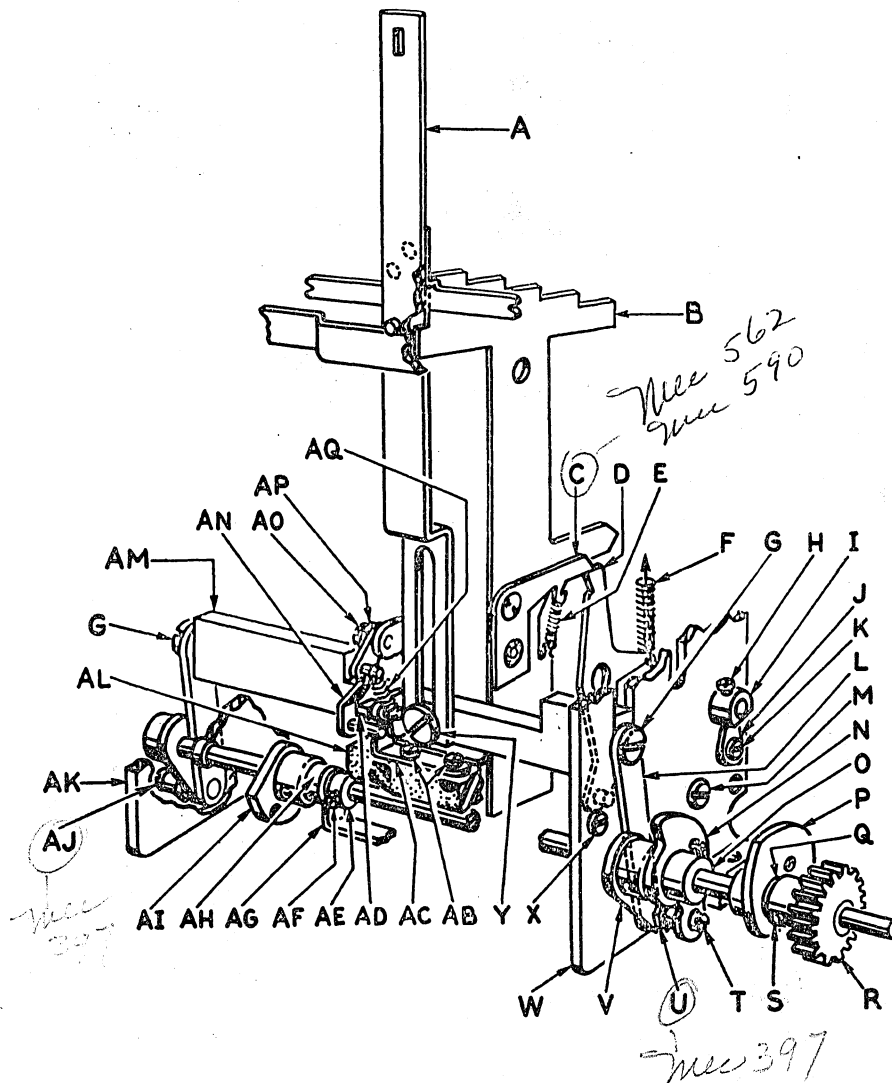
A 74151 No. 1
B 1-74151 No. 2
C 74139
D 74139
E 1A-74137 No. 1
F 74180B flat spring
G 72810
H 74919 guide, use 74534 screws
I 74031
H 74252
I 72567 use 74523 screws without bracket H1
J 74937
K 704937
L 74505
M 1-74140A
N 1-74140 early
O 1-74110R No. 1 cl. 72
P 1-74110R No. 2 cl. 76, 77
Q 1-74110R No. 3 cl. 78
R 1-74129 (11-704129 No. 3)
S 1-74129 No. 2 cl. 78
T 1-74150A No. 3
U 1-74150 No. 3 early
V 74148 No. 2 brace

Q 79543
R 1-74253A
S 74500 No. 2 (74500)
T 681 1/2
U 79824
V 74500
W 74587
X 1A-74255
Y 74527
Z 74526
AB 74500
AC 74249A
AD 1C-74013 see plate 25 for other styles
AE 74583
AF 1-74331A includes 71519 screw
AG 74500
AH 74123
AI 1-74124A No. 1 cl. 71, 72, 73
1-74124 No. 2 cl. 76, 77
1-74124 No. 4 with reg. subt., Cl. 76
1-74124A No. 5 cl. 78
1-704124 No. 1 with or without reg. subt., cl. 76, 77

1-704124 No. 2 cl. 78
1-704124 No. 3 cl. 71, 72, 73
1-74128A No. 1
AJ 74529 screw
AK 75615 screw, 74304 roller
AL 79600
AM 74143A (20 No. 122) } use 74502
AN 704143 (20 No. 123) } screws
AO 74806
AP 1-74135 No. 1 cl. 72
1-74135 No. 2 cl. 76, 77, 78
1-74135 No. 3 (1 req.) used in extreme left position
1-74135 No. 4 (1 req.) used on right
AQ 74101 No. 1
704101
AR 74535
AS 79543 screw
AT 74101 No. 1 } brace
704101
AU 74114 No. 1
AV 74941 } brace
704941
AW 79543
AX 74147

SEE EXPLANATION ON INSIDE OF FRONT COVER

MULTIPLIER LATCH PAWL, CLASS 72 MACHINES (Plate 22-1)



SYMBOLS (Plate 22-1)

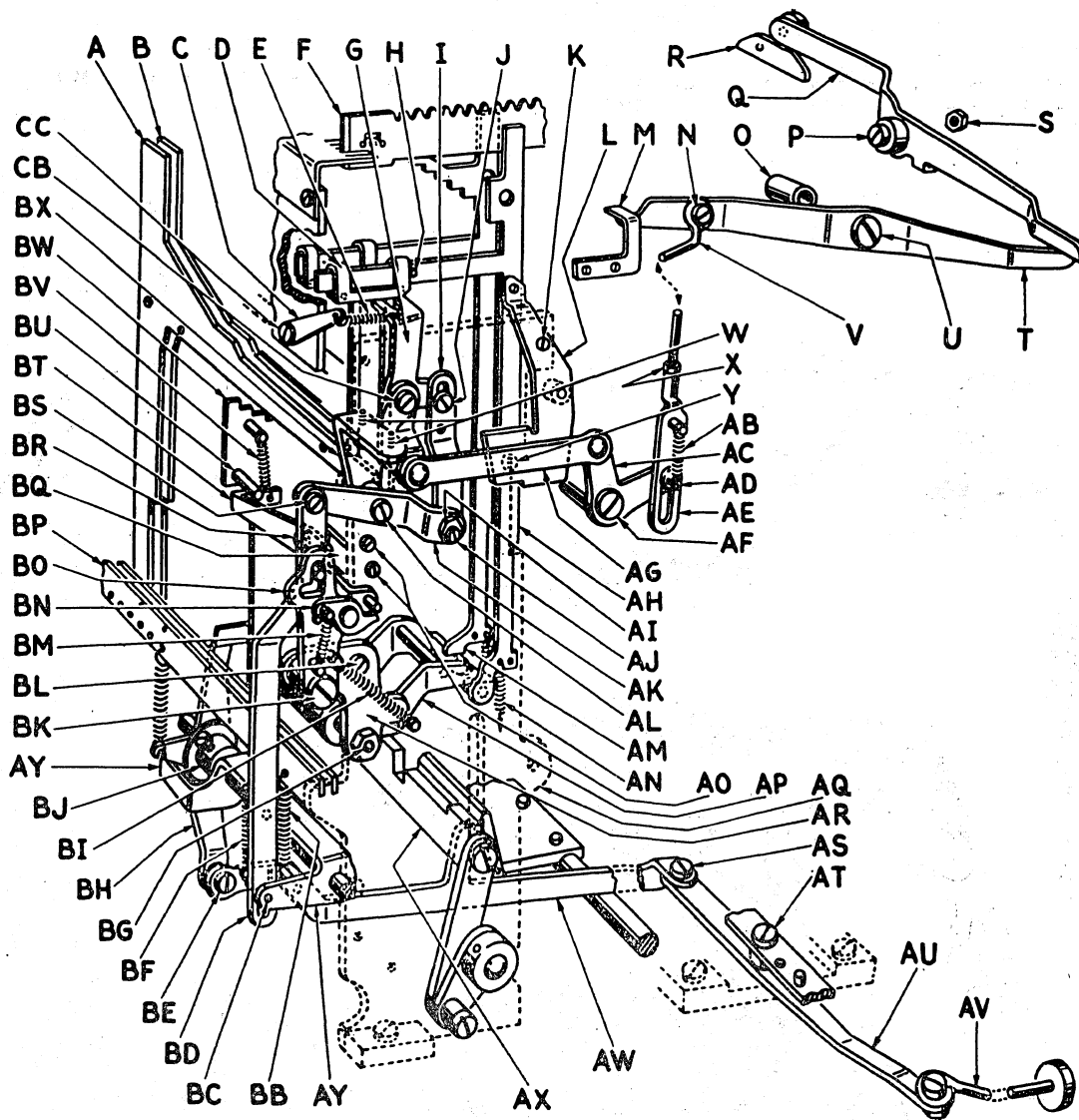
*A 1-704129 No. 3 (1A-704129 No. 3,
1-704150 No. 5)
B 1-74107 No. 4
C 74154 No. 1
D 1-74132 No. 15
E 74801
F 74803
G 74526
H 75618
I 1-74317 includes H
J 74230
K 74565
L 74123
M 74526 No. 2
N 74249A
O 1-74331A collar, includes 71519
screw

P 1-74192 No. 2 use 550 $\frac{3}{4}$ screw
Q 74342 space washer
R 74311
S 52 pin
T 74589A screw
U 704300 $\frac{1}{2}$ eccentric
V 1-74121 use 51 pin
W 1-704110L No. 2
X 74500
Y 79600
AB 7562
AC 704130
AD 704528
AE 1-8344 collar, includes AF
AF 4463 screw
AG 1-74268

AH 306 Fte. 202 space collar
AI 1-74157 No. 2 use 52 pin
AJ 74588A screw, 74330A collar
AK 1-74110AR No. 1
*AL 1-74665A No. 1 for narrow base
21-704665 No. 1 for wide base
*AM 1-74914 No. 1 for narrow base
1-704914 No. 1 for wide base
1-704914 No. 6 new style wide base
machine with multiplier to print
extensions—columns specified—
cge. controlled
AN 1-704129 $\frac{1}{2}$
AO 75615
AP 71361 eccentric
*AQ 205801

*Parts Required for Field Installation.

MULTIPLIER FACTOR TO PRINT—EXTENSION OF ONE IN SPECIFIED COLUMNS, CARRIAGE CONTROLLED (Plate 22-2)



SYMBOLS (Plate 22-2)

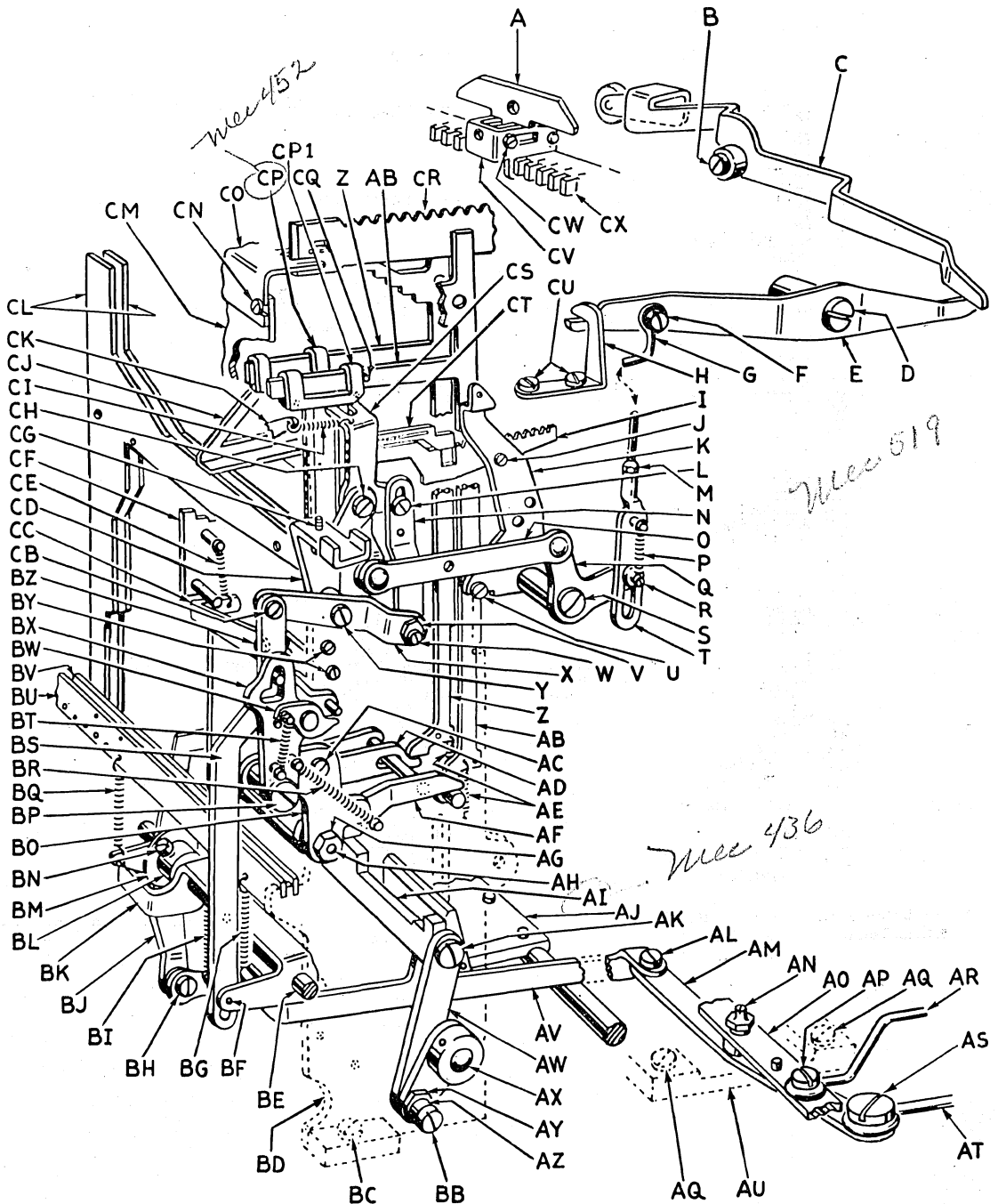
- 704150 No. 3 position 1, 1 required
704150 No. 1 positions 2 thru 8, 7 required
704150 No. 2 positions 9 and 10, 2 required
20 No. 102 anchor
1A-74137 No. 1
12084 1/4
1-76111 specify No., see chart, plate 3-1, printing symbol list
1-704137 assembly includes AC, AG
74512 No. 1* included in AH
704149
79552 screw
504 Fte. 138
1-704216L
709260 use 79545 screws
72572 No. 1
79341 No. 3 use without positive register control
1362 1/2
1-709249
1-709249A use for 6 line control
73216A No. 30
46 1/4
1-709251 No. 2
8054 1/4
- V 1-709702
W 73611 screw
X 49 3/4
Y 350 1/4 screw
AB 3489 3/4 spring
AC 704140* included in G
AD 74315
AE 1-709294
AF 704518
AG 704138* included in G
AH 1-704151L No. 4
AI 104380 eccentric
AJ 70512 screw
AK 1-704148
AL 704521
AM 704151R No. 4
AN 74806
AO 74502
AP 1-704305A
AQ 1-704110L No. 2 side plate
AR 1-704136
AS 9053 3/4
AT 72624
AU 1-702278
AV 1-702709 No. 4
AW 72279 No. 2
- AX 1-704914 No. 6
AY 1-704145
BB 3284 1/2
BC 72514 No. 2 screw
BD 1-704146
BE 75637
BF 87800 No. 4 spring
BG 704519A screw, use 47 nut
BH 1-74132 No. 18
BI 71805
BJ 1-28345 collar, includes 75618 screw
BK 704522
BL 74565 screw
BM 76806
BN 1-704135* included in BO
BO 1-704134 includes BN
BP 704126 No. 3
BQ 1-18 Fte. 134 brace
BR 53 Fte. 134 screw
BS 79552
BT 1-704133
BU 52 Fte. 134* included in BW
BV 79810
BW 1-16 1/4 A Fte. 134
BX 704141
CB 3259 1/4 A
CC 72614

SEE EXPLANATION ON INSIDE OF FRONT COVER

Mec 544

MULTIPLIER FACTOR TO PRINT—EXTENSION OF ONE IN SPECIFIED COLUMNS, CARRIAGE CONTROLLED—IMPROVED, CLASS 72
(Plate 22-3)

NOTE: This improved mechanism was included in Style 72 07 22 machines beginning with Serial No. A915672, and in other Class 72 machines beginning with Serial No. B10062.



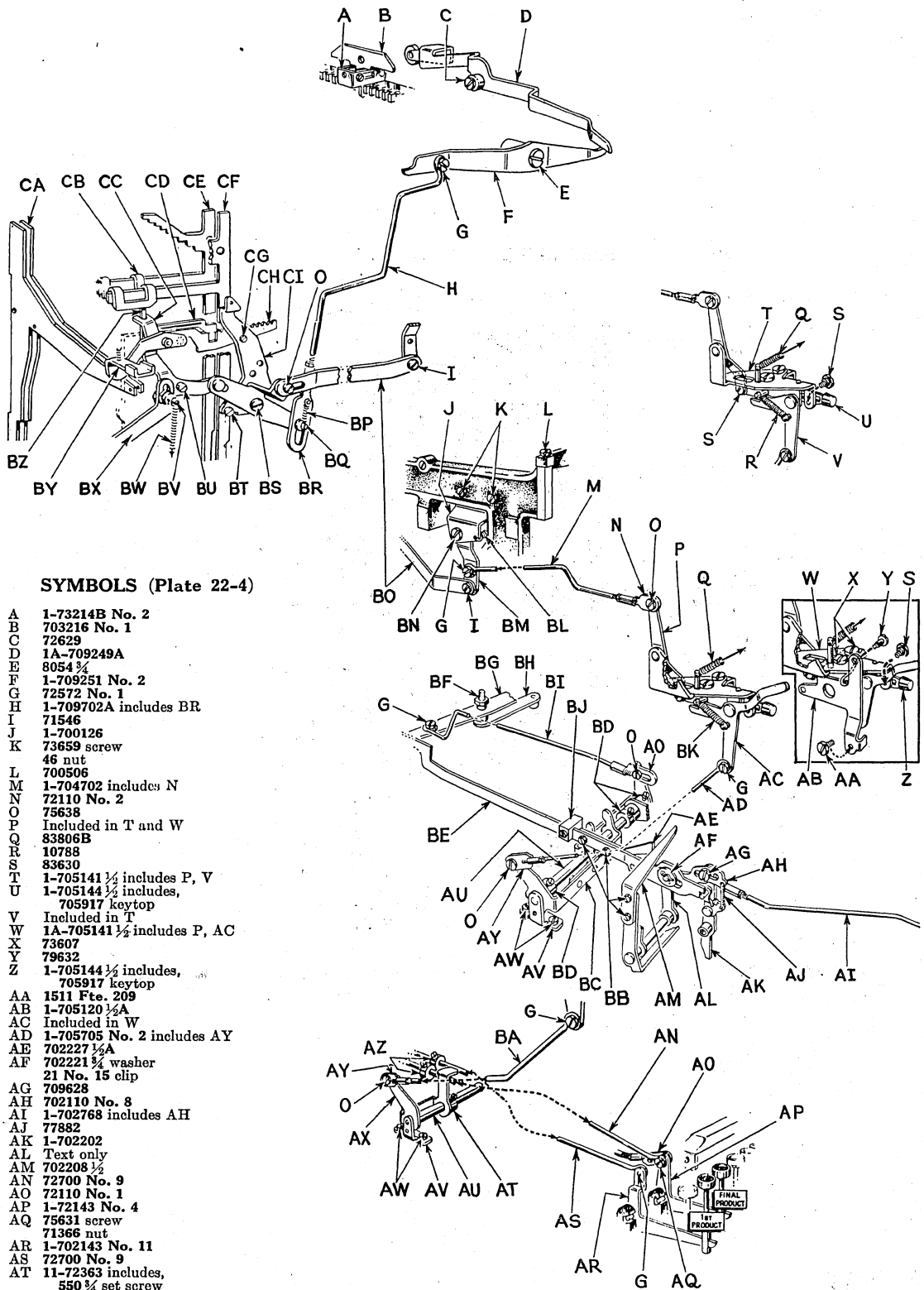
Symbols on back

SYMBOLS (Plate 22-3)

A	703216 No. 1	AY	704300½ eccentric
B	72629	AZ	74330A roll
C	1A-709249A	BB	Use 702589, 704300½ No. 2 2 req., 704589 2 req., 704588, 406320, on Class 72, 704300½ No. 2 2 req., 704589 2 req., 74501 on Class 77
D	8054¾	BC	74524
E	1-709251 No. 2	√BD	1-704110L No. 4
F	72572 No. 1	BE	21-704025 No. 1 includes BJ, BL, BK, BM
G	1-709702 includes M, T	BF	72514 No. 2 screw
H	709260	BG	3284½
√I	704114	BH	75637
J	504 Fte. 138	BI	87800 No. 4 spring
K	1-704216L No. 2	BJ	1-131 Fte. 149 No. 3
L	79552	BK	1-704145
M	49¾	BL	1-74308 includes BN
N	704149	BM	74305
O	Included in CS	BN	12055 ⅞
P	3489¾	BO	1-704136
Q	Included in CS	BP	704522
R	74315	BQ	74803
S	704518	BR	71805
T	1-709294	BS	1-704146
U	350¾	BT	76806
V	705367	BU	Use 1-704126 No. 3
W	70512	BV	Use 1-704126 No. 2
X	1-704148	BW	Included in BX
Y	704521	BX	1-704134 includes BW
Z	704151R No. 4 used in columns 9 thru 15	BY	74502
AB	1-704151AL No. 4 includes CQ	BZ	53 Fte. 134 screw
AC	74565	CB	79552
AD	Included in AF, use set screw 550¾	CC	1-704133
AE	74806 springs	CD	704141
AF	1A-704305A includes AD	CE	79810
AG	47	CF	1-16½A Fte. 134
AH	704519A screw	CG	73611
AI	1-704914 No. 6	CH	3259¼A
AJ	41-702011	CI	12084½
AK	74526	CJ	21-704129 No. 3
AL	9053¾	CK	20 No. 102 use screw 72614
AM	1-702278A	√CL	704150 No. 7
AN	72624 No. 2	√CM	704139 No. 2
AO	1-702280 No. 4 with power result keys Use 1-702280A No. 3, 702197, 702157A No. 20, without power result keys	CN	74533
AP	72572 No. 1	CO	704100 No. 3
AQ	71518	√CP	1A-704137½
AR	1-702774	√CP1	11-704137½
AS	200544½ screw 46¾ nut	CQ	Included in AB
AT	1-702709 No. 5 for power result keys 1-702709A No. 4 not power result keys	CR	1-76111 No. 17 stamped "1-17," used in column 15
AU	702672	CS	1-704137 includes O, Q
AV	72279 No. 2	√CT	704147½
AW	74123	CU	79545
AX	11D-704013 No. 1	CV	1-73214A No. 2
		CW	9050¾
		CX	1-703913C Styles 22, 30

√Parts relating to the Improved Lift Arm Construction—adopted on Style 72 07 22 machines beginning with Serial No. A915672 and on other styles of Series M machines beginning with Serial No. B62810.

MULTIPLIER FACTOR TO PRINT—NORMALIZED BY KEY NO. 52 (Plate 22-4)

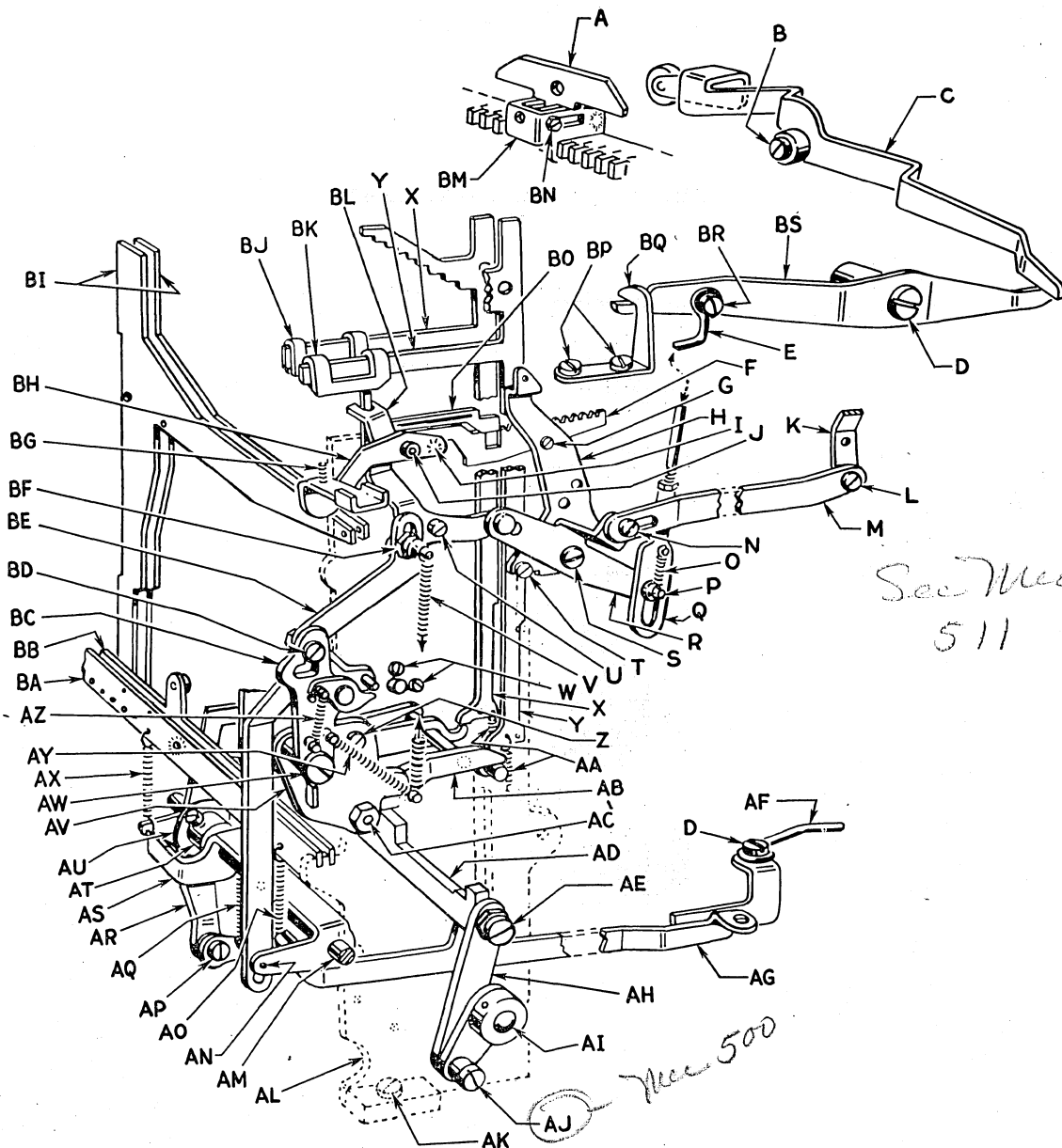


SYMBOLS (Plate 22-4) Continued

AU 31-702003 No. 3
 AV 72148 No. 4
 AW 72567
 AX 702289 $\frac{1}{4}$ No. 2
 AY 72110 No. 5
 AZ 1-72315 No. 1 includes,
 72573 set screw
 BA 1-705707 includes AY
 BB 545 Fte. 217
 BC 1-702289 $\frac{1}{4}$ No. 3
 BD 1-75332 includes,
 75618 set screw
 BE 1A-702171 No. 14
 BF 72624 No. 2
 BG 1-702280 No. 4
 BH 1-702278 No. 2
 BI 1-702774 includes AO
 BJ 1-702906 includes,
 702605 set screw
 BK 10788
 BL 706801
 BM 704266
 BN 704538
 BO 704267A
 BP 3489 $\frac{3}{4}$
 BQ 74315
 BR 1-709294
 BS 704518
 BT 350 $\frac{1}{8}$
 BU 75648
 BV 523 Fte. 216
 BW 983
 BX 1-704146A
 BY 1-704141A
 BZ 11-704137 $\frac{1}{2}$
 CA 704150 No. 7
 CB 1A-704137 $\frac{1}{2}$
 CC 1-704137A
 CD 704147 $\frac{1}{2}$
 CE 704151R No. 4
 CF 1A-704151AL No. 4
 CG 504 Fte. 138
 CH 704114
 CI 1-704216L No. 2

MULTIPLIER FACTOR TO PRINT—EXTENSION OF ONE OR FIVE (ADJUSTABLE) IN SPECIFIED COLUMNS—CARRIAGE CONTROLLED (Plate 22-5)

Note: This improved mechanism was included in Class 72 and Series M 200 machines beginning with Serial No. B135726.



SYMBOLS (Plate 22-5)

A 703216 No. 1
B 72629
C 1A-709249A
D 8054 1/4
E 1-709702A includes Q
F 704114
G 504 Fte. 138
H 1-704216L No. 2
I Included in BH
J 702605 screw
K 704266

L 71546
M 704267A
N 75638
O 3489 1/4 spring
P 74315 spring stud screw
Q 1-709294
R Included in BL
S 704518
T 350 1/8
U 75648
V 983

W 74502
X 704151R No. 4 in columns 9 thru 15
Y 1A-704151AL No. 4
Z 74565
AA 74806 springs
AB 1B-704305A
AC 704519A screw
AD 47 nut
AE 1-704914 No. 6
AF 704589 screw
AG 704300 1/2 No. 2 eccentric

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 12-10-52

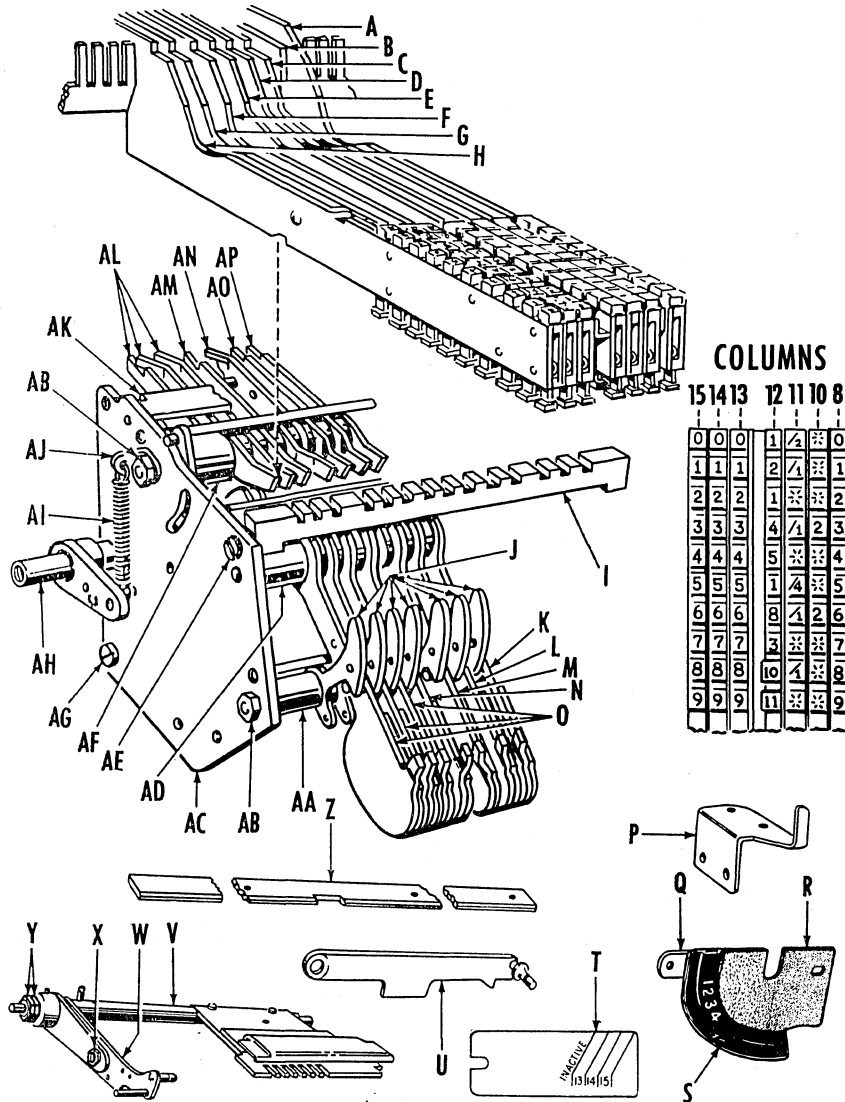
For Form 2954

Replaces General Print 609-1/M

SYMBOLS (Plate 22-5)—Continued

AF 1-702709 1/4
 AG 1-702279 No. 2
 AH 74123
 AI 11D-704013 No. 1 shaft assembly
 AJ 702589 screw
 406320 roller
 AK 74524 screw
 AL 1-704110L No. 4 side frame
 AM 21B-704025 No. 1 shaft assembly
 AN 72514 No. 2 screw
 AO 3284 1/2
 AP 75637
 AQ 87800 No. 4 spring
 AR 1-704132 No. 18
 AS 1-704145
 AT 1-74308 includes,
 12055 3/4 set screw
 AU 704305 1/2 spacer
 AV 1-704136
 AW 704522 screw
 46 nut
 AX 74803
 AY 71805
 AZ 76806
 BA 1-704126 No. 3
 BB 1-704126 No. 2
 BC 1-704134
 BD 12356 3/4 screw
 46 nut
 BE 1-704146A
 BF 705367 eccentric
 523 Fte. 216 spring screw stud
 BG 73612 screw
 BH 1-704141A includes I, J
 BI 704150 No. 7
 BJ 1A-704137 1/2
 BK 11-704137 1/2
 BL 1-704137A includes R
 BM 1-73214B No. 2
 BN 9050 3/4
 BO 704147 1/2
 BP 79545
 BQ 709260
 BR 72572 No. 1
 BS 1-709251 No. 2

MULTIPLIER FACTOR WITH $\frac{1}{12}$ FRACTIONS TO PRINT, SERIES M 200 (Plate 22-5A)



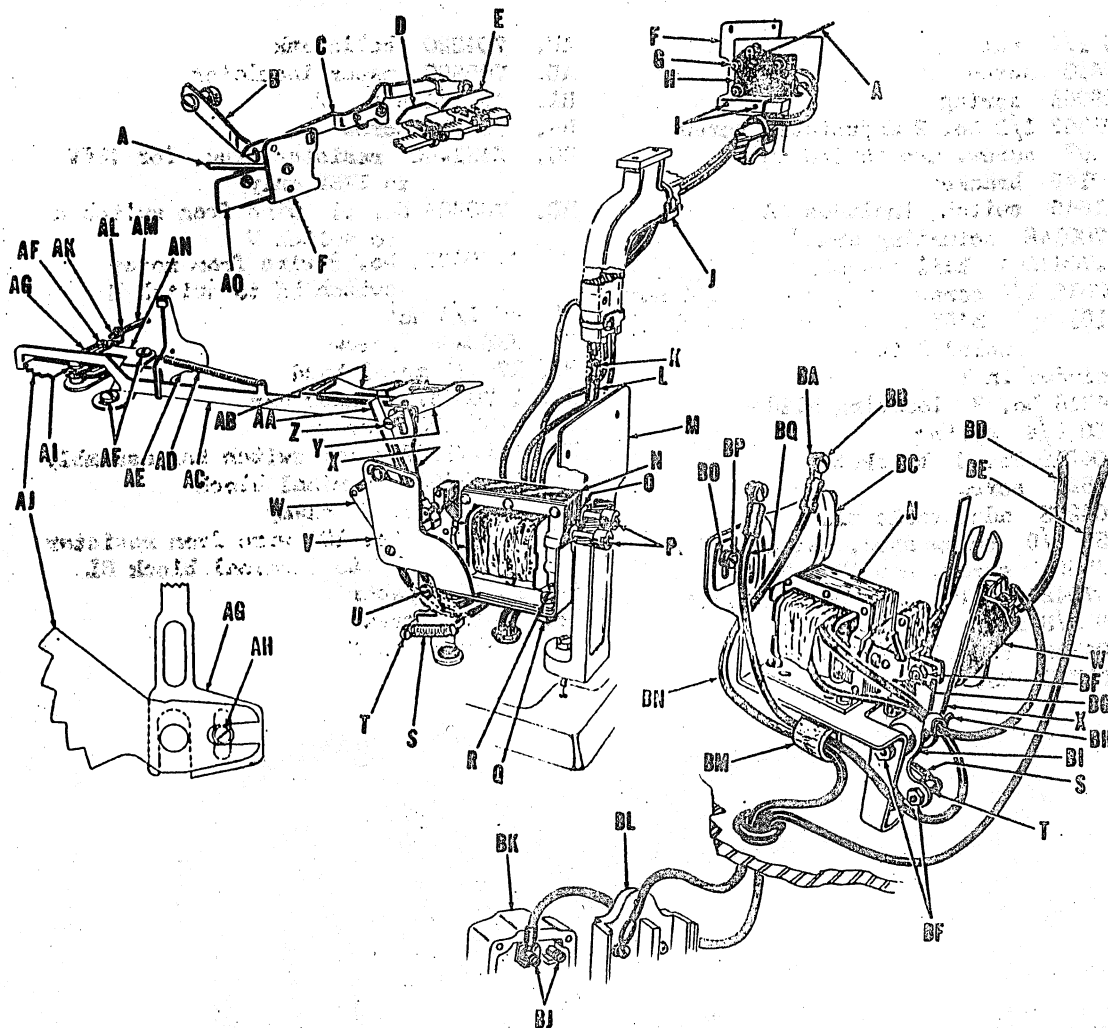
SYMBOLS (Plate 22-5A)

- | | | | | | |
|---|-----------------|----|-------------------------------------|----|------------------------------------|
| A | 1-76111 No. 8 | Q | 1-705186B | AC | 11-77110AL left side frame |
| B | 76111 No. 61 | | 2-705186B No. 25 complete assembly, | AD | 11A-707110R No. 1 right side frame |
| C | 1-706111 No. 54 | | includes R, S | AE | 707001 No. 10 |
| D | 1-706111 No. 52 | R | 1A-705186 $\frac{1}{2}$ | AF | 703502 $\frac{1}{2}$ screw |
| E | 1-706111 No. 53 | S | 705986 No. 25 cardboard | AG | 1097 $\frac{1}{8}$ washer |
| F | 1-76111 No. 9 | T | 705986 $\frac{1}{2}$ clear plastic | AH | 1A-707004 No. 10 |
| G | 11-76111 No. 17 | U | 705921 No. 5 | AI | 79544 |
| H | 707903 No. 17 | V | 1-706205 No. 7 | AJ | 1-707000A No. 10 |
| I | 77116 | W | 71-702001A No. 5 includes W, X, Y | AK | 707802 |
| J | 11-77115 | X | 1-702182 $\frac{1}{2}$ | AL | 20 No. 157 |
| K | 11-707115 No. 8 | Y | 72307 eccentric | AM | 707125 |
| L | 1-707115 No. 7 | Z | 79547 screw | AN | 707118 No. 10 |
| M | 1-707115 No. 9 | AA | 46 nut | AO | 707118 No. 15 |
| N | 11-707115 No. 9 | AB | 204309 No. 2 | AP | 1-707118 No. 14 |
| O | 11-707115 No. 6 | | 709931 No. 13 | | 707118 No. 16 |
| P | 709118A No. 9 | | 1-707002 No. 10 | | 77118 No. 7 |

Longway

Burroughs - Series M Symbol Book - Accumulation

Multiplier Factor Extend Column Selection, Carriage Controlled
Series M200 (Plate 22-5B)



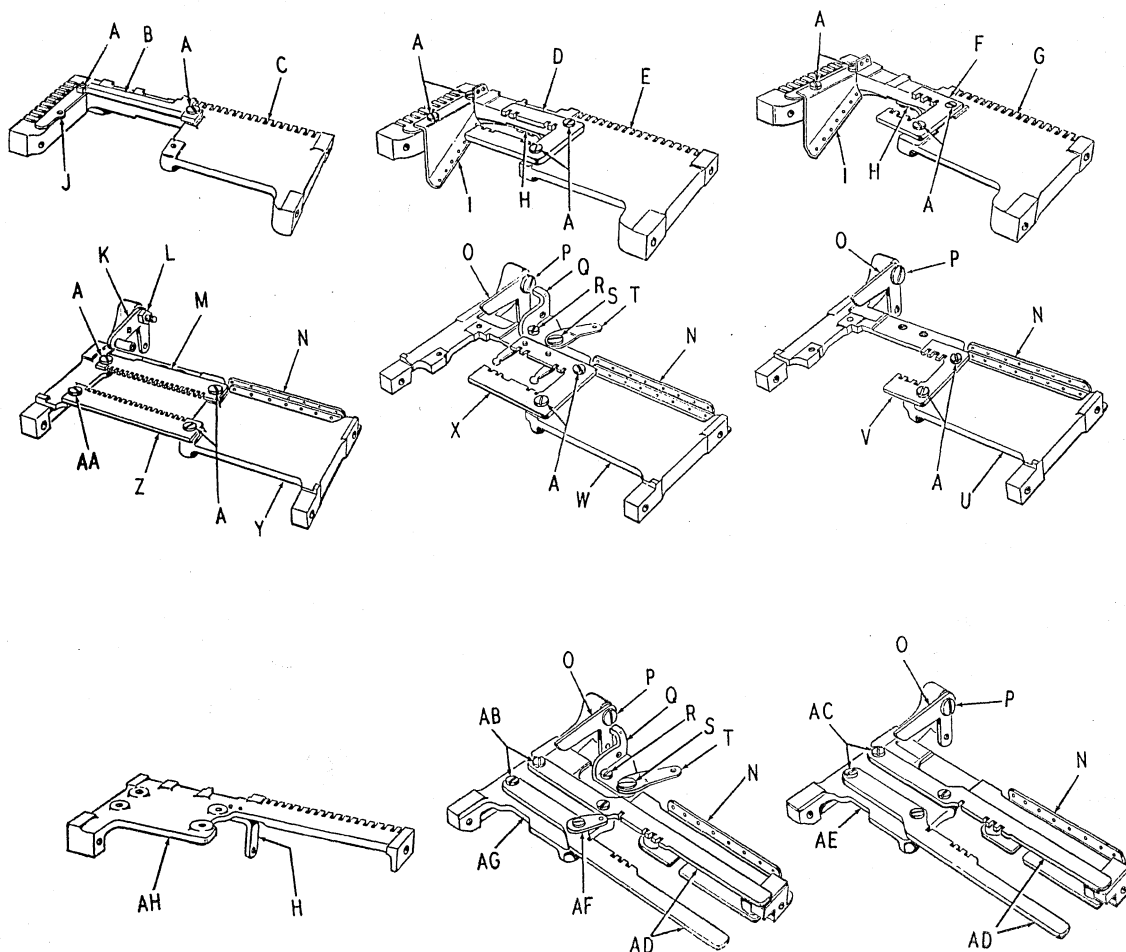
SYMBOLS

- | | |
|--|---|
| A. 1-101 Env. 3483 switch arm assembly | J. 1FX408 metal band |
| B. 1-709251 No. 2 rocker arm | K. 74533 screw, use 49 3/8 nut |
| C. 1A-709249A rocker arm | L. 701997 rubber sheathing |
| D. 703216 No. 1 rail | M. 700150 solenoid retaining bracket |
| E. 703216 No. 16 rail | 1-700150 complete solenoid & switch assembly with brackets, 100V thru 175V |
| 1-73214C No. 2 hanger | 11-700150 Complete solenoid & switch assembly with brackets, 175V thru 220V |
| 703571 screw | N. 1X73-1 solenoid, 100V thru 175V |
| 702343 spacer | 2X73-1 solenoid assembly, 100V thru 175V includes H,N,W,BD,BE |
| 49 1/8 nut | 1X73-8 solenoid, 200V thru 220V |
| F. 11-709231 No. 5 bracket, for automatic extend | 2X73-8 solenoid assembly, 200V thru 220V includes H,N,W,BD,BE |
| 709263 No. 2 bracket, without automatic extend | O. 200596 1/2 screw |
| G. X225-150 screw | P. 83200 nut |
| 75210 washer | |
| X170-16 nut | |
| H. PX1846 switch, includes A | |
| I. 72567A screw | |

SYMBOLS (Plate 22-5B)

Q. 45 1/4 nut	AN. 704220 bellcrank
R. 79610 screw	AO. 709990 paper insulator
S. 60804A spring	BA. 49 1/4 nut
T. 203567 1/2 No. 2 adjustable screw	BB. 75615 screw
U. 74597 screw, use 46 1/8 nut	BC. X431-50 resistor, req. for 136V to 175V only
V. 700149 bracket	BD. 700906 No. 11 wire from switch H to switch W
W. FX1846 switch, includes AA	BE. 1-700906 No. 9 wire from motor switch BK to switch H
X. 1-700148 actuating arm	BF. 46 1/8 nut
Y. 1C-704305A bail assembly	BG. FX60-46 screw
Z. 702515 1/2 screw stud, use 49 1/4 nut	BH. X74-1 metal band
AA. 1-101 Env. 3483 switch arm assembly, included in W	BI. 1-700147 rocker arm
AB. Included in Y	BJ. X232-820 screws
AC. 704218 No. 2 locating slide	BK. 11A-71907 motor switch box assembly
AD. 780 1/4 spring	BL. 11A-70903 terminal block
AE. 704219 No. 2 bracket	BM. 93 1/8 No. 6 clamp
AF. 74529 screw	BN. 1-700906 No. 10 wire from resistor BC to terminal block BL
AG. 704273 adjustable slide	BO. 16340 spacer
AH. 256 1/8 screw stud, use 46 1/8 nut	BP. 73612 screw
AI. 53550A screw, use 46 1/8 nut	BQ. included in N
AJ. 1-704274 alternate column limit	
AK. 49 3/8 nut	
AL. 704316 should nut	
AM. 705710 No. 2 wire	

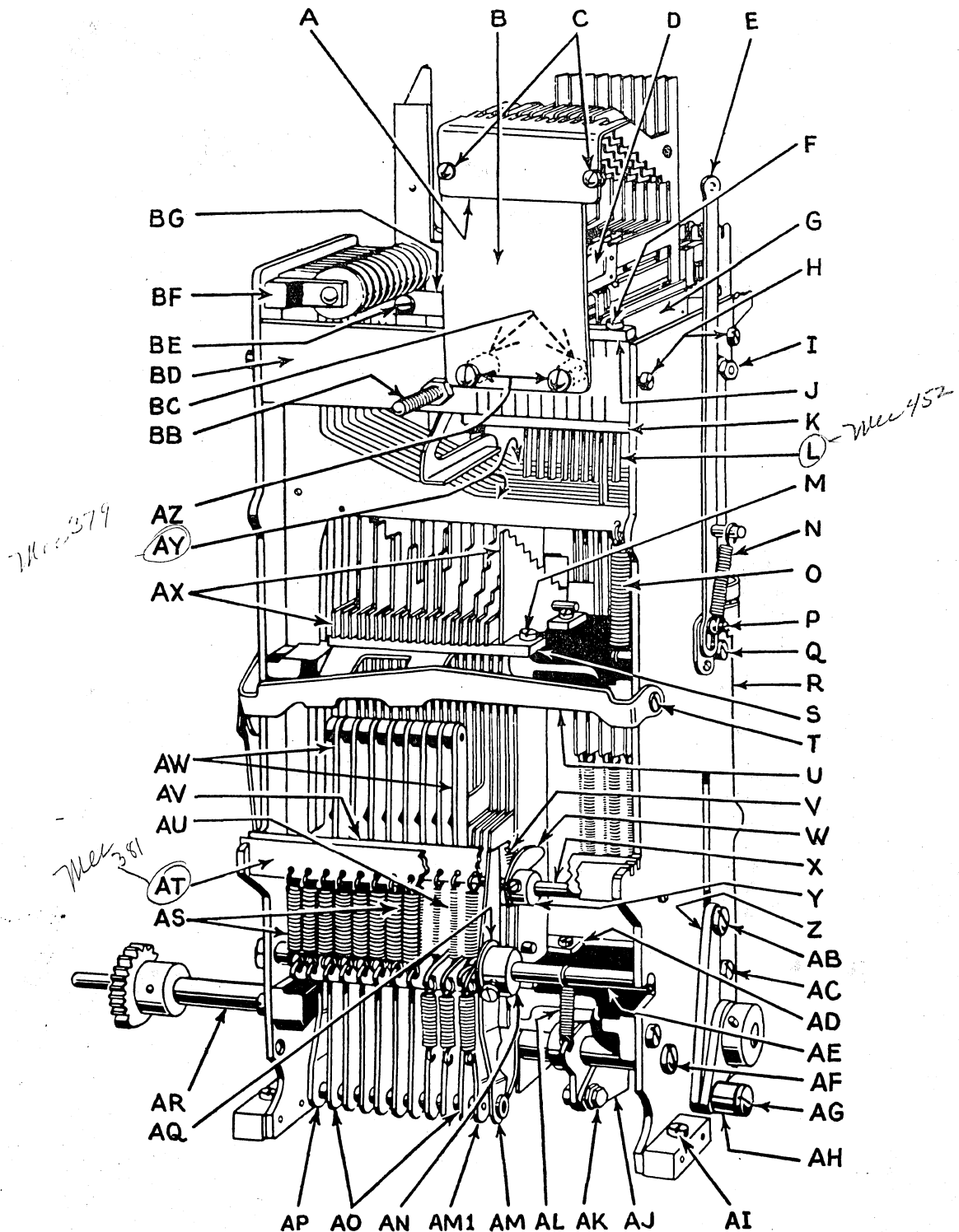
MULTIPLIER-SUBTRACTOR CASTINGS, CLASS 72, 77, 78 WIDE BASE AND SERIES M 200, M 700, M 800 (Plate 22-6)



SYMBOLS (Plate 22-6)

A	74502 screws	K	1-74128A No. 1	Y	704665 No. 1 lower casting only	Class 72 wide base and M 200
B	74127 No. 4	L	704509	Z	74127 No. 1	
C	704666A No. 1 upper casting only	M	74127 No. 2	AA	74530	
	21-704666A No. 1 assembled upper casting, includes A, B, C, J	N	20 No. 123 spring anchor, 74502 screws	AB	79624 No. 2 4 req.	
D	74127A No. 11	O	74128A No. 3	AC	76559 4 req.	
E	704666A No. 2 upper casting only	P	74525	AD	704127A	
	1-704666A No. 2 assembled upper casting, includes A, D, E, H, I	Q	74201	AE	704665 No. 4 lower casting only	Sterling. Class 77 and M 700
F	74127 No. 9	R	704544		11-704665 No. 4 assembled lower casting, includes AC, O, P, N, AD, AE	
G	704666A No. 1 upper casting only	S	73611	AF	20 No. 119 spring anchor	
	11-704666A No. 1 assembled upper casting, includes A, F, G, H, I	T	20 No. 118	AG	704665 No. 4 lower casting only	Sterling. Class 78 wide base and M 800
H	704203 bracket, 74502 screws	U	704665 No. 1 lower casting only		1-704665 No. 4 assembled lower casting, includes AB, O, P, Q, R, S, T, N, AD, AF, AG	
I	20 No. 121	V	11-704665 No. 1 assembled lower casting, includes O, P, N, U, A, V	AH	704666 No. 4 upper casting only	Sterling. Class 77, 78 wide base, M 700 and M 800
J	704184	W	74127 No. 8		1-704666 No. 4 assembled upper casting, includes H, AH	
		X	1-704665 No. 2 assembled lower casting, includes O, P, Q, R, S, T, N, W, X			

MULTIPLIER ASSEMBLY, REAR VIEW (Plate 23)



Symbols on back

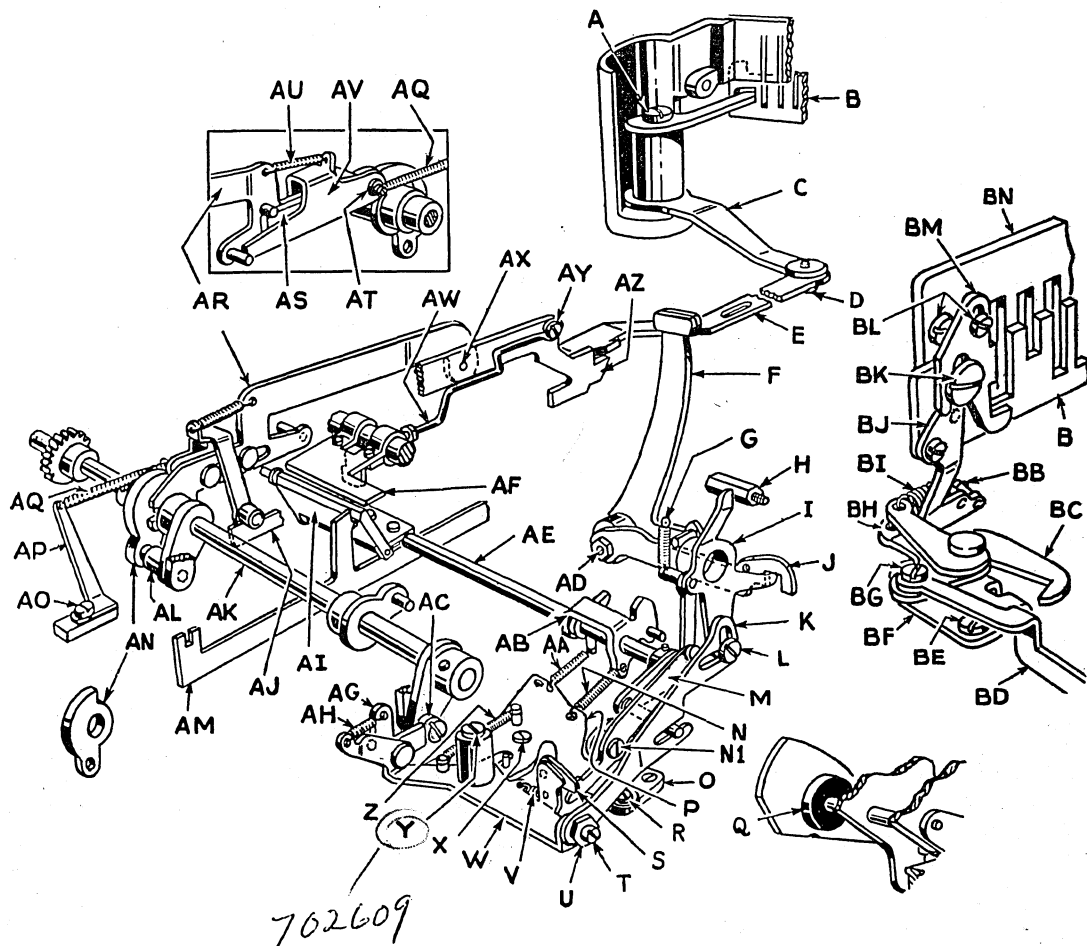
SYMBOLS (Plate 23)

A	74100	AK	76567 screw, 72307 ecc., 46 nut
B	704100 No. 1	AL	74808
	74139	AM	1-74132 No. 3 (1 req.)
C	704139	AM1	1-74132 No. 2 use 74803 no. 2 spring
D	74533	AN	1-74308 includes 12055 $\frac{1}{16}$ screw
E	74180B flat spring	AO	21-74132 No. 5
	1-74104		1-74132 No. 1 early
F	1-704104	AP	1-74132 No. 4
G	79543	AQ	74305 space collars
H	74147	AR	1C-74013 see plate 25 for other styles
I	74505	AS	74803
J	47 nut, 10240 washer	AT	74126 No. 1 cl. 72, 76
K	74101 No. 1		74126A No. 5 cl. 78
	704101		704126 No. 1 cl. 76, 77
L	74101 No. 1		704126 No. 3 cl. 72
M	1A-74137 No. 1		704126 No. 5 cl. 78
N	74502	AU	74804
O	79810		74803 No. 2 used for AM1 } inside springs
P	77879	AV	74126 No. 2
Q	74546 No. 2		704126 No. 2
R	74500	AW	1-74136
	1-74110L cl. 72, 76	AX	MULTIPLIER PLATES: COUNT FROM LEFT TO
	1-704110L cl. 72, 77		RIGHT FROM REAR OF MACHINE
	21A-74110L cl. 78		1-74107 No. 1-19 (1-74107 No. 1) full cent plate, stamped 1-19
	21-704110L (1-704110L No. 3) cl. 78		1-74107 No. 2 no. 9 first stroke plate, stamped no. 2
	74127 No. 3		1-74107 No. 3 no. 9 second stroke plate, stamped no. 3
	74127 No. 4 rear plate, use 74502 screws		1-74107 No. 4 no. 8 first stroke plate, stamped no. 4
	74500 No. 2 (74500)		1-74107 No. 5 no. 8 second stroke plate, stamped no. 5
T	1-74113A		1-74107 No. 6 no. 7 first stroke plate, stamped no. 6
U	1Z-74113 early		1-74107 No. 7 no. 7 second stroke plate, stamped no. 7
	1-74113B No. 2		1-74107 No. 8 no. 6 first stroke plate, stamped no. 8
	1Z-74113 No. 2 early } cl. 78		1-74107 No. 9 no. 6 second stroke plate, stamped no. 9
	1-704113A No. 1		1-74107 No. 10 no. 5 first stroke plate, stamped no. 10
	1Z-704113 No. 1 early		1-74107 No. 11 no. 5 second stroke plate, stamped no. 11
	1-704113B No. 2		1-74107 No. 12 no. 4 first stroke plate, stamped no. 12
	1Z-704113 No. 2 early } cl. 78		1-74107 No. 13 no. 4 second stroke plate, stamped no. 13
V	74801		1-74107 No. 14 no. 3 first stroke plate, stamped no. 14
	62880 (89801) cl. 78 } spring		1-74107 No. 15 no. 3 second stroke plate, stamped no. 15
W	74134 bail		1-74107 No. 16 no. 2 first stroke plate, stamped no. 16
X	74024		1-74107 No. 17 no. 2 second stroke plate, stamped no. 17
	704024		1-74107 No. 18 no. 1 plate, stamped no. 18
Y	1-28345 includes 75618 screw		1-74107 No. 1-19 (1-74107 No. 1) cipher plate, stamped no.
Z	74123		1-19
AB	74526	AY	1-74107 No. 20 subt. plate, stamped no. 20
AC	74500		74150 No. 1
AD	74127 No. 2 use 74502 screw		704150 No. 1
	74127 No. 1 front comb, use (1) 74502 and (1) 74530 screw		704150 No. 2 short
AE	74025 complete assembly 1-74025, includes AE, AM, AM1,	AZ	74532 (72614)
	AN, AO, AP, AQ	BB	74531 screw, 46 nut
	704025 No. 1 complete assembly 21-704025 no. 1	BC	74309
AF	74526 use 74310 collar on inside	BD	74938
AG	74529		704938
AH	74330 (406320)	BE	74534
AI	74524	BF	74918 use 74523 screw
AJ	74156	BG	74148 No. 1

Will 302

MULTIPLYING KEYS, EASIER DEPRESSION, AND TYPEWRITER KEY LOCK MECHANISMS INDEXED FROM MACHINE OPERATION (Plate 25)

(Plate 24 in Instruction Book only)



SYMBOLS (Plate 25)

SEE KEYBOARD SYMBOL LIST, PLATES 1, 2, 9, 20, 21
FOR OTHER SYMBOLS

- | | | | |
|---|---|----|---|
| A | 77513 long screw, 75503 sleeve, 7356 3/4 short screw | W | 1-72101 1/2 includes S, AG |
| B | 1-75214A | X | 73611 |
| C | 11-75214A used with 39 keyboard construction | Y | 103515 use 46 nut |
| D | 21-75214A used with four period type and auto. date | Z | 3281 1/2 |
| E | 31-75214A used with auto. date or four period type | AA | 3688 |
| F | 1-75121A | AB | 1-72114 1/2 |
| G | 1-705121A | AC | 74330 (406320) roller, 74589 screw |
| H | 71520 screw | AD | 72511 screw, 72340 nut |
| I | 72283 No. 3 } see keyboard book, | AE | 11-72011 cl. 76 |
| J | 1-702223A No. 3 } plate 20 for other styles | | 21A-72011 cl. 78 |
| K | 11-72163 No. 1 } see keyboard book, | | 51-72011 used with auto. ext., cl. 71, 72, 73 |
| L | 1-702251 } plate 6 for other styles | | 61-72011 used without auto. ext., cl. 71, 72, 73 |
| M | 284 1/12 (74813) | | 1-702011 cl. 76, 77 |
| N | 72571 | | 11-702011 cl. 78 |
| O | 11-71220 | | 21A-702011 used without auto. ext., cl. 71, 72, 73 |
| P | 1-71220 early, use 71310 space collar | | 1-702011 Env. 1415 used with auto. ext., cl. 71, 72, 73 |
| Q | 1-72175 No. 5 see keyboard book, plate 7 for other styles | AF | 71148 |
| R | 72107 1/2 | | 1-701148 shown |
| S | 79600 | AG | 72102 1/2 use 83502 rivet |
| T | 1-72108 1/2 | AH | 72813 (302801) |
| U | 4489 (83800A) | AI | 72900 No. 1 |
| V | 74527 | AJ | 1-72102A No. 6 |
| | 72148 No. 6 use 4451 1/2 R flat head screw | | 1-72102 No. 6 early |
| | 1-72100 1/2 | AK | 1C-74013 complete shaft assembly, includes AL, AN, cl. 71, 72, 73 |
| | 71912 | | 11-74013 cl. 76 |
| | 2850 1/4 A | | 1B-74013 No. 2 cl. 78 |
| | 72103 1/2 use 72517 1/2 rivet | | 1-74013 No. 1 cl. 77 |
| | 79610 use 46 1/4 nut | | 11C-74013 No. 1 cl. 71, 72, 73 |
| | 79322 | | 1A-74013 No. 2 used with cge. tab on sub. stroke, cl. 78 |
| | 8381 spring | | 21-74013 No. 2 used without reg. sub., cl. 78 |
| | | AL | 74588 |

SEE EXPLANATION ON INSIDE OF FRONT COVER

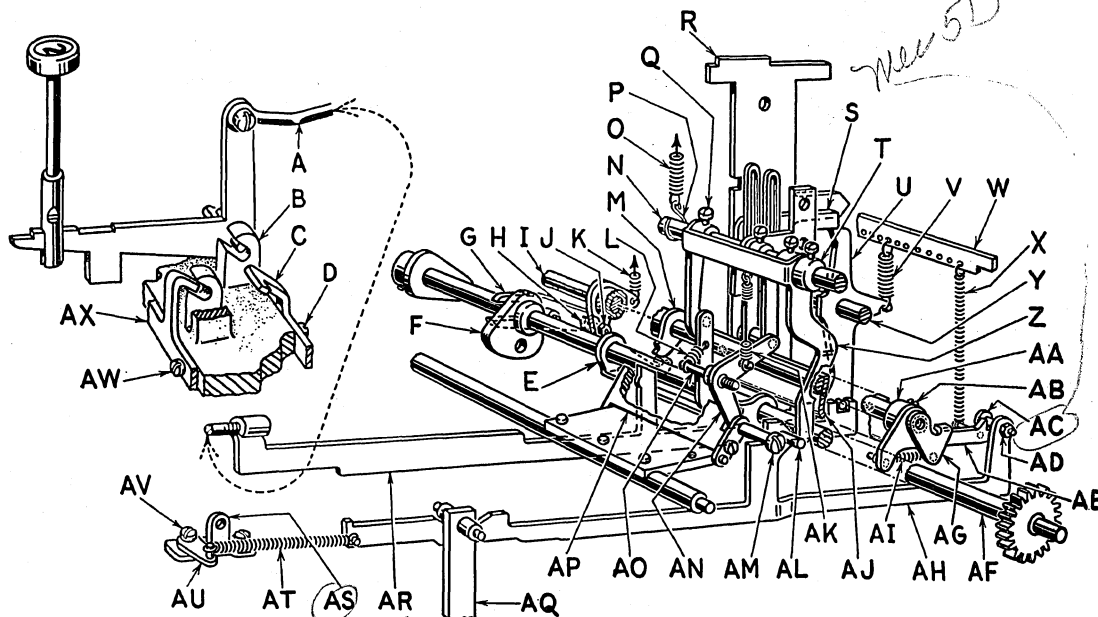
Printed in U. S. America 5-20-49

For Form 2954

SYMBOLS (Plate 25)—Continued

AM 72102 No. 1	BB 3688 bottom spring
AN 74249A	BC 72146 No. 2 included in BF, use 72543A rivet
AO 74524	BD 72242
AP 74250	BE 73611
AQ 10080	BF 72145* complete assembly 31-72145 includes BC, BH, cl. 71, 72, 73
AR 1-72111½A	Complete assembly 11-72145, cl. 76, 77, 78
AS 1-72111½ early	Complete assembly 41-72145, used with CF non-clear lock
AT 72112½* included in AR	BG 72591
AU 72635 No. 2	BH 21-72246 included in BF
AV 79819	BI 8381
AW 1-72110½	BJ 1-75134A (1-705134¼) use 73548 screw
AX 1-72716 includes 72110 No. 1 turnbuckle, use 75638 screw	BK 75610
AY 75342 ecc., 72522½ screw	BL 74523
AZ 72572 No. 1	BM 75136A (705136¼)
1-72221 No. 3	BN 1-75128B
1-72221 early	11-75128B used with 39 keyboard construction
1-702221 No. 3	
1-702221A No. 1 early	

MULTIPLYING FUNCTION AND CLUTCH ENGAGEMENT INDEXED,
NOT ACTUATED, FROM MULTIPLIER KEYS (Plate 25-1)

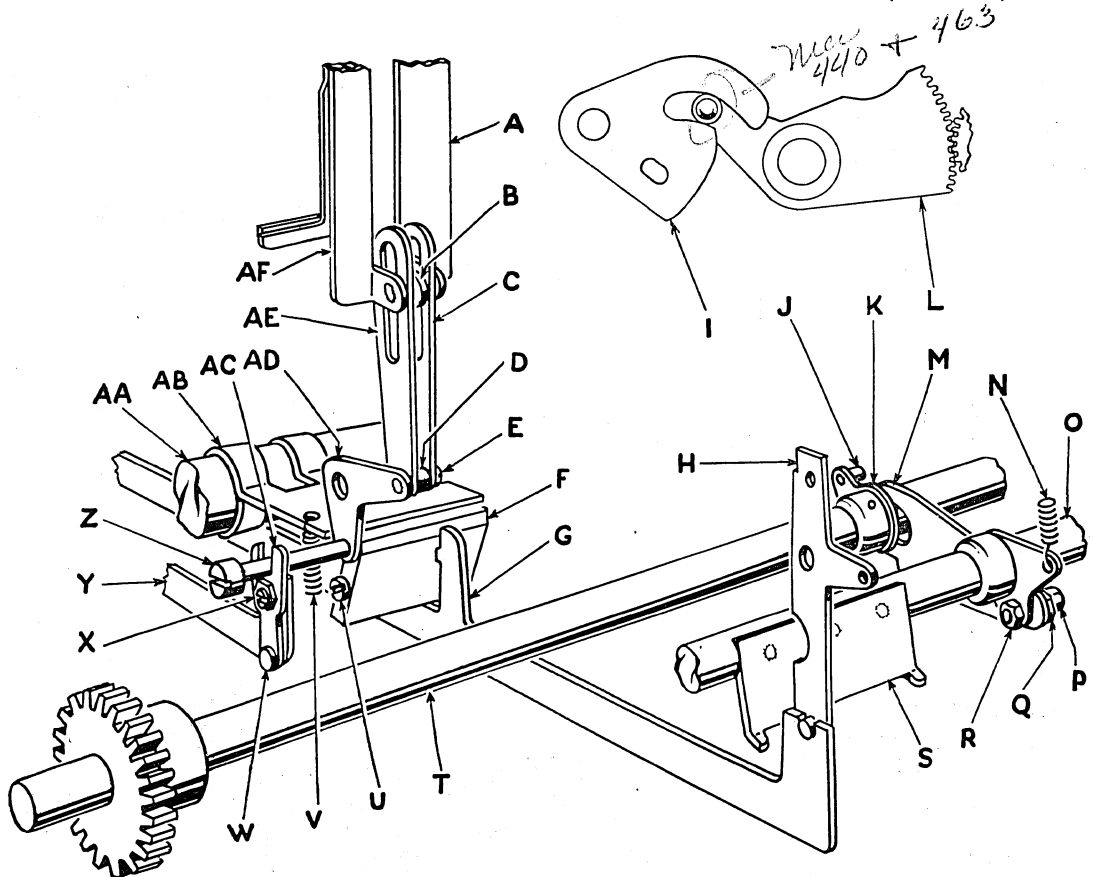


SYMBOLS (Plate 25-1)

A 72703 No. 3	AA 1-75332 collar, includes AB
B 72670B casting	AB 75618 screw
C 72113½ No. 2	AC 75631 shouldered screw
D 79543 screw	AD 49½ nut
E 1-74268* included in AF	AE 1-74266* included in I
F 1-74157 No. 2* included in AF	AF 1E-74013
G 1-74156B	1D-74013 early } assembled shaft
H 76567 screw, use 72307 ecc.	includes E, F
I 1-74044A assembled shaft includes G, H, J, M, AA, AB, AE, AG, AJ	AG 1-74265* included in I
J 46 nut	AH 1-72102B No. 16 includes AL
K 9283½ spring	AI 16681A spring
L 74814 (3486½) spring	AJ 74149* included in I
M 74267* included in I	AK 681 spring, use 20 No. 84 spring anchor
N 1A-72007 includes Q, T, Z	AL 74550 No. 2* included in AH
O 1-16380B	AM 72509A No. 3
P 20 No. 84 spring anchor	AN 1-74128A No. 1
Q 75618	AO 9054¼ screw stud
R 1-74107 specify No., see plate 23, accumulation book	AP 72900 No. 1
S 74154 No. 1* included in R	AQ 1-71903A No. 1
T 1-28345 collar	AR 72102 No. 18
U 1-74132 No. 16	AS 72148 No. 1
V 74803	AT 77880A No. 3
W 74126 No. 1	AU 11-20 No. 89
X 71804	AV 72567
Y 1-74025A assembled shaft includes U	AW 79624 No. 2
Z 72102¼ bail	AX 72113½A

NOTE: To install spring X, assembled shaft I and spring anchor W are also required.

MULTIPLYING AND SUBTRACT KEY CONTROL LOCKS (Plate 26)



SYMBOLS (Plate 26)

SEE KEYBOARD SYMBOL LIST,
PLATES 1, 2, 9, 20, 21 FOR OTHER
SYMBOLS

A 1-74140A
1-74140 early
1-74140 No. 2 cl. 78

B 72512*

C 74163*

D 74304

E 75615 screw

F 72900 No. 1

G 72102 No. 1

H 1-74132 No. 1

I 71119 No. 1 use 71316 ecc., 72617 screw
71119 No. 2 cl. 76, 77, 78

J 72550*

K 1-74157*

L 1-71147 use 1-71336 collar on inside,
includes 550% screw

M 74156

N 74808

O 1-74044 } includes
1-704044 } M, P, Q, R, S

P 76567

Q 72307 ecc.

R 46

S 74149*

T 1C-74013 } includes J, K,
1-704013 } see plate 25
No. 1 } for other styles

U 70512

V 71807

W 83504*

X 72383 ecc., 70512 screw

Y 1-72102A No. 16 } includes
1-702102A No. 16 / W, X, AC

Z 72509A No. 1 cl. 71, 72, 73 wide base
72509A No. 1 cl. 76, 78 narrow base
72509A No. 3 cl. 71, 72, 73 narrow
base
702509A cl. 76, 77, 78 wide base

AA 1A-71012 (1B-71012, 1-701148) spec-
ify machine style and number

AB 71148

AC 72102 1/4

AD 1-74128A No. 1 use 74529 screw

AE 74163* included in AF

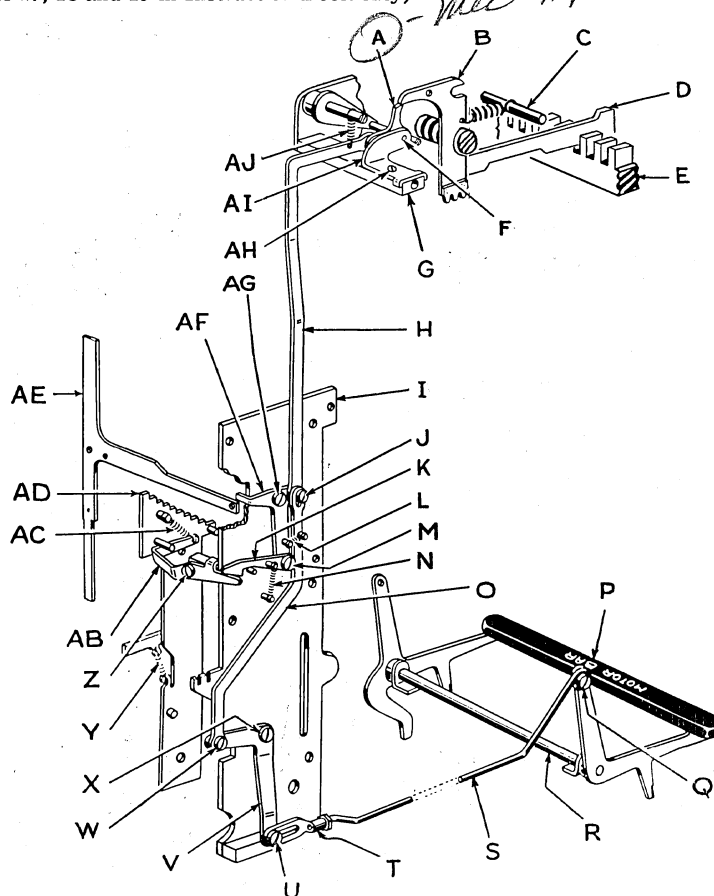
AF 1-74150A No. 3
1-74150 No. 3 early

SUB-PRODUCT DEDUCTION MECHANISM (Plate 30)

(Plates 27, 28 and 29 in Instruction Book only)

SYMBOLS (Plate 30)

- A 1-10A Fte. 134 No. 1 narrow base
11A-10A Fte. 134 No. 2 } wide base
11-10A Fte. 134 No. 2 }
early
- B 1-79222 No. 1
- C 1 Fte. 134 narrow base
1 Fte. 134 No. 2 wide base
- D 79221 No. 1 (24 Fte. 134)
- E 1-79912 No. 1
- F 77529 screw
76528 screw, 49 nut, wide base
- G 79901A
- H 12B Fte. 134 No. 1 or No. 2* included
in A
- I 1-14 Fte. 134 No. 1 narrow base
1-14 Fte. 134 No. 2 (1-704110L No. 2)
wide base
- J 54 Fte. 134
- K 1-17 Fte. 134
- L 489 spring
- M 77529
- N 12084 1/4
- O 1-21A Fte. 134
- P 2-72125 No. 3
- Q 72572 No. 1
- R 72017* complete assembly 11-22 fte.
134
- S 70B Fte. 134
- T 72110 No. 1 use 49 3/8 nut
- U 79503
- V 1-20A Fte. 134
- W 77529
- X 71595
- Y 74801
- Z 53 Fte. 134
- AB 1-19 1/2 Fte. 134 No. 1 narrow base
1-19 1/2 Fte. 134 No. 2 wide base
- AC 79810
- AD 1-16 1/2 Fte. 134
- AE 74150 No. 1
- AF 1-15 Fte. 134
- AG 51 Fte. 134
- AH 79545
- AI 11A Fte. 134 No. 1 } narrow
11 Fte. 134 No. 1 early } base
11A Fte. 134 No. 2 }
(11B No. 1 Fte. 134) } wide base
11 Fte. 134 No. 2 early }
- AJ 80 Fte. 134



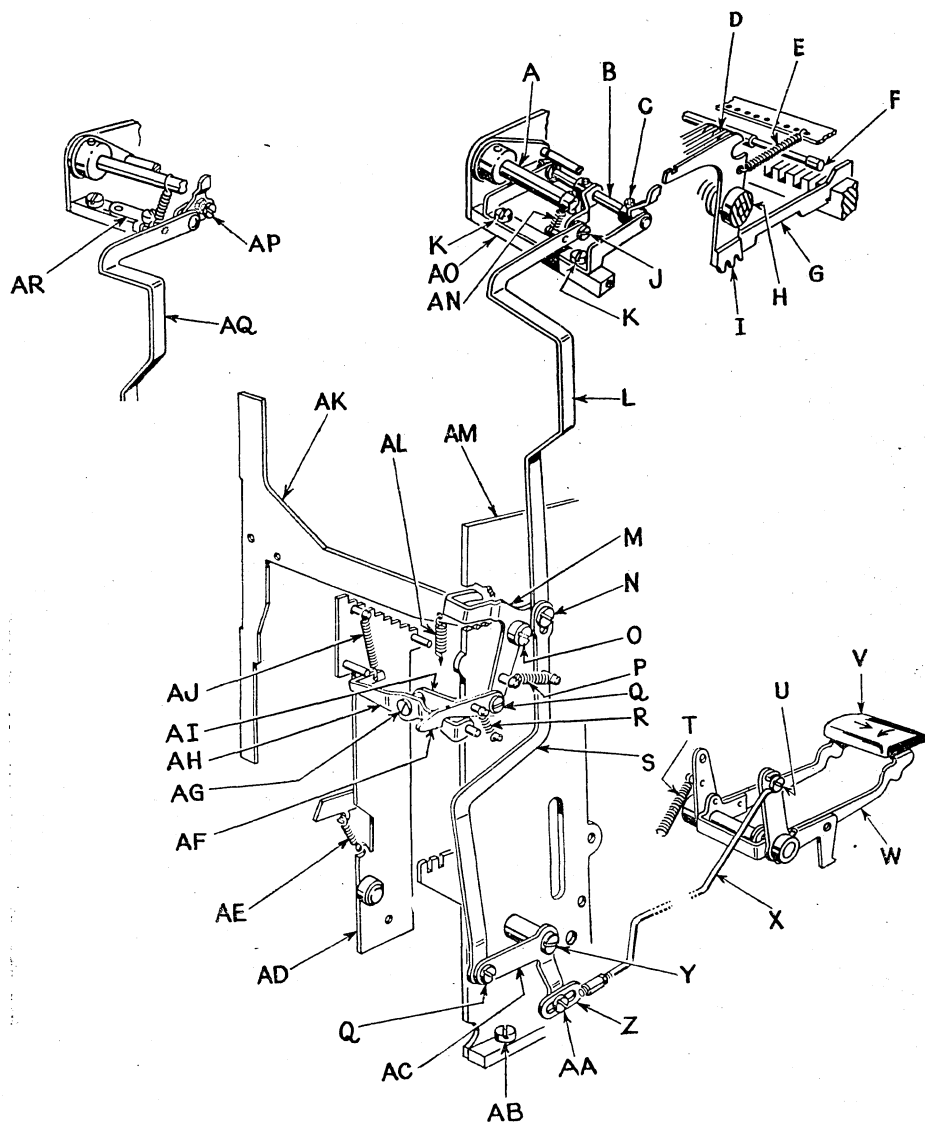
SYMBOLS (Plate 31)

- A 111 No. 1 Env. 374C points off two places
111 No. 2 Env. 374C points off three places
111 No. 3 Env. 374C points off one place
111 No. 4 Env. 374C points off four places
- B 71807
- C 46
- D 12059 3/8 screw
- E 72567 screw, 301 env. 374C washers
- F 74154 No. 1* included in Z
- G 101A Fte. 149* included in H
- H 1A-100 Fte. 149 includes G, I, K
- I 500A Fte. 149 shaft, 300A fte. 149 roller
- J 74804
- K 102 Fte. 149 use 83504 rivet
- L 99447
- M 1-103A Fte. 149
- N 74804
- O 1-117A Fte. 149
- P 503 Fte. 149*
- Q See letter Z
- R 111A Fte. 149
- S 119 Fte. 149
- T 72102 No. 1
- U 74154 No. 1* included in Z
- V 1-74124A No. 1 Env. 374C
- W 701 Fte. 149
- X 79503
- Y 115 Fte. 149
- Z 1-107A Fte. 149 specify machine number, factor wanted, factor to be replaced, position of pointer on plate to be replaced, style of point off mechanism and key position. Also submit a sample of the results desired.
Example: Extend \$5000 point off to indicate value
Factor .05
Result \$250.00 point off to indicate value
- AB 1-113 1/4 Fte. 149
- AC 72591
- AD 99808
- AE 114A Fte. 149
- AF 3286 1/2
- AG 72521 No. 2
- AH 72572 No. 1
- AI 1-120 Env. 374C
- AJ 508 Env. 374C
- AK 506 Env. 374C use 46 nut
- AL 74806
- AM 74812
- AN 1-103B Env. 374C
- AO 1-79009A No. 1 Env. 374C
- AP 79823A Env. 374C
- AQ 79122 No. 1* included in AW
- AR 503 Env. 374C ecc., 203401 roller, 49 1/2 nut
- AS 1-101A Env. 374C
- AT 79924A Env. 374C use 79582 screw
- AU 79924 use 79582 screw
- AV 46 nut, 79581 screw
- AW 1-79121 No. 2 includes AQ
- AX 1-79121 No. 1 Env. 374C (1A-74140 No. 3, 1A-79923, 1-101A Env. 374C) includes BA
- AY 79815 (701806)
- AZ 79822
- BA 79122 No. 2 Env. 374C* included in AX
- BB 1-116B Env. 374C
- BC 75637
- BD 121 Env. 374C
- BE 74502 screw, 71361 ecc.

SEE EXPLANATION ON INSIDE OF FRONT COVER

SUB-PRODUCT DEDUCTION MECHANISM—WITH HEAVY LIFT ARM CONSTRUCTION (Plate 30-1)

NOTE: This mechanism was included in Style 720722 machines beginning with serial No. A915672, and in other Class 72 machines beginning with serial No. B62810



SYMBOLS (Plate 30-1)

A 11-709017 for Style 720722
1-709017 for other styles
B 1-11C Fte. 134 No. 1 for machines
after serial No. B134940
C 72573 set screw
D 1-79222 No. 1
E 79802 spring
F 1 Fte. 134 No. 2
G 24 Fte. 134
H 709013 No. 3 for Style 720722
79013 for other styles
I 1-25 Fte. 134
J 79503 screw, for machines after serial
No. B134940
K 79545
L 1-12D Fte. 134 for machines after
serial No. B134940
M 1-15 Fte. 134 No. 2
N 54 Fte. 134
O 51 Fte. 134 screw

P 489 spring
Q 77529 screw
R 12084 1/4 spring
S 1-21A Fte. 134
T 72836
U 200544 1/2 screw
V 2A-702125 No. 4 (↑ ←)
W 702625 nuts
X 31-702117 1/2 No. 1
70B Fte. 134 not power result keys
includes Z, AA
Y 79585
Z 72110 No. 1
AA 75638
AB 74524
AC 1-20A Fte. 134
AD 1-16 1/2A Fte. 134
AE 74801 spring

AF 1-17 Fte. 134
AG 53 Fte. 134
AH 1-704133
AI 1-18 Fte. 134
AJ 72820 spring
AK 704150 No. 7
AL 77879 spring
AM 1-704110L No. 4
AN 80 Fte. 134 spring
AO 79901A
AP 72656 screw
49 1/4 nut
AQ Use 1-12D
Fte. 134
1-11C Fte.
134 No. 1
79503
AR 11B Fte. 134
No. 1

for machines between
serial No. A915672 and
B134900 for Style
720722, and between
serial No. B62810 and
B134900 for other
styles

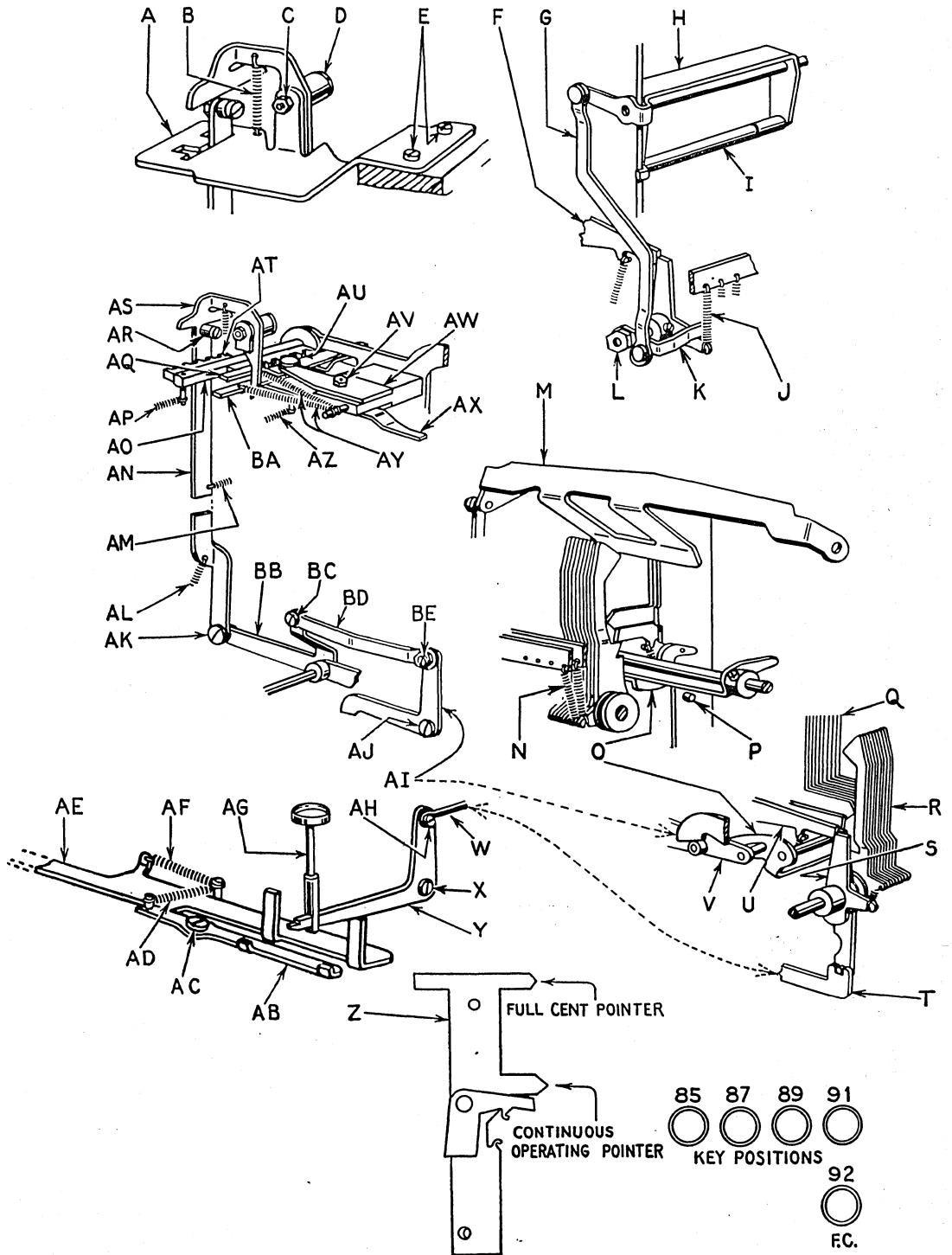
Replaces general print 601-1/M

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 6-25-52

For Form 2954

CONSTANT FACTOR, AUTOMATIC POINT OFF, AND AUTOMATIC FULL CENT
KEY MECHANISM (Plate 31)



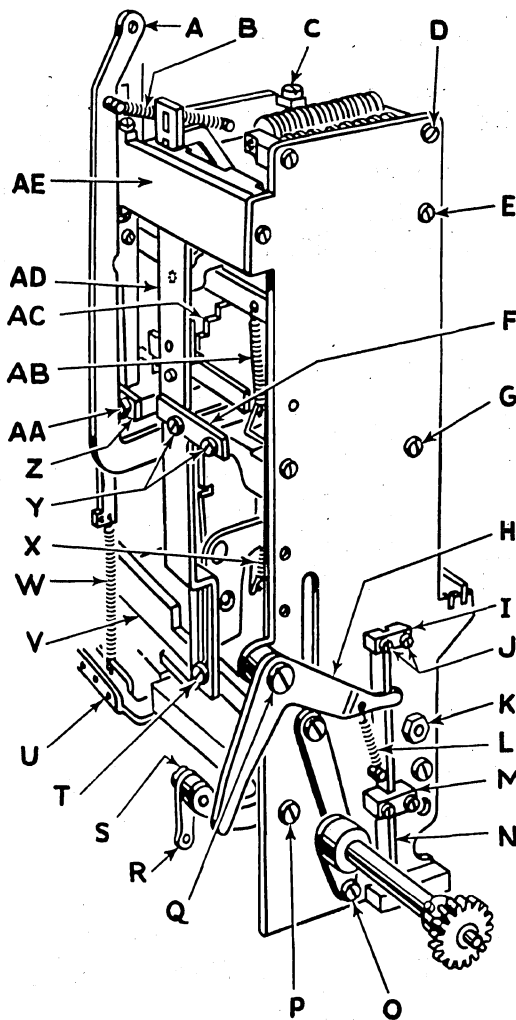
SUBTRACT ASSEMBLY, FRONT VIEW, CLASSES 76 AND 77 (Plate 32)

SYMBOLS (Plate 32)

SEE PLATE 33 FOR OTHER VIEW

Wcc 293

A	1-74181 No. 1
B	3683
C	79543
D	74523
E	74505
F	74148 No. 1
G	74500
H	1-74124 No. 2 see plate 22 for other styles
I	74917 No. 2
J	74528
K	47
L	74802
M	74917 No. 1
N	74125 No. 1
O	74501
P	74500
Q	74527
R	704128
S	74523
T	79600
U	74143A (20 No. 122)
V	704143 (20 No. 123)
W	74914 No. 1
X	704914 No. 1
Y	74806
Z	74801 spring
AA	79543
AB	74101 No. 1
AC	704101
AD	74535 hex. screw
AE	74809 No. 1
	1-74107 No. 20
	1-74129 (11-704129 No. 3)
	74937
	704937

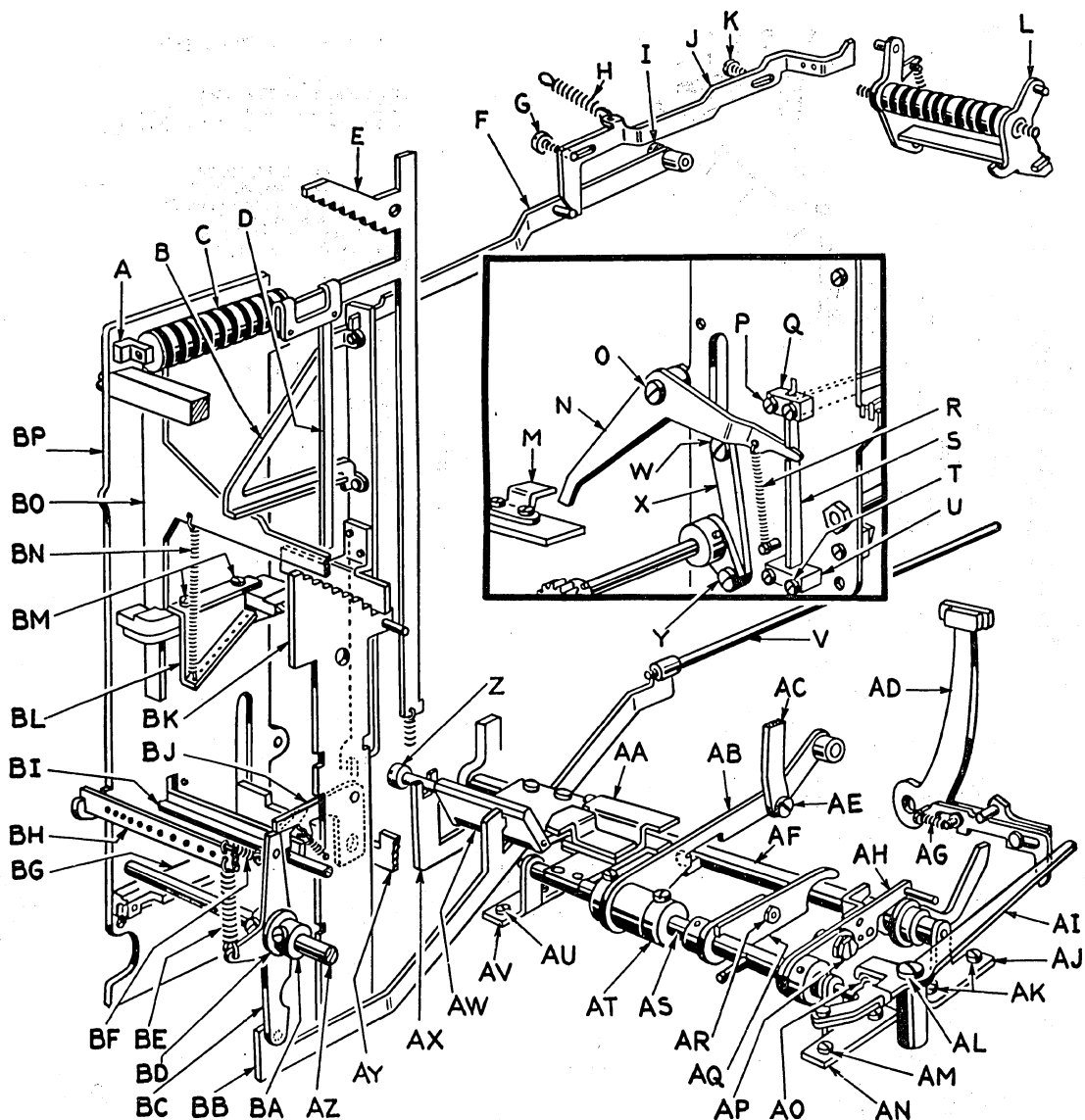


SYMBOLS (Plate 33)

A	74918 use 74523 screw	AC	1-76104
B	1-74129 (11-704129 No. 3)	AD	1-72163 No. 3 } see keyboard book,
C	74031		1-702251 } plate 6 for other styles
D	1A-74137 No. 1	AE	79511
E	74151 No. 1	AF	11-72011 } includes Z, AW
F	11-76126A		1-702011 } see plate 25 for other styles
G	76528	AG	72805 (72820)
H	76806	AH	1-72182 No. 2
I	76534A screw	AI	1-72187A
J	76128A	AJ	72148 No. 5
K	706128	AK	72567
L	71546	AL	72569
M	1-77113A No. 3*	AM	72567
N	702229 No. 2 use 74533 screws	AN	72148 No. 3
O	1-74124 No. 2 see plate 22 for other styles	AO	72831 spring
P	74527	AP	72568 screw, 72307 ecc., 46 nut
Q	74528	AQ	72182 No. 3
R	74917 No. 2	AR	46 nut, 72307 ecc., 72568 screw
S	74802	AS	21-72001 No. 1
T	74125 No. 1		1-72001 No. 1 early } cl. 71, 72, 73
U	74528		1-72001 No. 2 cl. 76
V	74917 No. 1		11-72001 No. 2 with reg. subt., cl. 76
W	72700 No. 14		31-72001 No. 2 cl. 78
X	74526		41-72001 No. 2 with CF subt., cge. controlled, cl. 78
Y	74123		1-702001 No. 1 shown, includes AA, AB, AH, AP, AQ, AR,
Z	74501		AT, cl. 76, 77
AA	72509A No. 1		11-702001 No. 1 with reg. subt., cl. 77
AB	702509A		1-702001 No. 2 cl. 78
	1-702113 No. 1* included n AS		1A-702001 No. 3 cl. 71, 72, 73
	1-72112* included in AS		AT 1-7140 3/4 includes 550 3/4 screw

SEE EXPLANATION ON INSIDE OF FRONT COVER

CROSSFOOTER SUBTRACT MECHANISM, CLASSES 76 AND 77 (Plate 33)



SYMBOLS (Plate 33)—Continued

- | | |
|---|--|
| AU 72567 | 1-704665 No. 1 (11-704665 No. 1) without reg. subtt., cl. 76, 77 |
| AV 72148 No. 3 | 11-704665 No. 1 with reg. subtt., cl. 76, 77 |
| AW 72900 No. 2 included in AF | 21-704665 No. 1 cl. 72 |
| AX 1-72102 No. 3 | 1-704665 No. 2 cl. 78 |
| AY 74914 No. 1 | BH 74126 No. 1 |
| 704914 No. 1 } bail | 704126 No. 1 } see plate 23 for other styles |
| AZ 74025 complete shaft assembly 11-74025 | BI 74024 |
| includes BA, BC, BD | 704024 |
| 704025 No. 1 complete assembly 1-704025 | BJ 74154 No. 1* included in BK |
| No. 1 | BK 1-74107 No. 20 |
| 74025 complete assembly 31-74025 | BL 74158 (20 No. 121) |
| 704025 No. 1 complete assembly | BM 74502 |
| 11-704025 No. 1 | BN 74809 No. 5 shown, used in 1st and 2nd holes |
| BA 1-74308 includes 12055% screw | 74809 No. 4 (200825) used in 3rd and 4th holes |
| BB 72102 No. 9 | 74809 No. 3 used in 5th and 6th holes |
| 702102 No. 1 | 74809 No. 2 (986) used in 7th hole |
| BC 1-74132 No. 5 | 71805 used in 8th hole |
| BD 74305 collar | 74809 No. 1 used in 9th hole |
| BE 74803 | BO 74150 No. 1 |
| BF 79819 spring | 704150 No. 1 |
| BG 1-74665A No. 1 lower casting, cl. 72 | 704150 No. 2 short |
| 11-74665 No. 1 cl. 76 | BP 1-74110R No. 1 cl. 72 |
| 1-74665A No. 3 cl. 78 | 1-74110R No. 2 cl. 76, 77 |
| | 1-74110BR No. 3 cl. 78 |

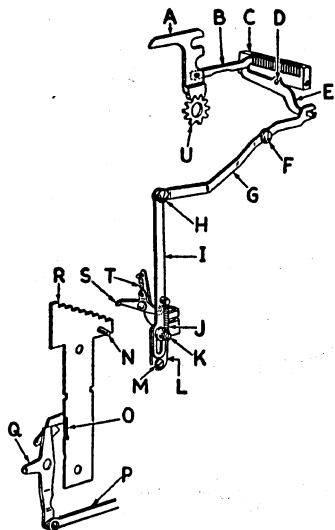
SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 5-20-49

For Form 2954

AUTOMATIC ONE MECHANISM (Plate 35)

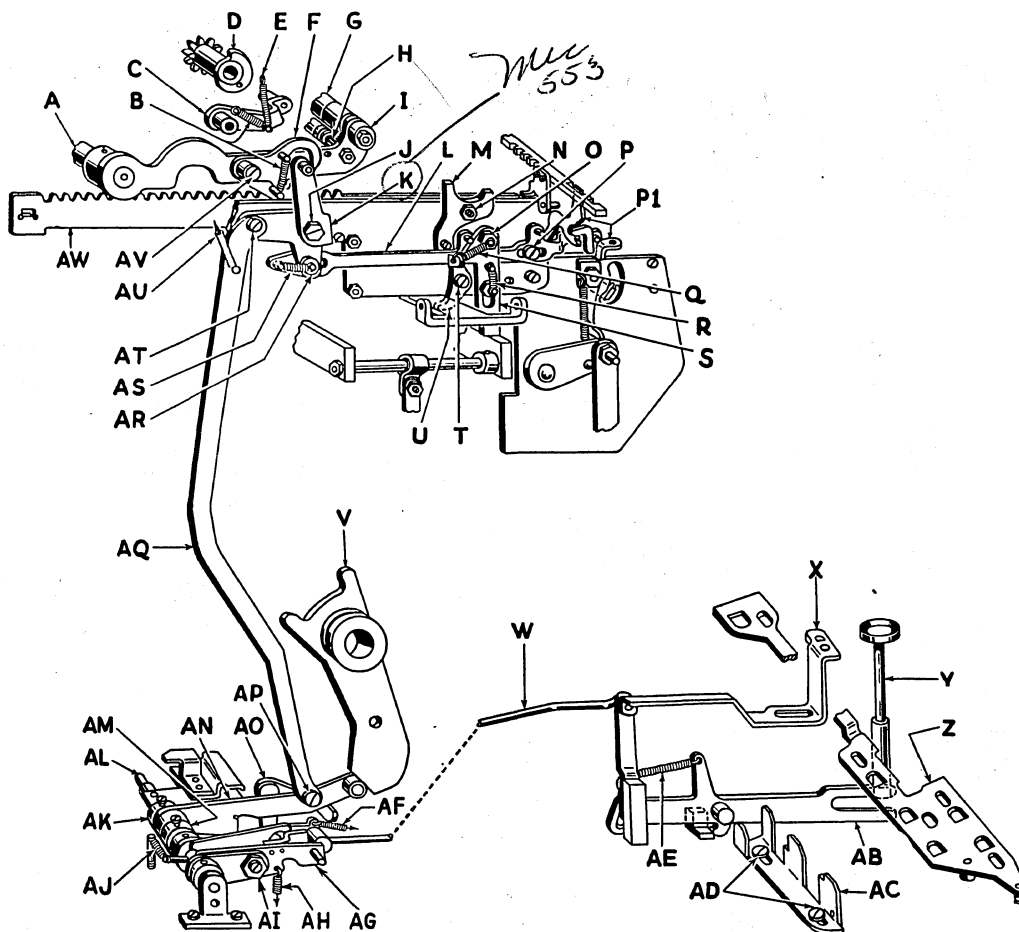
(Plate 34 in Instruction Book only)



SYMBOLS (Plate 35)

A	11-79222 No. 1
B	79221 No. 1 (24 Fte. 134)
C	1-79912 No. 1 } includes D, E, see 1-709912A } plate 13 for other sty.
D	79502*
E	79214*
F	76575 shown, cl. 71, 72, 73 76501A long screw, cl. 76, 78 706501 No. 2 long screw, cl. 78 706505 long screw, cl. 77
G	74105A No. 1 cl. 71, 72, 73 1-74105A No. 2 cl. 76, 78 1-704106
H	79511 use 49 1/4 nut
I	1-74104
J	1-704104
K	79810
L	74546 No. 2 1-74102 } includes S 1-704102 }
M	74533
N	74503 No. 1*
O	74801
P	72279
Q	1-74132 No. 3
R	1-74107 No. 20 11-74107 No. 20 cl. 78
S	74103* included in L
T	72820
U	79116 No. 1

OVERDRAFT MECHANISM, LATER (Plate 36)

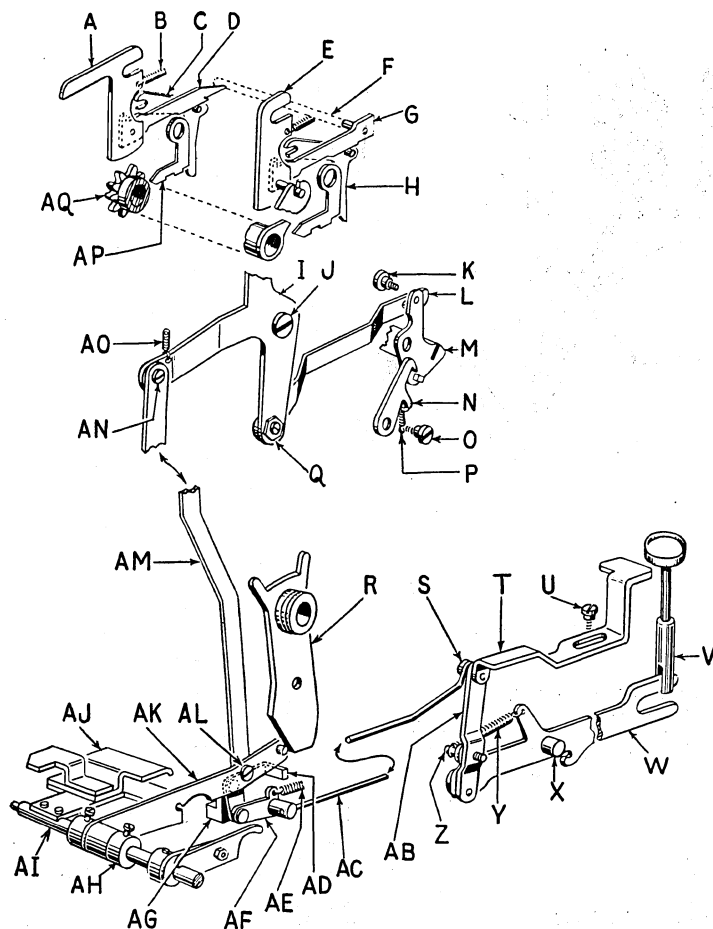


SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 36)

A	21-79001A cl. 76, 78 21-709001 No. 1 (12 cap.) cl. 77 41-709001 No. 1 (14 cap.) cl. 77	} see plate 10 for other styles
B	4489 (83800A)	
C	1-79125	
D	1-79300 No. 2 narrow base, cl. 76, 78 1-79300 No. 2 wide base, 12 cap., cl. 76, 77, 78 1-709300 No. 2 wide base, 14 cap., cl. 76, 77, 78	
E	72815 (3981)	
F	1-79124	
G	79341 No. 3 collar, use 79341 no. 1 on other side	
H	79343 knurled nut	
I	79342 collar, 46 nut	
J	76501A cl. 76, 78 706501 No. 2 cl. 78 706505 cl. 77	
K	1-76108A cl. 76 1-76108 No. 2 cl. 78 1-706108 No. 1 cl. 77 1-706108 No. 2 cl. 78	
L	1-76102A 1-706102A	
M	76116L No. 1 (76116L No. 2) use 71553 screw at bottom	
N	76311 ecc., 72567 screw	
O	76502	
P	79503	
Q	709115 No. 2	
R	71803	
S	4487	
T	1-76100	
U	76500	
V	76107 1-71110*	
W	72700 No. 8	
X	72138 use 72572 No. 1 screw in slot	
Y	72521 No. 3	
Z	1A-72205 No. 2 see keyboard book, plate 9 for other styles	
AB	1-72137	
AC	72118 No. 4 1-702156A	
AD	72589	
AE	75814	
AF	3683	
AG	1-72182 No. 2	
AH	3281½	
AI	72307 ecc., 72568 screw, 46 nut	
AJ	8082A	
AK	1-7140¾ includes 550¾ screw 1-72363 (72363, 7061½) cl. 78	
AL	1-72001 No. 2 cl. 76 31-72001 No. 2 cl. 78 1-702001 No. 1 cl. 76, 77	} includes AK, AM, AN, see place 33 for other styles
AM	1-7140¾ includes 550¾ screw 11-72363 includes 75018 screw, cl. 78	
AN	1-72112* included in AL	
AO	1-702182	
AP	79511	
AQ	1-76104	
AR	76504 screw, 76308 nut	
AS	3489¾	
AT	71546	
AU	72827 cl. 76 3683 cl. 77	
AV	79585	
AW	76111 No. 61 see chart, plate 3-1, printing symbol list	

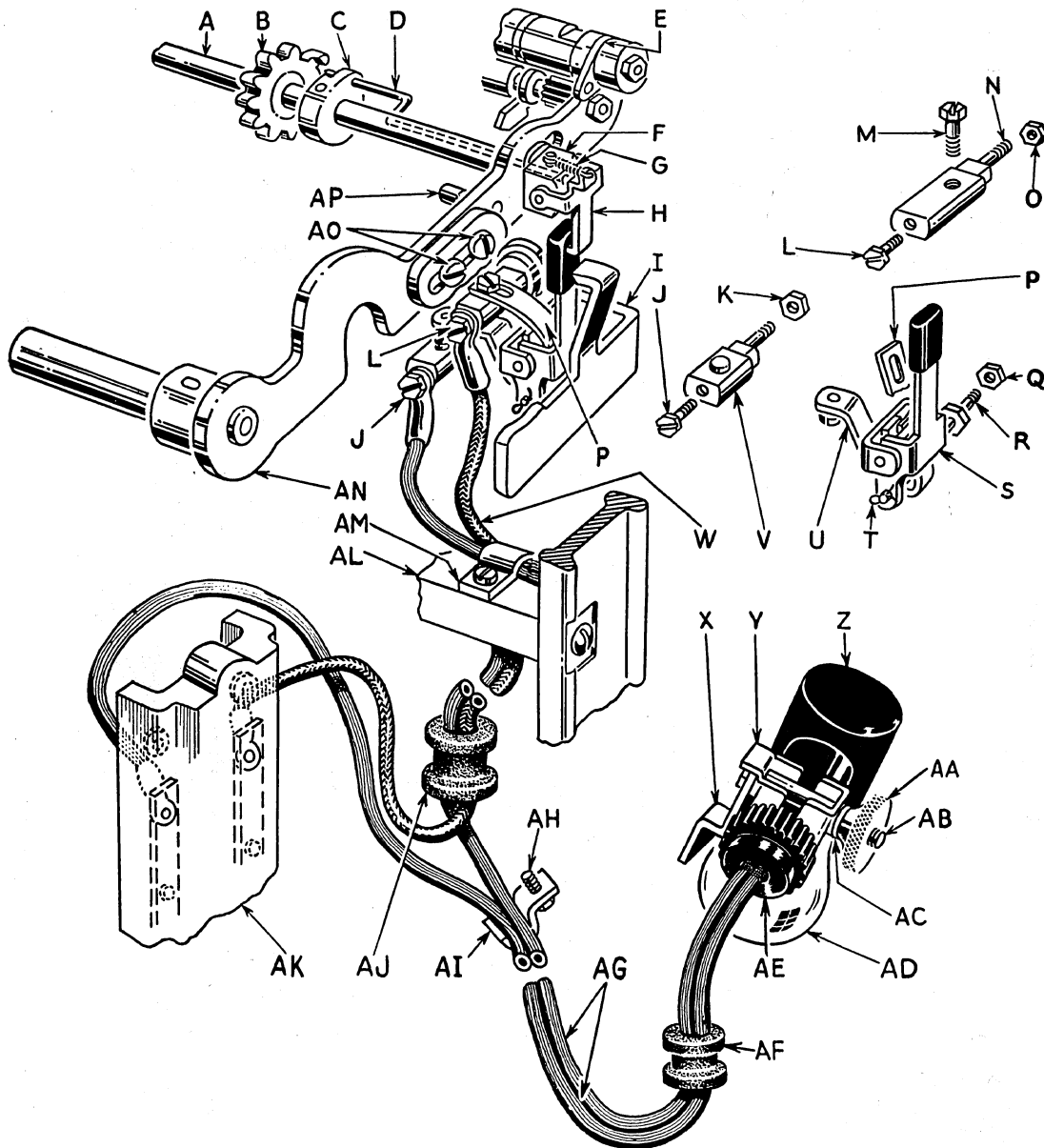
OVERDRAFT MECHANISM, EARLY (Plate 37)



SYMBOLS (Plate 37)

A	C3CXX Style 7603
B	79802
C	1-79209 No. 1
E	C3DXX Style 7603
F	C206B Style 7603* stud
I	S27-1 Style 7603
J	72602 No. 1
K	71546
O	77520
P	77802 spring
Q	72307 ecc., 72572 No. 1 screw
R	1-71110*
S	72504
T	72138
U	75645
V	72521 No. 3
W	1-72137 includes AB
X	72536*
Y	75814
Z	72557
AB	72136*
AC	72700 No. 8
AD	72179* included in AG
AE	3683
AF	1-72180
AG	72503 complete assembly 1-72503, includes AD, AF
AH	1-7140¾ use 550¾ screw
AI	1-72001 No. 2
AJ	11-72113* included in AI
AK	1-72112* included in AI
AL	71546
AN	71546
AP	79109 No. 1
AQ	P109A-1XX Style 7603

OVERDRAFT LIGHT SIGNAL, CLASS 72 (Plate 38)



SYMBOLS (Plate 38)

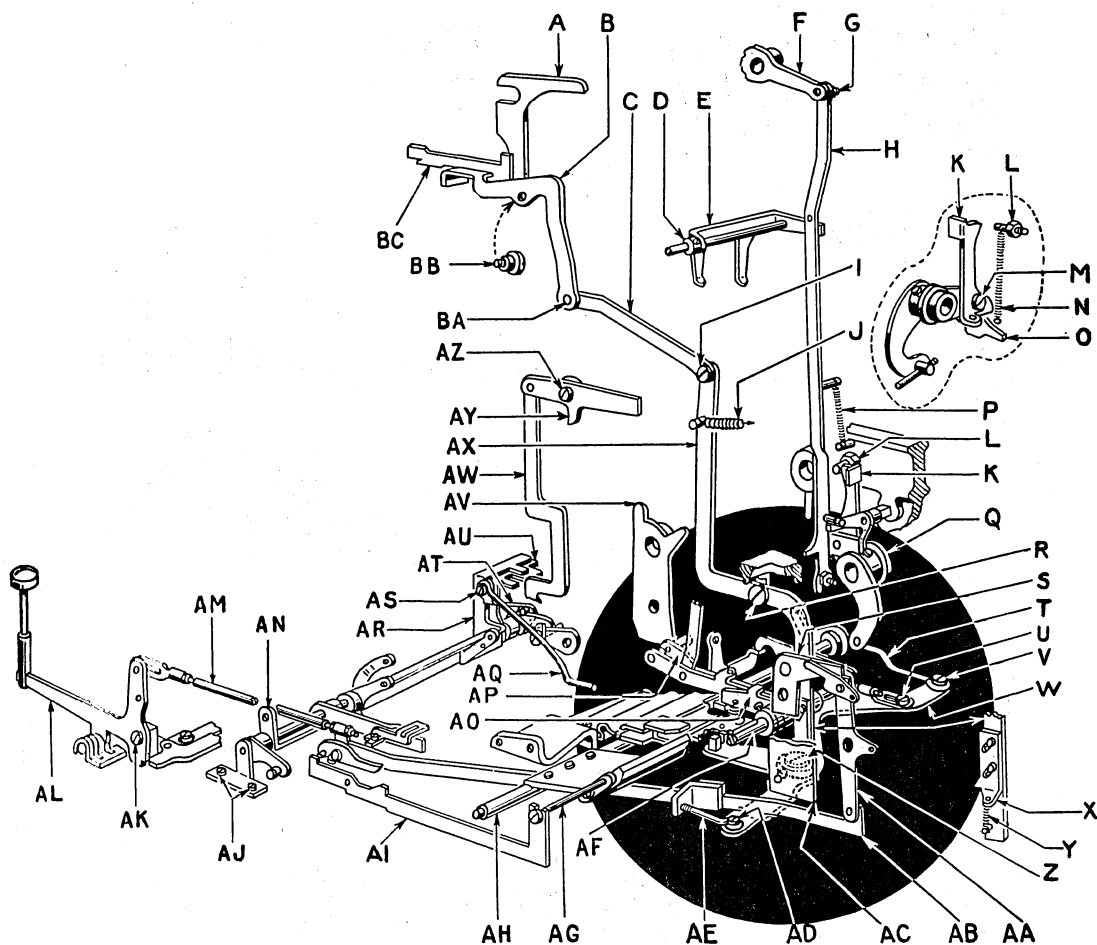
A 1-79009 No. 3 includes B, C, F
 B 79116 No. 7
 C 79303 No. 8* included in A
 D 79702 use 79703 wire retainer
 E 20 No. 98
 F 79364* included in A
 G 79821A
 H 79158A
 I 1B-79157 } includes J, K, L, M, N, O,
 1-701162 } P, Q, R, S, T, U, V
 J 4553 1/2
 K 46 1/4
 L 4553 1/2
 M 4553 1/2
 N 4556 1/2 No. 5 top post
 O 46 1/4
 P 79159* included in S

Q 46 1/4
 R 4552B
 S 1-701164 includes P, U, T
 T 72 No. 4 (21 No. 17)
 U 1B-4523A* (1B-4524A*) included in S
 V 1-79556 1/2 switch point, lower post
 W Description only, included in AG
 X 75299 1/4 use 73612 screws
 Y 200195
 Z 1-75907 complete assembly, includes
 Y, AA, AB, AC
 AA 200570A
 AB 200565A
 AC 1417 washer
 AD 200906 No. 3 green bulb
 AE 200927A
 AF 4591 (93 1/2 No. 1)

AG 1-79936A No. 1 } includes W, AE,
 1A-79936 early } without resistance
 coil
 1-79936A No. 2 } with
 1A-79936 No. 2 } resistance
 early } coil
 AH 73612
 AI 71199 (93 1/2 No. 4, 5 or 6)
 AJ 70994 (93 1/2 No. 4)
 AK 1-70903
 AL 74000 No. 2
 AM 71199 (93 1/2 No. 4, 5 or 6) use 73612
 screw
 AN 81-79001A includes A, B, C, D, E, F
 G, H, AP
 AO 75608
 AP 79575 No. 2*

SEE EXPLANATION ON INSIDE OF FRONT COVER

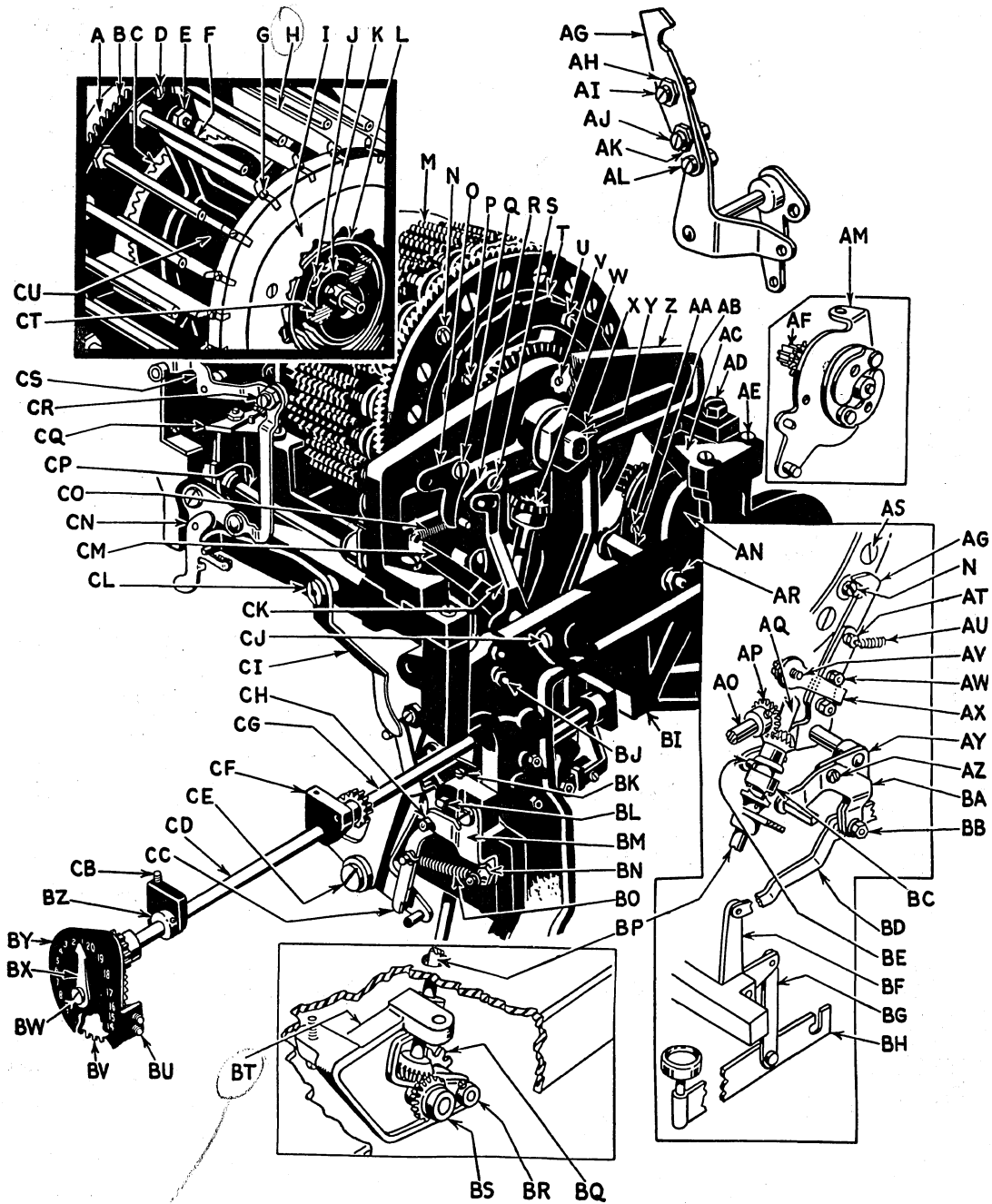
REGISTER SUBTRACT MECHANISM, CLASSES 76 AND 77 (Plate 39)



SYMBOLS (Plate 39)

A	1-79222 No. 1	W	1-72290		1-72102 No. 13 cl. 78
B	11-79245	X	1-702293 shown	AJ	72567
C	79246 No. 2* included in B	Y	74182* included in AX	AK	79503
D	1-28345 includes 75618 screw	Z	77802	AL	72243 No. 6
E	79212		72651 screw		702243 No. 1
F	1-79234	AA	1-74132 No. 6 (31-74132 No. 5)	AM	72700 No. 13 cl. 76
	1-709234 No. 1 (1A-709234 No. 1, 709373)	AB	1-72102 No. 8 cl. 76		1-72714A No. 14 cl. 78
G	72568 screw, 72307 ecc.		11-702102B No. 2 shown, cl. 77		1-702700A No. 1 cl. 77
H	1-72186 No. 2	AC	72102 No. 12 cl. 78	AN	702145
I	79503	AD	1-74107 No. 23 subtract plate	AO	702112½* included in AF
J	3683	AE	72572 No. 1	AP	1-72112 No. 3* included in AF
K	71162	AF	72711 No. 1	AQ	1-702723
L	71568 narrow base		702712 No. 1	AR	1A-702157 No. 3 (1-702157 No. 12)
	702530 No. 2 wide base	AF	11-72001 No. 2 } see plate 33 for	AS	72572 No. 1
M	71542		11-702001 No. 1 } other styles	AT	1-702293¼
N	77880A No. 2	AG	72509A No. 1	AU	702157 No. 16
O	1-72175 No. 2		702509A	AV	1-71110*
P	72814	AH	11-72011 cl. 76	AW	71146
Q	1-71163 use 1-71336 collar on left		21A-72011 cl. 78		701146
R	74553		51-72011 with auto. ext., cl. 72	AX	1-74181 No. 1 (1-704181 No. 4) cl. 76, 77
S	74154 No. 1* included in AC		61-72011 without auto. ext., cl. 72		1-74181A No. 2 cl. 78
T	72711 No. 2 cl. 76		1-702011 cl. 70, 77	AY	1-71144
	702709 No. 1 cl. 77		11-702011 cl. 78		1-701144
	1-72714A No. 4 cl. 78		21A-702011 without auto. ext., cl. 72	AZ	79551
U	79503		1-702011 Env. 1415 with auto. ext., cl. 72	BA	76521 rivet
V	72572 No. 1	AI	1-72102 No. 3 cl. 76, 77	BB	79599
				BC	79221 No. 1 (24 Fte. 134)

ROTARY MAGAZINE AND REGISTER PINION ASSEMBLY (Plate 40)



SYMBOLS (Plate 40)

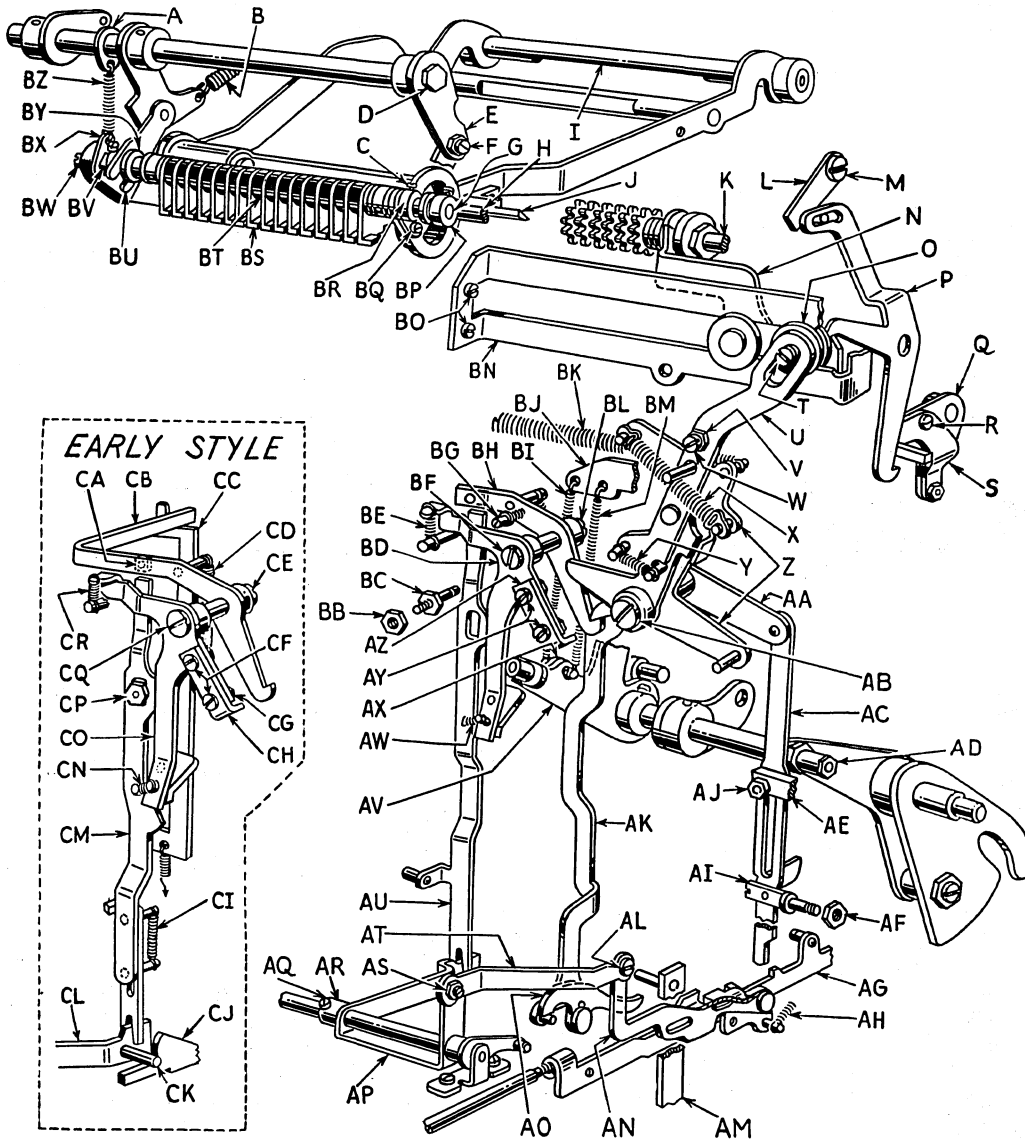
SEE PRINTING SYMBOL LIST, PLATES 10, 11 FOR OTHER VIEW

New Style
meas 320

A 1-700665* included in CU
B 709148
C 709300 No. 1
D 77515
E 47 nut, 709147 lock washer
F 709019 No. 2 pin
709019A No. 3 for blank register position
G 709519 use 709518A screw on other end
H 709931 No. 2 use 709518A screw
I 1-709143A No. 1 two col. reg. des. } use 1653½ screws
11-709143A No. 1 single col. reg. des.
J 87900 ball bearings
K 709302 No. 1 collar for ball bearings
L 83 No. 15A heavy barrel spring
M 1A-709309A (10 cap.)
21A-709309A (12 cap.)
31A-709309A (10 cap., with two bar reg. des.)
51A-709309A (12 cap., with two bar reg. des.)
61A-709309A (11 cap., with single bar reg. des.)
71A-709309A (13 cap., with single bar reg. des.)
91A-709309A (14 cap.)
N 709522 use 709146 lock washer
O 709135 No. 1
P 75603 No. 1
Q 9053½
R 1A-709286A
1-709286A early
S 73564A
72624 early
T 709108 No. 1
U 709304 No. 1 ecc., 709517 screw, 709147 washer, 47 nut
V 10056½
W 701310* included in AQ
X 709303 nut, 709145 washer
Y 1-709002
Z 1-701672A No. 1 complete assembly, includes O, Q, R, S, W,
AC, AH, AI, AJ, AK, AL, AY, BC, BE
AA 952½
AB 709530 (1-709149A, 709530A, 79598) use 8054¼ screw
AC 1A-700668 No. 3 casting
AD 701510 screw, 701511 screw on other side
AE 79545
AF 1-709321 (1-709149A, 709530A, 79598) use 75615 screw
AG 701209 complete assembly 2-701208, includes AH, AI, AJ,
AK, AL, AT, AW, AY
AH 72307 ecc.
AI 701508
AJ 79548
AK 72307 ecc.
AL 72568 screw, 46 nut
AM 1-709149 (1-709149A, 709530A, 79598) } includes AA,
11-709149 (1-709149A, 709530A, 79598) } AF, AN
sel. skip tab
AN 709152 (1-709149A, 709530A, 79598) cover
AO 1-701020
AP 1-701320A use 550¼ screw
AQ 1-701019A
1A-701019 early } includes W
AR 47
AS 709521 use 709146 lock washer

AT 46 nut, 1097¼ washer
AU 3880½
AV 76567 screw, 701331 ecc.
AW 46 nut, 1097¼ washer
AX 701210
AY 1-701207A* included in AG
AZ 952½
BA 1-701219
BB 46 nut, 701518 screw, 1097¼ lock washer
BC 701316A
BD 1-701206
BE 701507* stud included in AY
BF 1-705235 No. 1 use 950¼ screw
BG 705233* included in BH
BH 1-705110A No. 1 reg. return
BI 1A-700666R No. 1 (1-700666AR No. 1, 1A-701236, 701599)
BJ 709543 screw, 46 nut
BK 950½
BL 70501
BM 709132 complete assembly 1-709132, includes CC, CH
BN 709554
BO 71806
BP 1-701018A
BQ 1-701017A
1-701017 early } regular, includes BR
11-701017A
11-701017 early } used with sel. skip tab
BR 542½ collar, use 71510 screw
BS 1A-701016
BT 1A-701671 casting, includes BS, use 702583 and 75617 screws
BU 70512
BV 1-705240
BW 8054¼ screw
BY 1-705186 No. 1 specify no. of reg., includes BV, BW
BZ 1-75332 includes 75618 screw
CB 756½
CC 1-709131 No. 1
CD 1-705025
CE 709501 No. 1 screw, 709327 collar, 3820½ washer, 1097½ lock
washer, 47 nut
CF 705904 No. 2* use 756½ screw
CG 1-701020
CH 46 nut, 709541 screw
CI 1-705241 use 480¼ spring
CJ 72614 screw, 701509 bushing
CK 1-701204 No. 1
1A-701204 No. 2 used with synchronizing mechanism
CL 709510A
CM 1-701211
CN 1-709252A
1-709252 early } includes 681 spring
CO 10180
CP 1A-709031 includes CQ
CQ 1-709111 use 74502 screw, 71361 ecc.
CR 73612 screw, 79333A no. 2 ecc.
CS 1-709251A No. 1
1-709251 No. 1 early
CT 1-709338 collar for spring L
CU 2-709665 (2A-709665) complete magazine, specify machine
style and number, includes A, B, C, D, E, F, G, H, I, J, K,
L, N, P, T, U, V, X, Y, AS, CT

REGISTER SHUTTLING-IN MECHANISM (Plate 41)



SYMBOLS (Plate 41)

- | | | | |
|---|---|----|--|
| A | 20 No. 98 | Q | 1A-701204 No. 2 used with synchronizing mech. |
| B | 1-79808 No. 2 | R | 1-701207A* included in 2-701208 |
| C | 709508 | S | 952 3/4 |
| D | 709540 | T | 1-701219 |
| E | 709228A (709228 No. 2) | U | 709516 screw, 709314 collar, 1097 3/4 washer, 46 nut |
| F | 79333 No. 1 ecc., 7062 screw | V | 1A-709123 includes V, W, Y |
| G | 1-709006 No. 1 (10 cap.) | W | 79362 |
| | 21-709006 No. 1 (12 cap.) | X | 709558 screw, 1097 3/4 washer, 46 1/4 nut |
| | 31-709006 No. 1 (10 cap., with two bar reg. des.) | Y | 1-709804A |
| | 41-709006 No. 1 (12 cap., with two bar reg. des.) | Z | 1-709804 early |
| | 71-709006 No. 1 (14 cap.) | | 7787 |
| H | 1-709019 No. 1 (1-1019 Fte. 717) pinion guide shaft, use 75008 screws | | 1-709125 No. 2 |
| I | 1A-709000 No. 1 frame only | AA | 1-709126 No. 2 |
| J | 709931A No. 1 use 79543 screws | AB | 709501 No. 1 screw, 709327 collar, 3820 1/2 washer, 1097 7/8 lock washer, 47 nut |
| K | 1A-709309A (10 cap.) | AC | 701203 No. 1 use 957 1/2 screw in top |
| L | 21A-709309A (12 cap.) | AD | 701328 bushing, 701327 collar, 71320 ecc., 701505 screw |
| | 1A-709286A | AE | 701515A use 47 nut |
| M | 1-709286A early | AF | 47 |
| | 73564A | AG | 1-72102A No. 6 |
| N | 72624 early | AH | 7680B |
| O | 1-709122A No. 2* included in BN | AI | 701515A |
| P | 709315 | AJ | 49 3/4 nut, 701504 screw |
| | 1-701204 No. 1 | | |

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 41)—Continued

AK 701228A use 7559½ screw, 7919½A washer in top
 AL 79503
 AM 1-701903A
 AN 1-702105A
 AO 1-702230 No. 3
 AP 702145
 AQ 75618
 AR 1-28345 includes AQ
 AS 71361 ecc., 74502 screw
 AT 702105½
 AU 1-702152D use 71806 spring
 AV 1-701150A No. 2
 1-701150 No. 3 with reg. timing mech.
 AW 709803 spring
 AX 1-701150A No. 1 inside release arm
 AY 70512 use 49¼ nuts
 AZ 709130 No. 1
 BB 12046½
 BC 702535A
 BD 1-709128A No. 1 includes AY, AZ
 BE 73828

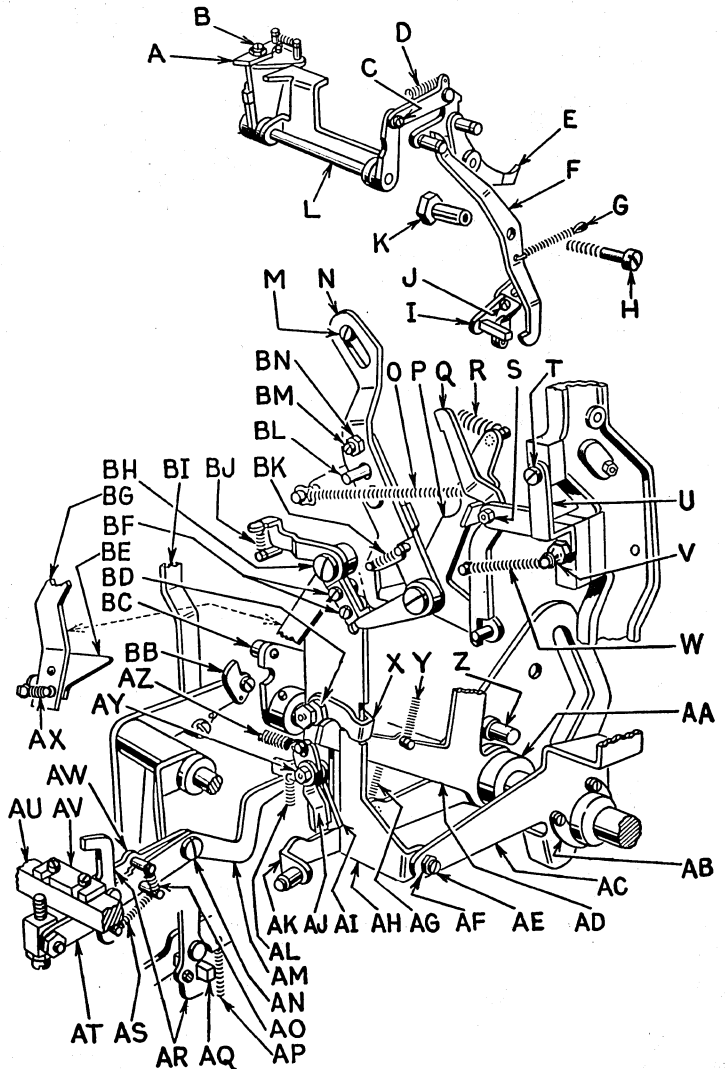
BF 957½
 BG 701533 in casting
 BH 1-709127 No. 2 use 7283¼ spring
 BI 74809 No. 3
 BJ 1-706201A*
 BK 709801 No. 2
 BL 7559½ screw, 7919½A washer
 BM 75816 regular
 981¼ used with reg. timing mech.
 BN 1A-709121
 11A-709121 early } includes N, O, T
 BO 550¼
 BP 1-79317A No. 3 includes 72573 screw
 BQ 76570
 BR 1-709350 includes C
 BS 79109 No. 1
 BT 79315 No. 1 Style 25 (.125)
 79315 No. 1 Style 26 (.126)
 BU 79230 No. 2
 BV 709330 nut
 BW 75609

BX 20 No. 98 anchor
 BY 1-79317A No. 3 includes 72573 screw
 BZ 79812A No. 2
 79812 No. 2 early
 CA 709538*
 CB 1-709127 No. 1
 CC 72271 No. 1
 CD 7283¼ spring
 CE 957½
 CF 70512
 CG 49¼ nut
 CH 709130 No. 1
 CI 3284½
 CJ 1-702102 No. 2
 CK 750¾ No. 2*
 CL 1-702157A No. 1*
 CM 1-702152B
 CN 709803
 CO 1-709128A No. 1 includes CF, CG, CH
 CP 12046½ nut, 702535A screw
 CQ 957½
 CR 73828

REGISTER SHUTTLING-OUT MECHANISM (Plate 42)

SYMBOLS (Plate 42)

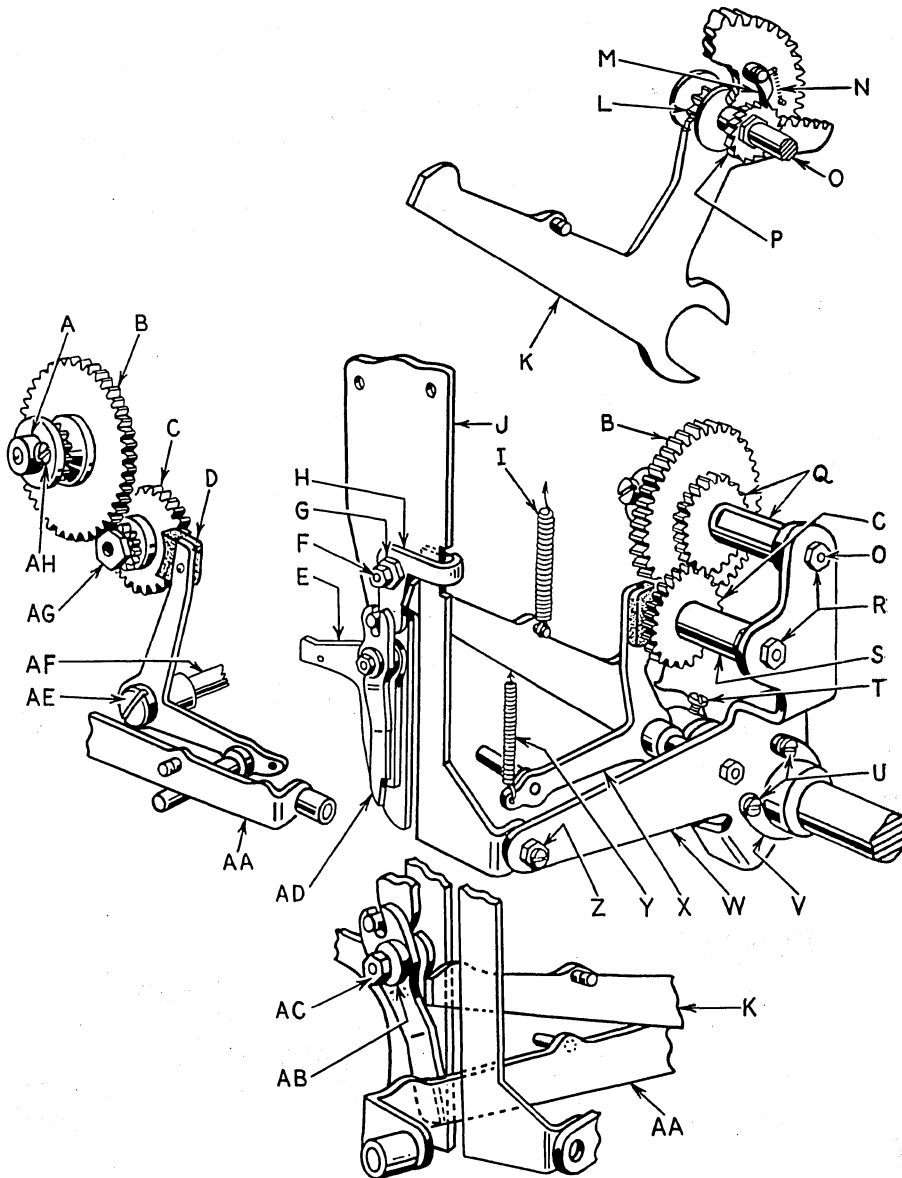
A 1-709111
 B 74502 screw, 71361 ecc.
 C 79552
 D 3284½
 E 1-709118B No. 2 } use 709501 No. 2
 1A-709118 No. 1 } screw
 F 1-701211
 G 71807
 H 72614
 I 1-701219
 J 952½
 K 701509
 L 1A-709031 includes A, B
 M 709516 screw, 709314 collar, 1097¼ washer, 46 nut
 N 1A-709123 includes BK, BL, BM, BN
 O 1-709804A
 P 1-709804 early
 Q 1-709125 No. 2
 R 1-709131 No. 1
 S 709801 No. 2
 T 46 nut, 709541 screw
 U 72617
 V 709132 complete assembly 1-709132, includes Q, S
 W 709554
 X 71806
 Y 1-701213
 Z 75816 regular
 981¼ used with reg. carry timing mech.
 AA 701550
 AB 1-701333A includes 950½ screw
 AC 701170 use 952¼ screws
 AD 701174
 AE 1-701150 No. 3 with reg. carry timing mech.
 1-701150A No. 2 without reg. carry timing mech.
 AF 73611
 AG 75342
 AH 74809 No. 3
 AI 1-701234 No. 2 includes AI, AJ, AY
 AJ 1-701202A* included in AH
 AK 701212
 AL 1-701150A No. 1
 AM 79807
 AN 1-705236 includes AR
 AO 74529
 AP 3486½
 AQ 71810 No. 2
 AR 701513
 AS 1-705243* included in AM
 AT 71806
 AU 1-701140* complete assembly 1-701332, includes AQ, BB
 AV 1-705901A No. 2 includes AV
 AW 705192 No. 1 use 2854½ screws
 AX 1-705239 No. 1
 AY 709803
 AZ 46 nut, 7919½A washer
 BB 71807
 BC 1-701136 use 71542 screw
 BD 71301A roller, 71500A stud
 BE 12046½ nut, 702535A screw
 BF 709107A* included in BG
 BG 70512 screws, use 49¼ nuts
 BH 1-709128A No. 1 includes BE, BF



BH 957½
 BI 71160A No. 1 } use 74501 screw
 71160 No. 1 early } in bottom
 BJ 73828

BK 7787
 BL 709503*
 BM 709558 use 1097¼ washer, 46¼ nut
 BN 79362

REGISTER CARRY TIMING MECHANISM (Plate 43)

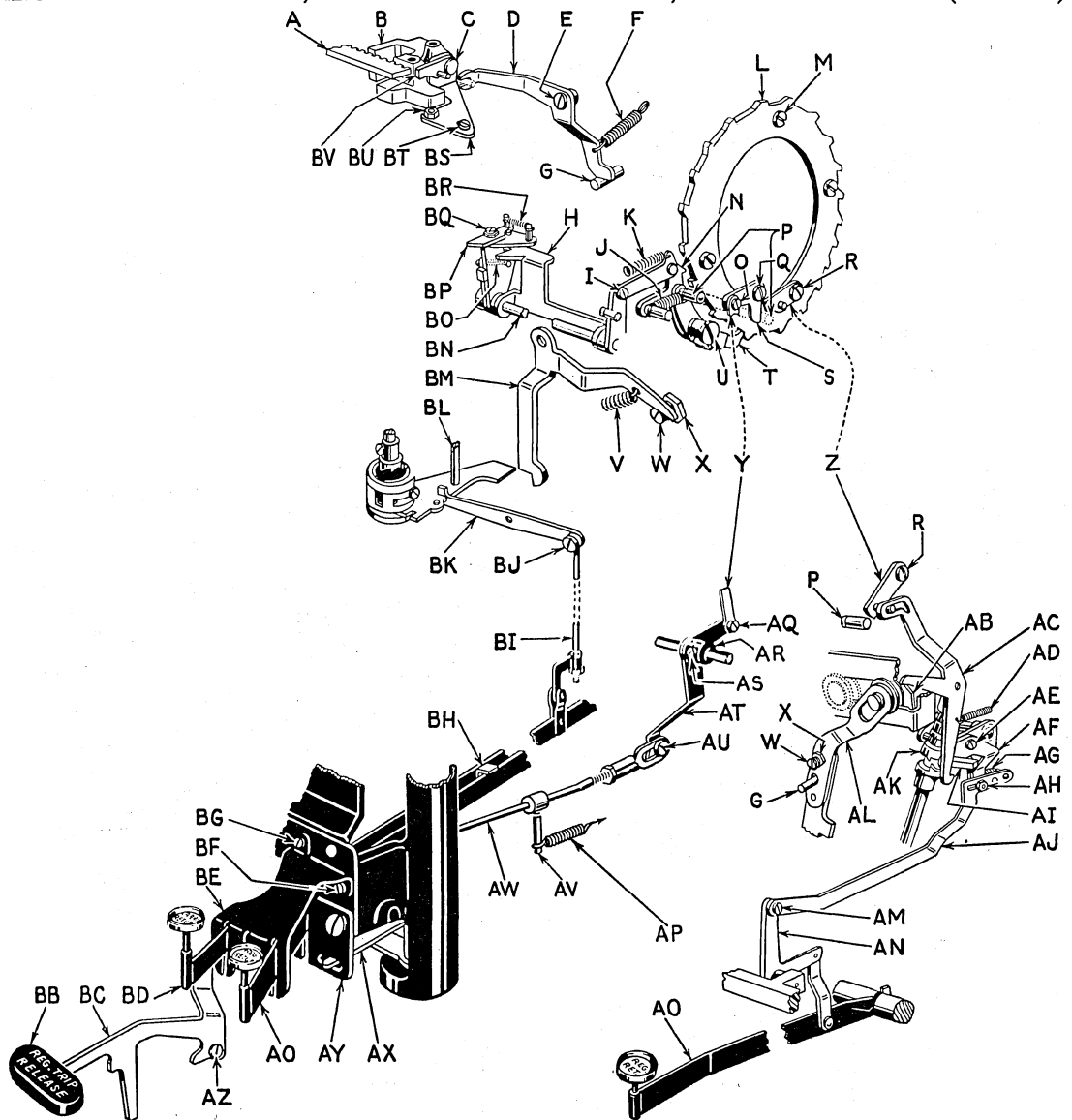


SYMBOLS (Plate 43)

A	1-72310 No. 2 includes AH	K	1-701150 No. 3	V	701170
B	1-701361 includes L, M, N, P		1-701150A No. 2 used without reg.	W	701174
C	1-701363		carry timing mech.	X	1-701169 includes D
D	701900 use 504 fte. 717 rivet, included in X	L	701361* included in B	Y	71804
E	1-701202A* included in J	M	1-75114 No. 1 included in B	Z	75342 ecc., 73611 screw
F	702535A screw, 46 nut	N	75815	AA	1-701150A No. 1
G	12046 3/4	O	701568	AB	7919 1/2 A
H	1-701213	P	701362* included in B	AC	46
I	981 1/4 used with reg. carry timing mechanism	Q	701365	AD	701212
J	75816 regular	R	45 1/4	AE	8054 3/4
K	1-701234 No. 2 includes E, AB, AC, AD	S	701567	AF	701566 use 46 nut
		T	950 5/8 complete assembly 1-701333A	AG	701366
		U	952 3/4	AH	72573

SEE EXPLANATION ON INSIDE OF FRONT COVER

REGISTER SELECTION, CARRIAGE CONTROLLED, AND INTERLOCKS (Plate 44)



A 1-73913B Style 12, 15, 18

B 1-703913B Style 22, 30

C 1-705673A No. 4

D 650A rivet

E 3960 screw, early

F 1-705241

G 709510A

H 480 1/4

I 709503* included in AL

J 709109A use 73612 screws

K 79552

L 71808

M 3284 1/2

N 709108 No. 1

O 75603 No. 1

P 1-709117A

Q 79503

R 709509* stud, included in T

S 9053 3/4

T 73564A

U 72624 early

V 709135 No. 1

W 1-709118B No. 2

X 1A-709118 No. 1 early

Y 709501 No. 2

Z 71806

AW 709558 screw, 1007 3/4 washer, 46 1/4 nut

AX 79362

AY 709134A

SYMBOLS (Plate 44)

Z 1A-709286A

AB 1-709286A early

AC 1-709122A No. 2* see plate 41 letter

AD 1-701204 No. 1

AE 1A-701204 No. 2 used with synchro-

AF 71806

AG 952 3/4

AH 1-701219 includes AI

AI 2886 1/2

AJ 46 nut, 701518 screw, 1097 3/4 lock

AK washer

AL 701512* stud

AM 1-701206

AN 701316A

AO 1A-709123 includes G, W, X

AP 75645

AQ 1-705235 No. 1 use 950 3/4 screw

AR 1-705110A No. 1 reg. return

AS 10082 1/2

AT 79503

AU 1-75332 collar, includes AS

AV 75618

AW 1-705238

AX 75645

AY 70508 screw, 72315 No. 1 collar

AW 1-702710 No. 2 includes AV and

AX 72110 No. 1 turnbuckle

AY 1-705121A

AZ 1-75214A

BB 1-705214 No. 3 with skip tab

BC 74529

BD 1A-702125 No. 2 specify reg. trip re-

BE 705237

BF 1A-705110 No. 2 oge. return

BG 705237

BH 74523

BI 73562

BJ 705110 1/2 use 73612 screw, 46 1/4 nut

BK 705700

BL 72572 No. 1

BM 1-705115 includes BI, BJ

BN 11-705023

BO 709133B use 709511 screw

BP 1A-709031 includes H, BP, BQ

BQ 7287 Style 10

BS 1-709111

BT 74502 screw, 71361 oco.

BV 79810

AW 1-705172 1/2 includes C, BV

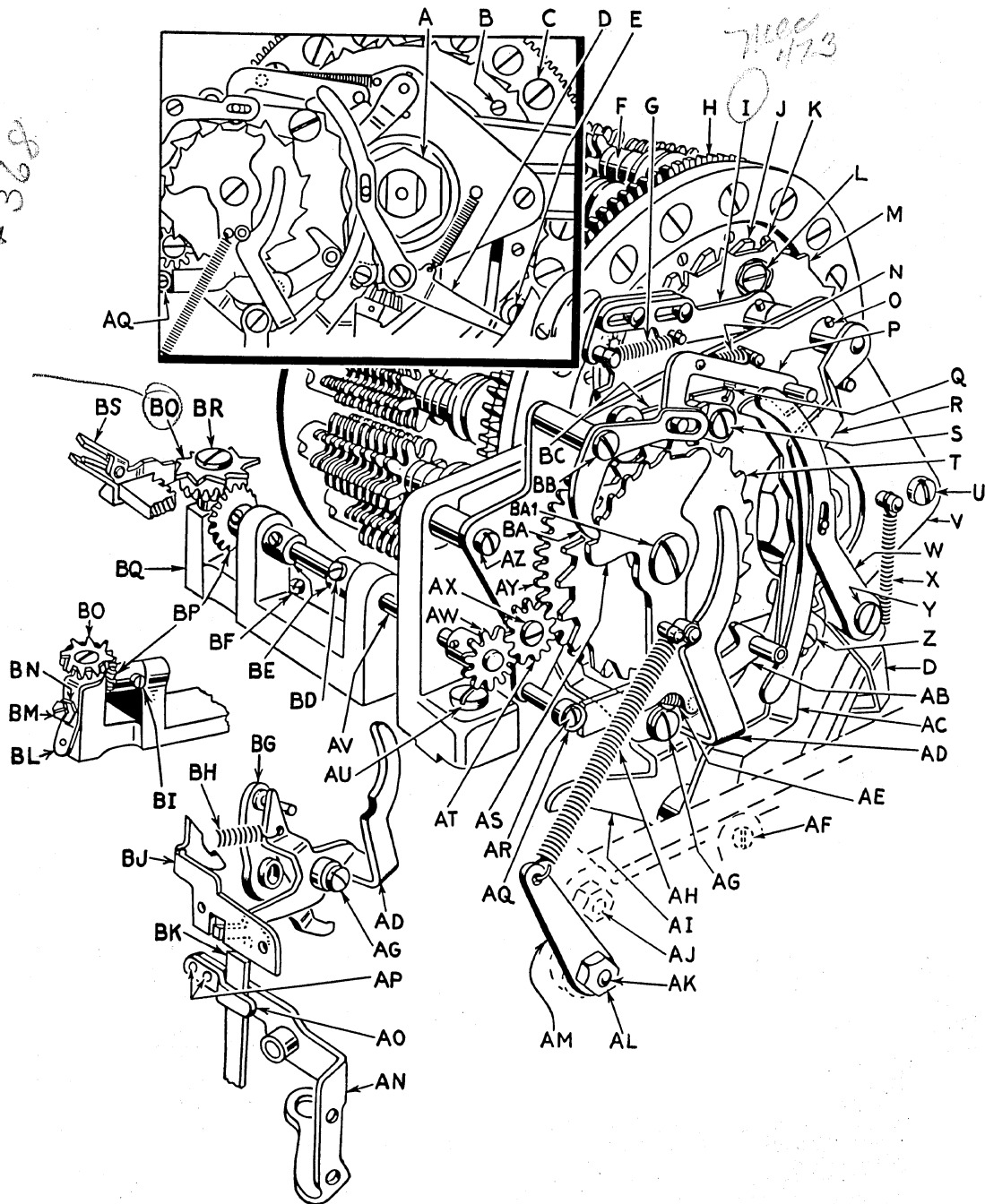
AX 7357 1/2

AY 47 nut, 75655 screw, 0028 1/2 washer

AZ 1-705172 No. 2

AW 1-705172 early, use 3960 screw

REGISTER AND CARRIAGE SYNCHRONIZING MECHANISM (Plate 45)



SYMBOLS (Plate 45)

A	709303	J	709108 No. 1	T	709269A* complete assembly
B	10750 3/4 Style 9	K	709518A	U	1-709600A
C	709521 use 709146 lock washer	L	709517 screw, 709304 No. 1 ecc.,	V	53 Fte. 116 (519 Fte. 213)
D	1-709267 1/4		709147 lock washer, 47 nut	W	1B-709268A
E	709522	M	709108 1/2	X	1A-709268A early } includes G, I, R,
F	1A-709309A see plate 40 for other styles	N	10180	Y	1-709267 1/2
G	72813 (302801)	O	8050 3/4	Z	10085
H	709148 use 77515 screws	P	1-709274 1/4	AB	74587
I	1-709265 1/2* complete assembly	Q	44800	AC	9755
	1A-709037A, includes G, I, O, R	R	1-709267A* included in I		
		S	305502		

SEE EXPLANATION ON INSIDE OF FRONT COVER

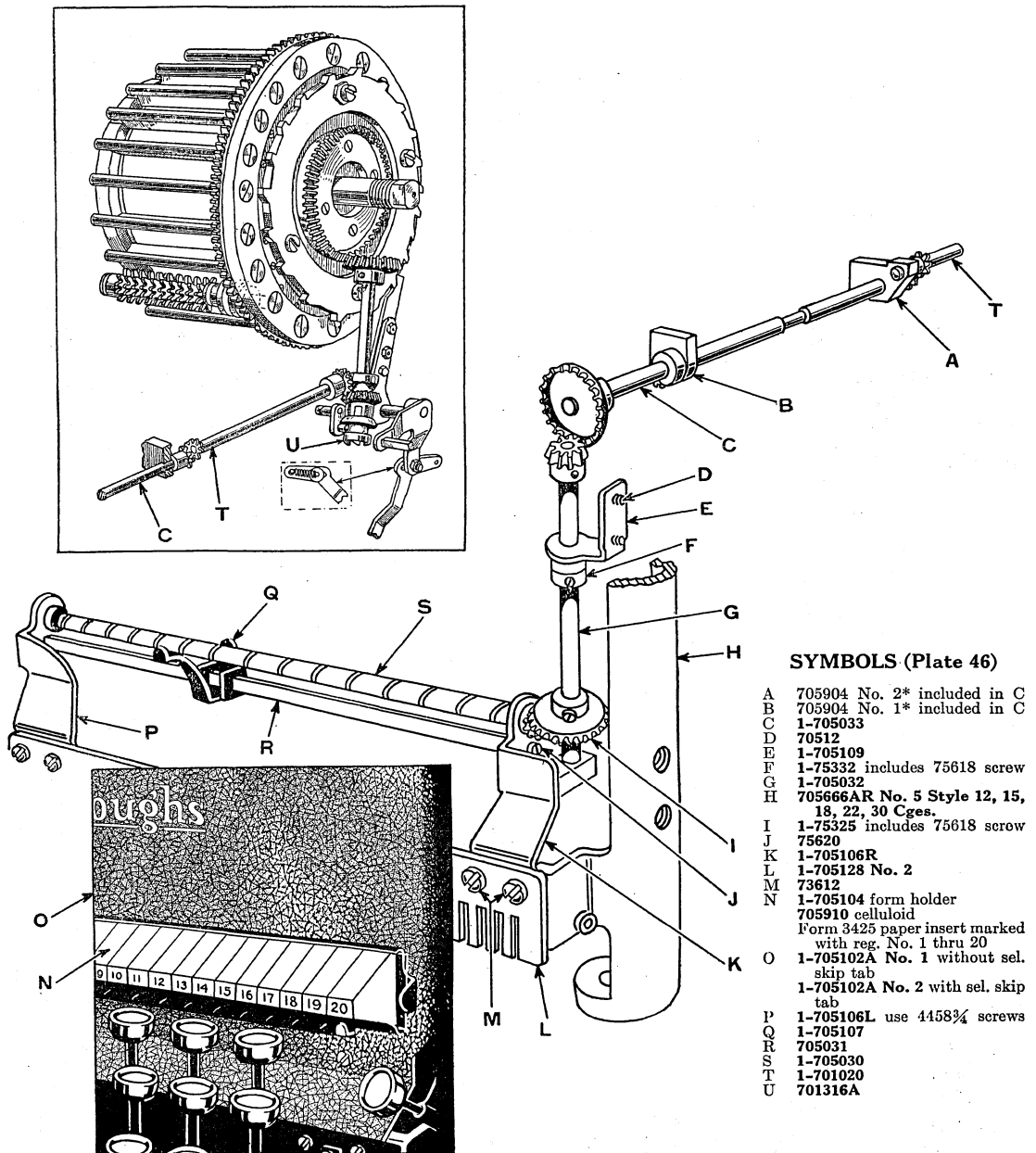
SYMBOLS (Plate 45)—Continued

AD 1-709273C
 AE 71803 spring
 AF 72614 screw, 701509 No. 2 bushing
 AG 709606
 AH 709807
 AI 1A-701204 No. 2 use 71806 spring
 AJ 709543 screw, 46 nut
 AK 709543 screw
 AL 46
 AM 20 No. 102
 AN 1-701205A use 72567 screws
 AO 701205½
 AP 70512
 AQ 709368
 AR 73612
 AS 1-709271C
 1-709271A early } includes AB

AT 709276
 AU 1055¾ Style H
 AV 1A-709035 includes AW, BI, BP
 AW 709342* included in AV
 AX 709607 screw, 709605 pivot stud, 46 nut
 AY 709270A* complete assembly
 1-709600A
 AZ 94529 screw, 46 nut
 BA 709274½
 BA1 3450¾ Style 9
 BB 74587
 BC 1-709275B
 BD 73643
 BE 1-73314 includes BD
 BF 4456½
 BG 1-709118B No. 2

BH 489
 BI 709612A
 BJ 1-709122A No. 2* complete assembly
 1A-709121
 Complete assembly 11A-709121,
 early
 BK 1-702104 No. 4 see plate 20 for other
 styles
 BL 1-709160
 BM 76567
 BN 72307
 BO 1-709348A
 BP 709341A use 709612A screw
 BQ 1-709667A complete assembly, in-
 cludes BL, BM, BN
 BR 203578A No. 2
 BS 1-73286 No. 2

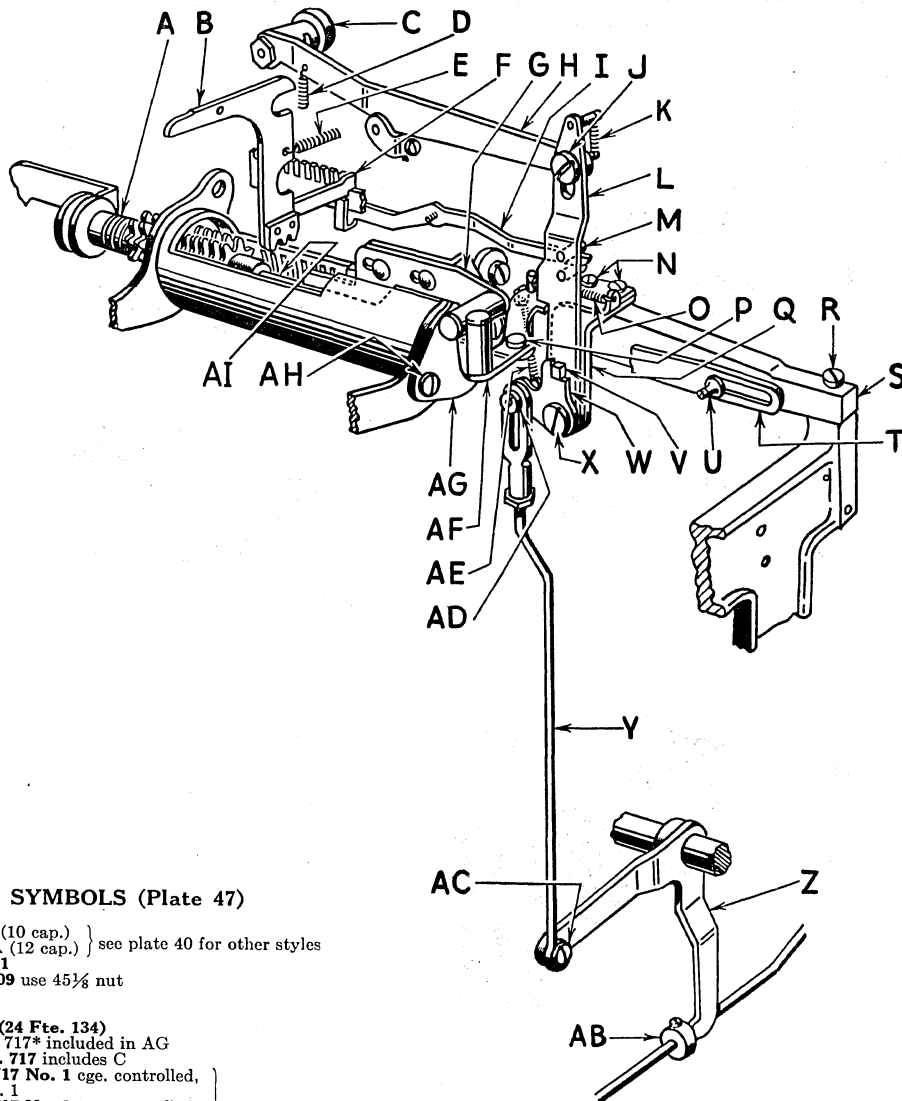
REGISTER INDICATOR, HORIZONTAL (Plate 46)



SYMBOLS (Plate 46)

A 705904 No. 2* included in C
 B 705904 No. 1* included in C
 C 1-705033
 D 70512
 E 1-705109
 F 1-75332 includes 75618 screw
 G 1-705032
 H 705666AR No. 5 Style 12, 15,
 18, 22, 30 Cges.
 I 1-75325 includes 75618 screw
 J 75620
 K 1-705106R
 L 1-705128 No. 2
 M 73612
 N 1-705104 form holder
 O 705910 celluloid
 Form 3425 paper insert marked
 with reg. No. 1 thru 20
 P 1-705102A No. 1 without sel.
 skip tab
 Q 1-705102A No. 2 with sel. skip
 tab
 R 1-705106L use 4458¾ screws
 S 705031
 T 1-705030
 U 1-701020
 V 701316A

CONSECUTIVE NUMBERING MECHANISM, CLASSES 75 AND 77 (Plate 47)



SYMBOLS (Plate 47)

- A 1A-709309A (10 cap.) } see plate 40 for other styles
- B 21A-709309A (12 cap.) }
- C 1-79222 No. 1
- D 1-500 Fte. 709 use 45½ nut
- E 3984
- F 79802
- G 79221 No. 1 (24 Fte. 134)
- H 1-1101A Fte. 717* included in AG
- I 1-1105A Fte. 717 includes C

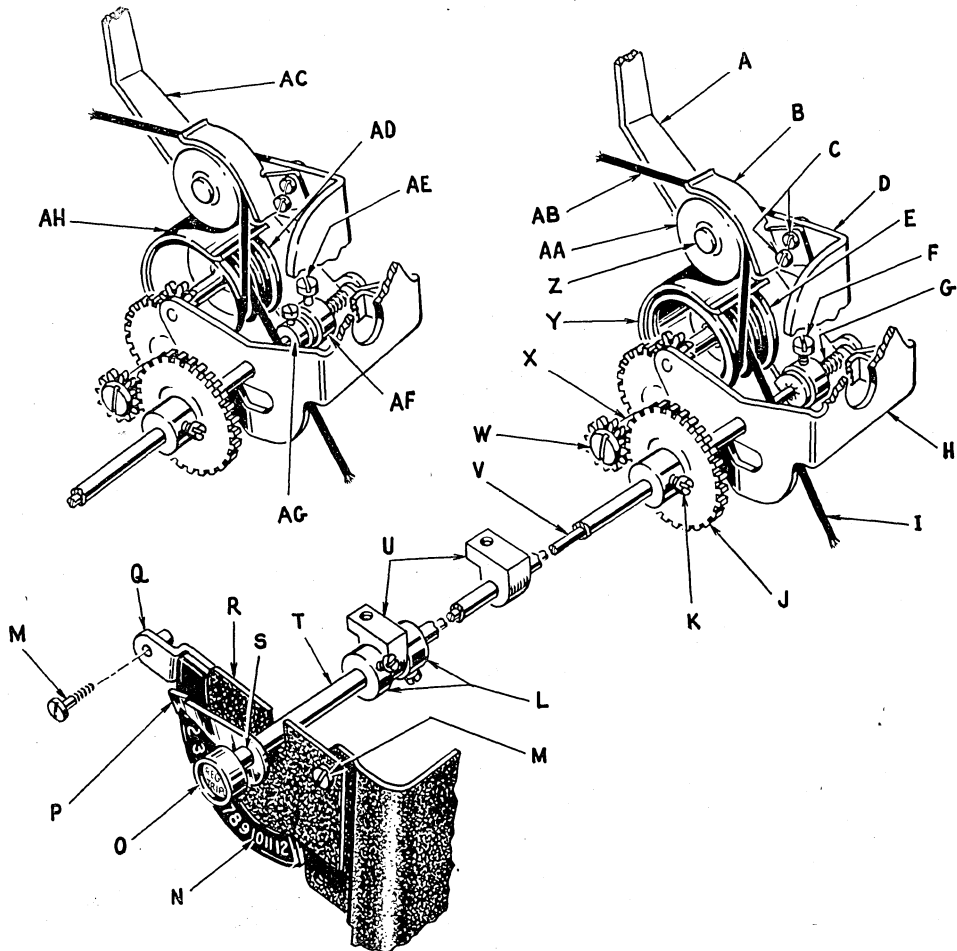
- 1106A Fte. 717 No. 1 cge. controlled, trips in col. 1
- 1106A Fte. 717 No. 2 cge. controlled, trips in col. 2
- 1106A Fte. 717 No. 3 cge. controlled, trips in col. 3
- 1106A Fte. 717 No. 4 cge. controlled, trips in col. 4
- 1106A Fte. 717 No. 5 cge. controlled, trips in col. 5
- 1106A Fte. 717 No. 7 key controlled, trips in col. 1
- 1106A Fte. 717 No. 8 key controlled, trips in col. 2
- 1106A Fte. 717 No. 9 key controlled, trips in col. 3
- 1106A Fte. 717 No. 10 key controlled, trips in col. 4
- 1106A Fte. 717 No. 11 key controlled, trips in col. 5
- 1106A Fte. 717 No. 12 key controlled, trips in col. 1, cl. 72, 74, 76, 78 wide base
- 1106A Fte. 717 No. 13 key controlled, trips in col. 2, cl. 72, wide base
- 1106A Fte. 717 No. 14 key controlled, trips in col. 6, cl. 75, 77
- 1106A Fte. 717 No. 15 key controlled, trips in col. 4, cl. 72, wide base
- 1106A Fte. 717 No. 16 key controlled, trips in col. 3, cl. 72, wide base
- 1106A Fte. 717 No. 17 (1106B Fte. 717 No. 3) cge. controlled, trips in col. 7, cl. 75, 77
- 1106A Fte. 717 No. 18 key controlled, trips in col. 5, cl. 75, 77 with four position printing

cl. 75, 77
use 1501 fte.
717 screw

- J 75582
- K 75814
- L 1-1102 Fte. 717 No. 1
- M 87503*
- N 75621
- O 10686½
- P 351½*
- Q 1110A Fte. 717 bracket
- R 79545
- S 1-1669B Fte. 717 (21-700669 No. 1, 1-1109B Fte. 717, 75621 —2 req.)
- T 706144A No. 1 (706144 No. 1) see plate 48 for other styles
- U 74546 No. 2
- V 8361*
- W 1107 Fte. 717 latch
- X 1500 Fte. 717
- Y 1-1700 Fte. 717 No. 1 cge. controlled
- Z 1-1700 Fte. 717 No. 2 key controlled
- AB 1-1108 Fte. 717
- AC 1-72315 No. 1 includes 72573 screw
- AD 72572 No. 1
- AE 72339 (71366) bushing, 1502 fte. 717 screw
- AF 71803
- AG 1-1104A Fte. 717* complete assembly 1-1109B Fte. 717, includes P, AF
- AH 1-1103 Fte. 717 includes G
- AI 75602
- AI 1-1019 Fte. 717 guide pin for A

SEE EXPLANATION ON INSIDE OF FRONT COVER

REGISTER POSITION INDICATOR MECHANISM—GEAR CONTROLLED—FOR 60
AND 100 PINION CONSTRUCTION REGISTER SECTION—SERIES
M 200 AND M 800 MACHINES (Plate 46-1)



SYMBOLS (Plate 46-1)

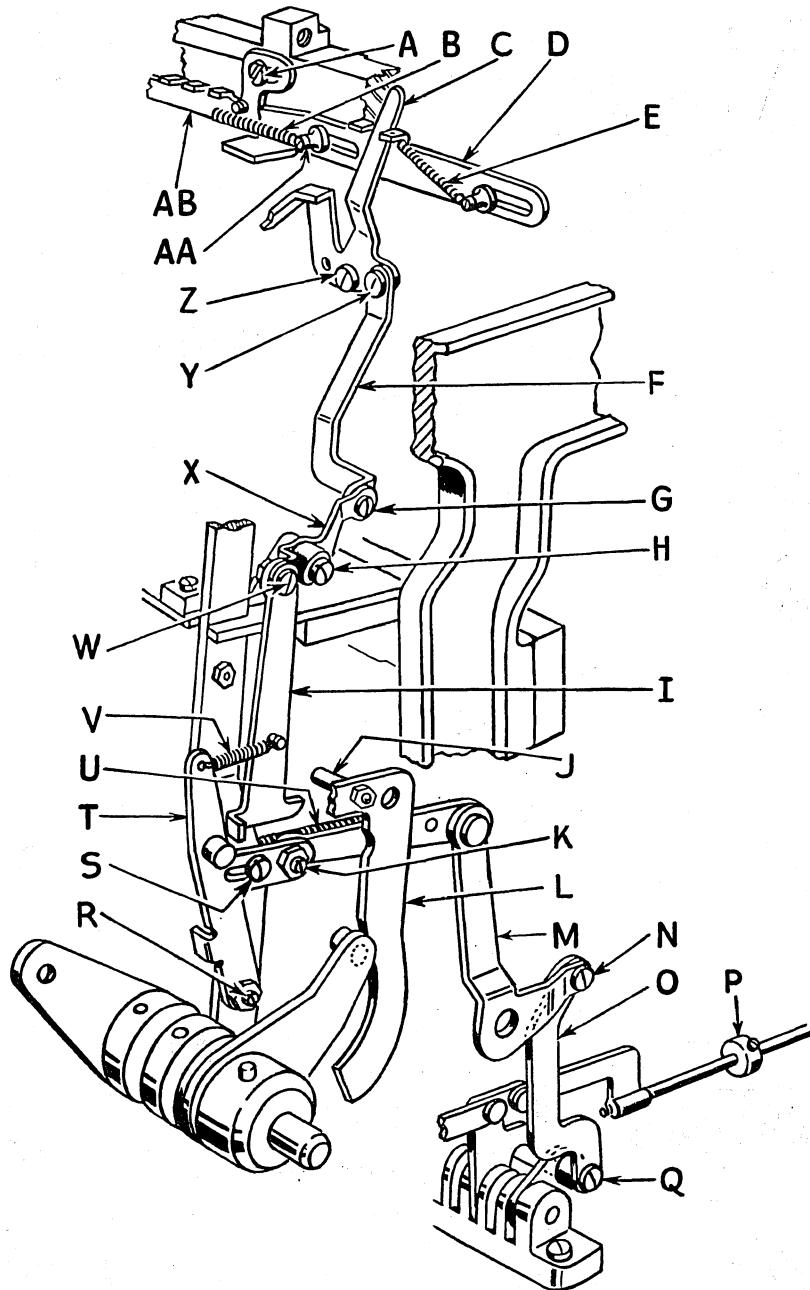
- | | | | |
|---|--|----|-------------------------------------|
| A | 1-705204A No. 2 includes F | P | Included in U |
| B | 709274 3/4 No. 2 | Q | 1-705186B bracket only |
| C | 79543 screws | | 2A-705186C No. 1 4x15 capacity |
| | 49 3/4 nuts | | 2A-705186C No. 3 5x10 capacity |
| D | 1-709273 1/2 No. 3 includes B, C, Z, AA | | 2A-705186C No. 6 6x10 capacity |
| E | 1-705362A drum | | 2A-705186C No. 10 4x10 capacity |
| | 9052 1/2 screw | | 2A-705186C No. 21 4x7 capacity |
| F | 950 5/8 | | 2-705186B No. 19 12x8 capacity |
| G | 705810 spring | | 2-705186B No. 20 8x12 capacity |
| H | 1-705127 No. 2 | | 2-705186B No. 22 6x15 capacity |
| I | 709902 No. 3 cord, 19' long | | 2-705186B No. 23 8x9, 8x10 capacity |
| J | 11-705227 1/2 100 pinion | | 2-705186B No. 24 10x10 capacity |
| K | 11-705227 1/2 No. 2 60 pinion | R | 1A-705186 1/2 |
| | includes K | S | 73320 limit collar |
| L | 550 3/4 set screw | T | 1-705025A No. 3 includes P |
| | 1-75332 collars, includes | U | 75904 casting |
| M | 75618 set screws | | 74523 screw |
| N | 75608 | V | 1-705024 |
| | 705986 1/2 clear plastic cover | W | 705590 screw |
| | 705986A No. 1 4x5 capacity | X | 1-705227 1/2 100 pinion |
| | 705986A No. 3 5x12 capacity | Y | 1-705227 1/2 No. 2 60 pinion |
| | 705986A No. 6 6x10 capacity | Z | 709274 3/4A No. 3 |
| | 705986A No. 10 4x10 capacity | | Included in D |
| | 705986A No. 21 4x7 capacity | AA | Included in D |
| | 705986 No. 19 12x8 capacity | AB | 709902 No. 4 cord, 21' long |
| | 705986 No. 20 8x12 capacity | AC | Use 1-705204A No. 2 |
| | 705986 No. 22 6x15 capacity | AD | Use 1-705362A, 709274 3/4A No. 3 |
| | 705986 No. 23 8x9, 8x10 capacity | AE | 72573 |
| | 705986 No. 24 10x10 capacity | AF | Use 1-705204A No. 2 |
| O | 72200A No. 1 ring | AG | Use 1-705204A No. 2 |
| | 72992 No. 1 glass | AH | Use 709274 3/4A No. 3, 1-705362A |
| | 92 No. 1 Specify Character and Color, keypaper | | |

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America

Revised 12-10-52 For Form 2954

CONSECUTIVE NUMBERING, WITH MECHANISM FOR BLOCKING TRIP PAWLS,
CLASSES 75 AND 77 (Plate 48)



SYMBOLS (Plate 48)

A 76558
B 483
C 1114A Fte. 717
D 706144 No. 1 (10 cap.)
706144 No. 3 (12 cap.)
706144 No. 5 (14 cap.)
E 71806
F 1116 Fte. 717
G 79503
H 9052½

I 1-1113 Fte. 717
J 1503 Fte. 717 ecc., 46 nut
K 72567 screw, 79362 ecc.
L 1-701187 (1A-701187, 71586A)
M 1-71189 No. 2
N 71589
O 71188
P 1-72315 No. 1 includes 72573 screw
Q 75615
R 73611 screw, 79362 ecc.

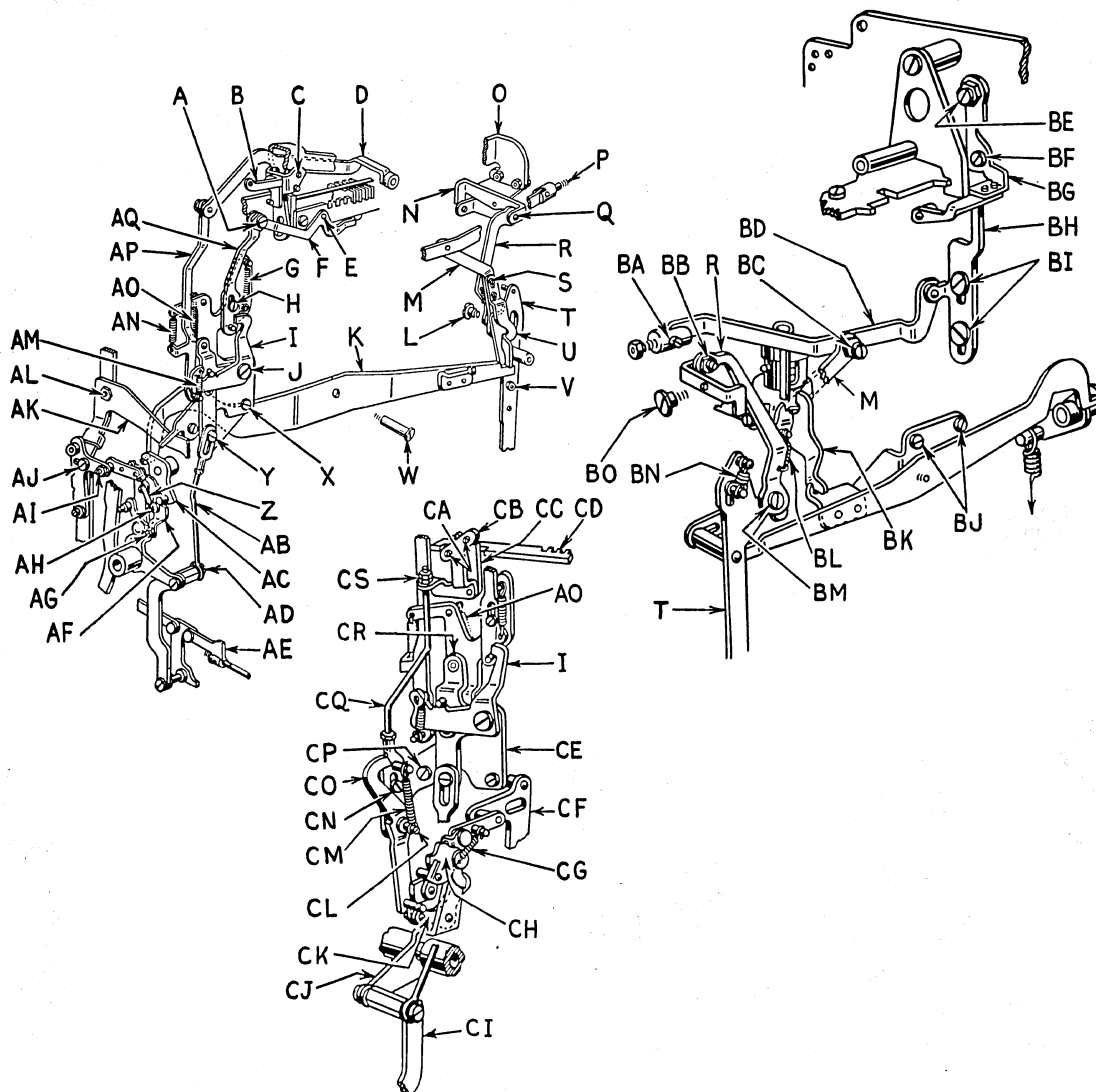
S 79613
T 1-1112 Env. 717 (1-79233A No. 2)
U 7283A Style 10
V 76806
W 72656 screw, 49 nut
X 1-1115A Fte. 717
Y 79503
Z 79503
AA 74546 No. 2
AB 1-709242 No. 1

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 5-20-49

For Form 2954

CONSECUTIVE NUMBERING MECHANISM, CLASS 72 (Plate 49)



- A 73611 screw, 72307 ecc., 46¼ nut
- B 1-79232B
- C 79555 screw
- D 1-112A Fte. 717 narrow base
- E 1-1112½ Fte. 717 wide base
- F 502 Fte. 717 rivet
- G 122 Fte. 717 specify No., see plate 58, letter C
- H 71806
- I 79503
- J 102A Fte. 717 included in AP, use 62506 rivet
- K 94527
- L 1-145 Fte. 717
- M 74529 used with 30 pinion
- N 103542A used with 60 pinion
- O 1-148 Fte. 717
- P 72125½
- Q 1-79273A
- R 71565 No. 2
- S 72568 screw, 79322 ecc.
- T 72128½ used with 30 pinion
- U 72126½ used with 60 pinion
- V 73563 screws
- W 1-72104B No. 3 see plate 20 for other styles
- X 143 Fte. 717 No. 1 used with 60 pinion
- Y 143 Fte. 717 No. 2 used with 30 pinion
- Z 49½ nut, 72527½ square stud
- AA 71598

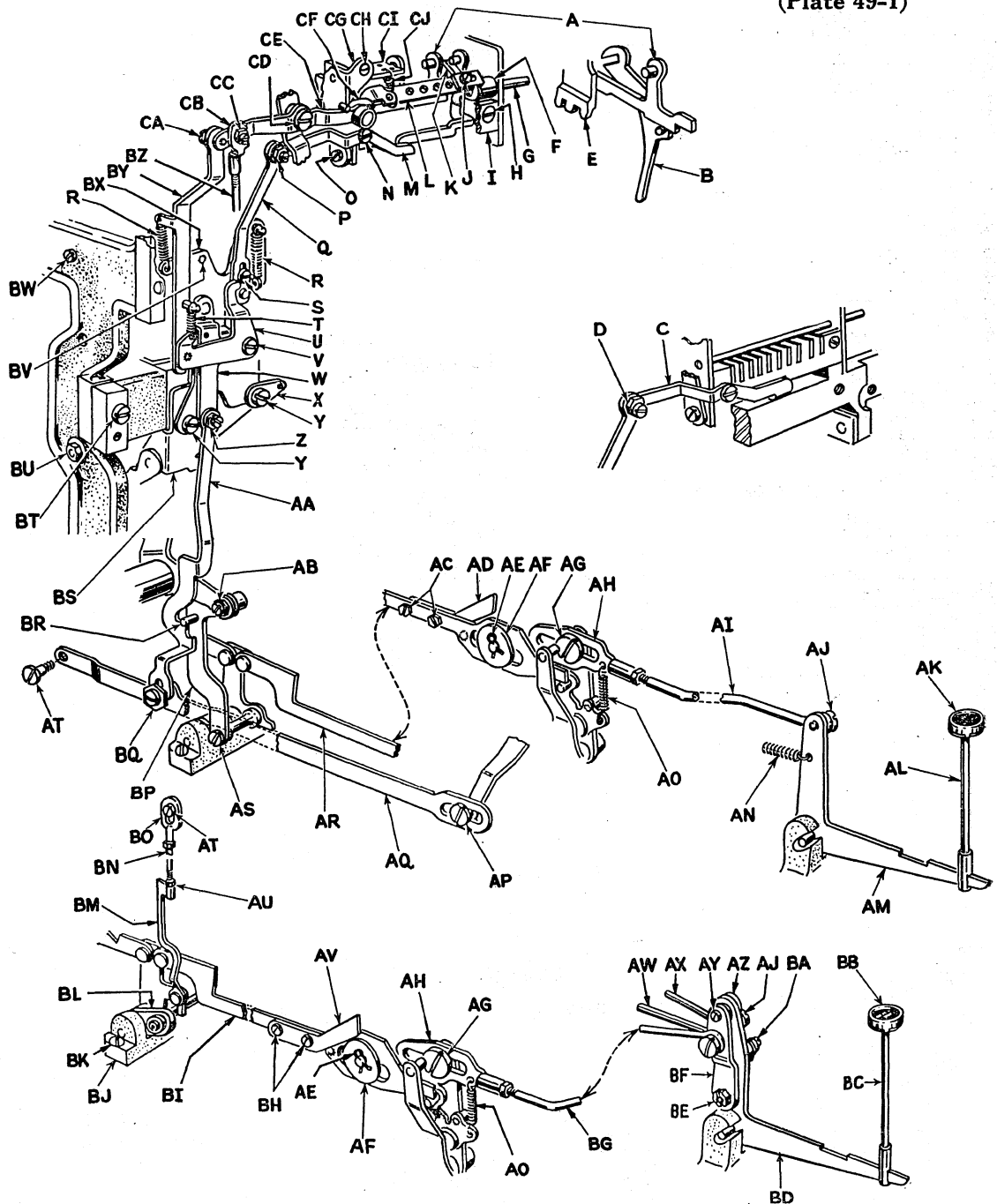
SYMBOLS (Plate 49)

- X 75617
- Y 79503
- Z 8082A
- AB 1-701A Fte. 717
- AC 1-155 Fte. 717* complete assembly
- AD 1A-154 fte. 717
- AE 72572 No. 2 screw
- AF 1B-117 Fte. 717 reg. sub-total
- AG 147 Fte. 717
- AH 74502 screw, 71361 ecc.
- AI 74315
- AJ 72567 screw, 79362 ecc.
- AK 79613
- AL 129A Fte. 717
- AM 76308
- AN 71807
- AO 71806
- AP 75814 spring
- AQ 1-103A Fte. 717 narrow base
- BA 1-1103½ Fte. 717 wide base
- BB 1-113 Fte. 717 No. 1 cge. controlled
- BC 1-113 Fte. 717 No. 2 key controlled
- BD 71564
- BE 79322 ecc., 72568 screw
- BF 75602 screw, 75342 ecc.
- BG 72104½
- BH 73611 screw, 76311 ecc.
- BI 74500

- BG 1A-79248 No. 2
- BH 1-79117A No. 2
- BI 79600
- BJ 71553
- BK 1-156 Fte. 717 use 79552 screw
- BL 10784 spring
- BM 74529 used with 30 pinion
- BN 103542A used with 60 pinion
- BO 79819
- BP 74529
- BQ 75621 screws
- BR 70125
- BS 79115
- BT 79934 No. 1
- BU 1-79934 No. 1 early
- BV 1-119A Fte. 717 No. 1
- BW 1-79233 (1-79233A)
- BX 7283A Style 10
- BY 153A Fte. 717* included in CJ
- BZ 71188
- CA 1-151 Fte. 717
- CB 1-152 Fte. 717* included in CJ
- CC 511 Fte. 717
- CD 72830
- CE 79503
- CF 1-125 Fte. 717 No. 2 cl. 72
- CG 1-125C Fte. 717 cl. 78
- CH 75617
- CI 1-700A Fte. 717 includes 1-110 fte. 717 turnbuckle
- CJ 1-120A Fte. 717* included in CE
- CK 49
- CL
- CM
- CN
- CO
- CP
- CQ
- CR
- CS

SEE EXPLANATION ON INSIDE OF FRONT COVER

CONSECUTIVE NUMBERING MECHANISM TO COUNT IN A SPECIFIED COLUMN, CARRIAGE CONTROLLED—CLASS 72 AND SERIES M 200 MACHINES
(Plate 49-1)



SYMBOLS (Plate 49-1)

- A 1-709221 No. 1
B 11-79209A No. 1 columns 1, 2 and 3
1-79209A No. 1 columns 4 thru 15
C 1106A Fte. 717 No. 12 count in column 2) for machines with
1106A Fte. 717 No. 13 count in column 3) out four position
1106A Fte. 717 No. 16 count in column 4) printing and adding
1106A Fte. 717 No. 15 count in column 5) control

- 1106B Fte. 717 No. 1 Env. 1689
count in column 1
1106A Fte. 717 No. 17 Env. 1689
count in column 2
1106B Fte. 717 No. 6 count in column 3
1106B Fte. 717 No. 4 count in column 4
1106A Fte. 717 No. 16 Env. 1689
count in column 8
1106B Fte. 717 No. 5 count in column 9
1106A Fte. 717 No. 15 Env. 1689
count in column 10

for machines with
four position
printing and
adding control

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 49-1)—Continued

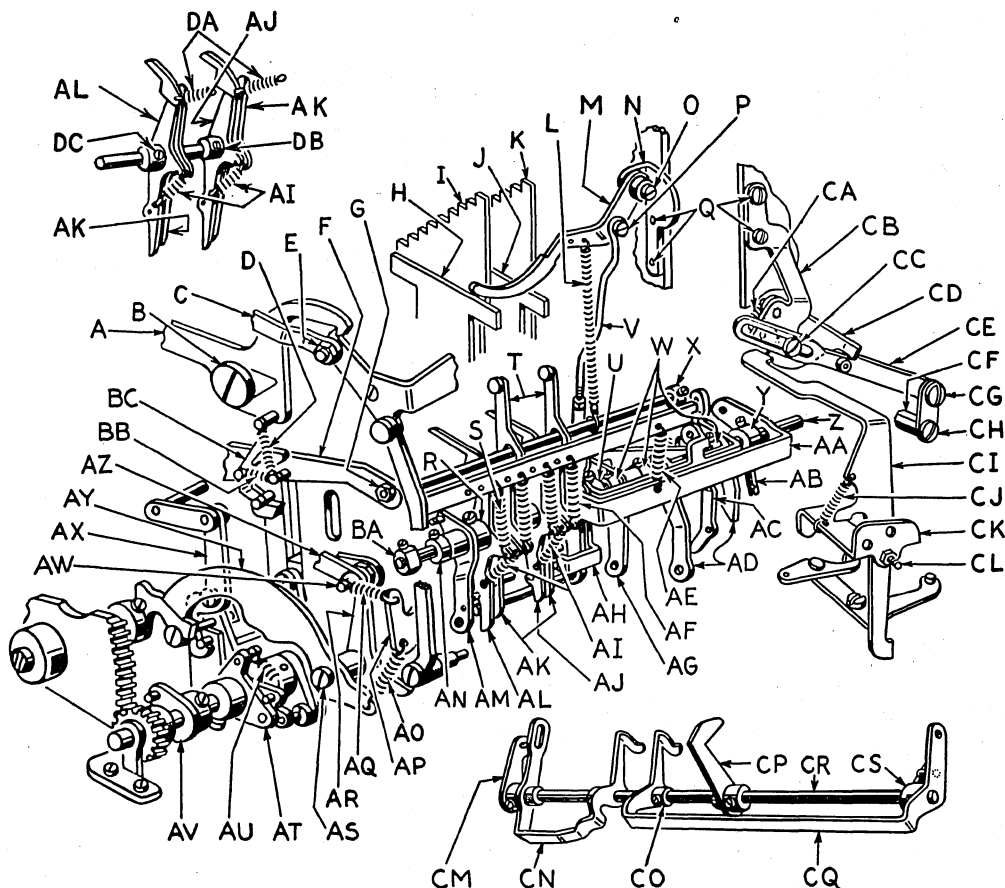
D	75342 eccentric	AV	702227 1/2
E	73611 screw	AW	702771
	1-709222 No. 4 includes A	AX	1-702770
F	1-79222 No. 1 does not include A	AY	82521
G	709384 collar	AZ	702143 1/2 R blank
H	79005 No. 2 shaft	BA	74575 spring anchor screw
I	79547		71808 spring
J	1A-79206A No. 1	BB	72200A No. 1 ring
K	73563 screw		72199 No. 1 cup
L	709169		72992 No. 1 glass
M	709168		72210 disk
N	1106B Fte. 717 No. 7		92 No. 1 Specify Character and Color, keypaper
O	1501A Fte. 717	BC	72521 No. 5
P	75609	BD	1-702143 No. 6
	72307 eccentric	BE	71366 nut
Q	73611 screw		75648 screw
R	1-113 Fte. 717 No. 3	BF	702143 1/2 L No. 2
S	71806	BG	1-702759 includes AH
T	79503	BH	545 Fte. 217
U	76812 spring	BI	Use 1A-702171 No. 8, 702227 1/2 A, 9050 3/4 2 Req., includes BM
V	Included in BY	BJ	666 Fte. 717 No. 2
W	94523	BK	75617
X	Included in BX	BL	1-131 Fte. 717
Y	20 No. 104	BM	Included in BI
Z	12050	BN	1-702A Fte. 717 includes BO
	705367 eccentric	BO	72110 No. 1
AA	76559 screw	BP	1-701188
AB	702216 1/2	BQ	203495 eccentric
	705367 eccentric		73611 screw
AC	79565 screw	BR	Included in BP
AD	9050 3/4	BS	11-701201 No. 2
AE	702227 1/2 A	BT	700506
AF	21 No. 15	BU	47 nut
AG	702221 3/4		71586A screw
AH	709628	BV	75814 spring, used on stud
AI	702110 No. 8	BW	73659
AJ	1-702758 reg. total wire, includes AH	BX	1-119B Fte. 717 No. 1 includes W
AK	72572 No. 1	BY	1-103 Fte. 717 No. 3 includes U
	72200A No. 1 ring	BZ	1-702739 includes CB
	72199 No. 1 cup	CA	75342 eccentric
	72992 No. 1 glass		73611 screw
	72210 disk	CB	72110 No. 6
AL	92 No. 1 Specify Character and Color, keypaper	CC	71361 eccentric
AM	72521 No. 1 keystem		74502 screw
AN	1-72143 No. 1 reg. total position	CD	79607A
AO	3489	CE	11-709254 No. 2
AP	77882	CF	76302 No. 2 collar
AQ	72599	CG	11-79232B
AR	11-702216	CH	79555
AS	1A-702171 No. 13 reg. total link	CI	79204 No. 1
AT	75615	CJ	709803 spring
AU	75638		
	49 3/8 nut		

SYMBOLS (Plate 50)

SEE KEYBOARD SYMBOL LIST, PLATES 33 THRU 40
FOR OTHER SYMBOLS

A	1-75108 1/2
B	74500 No. 3
C	1-74261
D	82809
E	71361 ecc., 72573 screw
F	1-74263
G	46 1/2 nut, 79610 screw
H	1A-74107A No. 25 (1-74107B No. 25, 74115A No. 1)
I	11-74107 No. 23
J	1A-74107A No. 25 (1-74107B No. 25, 74115A No. 1)
K	11-74107 No. 20
L	74812 spring
M	20 No. 36A anchor
N	1-74226
	74235
	704235 No. 1
O	705505 1/2
P	72572 No. 1
Q	79543
R	1-74308 includes 12055 3/8 screw
S	74813
T	1-74136A No. 2 use 74804 spring
U	1-74308 includes 12055 3/8 screw
V	1-74700A No. 5
W	1-74326 includes 75618 screw

SUBTRACTOR ASSEMBLY, CLASS 78 (Plate 50)



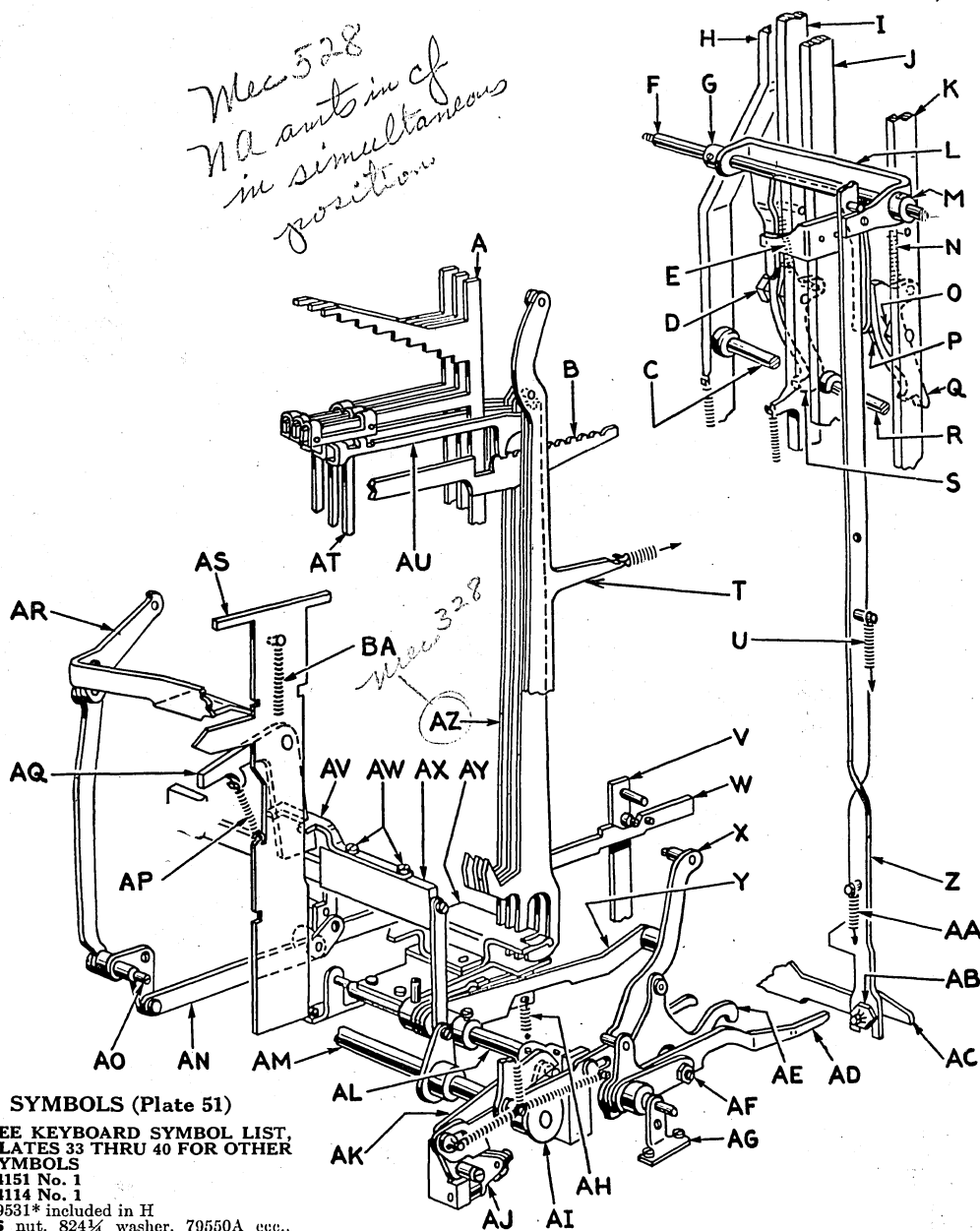
SYMBOLS (Plate 50)—Continued

X 96305 use 75618 screw, narrow base
 1-74320 includes 75618 and 74572 screws, wide base
 Y 1-74308 No. 4 includes AB and 71519 screw
 Z 72038 complete assembly 1-74025A No. 2, includes R, T, U, W, Y, Z, AA, AB, AC, AD, AG, AH, AJ, AK, AL, AM, AN, BA, used with reg. sub. specify machine style and number
 72038 complete assembly 21-74025A No. 2, used without reg. sub.
 1-704025 No. 2 (1A-704025 No. 2, 76500) complete assembly, used with reg. sub.
 702038 complete assembly 11-704025 No. 2, used without reg. sub.
 AA 1-74132A No. 8
 1-704132 No. 2
 AB 74560
 AC 1-74242
 AD 1-74233 (1-132 Fte. 709)
 AE 73805
 AF 74804
 AG 1-74227
 AH 74234
 704234 (704234A, 76500, 49 1/4)
 AI 71806
 AJ 1-74132 No. 11 use 3486 1/2 spring
 AK 1-74132A No. 9
 AL 1-74132 No. 10
 AM 1-74215A
 AN 1-74326 includes 75618 screw
 AO 60807
 AP 74210A use 74565 screw
 AQ 10785 1/2
 AR 1-74257A
 AS 74597
 AT 1-74260 includes 72581 screw
 AU 99801A (87801A)
 AV 11-74192 includes 72581 screw
 AW 74574 screw, 72307 ecc.
 AX 1-72220 No. 2 use 75637 screw
 AY 1-74258

1-704258
 AZ 72296 1/2 narrow base
 702296 1/2 No. 2 wide base
 BA 1-74316 includes 75618 screw
 BB 10784
 BC 1-74264 use 71366 bushing
 CA 489
 CB 1-74238 includes CD
 CC 75638
 CD 1-74217* use 72512 rivet
 CE 1-72178
 CF 74580
 CG 75631 screw
 71366 bushing
 CH 9052 1/2
 CI 1-70119
 CJ 10686 1/2
 CK 70118A use 72584 screws, 46 nuts
 CL 79593 screw, 46 nut
 CM 1-74186R includes 72573 screw
 CN 74196 No. 2
 CO 96305 use 75618 screw
 CP 1-74212 includes 72573 screw
 CQ 1-74196 No. 1
 1-704196
 CR 74045 complete assembly 1A-74045, includes X, CM, CN, CO, CP, CQ, CS, used with reg. sub.
 74045 complete assembly 11-74045, includes X, CM, CO, CQ, CS, used without reg. sub.
 1-704045 (1-704045A, 70118A, 1-70119, 79819) complete assembly, used with reg. sub.
 704045 shaft
 11-704045 (11-704045A, 70118A) complete assembly, used without reg. sub.
 CS 1-74320 includes 75618 and 74572 screws, narrow base
 96305 use 75618 screw, wide base
 DA 62880 (89801)
 DB 1-74322 includes 75618 screw
 DC 12055 1/2 included in R

EXTEND MECHANISM, FORWARD STROKE, CLASS 78 (Plate 51)

*Mec 528
NA auto in cf
in simultaneous
position*



SYMBOLS (Plate 51)

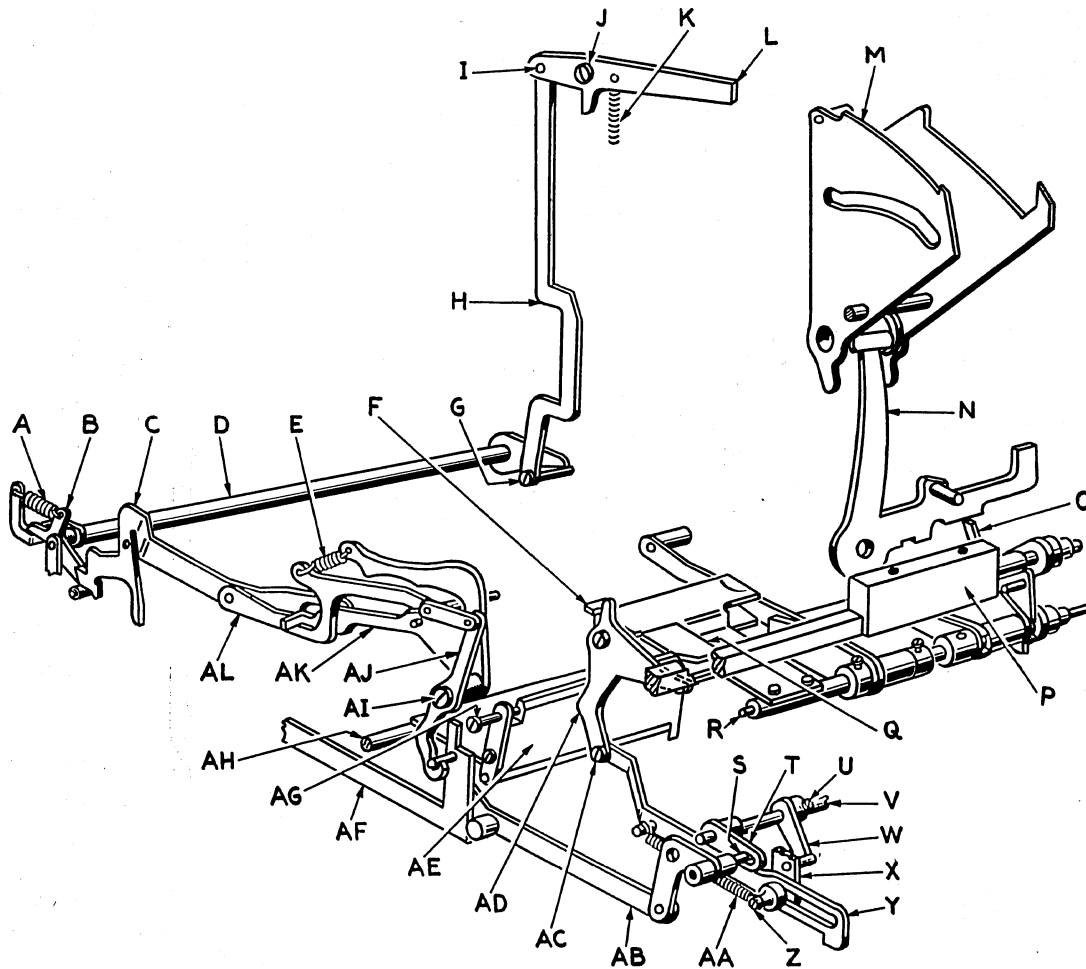
SEE KEYBOARD SYMBOL LIST,
PLATES 33 THRU 40 FOR OTHER
SYMBOLS

A	74151 No. 1
B	74114 No. 1
C	79531* included in H
D	46 nut, 824 1/4 washer, 79550A ecc., 47 nut
E	79807 spring
F	79021
G	79021
H	1-28345 includes 75618 screw
I	1-79207 No. 1
J	11-79207 No. 2 } See plate 15 for includes D, S } other styles
K	1-709215
L	21-79223A No. 2 includes O, P, Q see plate 9 for other styles
M	79212
N	1-28345 includes 75618 screw
O	79807
P	79550A screw
Q	46 nut, 824 1/4 washer, use 47 nut on other end
R	1-79224
S	79534* included in J
T	1-79211 pawl
U	11-71150A No. 2 see plate 7 for other styles
V	72814

V	1-71903A No. 2
W	1-72102 No. 13
X	1-72133A No. 1
Y	1-702133
Z	1-72112 No. 4* included in AL
AA	1-72186 No. 2
AB	72806
AC	10080 cl. 78
AD	309519 stud
AE	1-72175A No. 3
AF	1-72247
AG	1-72252A
AH	1-702252 No. 2
AI	76567 screw, 72307 ecc., 46 nut
AJ	72148 No. 3 use 72567 screws
AK	3688
AL	1-74192* included in AM
AM	1-72123 No. 1 use 72507 1/2 screw
AN	1-72165A No. 1
AO	31-72001 No. 2 } includes Y, AD, 1-702001 No. 2 } AE, AF, AY

AM	1B-74013 No. 2 complete assembled shaft, see plate 25 for other styles
AN	1B-74119
AO	11-704119
AP	74557 screw
AQ	7282 1/4
AR	74154A No. 4* included in AS
AS	1-74113B No. 2 } see plate 23 for 1-704113B No. 2 } other styles
AT	1A-74107A No. 25 (1-74107B No. 25, 74115A No. 1) includes AQ
AU	1A-74137 No. 1
AV	74117 No. 1* included in AZ
AW	74115 No. 1 (1-74107B No. 25, 74115A No. 1)
AX	70512
AY	74914 No. 3
AZ	704914 No. 3
BA	21-72113* included in AL
BB	1-74135 No. 2
BC	74811 long spring to anchor 20 No. 19

EXTEND MECHANISM, RETURN STROKE, CLASS 78 (Plate 52)



SYMBOLS (Plate 52)

SEE KEYBOARD SYMBOL LIST,
PLATES 33 THRU 40 FOR OTHER
SYMBOLS

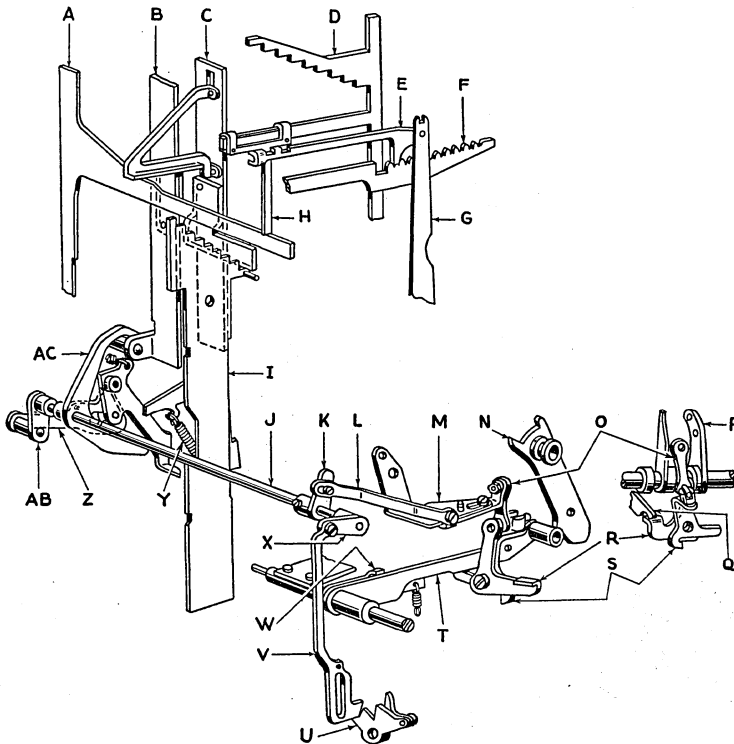
A	73809
B	1-72149A No. 2
C	1-72221 No. 3
	1-72221 early
	1-702221 No. 3
	1-702221A No. 1 early
D	72036 No. 3* complete assembled shaft
	1-72036 No. 3 specify machine style
	and number
E	8082A
F	74201 limit, use 12055% screws
G	72570 No. 1 (72570 No. 2)
H	71146
	701146
I	71546

J	79551
K	71806
L	1-71144
	1-701144
M	31A-71129
	31-71129 early
N	1-72163 No. 6
O	1-72161 No. 2* included in AH
P	74914 No. 3
	704914 No. 3
Q	702181* included in R
R	31-72001 No. 2 } see plate 33 for
	1-702001 No. 2 } other styles
S	74557 screw
T	1-74185* included in V
U	550%
V	21-74048 }
	1-704048 } includes T, U, W
W	21-74193 includes U

X	1-74215A
Y	1-74207A
Z	72514 No. 2
AA	7283A Style 10
AB	1B-74119
	11-704119
AC	79552
AD	74194
AE	72900 No. 2
AF	1-72102 No. 13
AG	72509A No. 1
	702509A
AH	21A-72011 } includes
	11-702011 } O, AE, AG
AI	75637
AJ	1-72220 No. 2
AK	1-72216A
AL	72219* included in C

CROSSFOOTER SUBTRACT MECHANISM, FORWARD STROKE, CLASS 78 (Plate 54)

(Plate 53 in Instruction Book only)

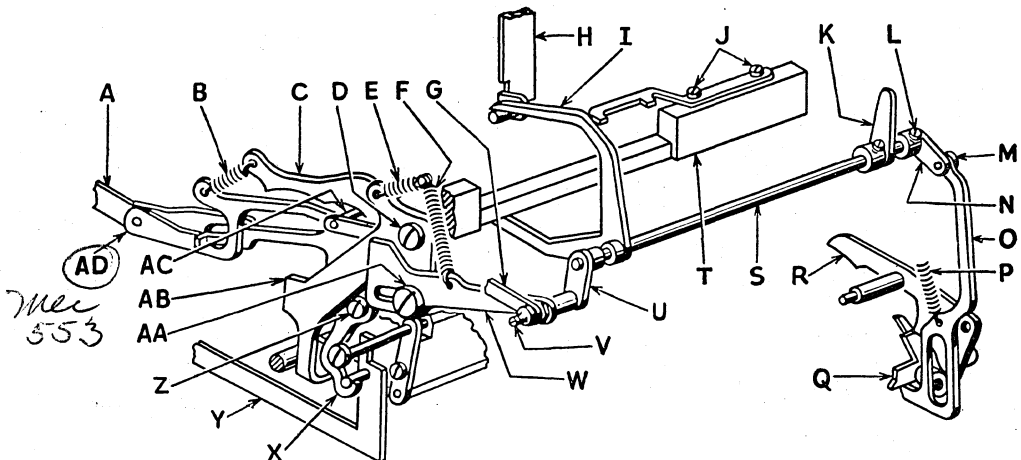


SYMBOLS (Plate 54)

SEE KEYBOARD SYMBOL LIST,
PLATES 33 THRU 40 FOR OTHER
SYMBOLS

- A 74150 No. 1
- B 704150 No. 1
- C 1-74140 No. 2
- D 1-74129 No. 2
- E 74151 No. 1
- F 74117 No. 1* included in G
- G 74114 No. 1
- H 1-74135 No. 2
- I 1A-74137 No. 1
- J 11-74107 No. 20
- K 1-74049
- L 1-74049 } includes K, X, AB, AC
- M 11-74213 includes 550 $\frac{1}{4}$ screw
- N 74218
- O 1-72142A
- P 1-71110*
- Q 1-72292
- R 1A-71152 No. 2
- S 72182 No. 3
- T 72114 No. 3 (702114 No. 4) without
- U reg. subt.
- V 72114 No. 5 with reg. subt.
- W 1-72114A No. 8
- X 1-72114 No. 8 early
- Y 1-72112 No. 4*
- Z 1-72123 No. 1 use 72507 $\frac{1}{2}$ screw
- AB 72134A No. 1
- AC 72140 No. 2*
- 1-74189 includes 550 $\frac{1}{4}$ screw
- 62880 (89801)
- 74145
- 1A-74209*
- 1-74208A* included in J

CROSSFOOTER SUBTRACT MECHANISM, RETURN STROKE, CLASS 78 (Plate 55)



SEE KEYBOARD SYMBOL LIST,
PLATES 33 THRU 40 FOR OTHER
SYMBOLS

SYMBOLS (Plate 55)

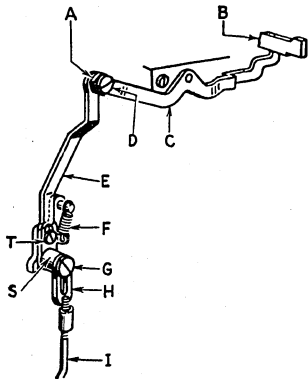
- A 1-72221 No. 3 includes AD, see plate
- B 8082A
- C 1-72216A
- D 74559
- E 74803
- F 3489
- G 72296 $\frac{1}{2}$
- H 702296 $\frac{1}{2}$
- I 1-74140 No. 2

- J 1-74208A* included in S
- K 70512
- L 11-74213 includes 550 $\frac{1}{4}$ screw
- M 550 $\frac{1}{4}$
- N 75637
- O 1-74189 includes L
- P 72134A No. 1 use 72663 screw in
- Q bottom
- R 8082A
- S 1-72123 No. 1 use 72507 $\frac{1}{2}$ screw
- T 1-72165A No. 1 use 77517 No. 1 screw

- S 1-74049 } includes I, K, L, N, U
- T 1-704049 } includes I, K, L, N, U
- U 74914 No. 3
- V 704914 No. 3
- W 1A-74209*
- X 74574 screw, 72307 ecc.
- Y 74145
- Z 1-72220 No. 2 includes AC
- AB 1-72102 No. 13
- AC 75637
- AD 72663
- 1A-74124A No. 5
- 72590* included in X
- 72219* included in A

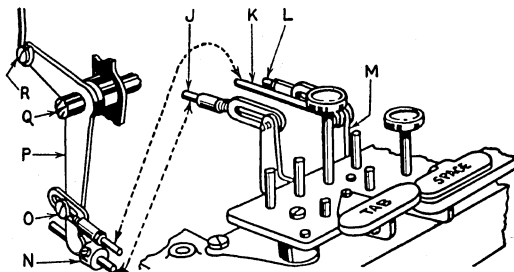
CONSECUTIVE NUMBERING MECHANISM, CLASS 78 (Plate 58)

(Plates 56 and 57 in Instruction Book only)

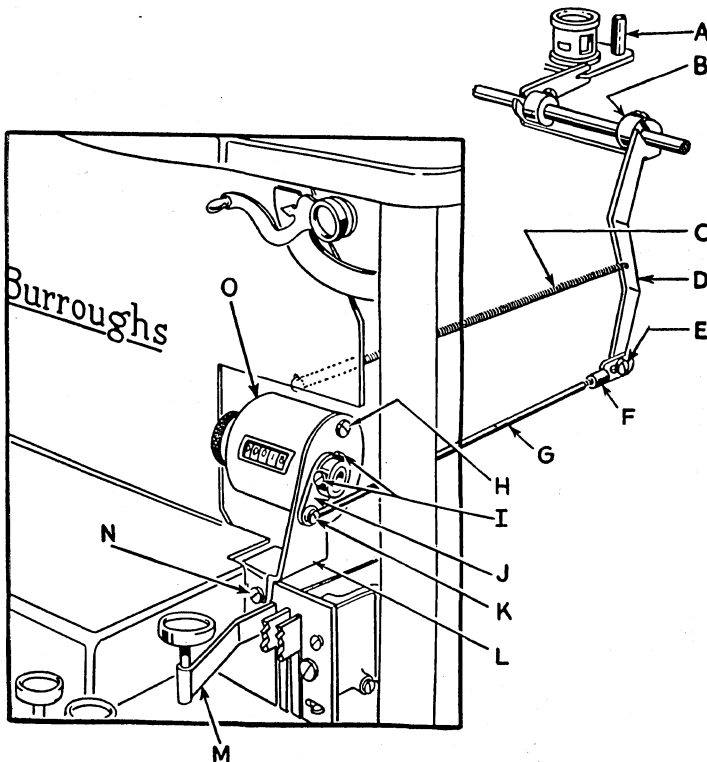


SYMBOLS (Plate 58)

A	72307 ecc.
B	79221 No. 1 (24 Fte. 134)
C	122 Fte. 717 No. 1 trips in col. 1
	122A Fte. 717 No. 2 trips in col. 2
	122 Fte. 717 No. 3 trips in col. 3
	122 Fte. 717 No. 4 trips in col. 4
	122 Fte. 717 No. 5 trips in col. 5
	122 Fte. 717 No. 6 trips in col. 6
	use 502 fte. 717 rivet
D	73611 use 46 1/4 nut
E	1-113 Fte. 717 No. 2
F	71806
G	72506 No. 2
H	72110 No. 1
I	1-702 Env. 1779
J	1-72714 No. 9 sub-total index
K	1-701 No. 2 Env. 1779 reg. sub-total
L	1-72702 Env. 1779 reg. sub-total
M	1-72143 No. 2 Env. 1779
N	1-72315 No. 1 includes 72573 screw
O	77529
P	1-1108 Fte. 717 Env. 1779
Q	21A-75014
R	72572 No. 1
S	72374
T	79503



COUNTER DIALS TO ADVANCE FROM MOTOR CARRIAGE RETURN (Plate 59)

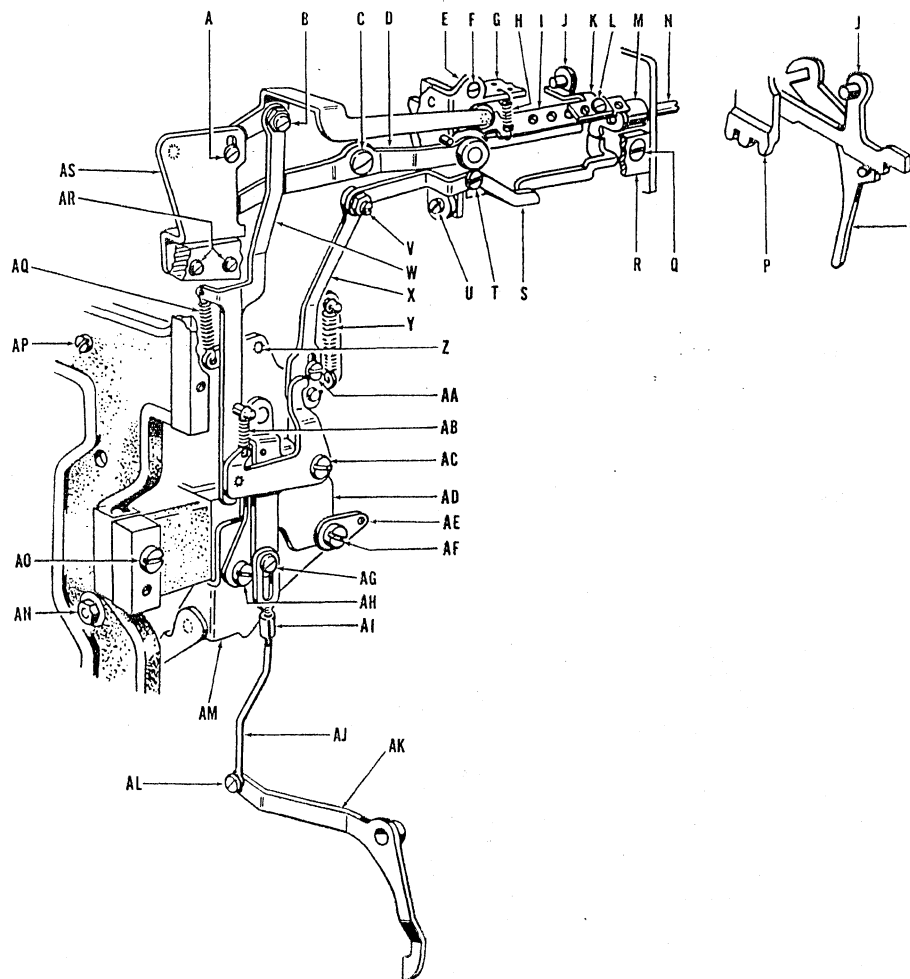


SYMBOLS (Plate 59)

A	1-3 Fte. 145
B	1-301 Fte. 145 includes 74502 screw
C	4484 Style 11
D	118A Fte. 145
	118 Fte. 145 early
E	79503
F	117 Fte. 145
G	1-702 Fte. 145 includes F
H	7357 1/2
I	73563
J	1-115 Fte. 145
K	72572 No. 1
L	100 Fte. 145 No. 2
M	1-114 Fte. 145
N	73562
O	3-104 Fte. 145 No. 3 complete assembled counter dial

SEE EXPLANATION ON INSIDE OF FRONT COVER

CONSECUTIVE NUMBERING MECHANISM TO COUNT IN A SPECIFIED COLUMN, CARRIAGE CONTROLLED—SERIES M 800 (Plate 58-1)

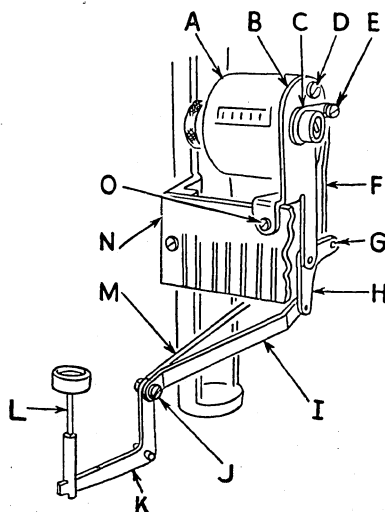


SYMBOLS (Plate 58-1)

A	79552	O	11-79209A No. 1 columns 1, 2 and 3	AE	20 No. 104
B	79510 screw	P	1-79209A No. 1 columns 4 thru 15	AF	12050 for M 802, 803
C	62341 eccentric	Q	1-79222 No. 4 includes J	AG	550 1/2 for M 805, 806, 807
D	79607A	R	1-79222 No. 1 does not include J	AH	75638
	1-709254 No. 2 long	S	79547	AI	12050
	hub 11/16"	T	1-1132 Fte. 717 No. 2	AJ	72110 No. 1
	11-709254 No. 2 short	U	1106B Fte. 717 No. 7	AK	1-709 Fte. 717 includes AI
	hub 1/4" for four position printing control	V	1501A Fte. 717		1-1108A Fte. 717 No. 2 included in 51A-705014 complete shaft assembly
E	11-79232B	W	75609	AL	72572 No. 1
F	79555	X	73611 screw	AM	11-701201 No. 2
G	79204 No. 1	Y	72307 eccentric	AN	47 nut
H	709803	Z	1-103 Fte. 717 No. 4	AO	71586A screw
I	709168	AA	1-113 Fte. 717 No. 3	AP	700506
J	1-709221 No. 1	AB	76812	AQ	73659
K	709169	AC	75814 spring on rear	AR	71806
L	73563	AD	79511 screw	AS	72567
M	709384		71807		1-709231 No. 5 includes A
N	79005 No. 2		94523		

4-1-A
SERIES M MACHINES—ACCUMULATION

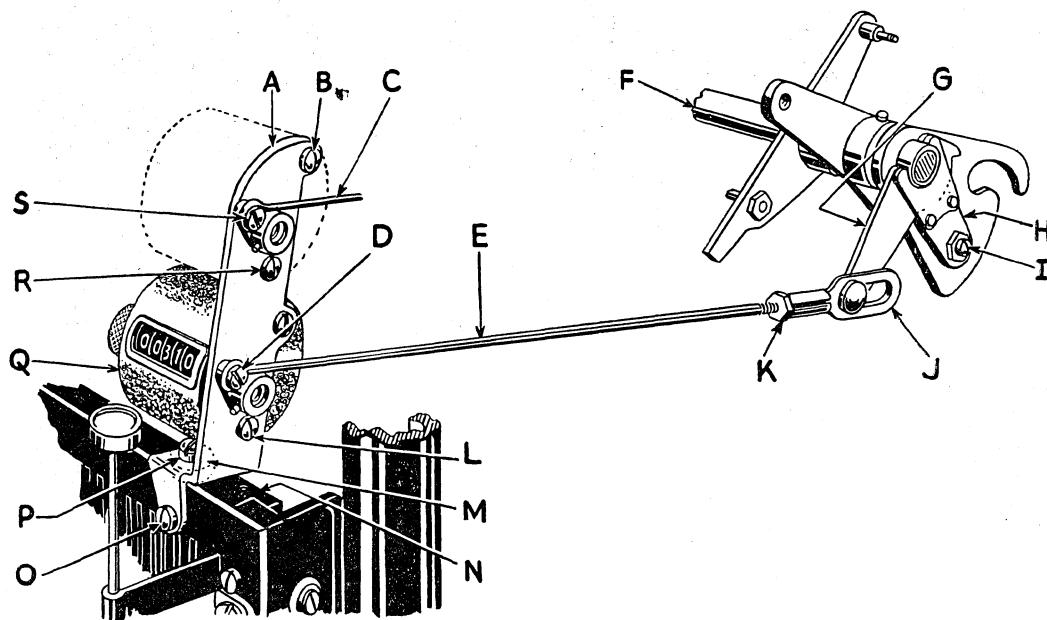
COUNTER DIALS TO ADVANCE FROM DEPRESSION OF RESULT KEYS (Plate 60)



SYMBOLS (Plate 60)

- A 3-104 Fte. 145 No. 2 Env. 780 complete assembled counter dial
- B 1A-100 No. 2 Env. 780 includes H
- C 1-104 Fte. 145* included in A
- D 7357½
- E 502 Env. 780
- F 700 Env. 780 use 72110 No. 2 env. 780 turnbuckle
- G 72572 No. 1
- H 104 Env. 780* included in B
- I 101A Env. 780 operated from bal. or prod. key
- 102A Env. 780 operated from cr. bal. key
- 1-701 Env. 780 operated from reg. total key
- J 79511 screw, 72324 bushing
- K 1-72143 No. 4 first prod.
- L 72521 No. 2 first prod.
- M 72700 No. 9 first prod.
- N 1-75128B Env. 780
- O 74528

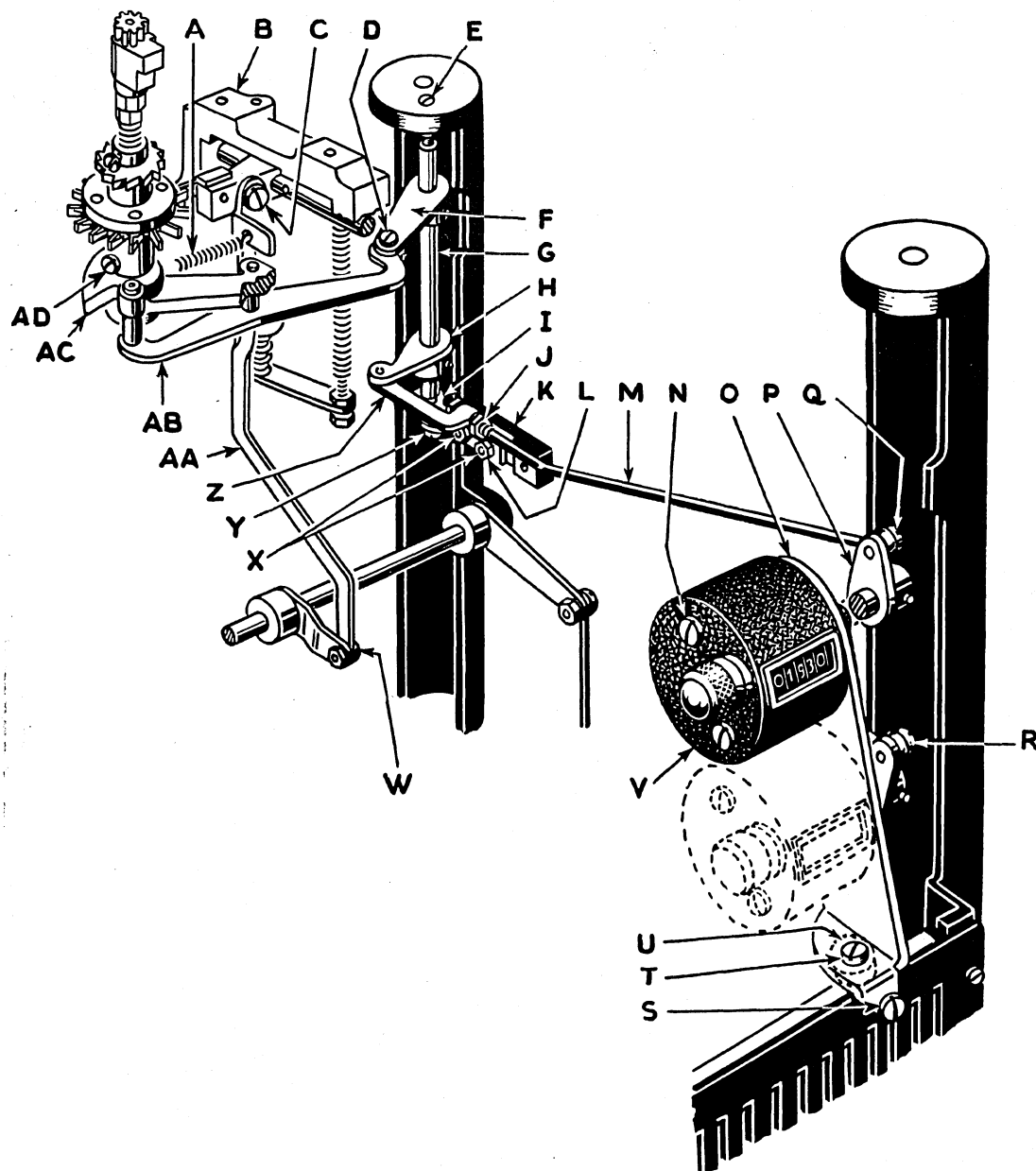
COUNTER DIALS TO ADVANCE FROM MACHINE OPERATIONS (Plate 61)



SYMBOLS (Plate 61)

- | | |
|--|--|
| A 100 Fte. 145 No. 1 | K 49¼ |
| B 7357½ | L 7357½ |
| C 701A Fte. 145 | M 79342 space collar |
| D 72572 No. 1 | N 1-900 Fte. 145 |
| E 700 Fte. 145 No. 1 | O 73562 |
| F 141B-71001 specify machine style and No. | P 75609 |
| G 1-107 Fte. 145 No. 1 includes J | Q 3-104 Fte. 145 No. 2 complete assembled counter dial |
| H 1-106 Fte. 145 | R 7357½ |
| I 73610 screw, 71320 ecc. | S 72572 No. 1 |
| J 72110 No. 1* included in G | |

COUNTER DIALS TO ADVANCE FROM TYPEWRITER SPACES IN UNITS OF TWELVE (Plate 62)



SYMBOLS (Plate 62)

A	800 Fte. 145	O	100 Fte. 145 No. 1 use 7357½ screws to fasten counter dial V
B	1A-601 Fte. 145 complete assembly, includes A, C, AA, AB	P	1-104 Fte. 145* included in V
C	71546	Q	72572 No. 1
D	75645 screw, 49½ nut	R	72572 No. 1
E	500A Fte. 145 screw, 113 fte. 145 bearing, use 74523 screws	S	73562
F	1-103 Fte. 145* included in G	T	75609
G	1-1 Fte. 145 includes F, H, Z	U	79342 space collar
H	1-105 Fte. 145*	V	3-104 Fte. 145 No. 1
I	102A Fte. 145 bracket for pivot Y	W	72582 screw, 49 nut
J	49½	X	72567 screw
K	600B Fte. 145 typewriter leg	Y	502 Fte. 145
L	46 nut	Z	108 Fte. 145* included in G
M	701A Fte. 145	AA	111 Fte. 145
N	952½	AB	1-101A Fte. 145
		AC	1-109 Fte. 145 includes AD
		AD	75618

SEE EXPLANATION ON INSIDE OF FRONT COVER

Mr M R Lovejoy
Buffalo N Y Branch 10-5

SERIES M MACHINES

**Type 70
POWER**

Symbol List

May 27, 1949

Issued _____

To _____

Of _____

Property of and to be returned to

**BURROUGHS ADDING
MACHINE COMPANY**

DETROIT 32, MICHIGAN

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

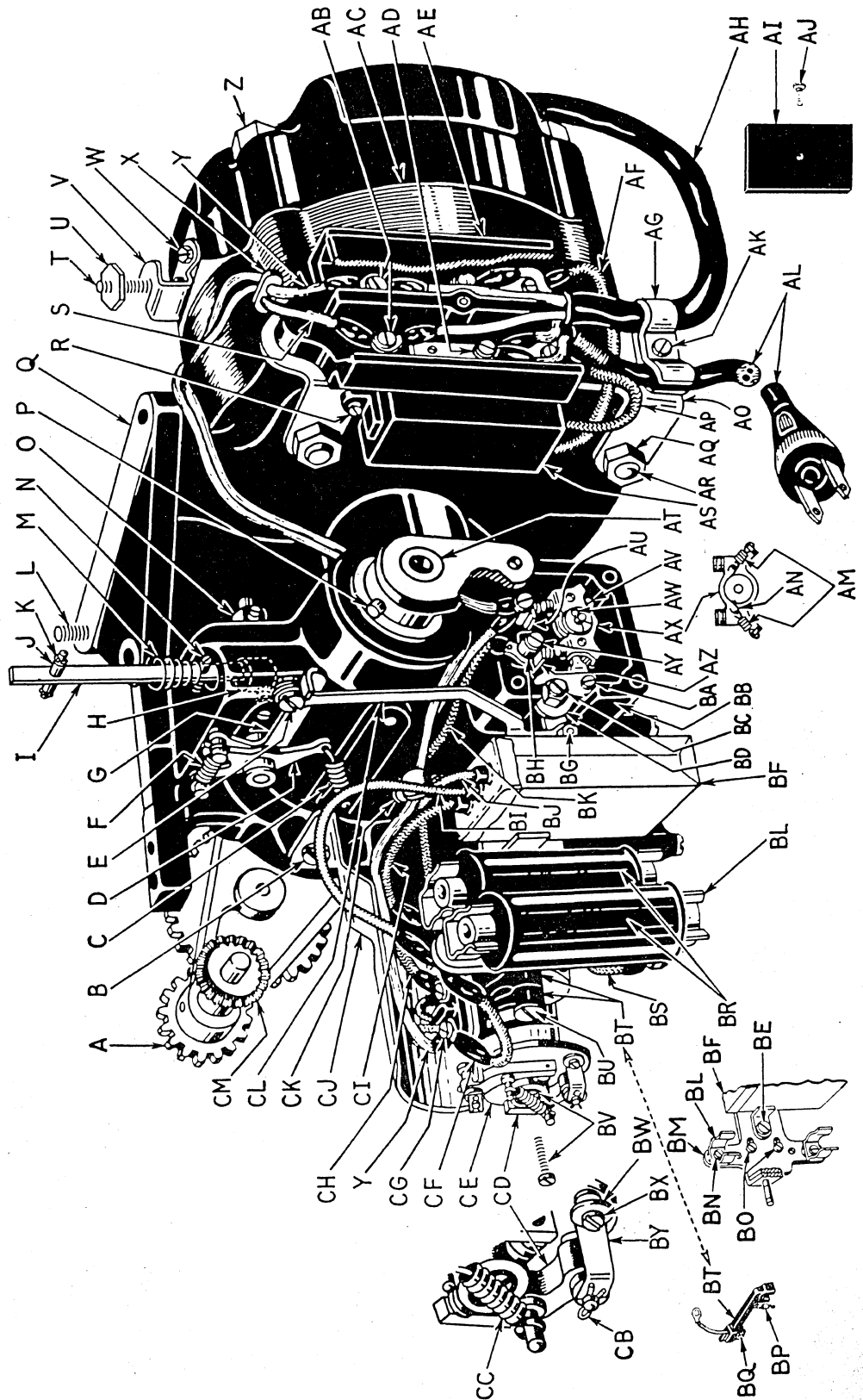
EXAMPLE: 1-8817 $\frac{1}{4}$ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817 $\frac{1}{2}$ ZL, 8828 $\frac{1}{4}$ C, 8828 $\frac{1}{2}$ B, 47 $\frac{3}{4}$, 49 $\frac{1}{4}$ —2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

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MOTOR, GOVERNOR AND SWITCH, TYPE 6, LATER (Plate 1)

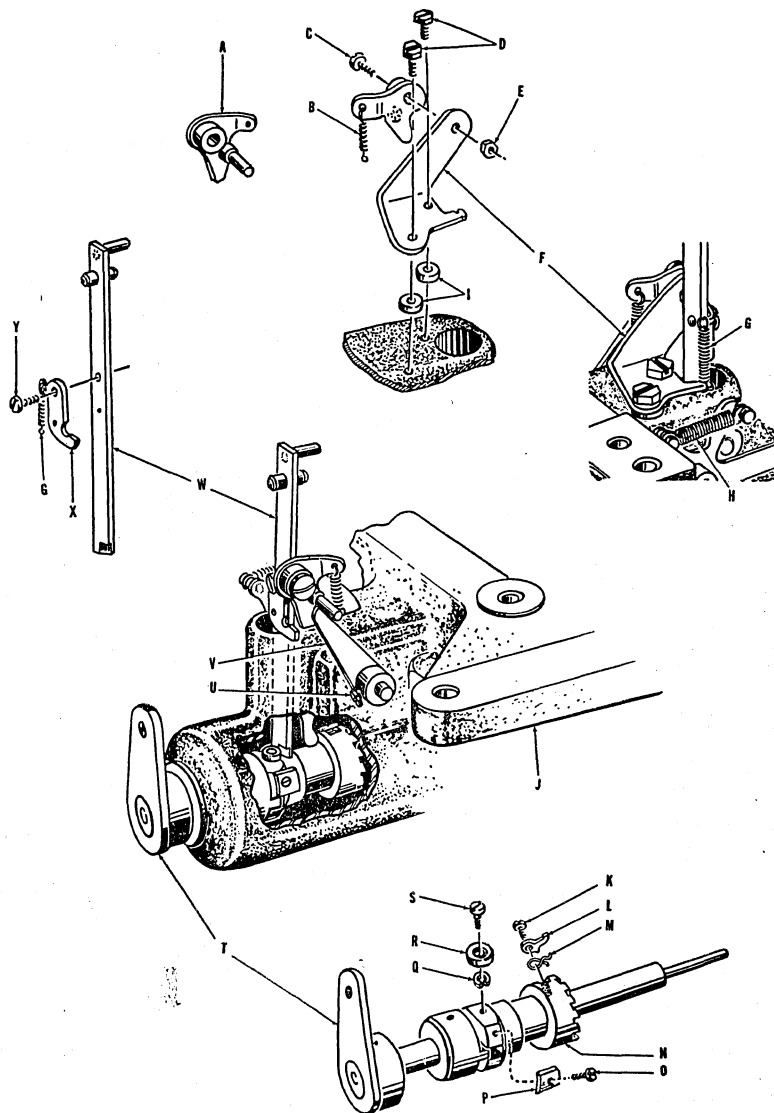


SYMBOLS (Plate 1)

Use 1A-4667 No. 2 32 D.C., 50, 110, 150 or 220 volt, this motor used in machines beginning with serial No. A915672, also used for replacement on machines prior to this serial number		complete type 6 motor, gray	AL Use 1-3697 $\frac{1}{2}$ C 2 wire conductor cord 11-3697 $\frac{1}{2}$ C 3 wire conductor cord
22A-4667 No. 3 32 D.C., 50, 110, 150 or 220 volt for narrow base machines			AM 3885B
32B-4667 No. 3 32 D.C., 50, 110, 150 or 220 volt, for Class 75, 77 and Series M 700 machines. Also Class 72, 78, Series M 200 and M 800 wide and new wide base machines after serial No. B83080		complete motor and drive assembly	AN 20 No. 77 hair spring anchor
32B-4667 No. 3 32 D.C., 50, 110, 150 or 220 volt, 1-701017 No. 2, 74335, 47, for Class 72, 78 wide and new wide base machines before serial No. B83080			AO 3611 $\frac{1}{2}$
A 1-71009B narrow base			AP Included in AS
11-701009A wide base			AQ 4647
Use 71616A			AR 4650
74803			AS 1-4699 $\frac{1}{2}$ B
1-71016A			AT 1B-71007 complete assembled clutch shaft, see plate 3 for detail assembly
94523 screw, 46 nut			AU 1A-12021 $\frac{1}{4}$ AL upper contact point
10785 $\frac{1}{2}$			AV 71541
1-71175			AW 21 No. 15
71311 guide sleeve for I, use 71513 screw			AX 1A-3842B includes AN, AM
1-71903A No. 2 wide and narrow base			AY 4252 screw, 1097 $\frac{1}{8}$ lockwashers
1-701903A Class 75, 77			AZ 1A-12021 $\frac{1}{4}$ AR upper contact point
71339 roller			BA 952 $\frac{3}{4}$
277 wire			BB Use 11-71907 assembled switch box, includes AU, AW, AX, AY, AZ, BA, BD, BH
70500			BC 7356 $\frac{1}{2}$
71802A			BD 1B-71178 includes AM, AN, AW, AX, BA
71521B			BE 79510
1-28345 collar, includes 75618 screw			BF 1-4694C No. 2
56 $\frac{1}{2}$			BG 94523 screw, 46 nut
Use 11-71666C narrow base machines			BH 12045 collar
11-701666D No. 1 Class 75, 77 and Series M 700 machines. Also Class 72, 78, Series M 200 and M 800 wide and new wide base machines after serial No. B83080		complete drive assembly	BI Red wire, included in BF
11-701666D No. 1, 1-701017 No. 2, 74335, 47, for Class 72 and 78 wide and new wide base machines before serial No. B83080			BJ Green wire, included in BF
R 3256 $\frac{1}{8}$ screw, 1097 $\frac{1}{8}$ lockwasher			BK 1-71703 black wire
Use 1A-71705			BL 200202
4651A			BM 1-71180A bracket only
4630A			BN 200538 $\frac{1}{2}$ No. 1 screw, 1097 $\frac{1}{8}$ lockwasher, 7919 $\frac{1}{2}$ A washer, 46 $\frac{1}{4}$ nut, 46 nut
4620 No. 2			BO 74523
2859 $\frac{1}{2}$ B			BP 71815A
200928			BQ 1-71909A brushes
Use 1A-71705			BR 1B-200911 Specify Resistance 110 volt use 65 ohms 150 volt use 140 ohms 220 volt use 250 ohms 250 volt use 300 ohms
20747			BS 1-71701 short black wire
AB 4252			BT Use 1-71908B, 1A-71181A, 79505, 1-4694D No. 2
AC 12-4617A specify voltage, complete assembled field coil only			BU 71609
AD 2820 $\frac{1}{2}$ washers			BV 73659
AE Use 11-70903 switch box, 3455 $\frac{1}{2}$ screws, 1097 $\frac{1}{4}$ washers to fasten to bracket AO			BW 75210 washer
AF Included in AS			BX 71577
AG 3611 $\frac{1}{2}$			BY 71179A
AH Included in AC			CB 21 No. 17
AI Use 70902B			CC 71814B
AJ 79603			CD Use 1A-71181A, 1-71908B, 79505, 1-4694D No. 2
AK 709621			CE Use 1A-71181A, 1-71908B, 79505, 1-4694D No. 2
			CF 1-71701 short black wire
			CG 71610 hexagon head screw
			CH 1-71701 short black wire
			CI Black wire, included in BF
			CJ 71182A shield
			CK 71238 clamp, use 79510 screw
			CL 71177A
			CM Use 1Z-71901A before machining serial No. M 5727D (M 200), M 6149D (M 700), M 5789D (M 800), includes set screw 550 $\frac{3}{4}$ 1-71901A after machine serial No. M 5727D (M 200), M 6149D (M 700), M 5789D (M 800), includes set screw 550 $\frac{3}{4}$

DRIVE CLUTCH SLIDE LATCH (Plate 1A)

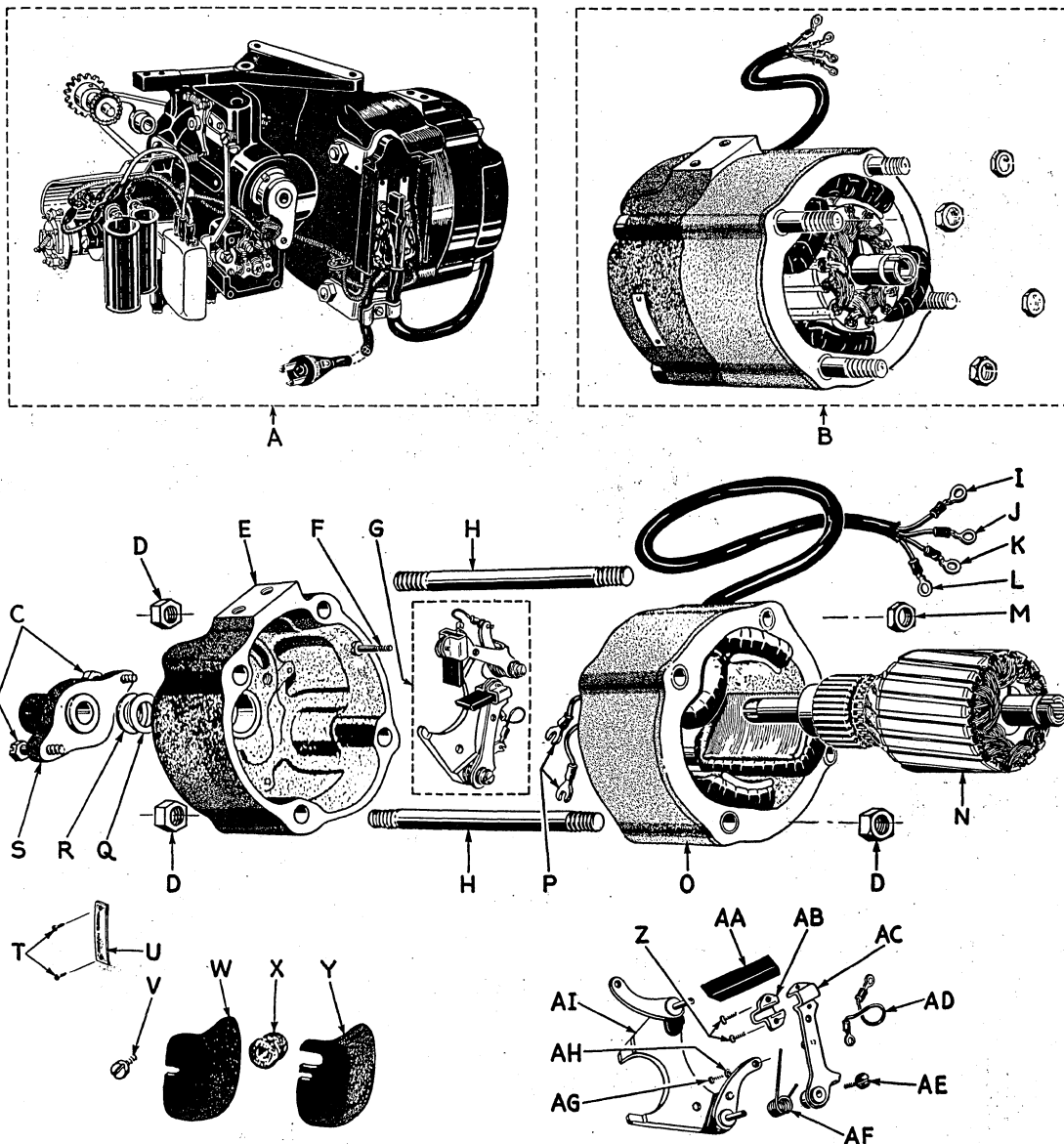
Note: This construction began with machine Serial No. M8492D



SYMBOLS (Plate 1A)

A	1-71241	K	701573	S	71506B
B	283A	L	701257	T	1B-71007 includes K, L, M, N, O,
C	71627 eccentric screw	M	701808		P, Q, R, S
D	76567	N	1-71304B includes K, L, M, O, P,	U	700556
E	46 3/4		Q, R, S	V	1-71242
F	1-71239	O	8064 3/8	W	1-71903A No. 2 for M200, M800
G	10784	P	71243		1-701903A for M700
H	10785 1/4	Q	1097 3/4	X	71240
I	76120	R	71309C	Y	75608
J	1Z-701666E drive housing with bushing only				
	1-701666E Specify Resistance complete assembled drive				

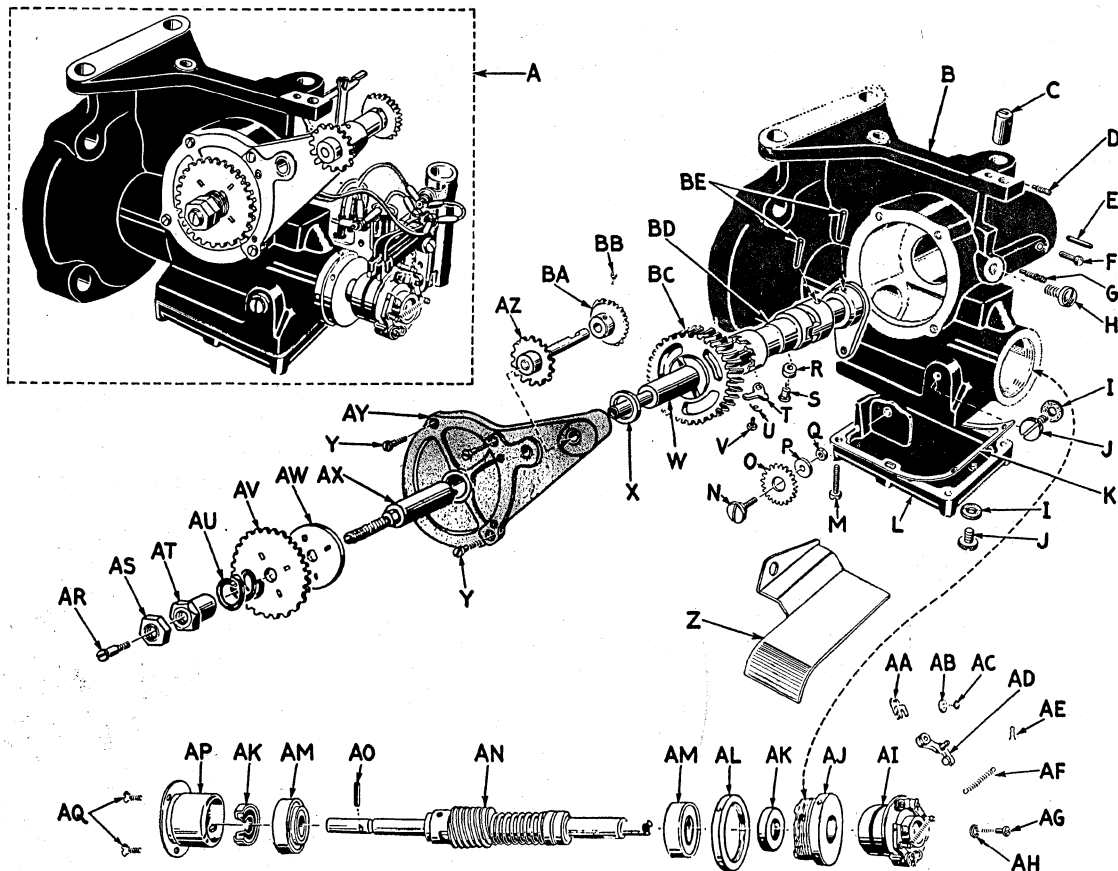
MOTOR AND DRIVE, MOTOR AND MOTOR ASSEMBLY FOR SERIES M200, M700 AND M800 MACHINES (Plate 1-1)



SYMBOLS (Plate 1-1)

A	32B-4667 No. 3 32DC, 50, 110, 150, 220 Volts—complete assembled motor and drive	N	1A-4200 1/4 32DC, 50, 110, 150, 220 Volts—complete assembled armature	V	2864 3/8 3 req.
B	1A-4667 No. 2 32DC, 50, 110, 150, 220 Volts—complete assembled motor	O	12-4617B 32DC, 50, 110, 150, 220 Volts—complete assembled field coil and casting	W	4619A No. 3 2 req.
C	12055 2 req.	P	24A No. 8 2 req.	X	93 1/2 No. 2A
D	20747 6 req.	Q	4615 1/2 No. 2 washer, .010" thick	Y	4619A No. 4
E	4665D	R	4615 1/2 washer, .020" thick	Z	7562 4 req.
F	10056 1/2	S	4665 1/2 B No. 1	AA	4690A 2 req.
G	2-4610A complete assembled brush holder	T	53 No. 2 2 req.	AB	4611 1/2 2 req.
H	4650 4 req.	U	91 1/2 No. 10 1/2 specification plate, blank for local marking	AC	1-4611B 2 req.
I	24A No. 3 black		91 1/2 No. 15 1/2 specification plate, 115 volt	AD	1-40708 2 req.
J	24A No. 3 1/4 red		91 1/2 No. 16 1/2 specification plate, 220 volt	AE	8054 1/4 2 req.
K	24A No. 3 1/2 green			AF	4680A 2 req.
L	24A No. 3 3/4 white			AG	4252 2 req.
M	4647 2 req.			AH	2820 1/2 2 req.
				AI	1-4610A

DRIVE AND DRIVE ASSEMBLY, LEFT SIDE, FOR SERIES M200, M700 AND M800 MACHINES (Plate 1-2)

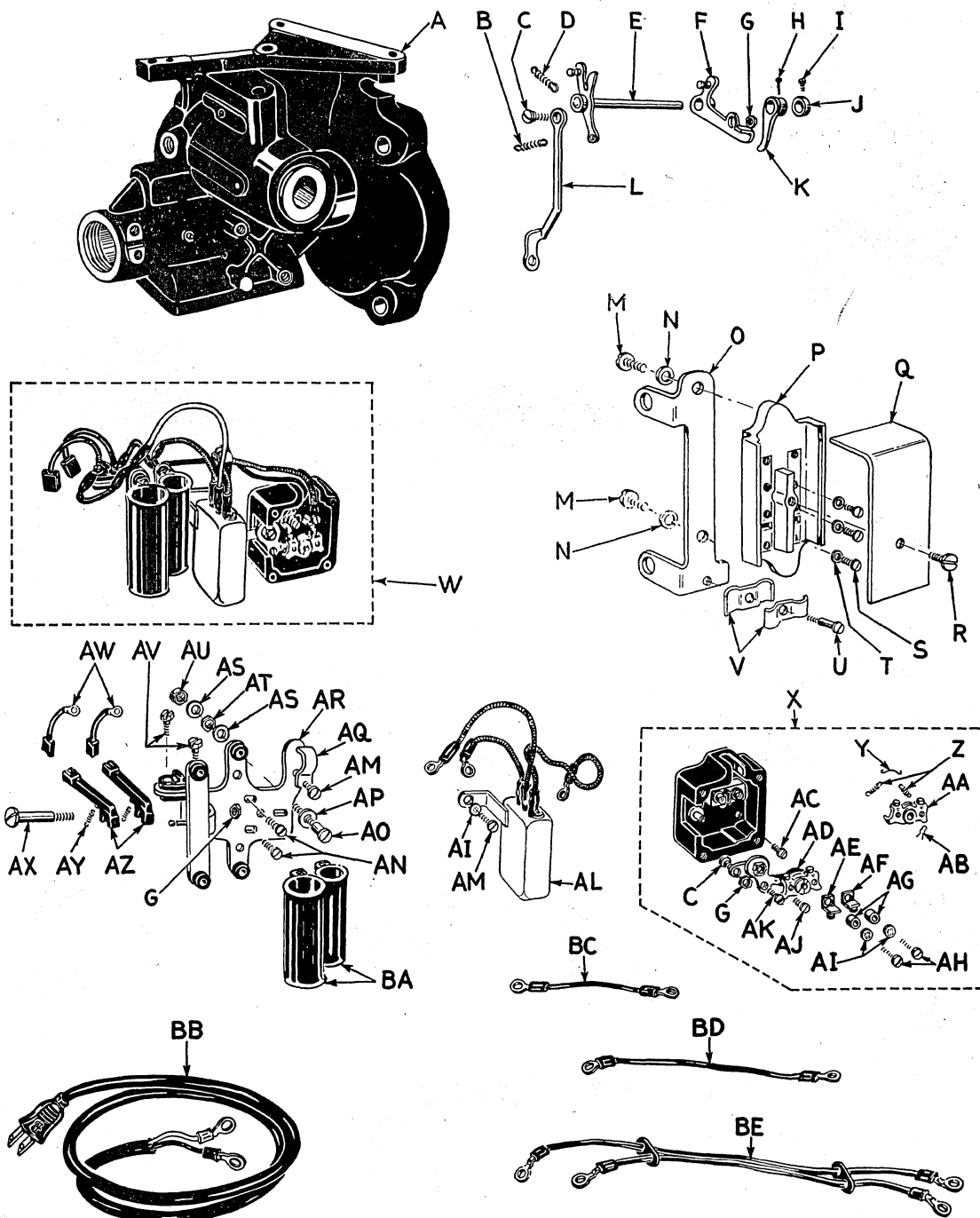


SYMBOLS (Plate 1-2)

A	11-701666D No. 1 complete drive assembly	U	701808	AM	1-71930
B	Included in A	V	701573	AN	1-71008C complete assembled worm shaft, see Plate 3-1 for other styles
C	71311	W	1A-71007 complete assembled clutch shaft, includes R, S, T, U, V, BD,	AO	3662 1/4 No. 1
D	71513		BE	AP	1-71351C includes AK
E	71571A	X	71115A	AQ	8064 1/2 3 req.
F	71571B	Y	76555 4 req.	AR	71617A
G	1058 3/4	Z	71182A	AS	71515
H	71616A	AA	71179A	AT	701397
I	3697 1/4	AB	75210 washer } to hold AA to AI	AU	701804
J	71616B	AC	71577 screw } to hold AA to AI	AV	71112
K	3694 3/4A gasket	AD	1A-4513	AW	71111
L	1-71666 3/4 includes I, J, N, O, P, Q	AE	21 No. 17	AX	71302B
M	77513 6 req.	AF	71814B	AY	1A-701665B No. 1
N	3650 1/4	AG	73659 screw } to hold AI to AN	AZ	11-701009A
O	71116B No. 1	AH	1097 1/2 lock washer } to hold AI to AN	BA	1-71901A includes BB
P	7521 1/2	AI	2B-71181 complete governor, includes	BB	550 3/4
Q	47 3/4		AA, AB, AC, AD, AE, AF	BC	1-71667A No. 1
R	71309A	AJ	1-71350C includes AK	BD	1-71304A includes R, S, T, U, V—use
S	71506	AK	1-71910B		71800A spring
T	701257	AL	71339 1/2	BE	650 1/4

W - 1C 71007, 701629, 71240A, 3259 1/8A, 7282 1/4,
8436, 83639, 83832, 1-71903 B No 2 on M 200
or M 800 or 701903 B on M 700

DRIVE ASSEMBLY, RIGHT SIDE, FOR SERIES M200, M700 AND M800 MACHINES (Plate 1-3)



SYMBOLS (Plate 1-3)

A Included in complete drive assembly,
Plate 1-2, letter A
B 74803
C 94523
D 10785 1/2
E 1-71016A includes H, K
F 1-71175
G 46

H 71604
I 75618
J 1-28345 includes I
K 1A-71174
L 71177A
M 3455 1/2
N 1097 1/2
O 3611 1/2

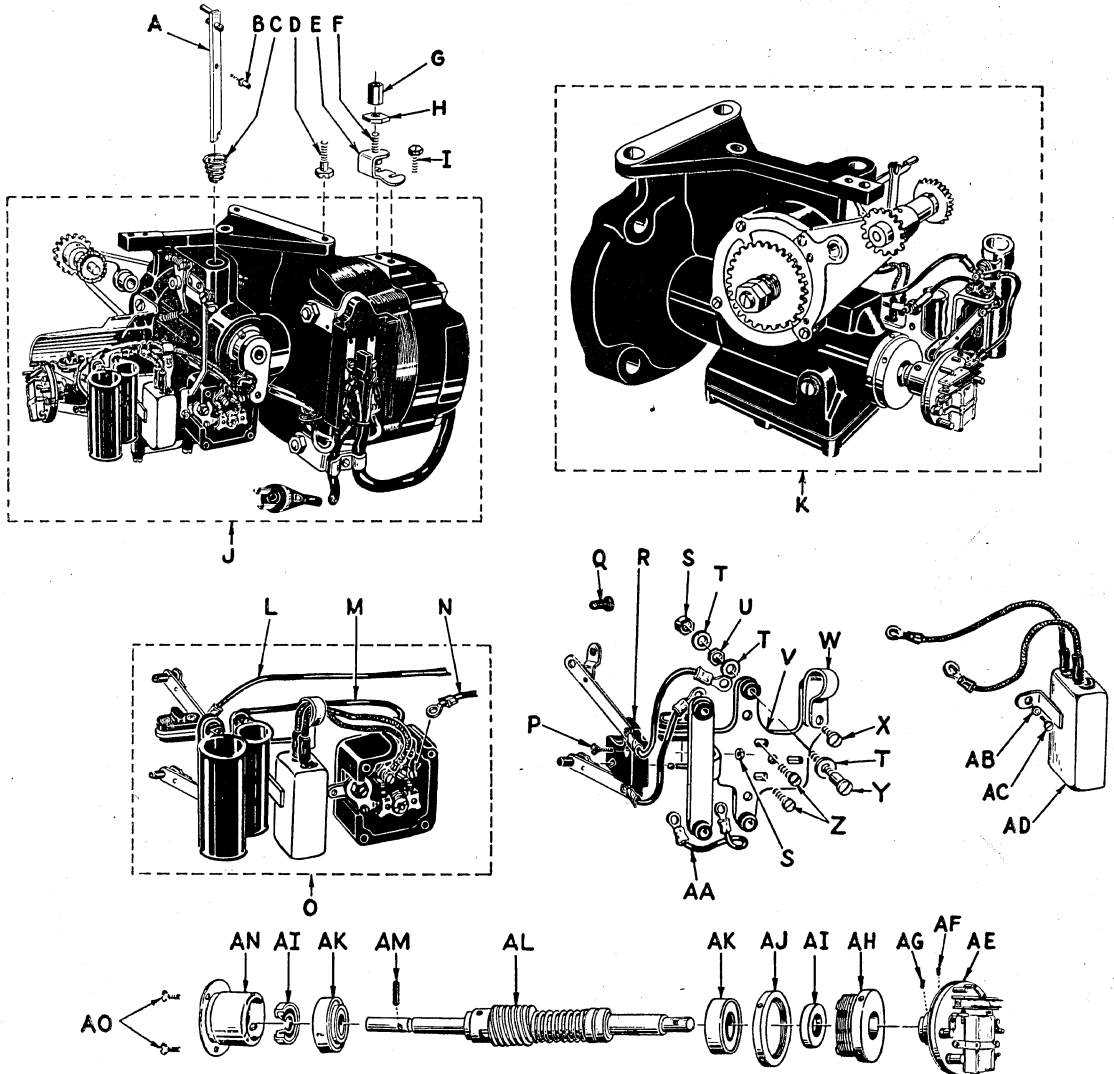
P 11-70903
Q 70902B
R 79603
S 4252 6 req.
T 2820 1/2 6 req.
U 709621
V 3611 1/2

SYMBOLS (Plate 1-3) Cont'd

W	12-71180A Specify Ohms Resistance complete bracket assembly, includes resistors, condenser, switch box, brushes and wires	AI	1097 1/4	AX	71609
X	11-71907 complete switch box, AC not included	AJ	7356 1/2 screw for AD	AY	71815A 2 req.
Y	20 No. 77	AK	952 3/4 adjusting screw in AD	AZ	1-71908A
Z	3885B	AL	1-4694C No. 2	BA	1B-200911 Specify Ohms Resistance
AA	1A-3842B includes Y, Z	AM	79510		65 ohms resistance for 110 volt
AB	21 No. 15	AN	74523		140 ohms resistance for 150 volt
AC	71541 retaining screws for X, 2 req.	AO	200538 1/4 No. 1 4 req.		250 ohms resistance for 220 volt
AD	1B-71178 includes Y, Z, AA, AB, AK	AP	7919 1/2 A 12 req.		300 ohms resistance for 250 volt
AE	1A-12021 3/4 AR	AQ	71235	BB	1-3697 1/2 C
AF	1A-12021 3/4 AL	AR	1-71180A	BC	1-71701 resistor wire, 3 1/2' over-all length
AG	12045	AS	7919 1/2 A 12 req.	BD	1-71703 resistor to switch box wire, 4 3/4' over-all length
AH	4252	AT	46 1/4 4 req.	BE	1A-71705 double wire from terminal block to switch box and resistor
		AU	46 4 req.		
		AV	71610		
		AW	1-71909A		

MOTOR AND DRIVE WITH SINGLE CONTACT CENTRIFUGAL GOVERNOR (Plate 1-3A)

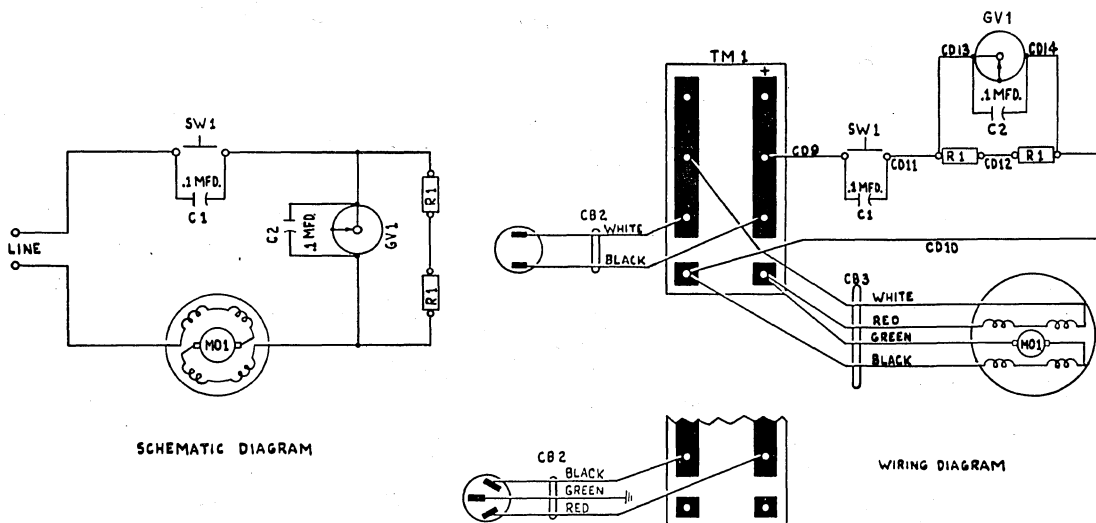
This construction replaces all Type 6 Motor and Drive Assemblies



SYMBOLS (Plate 1-3A)

See Plate 1-1, 1-2, or 1-3 for parts not symbolized A 1-71903A No. 2 B 71521B C 71802A D 70500 3 req. E 4620 No. 2 F 4651A G 4651 1/4 H 4630A I 2859 1/2 B 2 req. J 32B-4667 No. 3 110, 150, 220 Volts Complete assembled motor and drive K 11-701666D No. 1 complete assembled drive L 1-71703 wire, 3 3/4" long; motor switch to are suppressor resistor	M 1-700906 No. 8 wire, 9" long; terminal block to are suppressor resistor N 1-700906 No. 7 wire, 6 1/2" long; terminal block to motor switch O 12A-71180A Specify Resistance P 79505 Q 81990 2 req. R 1-71908B assembled brush holder S 46 5 req. T 7919 1/2 A 12 req. U 46 1/4 4 req. V 1-71180A W 93 1/4 No. 6 X 2855 3/4 Y 200538 1/2 No. 1 4 req. Z 74523 AA 1-71701	AB 1097 1/2 AC 79510 AD 1-4694D No. 2 AE 1-71181A AF X60-176 fluted socket cup pointed screw AG X60-177 fluted socket cone pointed screw AH 1-71350C includes AI AI 1-71910B AJ 71339 1/2 AK 1-71930 AL 1-71008D complete assembled worm shaft AM 3662 3/4 No. 1 AN 1-71351C includes AI AO 8064 1/4 3 req.
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WIRING DIAGRAM FOR TYPE 6 MOTOR WITH SINGLE CONTACT CENTRIFUGAL GOVERNOR (Plate 1-4)

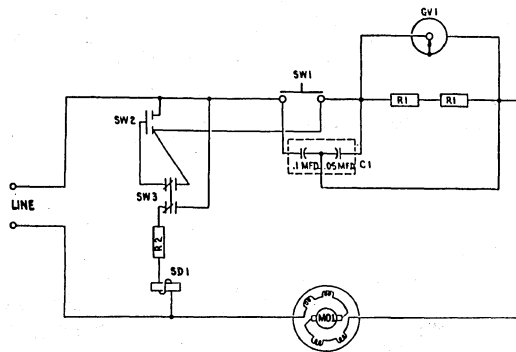


Note: This wiring diagram used in Series M 700 Machines after Serial No. M6896D.

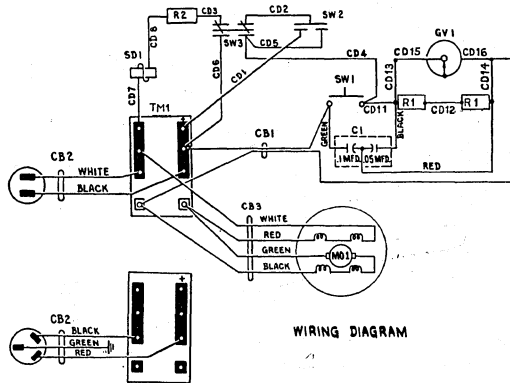
LEGEND

Symbol	Part Number	Req.	Description
C 1	1-4694D No. 2	1	Condenser, arc suppressor, .1 mfd.; motor switch
C 2	Included in Governor	1	Condenser, arc suppressor, .1 mfd.
CB 2	1-3697 $\frac{1}{2}$ C	1	2 wire conductor
	11-3697 $\frac{3}{4}$ C	1	3 wire conductor
CB 3	Included in Motor	1	Cord, motor
CD 9	1-700906 No. 7	1	Wire, 6 $\frac{1}{2}$ " long; terminal block to motor switch
CD 10	1-700906 No. 8	1	Wire, 9" long; terminal block to arc suppressor resistor
CD 11	1-71703	1	Wire, 3 $\frac{3}{4}$ " long; motor switch to arc suppressor resistor
CD 12	1-71701	1	Wire, 2 $\frac{5}{8}$ " long; between arc suppressor resistors
CD 13	Included in Brush Holder 1-71908B	1	Wire, 2 $\frac{5}{8}$ " long; arc suppressor resistor to governor brush holder
CD 14	Included in Brush Holder 1-71908B	1	Wire, 2 $\frac{5}{8}$ " long; arc suppressor resistor to governor brush holder
GV 1	1-71181A	1	Governor, single contact centrifugal
MO 1	1A-4667 No. 2	1	Motor, Type 6
	110 volt		For 85 to 125 volts A.C. or D.C.—25 to 85 cycles
	1A-4667 No. 2	1	For 130 to 160 volts A.C. or D.C.—25 to 85 cycles
	150 volt		
	1A-4667 No. 2	1	For 175 to 260 volts A.C. or D.C.—25 to 85 cycles
	220 volt		
R 1	1B-200911 65 OHM	2	Resistor, arc suppressor
	1B-200911 65 OHM	2	For 115 volts 60 cycles
	1B-200911 140 OHM	2	For 115 volts D.C.
	1B-200911 140 OHM	2	For 130 volts 50 cycles
	1B-200911 140 OHM	2	For 150 volts 60 cycles
	1B-200911 140 OHM	2	For 150 volts D.C.
	1B-200911 250 OHM	2	For 220 volts 60 cycles
	1B-200911 250 OHM	2	For 220 volts D.C.
	1B-200911 250 OHM	2	For 240 volts 50 cycles
SW 1	11-71907	1	Switch, motor
TM 1	11-70903	1	Terminal block, supply

WIRING DIAGRAM FOR TYPE 6 MOTOR WITH DOUBLE CONTACT CENTRIFUGAL GOVERNOR AND SOLENOID CONTROLLED RESULTS WITH CARRIAGE AND REGISTER RETURN SWITCH, SERIES M 200 and M 800 (Plate 1-5)



SCHEMATIC DIAGRAM



WIRING DIAGRAM

Note: This wiring diagram used between machine Serial No. M6412D and M6539D (M 200), and machine Serial No. M6379D and M6406D (M 800).

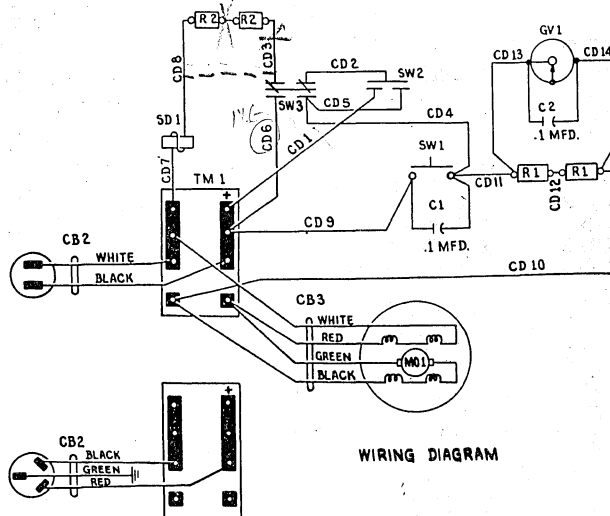
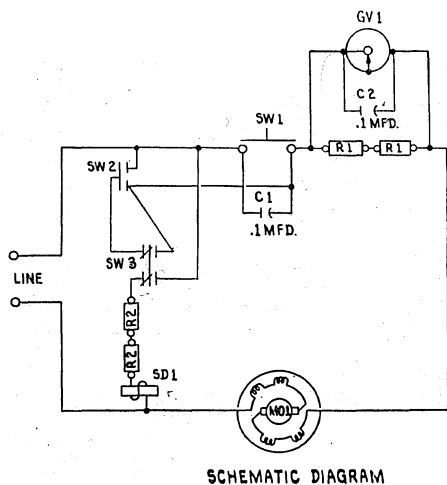
LEGEND

Symbol	Part Number	Req.	Description
C 1	1-4694C No. 2	1	Condenser, arc suppressor, .1 mfd. and .05 mfd., motor switch and governor
CB 1	1A-71705	1	Cord, parallel
CB 2	1-3697 1/2 C	1	Cord, line
	11-3697 3/4 C	1	2 wire conductor
		1	3 wire conductor
CB 3	Included in motor	1	Cord, motor
CD 1	1-700906 No. 1	1	Wire, 18" long; terminal block to result switch
CD 2	1-700906 No. 2	1	Wire, 15" long; result switch to carriage and register return switch
CD 3	1-700906 No. 3	1	Wire, 10" long; voltage drop resistor to carriage and register return switch
CD 4	1-700906 No. 4	1	Wire, 4" long; carriage and register return switch to motor switch
CD 5	1-700906 No. 5	1	Wire, 15" long; carriage and register return switch to result switch
CD 6	1-700906 No. 6	1	Wire, 6" long; terminal block to carriage and register return switch
CD 7	Included in Solenoid	1	Wire, 10" long; solenoid to terminal block
CD 8	Included in Solenoid	1	Wire, 3" long; solenoid to voltage drop resistor
CD 11	1-71703	1	Wire, 3 3/4" long; motor switch to arc suppressor resistor
CD 12	1-71701	1	Wire, 2 5/8" long; between arc suppressor resistors
CD 13	1-71701	1	Wire, 2 5/8" long; arc suppressor resistor to Governor Terminal Block
CD 14	1-71701	1	Wire, 2 5/8" long; arc suppressor resistor to Governor Terminal Block
CD 15	1-71909A	1	Governor Brush and Wire
CD 16	1-71909A	1	Governor Brush and Wire
GV 1	2B-71181	1	Governor, double contact centrifugal
MO 1	1A-4667 No. 2	1	Motor, Type 6
	110 volt		For 85 to 125 volts A.C. or D.C.—25 to 85 cycles
	1A-4667 No. 2	1	For 130 to 160 volts A.C. or D.C.—25 to 85 cycles
	150 volt		
	1A-4667 No. 2	1	For 175 to 260 volts A.C. or D.C.—25 to 85 cycles
	220 volt		
R 1	1B-200911 65 OHM	2	Resistor, arc suppressor
	1B-200911 65 OHM	2	For 115 volts 60 cycles
	1B-200911 140 OHM	2	For 115 volts D.C.
	1B-200911 140 OHM	2	For 130 volts 50 cycles
	1B-200911 140 OHM	2	For 150 volts 60 cycles
	1B-200911 140 OHM	2	For 150 volts D.C.
	1B-200911 250 OHM	2	For 220 volts 60 cycles
	1B-200911 250 OHM	2	For 220 volts D.C.
	1B-200911 250 OHM	2	For 240 volts 50 cycles
R 2	X92-9	1	Resistor, voltage drop
			Not required for 115 volts 60 cycles, use one side only as terminal for wires CD8 and CD3
	X92-9	1	200 OHM, 30 watt, for 115 volts D.C.

PART NUMBERS (Plate 1-5) Continued

Symbol	Part Number	Req.	Description
	1X92-6	1	350 OHM, 30 watt, for 130 volts, 50 cycles
	1X92-6	1	350 OHM, 30 watt, for 150 volts, 60 cycles
	1X92-6	1	350 OHM, 30 watt, for 150 volts D.C.
	X92-10	2	300 OHM, 30 watt, for 220 volts, 60 cycles
	X92-10	2	300 OHM, 30 watt, for 220 volts D.C.
	1X92-6	1	350 OHM, 30 watt for 240 volts
	X92-10	1	300 OHM, 30 watt/50 cycles
SD 1	X73-1	1	Solenoid, plunger type; 115 volts—50 or 60 cycles
SW 1	11-71907	1	Switch, motor
SW 2	X83-10	1	Switch, result
SW 3	X83-9	1	Switch, carriage and register return
TM 1	11-70903	1	Terminal Block, Supply

WIRING DIAGRAM FOR TYPE 6 MOTOR WITH SINGLE CONTACT CENTRIFUGAL GOVERNOR AND SOLENOID CONTROLLED RESULTS WITH CARRIAGE AND REGISTER RETURN SWITCH, SERIES M 200 and M 800 (Plate 1-6)



Note: This wiring diagram used in Machines after Serial No. M6593D (M 200) and M6406D (M 800).

LEGEND

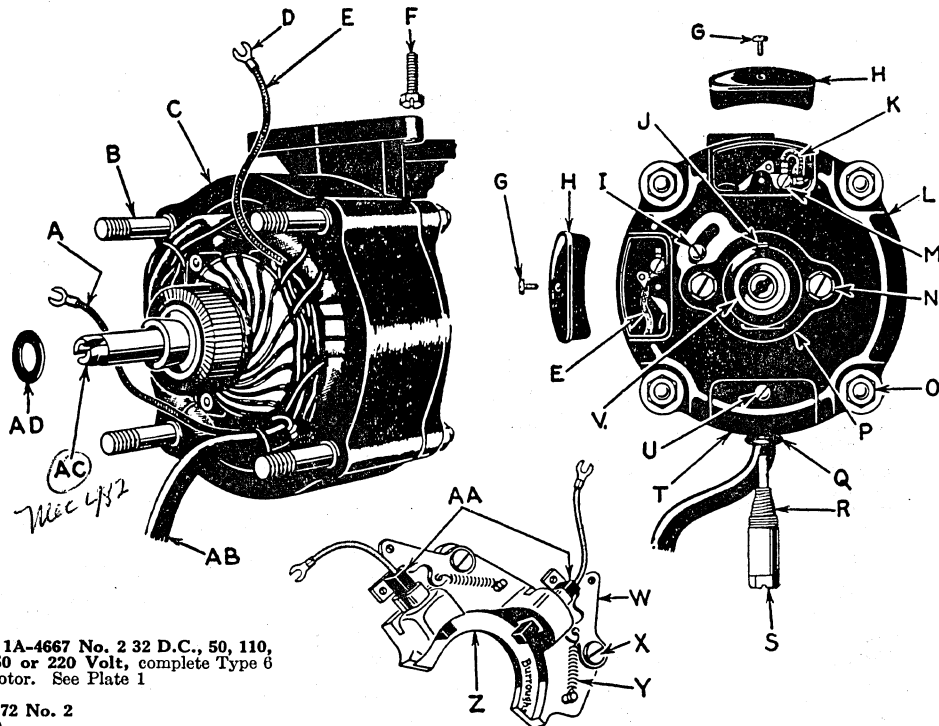
Symbol	Part Number	Req.	Description
C 1	1-4694D No. 2	1	Condenser, arc suppressor, .1 mfd.; motor switch
C 2	Included in Governor	1	Condenser, arc suppressor, .1 mfd.
CB 2	1-3697 $\frac{1}{2}$ C	1	Cord, line
	11-3697 $\frac{3}{4}$ C	1	2 wire conductor
CB 3	Included in Motor	1	3 wire conductor
CD 1	1-700906 No. 1	1	Cord, motor
CD 2	1-700906 No. 2	1	Wire, 18" long; terminal block to result switch
CD 3	1-700906 No. 3	1	Wire, 15" long; result switch to carriage and register return switch
		1	Wire, 10" long; voltage drop resistor to carriage and register return switch
CD 4	1-700906 No. 4	1	Wire, 4" long; carriage and register return switch to motor switch
CD 5	1-700906 No. 5	1	Wire, 15" long; carriage and register return switch to result switch
CD 6	1-700906 No. 6	1	Wire, 6" long; terminal block to carriage and register return switch
CD 7	Included in Solenoid	1	Wire, 10" long; solenoid to terminal block
CD 8	Included in Solenoid	1	Wire, 3" long; solenoid to voltage drop resistor

Continued on next page

PART NUMBERS (Plate 1-6) Continued

Symbol	Part Number	Req.	Description
CD 9	1-700906 No. 7	1	Wire, 6½" long; terminal block to motor switch
CD 10	1-700906 No. 8	1	Wire, 9" long; terminal block to arc suppressor resistor
CD 11	1-71703	1	Wire, 3¾" long; motor switch to arc suppressor resistor
CD 12	1-71701	1	Wire, 2⅝" long; between arc suppressor resistors
CD 13	Included in Brush Holder 1-71908B	1	Wire, 2⅝" long; arc suppressor resistor to governor brush holder
CD 14	Included in Brush Holder 1-71908B	1	Wire, 2⅝" long; arc suppressor resistor to governor brush holder
GV 1	1-71181A	1	Governor, single contact centrifugal
MO 1			Motor, type 6
	1A-4667 No. 2	1	For 85 to 125 volts A.C. or D.C.—25 to 85 cycles
	110 volt		
	1A-4667 No. 2	1	For 130 to 160 volts A.C. or D.C.—25 to 85 cycles
	150 volt		
	1A-4667 No. 2	1	For 175 to 260 volts A. C. or D.C.—25 to 85 cycles
	220 volt		
R 1			Resistor, arc suppressor
	1B-200911 65 OHM	2	For 115 volts 60 cycles
	1B-200911 65 OHM	2	For 115 volts D.C.
	1B-200911 140 OHM	2	For 130 volts 50 cycles
	1B-200911 140 OHM	2	For 150 volts 60 cycles
	1B-200911 140 OHM	2	For 150 volts D.C.
	1B-200911 250 OHM	2	For 220 volts 60 cycles
	1B-200911 250 OHM	2	For 220 volts D.C.
	1B-200911 250 OHM	2	For 240 volts 50 cycles
R 2			Resistor, voltage drop
	X92-9	1	Not required for 115 volts 60 cycles, use one side only as terminal for wires CD8 and CD3
	X92-9	1	200 OHM, 30 watt, for 115 volts D.C.
	1X92-6	1	350 OHM, 30 watt, for 130 volts 50 cycles
	1X92-6	1	350 OHM, 30 watt, for 150 volts 60 cycles
	1X92-6	1	350 OHM, 30 watt, for 150 volts D.C.
	X92-10	2	300 OHM, 30 watt, for 220 volts 60 cycles
	X92-10	2	300 OHM, 30 watt, for 220 volts D.C.
	1X92-6	1	350 OHM, 30 watt } for 240 volts 50 cycles
	X92-10	1	300 OHM, 30 watt }
SD 1	X73-1	1	Solenoid, plunger type; 115 volts—50 or 60 cycles
SW 1	11-71907	1	Switch, motor
SW 2	X83-10	1	Switch, result
SW 3	X83-9	1	Switch, Carriage and Register Return
TM 1	11-70903	1	Terminal block, supply

MOTOR AND BRUSH ASSEMBLY, TYPE 6, LATER (Plate 2)



Use 1A-4667 No. 2 32 D.C., 50, 110, 150 or 220 Volt, complete Type 6 motor. See Plate 1

- A 1-4272 No. 2
- B 4650
- C 12-4617A specify voltage, complete assembled field coil only
- D 24A No. 8 included in E
- E 1-4272
- F 70500
- G 2864½
- H 4619A No. 1
- I 10056½
- J 4657A
- K 1-4690 brush, see AA
- L 4665C rear plate of motor
- M 4252

SYMBOLS (Plate 2)

- N 12055 screw, 1097½ lock washer
- O 20747
- P Use 4665½ A No. 1 casting
- Q 93½ No. 2A
- R 1-4281 includes wick
- S 4233
- T 4619A No. 2
- U 2864½
- V 4644C bronze bearing
- W 1-4612

- X 4654
- Y 4680
- Z Use 2-4610A, 81609 complete brush holder, improved, see plate 6-1, series H, power symbol list
- AA 1-4690
- AB Included in C
- AC 1-4200½ specify voltage
- AD 4223, 4223½, 4224 different thicknesses

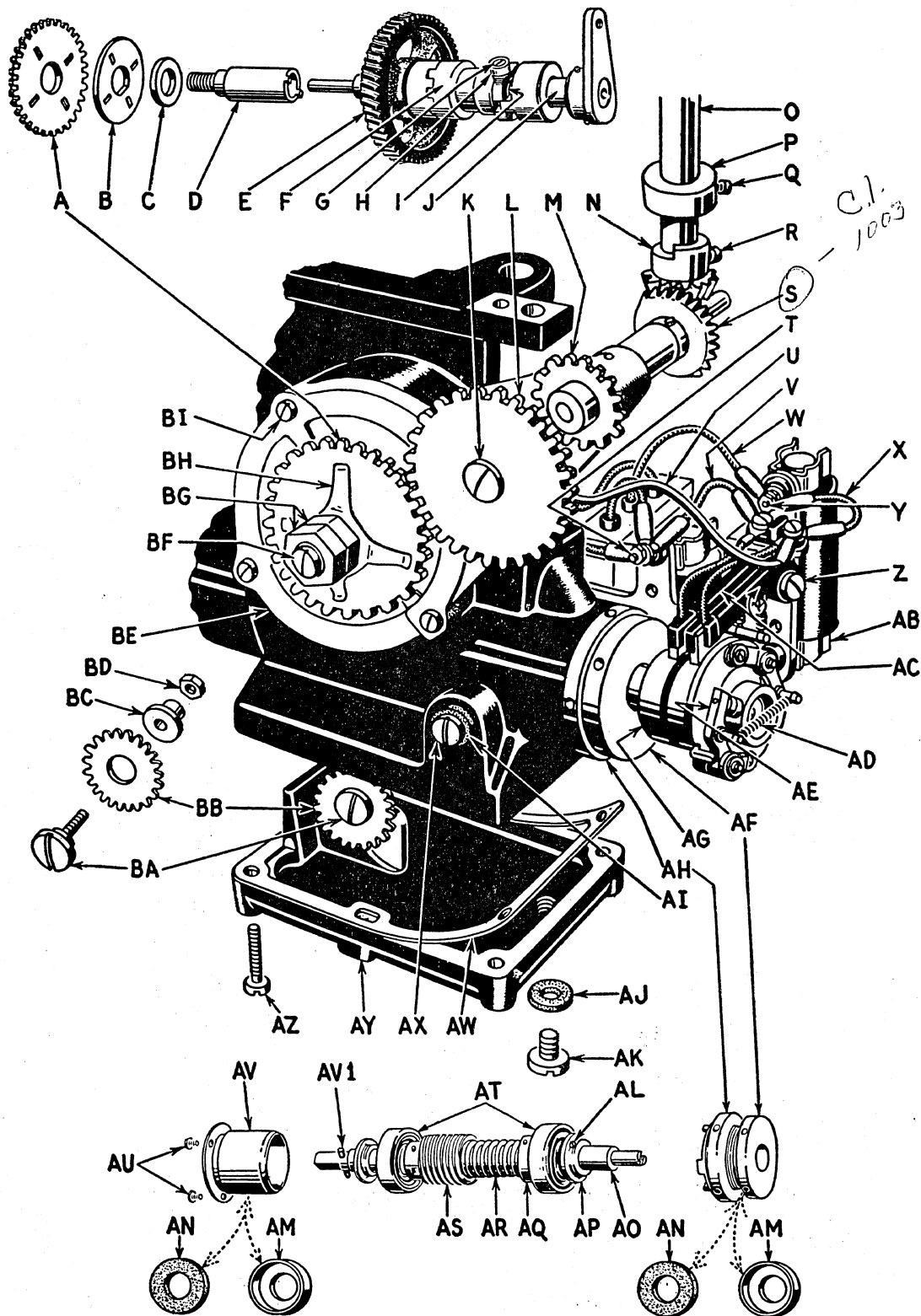
SYMBOLS (Plate 3)

- A 71112
- B 71111
- C 71115A
- D 71302A
- E 1-71667A No. 1 stamped 13-5
- F Use 1-71304B
- G 71506 screw
- H 71309A roller
- I 71800A spring
- J Use 1B-71007 includes F, G, H, I
- K Use 71502A screw, 47 nut
- L 1-71113
- M 1-71009B
- N Use 1Z-71901A before machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550½ set screw
- O Use 1A-71902A after machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550½ set screw
- P Use 1AZ-701010 No. 1 before machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes N, P, Q, R, S
- Q 1A-701010 No. 1 after machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes N, P, Q, R
- R 1-701340 includes Q

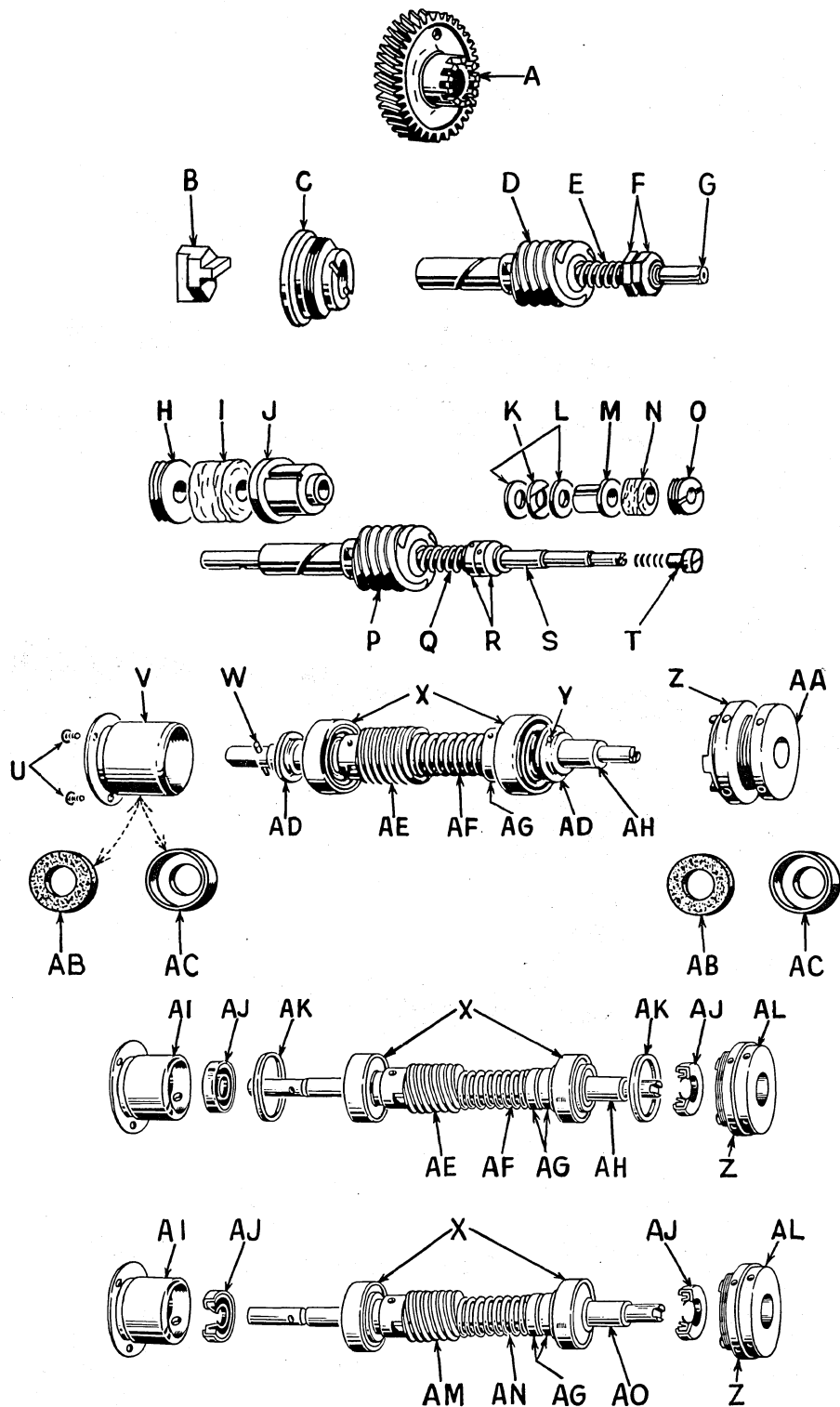
- S Use 1Z-71901A before machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 69558 set screw
- T 46 nut, 46½ nut, 7919½A washer, 1097½ lock washer, 200538½ No. 1 screw
- U Use 1A-71705 double wire from terminal block to switch box and governor brush
- V 1-71701 short black wire
- W Condenser wire
- X 1-71701 short black wire
- Y 46 nut, 46½ nut, 7919½A washer, 1097½ lock washer, 200538½ No. 1 screw
- Z 71609
- AB 200202
- AC Use 1-71908B, 1A-71181A, 79505, 1-4694D No. 2 for replacing brush holders
- AD 71814B
- AE Use 1A-71181A, 1-71908B, 79505, 1-4694D No. 2
- AF Use 1-71350C, 71399Z
- AG Use 1A-71181A, 1-71908B, 79505, 1-4694D No. 2
- AH 71339½ collar
- AI 3697½ leather washer
- AJ 3697½ leather washer
- AK Use 71616B
- AL 73621 screw

- AM 3619½
- AN 71910A leather washer
- AO Use 1-71008D, 1A-71181A, 1-71908B, 79505, 1-4694D No. 2, 1-71930 2 Req., 1-71350C, 1-71351C
- AP 1-71382 includes AL
- AQ 71515C 2 req., lock collars
- AR 71801C spring
- AS 71997B worm gear
- AT 1-71830
- AU 8064½
- AV Use 1-71351C, 71399Z
- AW 3662½ No. 1 pin
- AX 3694½ A gasket
- AY Use 71616B
- AZ 1-71666½ complete assembly, includes AJ, AK, BA, BB, BC, BD
- BA 702583 for cast iron bottom plate, letter AY
- BB 77513 for aluminum bottom plate, letter AY
- BC 3650½
- BD 71116B No. 1 stamped 13-5
- BE 3630½ No. 2
- BF 47¾
- BG 1-71665B narrow base
- BH 1-701665A No. 2 wide base, Cl. 72, 71, 70, 78
- BI Use 1A-701665B No. 1, 1-701017 No. 2, 74335, 47 for wide base Cl. 75 and 77
- BF 71617
- BG 71515
- BH 71117 regular
- BI 701117 for style 30 cge.
- BI 76555

DRIVE MECHANISM, BALL BEARING, TYPE 6, LATER (Plate 3)



WORM GEAR DRIVE SHAFT ASSEMBLIES (Plate 3-1)

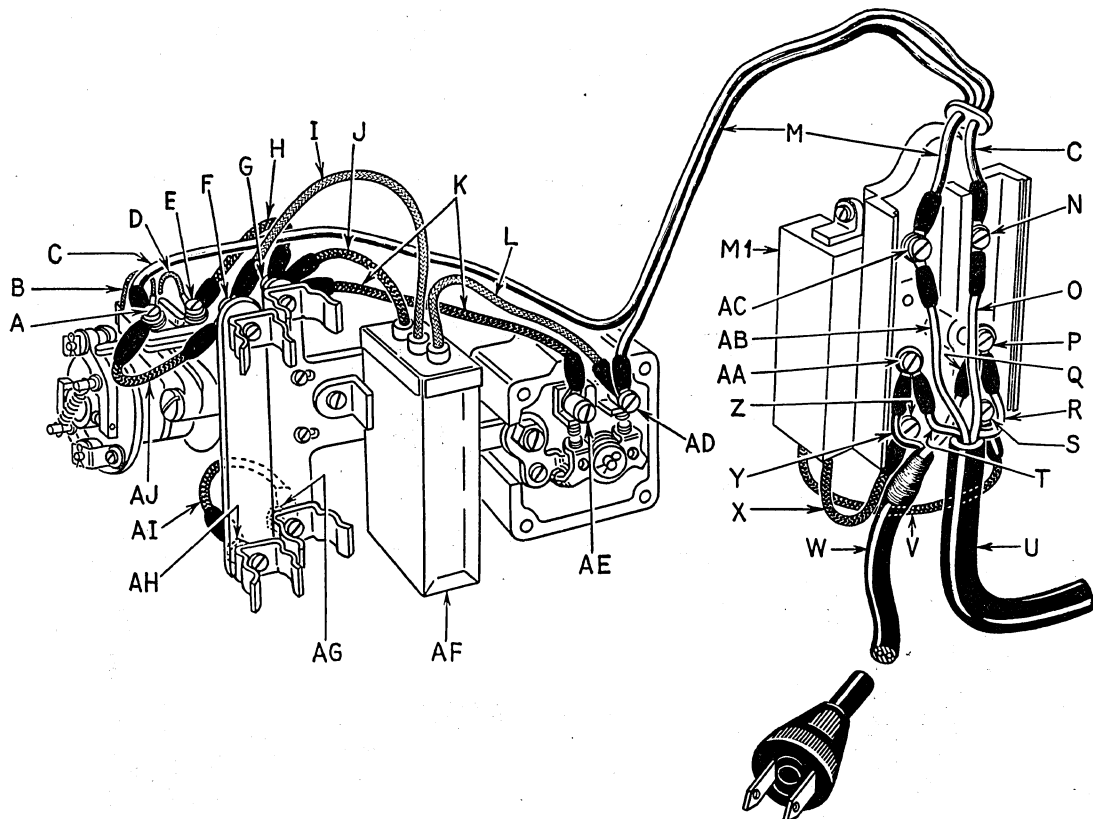


Symbols on next page

SYMBOLS (Plate 3-1)

A	1-71667 No. 1 stamped 13.6	P	71997 No. 1 stamped 13.6
	1-71667 No. 2 stamped 11.2	Q	71810A
	1-71667 No. 3 stamped 9.3	R	71515A
	1-71667 No. 4 stamped 10.5	S	1A-71008A stamped 13.6, shaft as-
	1-71667 No. 5 stamped 12.5		sembly, includes P, Q, R
	1-71667 No. 6 stamped 15	T	4554 1/4
	1-71667A No. 1 stamped 13.5	U	8064 1/8
B	71900	V	Use 1-71351C
C	71313		71399Z
D	71997 No. 1 stamped 13.6	W	3662 3/4 No. 1
	71997 No. 2 stamped 11.2	X	1-71930
	71997 No. 3 stamped 9.3	Y	73621 set screw
	71997 No. 4 stamped 10.5	Z	71339 1/2
	71997 No. 5 stamped 12.5	AA	Use 1-71350C
	71997 No. 6 stamped 15		71399Z
E	71800	AB	71910A
F	71515	AC	3619 1/2
G	1-71008 stamped 13.6	AD	1-71328 includes Y
	11-71008 stamped 11.2	AE	71997A stamped 13.6
	21-71008 stamped 9.3	AF	71801B
	31-71008 stamped 10.5	AG	71515C lock nuts
	41-71008 stamped 12.5	AH	1Z-71008B stamped 13.6, shaft as-
	51-71008 stamped 15		sembly, includes X, AE, AF, AG
H	71351	AI	1-71351C includes AJ
I	71910	AJ	1-71910B
J	71313B	AK	71399Z
K	36262A	AL	1-71350C includes AJ
L	3643 1/4	AM	71997B stamped 13.5
M	71350	AN	71801C
N	81900A	AO	1AZ-71008C stamped 13.5, shaft as-
O	71576		sembly, includes X, AM, AN, AG

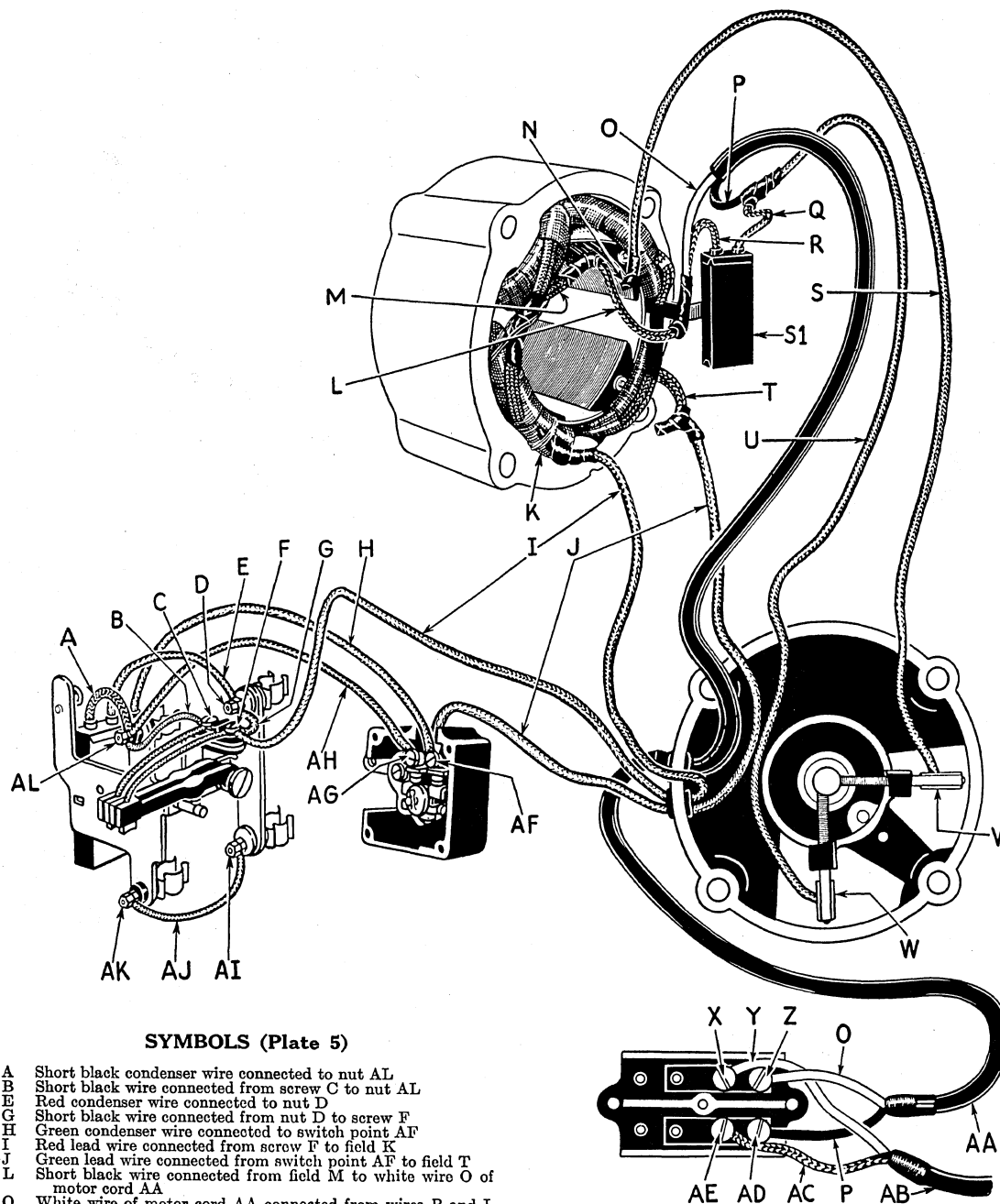
WIRING DIAGRAM FOR TYPE 6 MOTOR, LATER (Plate 4)



- SEE PLATE 1 FOR SYMBOLS
- B Brush wire connected to screw A
 - C Long lead wire connected from screw A to screw N
 - D Brush wire connected to screw E
 - H Short black wire connected from screw E to screw G
 - I Red condenser lead wire connected to screw F
 - J Black condenser lead wire connected to screw G
 - K Black lead wire connected from switch point AE to screw G
 - L Green condenser lead wire connected to switch point AD
 - M Short lead wire connected from screw AC to switch point AD
 - M1 1-4699 $\frac{1}{2}$ B
 - O Red wire of motor cord U connected to screw N

- Q White wire of wall cord W connected to screw P
- R White wire of motor cord U connected to screw P
- T Black wire of motor cord U connected to screw AA
- U Motor cord
- V Long black condenser lead wire connected to screw S
- W Wall cord
- X Short black condenser lead wire connected to screw Z
- Y Black wire of wall cord W connected to screw AA
- AB Green wire of motor cord U connected to screw AC
- AF 1-4694C No. 2
- AI Short black lead wire connected from screw AG to screw AH
- AJ Short black wire connected from screw A to screw F

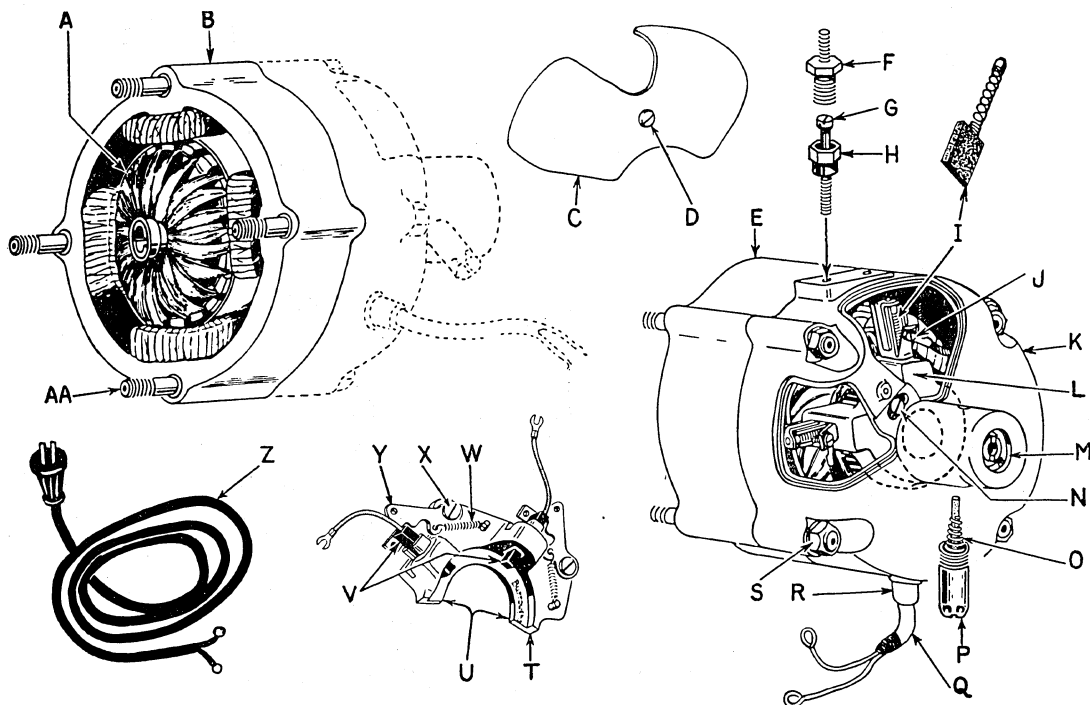
WIRING DIAGRAM FOR TYPE 6 MOTOR, EARLY, WITH RADIO INTERFERENCE ELIMINATOR ON INSIDE OF MOTOR (Plate 5)



SYMBOLS (Plate 5)

- A Short black condenser wire connected to nut AL
- B Short black wire connected from screw C to nut AL
- E Red condenser wire connected to nut D
- F Short black wire connected from nut D to screw F
- G Green condenser wire connected to switch point AF
- H Red lead wire connected from screw F to field K
- I Green lead wire connected from screw F to field T
- J Short black wire connected from field M to white wire O of motor cord AA
- O White wire of motor cord AA connected from wires R and L to screw Z
- P Black wire of motor cord AA connected from wires Q and U to screw AD
- Q Condenser wire connected to black wire P of motor cord AA
- R Condenser wire connected to white wire O of motor cord AA
- S Lead wire connected from field N to brush holder V
- S1 See note under motor and drives, plate 1
- U Lead wire connected from black wire P of motor cord AA to brush holder W
- Y White wire of wall cord AB connected to screw X
- AA Motor cord
- AB Wall cord
- AC Black wire of wall cord AB connected to screw AE
- AH Black wire connected from switch point AG to nut AL
- AJ Short black wire connected from nut AI to nut AK

MOTOR AND BRUSH ASSEMBLY, TYPE 6, EARLY, WITHOUT RADIO INTERFERENCE ELIMINATOR (Plate 6)

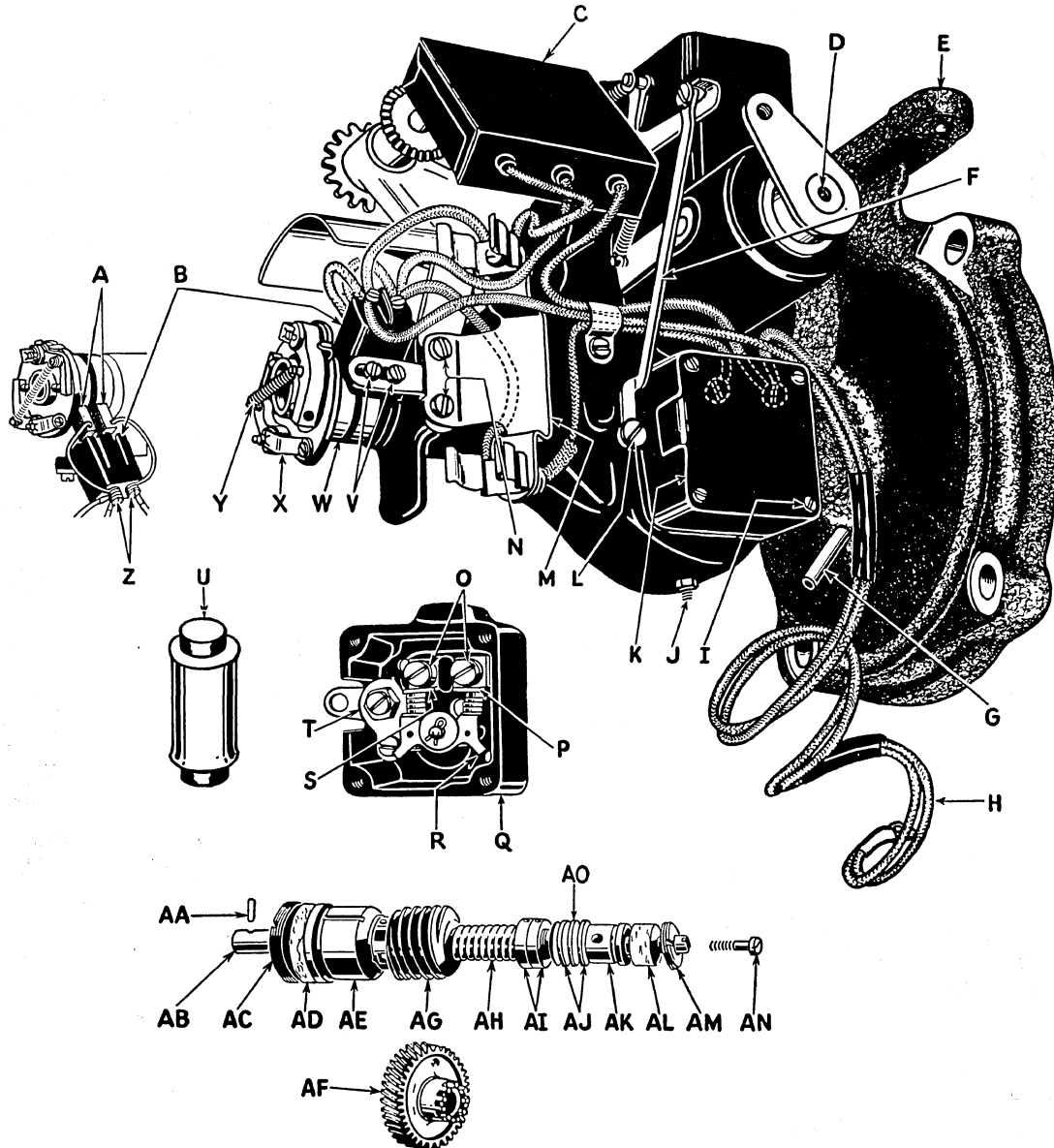


SYMBOLS (Plate 6)

A 1-4200 $\frac{1}{2}$ specify voltage
 B 22-4617A specify voltage, complete assembled field coil only
 C 4619 No. 2
 D 1054 $\frac{1}{2}$
 E 1-4667 (1-4667 No. 2 Specify Voltage and Cycle, 22Z-4699 $\frac{1}{2}$ B) complete motor
 F 71580
 G 4651 (4620 No. 2, 2859 $\frac{3}{8}$ B [2 req.], 4651A, 4630A)
 H 4630 (4620A, 2859 $\frac{3}{8}$ [2 req.], 4651A, 4630A)
 I 1-4290 over 80 volts
 1-4291 80 volts or less
 J 4252 screw
 K 1-4665B (4665C, 1-4665 $\frac{3}{8}$ No. 1, 4619A No. 1 [2 req.], 4619A No. 2, 2864 $\frac{3}{8}$ [2 req.], 12055 [2 req.], 1097 $\frac{1}{8}$ [2 req.], 4636, 2-4610A, 81609) rear plate of motor
 L Description only
 M 4644 bronze bushing
 N 81609

O 1-4281 includes wick
 P 4233
 Q 1-4672 (1-4271 $\frac{1}{2}$ A)
 R 4294 $\frac{1}{2}$ (93 $\frac{1}{2}$ No. 5)
 S 20747
 T 2-4610 (2-4610Z) complete assembled brush holder
 NOTE: Shown is the improved early style brush holder which is similar in appearance to the late style, except the diameter of the semicircle, as indicated by arrow U, is smaller. This style replaces the earlier style, letter L, which is discarded. See plate 2 for late style.
 U See note above
 V 1-4690
 W 4680
 X 4654
 Y 1-4612
 Z 1-3697 $\frac{1}{2}$ A regular
 1-3697 $\frac{1}{4}$ A (1-3697 $\frac{1}{4}$ B) three wire conductor cord
 AA 4650

DRIVE MECHANISM, NOT BALL BEARING, TYPE 6, WITHOUT RADIO INTER-FERENCE ELIMINATOR, WITH SINGLE RESISTANCE COIL BRACKET
(Plate 7)

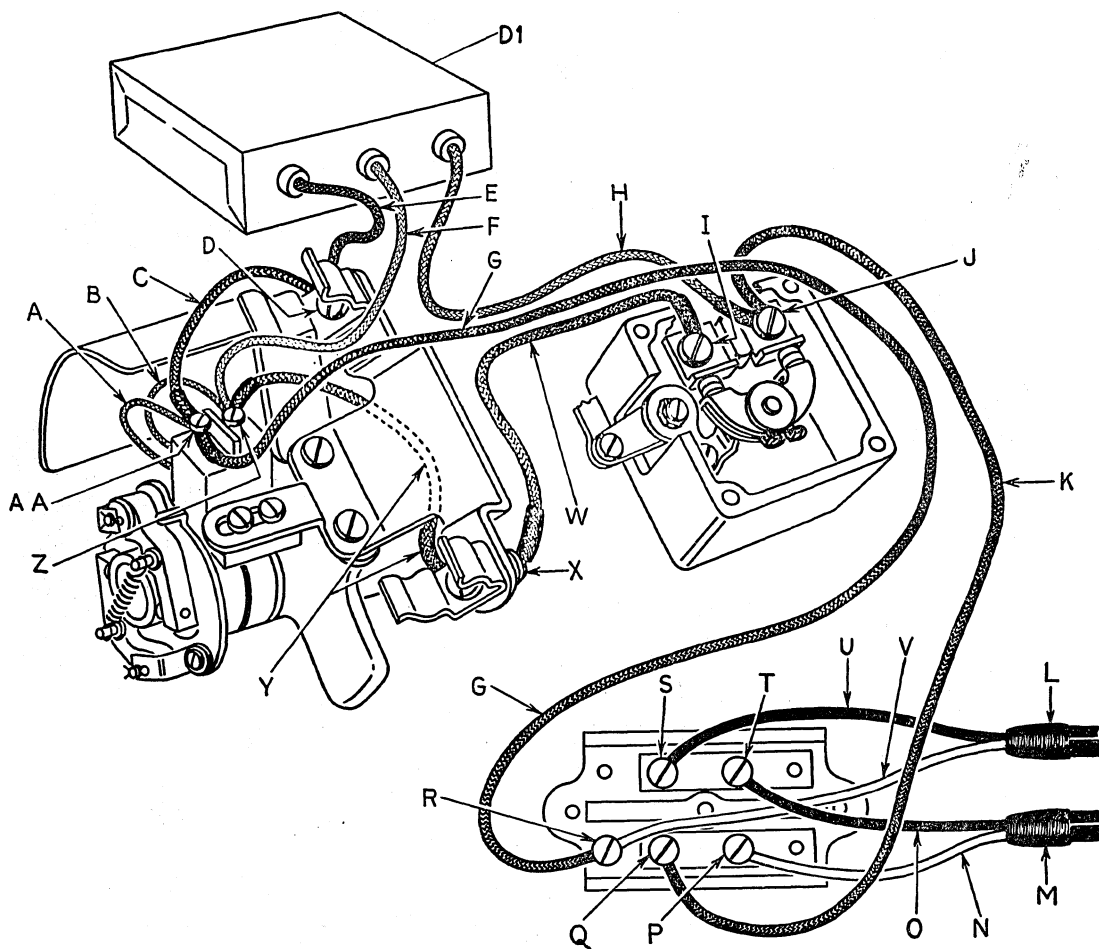


SYMBOLS (Plate 7)

A	1-71909	G	3690 1/2	V	2851 1/8
B	1-4595 No. 2	H	1-4670	W	1A-71181 (2B-71181) complete assem- bled governor
C	1-4694A (1-4694CZ No. 2)	I	7562	X	71179A
NOTE: To use this later style condenser it will be necessary to install a double coil bracket with connecting parts, symbol 2Z-71180 No. 2. Also when replacement of the governor 1A-71181 is necessary on machines having the early style drives, not ball bearing, not equipped with resistance coils or having a single coil, the following parts are recommended for installation to prolong the life of the governors: one double coil bracket, 2Z-71180 No. 2, which includes a condenser and connecting wires.			J	Y	71814A (83836)
D	1A-71007 assembled clutch, see plate 3 for detail	K	1-71116 No. 1 complete splash gear assembly	Z	4252
E	11-71666C complete assembled drive, specify style and machine number	L	12023 1/2 cover	AA	3662 3/4 (3662 3/4 No. 1) pin
F	71177	M	94523 screw, 46 nut	AB	1A-71008A assembled worm shaft in- cludes AG, AH, AI only
		N	1Z-71180 No. 2 bracket	AC	71351
		O	12051 1/8	AD	71910
		P	4252 screw, 1097 3/4 lock washers, 12045 collars	AE	71313B
		Q	1A-12021 1/4 AL upper contact point	AF	1-71667 No. 1 stamped 13-6
		R	1B-71907 assembled switch box, in- cludes O, P, R, S, T	AG	71997 No. 1
		S	1A-3842B lower switch points	AH	71801A
		T	1A-12021 1/4 AR upper contact point	AI	71515A
		U	1B-71178 includes R	AJ	3643 1/4
			1B-209111 Specify Resistance, see plate 3-1 series "H," power symbol list	AK	71350
				AL	81900A
				AM	71576
				AN	4554 1/4
				AO	3626A

SEE EXPLANATION ON INSIDE OF FRONT COVER

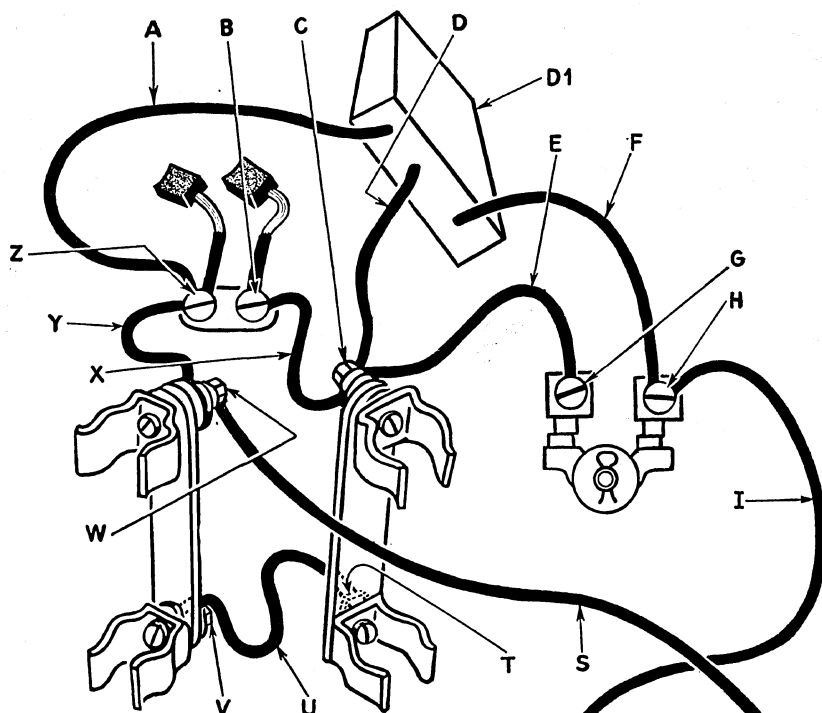
**WIRING DIAGRAM FOR TYPE 6 MOTOR, NOT BALL BEARING, WITHOUT
RADIO INTERFERENCE ELIMINATOR, WITH SINGLE RESISTANCE
COIL BRACKET (Plate 8)**



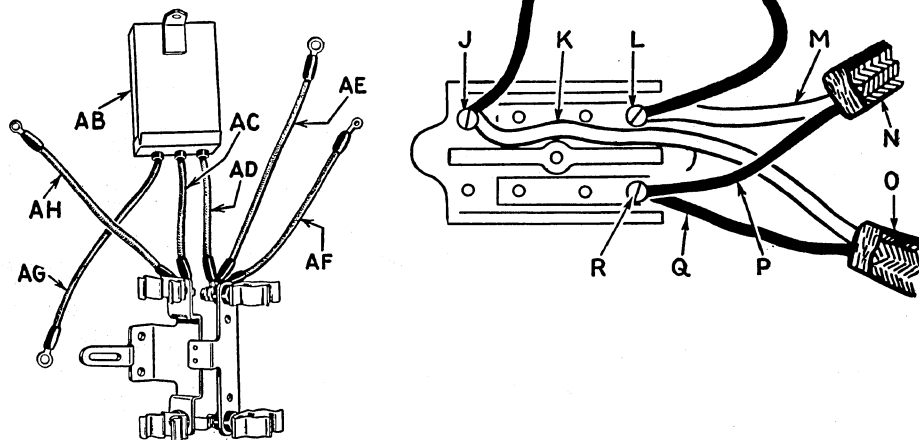
SEE PLATE 7 FOR SYMBOLS

- A Brush wire connected to screw AA
- B Brush wire connected to screw Z
- C Short lead wire connected from screw AA to screw D
- D1 1-4694A (1-4694CZ No. 2) see note, plate 7, letter C
- E Black condenser lead wire connected to screw D
- F Red condenser lead wire connected to screw Z
- G Long lead wire connected from screw AA to screw R
- H Green condenser lead wire connected to switch point J
- I Long lead wire connected from switch point J to screw Q
- L Motor cord
- M Wall cord
- N White wire of wall cord M connected to screw P
- O Black wire of wall cord M connected to screw T
- U Black wire of motor cord L connected to screw S
- V White wire of motor cord L connected to screw R
- W Short lead wire connected from nut X to switch point I
- Y Short lead wire connected from screw Z to nut X

WIRING DIAGRAM FOR TYPE 6 MOTOR, EARLY, WITH OR WITHOUT RADIO INTERFERENCE ELIMINATOR, WITH DOUBLE RESISTANCE COIL BRACKET (Plate 9)



WITH RADIO INTERFERENCE ELIMINATOR



- A Black condenser lead wire connected to screw Z
- D Red condenser lead wire connected to nut C
- D1 1-4694C No. 2 used for machines not constructed with radio interference eliminator, having double resistance coil assembly, ball bearing drive
- E Black lead wire connected from switch point G to nut C
- F Green condenser lead wire connected to switch point H
- I Black lead wire from screw J to switch point H
- K White wire of wall cord O connected to screw J
- M White wire of motor cord N connected to screw L
- N Motor cord
- O Wall cord
- P Black wire of motor cord N connected to screw R
- Q Black wire of wall cord O connected to screw R
- S Black lead wire connected from screw L to nut W

- U Short black wire connected from nut T to nut V
- X Short black wire connected from nut C to screw B
- Y Short black wire connected from nut W to screw Z
- AB 1-4694CZ No. 2 used for machines constructed to eliminate radio interference, and with double resistance coil assembly, not ball bearing drive

WITH RADIO INTERFERENCE ELIMINATOR

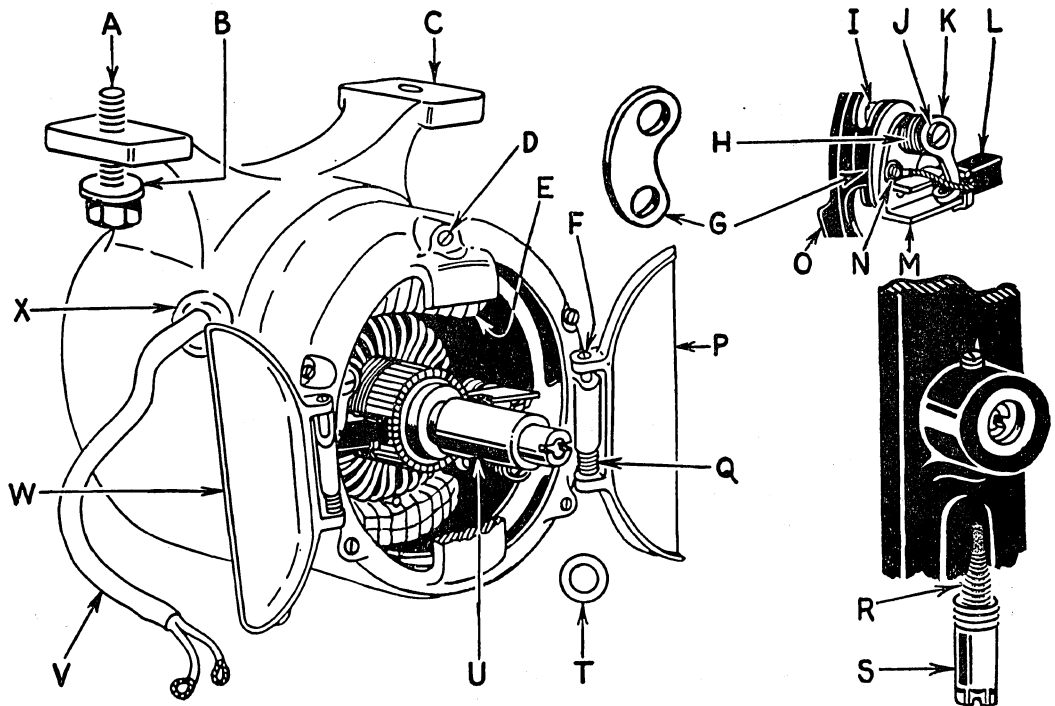
NOTE: Terminal screws referred to below are shown on plate 8

- AE Long black wire to switch box screw I
- AF Short black wire to governor brush screw Z
- AG Green condenser lead wire to switch box screw J
- AH Red wire to governor brush screw AA

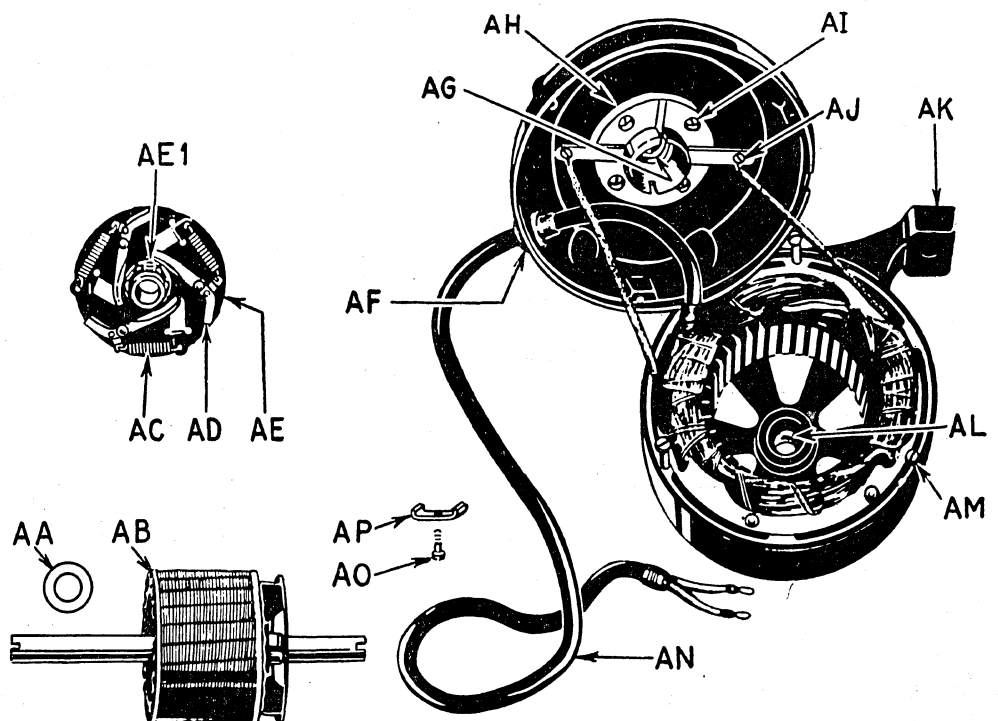
SEE EXPLANATION ON INSIDE OF FRONT COVER

CONSTANT RUNNING MOTORS (Plate 10)

DIRECT CURRENT



ALTERNATING CURRENT



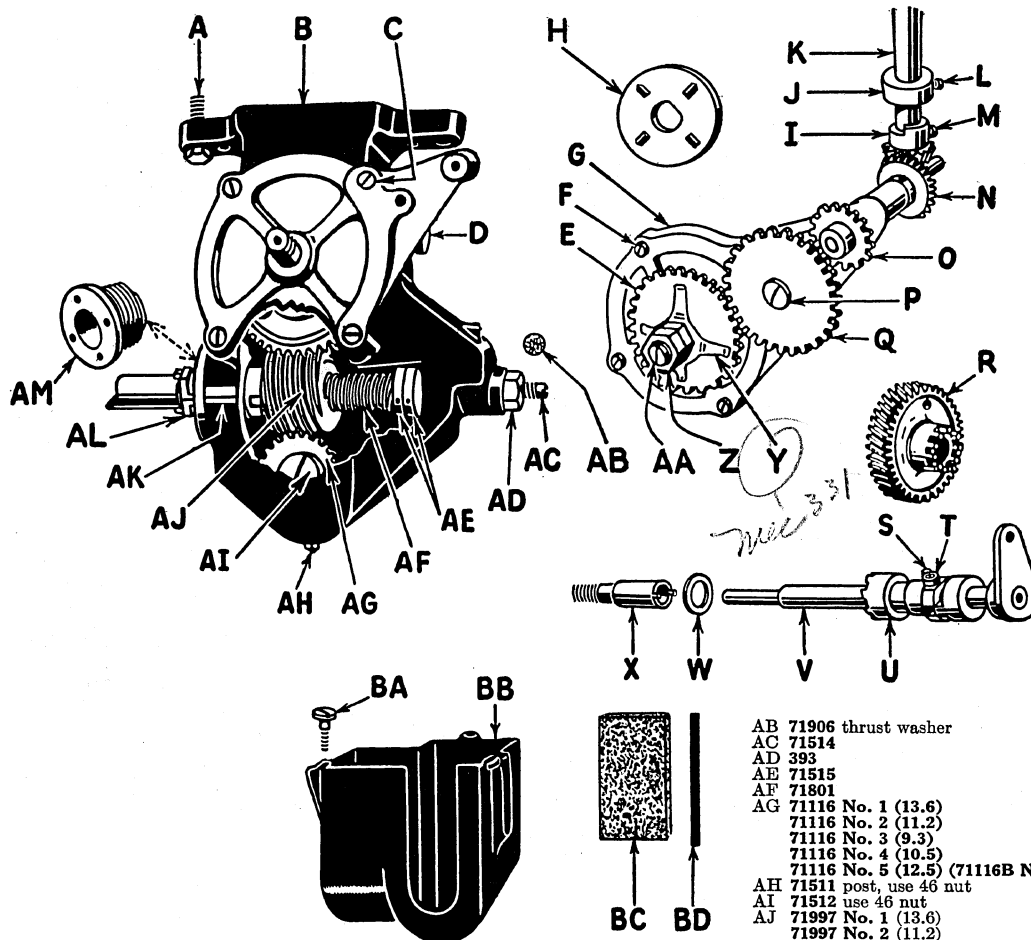
- A 70514
 B 925½
 C 1-4067½ complete motor, specify HP, voltage and cycle and order on supply order containing no other items
 D 4057¼ long screw
 E 4058¼ short screw
 F 1-4073¾ specify HP and voltage
 G 4095½ mica
 H 4082 spring
 I 4055½ screw, 4017 washer
 J 4014½
 K 4090½
 L 4096½ brush holder only, complete assembly 1-4066½, includes H, J, K, L, N
 N 4057½ screw, 4018 washer

SYMBOLS (Plate 10)

- O 1-4068¾ includes G, H, I, J, K, L, M, N
 P 4068¾L
 Q 4080½
 R 1-4281 includes wick
 S 4233
 T 4196 washer, specify 1/64" or 1/32"
 U 1-4000½ armature, specify HP and voltage
 V 1-4271½A
 W 4068½R
 X 4094½
 AA 4196 washer, specify 1/64" or 1/32"
 AB 1-4100½ specify HP, voltage and cycle
 AC 300809 (700 RPM)
 4184 (900 and 1100 RPM)
 82816 (1300 RPM)

- AD 1-4129 use 3829¼ washer, 4161 pin
 AE 2A-4140½ specify RPM number stamped on plate (700) (900) (1100) (1300)
 AE1 4158 screw
 AF 4294½ (93½ No. 5)
 AG 4130Z bronze bearing
 AH 1-4125
 AI 4151A
 AJ 4055
 AK 1-4167½ complete motor, specify HP, voltage and cycle and order on supply order containing no other items
 AL 4044½Z bronze bearing
 AM 4157½
 AN 1-4271½A
 AO 10751½
 AP 71101

DRIVE MECHANISM FOR CONSTANT RUNNING MOTORS (Plate 11)



- AB 71906 thrust washer
 AC 71514
 AD 393
 AE 71515
 AF 17801
 AG 71116 No. 1 (13.6)
 71116 No. 2 (11.2)
 71116 No. 3 (9.3)
 71116 No. 4 (10.5)
 71116 No. 5 (12.5) (71116B No. 1)
 AH 71511 post, use 46 nut
 AI 71512 use 46 nut
 AJ 71997 No. 1 (13.6)
 71997 No. 2 (11.2)
 71997 No. 3 (9.3)
 71997 No. 4 (10.5)
 71997 No. 5 (12.5)
 AK 1-71008 (13.6)
 11-71008 (11.2) Assembled worm
 21-71008 (9.3) gear, includes
 31-71008 (10.5) AE, AF, AJ only
 41-71008 (12.5)
 AL 71900
 AM 71313
 BA 70510 No. 1 used for early style cover
 83512A used for present style cover
 BB 71669
 1-71183A narrow and wide
 base except Cl. 75, 77 } Cover
 1-701183A No. 1 Cl. 75, 77 } for
 1-701183B No. 2 used for } Type 6
 sel. skip tab, Cl. 75, 77 } drive
 BC 71999 felt pad
 BD 71100 flat spring for BC

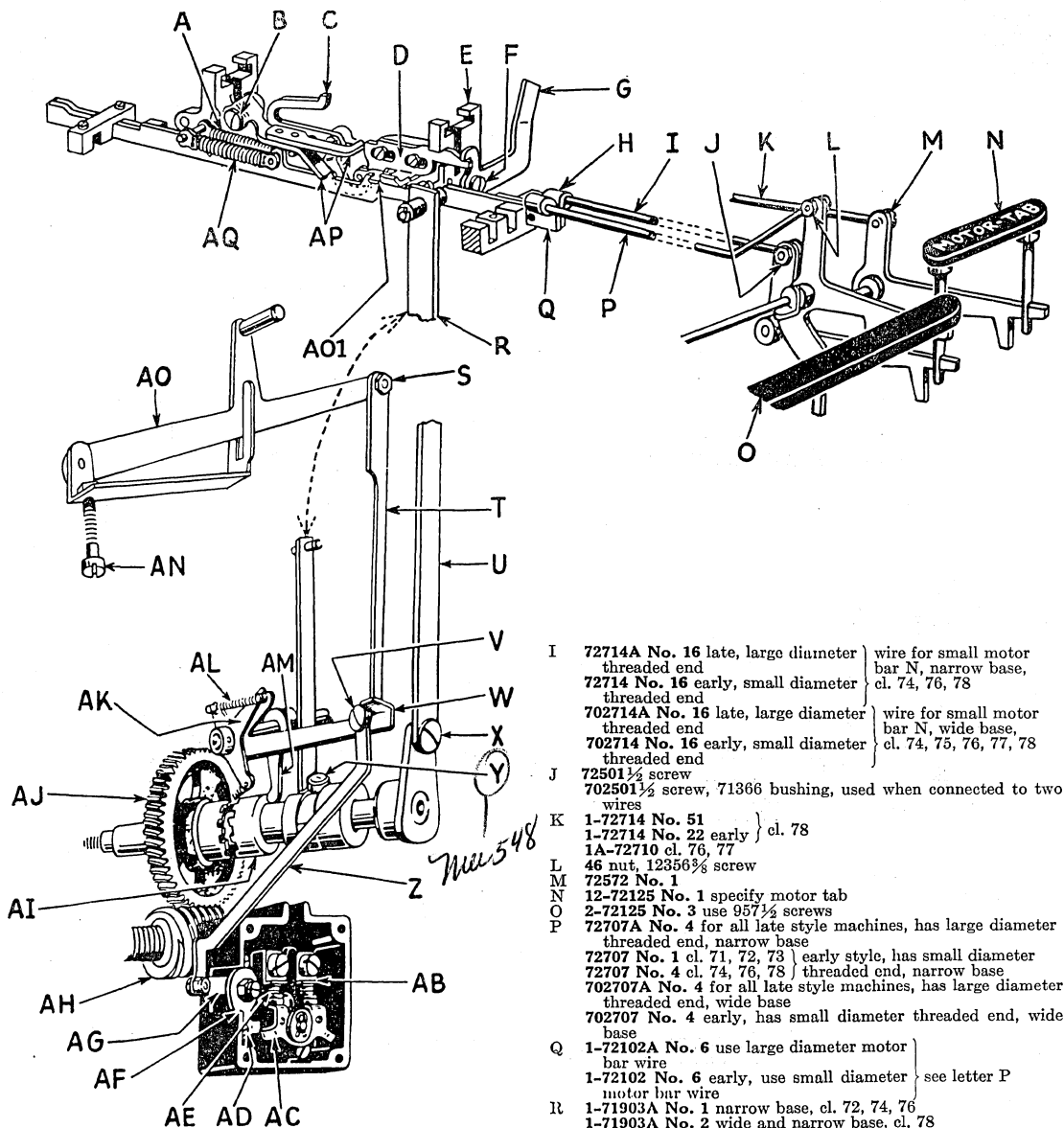
SYMBOLS (Plate 11)

- A 70500
 B 71666 drive casting only
 1-71666 (13.6)
 11-71666 (11.2) } Complete assembled
 21-71666 (9.3) } drive, specify style
 31-71666 (10.5) } and machine number
 41-71666 (12.5)
 C 76555
 D 3661¼B screw, 3697¼ washer
 E 71112
 F 76555
 G 1-71665B
 H 71111
 I 1-71902 includes M
 J 1-7140¾ includes L
 K 1-71010 includes I, J
 L 550¾
 M 550¾
 N 1-71901 includes 550¾ screw

- O 1-71009A
 P 71502 (300500½)
 Q 1-71113
 R 1-71667 No. 1 (13.6)
 1-71667 No. 2 (11.2)
 1-71667 No. 3 (9.3)
 1-71667 No. 4 (10.5)
 1-71667 No. 5 (12.5)
 S 71505A*
 T 71309 roller, 71506 screw
 U 1Z-71304A use 71800A spring
 V 1Z-71007 includes S, T, U
 W 71115
 X 71302
 Y 71117
 Z 71515
 AA 71617

SEE EXPLANATION ON INSIDE OF FRONT COVER

MOTOR BAR MECHANISM AND DRIVE TRIP (Plate 12)



SYMBOLS (Plate 12)

See Keyboard Symbol List, Plate 43 for Other Detail Symbols

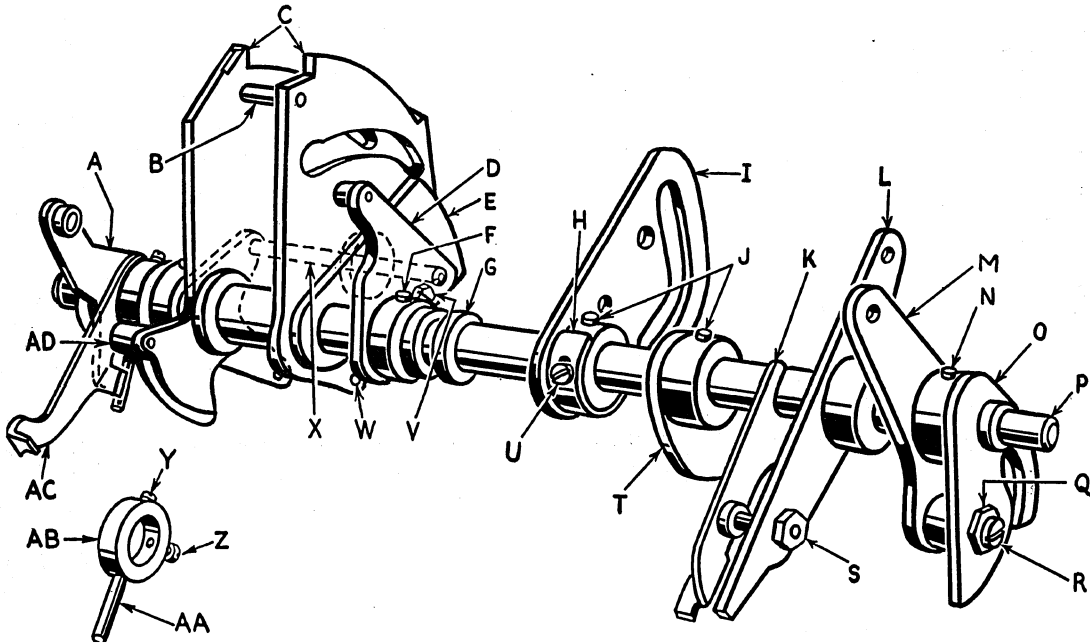
- A 1-72825
- B 72624
- C 1-72101
- D 1-72105 (1-72105A, 1A-72107) use 76528 screws
- E 72667 casting only, complete assembly 1-72667, includes B, C, D, A.P. use 79545 screw, narrow base
702667 casting only, complete assembly use 75617 screw
1B-702667, cl. 75, 77
702667 casting only, complete assembly wide base
11-702667, cl. 72, 74, 76, 78
- F 72602 No. 1
- G 1A-72104 No. 1 see accumulation book, plate 20
- H 1-72102A No. 2 use large diameter motor bar wire
1-72102 No. 2 early, use small diameter motor bar wire see letter I
- I 72714A No. 16 late, large diameter threaded end
72714 No. 16 early, small diameter threaded end
702714A No. 16 late, large diameter threaded end
702714 No. 16 early, small diameter threaded end
- J 72501 1/2 screw
702501 1/2 screw, 71366 bushing, used when connected to two wires
- K 1-72714 No. 51
1-72714 No. 22 early cl. 78
1A-72710 cl. 76, 77
- L 46 nut, 12356 3/8 screw
- M 72572 No. 1
- N 12-72125 No. 1 specify motor tab
- O 2-72125 No. 3 use 957 1/2 screws
- P 702707A No. 4 for all late style machines, has large diameter threaded end, narrow base
72707 No. 1 cl. 71, 72, 73 early style, has small diameter threaded end, narrow base
72707 No. 4 cl. 74, 76, 78 threaded end, narrow base
702707A No. 4 for all late style machines, has large diameter threaded end, wide base
702707 No. 4 early, has small diameter threaded end, wide base
- Q 1-72102A No. 6 use large diameter motor bar wire
1-72102 No. 6 early, use small diameter motor bar wire see letter P
- R 1-71903A No. 1 narrow base, cl. 72, 74, 76
1-71903A No. 2 wide and narrow base, cl. 78
1-701903A wide base, cl. 75, 77
- S 3960 screw, 46 nut
- T 701173A No. 1 cl. 75, 77, see plate 21 for other styles
- U 71156A
- V 94523 use 46 nut
- W 1-71175
- X 71556A screw, 47 nut
- Y 71309A roller, 71506 screw
- Z 71177A
- AB 1A-12021 3/4 AL
- AC 1A-3842B
- AD 952 3/4
- AE 1A-12021 3/4 AR
- AF 1B-71178 includes AC, AD, AG
- AG 71218
- AH 71997B see plate 3 for complete assembly
- AI 1-71304A
- AJ 1-71667A No. 1 stamped 13-5
- AK 1-71016A
- AL 10785 1/2
- AM 1A-71174 use 71604 screw
- AN 702583 screw, 47 nut
- AO 1-701172
- AO1 1-72109* included in D
- AP 1-72107 (1-72105A, 1A-72107)
- AQ 1-72825

SEE EXPLANATION ON INSIDE OF FRONT COVER

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For Form 2955

POWER OPERATING SHAFT ASSEMBLY (Plate 13)



SYMBOLS (Plate 13)

A 1-71133 No. 2*
 B 71526
 C 11A-71129 } cl. 71, 72, 73
 1-71129 early
 21-71129 cl. 74, 75, 76
 31A-71129 } cl. 77, 78
 31-71129 early
 D 1A-71125*
 E 71128A*
 F 56 1/2
 G 701311
 H 71126
 I 1-71124A*
 J 56 1/2
 K 1-71122
 L 1-71121*
 M 1-71120*
 N 56 1/2
 O 71119 No. 1 cl. 72
 71119 No. 2 cl. 76, 77, 78
 P For complete shaft assembly see plate 13-1

Q 71316
 R 71536 (72617)
 S 45
 T 1-71123*
 U 72581
 V 71619 No. 2 screw, 71322 collar, c 72, 74
 71619 (701619) screw, 1097 3/8 lock washer, 71308 collar, cl. 76, 78
 701619 screw, 1097 3/8 lock washer, 701308 collar, wide base
 W 71509
 71509Z screw stud, use 46 nut
 X 71002*
 Y 4557A
 Z 950 3/8
 AA 71548
 AB 1-71327 includes Y, Z, AA
 AC 71134
 AD 81376 roller, 71528A stud
 71528Z screw stud, use 46 nut

*To Change - Mee 300
 To Align - Mee 297
 New shaft - Mee 447*

MAIN OPERATING SHAFT ASSEMBLIES CHART (Plate 13-1)

Machine Class or Series	Base Narrow, Wide or New Wide	Machine Serial Number	Part Numbers	Description of Parts
72, 74	Narrow	Before A278214	141A-71001 71528Z 46 1-71812 No. 2 701521 45 71558A 1-72214Z	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{3}{4}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Restoring arm for Class 72 without automatic extend. (See Part E Plate 19, Keyboard Symbol List)
72, 74 with repeat of items	Narrow	Before A278214	21A-1 Fte. 141 No. 1 71528Z 46 1-71812 No. 2 701521 45 71558A 1-72214Z	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{3}{4}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Restoring arm for Class 72 without automatic extend. (See Part E Plate 19, Keyboard Symbol List)
72, 74	Narrow	Between A278214 and A480565	141A-71001 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Power spring with $\frac{3}{4}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
72, 74 with repeat of items	Narrow	Between A278214 and A480565	21A-1 Fte. 141 No. 1 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Power spring with $\frac{3}{4}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
72, 74	Narrow	After A480565	141B-71001	Assembled main operating shaft
72, 74 with repeat of items	Narrow	After A480565	21A-1 Fte. 141 No. 1	Assembled main operating shaft
NOTE: For Class 72 narrow base machines without positive register control, cut 1/10" off length of stud B (Plate 13)				
72	Wide	Before A278214	51C-701001 71528Z 46 1-71812 No. 2 701521 45 71558A 1A-702228B No. 2 1-702229B No. 1 3415 $\frac{1}{4}$	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{3}{4}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Error slide Restoring bracket on error rack Washer for wire on error slide
72 with repeat of items	Wide	Before A278214	1A-1 Fte. 141 No. 4 71528Z 46 1-71812 No. 2 701521 45 71558A 1A-702228B No. 2 1-137 Fte. 141 3415 $\frac{1}{4}$	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{3}{4}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Error slide Restoring bracket on error rack Washer for wire on error slide
72	Wide	Between A278214 and A766635	51C-701001 1A-702228B No. 2 1-702229B No. 1 3415 $\frac{1}{4}$	Assembled main operating shaft Error slide Restoring bracket on error rack Washer for wire on error slide
72 with repeat of items	Wide	Between A278214 and A766635	1A-1 Fte. 141 No. 4 1A-702228B No. 2 1-137 Fte. 141 No. 4 3415 $\frac{1}{4}$	Assembled main operating shaft Error slide Restoring bracket on error rack Washer for wire on error slide
72	New wide without easy depression power result keys	Between A766635 and B197641	51C-701001	Assembled main operating shaft

SERIES M MACHINES—POWER

SYMBOLS (Plate 13-1) Cont'd

Machine Class or Series	Base Narrow, Wide or New Wide	Machine Serial Number	Part Numbers	Description of Parts
72 with repeat of items	New wide without easy depression power result keys	Between A76635 and B197641	1A-1 Fte. 141 No. 4	Assembled main operating shaft
72 and M200	New wide with easy depression power result keys	After A915672	91-701001	Assembled main operating shaft
72 and M200 with repeat of items	New wide with easy depression power result keys	After A915672	1C-1 Fte. 141 No. 4	Assembled main operating shaft
76	Narrow	Before A278214	61A-71001 71528Z 46 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{1}{2}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
76 with repeat of items	Narrow	Before A278214	1B-1 Fte. 141 No. 1 71528Z 46 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{1}{2}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
76	Narrow	After A278214	61A-71001	Assembled main operating shaft
76 with repeat of items	Narrow	After A278214	1B-1 Fte. 141 No. 1	Assembled main operating shaft
76	Wide	Before A278214	61A-701001 71528Z 46 11-71812 701521 45 11-702228B No. 1 1-702229B No. 1 3415 $\frac{1}{4}$ 1-701186A 706160A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{1}{2}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)
76	Wide	After A278214	61A-701001 11-702228B No. 1 1-702229B No. 1 3415 $\frac{1}{4}$ 1-701186A 706160A	Assembled main operating shaft Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)
75, 77		Before A278214	61A-701001 71528Z 46 1A-701812 701521 45 71558A 1-701155 11-702228B No. 1 1-702229B No. 1 3415 $\frac{1}{4}$ 1-701186A 706160A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with $\frac{1}{2}$ " eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Restoring arm for result latch Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling machines only)
75, 77		Between A278214 and A484031	61A-701001 1-701155 11-702228B No. 1 1-702229B No. 1 3415 $\frac{1}{4}$ 1-701186A 706160A	Assembled main operating shaft Restoring arm for result latch Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)

SYMBOLS (Plate 13-1) Cont'd

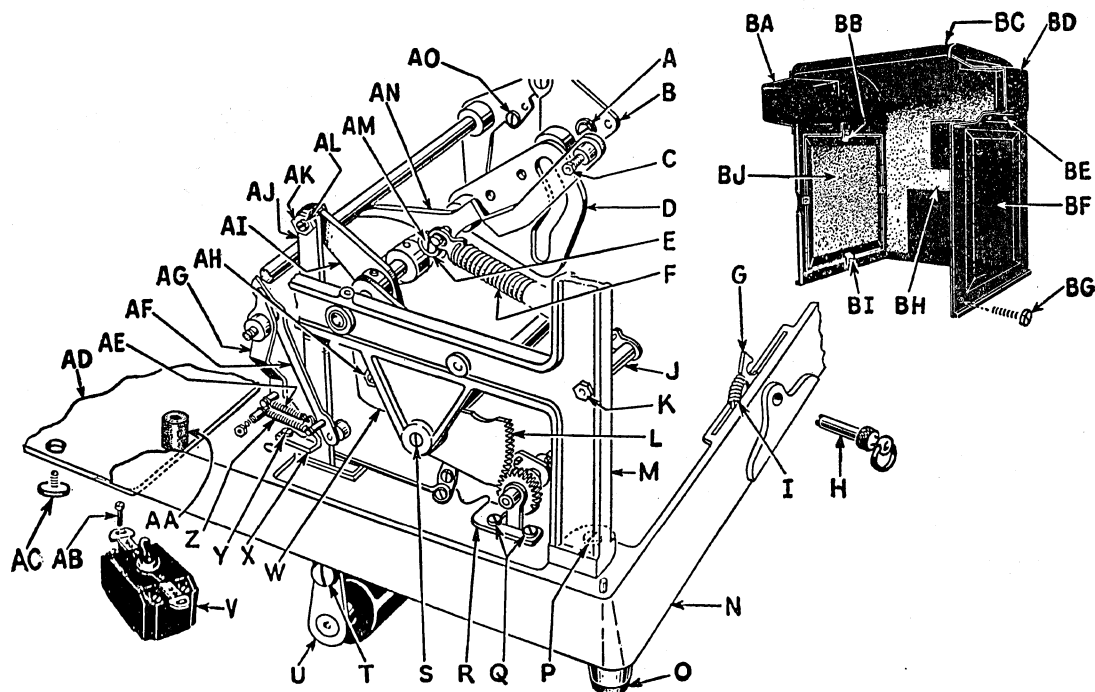
Machine Class or Series	Base Narrow, Wide or New Wide	Machine Serial Number	Part Numbers	Description of Parts
75, 77		Between A484031 and A766635	61A-701001 11-702228B No. 1 1-702229B No. 1 3415 1/4 1-701186A 706160A	Assembled main operating shaft Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)
77		After A766635	61A-701001	Assembled main operating shaft
77 with repeat of items		Before B83102	81B-701001 1-137 Fte. 141 1-101B Fte. 141 No. 2 12134 No. 1	Assembled main operating shaft Restoring bracket on error rack Control arm assembly for restoring arm Space washer for control arm assembly
77 and M700 with repeat of items		After B83102	81B-701001	Assembled main operating shaft
78	Narrow	Before A278214	51B-71001 71528Z 46 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with 3/4" eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
78 with repeat of items	Narrow	Before A278214	11A-1 Fte. 141 No. 1 71528Z 46 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with 3/4" eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
78	Narrow	Between A278214 and A476171	51B-71001 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Power spring with 3/4" eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
78 with repeat of items	Narrow	Between A278214 and A476171	11A-1 Fte. 141 No. 1 1-71812 No. 2 701521 45 71558A	Assembled main operating shaft Power spring with 3/4" eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring
78	Narrow	After A476171	51C-71001	Assembled main operating shaft
78 with repeat of items	Narrow	After A476171	11B-1 Fte. 141 No. 1	Assembled main operating shaft
78	Wide	Before A278214	21B-701001 71528Z 46 1-71812 No. 2 701521 45 71558A 11-702228B No. 1 1-702229B No. 1 3415 1/4 1-701186A 706160A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with 3/4" eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)
78 with repeat of items	Wide	Before A278214	1B-1 Fte. 141 No. 3 71528Z 46 1-71812 No. 2 701521 45 71558A 11-702228B No. 1 1-137 Fte. 141 3415 1/4 11-101A Fte. 141 1-701186A 706160A	Assembled main operating shaft Threaded post in twin cam to release inner result latches Nut for threaded post Power spring with 3/4" eyes for restoring main operating shaft Threaded post in main operating shaft for anchoring power spring Nut for threaded post Threaded post in side frame for anchoring power spring Error slide Restoring bracket on error rack Washer for wire on error rack Control arm assembly for restoring arm Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)

SERIES M MACHINES—POWER

SYMBOLS (Plate 13-1) Cont'd

Machine Class or Series	Base Narrow, Wide or New Wide	Machine Serial Number	Part Numbers	Description of Parts
78	Wide	Between A278214 and A766635	21B-701001 11-702228B No. 1 1-702229B No. 1 3415 1/4 1-701186A 706160A	Assembled main operating shaft Error slide Restoring bracket on error rack Washer for wire on error slide Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)
78 with repeat of items	Wide	Between A278214 and B97847	1B-1 Fte. 141 No. 3 11-702228B No. 1 1-137 Fte. 141 3415 1/4 11-101A Fte. 141 1-701186A 706160A	Assembled main operating shaft Error slide Restoring bracket on error rack Washer for wire on error slide Control arm assembly for restoring arm Error release link for subtract key Restoring link for No. 10 stop from error key. (For Sterling Machines only)
78 and M800	Wide and new wide	After A766635	21B-701001	Assembled main operating shaft
78 and M800 with repeat of items	Wide and new wide	After A766635	1B-1 Fte. 141 No. 3	Assembled main operating shaft

POWER OPERATING AND RESTORING MECHANISM, BASES, CASES, AND SIDE FRAMES (Plate 14)



SYMBOLS (Plate 14)

A	701619 screw 1097 $\frac{1}{4}$ lock washer 200313 $\frac{1}{2}$ collar	Q	72567
B	Included in assembly, see Plate 13-1	R	72297 $\frac{1}{4}$ A
C	703582 screw } narrow base 46 nut 79541 screw } wide base 46 nut	S	71547
D	Included in assembly, see Plate 13-1	T	71556A screw, 47 nut
E	Use 71394A roller 71524B screw post	U	1A-71007 assembled clutch, see Plate 3 for detail
F	1-701812A wide and narrow base	V	1-71994
G	1013A use 1054 pin	W	71119 No. 1 71119 No. 2 Cl. 76, 77, 78
H	1-1056	X	20 No. 110 narrow base 1-20 No. 110A wide base
I	1080A	Y	74524
J	71558A narrow base 701522 wide base	Z	77879 narrow base 702808 wide base
K	47	AA	70907 rubber bushing
L	1-71147 use 1-71336 collar on inside, includes 550 $\frac{3}{4}$ screw	AB	8451
M	1-70666R No. 1 3 reg. or less } Cl. 72, 74, 76, 78 1-70666R No. 2 4 reg. or more } right side Use 1Z-70666L No. 1 1-700128 } Cl. 72 72617 2 req. } left side 71538 } narrow base Use 11Z-70666L No. 1 1-700128 No. 2 } Cl. 74, 76, 78 72617 } left side 71538 } 700517 } Use 1-700666AR No. 1 } right side 1A-701236 } Cl. 75, 77 701599 } 1-700666AL No. 1 left side } Use 1-700666AR No. 2 } right side 1A-701236 } Cl. 72, 74, 76, 78 701599 } wide base For Cgs. Return Space Bar Add 700306A 2 req. } 1-700666AL No. 1 left side } 1-70665A No. 1 complete base }	AC	3450 $\frac{1}{16}$ Style 9
		AD	Use 1A-700121 No. 2 gray, narrow base } dust shield for 1A-700121 gray, wide base } black or gray machines
		AE	70527 No. 1 $1\frac{1}{4}$ " long hex. post } for dust shield 70527 No. 2 $\frac{7}{8}$ " long hex. post } 69807 Style 17 narrow base } Use 701805 } wide base 1-20 No. 110A }
		AF	1A-71157 use 71557 screw, 47 nut, narrow base 1-701157 No. 1 Cl. 75, 77 } use 700501 screw, 1A-701157 No. 2 Cl. 72, 74, 76, 78 } 47 nut, wide base
		AG	1-71235 use 71557 screw, 47 nut, narrow base 1-701235A No. 1 Cl. 75, 77 } use 700501 screw, 1-701235 No. 2 Cl. 72, 74, 76, 78 } 47 nut, wide base
		AH	71316 ecc., 72617 screw
		AI	Included in assembly, see Plate 13-1
		AJ	71156A
		AK	71320 ecc.
		AL	71554 No. 2 screw } Cl. 72, 78 47 nut } M200, M800 701505 screw } Cl. 77, M700 701327 collar } 701328 bushing }
		AM	8054 $\frac{3}{4}$
		AN	1-71236 narrow base 1-701236 wide base
		AO	74501
		BA	70670A No. 3 black 70670B No. 3 gray
		BB	1011 $\frac{3}{4}$ cleat

NOTE: Order by letter and only for actual replacement,
also forward number removed from other base.

700548

Symbols continued on next page

SYMBOLS (Plate 14) Cont'd

BC	1-70667 No. 1 30 pinion	} narrow base	BE	12058 $\frac{3}{8}$ screw
	1-70667 No. 4 50 & 60 pinion		BF	70112 black, narrow base
	31-70667 No. 1 30 pinion			700112 black } wide base
	31-70667 No. 4 50 & 60 pinion			700112A gray }
			BG	77513 narrow base
	1-700667A No. 2 black			700505 wide base
	Use 1-700667B No. 2	} Cl. 72, 74, 76, 78	BH	70990B No. 1 narrow base
	700670R No. 1			700901A No. 1 wide base, Cl. 75, 77
	700670L No. 1			700901B No. 2 wide base, Cl. 72, 74, 76, 78
	1-700667A No. 1 black	} Cl. 75, 77	BI	1053 $\frac{1}{4}$ screw
	1A-700667A No. 1 gray		BJ	70990B No. 2 narrow base
BD	70670A No. 4 black			700900A No. 1 wide base, Cl. 75, 77
	70670B No. 4 gray			700900A No. 2 wide base, Cl. 72, 74, 76, 78

CASE CHART (Plate 14A)

Narrow Base Case

Rear Holes (on Pins) $10\frac{3}{4}$ " Between Centers

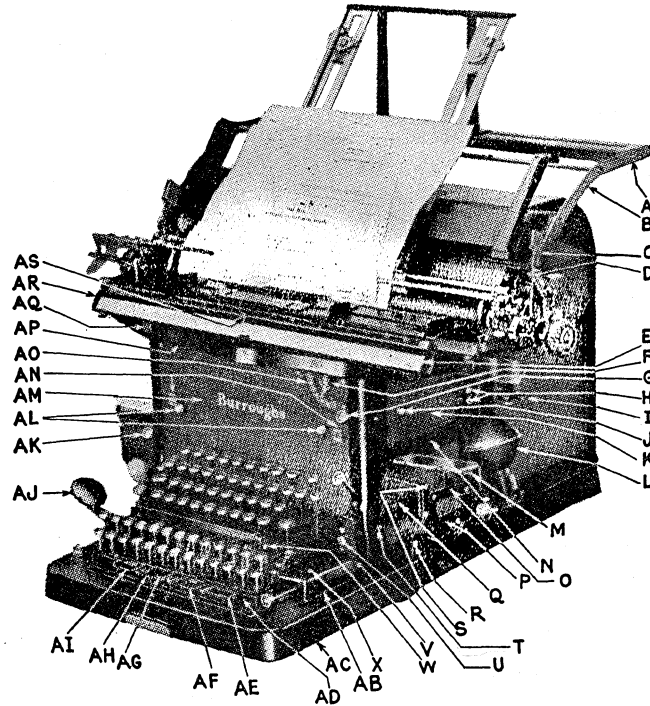
R. M. R.—Wide—New Wide Base Cases

Rear Holes (on Pins) $12\frac{3}{4}$ " Between Centers

Note:—Ears and screws are not furnished with case, order as separate parts.

Type or Series	Base	Color	Pinion	Registers	Description	Screws for Ears	Left Ear	Right Ear	Case
70	Narrow	Black	30	1, 2 or 3	Ledger Chute and Roll Paper Holder to Travel with Carriage				1-70667 No. 1
70	Narrow	Black	30	1, 2 or 3					31-70667 No. 1
70	Narrow	Black	50	4, 5 or 6	Sterling Construction	12058 $\frac{3}{8}$	70670A No. 3	70670A No. 3	1-70667 No. 2
70	Narrow	Black	60	6, 7, 8 or 10	Sterling Construction	12058 $\frac{3}{8}$	70670A No. 3	70670A No. 4	1-70667 No. 2
70	Narrow	Black	50	4, 5 or 6	Sterling Construction— with Ledger Chute and Roll Paper Holder to Travel with Carriage	12058 $\frac{3}{8}$	70670A No. 3	70670A No. 3	31-70667 No. 2
70	Narrow	Black	60	6, 7, 8 or 10	Sterling Construction— with Ledger Chute and Roll Paper Holder to Travel with Carriage	12058 $\frac{3}{8}$	70670A No. 3	70670A No. 4	31-70667 No. 2
70	Narrow	Black	50	5, 6, 7 or 8	Ledger Chute and Roll Paper Holder to Travel with Carriage	12058 $\frac{3}{8}$	70670A No. 3	70670A No. 3	1-70667 No. 4
70	Narrow	Black	60	6, 7, 8 or 10		12058 $\frac{3}{8}$	70670A No. 3	70670A No. 4	1-70667 No. 4
70	Narrow	Black	50	5, 6, 7 or 8		12058 $\frac{3}{8}$	70670A No. 3	70670A No. 3	31-70667 No. 4
70	Narrow	Black	60	6, 7, 8 or 10	Ledger Chute and Roll Paper Holder to Travel with Carriage	12058 $\frac{3}{8}$	70670A No. 3	70670A No. 4	31-70667 No. 4
75, 77 M700	Wide	Black		R. M. R.					1-700667A No. 1
	Wide	Gray		R. M. R.					1A-700667A No. 1
70 & M	Wide & New Wide	Black	60 & 100	Any Amount		700514	700670ZL No. 1	700670ZR No. 1	1-700667BZ No. 2
70 & M	Wide & New Wide	Gray	60 & 100	Any Amount		700514	700670L No. 1	700670R No. 1	1-700667B No. 2

NEW WIDE BASE—ENCLOSED MODELS—EXTERNAL FEATURES (Plate 14-1)

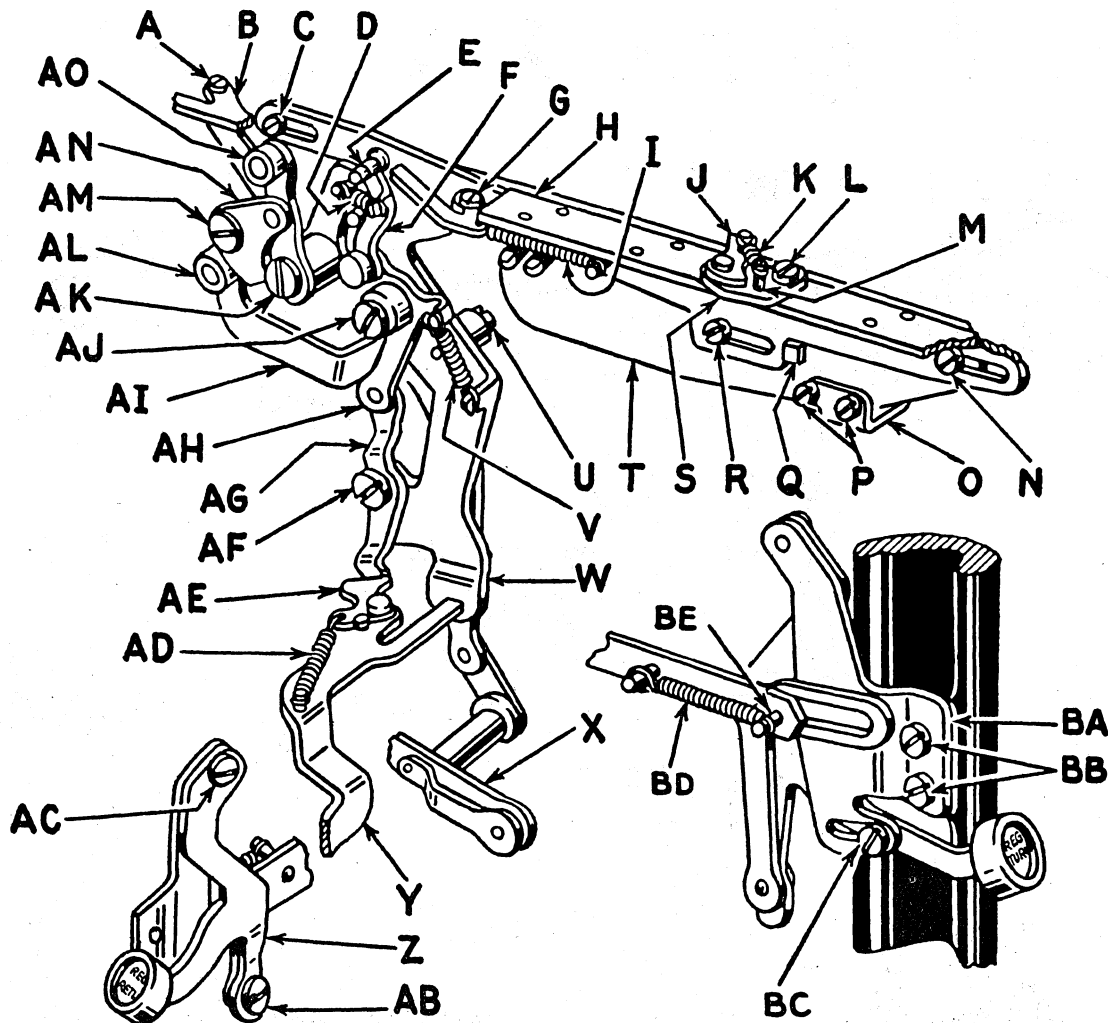


SYMBOLS (Plate 14-1)

- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|---|--|---|------------------------------|---|--|---|----------|---|------------------------|---|--|---|--|---|--------|---|---|---|---|---|--|---|---|---|---------------|---|---|---|---|---|---|---|-------------|---|-------|---|-------|---|-------|---|-------------|---|------------------------------|----|---|----|---|----|---|----|----------------------------|----|--|----|--|----|------------------------------|----|----------------------------------|----|--|----|--|----|---|----|--|----|---|----|------------------------|----|--------------------------------------|----|--------------------------------------|----|---|
| A | 72617 screw
1097 $\frac{1}{8}$ lockwasher
47 nut | B | 1-703153AR No. 10, 1-703153AL No. 10 for left side | C | 1-703236R No. 2, 1-703236L No. 2 for left side | D | 75342 eccentric, 73611 screw | E | 73904 No. 2 Style 12, 18 Vinylite 703904A Style 22, 30 strip | F | 1-705024 | G | 1-705133 $\frac{1}{2}$ | H | 46 nut, 12020 $\frac{1}{8}$ washer, use 73381 knurled nuts when bracket I is omitted | I | 705132 $\frac{1}{2}$ black bracket—use with 705132 $\frac{1}{2}$ A gray/185 Fte. 133 Bracket, 200582A screw, 1417 washer, 200570A knurled nut, 1-178 Fte. 133 mirror holder, 3455 $\frac{1}{8}$ screw, 1097 $\frac{1}{8}$ washer, 46 nut and 999 No. 2 Fte. 133 mirror | J | 705583 | K | 1-705108 $\frac{1}{2}$ R } black
1-705108 $\frac{1}{2}$ L }
1A-705108 $\frac{1}{2}$ R }
1A-705108 $\frac{1}{2}$ L } gray | L | 1-200925A complete assembled post-ing light | M | 1-178 Fte. 133 black } mirror holder
1A-178 Fte. 133 gray }
—use 999 No. 1 Fte. 133 mirror | N | 1-705102R No. 5 } black
1-705102L No. 5 }
1A-705102R No. 5 } gray
1A-705102L No. 5 } | O | 181R Fte. 133 | P | 705160 $\frac{1}{2}$ BR } black
705160 $\frac{1}{2}$ BL }
705160 $\frac{1}{2}$ CR } gray
705160 $\frac{1}{2}$ CL } | Q | Use 705134 $\frac{1}{2}$ BR, 705135 $\frac{1}{2}$ B No. 2 } for black, use 705134 $\frac{1}{2}$ BL, 705135 $\frac{1}{2}$ B No. 2 } 46 $\frac{1}{4}$ nuts
705134 $\frac{1}{2}$ CR No. 2 }
705134 $\frac{1}{2}$ CL No. 2 } gray | R | Use 705135 $\frac{1}{2}$ B No. 2, 705134 $\frac{1}{2}$ BR No. 2 or 705134 $\frac{1}{2}$ BL No. 2 for black brace. Use 73611 screws, 46 $\frac{1}{4}$ nuts | S | 73611 screw | T | 75608 | U | 75633 | V | 73611 | W | 79543 screw | X | 89568 $\frac{1}{4}$ Style 13 | AB | 702665 $\frac{1}{2}$ R black } for Class 72, 78
702665 $\frac{1}{2}$ AR gray }
702665 $\frac{1}{2}$ L No. 1 black } for Class 78
702665 $\frac{1}{2}$ BL No. 1 gray/on left
702665 $\frac{1}{2}$ L No. 2 black } for Class 72
702665 $\frac{1}{2}$ AL No. 2 gray/on left | AC | Note: Order by letter and only for actual replacement, also forward serial number removed from old base.
1-700665B No. 1 Class 72 }
1-700665B No. 5 Class 78 }
1-700665B No. 6 Class 77 } black
11-700665A No. 1 Sterling }
Class 77
Use 1-700665D No. 1, 700903 No. 3 4 req., 700113 No. 2, 700554, 88903, 700505 No. 3 2 req., 700904 2 req., for Class 72 and Series M 200 gray—before machine serial No. M 5855D
1-700665D No. 1 for Series M 200 gray—after machine serial No. M 5855D
11-700665D No. 1, 700113 No. 2, 700903 No. 3 4 req., 700554, 88903, 700505 No. 3 2 req., 700904 2 req., for Class 78 and Series M 800 gray—before machine serial No. M 5855D
11-700665D No. 1 for Series M 800 gray—after machine serial No. M 5855D
1-700665C No. 6 Class 77 gray
AD 702213 $\frac{1}{2}$ A No. 2, use 74587 screws | AE | Use 2-702125 No. 6 Specify, -1 702117B No. 3, 705367, 1A-72903, 72618A, 79565 for full cent motor bar | AF | Use 2A-702125 No. 4 → (-2) | AG | 702119 No. 2 black
702119A No. 2 gray | AH | Use 2A-702125 No. 4 ↑ (-1)
2A-702125 No. 4 ← (-3) | AI | Use 2A-702125 No. 4 ↑ ← (-4) | AJ | 1-702913 black
1A-702913 gray | AK | 1-705112 No. 3 black
1A-705112 No. 3 gray | AL | 1-705582 black } use 1097 $\frac{1}{8}$ washer,
1A-705582 gray/49 nut | AM | See letter AO plate 51 keyboard symbol list | AN | 705920 No. 1 for add register and add register and crossfooter
705920 No. 2 for tab and non-tab | AO | 2-705186B No. 1 black } 4x15
2A-705186B No. 1 gray }
2-705186B No. 3 black } 5x12
2A-705186B No. 3 gray }
2-705186B No. 6 black } 6x10
2A-705186B No. 6 gray }
2-705186B No. 7 black } 7x8
2A-705186B No. 7 gray }
2-705186B No. 8 black } 8x7
2A-705186B No. 8 gray }
2-705186B No. 9 black } 5x10
2A-705186B No. 9 gray }
2-705186B No. 10 black } 4x10
2A-705186B No. 10 gray }
2-705186B No. 17 black } 10x6
2A-705186B No. 17 gray }
2-705186B No. 21 black } 4x7, Class 72
2A-705186B No. 21 gray }
705665 No. 4 black
705665 No. 5 gray | AP | 1-705124 $\frac{1}{2}$ | AQ | 1-703160B Style 12, 18, 22, 30 black | AR | 1A-703160B Style 12, 18, 22, 30 gray | AS | 703195A No. 2 black indicator, right
703195B No. 2 gray point, use 73548 screw
1-703195 $\frac{1}{2}$ black indicator, left
1A-703195 $\frac{1}{2}$ gray/point |
|---|--|---|--|---|--|---|------------------------------|---|--|---|----------|---|------------------------|---|--|---|--|---|--------|---|---|---|---|---|--|---|---|---|---------------|---|---|---|---|---|---|---|-------------|---|-------|---|-------|---|-------|---|-------------|---|------------------------------|----|---|----|---|----|---|----|----------------------------|----|--|----|--|----|------------------------------|----|----------------------------------|----|--|----|--|----|---|----|--|----|---|----|------------------------|----|--------------------------------------|----|--------------------------------------|----|---|

MOTOR RETURN REGISTER MECHANISM, KEY CONTROL (Plate 17)

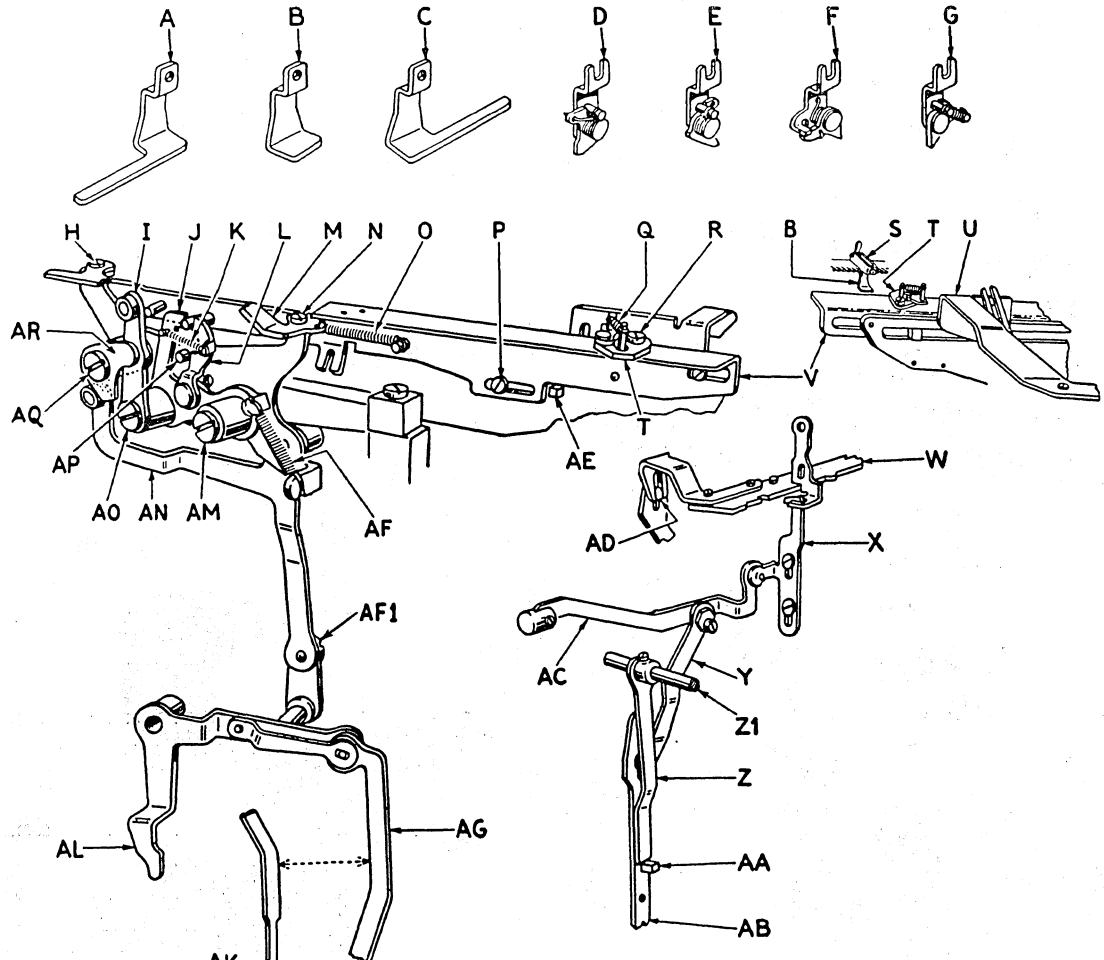
(Plates 15 and 16 in Instruction Book only)



SYMBOLS (Plate 17)

A	73563	W	1-79266B
B	79270A	X	Use 1-75240A No. 2
C	79552	Y	1-75131½ includes AE
D	8082A	Z	1-75133½
E	73342 roller, 79630 stud, 7914½A washer, included in H	AB	74529
F	Included in AH	AC	74529
G	73563	AD	10783
H	1-79265C No. 1, see plate 19 for other styles	AE	75134½ use 9059½ rivet
I	3683	AF	79503
J	Included in S	AG	79268½
K	79804	AH	1-79268C includes F
L	79628A	AI	1-79275B
M	79642	AJ	79627
N	72576 No. 1	AK	71605
O	79118¼ bracket	AL	Included in AI
P	75615	AM	79626
Q	Included in T	AN	1-79269B
R	72576 No. 1	AO	Included in AN
S	1-79272B	BA	75130½
T	1-79105A No. 13 use 79603 screws	BB	74502
U	79627	BC	3259½A
V	3281½	BD	79824
		BE	75596A

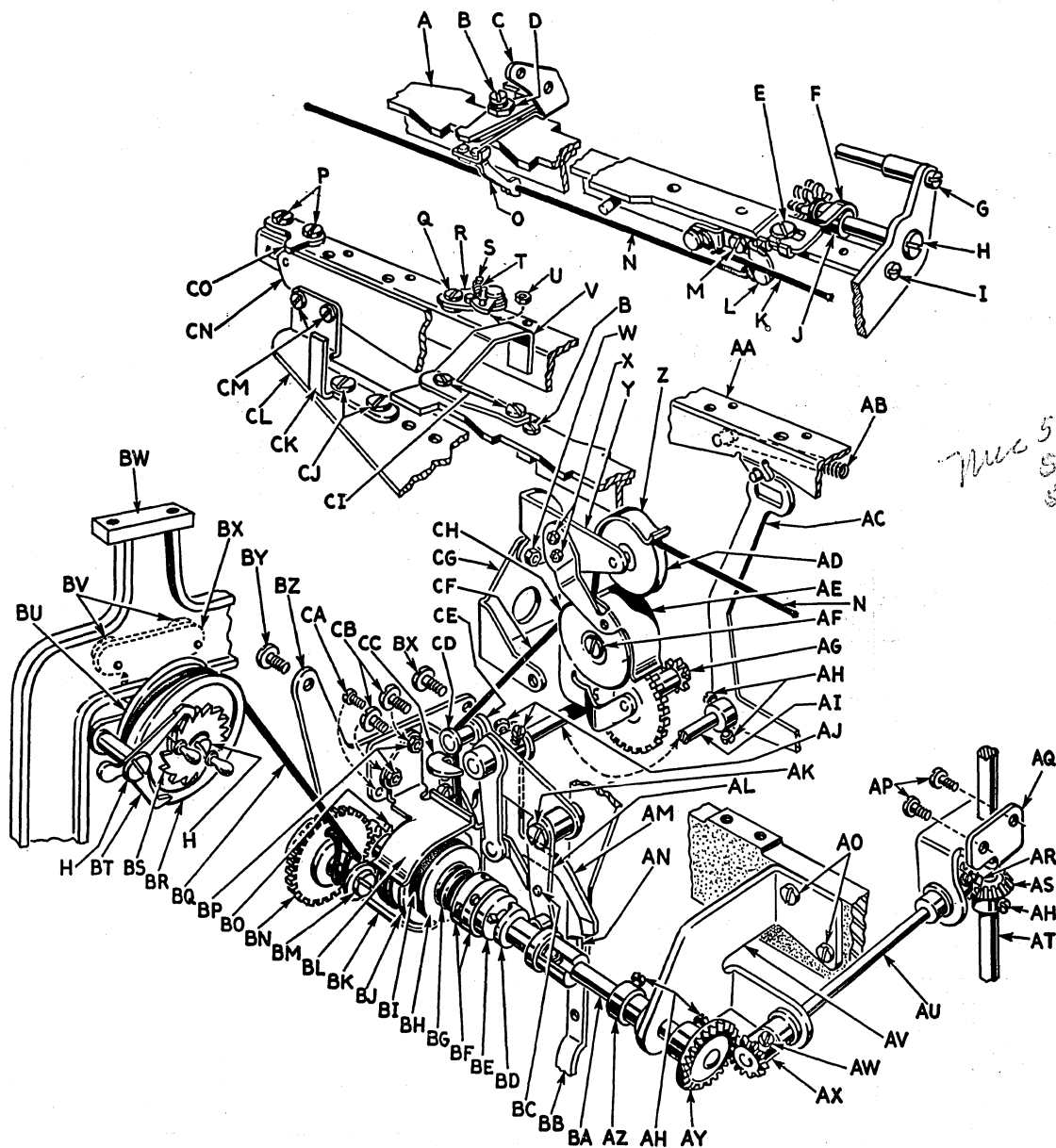
MOTOR RETURN REGISTER MECHANISM, CARRIAGE CONTROLLED, LATER (Plate 18)



SYMBOLS (Plate 18)

A	Use 73293A	Z	1-75204 1/2 A use 550 3/4 screw
B	Use 73293A	Z1	Description only
C	Use 73293A	AA	72527 1/2
D	1-73294AR	AB	1-72104B No. 3, see accumulation book, plate 20 for other styles
E	1-73294AL	AC	72104 3/4
F	1-73291		702104 1/4 A
G	1-73294 use 72820 spring	AD	79644
H	73563	AE	Description only
I	Included in AR	AF	3281 1/2
J	1-79268B shown	AF1	75621 screw, 71361 ecc.
K	1-79268C later	AG	71173 see plate 21 for other styles
L	8082A	AH	1-71175
M	Included in J	AI	71177A
N	79270A	AJ	1A-3842B
O	73563	AK	1A-71174 use 71604 screw
P	3683	AL	Use 1-75240A No. 2 for machines with motor register return
Q	72576 No. 1		Use 1-75240A for machines without motor register return
R	79804	AM	79627
S	79628A	AN	1-79275B
T	Use 1-73214C No. 2, and 73227AR No. 2 or 73227AL No. 2 if necessary		1-79275A early
U	1-79272B	AO	71605
V	79131B No. 2	AP	Description only
W	1-79265C specify No., see plate 19	AQ	79626
X	1-79130A specify No., see accumulation book, plate 8	AR	1-79269B includes I
Y	1-79117A No. 2 use 79600 screws		
	72104 3/4		

REGISTER RETURN MECHANISM, MOTOR DRIVEN—FOR 100 PINION CONSTRUCTION REGISTER SECTION—SERIES M 200 AND M 800 MACHINES (Plate 19-1)



SYMBOLS (Plate 19-1)

A See chart 1 below
 B 79505 screw
 C 1097 3/4 washer
 D 1A-79200A No. 2 includes B, D, O
 E 79309 eccentric
 F 709635
 G 1-709146 1/2
 H 79512
 I 8054 3/4
 J 79508
 K 709356 retaining nut
 L 709902 No. 1 cord, 24' long
 M 1-79277D
 N 74533
 O 709902 No. 4 cord, 21' long

O Included in C
 P 73607
 Q 79628 screw
 R 74529 screw, when R is used as permanent stop
 S 2820 1/2 washer
 T 1-79272B
 U 79642
 V 205801
 W 49 3/4
 X 709131 No. 3
 Y 46 nut
 Z 4450 5/8 A screw
 AA 49 3/8 nuts
 AB 70512 screws

Y Use 1-709273 1/2 A No. 3 includes Z, AD
 Z 709274 1/4 No. 2
 AA See chart 2 below
 AB 3683 spring
 AC 1-701215 1/2 A
 AD 1-701215 1/2 No. 3 includes AH
 AE Included in Y
 AF Use 709274 1/4 A No. 3, 1-705362B
 AG 9052 1/2
 AH 1-705227 1/2
 AI 705590 shoulder screw
 AJ 550 3/4
 AK 1-71019

(OVER)

SYMBOLS (Plate 19-1) Continued

AJ 550 1/4	AY Use 11Z-71901A before machine serial	BS Included in BR
AK 71601	No. M 5727D (M 200), M 5789D	BT 79165
AL 1-71214A	(M 800)	BU 1-79164
AM 1-705204 1/2 includes AJ	1-71901A after machine serial No.	BV 528 Fte. 216
AN Included in BB	M 5727D (M 200), M 5789D	BW 1-700666AR No. 2 side frame
AO 79548	(M 800), includes 550 1/4 set screw	BX 1-701240 bracket only
AP 3256 1/4	AZ 1-7140 3/4 includes AH	1A-701241 spring drum assembly, in-
AQ 1-707126A No. 1	BA Use 1-701017 1/4 A	cludes H, BR, BS, BT, BU, BX
AR Use 11Z-71901A before machine serial	BB 1-72104C No. 3 includes AN	83 No. 20 drum spring
No. M 5727D (M 200), M 5789D	BC 79511 screw	BY 79610
(M 800)	BD 71372A	BZ 1-701206 1/2
1-71902A No. 2 after machine serial	BE 71374A	CA 7562
No. M 5727D (M 200), M 5789D	BF 73567 set screw	CB 73611
(M 800)	BG Use 1-71373D, 1-701306A, 701377,	CC 701244
AS Use 11Z-71901A before machine serial	71626 2 req.	74533 screws
No. M 5727D (M 200), M 5789D	BH 71376	CD Included in CE
(M 800)	BI 71904Z	CE Use 1A-701208 1/2 No. 2, includes AJ,
1-71901A after machine serial No.	BJ Use 1-71373D, 1-701306A, 701377,	AK, AL, AM, BC, CD, CE
M 5727D (M 200), M 5789D (M 800)	71626 2 req., for complete clutch	CF 709902 No. 4 cord 21" long
AT Use 1AZ-701010 No. 1 before machine	assembly, includes BE, BF, BG,	CG Use 1-705127A No. 2 for 100 pinion
serial No. M 5727D (M 200),	BH, BI, BJ	construction
M 5789D (M 800)	BK 71209	Use 11-705127A No. 2 for 60 pinion
1A-701010 No. 1 after machine serial	74533 screws	construction
No. M 5727D (M 200), M 5789D	BL 71209 No. 2	CH Use 1-705362B, 709274 1/2 A No. 3
(M 800), includes 550 1/4 set screw	BM 701572	CI 73612
AU 71018	BN 1-701242	CJ 705508 1/2
AV 1-71212B	BO Use 1-701306A, 1-71373D, 701377,	CK 709118 No. 14
AW 75618	71626 2 req.	CL 709118 1/2
AX Use 11Z-71901A before machine serial	BP 46 1/4	CM 75615
No. M 5727D (M 200), M 5789D	BQ 709902 No. 2 cord, 13' long	CN 1-709105 No. 2
(M 800)	BR 1-79166 includes BS	CO See chart 3 below
1-71902A No. 2 after machine serial		
No. M 5727D (M 200), M 5789D		
(M 800), includes 75618 set screw		

CHART NO. 1

REGISTER ESCAPEMENT RACK

REGISTER CAPACITY	SERIES M 200 FRACTION NON ADD NON PRINT	SERIES M 200 WITH FRACTIONS	SERIES M 200 WHOLE NUMBERS	SERIES M 800
6 X 15			1-709130 No. 19	
8 X 9		1-709130 No. 18		
8 X 10		1-709130 No. 18		
8 X 12	1-709130 No. 16	1-709130 No. 16		1-709130 No. 16
10 X 10	1-709130 No. 17			1-709130 No. 17
12 X 8	1-709130 No. 15		1-709130 No. 15	1-709130 No. 15

CHART NO. 2

REGISTER RETURN CONTROL SLIDE

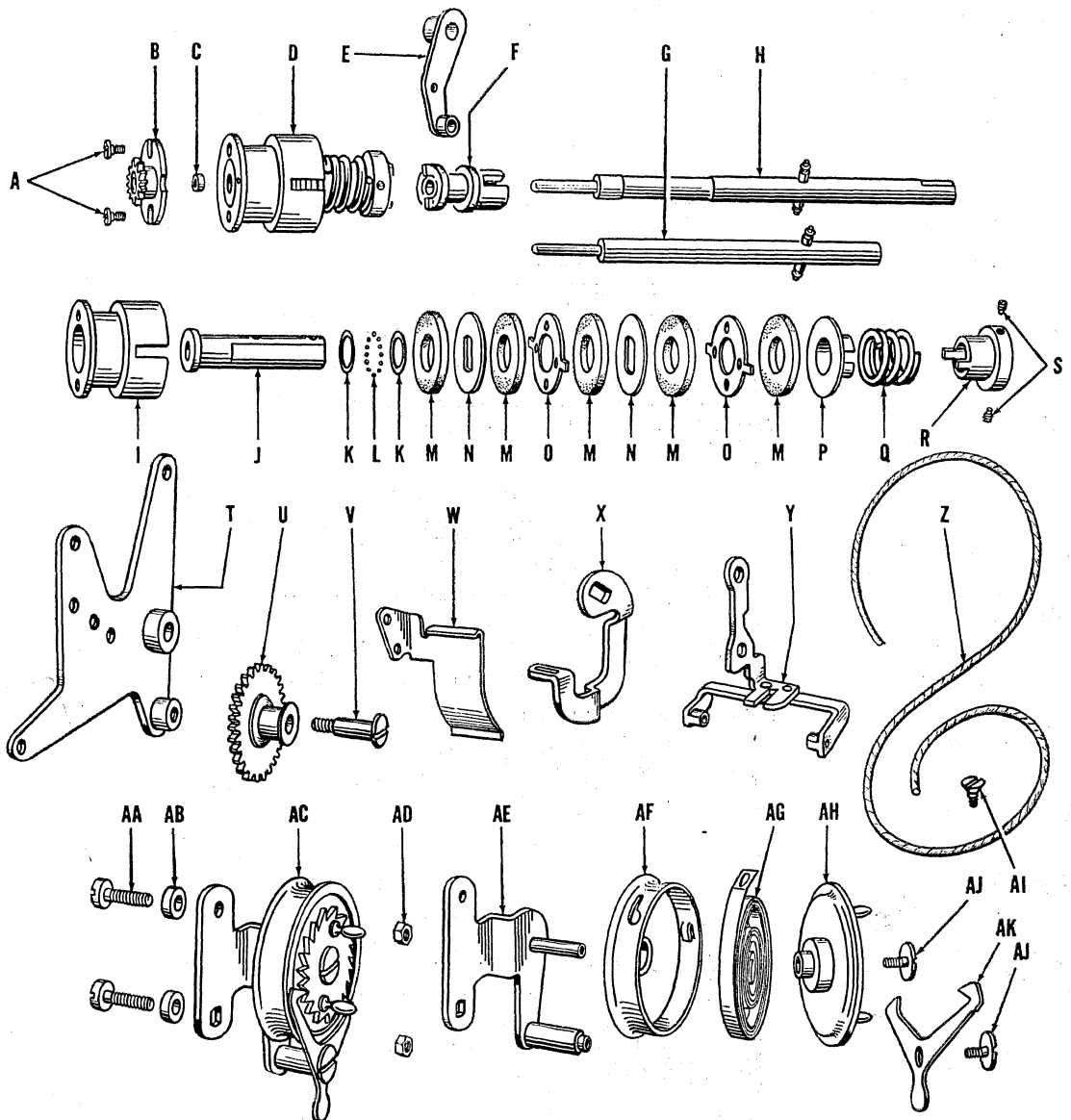
REGISTER CAPACITY	SERIES M 200 FRACTION NON ADD NON PRINT	SERIES M 200 WITH FRACTIONS	SERIES M 200 WHOLE NUMBERS	SERIES M 800
6 X 15			21-709265 No. 9	
8 X 9		31-709265 No. 9		
8 X 10		31-709265 No. 9		
8 X 12	11-709265 No. 9	11-709265 No. 9		11-709265 No. 9
10 X 10	31-709265 No. 9			31-709265 No. 9
12 X 8	1-709265 No. 9		1-709265 No. 9	1-709265 No. 9

CHART NO. 3

REGISTER RETURN STOP—NO. 1 POSITION

REGISTER CAPACITY	SERIES M 200 FRACTION NON ADD NON PRINT	SERIES M 200 WITH FRACTIONS	SERIES M 200 WHOLE NUMBERS	SERIES M 800
6 X 15			709272 1/2	
8 X 9		709272 1/2		
8 X 10		709272 1/2		
8 X 12	709272 1/2	709272 1/2		709272 1/2
10 X 10	709272 1/2			709272 1/2
12 X 8	709272 1/2		709272 1/2 No. 2	709272 1/2 No. 2

REGISTER RETURN CLUTCH AND PARTS USED FOR REPLACEMENT (Plate 19-2)



SYMBOLS (Plate 19-2)

A 71626
B 1-701306A
C 701377
D 1-71373D clutch assembly, includes I to S inc.
E 1-71214A
F 71372A
G 1-71017A No. 1 narrow base
H 1-701017½A wide base
I 71375E
J 71373D
K 71100½ 2 req., steel washer
L 75999 22 req., steel balls
M FG158 5 req., felt washers

N 408187 2 req., steel washer
O 71226 2 req., steel washer
P 71376A
Q 71816C
R 71374B
S 73567 2 req.
T 1-701206½
U 1-701242
V 701572
W 71209 No. 3
X 79143AL
Y 1A-79248 No. 2
Z 709902 No. 2 13" take-up draw cord
709902 No. 4 21" register escapement rack draw cord

AA 71518 2 req.
AB 10735½ 2 req.
AC 1A-701241 take-up spring drum assembly, includes AE to AJ inc.
AD 47½ 2 req.
AE 1-701240
AF 1-79164
AG 83 No. 20
AH 1-79166
AI 79640
AJ 8054½
AK 79165

(OVER)

SYMBOLS (Plate 19-2)—Continued

Replacement parts necessary,

For machines after Serial No. M8376D

1-71373D clutch assembly

For machines between Serial No. M8376D and No. M2519D

1-71373D clutch assembly

701377 bronze bearing in clutch assembly

1-701306A gear to drive take-up spindle

71626 2 req., screws to hold gear to clutch assembly

For machines between Serial No. M2519D and A442270

1-71373D clutch assembly

701377 bronze bearing in clutch assembly

1-701306A gear to drive take-up spindle

71626 2 req., screws to hold gear to clutch assembly

71209 No. 3 shield for clutch drum

1-701206 $\frac{1}{2}$ bracket to support right end of clutch shaft

1A-701241 take-up spring drum assembly

1-701242 take-up spindle assembly

701572 screw to retain spindle

709902 No. 2 take-up draw cord

71518 2 req., screws to retain spring drum bracket on right side

frame

Kit 260 No. 21 used to drill machine side frame

10735 $\frac{1}{8}$ 2 req., space washer between spring drum bracket and right side frame

47 $\frac{1}{4}$ 2 req., nuts for screws to retain spring drum bracket on right side frame

For machines before Serial No. A442270

1-71373D clutch assembly

701377 bronze bearing in clutch assembly

1-701306A gear to drive take-up spindle

71626 2 req., screws to hold gear to clutch assembly

71209 No. 3 shield for clutch drum

1-701206 $\frac{1}{2}$ bracket to support right end of clutch shaft

1A-701241 take-up spring drum assembly

1-701242 take-up spindle assembly

701572 screw to retain spindle

709902 No. 2 take-up draw cord

71518 2 req., screws to retain spring drum bracket on right side

frame

Kit 260 No. 21 used to drill machine side frame

10735 $\frac{1}{8}$ 2 req., space washer between spring drum bracket and right side frame

47 $\frac{1}{4}$ 2 req., nuts for screws to retain spring drum bracket on right side frame

1A-79248 No. 2 draw cord guide attached to right side of carry section

79640 screw for draw cord to register escapement rack

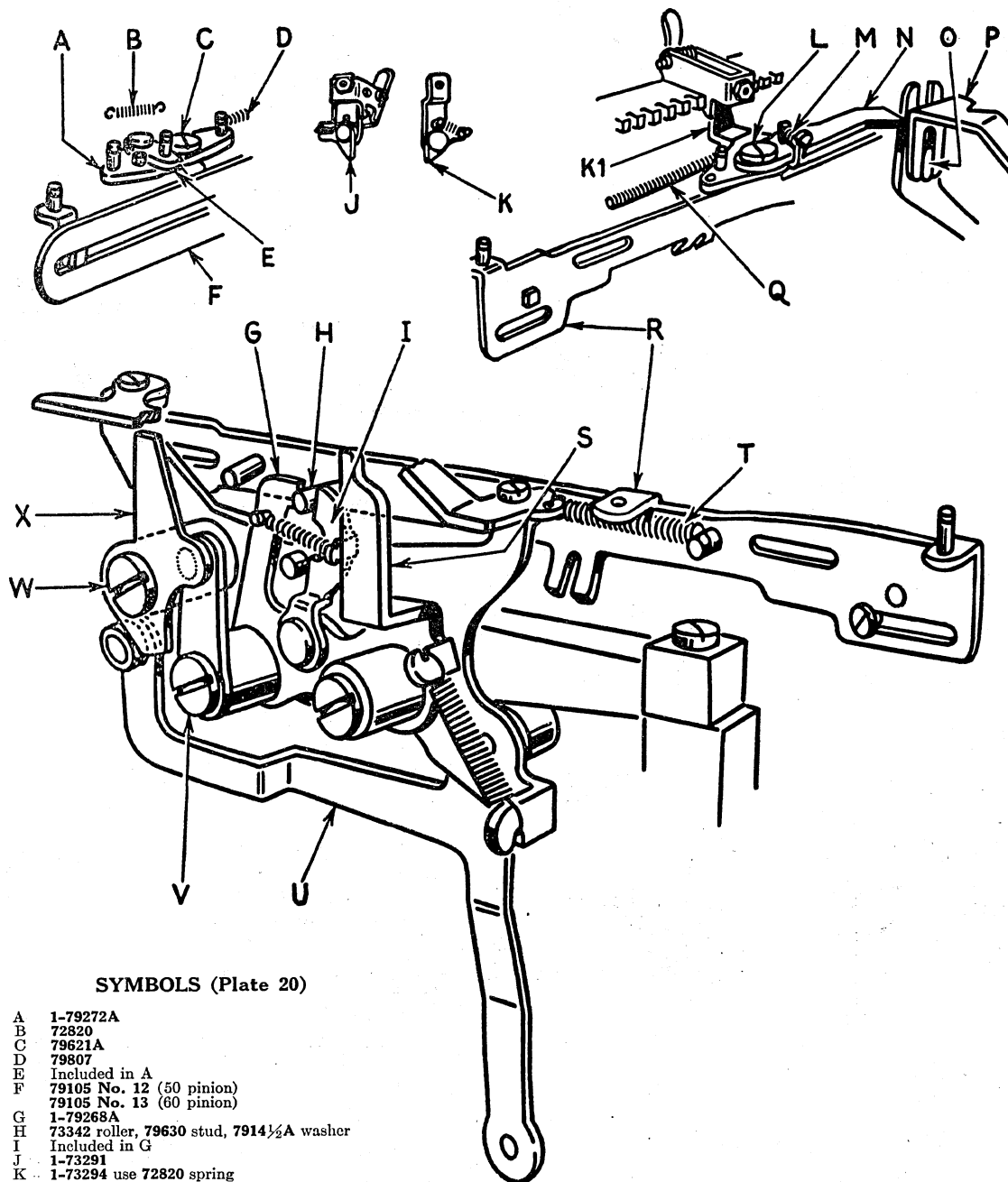
79143AL brace for left side of register section

1-71214A clutch control arm

1-71017A No. 1 clutch shaft, narrow base machines

71372A clutch dog

MOTOR RETURN REGISTER MECHANISM, CARRIAGE CONTROLLED, EARLY (Plate 20)



SYMBOLS (Plate 20)

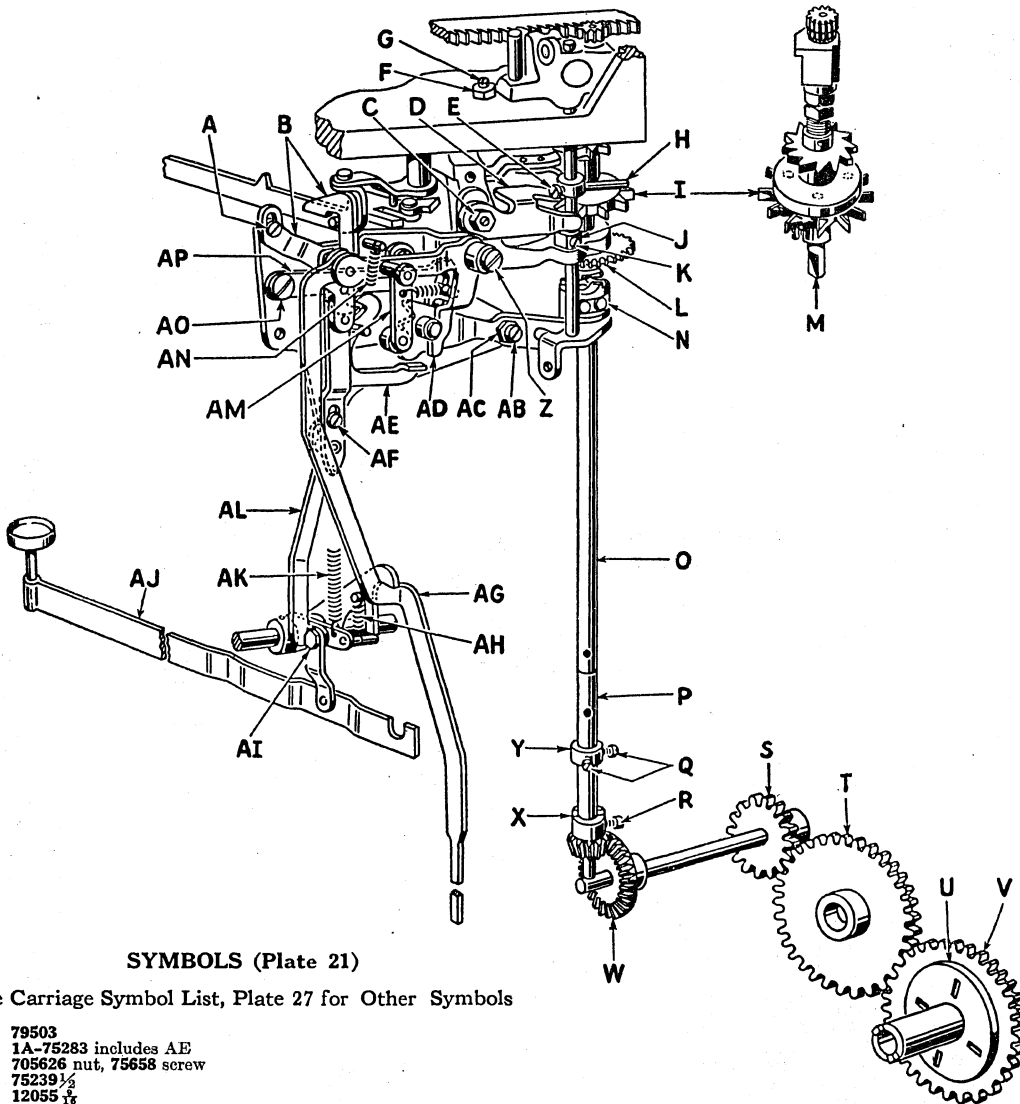
A	1-79272A
B	72820
C	79621A
D	79807
E	Included in A
F	79105 No. 12 (50 pinion)
	79105 No. 13 (60 pinion)
G	1-79268A
H	73342 roller, 79630 stud, 7914 1/2 A washer
I	Included in G
J	1-73291
K	1-73294 use 72820 spring
K1	73293
L	701571
M	3486 1/2
N	1-79281
O	75664 coupler
P	79131 No. 3
Q	10082 1/2
R	1-79265B No. 1 (6x10) with intermediate stop for 3rd reg.
	1-79265B No. 3 (6x10) with intermediate stop for 2nd reg.
	1-79265B No. 4 (8x7) without intermediate stop
	1-79265B No. 5 (7x8) without intermediate stop
	1-79265B No. 6 (6x10) with intermediate stop for 4th reg.

60 pinion

	1-79265B No. 2 (4x10) (5x10) (6x8) with intermediate stop for 2nd reg.
	1-79265B No. 7 (6x10) with intermediate stop for 3rd reg.
S	1-79268A
T	3683
U	1-79275A
V	71605
W	79626
X	1-79269A

50 pinion

MOTOR RETURNED CARRIAGE MECHANISM (Plate 21)



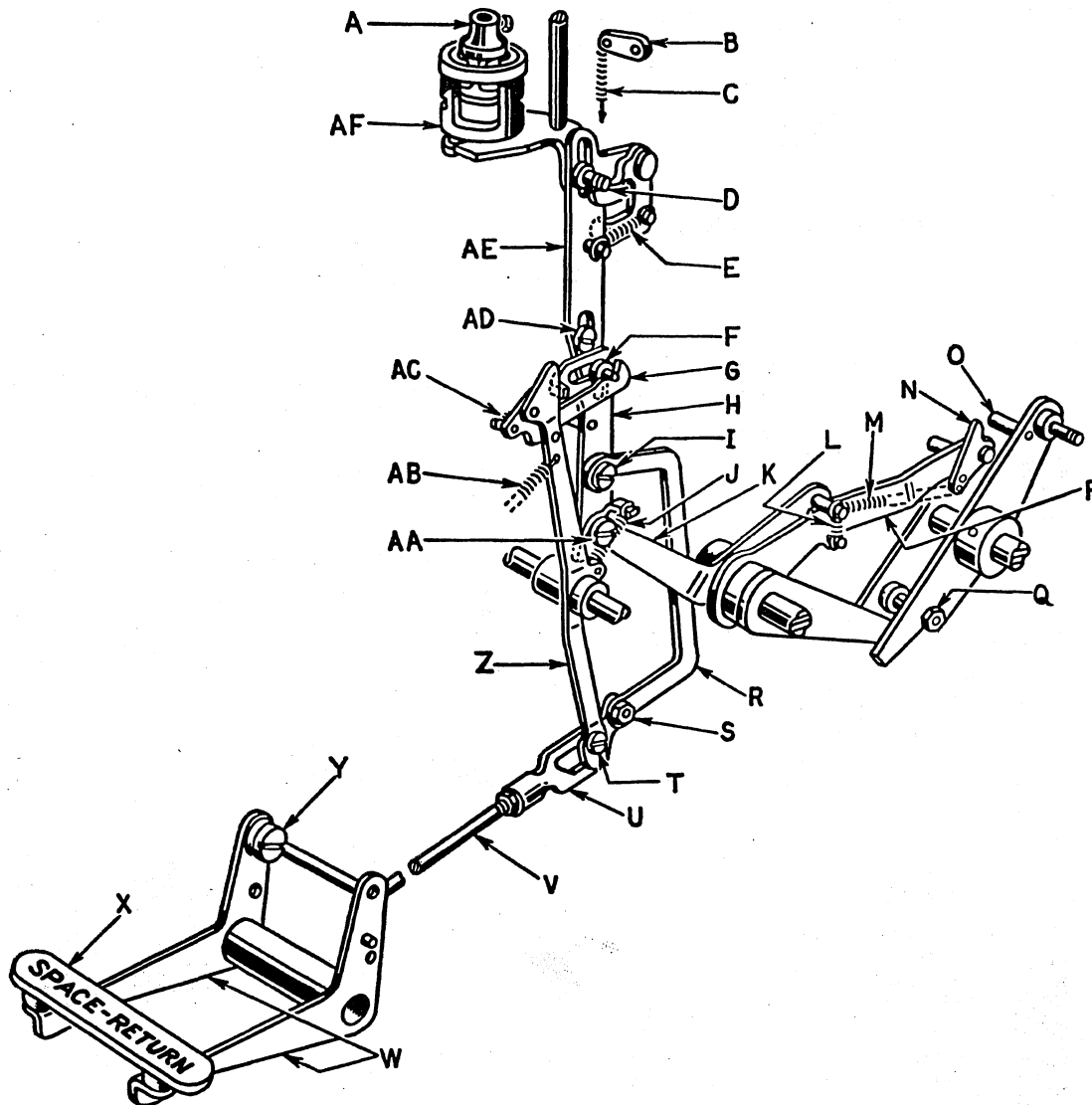
SYMBOLS (Plate 21)

See Carriage Symbol List, Plate 27 for Other Symbols

- A 79503
- B 1A-75283 includes AE
- C 705626 nut, 75658 screw
- D 75239 1/2
- E 12055 1/8
- F 47
- G 75655
- H 1-75381 includes E
- I 1-75229A
- J 1-705906 includes K
- K 73548
- L 1-705260 includes 705523A screw
- M 1B-705009 standard for all Style 12, 18, 22, 30 carriages beginning with machine No. A545022
- 705873 compression spring in casting
- 1-75009 for Style 12, 15, 18 cgs. } used previous
- 1-31 Fte. 100 for Style 22 cgs. } to machine
- 1-705009 for Style 30 cgs. } No. A545022
- N 1-705353
- O Use 1A-701010 No. 1 before machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes P, Q, R, W, X, Y
- 1A-701010 No. 1 after machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes P, Q, R, X, Y
- 701010 No. 2 lower part of split shaft
- 550 3/4
- 75618
- 1-71009B narrow base
- 11-701009A wide base
- 1-71113
- 71111
- 71112
- W Use 1Z-71901A before machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 3/4 set screw
- 1-71901A after machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 3/4 set screw

- X Use 1Z-71901A before machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 3/4 set screw
- 1-71902A after machine serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 3/4 set screw
- Y 1-701340 includes Q
- Z 506 Fte. 209
- AB 7357 1/2
- AC 72307
- AD Use 1-75240A No. 2 for machines with motor register return
- AE Use 1-75240A for machines without motor register return
- AF 79503
- AG 71173 narrow base
- 701173A No. 1 wide base, Cl. 75, 77, see Plate 12
- 1-701173 No. 3 wide base except Cl. 75, 77
- AH 44800
- AI 75581A use 46 nut
- AJ 1-75110A No. 14 black
- 1B-75110A No. 14 gray
- AK 75836
- AL 75287A
- AM 1-75241A
- AN 71805
- AO 75582
- AP 1-75285A

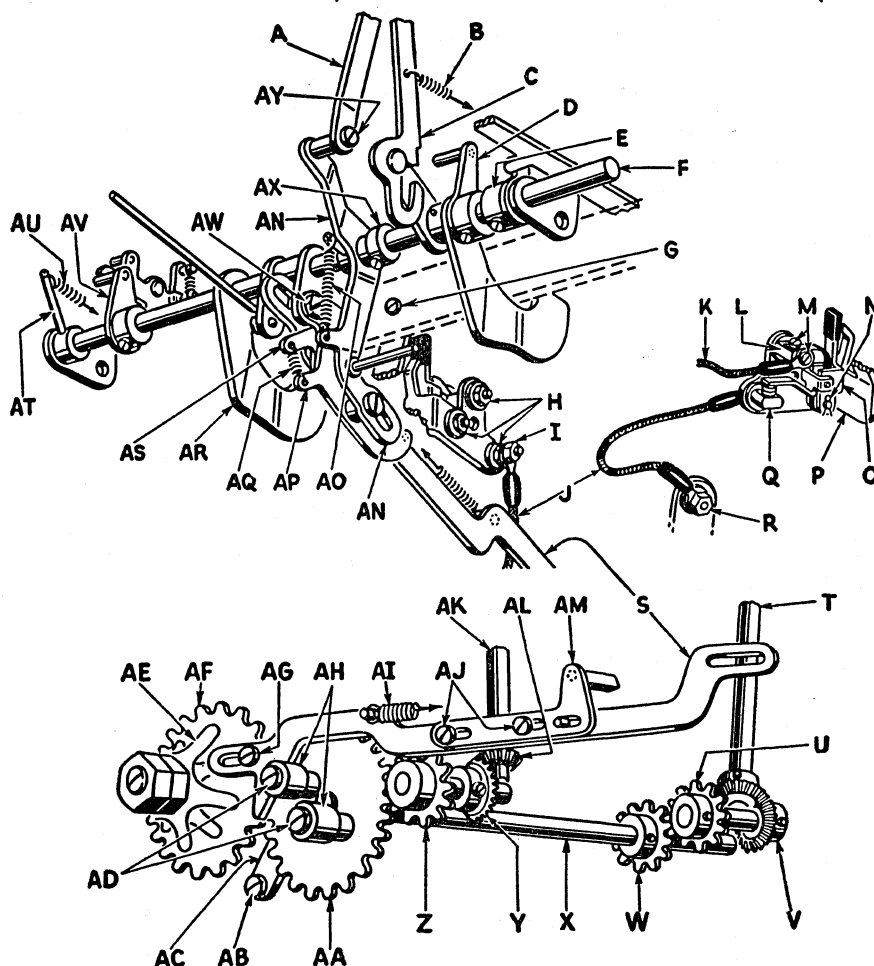
MOTOR BAR TO CONTROL CARRIAGE RETURN MECHANISM (Plate 22)



SYMBOLS (Plate 22)

A	1-75323 No. 1 includes 72573 screw	T	517A Fte. 146
B	156 Fte. 146	U	1-158A Fte. 146
C	1086	V	1-710A Fte. 146 No. 1
D	519 Fte. 146		Cl. 72
E	7287 Style 10		1-710A Fte. 146 No. 2
F	Included in H		Cl. 74, 76
G	Included in Z		1-710A Fte. 146 No. 3
H	1-133A Fte. 146 includes F, AE		Cl. 78
I	79511	W	11-310 Fte. 146
J	3489 $\frac{3}{4}$	X	2-72125 No. 1 specify space and return, use 73612 screws
K	Included in P	Y	72572 No. 1
L	12383	Z	1-136A Fte. 146 includes G
M	72827	AA	72576 No. 1
N	1-131 Fte. 146 use 72528 $\frac{1}{2}$ rivet	AB	71805
O	508 Fte. 146	AC	76806 srping
P	1-135 Fte. 146 No. 2 wide base	AD	77529
Q	45	AE	Included in H
R	159A Fte. 146	AF	1-75353
S	49 nut, 75621 screw, 71361 ecc.		

MOTOR TRIP MECHANISM, SELECTIVE SKIP TABULATION (Plate 23)



SYMBOLS (Plate 23)

See Carriage Symbol List, Plate 20, for Other Symbols

A	705282	
B	72814	
C	Use 705285A, 1B-702037 No. 3 for machine with register subtraction	
	705285A, 11B-702037 No. 3 for machines without register subtraction	includes
	705285A, 21A-702037 No. 3 for sterling machines with register subtraction	AN, AX
D	1-702138 includes 51550 screw	
E	1-702131 No. 2 use 51550 screw	
F	Use 1B-702037 No. 3, 705285A for machines with register subtraction	
	11B-702037 No. 3, 705285A for machines without register subtraction	includes
	21A-702037 No. 3, 705285A for sterling machines with register subtraction	AN, AX
G	72567 screw, 46 nut	
H	46 1/4	
I	46	
J	1-71703	
K	1-701700	
L	4556 1/4 No. 5	
M	4553 1/4	
N	21 No. 17	
O	1Z-701164	
P	1-701162 includes L, M, N, O, Q	
Q	1-701556 lower switch point	
R	46	
S	1-701225C includes AJ, AM	
T	1-701018A	
U	1A-701016	
V	Included in U	
W	Included in X	
X	1-701017 without sel. col. tab.	before machine serial No.
	11-701107 with sel. col. tab.	A268363. With cast iron plate,
		includes W, AA, AD, AH
	11-701017A with or without sel. col. tab. after machine serial No. A268363. With die cast plate, includes W, AA, AD, AH	

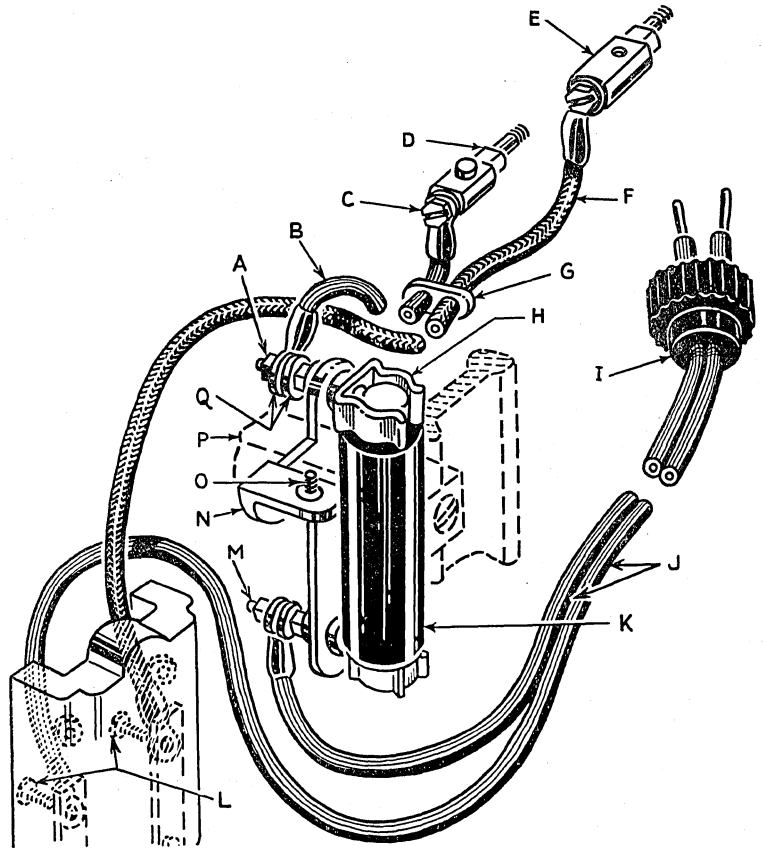
Y	Use 1Z-71901A before mach. serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 1/4 set screw
	Use 1-71901A after mach. serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 1/4 set screw
Z	11-701009A
AA	Included in X
AB	73612
AC	Use 701229B, 259 1/2 screw, 46 nut
AD	703594
AE	701117
AF	71112
AG	74529
AH	701354
AI	701802
AJ	952 1/4
AK	Use 1AZ-701010 No. 1 before mach. serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes Y, AL
	Use 1A-701010 No. 1 after mach. No. M5727D (M200), M6149D (M700), M5789D (M800), includes Y, AL
AL	Use 1Z-71901A before mach. serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 1/4 set screw
	Use 1-71902A after mach. serial No. M5727D (M200), M6149D (M700), M5789D (M800), includes 550 1/4 set screw
AM	1-701225 1/2
AN	1-702132A
AO	10983
AP	1-701231 includes AQ, AS
AQ	71803
AR	1-702247A No. 2
AS	Included in AP
AT	705506A
AU	3683
AV	1-702141 includes 51550 screw
AW	701569 screw, 701356 nut
AX	1-75332 includes 75618 screw
AY	76500

WIRING DIAGRAM FOR OVERDRAFT LIGHT (Plate 24)

SYMBOLS (Plate 24)

See Accumulation Symbol List,
Plate 38 for Overdraft Light Signal

- A 46
- B Description only, included in F
- C 4553 1/2
- D 1-79556 1/2, switch point, lower post
- E 4556 1/2 No. 5
- F 1-75909 No. 2.
- G 200928
- H 200202
- I 200927A
- J 1-79936A No. 2 } includes I,
1A-79936 No. 2 } with resistance
early } coil
- K 1-79936A No. 1 } without
1A-79936 early } resistance coil
- L 1B-200911 specify resistance, see plate
3-1 series "H," power symbol list
- M 4252
- N 200538 1/2 No. 1 screw, 1097 1/2 lock
washer, 7919 1/2 A washer, 46 1/4 nut,
46 nut
- O 1A-160 Fte. 133 complete bracket,
includes A, F, H, I, J, M, Q
- P 10960 1/2
- Q 74000 No. 2
- R 7919 1/2 A washers

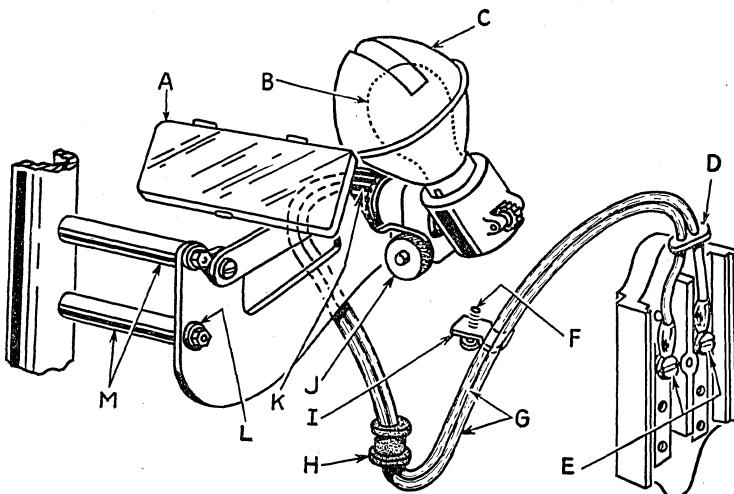


WIRING DIAGRAM FOR ALIGNING LIGHT (Plate 25)

SYMBOLS (Plate 25)

See Carriage Symbol List,
Plate 37 for Other Symbols

- A 999 Fte. 133 No. 1 long
- B 999 Fte. 133 No. 2 short
- C 200906 No. 1 flame tinted bulb
- D 200906 No. 2 white bulb
- E 200906 No. 3 green bulb
- F 175 Fte. 133
- G 200928
- H 4252
- I 73612
- J 1-75908 No. 5
- K 70994 (93 1/2 No. 4)
- L 71199 (93 1/2 No. 4, 5 or 6)
- M 200570A
- N 200927A
- O 824 1/2 washer
- P 513 Fte. 133 No. 1 } use 2864 1/2
short } screws, 1097 1/2
- Q 513 Fte. 133 No. 2 } washers on
long } inside of
- R 513 Fte. 133 No. 3 } typewriter
medium } leg



TYPE 70 MACHINES CARRIAGES

Instruction Book

April, 1942

Issued _____

To _____

Of _____

Property of and to be returned to
**BURROUGHS ADDING
MACHINE COMPANY**
DETROIT, MICHIGAN

CARRIAGES

FOREWORD

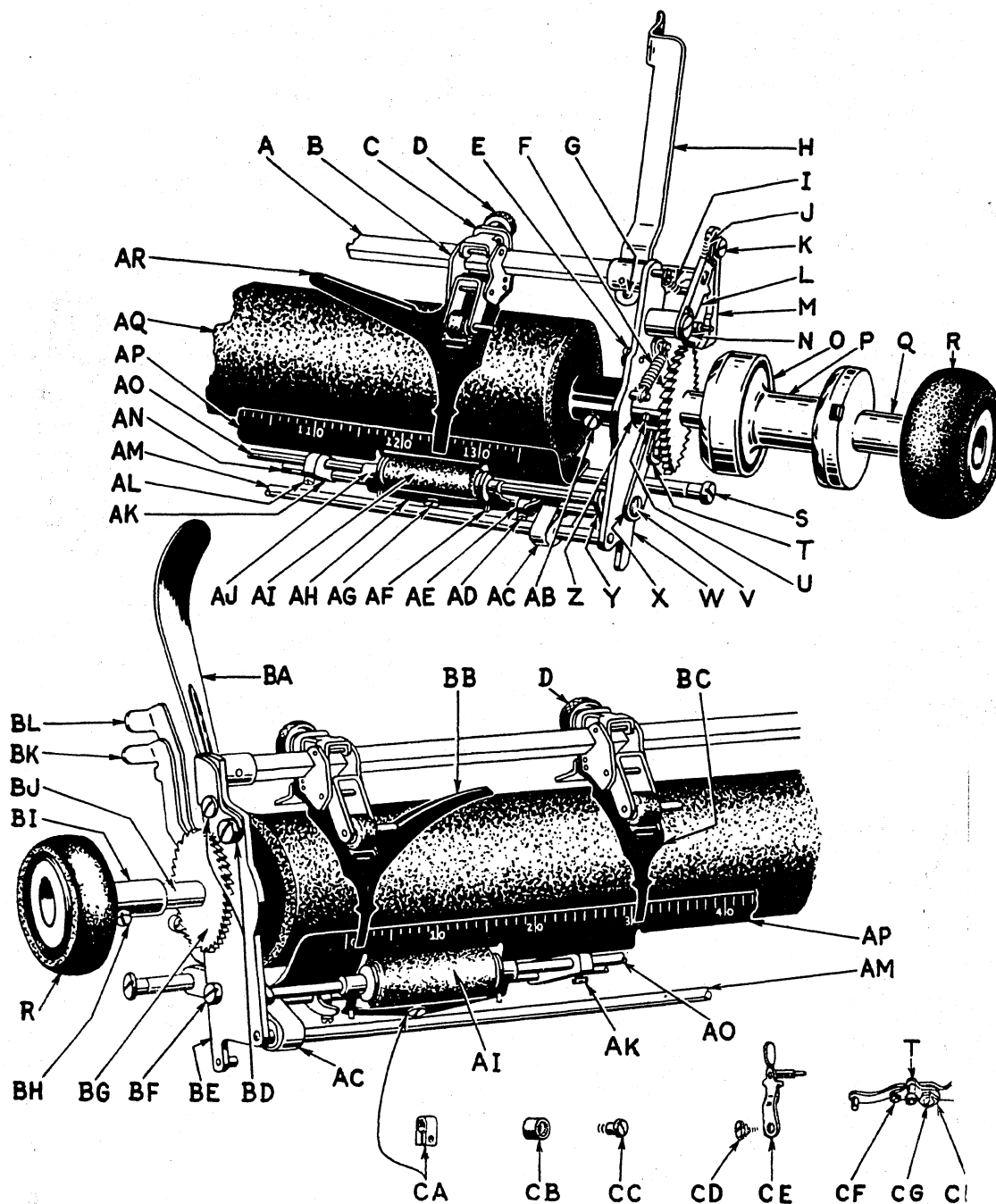
This instruction book deals with the different styles of carriages used on Type 70 machines. The construction of carriages, the carriage mechanisms and the tests and adjustments are explained under their proper headings.

Carriage return, skip tabulation and all mechanisms related to carriages, and commonly used, are covered. General and special prints on new or improved carriage construction and mechanisms are also included.

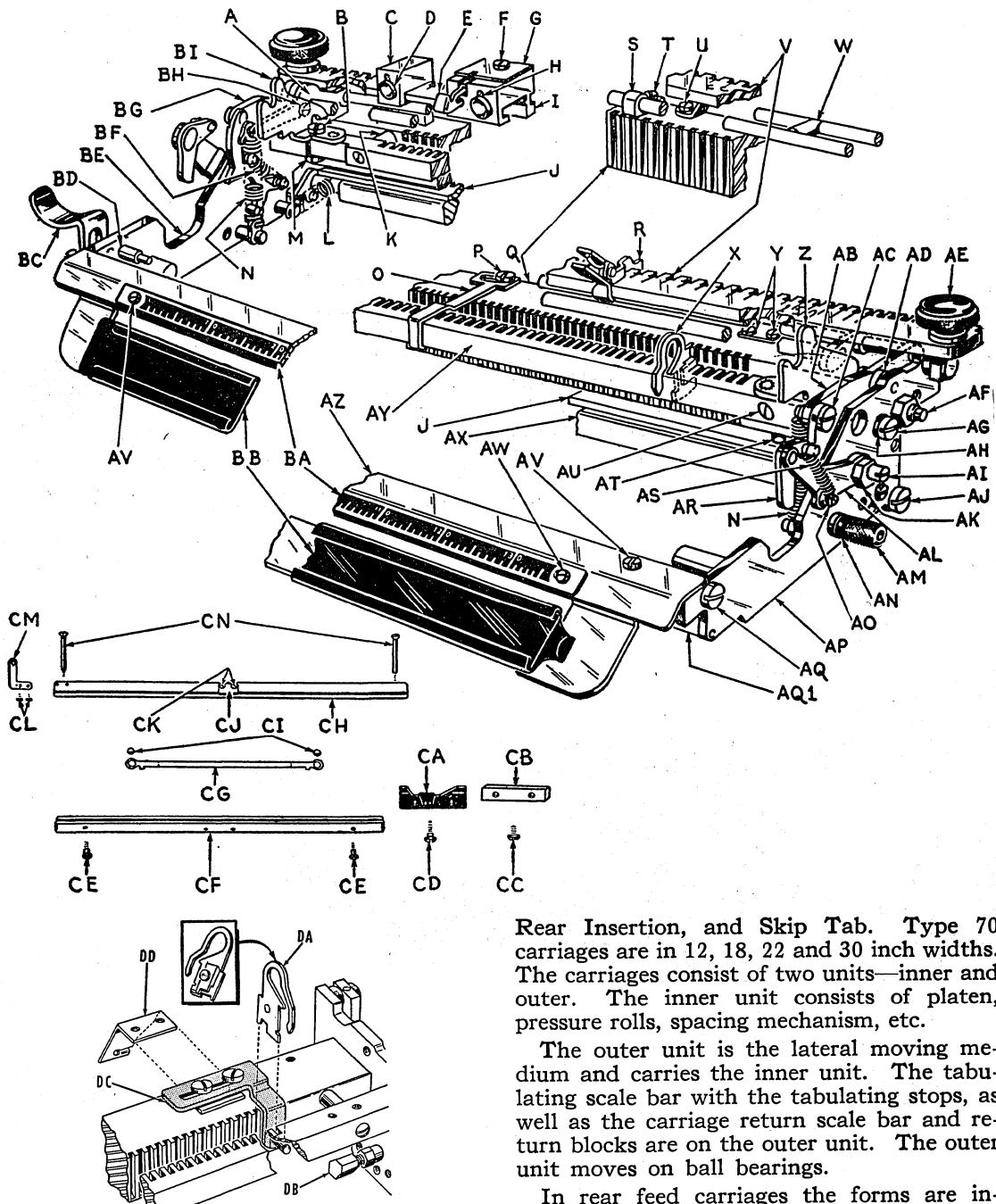
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INNER CARRIAGE (STANDARD) (Plate 1)



OUTER CARRIAGE, REAR INSERTION STYLE (FRONT VIEW) (Plate 2)



**Outer Carriage, Rear Insertion Style
(Front View) (Plate 2)**

Type 70 Carriages

Three styles of carriages are used on Type 70 typewriters: Front Insertion (Collating),

Rear Insertion, and Skip Tab. Type 70 carriages are in 12, 18, 22 and 30 inch widths. The carriages consist of two units—inner and outer. The inner unit consists of platen, pressure rolls, spacing mechanism, etc.

The outer unit is the lateral moving medium and carries the inner unit. The tabulating scale bar with the tabulating stops, as well as the carriage return scale bar and return blocks are on the outer unit. The outer unit moves on ball bearings.

In rear feed carriages the forms are inserted around the platen from the rear using the twirler. Adjustable guides on the back plate of the carriage guide the forms to proper position and paper fingers guide it around the platen. The writing line is aligned to pointers on the paper fingers. Two front red tip scale pointers indicate the writing point. The

(Plate 2)—Continued

left pointer indicates the printing position of the cents column of the adding machine and the right-hand pointer indicates the typing position.

Rebound Dog Restoring Stud (Adjustable) with Special Tabulator Stop

Adjustable rebound dog restoring stud bracket DC is used in place of the stationary rebound dog restoring stud to assure against a rebound of the carriage when tabulating into a tabulator stop position $1/10''$, $2/10''$, or $3/10''$ from the carriage limit. Stud bracket DC permits full use of the right end of the carriage platen—for typing or listing and totaling—in order to meet form requirements.

The stud bracket is assembled to the rear tabulator stop bar, on top of carriage tabulator cord bracket DD. The stud on the bracket assumes the position and function of the stationary rebound dog restoring stud when the bracket is positioned all the way to the left. However, when it is necessary to tabulate the carriage to a tabulator stop positioned $1/10''$, $2/10''$, or $3/10''$ from carriage limit screw DB, the restoring stud bracket is moved to the right. Positioning of the restoring stud bracket to the right permits rebound dog AA (Plate 18-1) to remain in active (upward) position when tabulating the carriage to a tabulator stop positioned $1/10''$, $2/10''$, or $3/10''$ from the carriage limit, thus preventing a carriage re-

bound causing irregular columnar printing alignment.

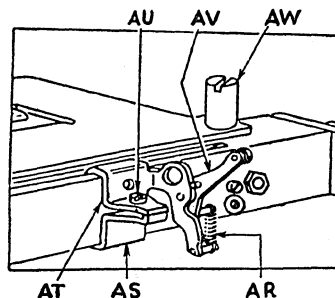
Special tabulator stop DA is used in conjunction with restoring stud bracket DC whenever the bracket is moved to the right. The special stop is always located in the last slot of the tabulator stop bar and assumes some of the functions of the adjustable restoring stud. It contains a wide slot which permits the carriage rebound dog to rise to its active position and prevent a carriage rebound during carriage tabulation when a regular tabulator stop is located either $1/10''$, $2/10''$, or $3/10''$ from the carriage limit. The special stop unlatches the tabulator arm when the carriage reaches its limit. Also, the lug on the stop is slotted in such a manner as to permit the tabulator arm to rise when tabulation is indexed at the carriage limit and at the same time prevent the arm from latching in a raised position.

Adjustment

1. When the carriage is tabulated to a position either $1/10''$, $2/10''$, or $3/10''$ from the carriage limit, the adjustable stud should be set as near as possible to the rebound dog without interfering with its upward movement to assure that the rebound dog will be raised to prevent rebound of the carriage and be lowered sufficiently to be relatched at normal.

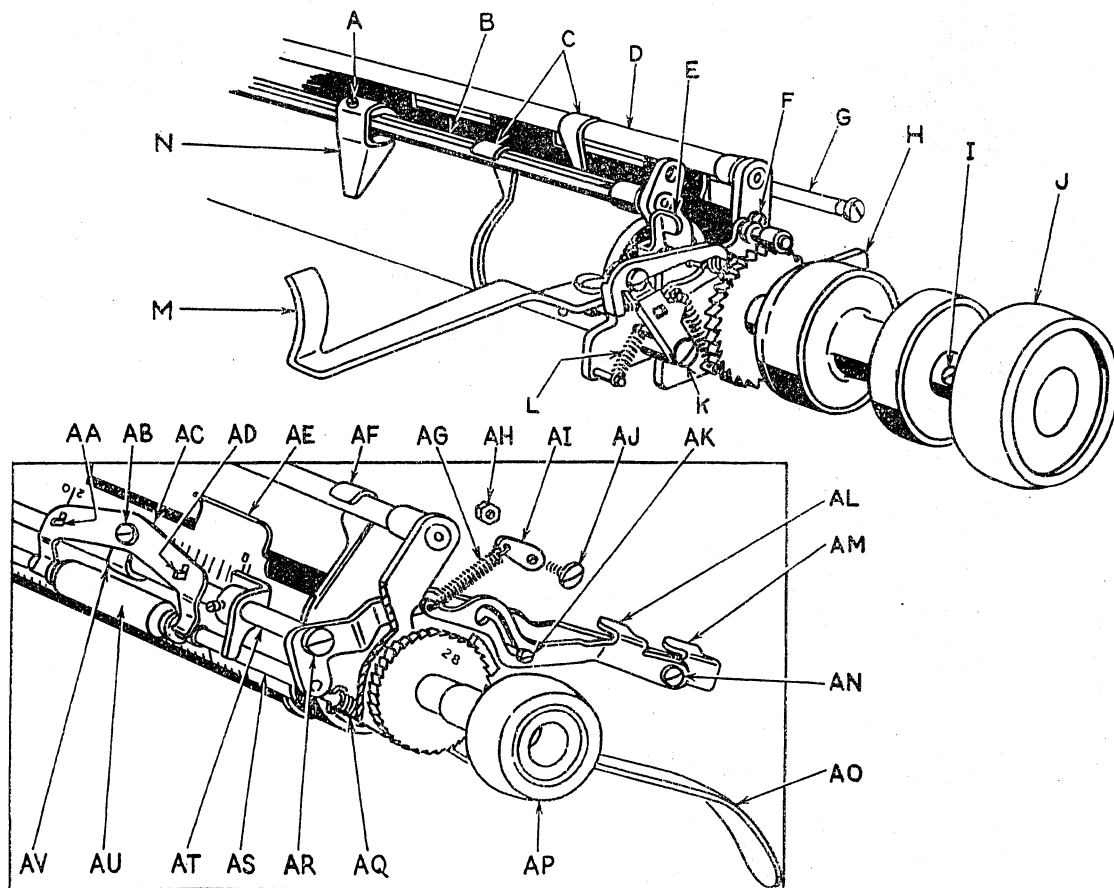
To adjust, position adjustable stud bracket DC.

(Plate 3)



COLLATING CARRIAGE, INNER (Plate 6)

(Plate 5 in Symbol Book only)



Collating Table Carriage

Collating table provides a flat surface for fast insertion and alignment of forms. The table is located on the outer carriage in front of the platen. When the platen is raised and the pressure roll release lever AM (Plate 6) is latched down, an open throat is formed on a plane with the flat surface of collating table, permitting fast, easy insertion of forms, and their removal from the front.

When the pressure roll assembly is in upper position, it must be released before the platen is placed in printing position in order to prevent rack bar type catching on the paper table. When the operator lowers the inner carriage without unlatching the pressure roll, long screw AW (Plate 4) limits the carriage sufficiently to hold the printing control, which prevents the hammers releasing and the type catching on the paper table.

The purpose of pressure rolls AD (Plate 4) is to hold the front inserted forms to the platen.

Pressure Roll Adjustments

Standard and collating pressure rolls are adjusted for equal pressure as follows:

Loosen screw AB (Plate 6) and swing block AV. Test all pressure rolls with finger.

On 22" and 30" Skip Tab machines, loosen screw X (Plate 7) and swing Plate W to adjust tension of pressure rolls. Geared pressure roll instructions are covered in Plate 30.

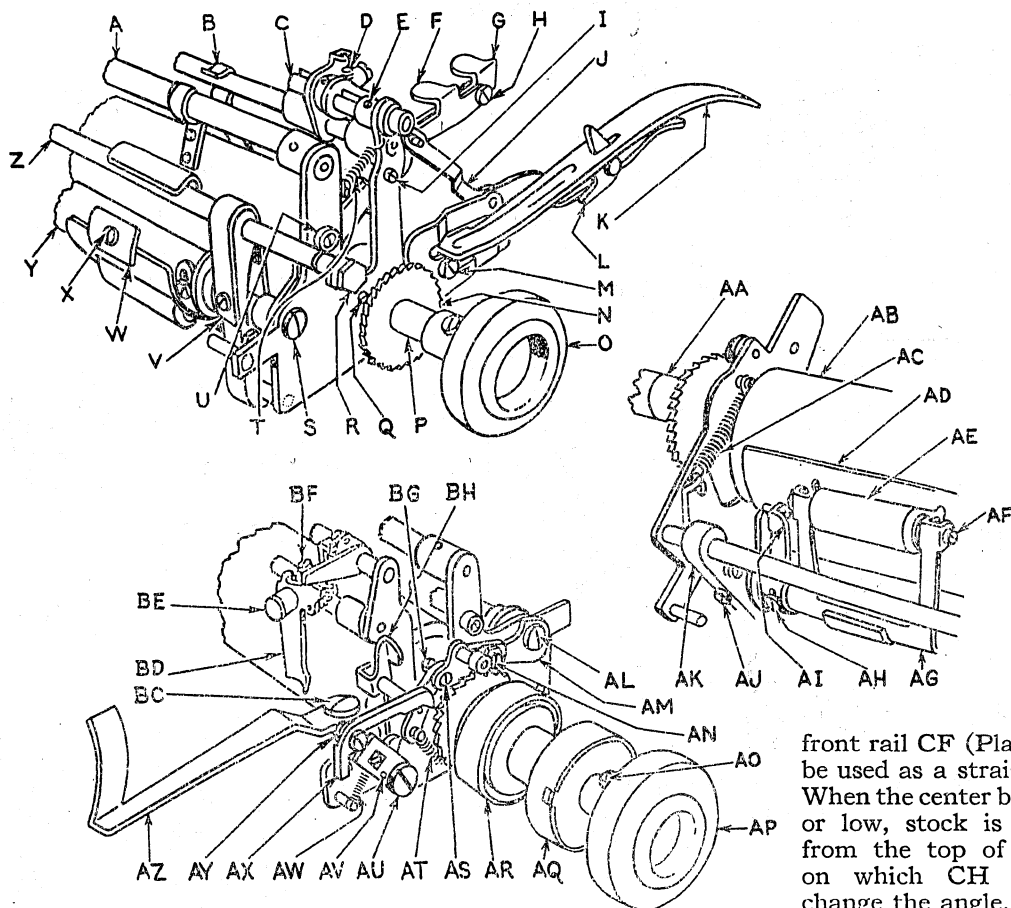
Pressure Roll Release (Plate 1)

To remove play of shaft AO loosen screws AL in tie block AK, holding handle BL upward, and then tighten screws in block AK in this position.

Setting Paper Table AP (Plate 1)

Print letter I, loosen set collar AE and align center graduation of AP with letter I. Paper table AP should have minimum end play between collar AE. Paper table AP should also have equal clearance with platen when the pressure roll release lever is latched. Adjustment is made by bending ears on AP.

COLLATING CARRIAGE, INNER, 22" AND 30" (Plate 7)



Platen Shift Motion

Rear limit (normal) should have minimum clearance between ratchets and space pawls BE and H (Plate 3). Adjust screw BC.

Forward motion of platen should align "&" sign with capital N which is adjusted from shift key wire. To prevent overthrow, forward limit screws M (Plate 3) are set with minimum clearance on side Plate H (Plate 6).

Vertical Spacing

When spacing pawl BE (Plate 3) reaches its normal position, detent AM (Plate 7) should seat in the ratchet teeth without over or under throw. Adjust eccentric AN.

Installing Carriages

When a change of carriages is made, the tests explained herewith should be applied and, if necessary, such adjustments made as to insure that these tests will be correct.

1. Test rail CH (Plate 2) for being level; place rail CH in position on lugs, fasten with screws CN (Plate 2). Place three steel balls on CH, one in center and one at each end. Apply a straight edge on the top of the balls,

front rail CF (Plate 2) can be used as a straight edge. When the center ball is high or low, stock is removed from the top of the lugs on which CH rests, to change the angle.

If the rail is higher at the center ball, stock is removed from the side of the lug nearest to center ball, so that when the rail is placed in position, screws CN (Plate 2) will draw rail downward.

If rail is lower at center ball, stock is removed from the opposite side of the lug so as to draw rail upward.

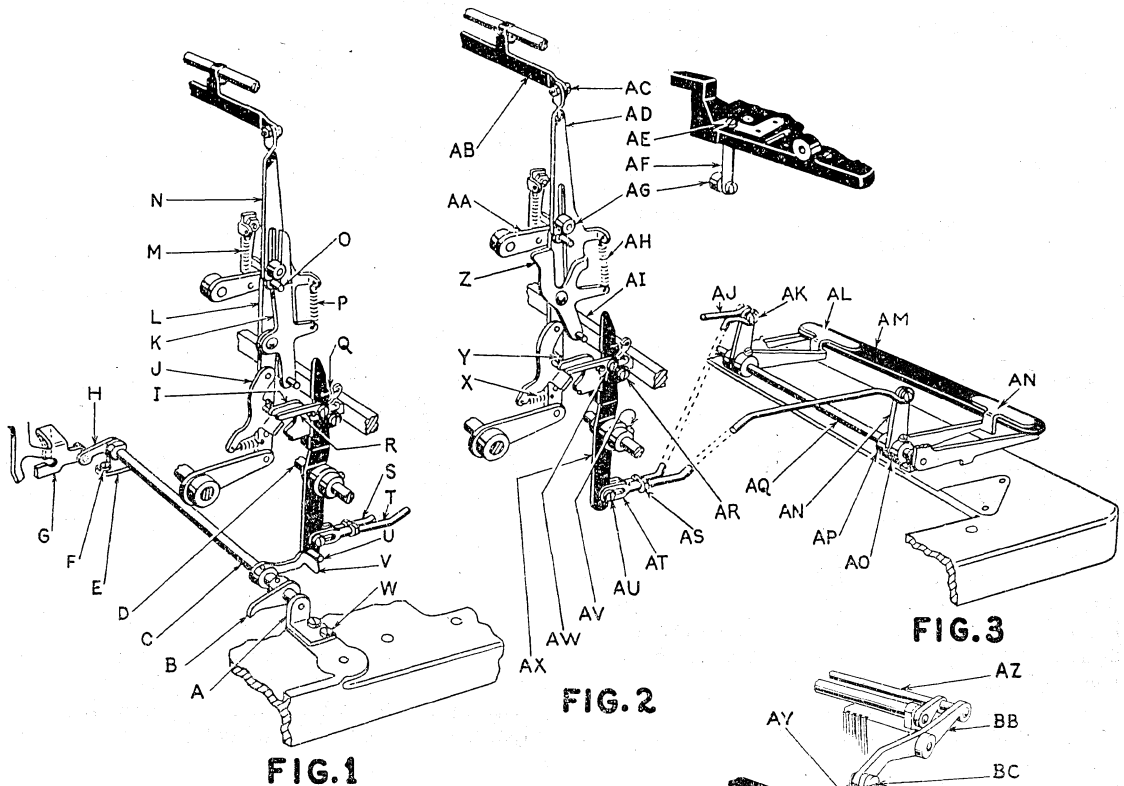
2. Place balls and carriage in position and test carriage for free movement, if not free, loosen eccentrics BI (Plate 3).

Now test the carriage for being level on both rails, that is, when it contacts on all balls, which is indicated by a complete absence of a rocking motion. If necessary, a little stock can be removed from the high point in the bottom of the hole through which screw CE (Plate 2) passes.

3. When the carriage is free moving and level, eccentrics BI (Plate 3) are adjusted. The purpose of these eccentrics is to eliminate all play between the rails. The center eccentrics are adjusted first by loosening screw BJ (Plate 3) and turning BI. The balance of the eccentrics are adjusted in the same manner.

VERTICAL FEED BAR (Plate 11)

(Plates 8, 9 and 10 in Symbol Book only)



Vertical Feed Bar (Plate 11)

The purpose of this mechanism is to stop platen feed to permit typing on the same line with machine calculating figures. The standard mechanism (Fig. 2) non-feeds when regular motor bar AM or multiplying keys are used. To feed the paper, feed bar AN or tabulating feed bar AL is used. The mechanism shown by Fig. 1 permits feeding when the regular motor bar is used. To non-feed, bar AN or AL is used.

Sequence (Fig. 2): When feed bar AN is depressed, wire T (Fig. 1) rocks assembly AX; the latter swings coupler Z in line with stud O in arm AA which is the spacing position. In this position, AX is latched by latch I. The purpose of arm R is to swing restoring arm J to clear latch I to allow the latter to engage the projection of AX.

During the machine operation arm AA through stud O rocks arm AB, which in turn rocks bail AZ and lever BB; the latter raises feed pawl BD, indexing it one or two teeth for single or double spacing. On the return stroke the downward movement of pawl BD spaces the platen, arm J raises latch I and the entire mechanism is restored.

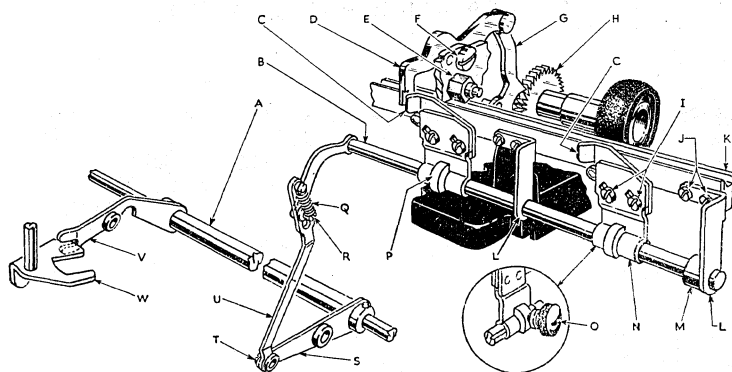
The feeding mechanism is actuated in Fig. 1 through coupler K in the same manner as in Fig. 2 when the regular motor bar is used. To non-feed, depress AN or AL to cause assembly AX to swing coupler K out of the range of stud O. When the multiplier or subtract keys are depressed, part G rocks arm H, which through arms B and V rocks assembly AX to swing coupler K to clear stud O.

Tests and Adjustments

When the feed bar is depressed, latch I should be latched on the lip of AX before the drive is tripped. This adjustment is made by turning turnbuckle AT. When a multiplier or subtract key is depressed (Fig. 1), cam G, arms H, B and V should latch I.

Adjustment: Arm V is bent upward or downward as required. If this adjustment is made, coupler K should be checked for resting on roller AG, also check coupler K to clear N when a multiplier key is depressed.

CARRIAGE RETURN SPACING MECHANISM (Plate 12)



Carriage Return Spacing Mechanism (Plate 12)

When the carriage return clutch is engaged, the upward movement of Plate W, through arm V, rocks shaft A; arm S raises link assembly U which rocks shaft assembly B; the latter swings spacing cam assemblies C in line with spacing pawl lever D. The returning carriage moves the foot of spacing pawl lever D over cam C, rocking the latter which causes pawl G to engage ratchet H and thereby space the platen.

When both cams C are indexed, a double space is secured, however, when a single space

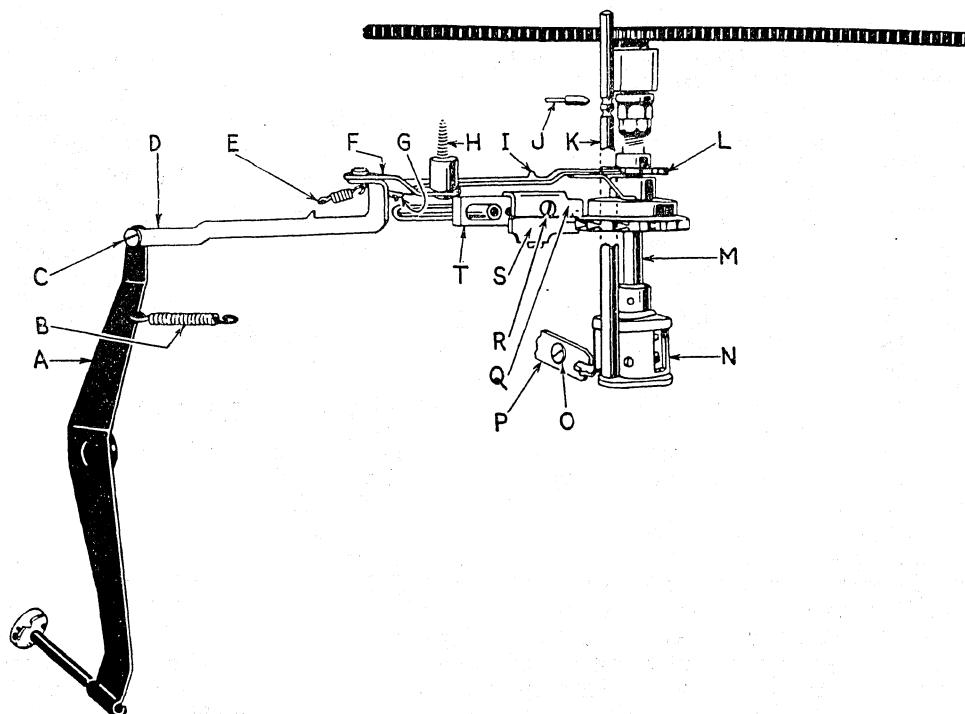
is wanted thumbscrew O is released and the cam turned downward out of range of spacing pawl lever D.

The correct amount of movement to seat detent W (Plate 31) in the tooth spaces of ratchet X (Plate 31) is secured by loosening screws I and locating cam C as required.

Tests and Adjustments

With the carriage return key depressed, the height of spacing cam C should turn the platen one full space without overthrow. To adjust, loosen screws I and set cam as required.

BACK SPACE LEVER (Plate 13)



Back Space Lever (Plate 13)

When the back spacer key is depressed, escapement shaft M is manually given a reverse movement equal to 1 space.

Back spacer ratchet L is carried by escapement shaft M which is actuated by pawl I. The latter pivots on arm F which is connected to back space lever A by link D.

Tests and Adjustments

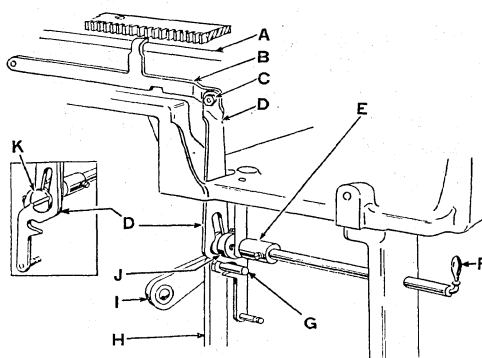
To insure positive spacing, pawl I must have sufficient hold on ratchet L. More than .003" clearance between I and shaft K can reduce the hold. Insufficient or no clearance

between I and K can cause I to stick. Clearance is secured by removing stock from I where it contacts on shaft K. Excessive clearance is corrected by installing a new pawl I.

The point of pawl I must clear the teeth of ratchet L. To secure clearance at this point, bend D towards the center of the machine.

There must be slight play between I and arm F to insure complete return to normal of I. To secure play, bend I to be parallel with arm F.

To remove pawl I, withdraw shaft K, unhook spring E and remove screw G.

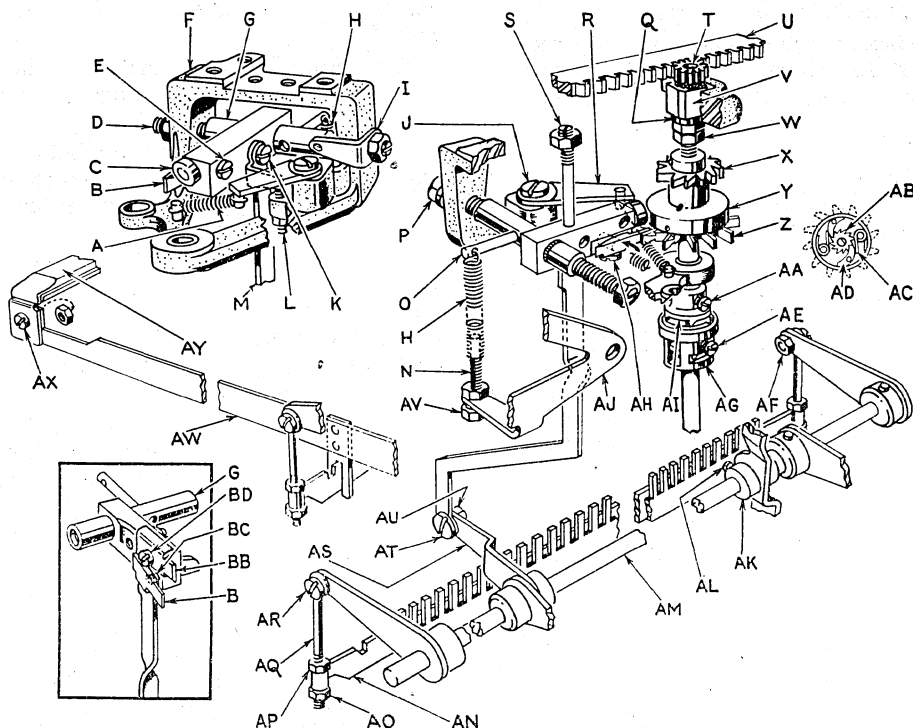
SPACE OR NON-SPACE CONTROL (EARLY) (Plate 14)**Space or Non-space Control (Early)
(Plate 14)**

When control lever F is turned from upward to downward position, collar J is turned; shoulder screw K, which acts as a guide is

located off center in J, which causes J to swing link D off stud G, thereby disconnecting the feed mechanism.

This mechanism is not used in late machines, space and non-space being obtained through vertical feed bar (Plate 11).

ESCAPEMENT AND SPACE BAR MECHANISM (Plate 15)



Escapement and Space Bar Mechanism (Plate 15)

The purpose of this mechanism is to laterally space the carriage one type width when typewriter keys are depressed. When one or more blank spaces are required the space bar is depressed.

One end of barrel spring (Plate 25) which is attached to the carriage through E is placed under increased tension when the carriage is moved to the right, the carriage being held by escapement dog B seating in one of the tooth spaces of escapement wheel Z. Escapement shaft T has an integral pinion which is meshed with rack U. Shaft T carries ratchet Z and pawl assembly Y.

When a typewriter key or the space bar is depressed, the type lever or space bar lever AW lowers and rocks universal bar AN, which through arm AS and link M, rocks block assembly G, the latter carrying escapement roller C and escapement dog B, causing B to move out of the tooth space in escapement wheel Z and roller C to move into the tooth space vacated by B. Spring BC moves B outward in line with the next tooth space in Z.

Roller C used in late machines provides easier action than the stationary dog used in early machines.

When a typewriter key or the universal bar AN is released, spring H pulls block assembly G upward, escapement dog B entering the next tooth space and roller C moving out of escapement wheel Z, which allows the barrel spring to move the carriage one type space to the left. Screw S limits the upward movement of block assembly G which is the adjusting point for dog B; the latter should have a full hold on Z.

Typewriter Key Touch: In order to increase or decrease the resistance of typewriter key depression, lower nut AV is turned either way as required. When the desired tension is obtained the position of spring H is locked by the upper nut. When adjusting the tension of spring H the following tests should precede:

The key levers should align centrally in rear guide comb and also in the front comb.

The keys should have the correct cushion effect.

Type bars should move freely with universal bar held down.

*(Plate 15)—Continued**Universal Bar AN*

Test universal bar AN for being level as indicated by escapement release when using keys which contact on right and left ends.

Adjustment: Universal bar is raised or lowered by turning nuts AO and AP on wire AQ.

Test universal bar for common escapement release of all keys. Release should take place when type is about $1\frac{1}{2}$ inches from platen for all keys except Q, A and P; the latter should release earlier on account of their pivoting point.

Adjustment: For keys which release earlier, universal bar AN is filed where that key contacts it.

Typewriter Keys

Test key depression for cushion effect, the purpose of which is to create sufficient momentum to cause the type to strike the platen and recede therefrom when the key is quickly depressed and held depressed. When the keys are slowly depressed, the escapement should take place when the type is within 1 to

$1\frac{1}{2}$ inches from the platen. When a snappy depression of the keys is made, the escapement will then occur slightly before the type strikes the platen.

Adjustment: Screw L is turned upward; when the proper adjustment is secured, screw L is locked with nut as shown.

Space Bar Tests and Adjustments

Test space bar for cushion effect, rock AN until M lightly limits on screw L; it should then be possible to slightly depress the space bar after its play has been taken up.

Adjustment: When making this test, if the space bar limits hard, the space bar is filed where it contacts on universal bar AN.

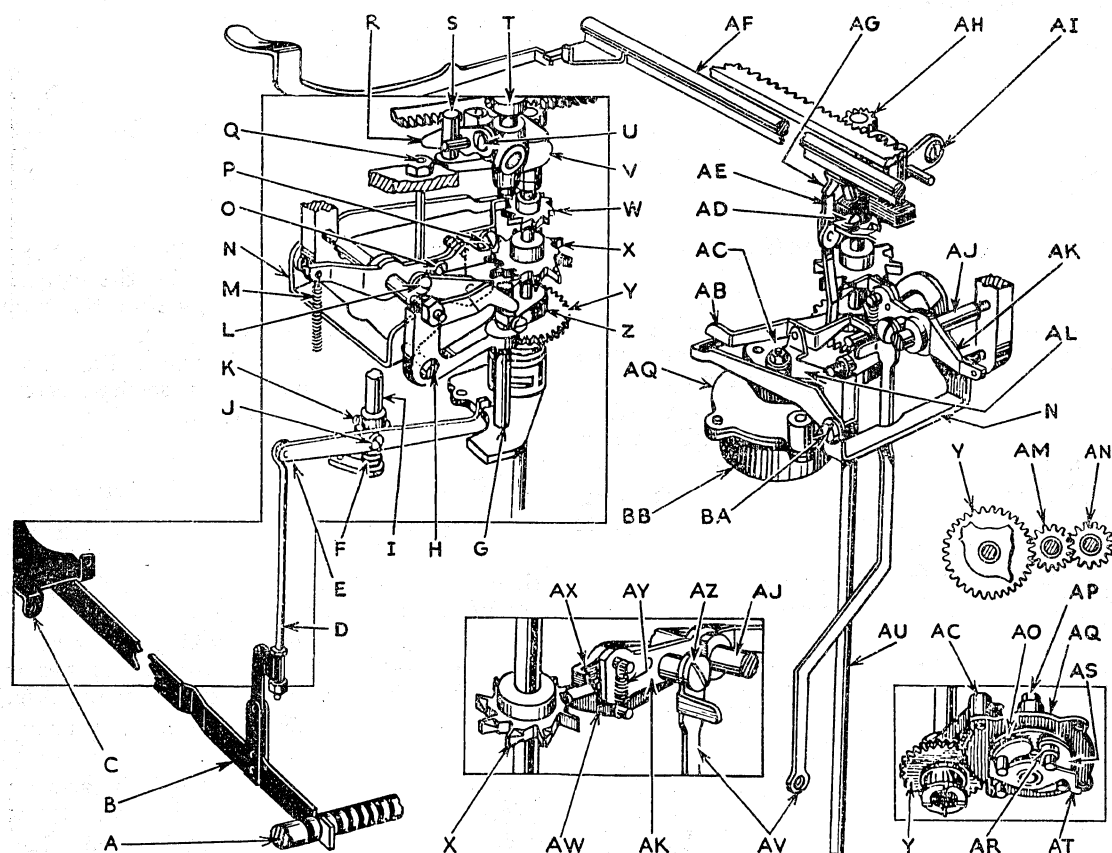
Caution: Excessive cushion causes heavy key depression.

1. Align eyes of AQ with hole in arm on AM, removing screw AR and using plyers.
2. To insure speed and light touch, align all key levers parallel and central in slots of comb AN.

Test space bar levers for being parallel and having equal clearance in the fork on AW.

Adjustment: File the fork.

ESCAPEMENT FOR 30" CARRIAGE WITH EARLY STYLE GOVERNOR (CLASS 77) (Plate 16)



Escapement for 30" Carriage With Early Style Governor (Class 77) (Plate 16)

This mechanism causes carriage tabulation to take place without disengaging the escapement pinion from the rack.

Sequence and Construction

Escapement wheel X is fastened rigidly to the pinion shaft. In order to provide the necessary clearance for the upper dog to move into the path of the escapement tooth, the lower dog is offset. Lower dog AW pivots on shoulder screw L, swinging vertically and held upward by spring AY.

Typewriter and Space Bar Control

When a typewriter key is depressed, assembly AK is rocked carrying upper and lower dogs

as a unit, upper dog AX limiting escapement wheel X as the lower dog moves from it. When typewriter key is released, spring M moves assembly AK to normal position, the lower dog limiting the next escapement tooth as upper dog moves above the previous tooth.

Carriage Return Key Control

When the carriage return key is depressed, collar Z rocks bail N which in turn rocks part AB disengaging lower dog AW as the carriage return mechanism returns the carriage.

Manual Control

When the carriage release lever is depressed, bail AF is rocked which rocks bell-crank AG, the latter rocks part AB through link AE, disengaging the lower dog and allowing the carriage to be manually moved.

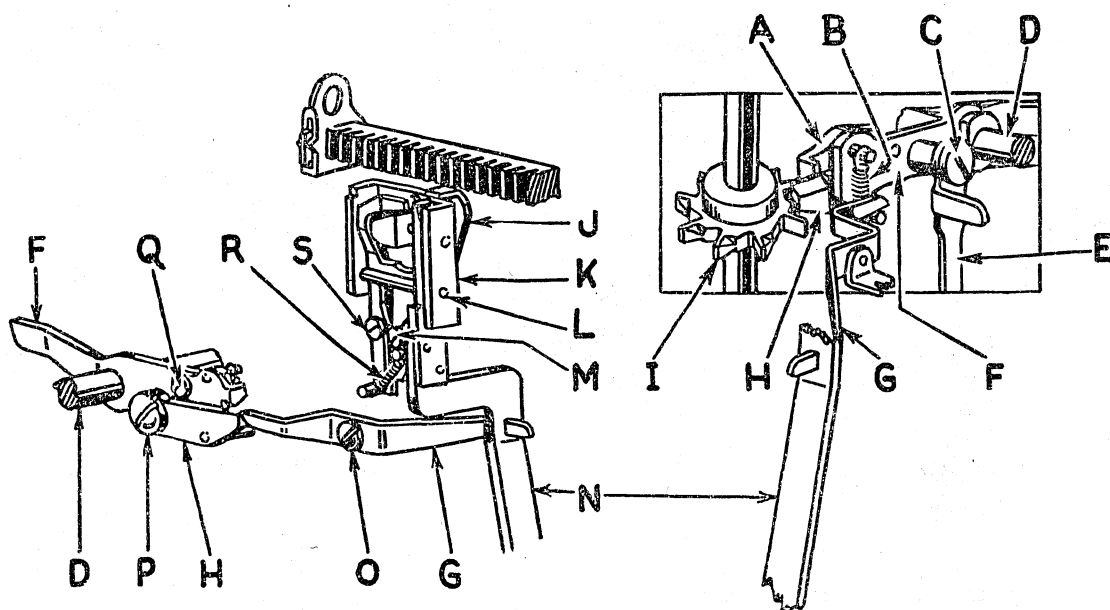
(Plate 16)—Continued
Speed Control

When the tabulator key is used, excessive speed is prevented by weights AS and AO contacting on the rim of drum BB. Weights AS and AO are carried by disk assembly AQ which is revolved by gears Y, intermediates AM and AN. When the carriage is being returned, which causes the pinion shaft assembly to revolve in opposite direction,

weights AO and AS are prevented from contacting in drum by seating in the pockets of cam arm AT.

In late machines with the standard free running escapement wheel, the carriage return key and the manual control which are described in this subject are not used. Also the governor shown on this plate is now discarded and replaced with the adjustable governor (Plate 22).

TABULATING MECHANISM, 30" CARRIAGE (Plate 17)



Tabulating Mechanism, 30" Carriage (Plate 17)

When tabulator assembly N is raised, lever G is rocked, which swings lower dog H downward, allowing escapement wheel I to revolve freely until the carriage limits the stop on the tabulator.

Tests and Adjustments

When the escapement mechanism is normal, the upper edge of lower dog H should be flush with the escapement wheel.

Adjustment: Screw Q (Plate 16) in the top plate is turned.

When the tabulator key is depressed and latched, there should be $1/64''$ clearance

between the lower escapement dog and the escapement wheel.

Adjustment: Lever G is bent.

When the carriage return key is held depressed, there should be $1/64''$ clearance between the lower escapement dog and the escapement wheel.

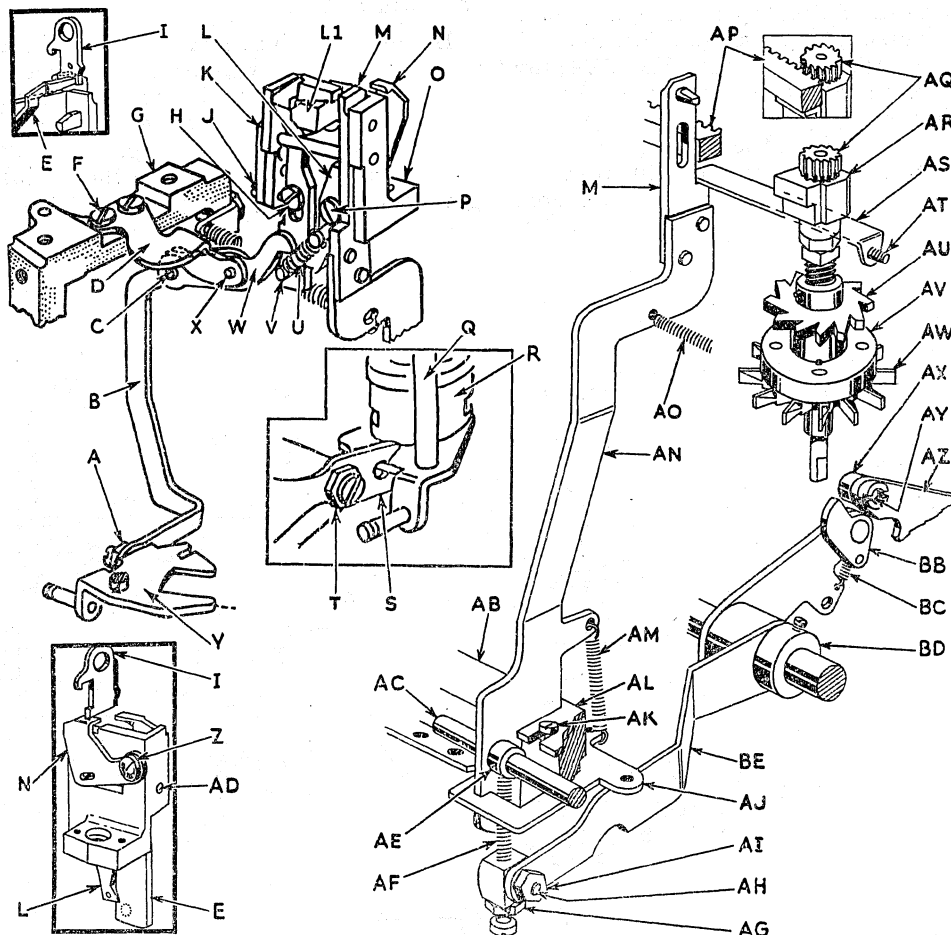
Adjustment: Collar Z (Plate 16) is moved upward or downward.

Gear Y (Plate 16) should be located to clear the top plate assembly AQ (Plate 16) held by set screw.

The tension of spring M (Plate 16) should be only sufficient to restore escapement dog assembly D to insure speedy and light key touch.

Adjustment: Nuts AV (Plate 15) are loosened and located as required.

AUTOMATIC TABULATING MECHANISM (Plate 18)



Automatic Tabulating Mechanism (Plate 18)

The automatic tabulating mechanism is indexed by the motor tab bar as shown on Plate 19. During the latter part of the machine operation, roller AX contacts passby pawl BB and swings lever BE. The front arm of lever BE carries screw AF which contacts on bushing AE and raises tab link AN.

When tab link AN is raised, its upper part moves above tab block O, spring AO pulls AN toward limit block L1 which trips latch L releasing rebound dog E, permitting spring U to raise E. The latter carries restoring arm N, spring AO exerts a downward pull on AN, thus holding tip M in the path of stop I.

When AN is moving upward, a step on tip M moves bail AS which disengages pinion assembly AQ. When the moving carriage approaches tip M, stop I first contacts on and partially lowers rebound dog E, then as stop I

contacts on M, rebound dog E again moves upward behind stop I, thereby preventing rebound of the carriage which occurs when stop I bumps M against tabulator block O. When tabulator link AN becomes normal, rebound dog E is restored by pawl N and latched by L as star wheel AW limits on the escapement dog (not shown here).

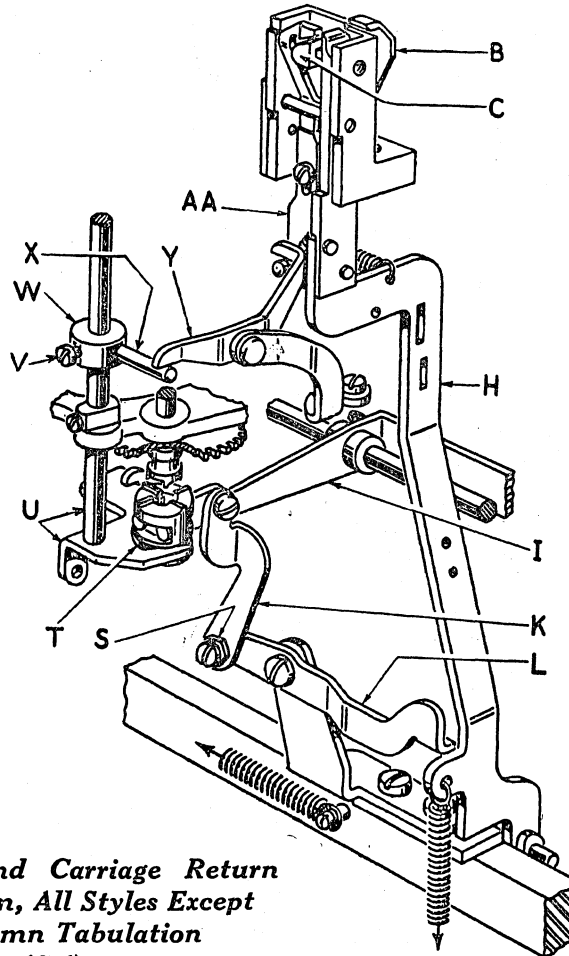
Tests and Adjustments

Positive hook-up of AN on block L1 is essential and depends on proper lift and ample hold of M on L1.

Screw AF is raised or lowered to increase or decrease the lift of AN. The latter should have a little lead over L1 when AN is at the high point.

Stop block L1 must be tight in order to insure positive hook-up and also to prevent AN binding. M should have .030" hold on L1. When necessary, hold on M can be

TABULATOR ARM AND CARRIAGE RETURN CLUTCH INTERLOCK ALL STYLES EXCEPT SELECTIVE COLUMN TABULATION (Plate 18-1)



**Tabulator Arm and Carriage Return
Clutch Mechanism, All Styles Except
Selective Column Tabulation
(Plate 18-1)**

Purpose

The purpose of interlocking lever L is to prevent locking the carriage on rebound dog AA should the carriage return key be depressed during a tabulating operation; and to disengage the carriage return clutch should the manual tabulating bar be depressed during a carriage return operation.

Operation

Lever L, which is limited by vertical tabulating arm H in upward position during carriage tabulation, prevents engagement of the carriage return clutch through link K and the forked end of bail I which engages assembly U.

Depression of the hand tabulating bar during a carriage return operation results in

arm H lowering assembly U, through lever L, link K, and bail I, to disengage carriage return clutch T.

Lever Y, being tilted by stud X as the carriage return clutch is engaged, assures restoration of rebound dog AA to prevent interference with the tabulating stops as the carriage returns.

Adjustment

1. With tabulating arm H latched upward on stud C, lever L should prevent engagement of clutch T.

To adjust, turn eccentric S.

2. Lever Y should fully restore rebound dog AA when clutch T is engaged.

To adjust, raise or lower collar W which contains stud X.

(Plate 18)—Continued

increased by removing a little stock from the limit stud in O.

When AN is moving upward, rebound dog E should not release until spring AO has pulled AN over block L1.

Adjustment: AN is formed to lie parallel to O.

Rebound dog E should be tested for positive action as follows: Carriage is held and hand tabulator tripped. Carriage is allowed to gradually move over E. When step I has engaged M to permit rebound dog E to rise, pressure is applied against carriage in opposite direction. In this position E should lock carriage. When making this test, if carriage can be moved back, it is an indication that E is not completely effective.

Adjustment: A little stock is removed from E to increase the clearance of E behind stop I. In some cases insufficient tension of spring U is responsible for E not being effective, a coil should be removed from U to insure more rapid action of E.

Each stop I should slightly contact on restoring arm N to insure that rebound dog E will be positively latched and thereby prevent locking the carriage on return. However, excessive contact of I on N must be avoided so that there will be no drag on the carriage; this can be determined by spacing the carriage with the space bar. To adjust N for proper contact, arm on rebound dog E is raised or lowered.

Caution: In making this adjustment, care should be exercised to retain a trifle play between N and O. Test for N being too long, which would allow rebound dog to restore too early.

Depress tabulator key, holding carriage, allow carriage to move very slowly when AN has been restored. Rebound dog should not restore until the star wheel has limited on the escapement dog.

Causes for carriage rebounding: Spring on rebound dog E is weak. Clock spring is wound too tight.

Relative position of tabulator tips and escapement wheel is necessary to insure that when tabulator tips are raised, they will clear any stop I which may be located over them.

Causes for the carriage moving beyond the desired position are as follows: Teeth of rack AP are worn, or has one or more wide teeth. Carriage is loose on rails.

Correct mesh of pinions AQ and rack AP: Pinion teeth should not limit in rack. There

should be proper clearance between rack AP and pinion AQ. Excessive clearance can cause the carriage to move one or more spaces further.

Test for pinion teeth bottoming in rack, when the carriage is moved towards the right, escapement pinion should not move inward and outward.

To test pitch of teeth on rack AP, apply scale to rack flush to the face of teeth, and each one inch graduation tooth of rack must align with graduation.

Sufficient hold of pinion AQ on rack AP is also an important factor to insure that the carriage will not move beyond the desired position. Test.

Repeatedly draw carriage from left to right, pausing at times to apply pressure against carriage in opposite direction.

Test for clearance of tab tip M and stop I. Test to be applied at each end of carriage, viz.: Tabulate to 50, move carriage back to 49. Depress tabulator key, there should be a slight drop, the latter denotes clearance between tabulator tip M and stop I. Again depress tabulator key and observe whether there is clearance behind stop I and tab tip M.

Adjustment: The escapement dog assembly is moved toward the front or rear by adjusting the pivot screws. This adjustment slightly changes the position of star wheel AW and the carriage, so as to secure the proper clearance between stop I and tab tip M.

$1/64''$ is the correct clearance between AQ and AP when the tabulator key is held down. When necessary, clearance can be regulated by removing stock from bail AS. For free movement of the escapement wheel AW to limit on the detent when tabulator key is depressed, there should be approximately $1/64''$ end play of the escapement shaft assembly.

The purpose of interlock W is to prevent rebound dog E blocking the carriage return when the carriage return key is depressed immediately after the tab bar.

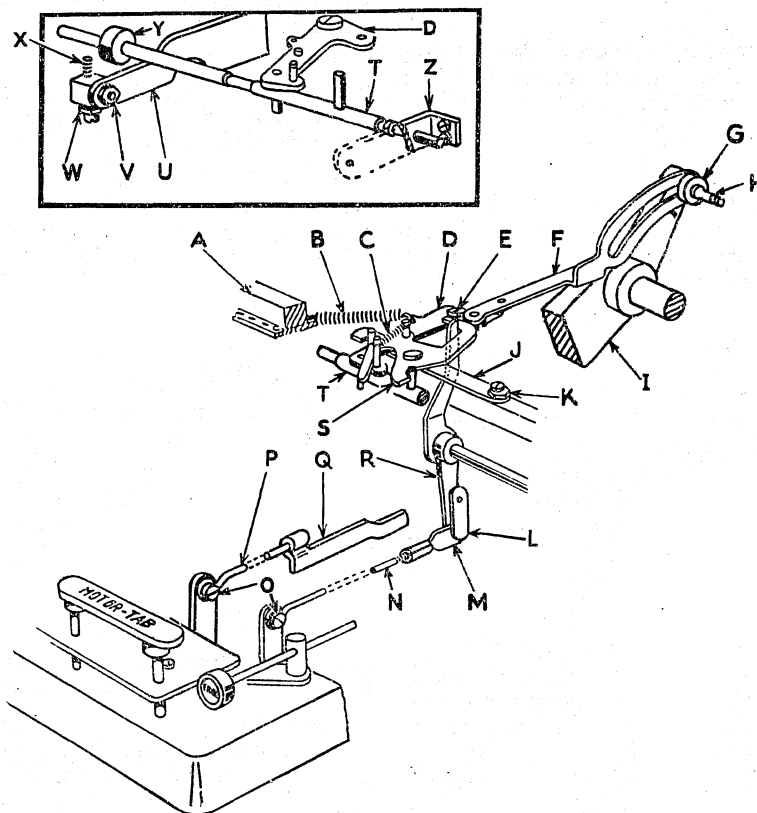
When the carriage return key is depressed, plate Y through link B and interlock W contacting on stud V, pulls rebound dog E downward, thereby preventing locking up of the carriage return mechanism.

Tests and Adjustments

When the carriage return key is depressed, rebound dog E should be latched by part L with slight excess.

Adjustment: Eccentric A is turned.

AUTOMATIC TABULATION CONTROL (Plate 19)



Automatic Tabulation Control (Plate 19)

The purpose of this mechanism is to index the automatic tabulating mechanism when the tabulating motor bar is depressed.

This improved mechanism differs from the non-tabulating control used in earlier machines in that the new mechanism indexes the automatic tabulator only when the tabulator motor bar is depressed. Earlier machines with non-tabulator control have the automatic tabulator mechanism in active position without having to be indexed. However, when the subtract key or the non-tabulating motor bar is depressed, the automatic tabulator mechanism is disabled.

Sequence and Construction

When the motor tab bar is depressed, lever R is rocked through connecting wire N. Lever R contacting on hook pawl S swings pivot lever J disengaging it from the stud in shaft T.

The front end of J is connected to shaft T by a stud passing through a hole in J. Restoring link F is connected to D with a spring

clip. The curved end of F seats on spring stud H and is held in position by collar G.

During the forward stroke of the machine, as arm I and restoring link F move forward, spring B pulls shaft T to the left, placing collar Y in the path of screw X. The tabulation takes place on the return stroke when arm U raises shaft T.

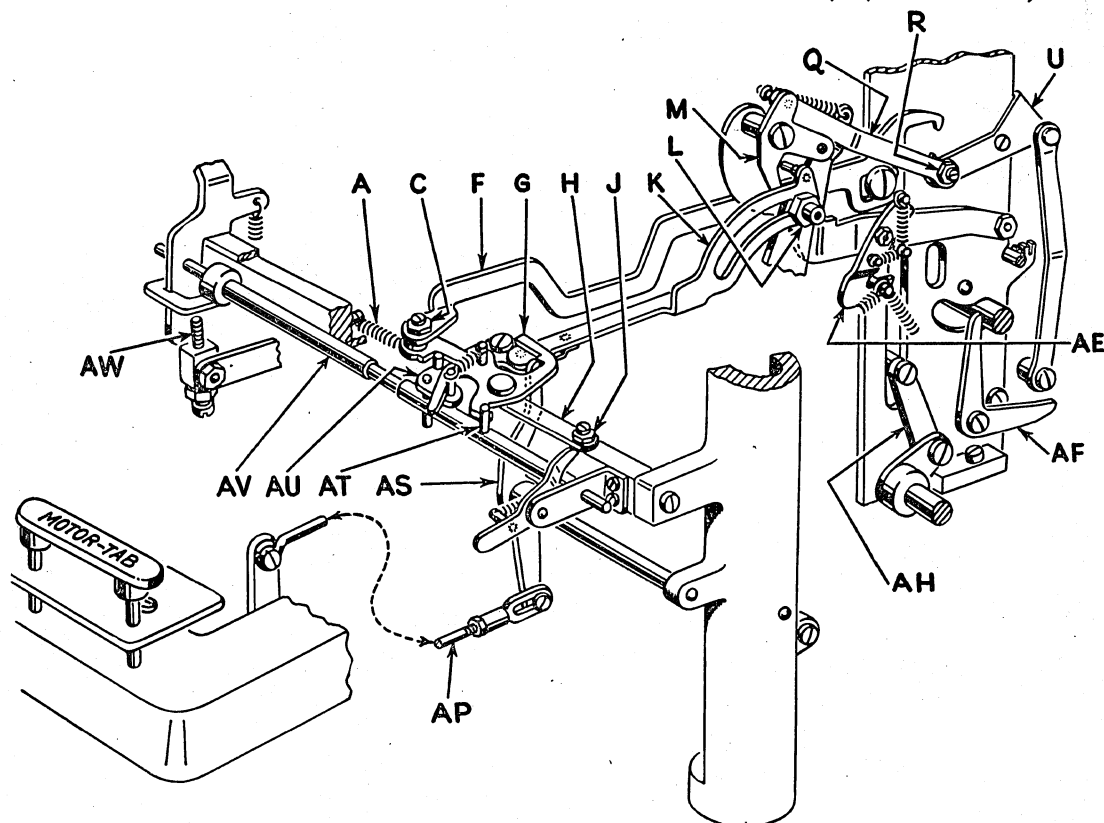
On the latter part of the return stroke, arm I pulls restoring link F rearward, rocking pivot blank D which moves shaft T to inactive position. Hook pawl S engages stud in D and holds the latter and shaft T in inactive position.

Tests and Adjustments

With the tabulator motor bar depressed (switch off) hook pawl S should have 1/16" clearance of the stud in pivot blank D. This adjustment is made from turnbuckle M on the motor bar rod.

When the machine is in normal position, hook pawl S should clear the stud in pivot blank D. To secure clearance, eccentric K is turned.

CARRIAGE TABULATION CONTROL FROM SUBTRACT OPERATION—EARLY CLASS 78 (ALL STYLES) (Plate 19-1)



Carriage Tabulation Control From Subtract Operation—Early Class 78 (All Styles) (Plate 19-1)

Purpose

The purpose of this mechanism is to delay tabulation until the return stroke of the subtract operation.

Operation

When a subtract operation is indexed and the motor tab bar depressed, lever AS moves pawl G rearward to rest against the rear side of stud AT. Pawl G swings lever H to clear the stud in lever AU and to move link F rearward where it is held by latch AE.

As the extend plate rocks bail U, lever M is swung, through link Q, to hold link K and lever AU normal, thereby preventing shaft AV from moving into tabulating position. The projection on the forward arm of bail U engages the hook of link F to prevent restoration of pawl G when link K is fully restored by stud L at the end of the extend operation.

The purpose of latch AE, which is released early in the subtract operation by link AH, is to assure that the arm of bail U will engage the hook of link F.

Bail U, also restored early in the subtract

operation, releases links F and K, allowing spring A to move shaft AV to the left into active position.

Tabulation occurs on the return stroke when screw AW raises shaft AV.

Shaft AV is restored at the end of the return stroke by stud L, through link K and lever AU.

The purpose of bellcrank AF is to aid in restoring bail U to normal.

Adjustment

1. With the machine normal, the hook of lever H should have slight clearance with the stud in lever AU.

To adjust, turn eccentric J.

2. Pawl G should have 1/64" lead over stud AT with the motor tab bar depressed.

To adjust, shorten or lengthen wire AP.

3. Pawl G should have slight clearance with stud AT when link F is held by either latch AE or bail U.

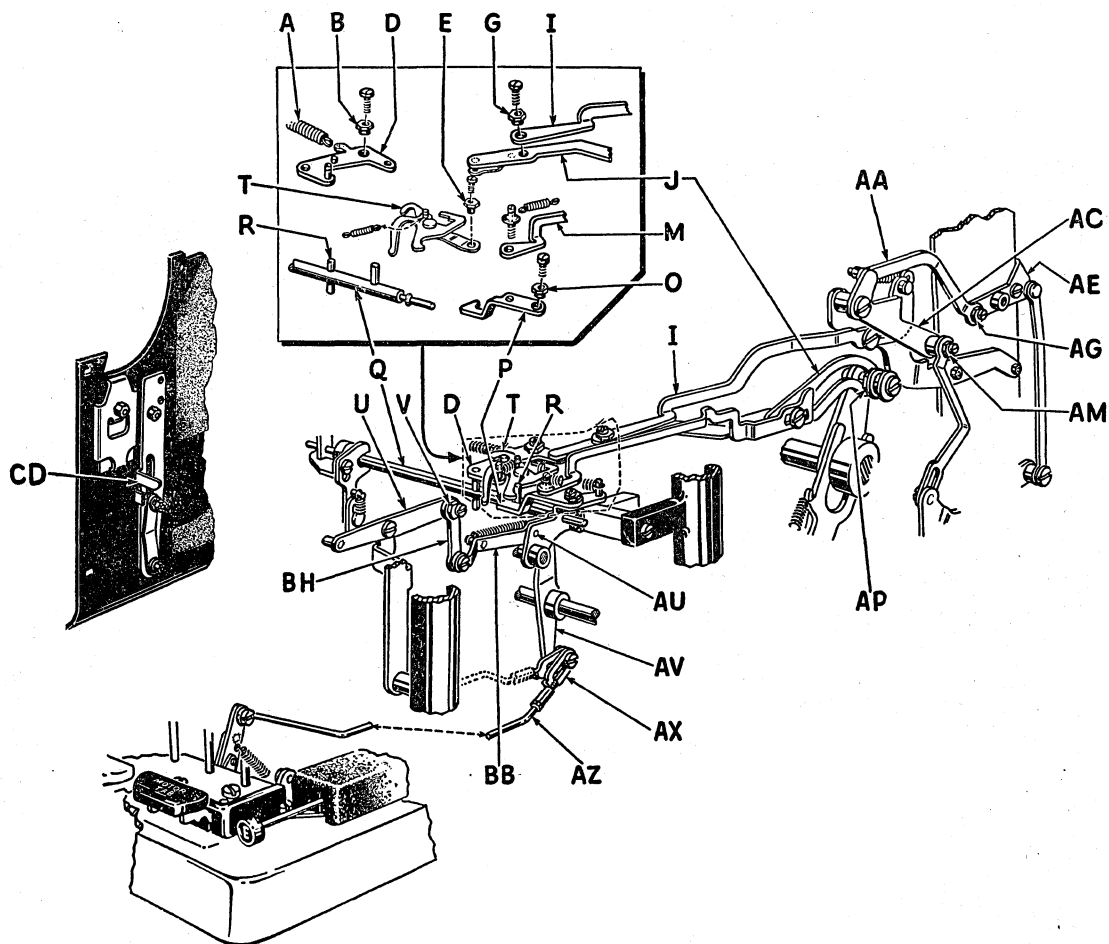
To adjust, turn eccentric C.

4. With bail U fully raised by the extend plate, the collar of shaft AV should be held to the right to clear the tabulator power arm screw AW.

To adjust, turn eccentric R.

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Buffalo N Y Branch 10-5

CARRIAGE TABULATION CONTROL FROM SUBTRACT OPERATION IMPROVED—SERIES M—CLASS 78 (Plate 19-2)



***Carriage Tabulation Control from
Subtract Operation Improved—
Class 78 (Plate 19-2)***

Purpose

This mechanism assures a positive control of carriage tabulation during subtract operations.

Operation

Tabulation control shaft Q is retained in normal position by lever D from hook T and/or restoring link J, and by latch P.

When a subtract operation is indexed from a key or carriage control and the motor tab bar is depressed, wire AZ swings lever AV moving hook T rearward where it is held by its pawl contacting the rear side of stud R in tabulation control shaft Q.

The main camshaft assembly, carrying

stud AP, rocks forward and releases link J allowing shaft Q to be held in normal position by latch P.

Subtractor bail AE, which is rocked by an extend plate, swings latch AC to block the movement of links I and J, retaining shaft Q in normal position at the end of the forward stroke when stud AP contacts slide M to release latch P. Latch P is restored with the return stroke movement of stud AP.

Latch AC releases links I and J when subtractor bail AE is restored at the beginning of the subtract stroke. Stud AP rocks forward to contact slide M and release latch P allowing shaft Q to move to the left under tension of spring A and to locate its collar over the screw (X, Plate 19, Carriage Symbol List.)

Tabulation occurs on the return stroke of the subtract operation when the power arm (U, Plate 19) raises shaft Q.

Stud AP restores shaft Q, through link J

and lever D, near the end of the subtract operation.

Adjustment

1. With the machine normal, shaft Q should be held fully to the right—by link J and lever D—without bind.

To adjust, turn eccentric B.

2. With the machine normal, hook T should have $1/32''$ lead over the stud in lever D.

To adjust, turn eccentric E.

3. With the machine normal, latch P should latch stud R with minimum clearance.

To adjust, turn eccentric O.

4. With the power off and the motor tab bar held depressed, the pawl of hook T should clear stud R by $1/16''$.

To adjust, lengthen or shorten wire AZ.

5. During an extend operation, latch AC

should move in front of the roll on link I with minimum clearance.

To adjust, turn eccentric G.

6. Latch AC should have full hold on the roll in link I with bail AE fully raised by an extend plate.

To adjust, turn eccentric AG.

Manual Control to Disable the Automatic Tabulation Mechanism

Manual control slide CD, through lever U and link BH, actuates latch BB to block the movement of tabulation control shaft Q and prevent automatic tabulation.

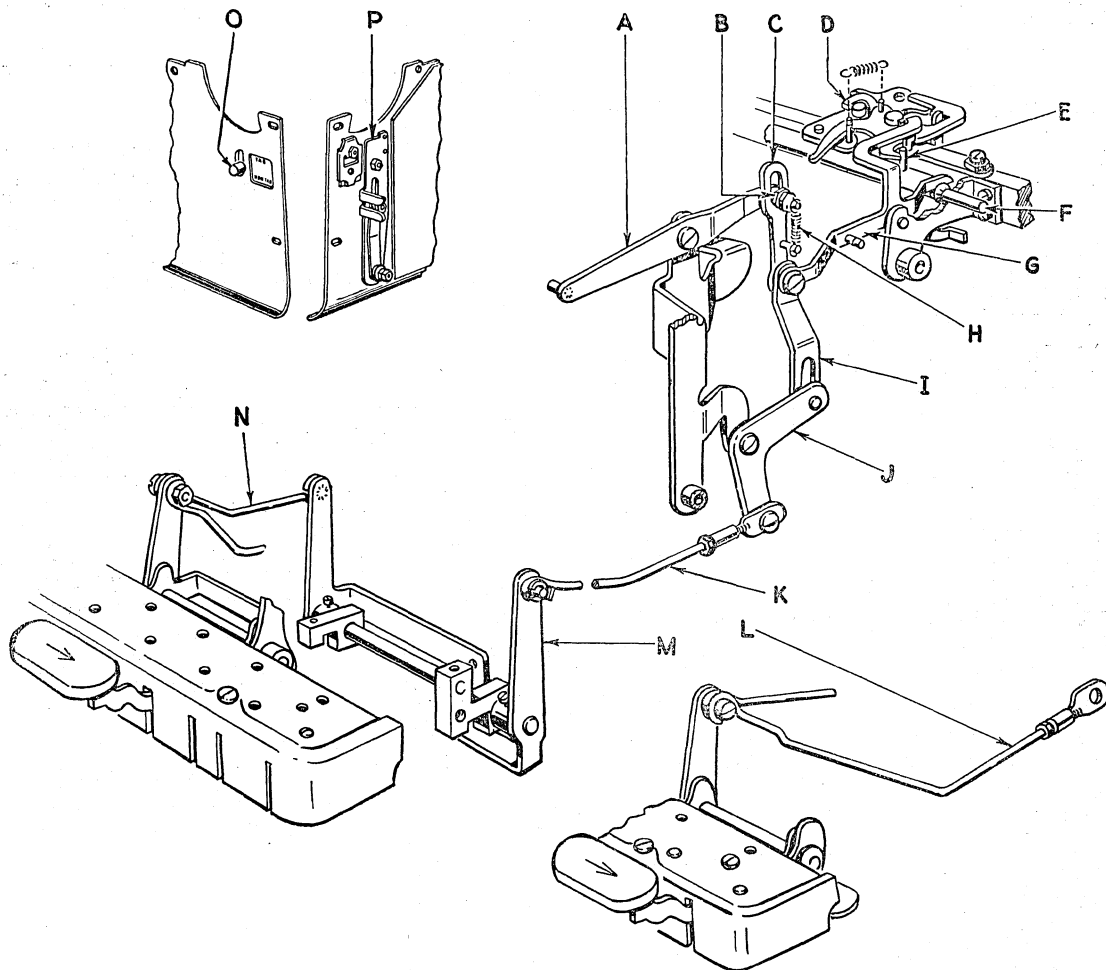
Adjustment

Latch BB should have full hold without bind in the groove of shaft Q.

To adjust, turn the eccentric on screw AU.

Eccentric V provides a means of equalizing the movement of slide CD and latch BB.

CARRIAGE TABULATING MOTOR BAR TO DISABLE THE MANUAL NON-TABULATING CONTROL, SERIES M200 AND M800 (Plate 19-2A)



Carriage Tabulating Motor Bar to Disable the Manual Non-Tabulating Control, Series M200 and M800 (Plate 19-2A)

Purpose

To permit carriage tabulation from the tabulating motor bars with the manual control button on the front panel positioned to non-tabulate the carriage from the power result keys.

Construction

Non-tabulating latch G is connected to manual control lever A by a broken joint. The latch is also connected to the tabulating motor bar. When the manual control lever is in non-tabulating position, the broken joint permits latch G to be inactivated upon depression of the tabulating motor bar.

Operation

When control button O is moved downward to "Non-Tab" position, slide P is lowered and latch G is positioned in the groove of tabulating shaft F through lever A, link C, and spring H. Shaft F is thereby held from moving to the left preventing carriage tabulation during a machine operation.

In Series M200 machines, depression of the tabulating motor bar rocks bell crank J through wire N, bail M, and wire K, while in Series M800 machines, bell crank J is rocked directly from the motor bar through wire L. Rocking of bell crank J lowers link I (expanding spring H) to move latch G from its active position on shaft F. Also, depression of the tabulating motor bar positions hook D rearward where it is retained through its pawl limiting on the rear side of stud E in shaft F,

(Plate 19-2A)—Continued

thereby allowing shaft F to be moved to the left to permit carriage tabulation.

Latch G is held out of active position, through the upper projection of the latch resting on top of the pawl of hook D when the motor bar is released, until the tabulating shaft is permitted to move inward to its active position. Spring H rocks the latch downward as the tabulating shaft moves inward.

Adjustments

(All adjustments should be made with power off and control button O set in "Non-Tab" position.)

1. Latch G should seat fully in the groove of shaft F (without bind).

To adjust, turn eccentric B.

2. With latch G fully seated in the groove in the tabulating shaft, the foot of the upper projection of the latch should have full hold of the pawl on hook D. This full hold will prevent the pawl on hook D from latching behind stud E in the tabulating shaft when using a result key that indexes the Automatic Tabulating Mechanism.

To adjust, weave the upper projection of latch G up or down.

3. With the tabulating motor bar depressed (not held) so that the foot of the upper projection of latch G rests on the pawl of hook D, the middle projection of the latch should be positioned out of the groove in shaft F with slight clearance.

To adjust, weave the upper projection of latch G up or down.

If adjustment is necessary, check that the foot of the upper projection of the non-tabulating latch has sufficient hold on the pawl of hook D to prevent the pawl latching behind the stud in the tabulating shaft when using a result key that indexes the Automatic Tabulating Mechanism.

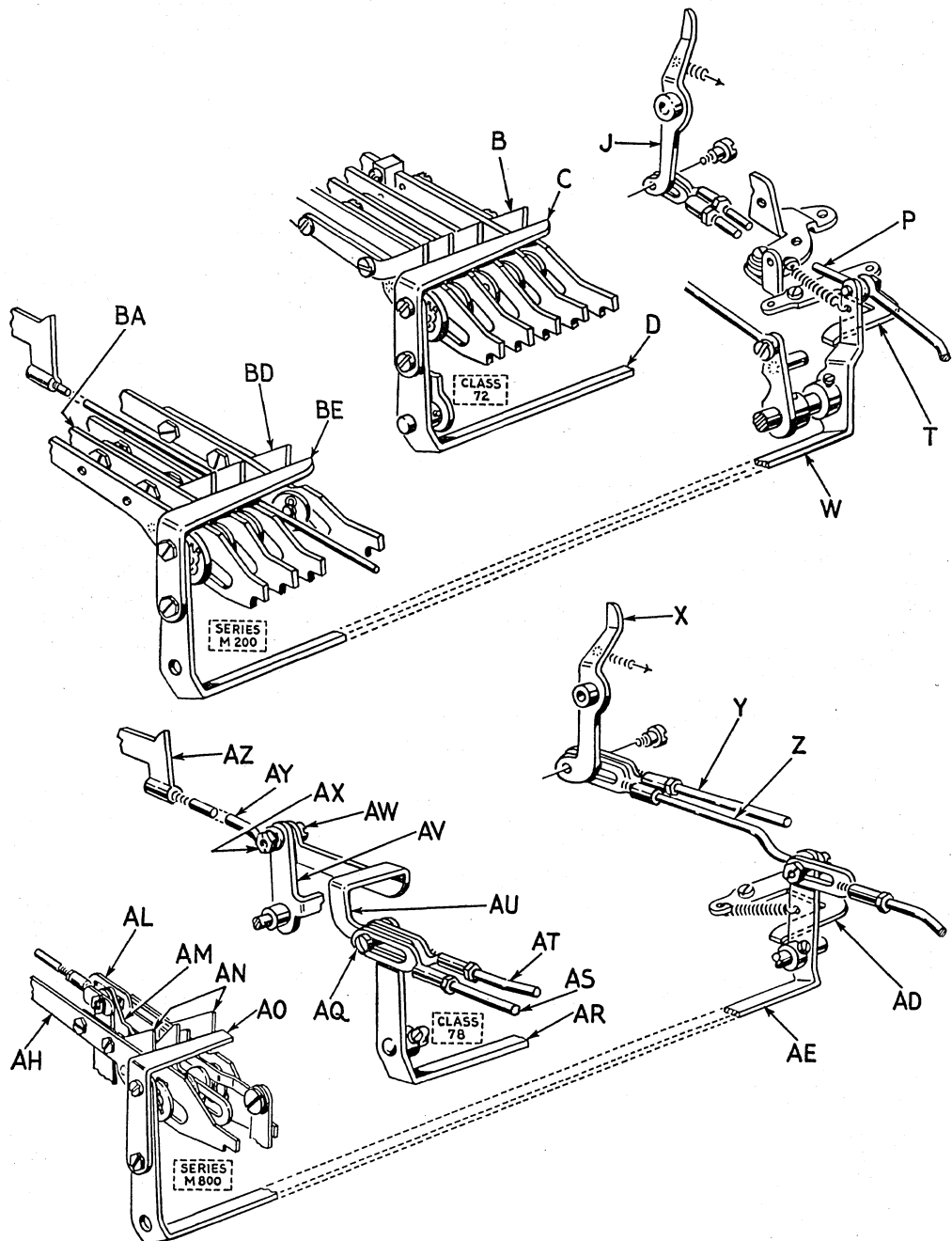
4. With the tabulating motor bar depressed (not held), the foot of the upper projection of latch G should have slight clearance rearward of the stud in shaft F.

To adjust, weave the foot of the upper projection of latch G rearward.

5. With the tabulating motor bar held fully depressed, the foot of the upper projection of latch G should have 1/32" clearance over the pawl on hook D.

To adjust, turn the turnbuckle on wire K or L.

CARRIAGE TABULATION—INDEXED FROM POWER RESULT KEY SECTION (Plate 19-3)



Carriage Tabulation—Indexed from Power Result Key Section (Plate 19-3)

Purpose

To index the Automatic Tabulating Mechanism from depression of power result keys, carriage controlled result operations, and carriage controlled blank machine operations

—thereby eliminating separately indexed tabulating operations.

Operation

In Series M 800 and Class 78 machines, the Automatic Tabulating Mechanism (Plate 19) is indexed when arm X is rocked.

In Series M 800 machines during a machine

(Plate 19-3) Continued

operation indexed from a power result key or from a carriage controlled result operation, finger AN is moved forward as the result linkage is being latched forward. If the operation is a carriage controlled blank machine operation, auxiliary slide AL is moved forward. Finger AN or slide AL rocks arm X through arm AO, bail AE, and wire Y; thereby indexing the Automatic Tabulating Mechanism.

During a minus balance operation, which consists of three machine cycles, tabulation is disabled during the first two cycles (extend and subtract) and then enabled so that the carriage can tabulate at the end of the third cycle. (See plate 19-4.) Toward the end of the second cycle, result linkage AM is latched forward rocking arm X through arm AO, bail AE, and wire Z.

In Class 78 machines, depression of either the balance key or the register total key rocks arm X through wire AT or AS, bail AR, and wire Z. During a minus balance operation toward the end of the second cycle, result linkage AZ is latched forward rocking arm X through wire AY, bail AV, link AU, bail AR, and wire Z.

To disable tabulation from any particular result key operation—in Class 78 machines—remove the connection between the key and bail AR. For example, to disable carriage tabulation from the minus balance operation, remove link AU and replace screw AW, bushing nut AX, and screw AQ as specified in the Symbol List. In Series M 800 machines, tabulation may be disabled by removing finger AN from the particular result key linkage.

In Series M 200 and Class 72 machines containing Easy Depression Power Result Keys, the Automatic Tabulating Mechanism is indexed when arm J is rocked.

During a machine operation indexed from a power result key or from a carriage controlled result operation, finger BD or B is moved forward as the result linkage is latched forward. Finger BD or B rocks arm J through arm BE, bail W, and wire P.

To disable tabulation from any particular result key operation—in Series M 200 and Class 72 machines containing Easy Depression Power Result Keys—remove finger BD or B from the particular result key linkage.

Construction

Fingers BD and AN are now mounted on the right side of linkages BA and AH respectively, by hexagon screws to facilitate removal and replacement. Arms BE and AO are also mounted to bails AE and W, respectively, with hexagon screws for the same reason.

Limit plates AD and T are provided as normal limits for bails AE and W respectively, to prevent interference between fingers BD and AN and arms BE and AO when linkages BA and AH drop during an indexing operation.

Adjustment

1. Carriage tabulation should be indexed before the drive is tripped: i.e., there should be sufficient latching lead of the pawl (S, plate 19) when bail W or AE is fully rocked, to assure that the pawl is latched on the stud before the drive is tripped.

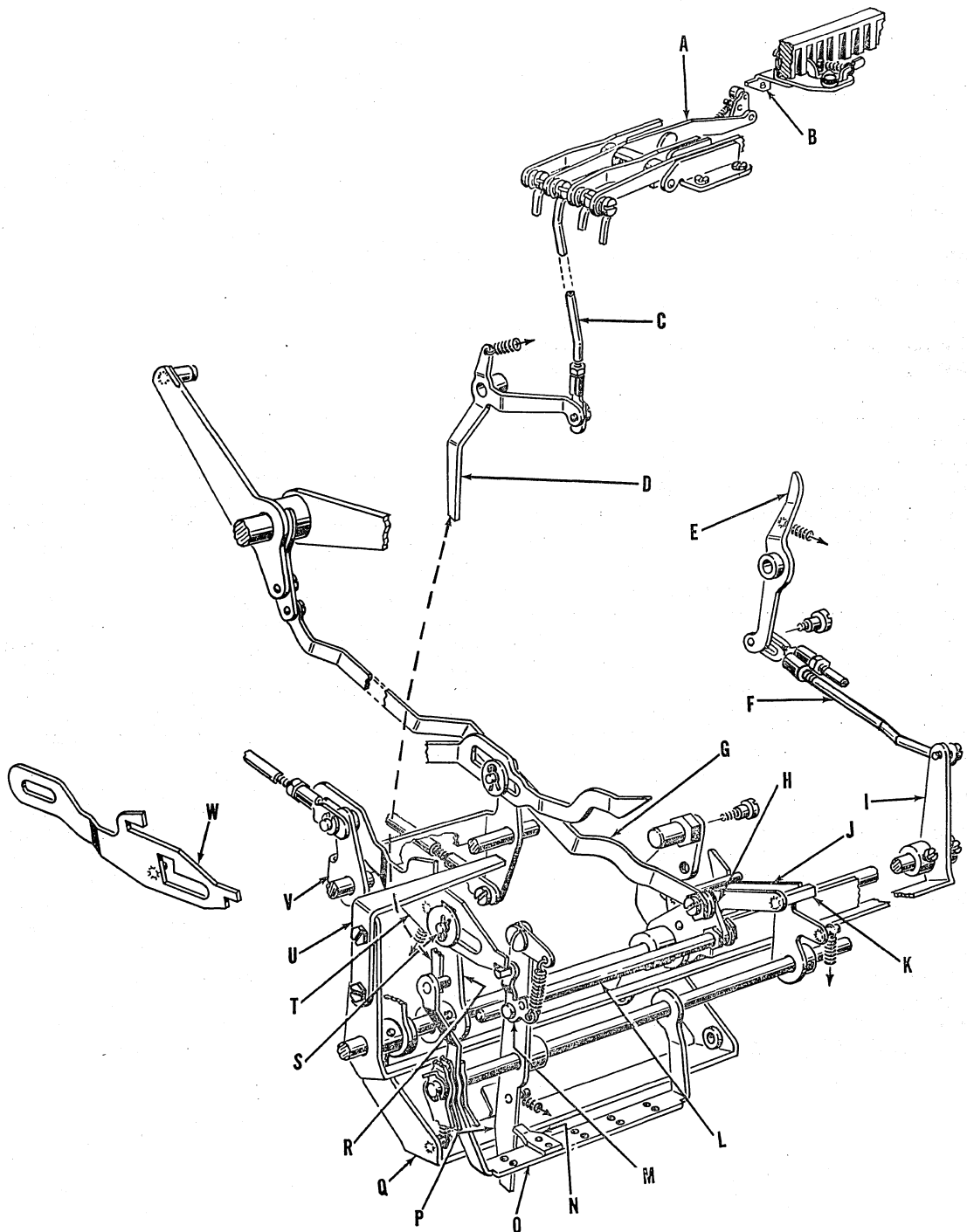
To adjust—in Class 78 machines—latch minus balance linkage AZ forward, then shorten or lengthen wire Z to obtain the latching lead of the pawl over the stud. Then shorten or lengthen wires AT and AS to obtain the same amount of latching lead from depression of the balance and the register total keys.

To adjust—in Class 72, Series M 200, and Series M 800 machines—latch the outermost power result linkage forward, and shorten or lengthen wire P or Z to obtain the latching lead of the pawl over the stud. Then swing arm C, BE, or AO to obtain the same amount of latching lead over the innermost power result key linkage.

2. With result linkages normal, arms C, BE and AO should have slight clearance with fingers B, BD and AN on the result linkages.

To adjust—swing limit T or AD.

**CARRIAGE TABULATION—INDEXED FROM POWER SHAFT DURING
CARRIAGE CONTROLLED BLANK MACHINE OPERATION,
SERIES M 800 (Plate 19-3A)**



Carriage Tabulation—Indexed From Power Shaft During Carriage Controlled Blank Machine Operation, Series M 800 (Plate 19-3A)

Purpose

To index the Automatic Tabulation Mechanism from the power shaft during Carriage Controlled, Blank Machine Operation.

Construction

General functioning of the Blank Machine Operation, Carriage Controlled, is not changed. However, tabulation indexing link T is only indexed (not actuated) as index cam B passes over the roll of control arm A.

Vertical rocker arm P in the blank machine operation position now contains rocker arm pawl M. The rearward slotted end of tabulation indexing link T is attached to minus balance bail V and the forward end rests on the square stud of the rocker arm pawl.

The index cam passing over the roll of the blank machine operation control arm indexes link T and the power in the same manner that the result linkage and the power are indexed during a carriage controlled total operation. The Automatic Tabulation Mechanism is then indexed as the power shaft is rocked.

Bail V, which is rocked at the end of the second machine cycle of the minus balance operation, moves tabulation indexing link T forward. As link T moves forward, it indexes the Automatic Tabulation Mechanism for the minus balance operation and also rocks the power shaft to maintain the ball raceway lock between the second and third machine cycles.

To disable carriage tabulation from the minus balance operation, tabulation indexing link T is replaced by link W which is similar in construction except that the top projection of the link is slotted so as not to give any

movement to arm U as the link is moved forward.

Operation

As the carriage tabulates into the blank machine operation position, index cam B, in line 9 on the front control bar, moves over the roll of control arm A rocking bail O through wire C and bell crank D. The rocking of bail O actuates rocker arm P, through lug N, moving the upper portion of the rocker arm forward, disengaging link T from the stud in rocker arm pawl M and permitting the vertical slot in the link to engage stud S in power shaft arm R to index the Automatic Tabulation Indexing Mechanism.

As the upper portion of rocker arm P is moved forward indexing the tabulation indexing mechanism, the lower portion of the rocker arm moves rearward rocking switch bail Q to close the electrical circuit in the normal manner, thereby energizing the solenoid and starting the motor to rock the power shaft.

The rocking of the power shaft causes link T to be moved forward through power shaft arm R. Link T moving forward rocks arm E, through arm U, bail I and wire F, thereby indexing the Automatic Tabulation Mechanism.

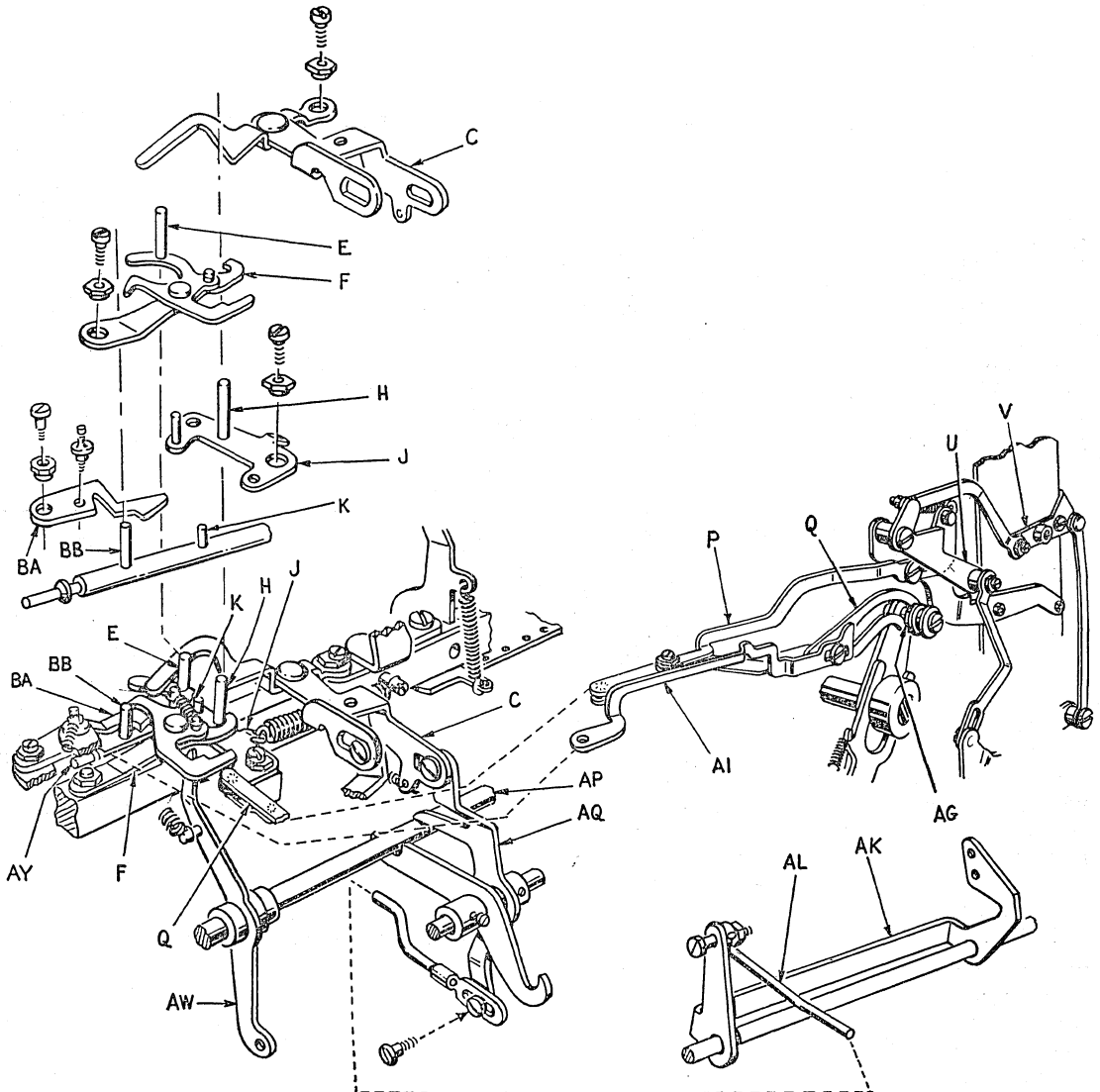
During the forward machine stroke, restoring shaft assembly H is raised through link G in the normal manner thereby raising the forward end of link T through restoring shaft L and permitting the stud in rocker arm pawl M to reset under the forward end of link T.

Adjustment

1. With the low point of index cam B resting on the roll of control arm A, control arm A should be rocked to index link T prior to latching square stud K on latch J. Square stud K should have approximately .020" latching lead on latch J.

To adjust, shorten or lengthen wire C.

**CARRIAGE TABULATION—INDEXED FROM POWER RESULT
KEYS—DISABLED DURING FIRST AND SECOND CYCLES
OF MINUS BALANCE OPERATION—SERIES M 800
MACHINES (Plate 19-4)**



***Carriage Tabulation—Indexed From
Power Result Keys—Disabled During
First and Second Cycles of Minus
Balance Operation—Series M 800
Machines (Plate 19-4)***

Purpose

To disable the Automatic Tabulating Mechanism during the subtract cycle of a minus balance operation.

Construction

This mechanism was introduced along with

easy depression power result keys. In Series M 800 machines, forward movement of the balance linkage during a minus balance operation, rocks the bail (AE, Plate 19-3) to index the Automatic Tabulating Mechanism; however, tabulation is normalized by the third cycle linkage wire AL which is also moved forward with the balance linkage.

This mechanism is not necessary in Class 78 machines since the Automatic Tabulating Mechanism is not indexed until the third cycle linkage is latched forward during the

(Plate 19-4) Continued

latter part of the second machine cycle of a minus balance operation.

Operation

During a minus balance operation, tabulation is disabled during the first two cycles—extend and subtract—and then enabled so that the carriage can tabulate near the end of the third cycle.

Extend Cycle: Depression of the minus balance key indexes both the balance linkage (Rightmost Linkage AN, Plate 19-3) and the third cycle mechanism. During machine operation when the balance linkage is moved forward by the rocking of the power shaft (U, Plate 6A, Keyboard Instruction Book) the bail (AE, Plate 19-3) and arm AW are rocked to index the Automatic Tabulating Mechanism; however, tabulation is disabled when subtractor bail V, rocked by the extend cycle plate, swings latch U to block the movement of links P and Q and lever J. Since lever J is connected to the tabulation shaft by stud K, the tabulation shaft is prevented from moving to the left and permitting tabulation to take place.

Tabulation is also disabled during an extend operation by hook arm assembly C, which is actuated by the third cycle mechanism; however, this is not the primary function of the hook arm mechanism. Forward movement of wire AL positions hook arm of assembly C to block the movement of lever J through stud H. Since lever J is connected to tabulation shaft AY by stud K, the tabulation shaft is prevented from moving to the left and permitting tabulation to take place.

The forward part of hook arm of assembly C contacts stud E in assembly F and pivots the pawl assembly F so that it will not latch behind stud BB and be retained in active position after lever J restores to normal near the end of the extend cycle.

Subtract Cycle: Tabulation is not indexed during the subtract cycle of a minus balance operation since assembly F was allowed to restore when the balance linkage and arm AW restored during the latter part of the extend cycle. Assembly F was prevented from latching in active position and allowed to restore by the action of hook arm of assembly C.

During the latter part of the subtract cycle, the minus balance linkage (AL, Plate 19-3) moves forward and rocks bail AK, arm AW and assembly F to index the Automatic Tabulating Mechanism for the third (Total) cycle.

Total Cycle: During the forward stroke of the total cycle of a minus balance operation, stud AG moves link AI forward to release latch BA. This allows the tabulation shaft to move to the left, thus permitting tabulation to take place at the end of the total cycle.

Adjustment

In addition to the adjustments listed in Plate 19-2, the following adjustment is also required:

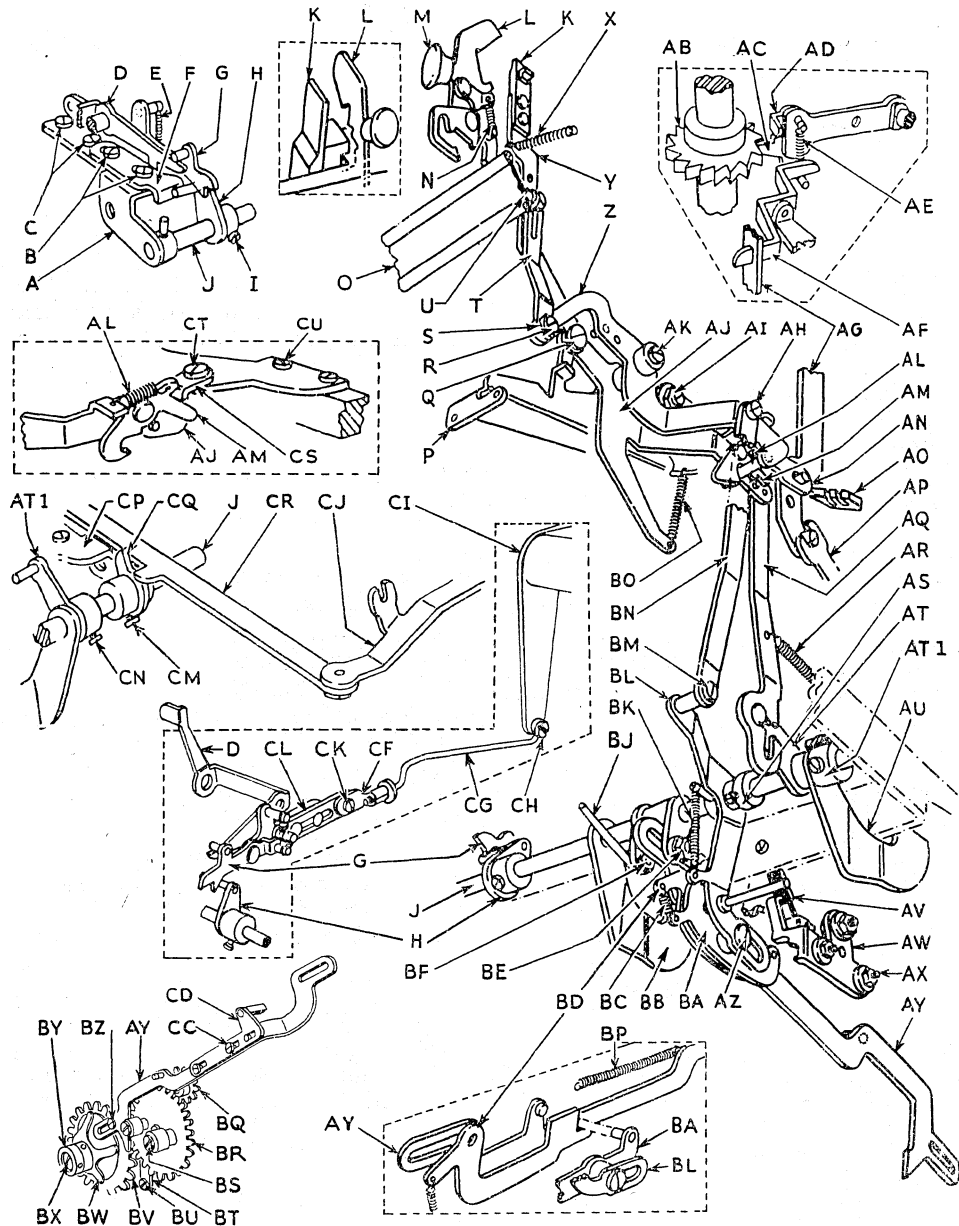
1. During the first part of the extend cycle of a minus balance operation when third stroke bail AK is latched forward, the hook arm of assembly C should hold the pawl of assembly F clear of stud BB so that when the pawl assembly is released near the end of the extend cycle, the pawl will not latch on stud BB.

To adjust, shorten or lengthen wire AL.

Caution: After adjusting wire AL, check foot of arm AQ to limit on shaft AP when hook arm assembly C is normal. This is to assure that hook arm of assembly C does not interfere with the movement of lever J as the tabulation shaft moves to the left.

Other adjustments for hook arm assembly C are contained in Plate 27-2.

SELECTIVE SKIP TABULATION MECHANISM (Plate 20)

**Selective Skip Tabulation Mechanism
(Plate 20)**

The purpose of this mechanism is to permit the selection of any column to the right of the present column. The registers are indexed by carriage position. In order to select a column to the left, the carriage is first returned to the extreme position.

Sequence and Construction

When key M is pushed in, bail O rocks lever

Z through link T; lever Z through link BN rocks part BL; the long stud in BL swings lever AV, the switch point of AV contacting on the switch point of assembly AW to operate the motor.

Key assembly mechanism L is restored by latch AM contacting on part AO.

Part BL also raises arm BA, which through spring BC swings arm BA into the path of the stud in driving link AY.

The rotation of gear BR through rollers BS

(Plate 20)—Continued

push driving link AY rearward, spring BP pulling AY forward.

Control shaft assembly J is rocked by driving link AY through arms BD and BA. Arm AT contacting in the horizontal slot of link AQ pulls the latter downward which rocks part AJ, the front arm of AJ raises tab tip assembly Y and the rear arm of AJ raises vertical AG and AF to lower dog AC to allow the carriage to tabulate.

When tab tip Y is completely raised, it is released by pin in hub AT1 which allows arm AT to locate in the vertical slot of link AQ; the latter drops to normal position when tab tip Y restores to normal.

Tests and Adjustments

The basic adjustment should be to limit part AG on plate AO, and projection of AJ should limit on ear of P which is accomplished by turning eccentric AI.

With power cable disconnected and tab tip manually latched, the clearance between dog AC and escapement wheel AB should be checked. To secure clearance, eccentric screw Q is turned.

Test tab latching lead; it should have about $1/64''$ lead over block with power on.

To adjust, turn eccentric BE. When key M is depressed, motor-trip should take place as late as possible to insure complete key depression. When key M is slowly depressed, the motor should start when the key is about $1/32''$ from the key limit bar. Adjustment is made by bending switch arm AV. Hub assembly H should latch G with $1/64''$ lead when control shaft assembly J is in forward position. Screw I is loosened and the hub assembly located as required. When tab arm Y is latched in upper position, the roller on T should clear bail O.

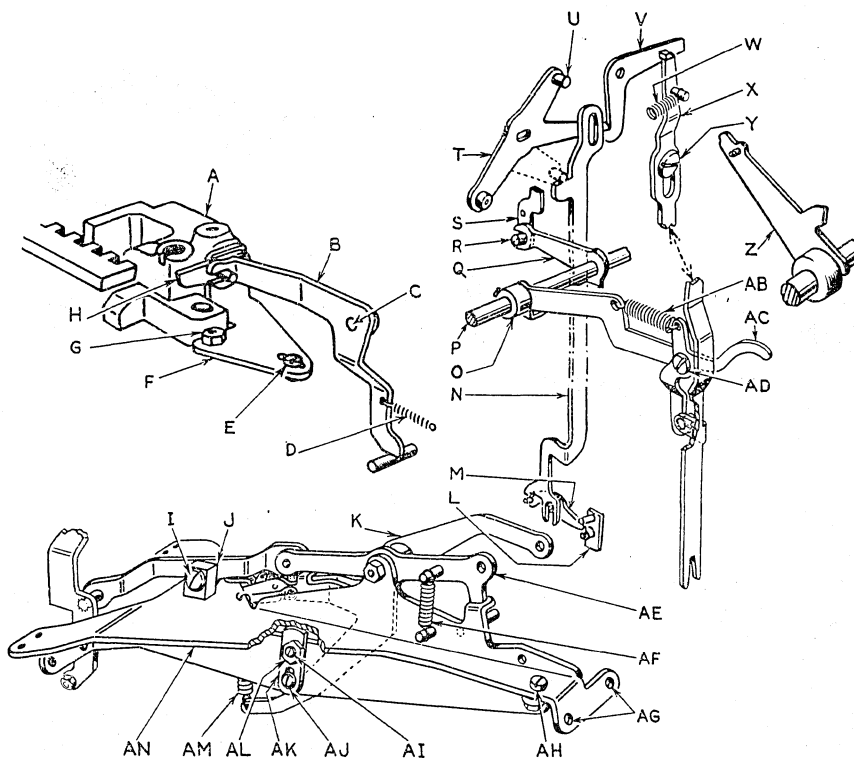
Adjustment: Turn eccentric S. Hub assembly AT1 is located to provide maximum lift to latch tabulation assembly Y before disengaging from the horizontal slot in link AQ.

Adjustment: Stud in arm AT is located in the horizontal slot of link AQ by adjusting limit F.

Set keyboard interlock CR to have play when shaft assembly J is latched. Adjustment is made from set collar CQ. Latch AC (Plate 21) is located under the stud of X (Plate 21) when the tabulator is latched and to clear X (Plate 21) when the machine returns to normal. Eccentric screw R (Plate 21) is turned.

With motor bar latched but not fully depressed, register should not trip until motor bar is completely depressed.

SELECTIVE SKIP TABULATION DETAIL AND CENTER SUPPORT (Plate 21)



Selective Skip Tabulation Detail and Center Support (Plate 21)

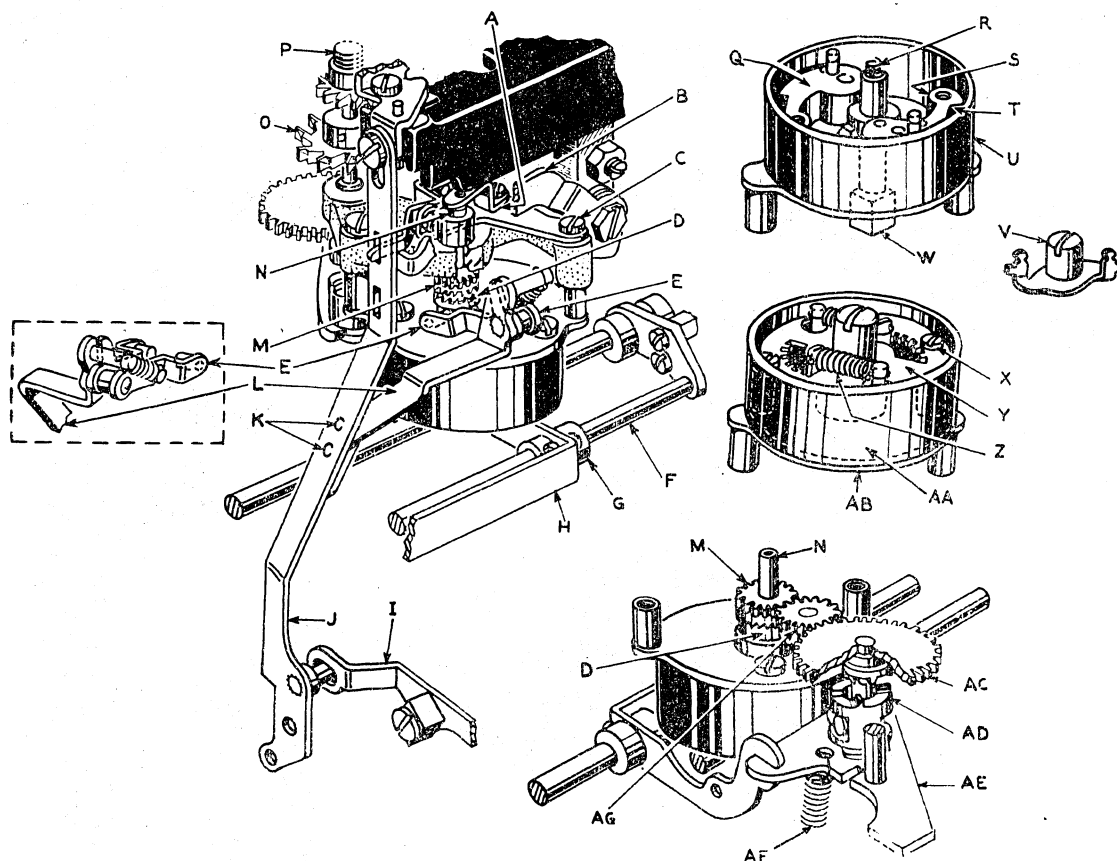
The upward movement of part S rocks bail Q, placing pawl AC under the stud in link X. The downward movement of link X swings latch V to release the register through part T. Part T trips the clutch by stud U contacting on link N which rocks lever M to raise clutch link L.

When the register shuttles in active posi-

tion, the stud in the shuttling-in arm rocks lever B which swings arm H into one of the rack spaces thereby locking the carriage.

The purpose of center support AK is to insure latching of the skip tab assembly by preventing the tension of spring AM from springing plate AN. There should be no clearance between plate AN and support AK, just contact pressure. Eccentric AL is turned.

ADJUSTABLE GOVERNOR FOR CARRIAGES WITH SKIP TAB (Plate 22)



Adjustable Governor for Carriages With Skip Tab (Plate 22)

The purpose of this governor mechanism is to secure positive and timed operation for carriage tabulation. The new governor is larger, has adjustable tension and operates only when needed, i. e., when the carriage tabulates and not when the carriage is being returned.

Sequence: When skip link J is raised, arm B moves up to disable the lower escapement dog in the usual manner.

Simultaneously, assembly L raises lower clutch member D to engage it with upper clutch member M. The tabulation movement through escapement assembly P rotates gears AC and AG and the gear integral with the upper clutch member which sets up the centrifugal force to cause friction arms Q and S to press against drum U and thereby control the speed of the carriage. On account of the larger drum, flat bail H replaces the tubular bail of the carriage return spacing mechanism.

Adjusting tension. Spring anchor V is moved upward to clear the notches in disk Y

and turned one way to increase and the other way to decrease the tension of springs Z.

Design: Friction arms Q and S revolve on posts of disk AA, the latter is held on shaft W by collar on AA. Spring anchor V is held engaged with the notches in disk Y by compression spring R. Spring anchor V is located under disk Y, the latter is held by screws X. Pin N passes through the sleeve of upper clutch member M and seats in the bore of shaft W; pin N is held by clip A.

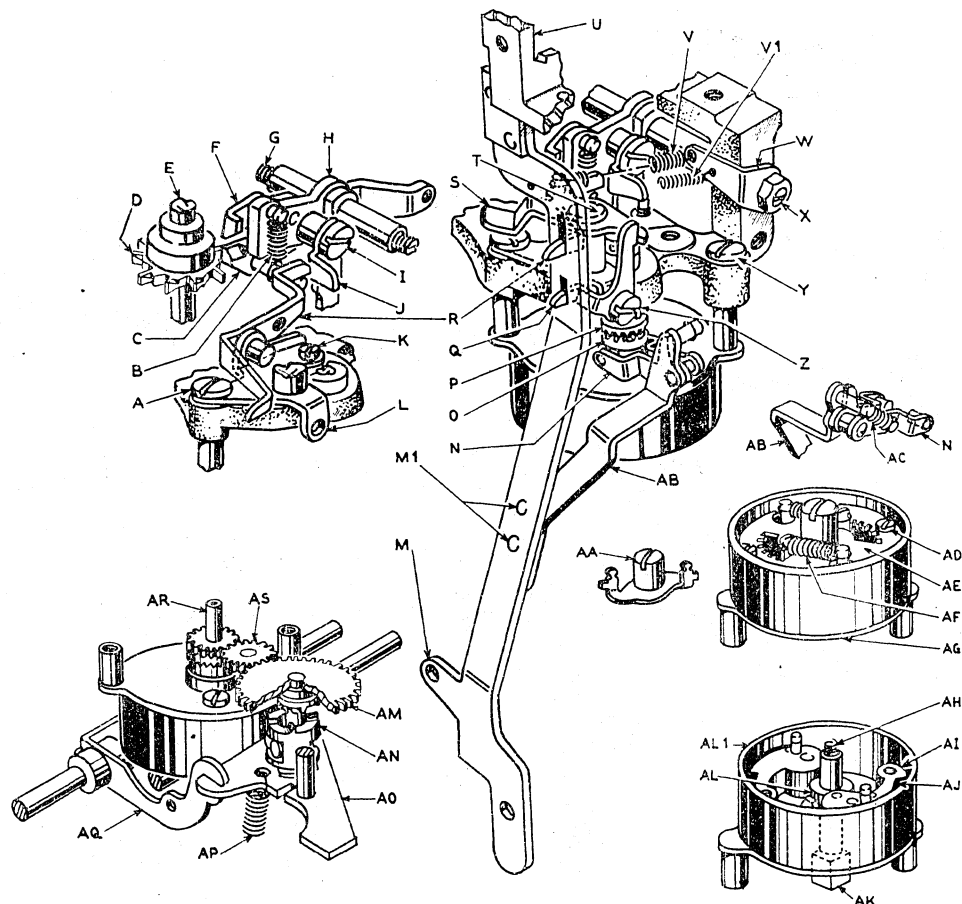
Adjustable Governor for Carriages Without Skip Tab (Plate 23)

This governor is of the same design as governor for skip tab shown on Plate 22; it differs by being connected to the standard auto tab.

When skip link assembly M is raised, the rear arm of lever R swings lower dog C below escapement wheel D thus disabling the latter; bell-crank Q swings detent S into one of the spaces of escapement wheel D.

Note: The escapement wheel shown on

ADJUSTABLE GOVERNOR FOR CARRIAGES WITHOUT SKIP TAB (Plate 23)



(Plate 23)—Continued

Plate 22 covering the adjustable governor for skip carriages is pinned to the escapement shaft and for that reason detent S is not required. All carriages, skip tab and 30" carriages, now have the standard free moving escapement wheel with detent S to hold the escapement wheel in position during tabulation.

Assembly AB raises lower clutch member O to engage it with upper clutch member P. The tabulation movement through escapement assembly E rotates gears AM and AS and gear AR which is integral with upper clutch member P which sets up the centrifugal force to cause friction arms AJ to press against drum AL1 and thereby control the speed of the carriage. On account of the larger drum, flat bail H (Plate 22) replaces the tubular bail used in machines not having this style of governor.

Adjusting Tension: Spring anchor AA is moved upward to clear the notches in disk

AE and turned in one direction to increase the speed or turned in opposite direction to decrease the tension of springs AF.

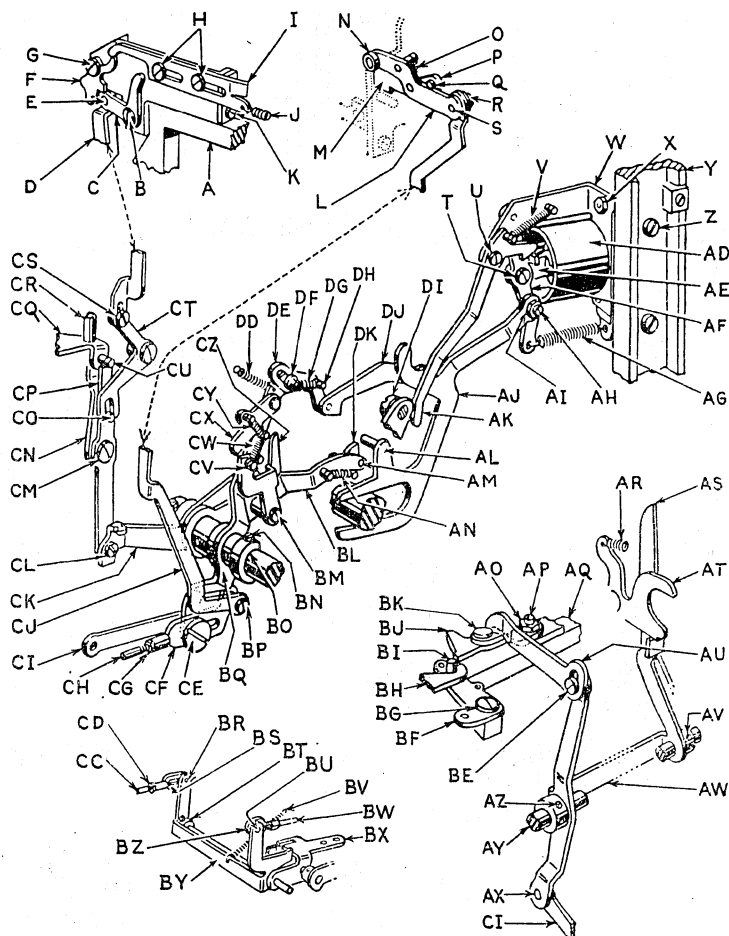
Design: Friction arms AI pivot on posts in disk assembly AL; the latter is revolved when the clutch is engaged. Disk assembly AL is fastened on shaft AK with screw in collar in AL. Spring anchor AA is held engaged with the notches in disk AE by compression spring AH. Spring anchor AA is located under disk AE; the latter is held by screws AD.

Note: Carriage return clutch assembly AN is smaller in diameter in machines having this style governor.

Escapement Mechanism

When a typewriter key is depressed, assembly H is rocked which swings upper and lower dogs downward. When the typewriter key is released, spring H (Plate 15) swings H back to normal position, the lower dog limiting the next escapement tooth as the upper dog moves above the previous tooth.

BALANCE KEY TO SPACE AND RETURN CARRIAGE (Plate 24)



Balance Key to Space and Return Carriage (Plate 24)

When the balance key or any result key is depressed the vertical feed and the carriage return mechanisms are indexed. The vertical feed mechanism is of standard construction, covered on Plate 11.

The carriage return mechanism is delayed and tripped by air dashpot AD which permits the carrying mechanism to function completely and also prevents bending trip pawls.

Sequence

When a control block contacts under roller N, link CJ locates the vertical slot of CF in the path of shoulder screw CE. Now, when any result key is depressed part BQ is rocked, which lowers hook arm DJ (pivots on AJ) into the path of screw head DI. BQ is latched by CZ. The purpose of latch CX is

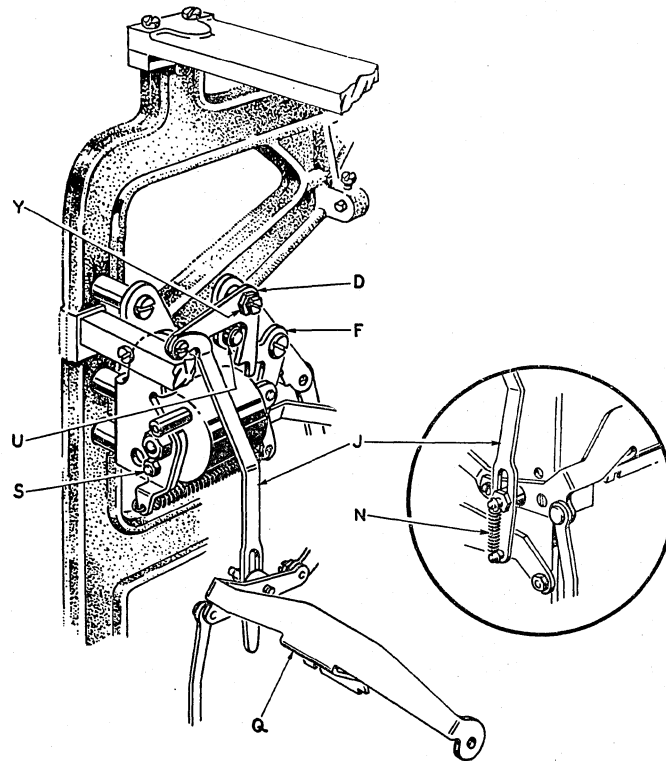
to prevent relatching BQ when result keys are held down.

Near the end of the forward stroke DI contacts on DJ pulling part AJ forward, which through lever AF pulls plunger AE outward, in which position it is latched by the hook on the upper arm of AK. As the end of the return stroke is about to take place, the camshaft arm which carries DI contacts on AK rocking it to clear the step on lever AF allowing spring AG to pull AJ rearward. Stud AL in AJ contacts on passby pawl DK, rocking part CK which raises lift lever CP to mesh the carriage return clutch by contacting on stud CU.

Carriage Return Mechanism Covered on (Plate 27)

When the carriage is about to be returned to normal position slide I contacts on bell-

MOTOR BAR TO SPACE AND RETURN CARRIAGE—IMPROVED (CLASS 78—NEW WIDE BASE) (Plate 24-1)



Motor Bar to Space and Return Carriage —Improved (Class 78—New Wide Base) (Plate 24-1)

Related Knowledge

This is the same Space and Return Mechanism that is described in Plate 24, Carriage Instruction Book, except that an auxiliary latch D better controls the timing of the carriage return clutch engagement during a subtract operation.

Purpose

This improved mechanism retains the Space and Return Mechanism in an indexed position until the end of the subtract stroke. It is not necessary to adjust the air dashpot so closely.

Operation

During a subtract operation (with the Space and Return Mechanism indexed) the subtractor bail Q, as it is rocked rearward, rocks the auxiliary latch pawl D through spring N and link J. As the air dashpot plunger is pulled forward (see Plate 24) the

rear arm of the bellcrank F is lowered, placing the roll U in the pocket of latch pawl D. Latch pawl D remains active in this position until it is normalized by the restoring of the subtractor bail Q at the beginning of the second machine operation. Carriage return is then accomplished at the end of the subtract stroke as described in Plate 24.

Adjustment

1. The auxiliary latch pawl D should raise high enough (with the subtractor bail Q rocked rearward) to permit the roll U to seat in its pocket as the dashpot plunger is pulled forward.

To adjust, turn the eccentric Y.

2. The air dashpot should permit only sufficient time for the engaging of the carriage return clutch at the end of the subtract stroke. There should be only a slight hesitation between the end of the operation and the engaging of the clutch.

To adjust, turn the vent screw S.

Note: Other adjustments, as listed in Plate 24, should be checked.

(Plate 24)—Continued

crank C, stud E in C restoring the carriage return. Bellcrank C also lowers link D, which through part CT swings lift lever CP to clear stud CU and thereby prevents engaging the clutch when the carriage is in normal position.

The depression of result keys also latches the vertical feed mechanism and simultaneously disables the tabulating mechanism.

Link CI, through arm on AY and link AU, swings part BJ to block BF, which disables tabulation. Arm AS of assembly AW latches under AT, which indexes the vertical feed mechanism. When the carriage return mechanism is controlled from the motor bar, turnbuckle CF is different having a long slot.

Tests and Adjustments

Motor bar depressed, latch CZ should hook over stud in BQ before motor clutch is tripped.

Adjustment: Made from turnbuckle on the wire going to motor bar.

Forward stroke, DI contacts DJ to latch AF.

Adjustment: Eccentric AI is turned to secure .010" lead over AK.

Return stroke, the camshaft arm which carries DI contacts AK to release AF.

Adjustment: The tail of AK is bent to clear AF with minimum clearance to provide maximum time.

Air Adjustment: Vent screw in rear of dashpot should be adjusted to provide maximum time to delay as long as possible the engagement of the carriage return clutch.

Carriage Control

With control block under N, CF should locate for vertical hold on shoulder screw CE.

Adjustment: Eccentric R is turned.

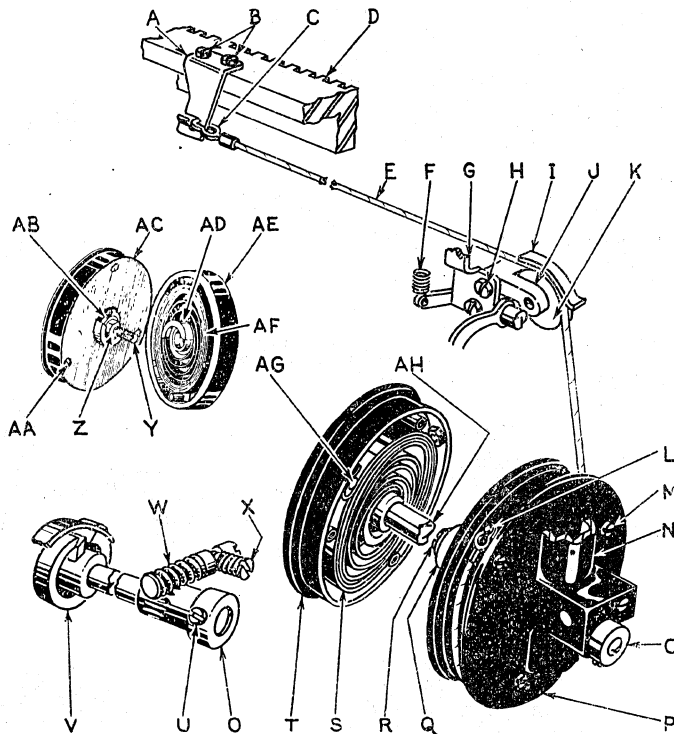
When any result key is depressed, the vertical slot should move freely around shoulder screw CE.

Adjustment: Turnbuckle CF is turned.

When any result key is depressed, latch CZ should hook over stud in BM before motor clutch is tripped.

Adjustment: Turnbuckle BS is turned.

DRUM SPRING ASSEMBLY, SINGLE AND DOUBLE (Plate 25)



Drum Spring Assembly, Single and Double (Plate 25)

The tension of springs S is adjusted by loosening screw X and turning worm W which revolves worm gear O.

When a spring is installed, the carriage is

placed in O position and worm W turned until the spring holds the carriage; worm W is then turned to revolve worm gear O, 4 to $4\frac{1}{2}$ times as indicated by the position of set screw U.

Guard I to clear draw string E.

Carriage Return Mechanism, Type 6 and 6A Motors (Plate 27)

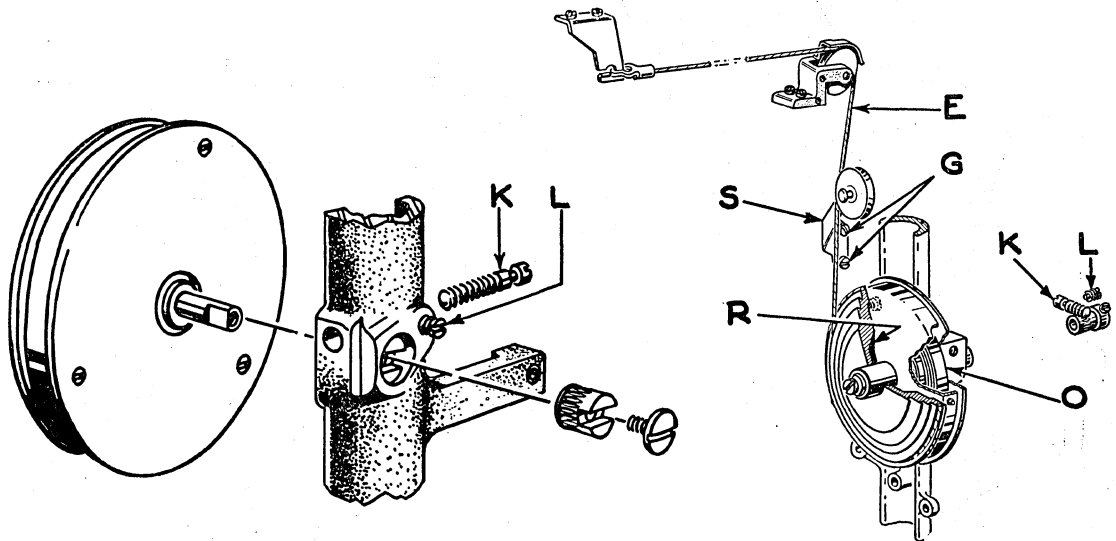
When the carriage return key is depressed, lever BW through link BS, spring BU and free moving arm BV, pulls link AO downward, its foot contacting on arm BE closes the switch causing the motor to operate and revolve shaft AX (Plate 28).

Lever BW also pulls link AQ downward, which through pawl AM lowers arm AP; the latter rocks part AK, which raises the revolving lower clutch assembly F, engaging upper clutch D, which revolves shaft assembly C;

the latter being in mesh with rack B returns the carriage.

Part AK is held in upward position by the roller in arm CE seating in the upper pocket of CH. When the clutch is completely engaged, part CH contacts on and disengages hook pawl AM from arm AP. During the time that the carriage is being returned, the depression of or holding down the carriage return key has no effect on the mechanism due to hook pawl AM being disconnected from arm AP. Bellcrank AG is held over shaft assembly AJ by latch O, which prevents engaging clutch members A and D when the

SPRING BARREL ASSEMBLY WITH SPIRAL REWIND FOR CARRIAGE DRAWBAND (Plate 25-1)



Spring Barrel Assembly With Spiral Rewind for Carriage Drawband (Plate 25-1)

Purpose

The purpose of the spiral rewind plate is to afford a more even tension on the carriage drawband. This is made possible by the fact that the decreasing radius of the spiral plate R compensates for the loss of tension in spring O as the carriage tabulates.

Installation

Note: The spiral rewind plate is standard on all Series M machines and eliminates the double clock-spring construction for wide carriages.

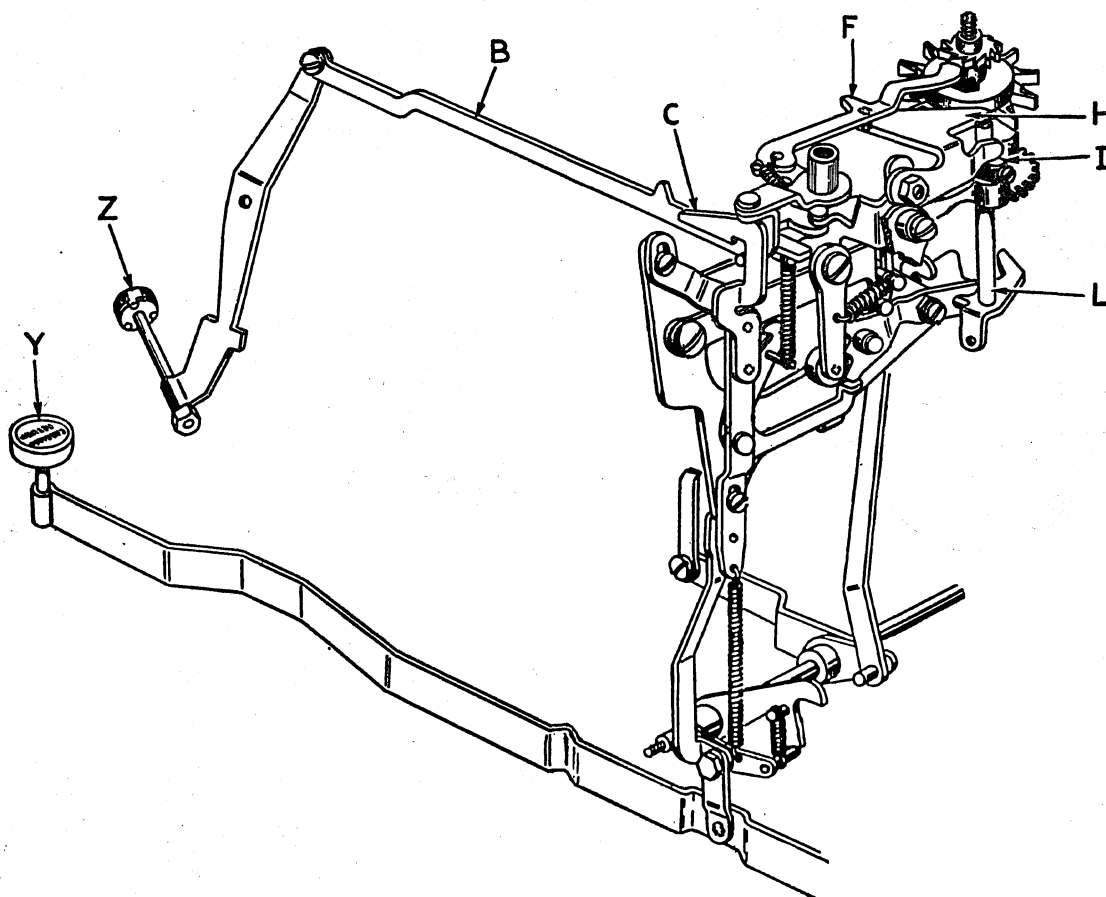
1. Since the inner hub on this drum is larger, a new margin release wire 1-75700A No. 3 (AA, Plate 28, Carriage Symbol List) is required when replacing an early style drum with a spiral rewind drum. On narrow base machines, margin release key coupler AC, Plate 28, must be re-formed to accommodate the new wire.

2. Pulley bracket S, which is assembled $\frac{1}{16}$ " above the mill-cut on the rear arm of ribbon spool bracket M, Plate 17, Printing Symbol List, is to be used as a template for drilling the ribbon spool bracket. Use a No. 37 drill and a $\frac{1}{8}$ -44 tap for screws G.

Adjustment

To regulate the tension on drawband E, loosen set screw L and turn adjusting worm K.

CARRIAGE RETURN AND BACK SPACE KEY INTERLOCK SERIES M (Plate 27-1)



Carriage Return and Back Space Key Interlock, Series M (Plate 27-1)

Purpose

The purpose of interlock H is to prevent simultaneous engagement of the carriage return mechanism and the back space mechanism.

Operation

When carriage return key Y is depressed, assembly L, through collar I, raises interlock H into the path of the stud in back space

pawl F to prevent the latter's engaging the back space wheel.

When back space key Z is depressed, the stud in link B moves forward under the forward projection of part C to prevent its downward movement, thereby preventing engagement of the carriage return mechanism.

Adjustment

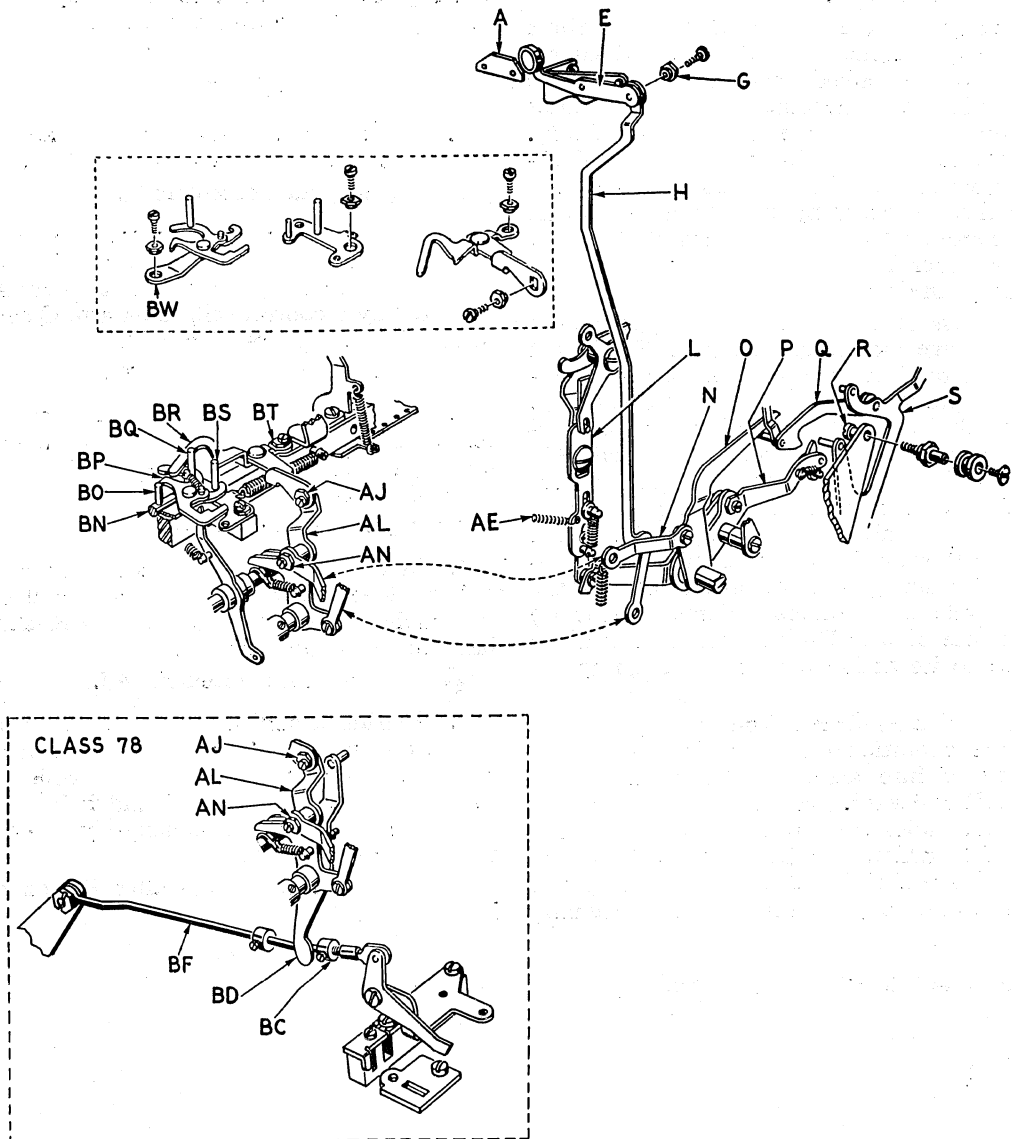
When back space key Z is depressed, there should be minimum clearance between the stud in back space pawl F and interlock H.

To adjust, raise or lower set collar I.

Mr M R Lovejoy

Buffalo N Y Branch 10-5

CARRIAGE RETURN—CARRIAGE CONTROLLED—CLASSES 72 AND 78 (Plate 27-2)



Carriage Return—Carriage Controlled— Classes 72 and 78 (Plate 27-2)

Purpose

To index the Carriage Return Mechanism from a carriage control rail.

Construction

When the carriage control is active (indexed by a control rail), the carriage will return from any machine operation.

The Carriage Return—Carriage Controlled

Mechanism does not alter the normal function of the return motor bar or of the carriage return key in the typewriter keyboard.

The Carriage Tabulating Mechanism, when indexed by any particular machine operation, is normalized when a control rail indexes the Carriage Return Mechanism.

Operation

When control rail A moves under the roll of lever E, link H is lowered, hub assembly AL is rocked rearward, and hook arm Q is lowered into the path of round nut R of the

(Plate 27-2) Continued

Main Operating Shaft Assembly, through link N and lever O.

Rocking of the Main Operating Shaft Assembly, with hook arm Q so aligned, causes link S to be pulled forward to latch the plunger in the air dashpot forward (see Plates 24 and 24-1, Carriage Instruction Book). Upon release of the plunger in the air dashpot near the end of the machine stroke, link S is pulled rearward by spring tension and its stud contacts the pass-by pawl of lever P, rocking lever P and raising meshing link L to engage the carriage return clutch.

On Class 78 machines, meshing link L is held inactive for the greater part of subtract or minus balance operations in order to prevent a premature return of the carriage. As clutch indexing wire BF is moved forward, rear collar BC contacts rocker arm BD, swinging the stud in the upper portion of arm BD rearward to disengage meshing link L. The latter remains disengaged until (near the end of the second cycle of a subtract operation; and during the forward stroke of the third cycle of a minus balance operation) the release of wire BF permits it (link L) to restore to its active position through spring AE.

Tabulation—indexed from any particular machine operation—is normalized when the rocking of hub assembly AL swings hook pawl BR rearward. Hook pawl BR, through stud BS, limits the movement of tabulating shaft BN which has been released by the hook of assembly BW. Hook pawl BR also contacts stud BQ to prevent the positioning

of pawl BP behind stud BO, thereby preventing carriage tabulation during a succeeding non-tabulating operation.

Adjustment

1. A control rail should move under the roll on control arm E without binding.

To adjust, turn eccentric G.

2. During a machine operation in which control lever E is normal, hook arm Q should clear round nut R; when control lever E is actuated by a control rail, hook arm Q should have full hold on round nut R.

To adjust, turn eccentric AN.

3. With a control rail located under the roll of lever E and no tabulation indexed, hook pawl BR should have passing clearance with stud BS.

To adjust, turn eccentric BT.

4. With a control rail located under the roll of lever E and with the Tabulating Mechanism indexed, hook pawl BR should have full hold on stud BS.

To adjust, turn eccentric AJ.

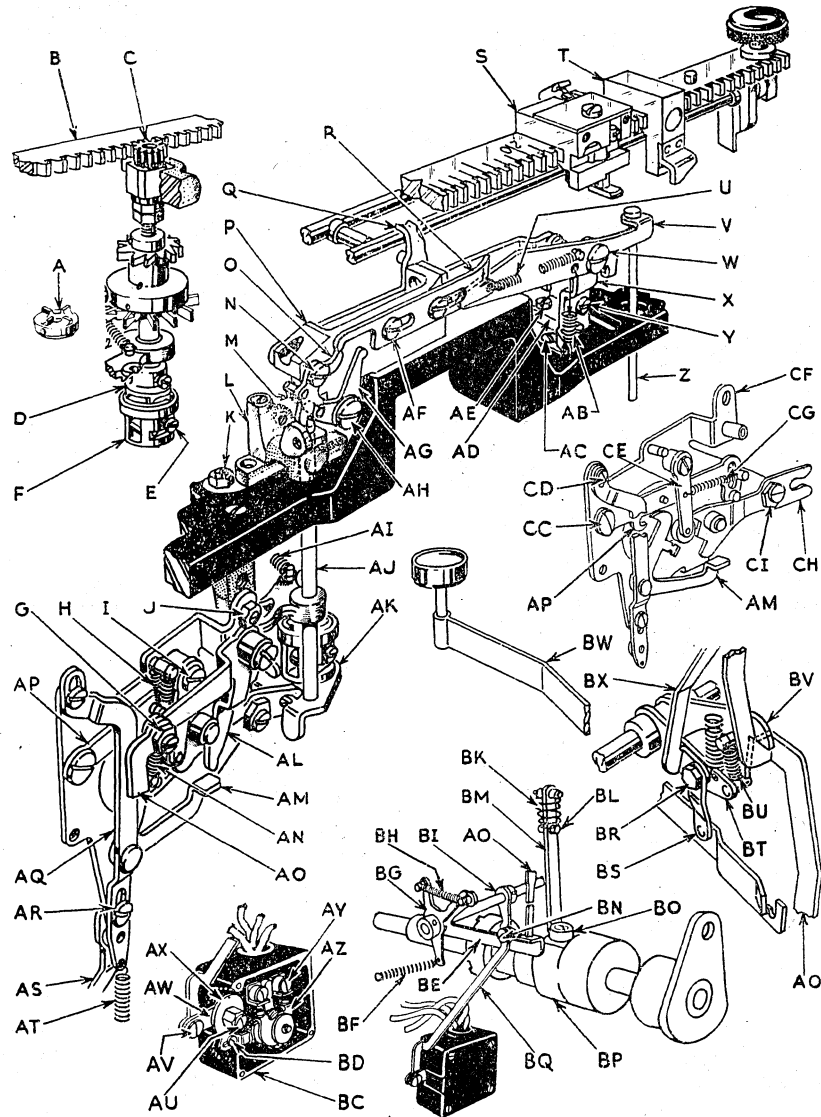
5. During a subtract or a minus balance operation on Class 78 machines—when wire BF is in its forward position—rear collar BC, through rocker arm BD, should hold return clutch meshing link L completely rearward without bind.

To adjust, locate rear collar BC on wire BF.

Replaces Prints 2-1/M and 2-2/M

CARRIAGE RETURN MECHANISM, TYPE 6 AND 6A MOTORS (Plate 27)

(Plate 26 in Symbol Book only)

**(Plate 27)—Continued**

carriage is in returned position with margin block S or T contacting slide R. Latch O is also effective when the carriage moves one space. When the carriage is spaced two or more spaces latch O is released and held by the curved prong of slide R, which cams latch O to clear bellcrank AG when margin blocks S or T are not contacting slide R.

Tests and Adjustments

When the switch is open, there should be a gap of .050" between two contact points with the other two held together.

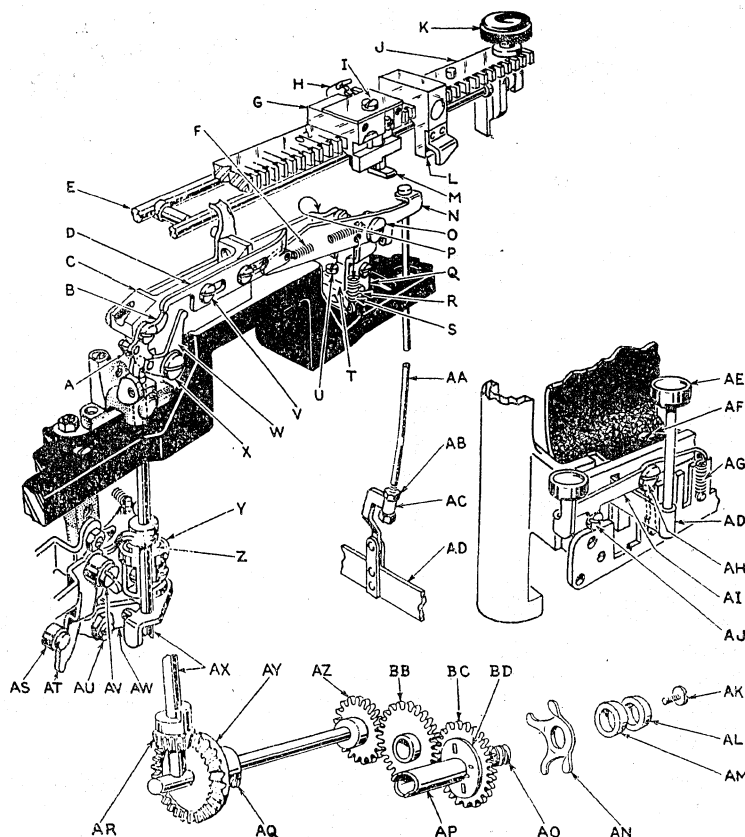
Adjustment: Screw BD is loosened and the switch arm shifted as required.

When the machine is in normal position there should be a slight clearance between link AO and lever BE. The clearance between AO and BE is limited to the motor running when clutch members D and A are tooth to tooth through the depression of the carriage return key.

With the carriage return clutch engaged, contact points should have full wiping action without bind. Adjustment is made from eccentric G.

The purpose of eccentric CI is to secure a full mesh of clutch members D and F.

MARGIN RELEASE MECHANISM AND CARRIAGE RETURN GEAR DRIVE (Plate 28)



Margin Release Mechanism and Carriage Return Gear Drive (Plate 28)

The purpose of the margin release mechanism is to enable the operator to list in the column to the left of the regular starting column by depressing the margin release key, which is then latched in the depressed position and manually unlatched by depressing the margin key lock lever. When it is desired to select the left column at times, latch lever AI is disabled or not used, the margin release key being held down by the operator.

Margin release block G can also be disabled by pushing latch H downward and inward. When margin release key AE is depressed, lever AD through rod AA rocks cam lever N, raising its cam in the path of cam plunger M. When the carriage is returning, plunger M rides over the incline of N, the latter preventing M from contacting

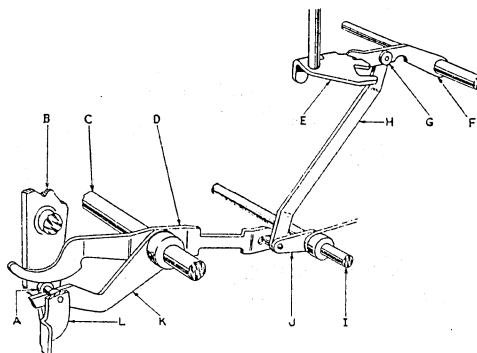
slide D, which allows the carriage return mechanism to continue in operation until block L contacts slide D.

Carriage Return Gear Drive

The carriage return mechanism is operated from the drive through gears AR, AY, AZ, BB and BC revolving shaft AX. As a precaution in the event of some interference gear BC is not fastened directly to sleeve assembly AP, but instead disk BD (on AP) has projections which engage pockets in gear BC. BC and BD are held engaged by spider AN. The tension of AN is adjustable by turning lock nuts AM and AL as required. Sleeve AP is held on drive shaft AO by screw AK.

When margin release key AE is depressed and latched, lever N should be sufficiently high to clear casting C. Adjustment is made from wire AA.

INTERLOCK TO BLOCK THE CARRIAGE RETURN KEY DURING THE MACHINE OPERATION (Plate 29)



Interlock to Block the Carriage Return Key During the Machine Operation (Plate 29)

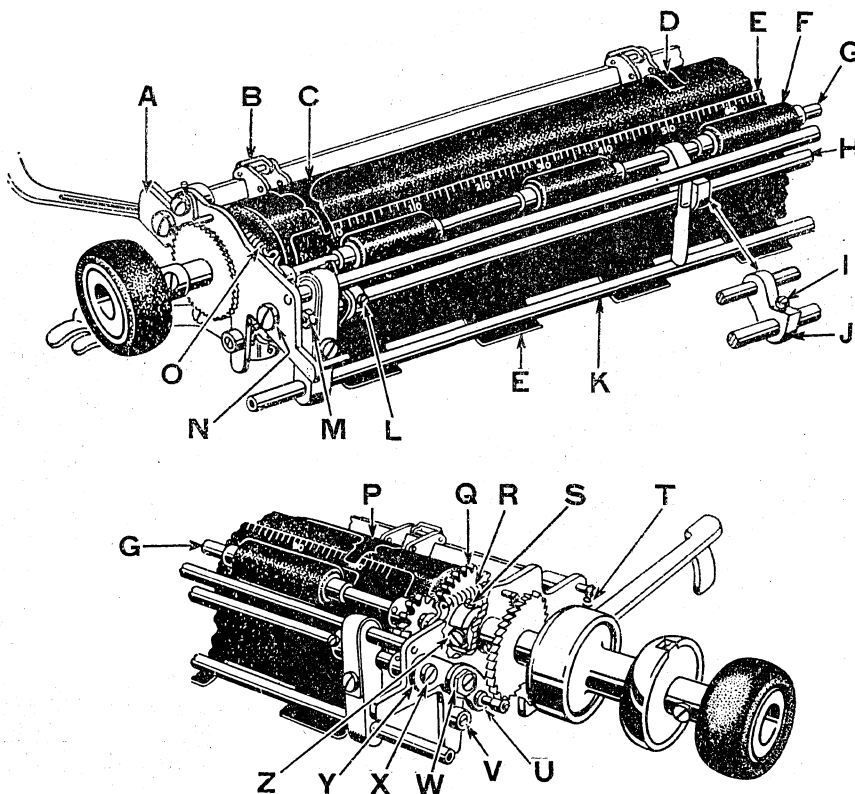
When the carriage return key is depressed, before the machine operation is completed, stud A riding on the cam surface of lever D, prevents the necessary movement of assembly E to engage carriage return clutch F (Plate 27), which causes spring AT (Plate 27) to expand. When the machine returns to

normal position, stud A is located in the pocket of lever D, which permits the necessary movement of assembly E to engage the carriage return clutch.

Tests and Adjustment: Excessive clearance between A and D can permit the carriage return clutch to be engaged.

The rear arm of lever D is bent to reduce the clearance which will prevent carriage return clutch engagement.

GEARED PRESSURE ROLL ASSEMBLY (Plate 30)

***Geared Pressure Roll Assembly (Plate 30)***

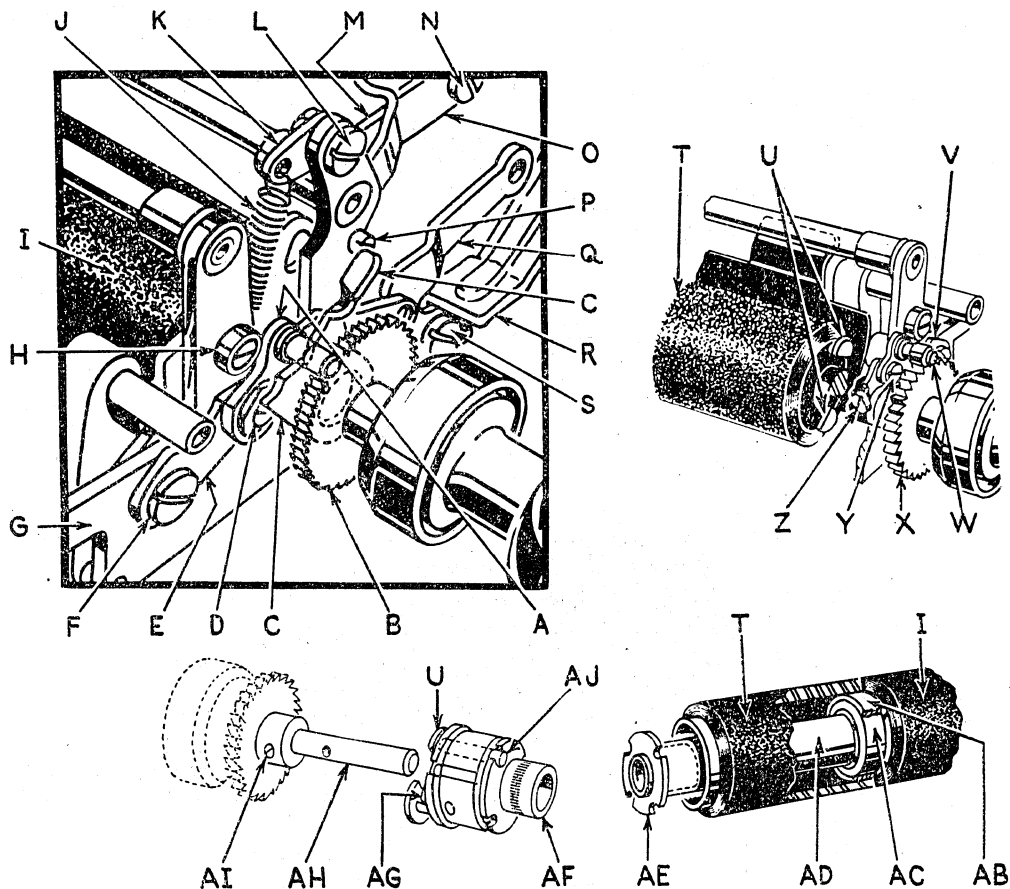
The purpose of the geared pressure rolls is to have the pressure roll shaft rotate equally with the platen in order to insure correct spacing. Carriages used for continuous bill forms have geared pressure rolls. Shaft G has a pinion which is in mesh with gear Q on the platen shaft. The pressure rolls are fastened to shaft G.

To Adjust Tension of Pressure Rolls F

Springs O provide the tension; to equalize their tension screws I in tie block J are loosened and while holding pressure on shaft G, screws are tightened. The object of this adjustment is to hold shaft G straight.

Test tension with a slip of paper under each pressure roll.

SPLIT AND NORMAL PLATEN (Plate 31)

*Split and Normal Platen (Plate 31)*

The purpose of the split and normal platen is to permit two forms to be inserted side by side and spaced independently of each other when the platen is in split position.

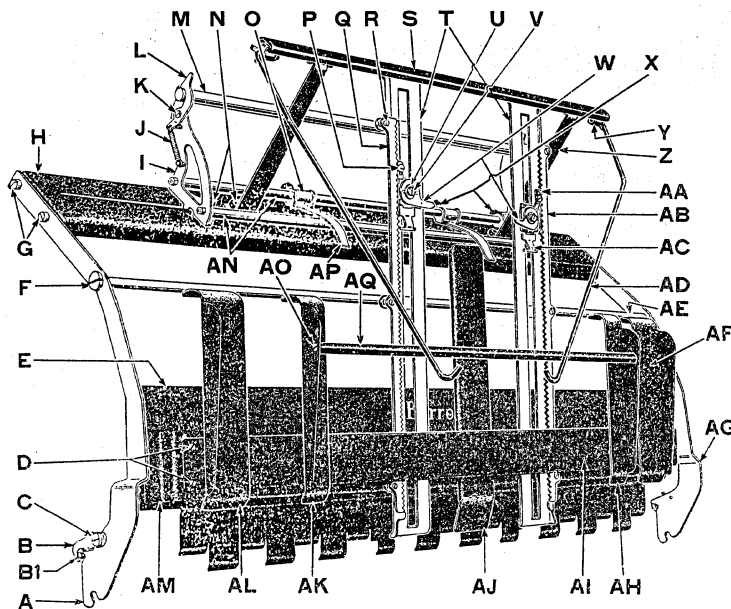
When the platen is placed in normal position, single forms wider than the split sections can be used.

The split and normal platen assembly consists of two members, I and T, which revolve independently or together through a clutch connection.

Platen I has a full length core with a four slot disk which is one of the clutch members. The other clutch member consists of plunger AJ carried by platen T, which, by pressing one of the buttons U, enters one of the slots in disk AE uniting platens I and T. When the other button U is depressed, plunger AJ moves out of the slot in disk AE, separating platens I and T.

Platen T has a short shaft AF, which turns in the bearing of AE. Core end AB of platen T turns on bearing AC.

HIGH-BACK WITH LEDGER CHUTE AND ROLL PAPER HOLDER (Plate 32)



High-Back With Ledger Chute and Roll Paper Holder (Plate 32)

Ledger Chute T

The purpose of ledger chute T is to permit quick alignment of forms to a uniform printing line.

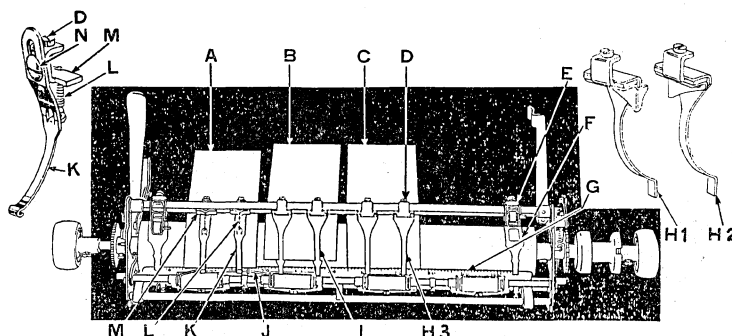
Ledger chute T is anchored to back E by clamps in the same manner that guides AK and AL are held. The upper ends of chute members T are fastened to bar S which is

supported by arms Z; the latter are fastened to upper back H by thumb nuts and screws N.

Roll Paper Holder

The roll paper assembly is fastened to upper back H by thumb nuts and screws N. The paper roll is carried on shaft M; the latter revolves in the pockets of brackets I and is held by latches L. To remove or install paper rolls, latches L are swung from shaft M and the latter removed.

BILL CHUTE (Plate 33)



Bill Chute (Plate 33)

The purpose of the bill chute is to permit insertion, without raising of the carriage, of bills that are inserted to a uniform printing line. There are three types of bill chutes, A, B and C.

Chute A

Chute A is anchored to platen scale G by rod J passing through eyes of fingers K and eyes in platen scale G. In order to permit opening the pressure rolls, fingers K are slotted and held to bracket M by screw N and spring L.

The inserted form limits on the eye of finger K and platen scale G, and provides a printing position approximately $1/3''$ from the bottom of the bill. Chute A does not interfere with forms inserted from the rear. Fingers K are not removable.

Chute B

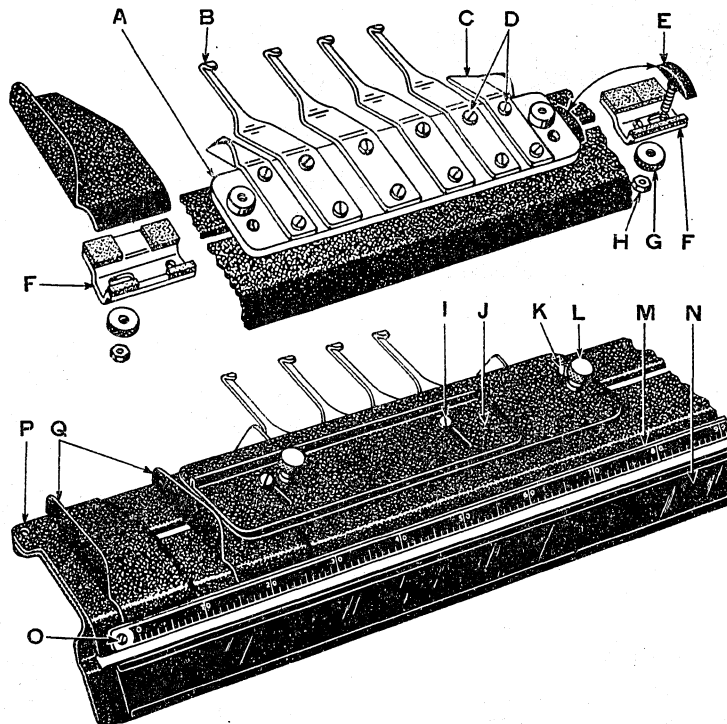
Chute B limits the bill by projecting lips on fingers I, the latter are specially made to provide any printing position desired from $1/10''$ to $1/3''$ from the bottom of the bill. Fingers I are removable by loosening set screws D.

Chute C

Fingers H3 have shoulders that guide the bill behind the platen scale. When the pressure rolls are not released, the bill will be limited by the pressure rolls, providing a printing line approximately $5/8''$ from the bottom of the form.

For a printing line greater than $5/8''$ from the bottom of the bill, studs are placed in platen scale G toward the rear of the platen. The studs may provide a printing line from $1\frac{1}{4}''$ to $1\frac{7}{8}''$ in $\frac{1}{8}''$ steps from the bottom of the bill but when once set are not adjustable. The pressure rolls must be released when the bill is inserted to these limits.

FORM CHUTE NO. 6 (BILL STOP) (Plate 34)



Form Chute No. 6 (Bill Stop) (Plate 34)

Form chute No. 6 (P) has a fixed printing of $\frac{1}{2}$ " from the bottom of the form.

The form is inserted between guides C and

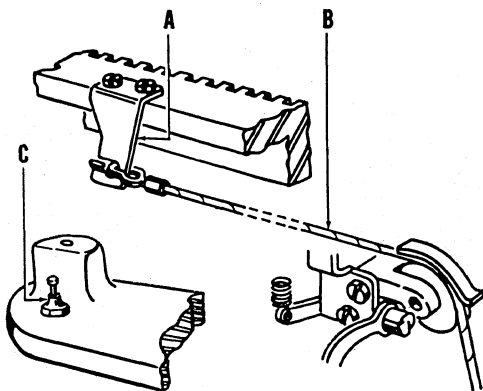
limited on bends of fingers B.

The number of fingers B depends on the width of the form. Bill stop plate J can be used with or without form chute No. 6 (P).

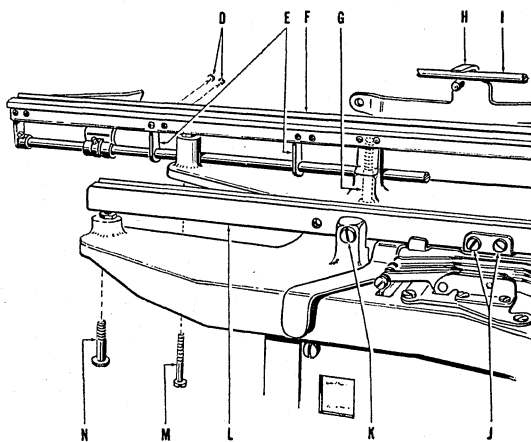
CARRIAGE REMOVAL AND INSTALLATION, SERIES M (Plate A)

A. Remove the following parts:

1. Highback.
2. Case.
3. Collating or Form Table.
4. Aligning Table (if contained).
5. Control Bars (front and rear).

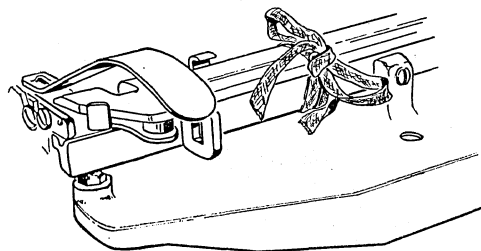


B. Unhook Draw Cord B from Bracket A and hook to Stud C in the Typewriter Top Plate.



C. Remove the following parts:

6. Screws D holding Brackets E to rear Carriage Rail F.
7. Screws J holding the Date Holder to front Carriage Rail L.
8. Right and left Screws N.
9. Right and left Screws M.
10. Right and left Screws G.
11. Right and left Screws K.



12. Tie the front Rails (right and left side) of the Inner and Outer Carriage together as illustrated.
13. Disengage lip of Arm H from Space Bail I and remove the Carriage from the machine.

INSTALLING THE CARRIAGE

- D. Connect the carriage to the machine by reversing the procedure beginning with Item 13 through Item 1.

Note: Test carriage for being free before attaching drawcord B to bracket A.

TYPE 70 MACHINES KEYBOARD

Instruction Book

May, 1948

Issued _____

To Lovejoy

Of _____

Property of and to be returned to
**BURROUGHS ADDING
MACHINE COMPANY**
DETROIT, MICHIGAN

KEYBOARD

Foreword

"Mechanisms controlled from the keyboard of all classes of Type 70 machines" is the subject of this instruction book. Indexing of adding, multiplying and subtract mechanisms, their functions, tests and adjustments are covered.

General and special prints commonly used and mecanogram subjects are included.

INDEX OF MECHANISMS

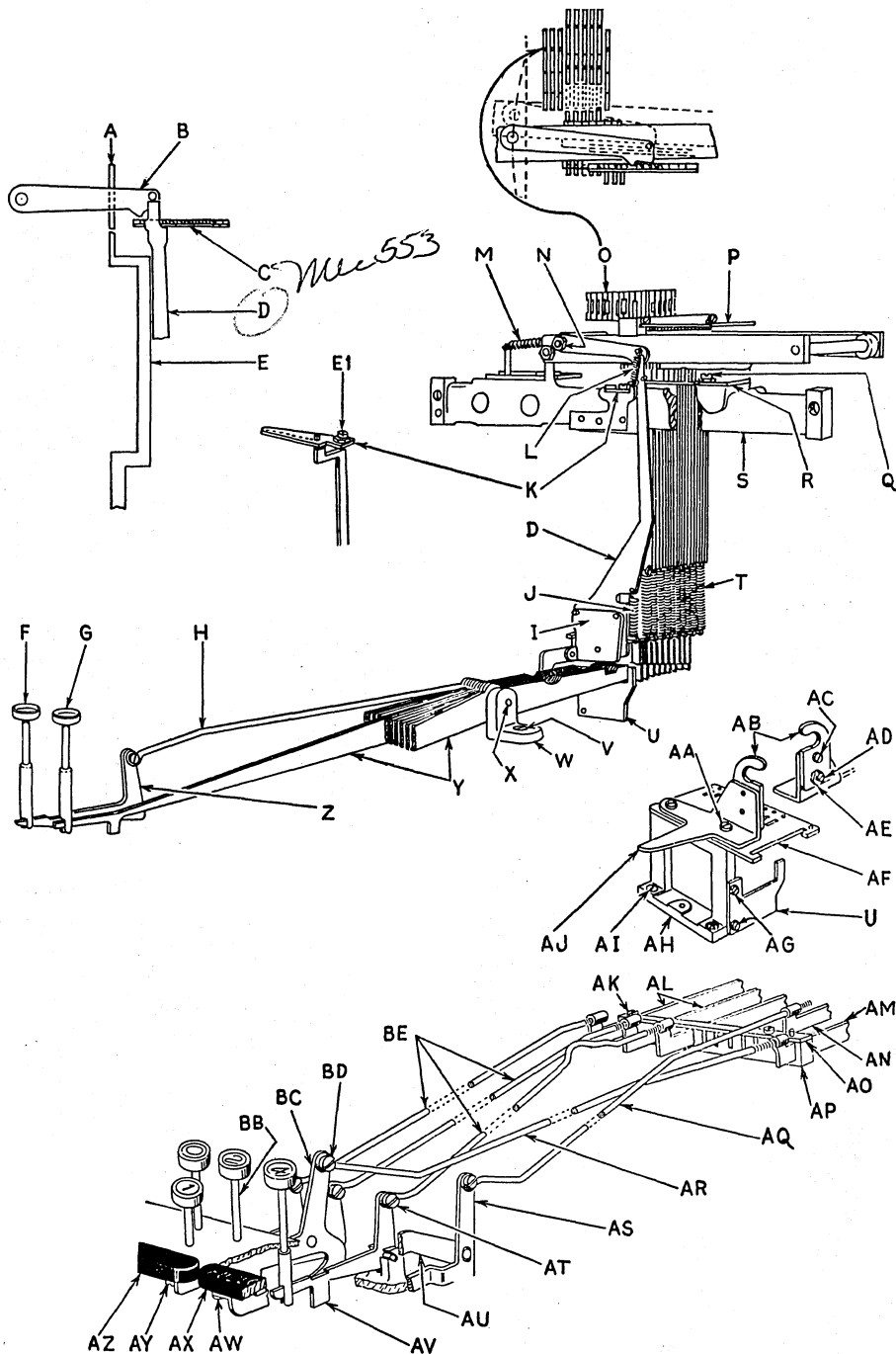
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ADDING AND MULTIPLYING KEYS, AND INTERMEDIATE KEYBOARD ESCAPEMENT MECHANISM (Plate 2)

(Plate 1 in Symbol Book Only)



Adding and Multiplying Keys, and Inter- mediate Keyboard Escapement Mechanism (Plate 2)

The Adding Keyboard

The adding keyboard has ten red keys, 0 to 9 inclusive. Keystems G are connected to

front ends of levers Y, which pivot on shaft X. Levers Y are closely spaced on shaft X; the front ends of Y are offset in order to allow sufficient room for the key operation.

The spacing of levers Y is secured by four globular bosses which are formed in levers Y. A similar boss is placed on the rear end of

(Plate 2)—Continued

levers Y to secure paralleled spacing of the ends of Y.

When a red key is depressed, the rear ends of levers Y contact with two vertical parts, D and E. Parts E are used to raise and set index bars A of the intermediate keyboard. Ten of parts E are used, one for each red figure, 0 to 9. Parts E are placed in a column similar to the keys in a column of an 81 keyboard plus a cipher.

Parts E are guided by passing through slots in upper guide plate K and lower guide plate AF, and supported by levers Y.

The rear end of the No. 9 lever Y is straight; the rear ends of the other levers Y are angled so as to bring them in line with lower ends of parts E.

Part D operates escapement arm B which allows the intermediate keyboard to tabulate into the next left column. Part D is equipped with flapper arm I which extends across all levers.

Intermediate Keyboard Escapement

When part D is raised by levers Y, its upper end contacts with the stud in B which raises point of B out of one of the spaces in rack C, at which time a lip on the upper left side of D enters the next space to the right.

Side movement of upper part of D is limited by a cut-out in R, which locates D to insure sufficient clearance between the lip of D and space in rack C, when arm B is in the space of rack C. When arm B clears the space of rack C, there is a slight movement or drop caused by rack C limiting against the lip of D. This slight movement of rack C causes the top of a tooth to stop under the point of B and permits spring M to move the intermediate keyboard until B is completely seated on the next right space of rack C on the return movement of D.

It will be noted that the right side of the teeth in rack C is beveled which guides the point of B into the next space when it is carried downward by spring L.

The purpose of flapper I is to provide for non-tabulation of the intermediate keyboard when a red key is depressed with the fraction key held down. This is necessary to allow a fraction set up in first register. The fraction key contacts on bell-crank Z which is connected to flapper I by wire H. When flapper I is pulled forward by the depression of the fraction key, I is moved over a cut-out in levers Y, which disables the escapement of B.

Flapper I is hinged to D by two long shoulder rivets. The top edge of I is rounded to prevent cramping at its hinged point.

Tests and Adjustments

E should have maximum hold in upper guide K when parts E are in lower or normal position. When parts E are raised through depression of the red keys G, there must be a slight clearance between the horizontal part of E and the under part of guide K.

Adjustment: Bend K.

Parts E can be readily removed by unhooking springs T and sliding E off lever Y, replacing them in the reverse manner. If, for any reason, it is desirable to remove more than one or all, it is advisable to replace them in order of their removal so as not to change other adjustments.

Adjusting Escapement Mechanism

Align intermediate keyboard stops A with rack bar stops O.

Adjustment: Turn eccentric N.

Locate position of D to allow for drop or clearance between side of lip and teeth of rack C.

Adjustment: Eccentric Q is turned. A maximum drop is desirable with non-binding contact of the lip on D in rack C when a red key is depressed.

Relative Upward Movement of Stops A and Pawl B: When red keys are slowly depressed, stops A should be fully raised, slightly before B clears rack C.

This test should be made with both 0 and 9 red keys. A gradual variation of clearance between 0 and 9 can be corrected by locating lower part of D so that the lower edge of flapper I will contact evenly on Y.

Adjustment: File the lower edge of I.

When red keys are held depressed there should be at least .020" clearance between B and C.

Test relative downward movement of stops A and the lip on D to insure against interference of E with stops A.

When red keys are caused to slowly return to normal, parts E should be to the right and below stop A before D releases from rack C.

When this test indicates interference of E and A, it is advisable to install another D according to these instructions.

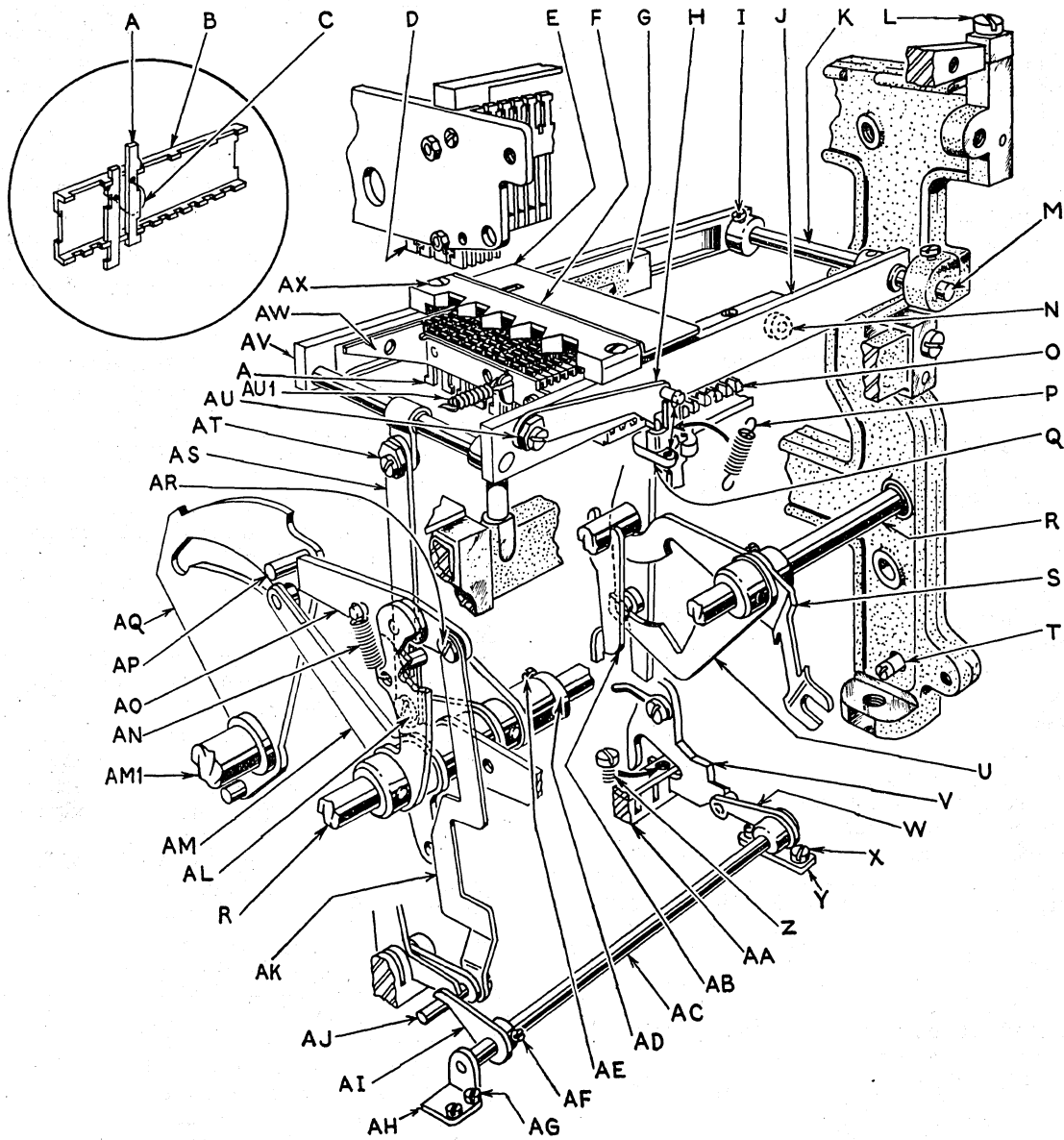
Align parts E with stops A.

Adjustment: Eccentric E1 in upper guide plate K is turned.

Note: Earlier machines do not have an eccentric in K; eccentric N in the earlier machines is turned to equalize the alignment of E and A and the alignment of stops A and B.

When the section is raised to engage stops O, it moves in an arc; for that reason the alignment of stops A and parts E must be considered in relation to the upper position of the section to insure ample contact hold of A on O. Test by raising the section with hand.

INTERMEDIATE KEYBOARD CONTROLS (Plate 3)



Intermediate Keyboard Controls (Plate 3)

The intermediate keyboard carries 90 index stops, letter A, and plate AW. Ten stops are arranged in 9 rows to correspond to an 81 keyboard arrangement. Plate AW sets cipher stops in columns to the left of the amount.

Index stops A have an upward and downward movement, also a side movement. When A is raised through the depression of a red key, it is cammed sideways to allow a square corner on A to seat on top of a separator located between the slots of guide plate B. This is necessary to insure positive upward position of A when it contacts on rack bar stops D.

One V-shaped spring C controls two index bars A. When both bars are in lower position, the tension of spring C is sideways. When one of the bars is raised, spring C is carried upward and the tension is changed, one end pushing upward and the other end pushing downward.

Any two index bars A which are controlled by the same spring C are located with the cam ends in the wide slot of guide plate B with their cams in opposite directions.

Guide plates B are assembled by placing them in frame G which forms the magazine for holding index bars A.

The intermediate keyboard moves in frame

AV on roller bearings N; it is moved to the left by spring AU1 when the keyboard is tabulated by the escapement movement.

The frame carrying the intermediate keyboard pivots on one end to provide an upward and downward movement.

At the beginning of the forward stroke, stud AP in the right twin cam contacts lever AO which oscillates shaft R. This movement, through link AS, raises the intermediate keyboard causing index bars A to contact and raise rack bar stops D.

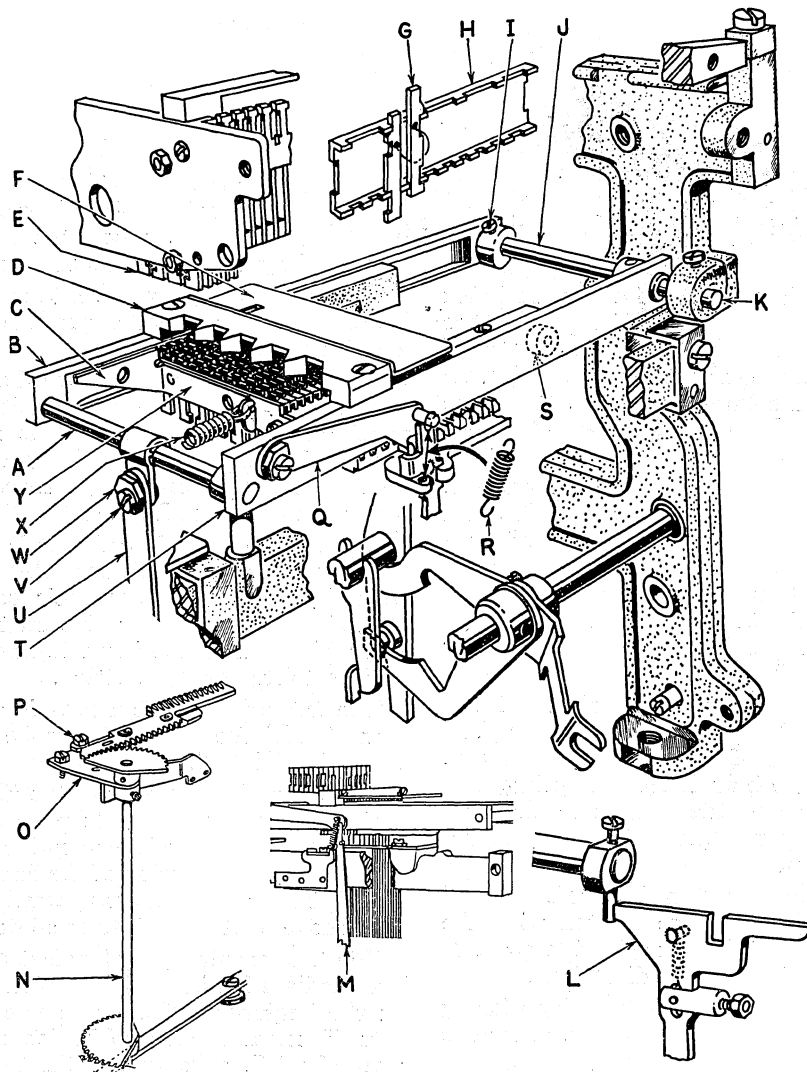
The movement of stud AP is downward and the movement of lever AO is upward which gradually reduces their contact and then allows lever AO to ride on top of stud AP, which allows the intermediate keyboard to drop to its normal position.

The intermediate keyboard is restored to normal on the forward stroke which is covered in Plate 5.

The upward movement of the intermediate keyboard is blocked when it returns to normal position by cam arm U, which locks shaft R. During the early portion of the forward stroke a pocket in arm U allows upward and downward movement of the intermediate keyboard.

When any multiplying key is depressed, the intermediate keyboard is disabled as follows: At the beginning of the machine operation, part V contacts arm W which rocks shaft assembly AC, causing arm AI to lower link AK which tilts lever AO to miss stud AP.

REMOVING THE INTERMEDIATE KEYBOARD (Plate 4)



Removing the Intermediate Keyboard (Early) (Plate 4)

1. Unhook spring X.
2. Remove part L from the right side frame.
3. Remove screw V and eccentric W.
4. Unhook spring R.
5. Remove part M from O.
6. Remove screw P and eccentric.
7. Remove N.
8. Set up all rack bar limit stops E.
9. Remove rear pin K.
10. Tip the complete assembly to the rear and through the right side frame.
11. To replace the complete assembly, reverse the order of instructions.

To Change Stops G

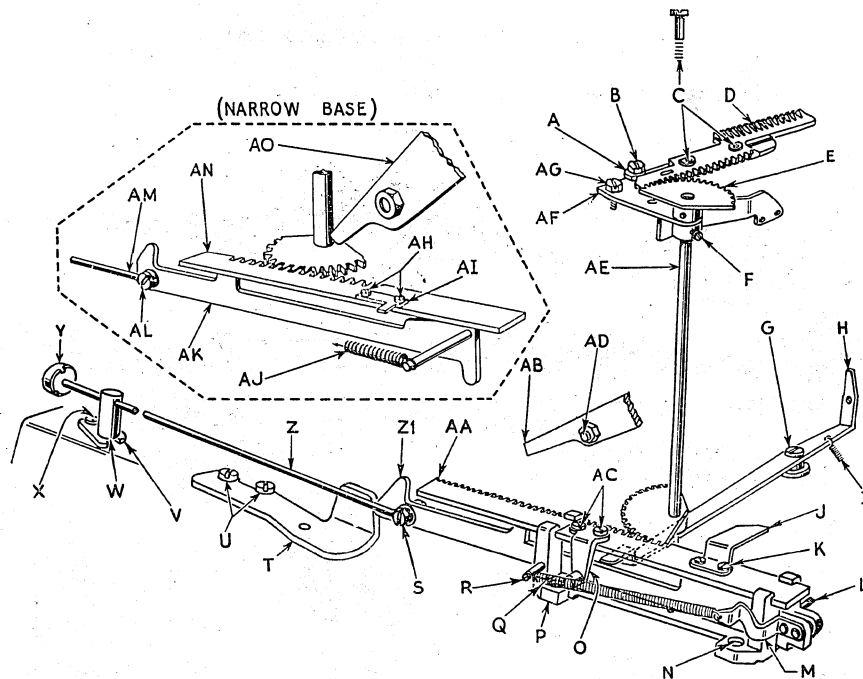
1. Remove plate D.
2. Stand complete section on end.
3. Remove lock plate C.
4. Remove as many plates H as necessary.

To Replace Stops G in Late Machines

The complete section is not removed from the machine.

1. Remove the nut from shaft A.
 2. Loosen screws holding comb D.
 3. Loosen screw I holding raceway B.
 4. Remove raceway B and stop section.
- Note:** Be careful not to drop roller S.
5. Stand the stop section on end, remove lock plate C.
 6. Remove as many plates H as necessary.

ERROR KEY AND KEYBOARD RESTORING MECHANISM (Plate 5)



Error Key and Keyboard Restoring Mechanism (Plate 5)

The purpose of the error key is to restore the amounts set up from the keyboard and also to restore the result keys. The motor bar, full cent, subtract and the multiplying keys are not affected by the error key.

When the error key is depressed, its wire connection moves slide Z1 rearward, the front projection of slide Z1 moves rack AN or AA rearward to reset the intermediate keyboard. The middle projection of slide Z1 swings lever H to release the result keys.

Keyboard Restoring Mechanism

The intermediate keyboard is restored to its right-hand position as follows: Arm AB or AO on main operating shaft engages lip of AI (or assembly O) thereby resetting rack AA or AN.

Rack AA or AN movement is applied to

the intermediate keyboard through lower segment gear on shaft AE, upper segment gear E and rack D, the latter being fastened to the intermediate keyboard.

As the keyboard is moving to the right during the resetting operation, index stops A (Plate 3) pass through comb F (Plate 3) which is beveled vertically and horizontally, thus releasing and lowering to normal position the index stops which were previously set by the red keys.

The lower gear of shaft AE is set with one tooth space open on each end of rack AN. The upper gear of shaft AE is set with two teeth of gear out of right end of rack D.

Shaft AE should have slight end play.

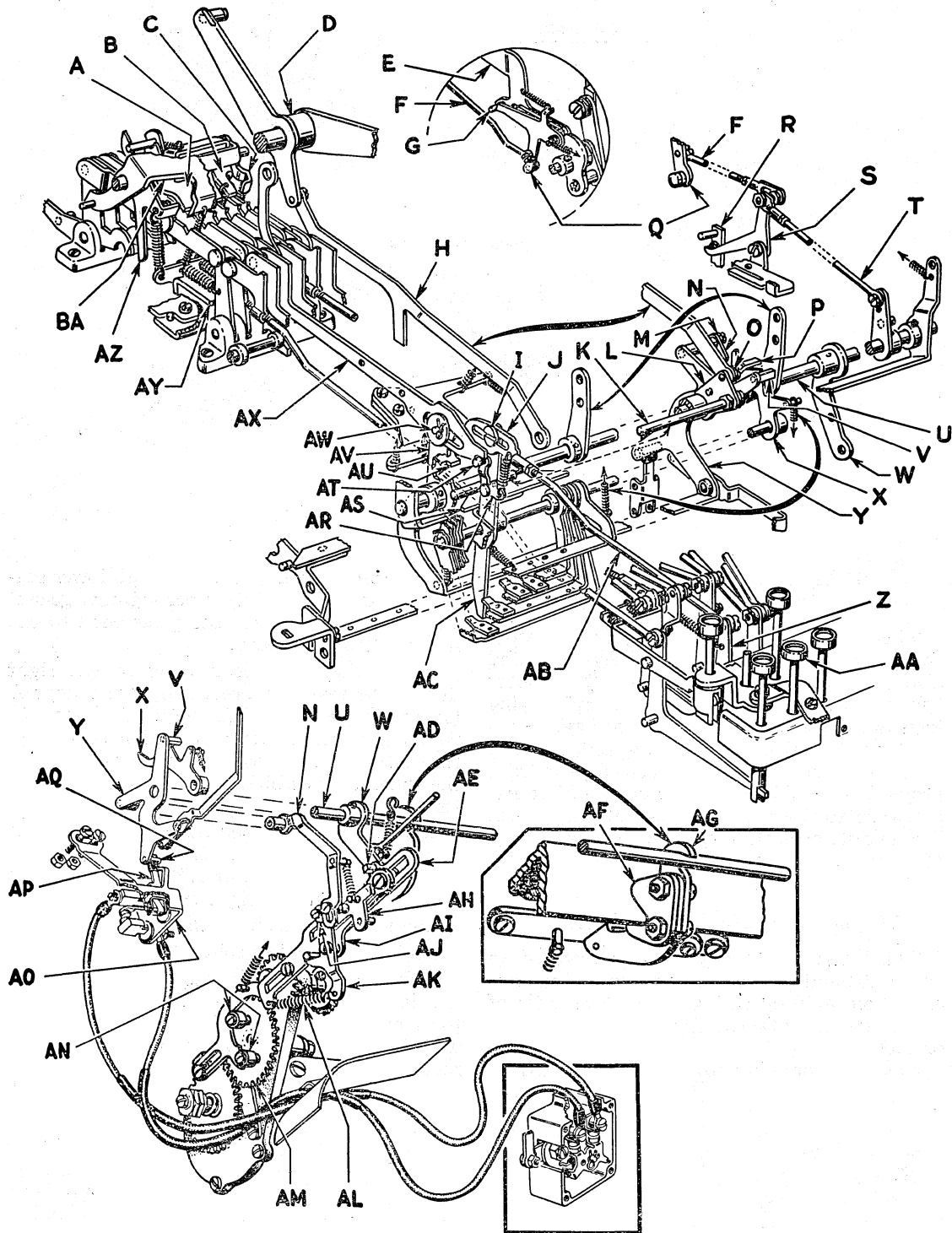
Adjustment: Set collar on shaft.

On wide base machines, lower gear of shaft AE is set with three teeth spaces open on front end of rack AA. The upper gear is set with two teeth of gear out of right end of rack D.

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 67—CLASS 72 AND SERIES M 200 MACHINES

(Plate 6A)

(Plates 5-1 and 6 in Symbol Book only)



**Easy Depression Power Result Keys and
Control Key in Pos. No. 67—Class 72
and Series M 200 Machines
(Plate 6A)**

Note: This mechanism was introduced in Style 72 07 22 machines, beginning with machine Serial No. A915672, as illustrated in Plates 6B, 6C, and 6F, Keyboard Symbol List. It was refined in design to permit all the operational functions of the other styles of Class 72 machines and then was introduced in all styles of Series M 200 machines beginning with Serial No. B197641.

Purpose

To permit the indexing of a selected result or control mechanism with a light, easy depression of the corresponding key (either a result key or the control key in Pos. No. 67), and to permit completion of the machine operation without manipulation of a motor bar.

Operation

PARTIAL DEPRESSION of result key AA moves the upper portion of rocker arm AC forward, through bell crank Z and wire AB, thereby releasing result key linkage AX from rocker arm pawl AR and permitting the vertical slot in linkage AX to engage stud AW in power shaft arm AV.

FURTHER DEPRESSION of result key AA rocks switch bail Y, through the lower extension of rocker arm AC, closing auxiliary switch AO, through stud AQ and switch arm AP, and latching switch bail Y in rocked position by means of square stud V and latch X. The rocking of switch bail Y to latched position raises drive pawl AH, through link N, into the path of square stud AD in power slide AE.

Closing of auxiliary switch AO (through the rocking of switch bail Y) operates the motor, thereby rotating intermediate drive gear AM and oscillating power slide AE through rolls AN. Oscillation of power slide AE (with drive pawl AH aligned with stud AD) causes power shaft U to be rocked through stud AD, drive pawl AH, arm AK, spring AL, auxiliary slide AI, and power shaft arm W. The purpose of this arrangement is to provide a broken joint in case the power shaft is prevented from rocking, permitting power slide AE to continue to oscillate.

The rocking of power shaft U causes result linkage AX to be moved forward, through shaft arm AV, where it is latched by result linkage latch A. As power shaft U is rocked, drive clutch release link R is raised

through wire T and bell crank S, thereby closing the main switch points and tripping the clutch to complete the selected machine operation.

Braces AF and AG keep power shaft U from weaving, thus providing a uniform latching of the result linkages on the result linkage latch.

When bell crank S is rocked as described above, wire F raises the forward extension of pawl Q clear of stud G in slide E, thereby preventing disabling of the intermediate keyboard during a Clear Multiplier Key Operation.

DURING THE FORWARD MACHINE STROKE, restoring shaft assembly L is raised through link H and the rocking of hub assembly D, thereby effecting the following functions: (1) releasing latch X from square stud V by means of extension P of the shaft assembly—permitting auxiliary switch AO to open and drive pawl AH and power shaft U to restore to their respective normal position; (2) raising the forward end of result linkage AX by means of shaft K—permitting stud AT in rocker arm pawl AR to reset under the forward end of the result linkage before the latter is released from latch A; (3) raising turnbuckle J by means of shaft K—releasing screw I from the pocket in the turnbuckle to permit rocker arm AC to restore to its limit in the event the key is held depressed during operation of the machine.

Note: The above functions, which have been traced from indexing of the register total key, would likewise be indexed and actuated upon depression of other result keys or control key in Pos. No. 67.

The extend key and the fraction-add C.F. key, the linkages of which are manually latched forward, may be used with a result key (operation permitting), provided the extend or fraction-add C.F. keys are depressed first. Due to the independent functioning provided by redesigned latches B and AZ, both keys may be released by the error key prior to machine operation.

Adjustment

1. Limits AY, AU, and AS are basic limits which have been adapted in manufacture to provide the following results:

a. Limit AY, which is the normal limit for the result linkages, should position the cutouts in the result linkages so that they align with interlock BA.

b. Limit AU, which serves as the normal limit for arms AV and power shaft U, should align studs AW with the vertical slots of linkages AX.

(Plate 6A) Continued

c. Limit AS, which serves as the normal limit for rocker arms AC, should so position arms AC that studs AT have a full hold under the forward end of result linkages AX and are flush with the forward vertical surfaces of the linkages.

Note: Failure of any one of these basic limits to produce the respective alignments listed, necessitates the replacing of either limit AY (if alignment "a" is in error) or shaft assembly U (if alignment "b" or "c" is in error).

2. Depression of a result key should move its respective turnbuckle J forward approximately .010" before rocker arm AC begins its rocking movement; and when the result key is fully depressed, square stud V should have approximately .010" latching lead on latch X.

To adjust, shorten or lengthen the respective result key wire AB.

Note: To obtain the .010" latching lead on latch X, to accommodate a wire which is necessarily adjusted long, it may be necessary to tip stud V by weaving its retaining arm.

3. Auxiliary switch AO should close just prior to the latching of stud V on latch X.

To adjust, bend switch arm AP.

4. Drive pawl AH should not be aligned with stud AD when result linkage AX engages drive arm stud AW (result key depressed half way); and should have a safe hold (half hold) on stud AD when stud V is rocked sufficiently to engage latch X.

To adjust, turn eccentric bushing M. (In machines not equipped with eccentric bushing M, weave the arm of switch bail Y to which link N is attached.)

5. Each result linkage should have slight latching lead, without bind (approximately .010"), on latch A or C when the linkage is moved to its maximum forward position by power shaft U.

To adjust, turn eccentric bushing AJ.

6. The drive clutch should trip shortly after the result linkage is latched in its forward position by latch A or C.

To adjust, shorten or lengthen wire T.

7. When the drive clutch is tripped through the indexing of a result or control key, pawl Q should remain in a raised position until it travels over and beyond the center of stud G.

To adjust, shorten or lengthen wire F.

8. With the machine normal and a result key indexed, reset shaft K should be so positioned that linkages AX are permitted to seat fully on studs AW; and during the forward machine stroke reset shaft K should raise linkages AX sufficiently to permit studs AT to reset under linkages AX.

To adjust, turn eccentric bushing O.

9. When a result key is held depressed, reset shaft K should raise turnbuckle J sufficiently during the forward machine stroke to align the shoulder of screws I (without bind) with the turnbuckle's rear slot.

To adjust, raise or lower the rear extension of the turnbuckle by bending wire AB up or down.

Note: Bending of a wire in order to bring about this alignment should be followed by rechecking adjustment No. 2.

10. Extension P should allow latch X to move forward to a full hold on stud V when the auxiliary switch is indexed; and should rock the latch sufficiently to release stud V during the forward machine stroke.

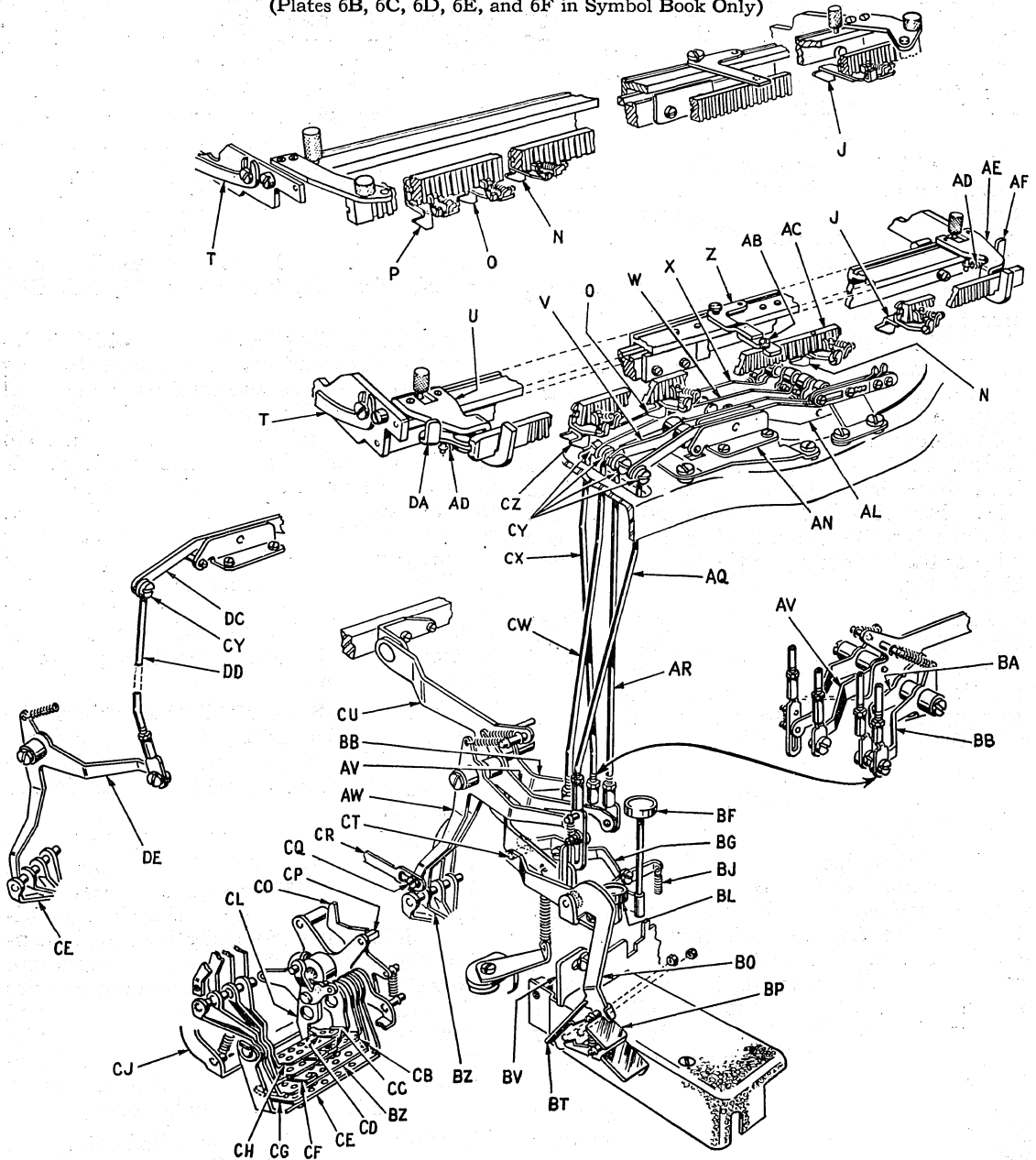
To adjust, bend extension P forward or rearward.

11. Brace AF should just contact the base with both projections, and brace AG should just limit forward on shaft U.

To adjust, position braces AF and AG.

CROSSFOOTER AND REGISTER TOTALS AND SUB-TOTALS INDEXING MECHANISM, CARRIAGE CONTROLLED— CLASS 72 AND SERIES M 200 MACHINES (Plate 6G)

(Plates 6B, 6C, 6D, 6E, and 6F in Symbol Book Only)



Crossfooter and Register Totals and Sub-totals Indexing Mechanism, Carriage Controlled—Class 72 and Series M 200 Machines (Plate 6G)

Result Key Mechanism (Plate 6A) and the Sub-total Indexing Mechanism (Plate 40-1).

Purpose

To permit automatic crossfooter and register totals and sub-totals by providing carriage control of the Easy Depression Power

Construction

This mechanism was introduced and used first in Style 72 07 22 machines beginning with Serial No. A915672. It was then refined in design and adapted for use in Series

(Plate 6G)—Continued

M 200 machines beginning with Serial No. B197641.

Style 72 07 22 machines prior to Serial No. B197641 contain individual register sub-total and sub-product result key linkages, and the four carriage controls are utilized to index these operations as well as the register total and product key operations.

Series M 200 machines utilize three of the carriage controls (lines 7, 9, and 11) for cross-footer and register total key operations, while the fourth control (line 13) is used for the Sub-total Indexing Mechanism.

Easily removable front control bar AC was introduced in machines beginning with Serial No. B100475 to provide a means of readily exchanging control bars if required by the operations. Control bar AC is held in place by brackets U and AE, which contain clamps DA and AF, respectively, that fit into the horizontal slot of the bar and are held there firmly by the tension of springs AD. Bar AC is located centrally on the carriage by the vertical slots in the lower edge of the bar fitting on the arms of brackets U and AE.

The swinging arm of bracket Z engages screw AB to prevent weaving of bar AC. Bracket Z may be located in any one of three positions, depending on the location of the form guide, in order to prevent interference with the nut which holds the form guide.

Operation

As the carriage tabulates into the register total position, index cam O in line 11 (on front control bar AC) cams over the roll on control rocker arm V, rocking bail BZ, through wire AR and bell crank AV. The rocking of bail BZ actuates the corresponding rocker arm CL, through lug CF, thereby indexing the register total result linkage and rocking bail CJ to close the auxiliary switch—to complete the register total operation as explained in Plate 6A.

In Style 72 07 22 machines prior to Serial No. B197641, carriage control of the register sub-total, product, and sub-product result linkages is also provided by means of corresponding index cams, control rocker arms, bell cranks, bails and lugs: register sub-total control in line 13 (outermost line) is provided by index cam P, control arm DC, wire DD, bell crank DE, bail CE, and lug CG; sub-product control in line 9 is provided by index cam N, control arm W, wire CW, bell crank BA, bail CB, and lug CC; product control in line 7 (innermost line) is provided by index cam

J, control arm X, wire CX, bell crank BB, bail CH, and lug CD.

In Series M 200 machines, which contain the Sub-total Index Mechanism, carriage control of the result linkages varies slightly. Register total control in line 11 is the same, however, being provided by index cam O, control arm V, wire AR, bell crank AV, bail BZ, and lug CF. Final product control (or minus balance control in Series M 225 machine) in line 9 is provided by index cam N, control arm W, wire CW, bell crank BA, bail CB, and lug CC. First product control (or product control in Series M 225 machines) in line 7 is provided by index cam J, control arm X, wire CX, bell crank BB, bail CH, and lug CD.

The Sub-totaling Mechanism, which is indexed simultaneously with whichever totaling mechanism requires sub-totaling, is indexed by index cam CZ, control arm AL, wire AQ, bell crank AW and link CR. Index cam CZ contains two camming surfaces which permit indexing the particular totaling operation as well as the sub-totaling operation during a carriage tabulation. The inner camming surface passes over the roll of the particular totaling operation control arm while the outer camming surface indexes the sub-totaling operation by coming to rest on the roll of control arm AL when tabulating into a specified position.

Note: In Style 72 07 22 machines, the clear multiplier linkage is usually indexed along with the sub-product result linkage through an extra lug which is attached to bail CB.

In Series M 200 machines, the final product operation (or minus balance operation in Series M 225 machines) clears the multiplier, and therefore, the clear multiplier linkage is not usually indexed in conjunction with another result key operation. However, if the operation should require the clear multiplier linkage to be indexed along with any result linkage, a lug may be put on the particular bail, but the Automatic Extend Mechanism should not be active during that particular operation.

Disabling of carriage controlled totals and sub-totals is accomplished by means of lever BO, which, when depressed and latched on latch BT, raises assembly CU, through stud CT, so that bell cranks DE, AV, BA, and BB fail to contact the studs of their respective bails CE, BZ, CB, and CH. Bell crank AW, when raised, fails to index the Sub-total Index Mechanism because screw CQ is idling in the slot of link CR. The disabling lever may be released by depressing latch pawl BP.

(Plate 6G)—Continued

Lever BO also indexes inner margin key BF, through stud CT and lever BG, in machines which require this function. Outer margin key BL is then usually disabled by unhooking spring BJ, to permit the inner margin key to release when the disabling lever is released.

Carriage release lever T is designed to prevent manual movement of the carriage from right to left, which movement would index an automatic total or sub-total operation.

Adjustment

1. The rolls of the various control arms (V, W, X, AL, and DC) should be aligned securely with their respective index cams (O, N, J, CZ, and P).

To adjust, form the control arm(s) at the right of bracket AN.

2. When the rolls of the various control arms are indexed by corresponding index cams, the control arms (V, W, X, AL, and DC) should be free to rock without interference from the other index cams in the same control line.

To adjust, if the wire or the screw causes the interference, reverse the interfering screw CY in the left end of the control arm and connect the wire to the other side of the control arm; if the control arm causes the interference, remove stock from along the upper edge of the control arm.

3. With the low point of an index cam (P, O, N, or J) resting on the roll of its corresponding control arm (DC, V, W, or X), the respective control arm should be rocked to index the selected result linkage, and square stud CP of switch bail CJ should be latched with approximately .010" latching lead on latch CO.

To adjust, shorten or lengthen the corresponding wire (DD, AR, CW, or CX).

Note: To adjust wire AQ, see Adjustment 2, Plate 40-1, Keyboard Instruction Book.

4. Each bell crank (DE, AV, BA, or BB) should contact the stud in its respective bail (CE, BZ, CB, or CH) with a full hold, thus assuring indexing of the selected result linkage.

To adjust, bend the lower extremities of the bell crank (DE, AV, BA, or BB).

5. When latched, disabling lever BO should not bind inner margin key BF against comb BV.

To adjust, remove stock from lever BG.

6. Index cams (P, O, N, and J) should be so positioned on control bar AC that they will clear the rolls of the control arms by not

more than .2" after tabulation into a carriage control position. The forward cam of index cam CZ should rest on the roll of control arm AL, and the rearward cam should clear the roll of the total operation control arm which is indexed simultaneously after tabulating into a carriage position.

To adjust, position index cams (P, O, N, J, and CZ).

Note: This location of the index cams permits maximum delay in the indexing of selected automatic results, thus providing the greatest possible time for register tabulating or returning.

7. (**Note:** In carriage positions in which this mechanism is active, the setting of the carriage tabulating stops is regulated by the minimum tabulating distance required for the setting of the index cams.)

In Class 72 machines—

The tabulating stops should be located as follows: .7" apart when no register tabulation or return is required, or when a register tabulation or return of one register position is required; an additional .2" apart (approximately) is required for each register position, in excess of one, which is involved in a register return (e.g., tab stops should be set .7" apart, when no register tabulation or return is involved, or when the register returns from position 2 to position 1; .9" apart, when the register returns from position 3 to position 1; 1.1" apart, when returning from 4 to 1; 1.3" apart, when returning from 5 to 1; 1.5" apart, when returning from 6 to 1, etc.); and approximately 1.5" apart when a register tabulation of two register positions is required.

In Series M 200 machines—

The tabulating stops should be located .7" apart in the first position following the outer or inner margin, and .6" apart in other positions when using just the carriage controlled totals.

When tripping two registers during one carriage tabulation, the stops should be located 2.3" apart in machines with eight registers, 2.0" apart in machines with ten registers, and 1.8" apart in machines with twelve registers.

When returning registers from any register position to register position 1 or to an intermediate register position, the stops should be set .6" apart. When returning to an intermediate register position immediately following another register return operation, the stops must be .7" apart.

CARRIAGE CONTROLLED TOTAL MACHINE OPERATION DELAYING MECHANISM—SERIES M 200 AND M 800 MACHINES (Plate 6H)

Carriage Controlled Total Machine Operation Delaying Mechanism—Series M 200 and M 800 Machines (Plate 6H)

Purpose

To delay the carriage controlled total machine operation until the registers have returned to either a normal or intermediate register position.

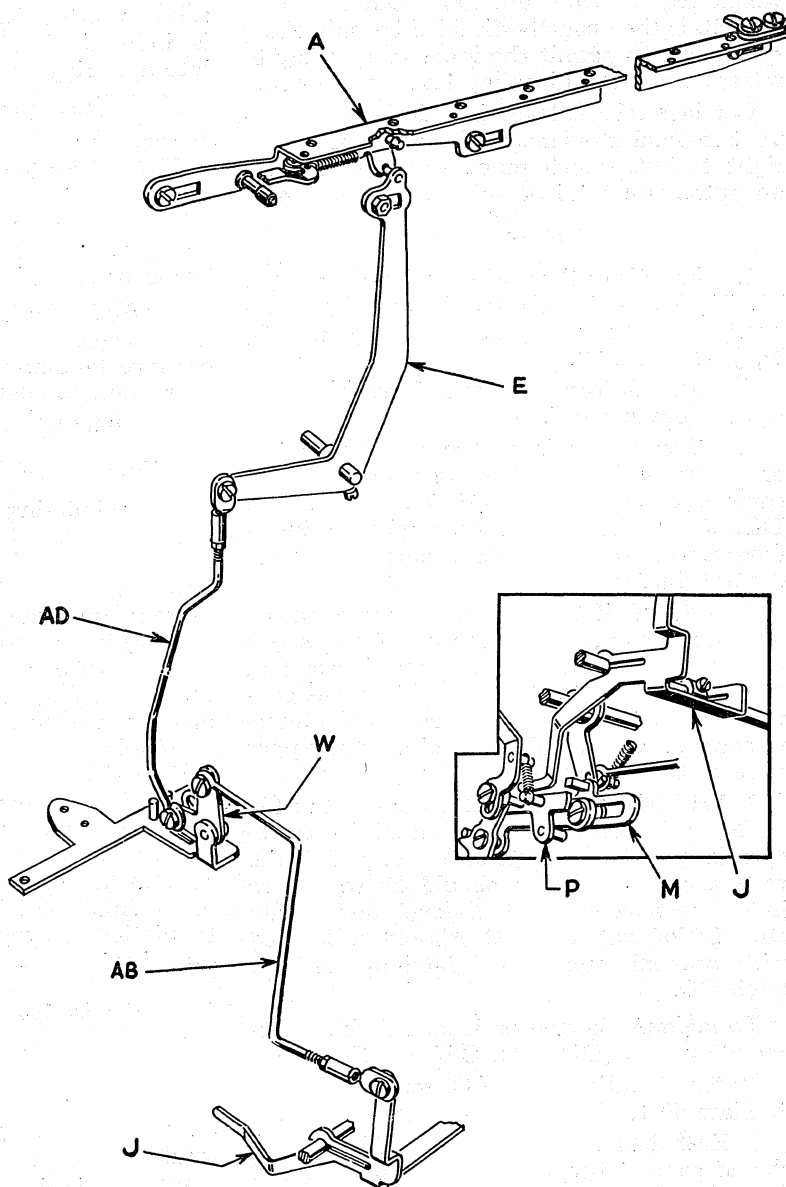
Construction

This mechanism is used only in those machines (Series M 200 and M 800) that contain the Cross-footer and Register Totals Indexing Mechanism, Carriage Controlled, and a one hundred pinion register assembly. Because of the longer one hundred pinion assembly, a longer time is required to permit the registers to return into active position before the machine cycle occurs. Consequently, use of the delaying mechanism permits indexing the Register Return Mechanism and the Crossfooter and Register Total Indexing Mechanism Carriage Controlled, during the same carriage tabulation while using the minimum tabulating distance.

Operation

Indexing of the Register

Return Mechanism from a carriage control, during the same carriage tabulation in which a crossfooter or register total operation is indexed from a carriage control, shifts control slide A inward to engage the register return clutch members through bell crank E. Bell crank E also, through wire AD, bell crank W, and wire AB, positions the arm of bail J over drive pawl P, preventing the latter from aligning with the square stud in oscillating power slide M, and thereby preventing the machine cycle from taking place.



When the register pinion assembly returns to either a normal or intermediate register position, control slide A is moved to the right, reversing the movement of bell crank E which raises the arm of bail J. This permits drive pawl P to align with the square stud in power slide M and complete the indexed crossfooter or register total operation.

Power slide M continues to oscillate during the register return function since the cross-footer or register total operation remains indexed until the machine cycle takes place.

(Plate 6H)—Continued**Adjustment**

1. With control slide A normal, the up-right arm of bell crank W should be in a perpendicular position so that the bell crank will not interfere with other parts.

To adjust, shorten or lengthen wire AD.

2. With the register return clutch member teeth limiting point to point, the Register Return Mechanism indexed (control slide A latched to the left), and a carriage controlled

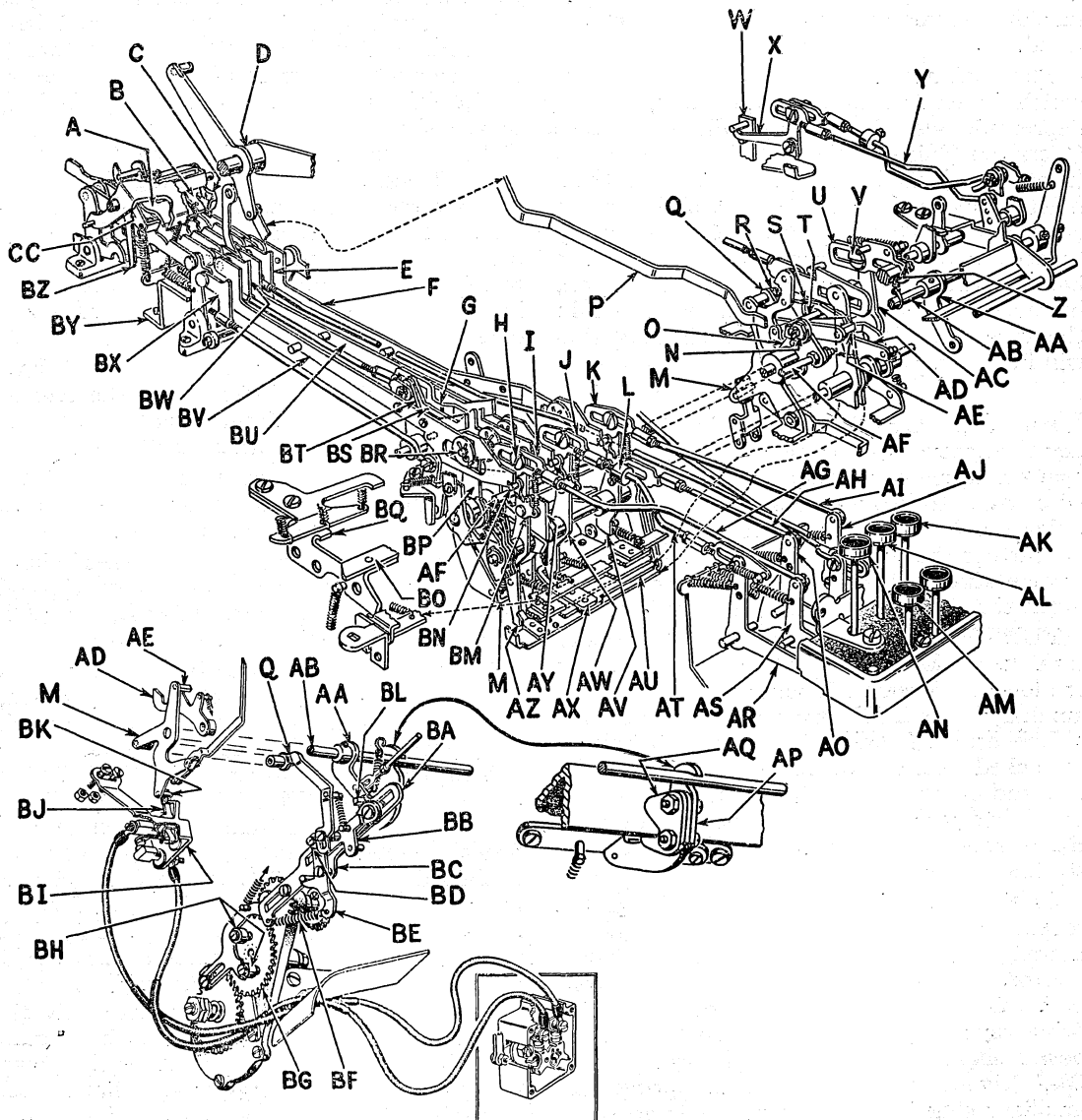
total operation indexed (drive pawl P latched in its active position), the arm of bail J should prevent drive pawl P from aligning with the square stud in power slide M. There should be just a slight clearance between the upper edge of pawl P and the lower side of the square stud.

To adjust, shorten or lengthen wire AB.

Note: When the Register Return Mechanism is not indexed, the arm of bail J should not prevent drive pawl P from aligning with the square stud in power slide M.

EASY DEPRESSION POWER RESULT KEYS AND CONTROL KEY IN POS. NO. 73—SERIES M 800 MACHINES (Plate 8-1)

(Plates 7 and 8 in Symbol Book only)



Easy Depression Power Result Keys and Control Key in Pos. No. 73—Series M 800 Machines (Plate 8-1)

Purpose

To permit the indexing of a selected result or control mechanism with a light, easy depression of the corresponding key (either a result key or the control key in Pos. No. 73), and to permit completion of the machine operation (except from the control key in Pos. No. 73) without manipulation of a motor bar.

Construction

This mechanism functions in the same manner as that contained in Series M 200 machines, but, due to variation in construction and purpose of the Series M 800 machines, some design changes were necessitated.

The balance and minus balance keys, which index the same result linkage when depressed, also index the Minus Balance Operation Third Cycle Indexing Mechanism (Plate 38-1) to insure power for the third machine cycle should an overdraft be in the crossfooter. This arrangement is necessary to accommodate the carriage control of the balance and minus balance key operations, because the occurrence of an overdraft in the crossfooter determines which operation will function.

Operation

PARTIAL DEPRESSION of register total key AM moves the upper portion of rocker arm AZ forward, through bell crank AS and wire AG, thereby disengaging result key linkage BV from rocker arm pawl BM and permitting the vertical slot in linkage BV to engage stud BR in power shaft arm BP to index the Register Totaling Mechanism.

FURTHER DEPRESSION of register total key AM rocks switch bail M through the lower extension of rocker arm AZ, closing auxiliary switch BI, through stud BK and switch arm BJ, and latching switch bail M in rocked position by means of square stud AE and latch AD. The rocking of switch bail M to latched position raises drive pawl BB, through link Q, into the path of square stud BL in power slide BA.

Closing of auxiliary switch BI, through the rocking of switch bail M, operates the motor, thereby rotating intermediate drive gear BG and oscillating power slide BA through rolls BH. Oscillation of power slide BA (with drive pawl BB aligned with stud BL) causes power shaft AB to be rocked through stud BL, drive pawl BB, arm BE, spring BF, auxiliary slide BC, and power shaft arm AA.

The purpose of this arrangement is to provide a broken joint in case the power shaft is prevented from rocking, permitting power slide BA to continue to oscillate.

The rocking of power shaft AB causes result linkage BV to be moved forward, through shaft arm BP, where it is latched by result linkage latch A. As power shaft AB is rocked, drive clutch release link W is raised through wire Y and bell crank X, thereby tripping the clutch and closing the main switch points to complete the selected machine operation.

DURING THE FORWARD STROKE, restoring shaft assembly O is raised through link P and the rocking of hub assembly D, thereby effecting the following functions: (1) releasing of latch AD from square stud AE, by means of stud T of hub assembly O—permitting auxiliary switch BI to open and drive pawl BB and power shaft AB to restore to their respective normal positions; (2) raising of the forward end of result linkage BV, by means of restoring shaft AF—permitting stud BN in rocker arm pawl BM to reset under the forward end of the result linkage before the latter is released from latch A; (3) raising of turnbuckle I, by means of shaft AF—releasing screw H from the pocket in the turnbuckle to permit rocker arm AZ to restore to its limit in event that the key is held depressed during operation of the machine.

Note: The above functions, which have been traced from indexing of the register total key, are likewise indexed and actuated upon depression of other result keys.

Balance key AN indexes balance result linkage BU and the power through bell crank AR, wire AT, and rocker arm AW.

Minus balance key AL also indexes balance result linkage BU and the power through bell crank AO, wire AH, collar L, wire AT, and rocker arm AW.

In addition, the balance and minus balance keys rock bail AU, through lug AX, moving slide U forward to engage it with screw V in power arm AC, thereby indexing the Minus Balance Operation, Third Cycle Indexing Mechanism (Plate 38-1). The Third Cycle Indexing Mechanism is then latched forward when power shaft AB is rocked as explained in Plate 38-1. Slide U is released to its normal position during the forward machine stroke. When hub assembly O is rocked, stud T, through arm S, raises slide U, disengaging the latter from screw V.

Sub-total index key AK indexes only the sub-totalling linkage F, through bell crank AJ, wire AI, and rocker arm AV—the power being indexed by the result key that is used in conjunction with the sub-total index key.

(Plate 8-1)—Continued

The error key does not release the sub-total index key since latch C releases linkage F from machine operation only.

The non-add key and the add C.F. key linkages, BX and E, respectively, are latched forward manually, and, due to the independent functioning provided by latches BZ and B, both keys may be released by the error key prior to machine operation.

Rocker arm AY indexes the power from a carriage control providing a blank machine operation in those machines containing the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled (see Plate 8-5).

Link G indexes the Automatic Tabulation Mechanism during the blank machine operation.

Bail BT, which is rocked at the end of the second machine cycle of the minus balance operation to latch minus balance linkage BW forward, moves link BS forward. The latter, moving forward, indexes the Automatic Tabulation Mechanism and also rocks the power shaft to maintain the ball raceway lock between the second and third machine cycles.

Adjustment

1. Limits BY, BQ, and BO are basic limits which have been adapted in manufacture to provide the following results:

(a) Limit BY, which is the normal limit for result linkages BU, BV, and BW, and non-add and sub-total index linkages BX and F, respectively, should position the cutouts in linkages BU, BV, and BW so that they align with interlock CC.

(b) Limit BQ, which serves as the normal limit for arms BP and power shaft AB, should align studs BR with the vertical slots of linkages F, BU, and BV.

(c) Limit BO, which serves as the normal limit for rocker arms AZ, AW, and AV, should position the arms so that studs BR of the respective arms have a full hold under the forward end of the corresponding linkage BV, BU, or F, and are flush with the forward vertical surface of the linkage. Limit BO also serves as the normal limit for rocker arm AY which indexes the power for the carriage controlled blank machine operation.

Note: Failure of any one of these basic limits to produce the respective alignments listed necessitates the replacing of either limit BY (if alignment "a" is in error) or shaft assembly AB (if alignment "b" or "c" is in error).

2. Depression of the register total key or the balance key should move its respective turnbuckle I or J forward at least .010" (approximately) before rocker arm AZ or AW

begins its rocking movement; and when the register total key or balance key is fully depressed, square stud AE should have approximately .010" latching lead on latch AD.

To adjust, shorten or lengthen either wire AG or AT.

Note: To obtain the .010" latching lead on latch AD (to accommodate a wire which is necessarily adjusted long) it may be necessary to tip stud AE by weaving its retaining arm.

3. Depression of the minus balance key should move balance key turnbuckle J the same distance as does balance key wire AT; and when the minus balance key is fully depressed, square stud AE should have approximately .010" latching lead on latch AD.

To adjust, position collar L to the rearward end of the slot in the turnbuckle on wire AH.

Note: Before making this adjustment, make sure the balance key wire is properly adjusted.

4. Depression of the sub-total index key should move turnbuckle K forward approximately .010" before rocker arm AV begins its rocking movement.

To adjust, shorten or lengthen wire AI.

5. Indexing slide U should engage screw V in power arm AC just prior to the latching of stud AE on latch AD.

To adjust, turn eccentric bushing Z.

6. Auxiliary switch BI should close just prior to the latching of stud AE on latch AD.

To adjust, bend switch arm BJ.

7. Drive pawl BB should not be aligned with stud BL when a result linkage engages drive arm BP (result key depressed half way); and should have a safe hold (half hold) on stud BL when stud AE is rocked sufficiently to engage latch AD.

To adjust, turn eccentric bushing R.

8. Result linkages BU and BV and sub-total index linkage F should have slight latching lead, without bind (approximately .010"), on latch A or C when the linkage is moved to its maximum forward position by power shaft AB.

To adjust, turn eccentric bushing BD.

9. The drive clutch should trip shortly after the result linkage is latched in its forward position by latch A.

To adjust, shorten or lengthen wire Y.

10. With the machine normal and a result key or the sub-total index key indexed, reset shaft AF should be so positioned that linkages BU, BV, and F are permitted to seat fully on their respective studs BR; and during the forward machine stroke, reset shaft AF

(Plate 8-1)—Continued

should raise the linkages sufficiently to permit studs BN to reset under the linkages.

To adjust, turn eccentric bushing N.

11. When a result key or the sub-total index key is held depressed, reset shaft AF should raise the respective turnbuckle I, J, or K sufficiently during the forward machine stroke to align the shoulder of screw H (without bind) with the turnbuckle's rear slot.

To adjust, raise or lower the rear extension of the respective turnbuckle by bending wire AG, AT, or AI up or down.

Note: Bending of a wire in order to bring

about this alignment should be followed by rechecking of Adjustment Nos. 2, 3, or 4.

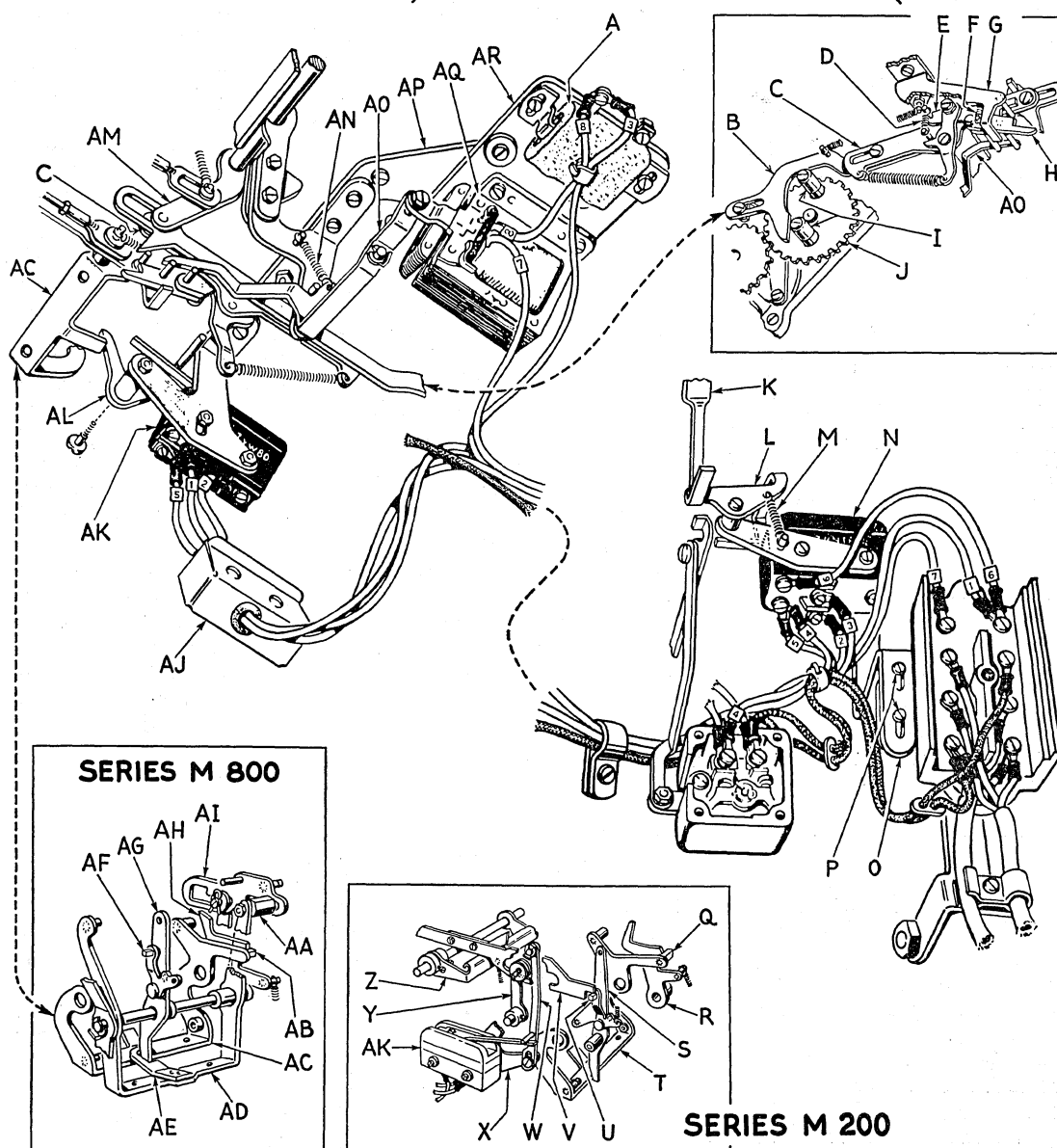
12. Stud T should allow latch AD to move forward to a full hold on stud AE, when the auxiliary switch is indexed; and should rock the latch sufficiently to release stud AE during the forward stroke. Stud T also should release slide U from screw V during the forward stroke.

To adjust, weave stud T up or down.

13. Brace AQ should just contact the base with both projections, and brace AP should just limit forward on the shaft.

To adjust, position braces AQ and AP.

SOLENOID CONTROLLED RESULTS WITH CARRIAGE AND REGISTER RETURN SWITCH, SERIES M 200 AND M 800 (Plate 8-4A)



Solenoid Controlled Results with Carriage and Register Return Switch, Series M 200 and M 800 (Plate 8-4A)

Purpose

In Series M 800 machines, this mechanism provides a means of controlling the positioning of drive pawl E during a minus balance operation until after the result linkage and the third cycle indexing mechanism have been fully indexed. In both Series M 200 and M 800 machines it provides a means of delaying a machine operation indexed from the carriage or from a result key while a carriage or a motor register return operation is indexed.

Construction

SOLENOID AQ is attached to plate AR which is mounted on plate AP. Plate AP in turn is attached to the underside of the base. Plate AR is insulated from plate AP to reduce noise. Resistor A is also mounted on plate AR and is required for protection and control of the solenoid when direct current of any voltage or alternating current of 150 volts or more is used. Snap-on cover AJ offers protection from contact with the terminals of switch AK.

Positioning of the drive pawl is controlled electrically through the solenoid which is connected in series with switches AK and N. Switch AK is a single-pole, single-throw switch while switch N is a single-pole, double-throw switch. In Series M 800 machines, the solenoid is energized when bail AC is rocked to close switch AK. In Series M 200 machines, the solenoid is energized as result linkage V moves downward and rocks bail Z to close switch AK.

CARRIAGE AND REGISTER RETURN SWITCH N is attached to bracket O which is assembled to the bracket holding the terminal block. Arm L is mounted on a plate attached to the switch and is located under power indexing link K. The solenoid circuit is normally held closed by double-throw switch N through arm L and spring M. When a carriage return or a motor register return operation is indexed, power link K moves down rocking arm L which opens the solenoid circuit and closes the motor circuit. This arrangement provides a means of delaying a carriage controlled total operation while the register return mechanism is indexed, and accomplishes the same purpose as the mechanism covered in Plate 6H. During return of the carriage, a machine operation indexed through a result key is delayed until after the carriage has completely returned.

SQUARE STUDS U and AF, which are used instead of round studs in the vertical rocker arm pawls, permit the result linkages to engage the studs in the power shaft arms later during the key depression.

In Series M 800 machines when the balance or minus balance key is depressed, square stud AF permits third cycle indexing slide AI and the balance result linkage to simultaneously engage their respective studs in the power shaft arms. Immediately following indexing of the result linkage the power is indexed through bail AC as square stud AB positions under latch AH.

In Series M 200 machines, as in Series M 800 machines, square stud U permits the result linkage to engage the stud in the power shaft arm later during the key depression; but in Series M 200 machines the power is indexed through the downward movement of the result linkage rocking bail Z. Bail T is rocked and square stud Q on the bail positions under latch R as the result linkage is indexed. Therefore, the result linkage and the power are indexed, as bail T is latched.

DRIVE PAWL E contains latch pawl H. Bracket G attached to plate AP contains a limit ear and a latching stud. In Series M 800 machines, this construction permits the power shaft to be actuated only once during a register or crossfooter total operation, or from a carriage controlled blank machine operation. In Series M 200 machines, it gives added assurance that the power shaft will be permitted to be actuated only once during a register or crossfooter total operation or from a clear multiplier key operation.

Oscillating slide B contains a projection, necessary in Series M 800 machines only, for releasing latch pawl H from the stud in bracket G when an index cam on the front control bar positions on the roll of a carriage controlled rocker arm and the control button in position No. 51A is set to non-tabulate.

Operation—Series M 800

As the upper portion of vertical rocker arm AG moves forward to disengage square stud AF from the result linkage, the lower portion of the arm moves rearward rocking bail AD, through lug AE. Rocking of bail AD pulls slide AI forward, through hexagon post AA, thereby indexing the Third Cycle Indexing Mechanism. Also, the lower portion of the arm AG moving rearward rocks bail AC to close switch AK, through the stud in bell crank AL. Switch AK is held closed by latch AH engaging square stud AB in bail AC.

(Plate 8-4A)—Continued

Closing of switch AK closes the solenoid circuit and energizes solenoid AQ to actuate the solenoid plunger. This action rocks bail AO upward allowing spring D to pull drive pawl E upward into the path of the square stud in oscillating slide B. As the drive pawl is raised, spring F on latch pawl H is expanded.

Closing of switch AK also operates the motor, thereby rotating intermediate drive gear J and moving oscillating slide B through rolls I. As the square stud in oscillating slide B moves drive pawl E rearward to actuate the power shaft, spring F pulls latch pawl H upward to align its step with the stud in bracket G.

During the forward machine stroke, the result linkage is raised as explained in Plate 8-1 allowing the power shaft to restore to normal. This permits drive pawl E to move forward, through arm AM and auxiliary slide C. However, latch pawl H attached to the drive pawl is prevented from moving forward since the step in the latch pawl is limiting against the stud in bracket G. Therefore, a toggle action is created forcing the drive pawl downward out of alignment with the square stud in oscillating slide B.

Following restoration of the power shaft, latch AH is released from square stud AB allowing bail AC to restore to normal. Restoring of bail AC to normal permits bell crank AL to restore and allows the switch to open, thus breaking the solenoid circuit. This permits spring AN to pull bail AO downward, to release latch pawl H from the stud in bracket G and retain the drive pawl in an inactive position. Rocking downward of bail AO also moves the solenoid plunger forward. Overthrow of latch pawl H, when released from the stud in bracket G, is prevented by the ear on the bracket.

Adjustments—Series M 800

1. Bail AC should contact as many vertical rocker arms AG as possible so that the bail receives equal movement from each rocker arm.

To adjust, weave bail AC.

2. With the power off depress the balance key. The result linkage and indexing slide AI should be indexed (dropped) just prior to the locking of square stud AB on latch AH. Depress the register total key. The result linkage should be indexed (dropped) just prior to the locking of square stud AB on latch AH.

Note: Before making this test, assure

that the result linkage and the third cycle indexing slide drop simultaneously. (See adjustment 1, Plate 38-1.)

To adjust, tip square stud AB up or down by weaving the arm on bail AC.

3. The power should be indexed simultaneously with the locking of stud AB on latch AH.

To adjust, position switch AK on its retaining bracket.

4. With the power off, manually hold the solenoid plunger "in" and position the step in latch pawl H on the stud in bracket G. When the solenoid plunger is released, the arm of bail AO should release the latch pawl from the stud.

To adjust, bend the arm of bail AO.

5. With power off, hold the solenoid plunger "in." Drive pawl E should have at least three-fourths hold on the square stud in oscillating slide B.

To adjust, weave solenoid bail AO.

6. The solenoid plunger should have no more than $\frac{1}{8}$ " movement to prevent excessive noise and wear of solenoid AQ.

To adjust, refine Adjustments Nos. 4 and 5.

7. Operate the machine manually. The projection on oscillating slide B should move latch pawl H clear of the stud in bracket G without binding on the ear of the bracket.

To adjust, bend the ear of bracket G.

8. With the power on, depress the carriage return key slowly. The motor should start before the carriage return clutch members engage; release the key and the power should shut off.

To adjust, with power on, loosen screws P and raise switch N the full length of the slots in retaining bracket O, and then lower the switch until the power shuts off.

9. With power on, depress the register return key slowly. The motor should start before the register return clutch members engage; and the power should shut off when the registers return to the selected position (either register 1 or an intermediate position).

Note: Before making this test, assure that Test No. 8 has been made correctly.

To adjust, turn the eccentric in register return power indexing bell crank AN (Plate 18, Power Instruction Book).

Operation—Series M 200

As the upper portion of vertical rocker arm S moves forward to disengage square stud U

(Plate 8-4A)—Continued

from result linkage V, the result linkage is permitted to move downward to engage its vertical slot with the stud in power shaft arm Y, and to rock bail Z to close switch AK through the stud in arm W. Switch AK is held closed by downward pressure of the result linkage on bail Z.

As the upper portion of vertical rocker arm S moves forward, the lower portion moves rearward to rock bail T to provide a temporary lock of the result keys, the extend key, and the add crossfooter key. Bail T is held latched by square stud Q and latch R.

Closing of switch AK completes the solenoid circuit and energizes solenoid AQ to actuate the solenoid plunger. This action rocks the forward arm of bail AO upward allowing spring D to pull drive pawl E upward into the path of the square stud in oscillating slide B. As the drive pawl is raised, spring F on latch pawl H is expanded.

Closing of switch AK also operates the motor, thereby rotating intermediate drive gear J and moving oscillating slide B through rolls I. As the square stud in oscillating slide B moves drive pawl E rearward to actuate the power shaft, spring F pulls latch pawl H upward to align its step with the stud in bracket G.

During the forward machine stroke, result linkage V is raised, as explained in Plate 6A, allowing switch AK to open the solenoid circuit just prior to the restoring of the power shaft. When the solenoid circuit is opened, spring AN rocks the arm of bail AO downward—positioning the drive pawl downward into inactive position, moving the step in latch pawl H downward out of alignment with the stud in bracket G, and moving the solenoid plunger forward to inactive position. As the power shaft returns to normal, the drive pawl moves forward through arm AM and auxiliary slide C.

The step in latch pawl H is aligned with the stud in bracket G to give added assurance that the drive pawl will be moved to inactive position when the power shaft restores to normal. When latch pawl H is released from the stud in bracket G, overthrow is prevented by the ear on the bracket.

Adjustments—Series M 200

1. Bail T should contact as many vertical rocker arms S as possible so that the bail receives equal movement from each rocker arm.

To adjust, weave bail T.

2. Depress each result key and determine which key comes the closest to latching square stud Q on latch R as result linkage V drops. This key should latch the square stud in the bail at the same time the result linkage drops to engage the stud in power shaft arm Y.

To adjust, tip square stud Q up or down by weaving the arm on bail T.

3. The power should be indexed in the last portion of the drop of result linkage V.

To adjust, position switch AK on bracket X.

4. With the power off, manually hold the solenoid plunger "in" and position the step in latch pawl H on the stud in bracket G. When the solenoid plunger is released, the arm of bail AO should release the latch pawl from the stud.

To adjust, bend the arm of bail AO.

5. With the power off, hold the solenoid plunger "in." Drive pawl E should have at least three-fourths hold on the square stud in oscillating slide B.

To adjust, weave solenoid bail AO.

6. The solenoid plunger should have no more than $\frac{1}{8}$ " movement to prevent excessive noise and wear of solenoid AQ.

To adjust, refine Adjustments Nos. 4 and 5.

7. Operate the machine manually. The projection on oscillating slide B should move latch pawl H clear of the stud in bracket G without binding on the ear of the bracket.

To adjust, bend the ear of bracket G.

8. With the power on depress the carriage return key slowly. The motor should start before the carriage return clutch members engage; release the key and the power should shut off.

To adjust, with power on, loosen screws P and raise switch N the full length of the slots in retaining bracket O, and then lower the switch until the power shuts off.

9. With the power on, depress the register return key slowly. The motor should start before the register return clutch members engage; and the power should shut off when the registers return to the selected position (either register 1 or an intermediate position).

Note: Before making this test, assure that Test No. 8 has been made correctly.

To adjust, turn the eccentric in the register return power indexing bell crank AN (Plate 18, Power Instruction Book).

Crossfooter and Register Totals and Sub-Totals, and Blank Machine Operation Indexing Mechanism, Carriage Controlled—Series M 800 Machines (Plate 8-5)

Purpose

To permit automatic crossfooter and register totals and sub-totals, and blank machine operations by providing carriage control of the Easy Depression Power Result Key Mechanism (Plate 8-1) and the Sub-total Index Key Mechanism (Plate 40A).

Construction

This mechanism functions in the same manner as that contained in Series M 200 machines, but, due to variation in construction and purpose of the Series M 800 machines, the index cams for operations common to both series of machines are located in different lines of control.

Two carriage control lines (lines 13 and 11) are utilized to index the register total key and the balance or minus balance key operations, respectively. The other two carriage control lines (lines 9 and 7) are utilized to index the blank machine operation and the sub-total index key operation, respectively.

The carriage controlled blank machine operation may be used for such operations as printing a date, printing an amount previously indexed with a repeat motor bar, resetting the carry racks prior to a position where consecutive numbering is to be used, indexing the Minus Balance Mechanism (with a crossfooter subtract control active) when a complement has been transferred from a register to the crossfooter, and tripping or returning of registers in advance of the following operation.

The balance key and minus balance key operations are indexed by the same index cam which also indexes the Minus Balance Operation Third Cycle Indexing Mechanism (Plate 38-1) to determine which operation will function. The carriage controlled minus balance operation may be disabled (see Plate 8-6) to permit optional printing of the minus balance.

Control bar O is easily removable to facilitate exchanging control bars if required by the operations. Control bar O is held in place by brackets C and S, which contain clamps CG and T, respectively, that fit into the horizontal slot of the bar, and are held there firmly by the tension of springs R. Bar O is located centrally on the carriage by the vertical slots in the lower edge of the bar fitting on the arms of brackets C and S.

The swinging arm of bracket L engages screw N to prevent weaving of bar O. Bracket L may be located in any one of three positions, depending on the location of the form guide, in order to prevent interference with the nut which holds the form guide.

Operation

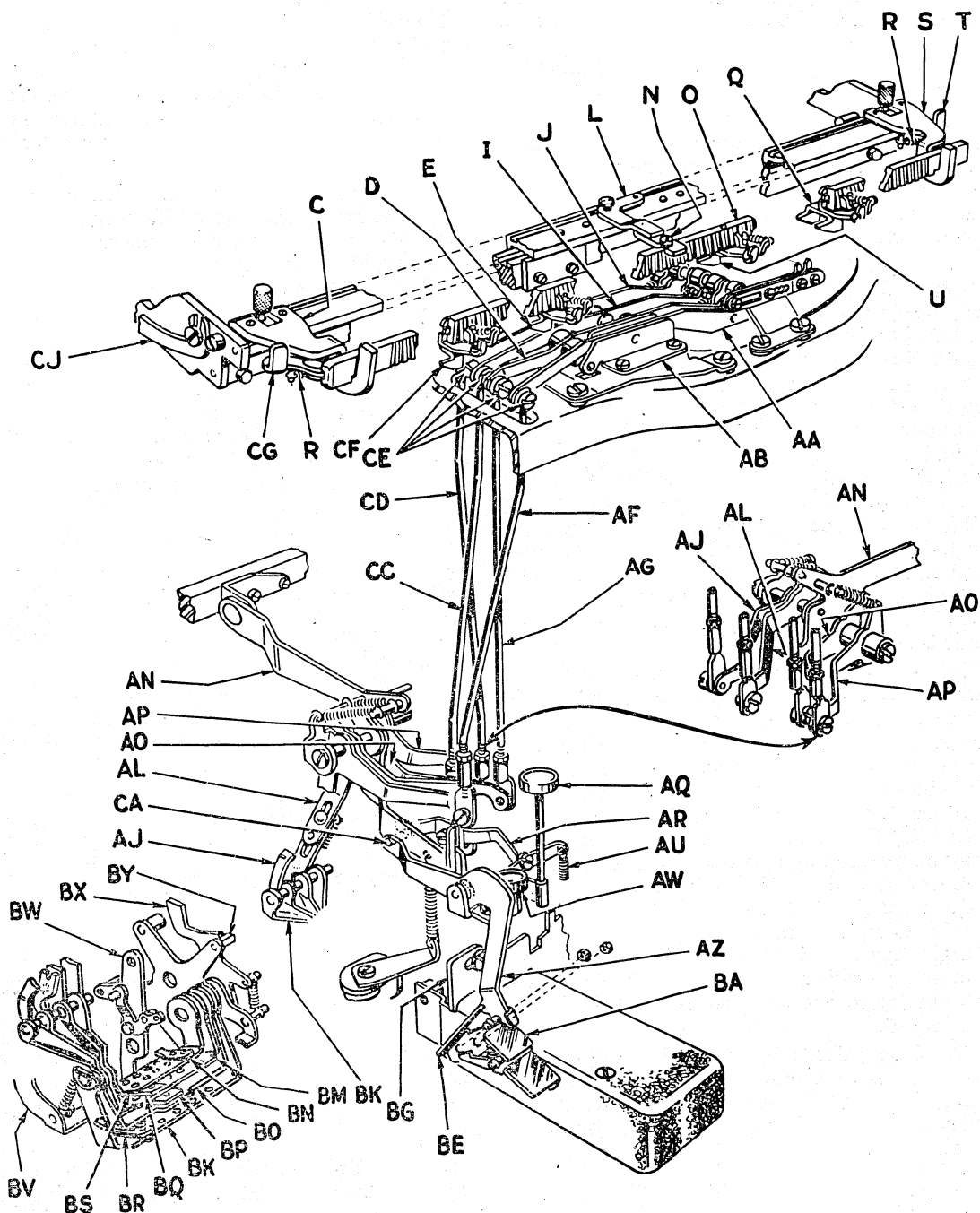
As the carriage tabulates into the register total position, index cam CF in line 13 (on front control bar O) cams over the roll on control arm AA, rocking bail BK, through wire AF and bell crank AJ. The rocking of bail BK actuates the corresponding rocker arm BW, through lug BR, thereby indexing the register total result linkage and rocking bail BV to close the auxiliary switch—to complete the register total operation as explained in Plate 8-1.

Carriage controlled indexing of the balance result linkage (for either the balance or minus balance operation) and the power is provided, in a like manner, by indexing cam

(continued on page 7-13)

CROSSFOOTER AND REGISTER TOTALS AND SUB-TOTALS, AND BLANK MACHINE OPERATION INDEXING MECHANISM, CARRIAGE CONTROLLED—SERIES M 800 MACHINES (Plate 8-5)

(Plates 8-2, 8-3 and 8-4 in Symbol Book only)



(Plate 8-5)—Continued

E (in line 11), control arm D, wire AG, bell crank AL, bail BO, lug BP, and the corresponding rocker arm BW. Rocking of bail BO also indexes the Minus Balance Operation Third Cycle Indexing Mechanism (see Plate 38-1) to determine whether the balance or minus balance operation will take place.

Carriage controlled indexing of the blank machine operation is provided by index cam U (in line 9), control arm I, wire CC, bell crank AO, bail BM, lug BQ, and the corresponding rocker arm BW. The corresponding rocker arm then rocks switch bail BV to index the power and provide a blank machine operation.

The sub-total index linkage, which is indexed simultaneously with whichever totaling operation that requires sub-totaling, is indexed by index cam Q (in line 7—the innermost line), control arm J, wire CD, bell crank AP, bail BS, lug BN, and the corresponding rocker arm BW. Index cam Q contains two camming surfaces which permit indexing the particular totaling operation as well as the sub-totaling operation during a carriage tabulation. Bail BS, through lug BN, actuates the corresponding rocker arm to index the sub-total indexing linkage only, bail BV being rocked (to close the auxiliary switch and index the power) by the rocker arm that indexes the particular total linkage that is sub-totaled.

Disabling of the carriage controlled totals, sub-totals, and blank machine operations is accomplished by means of lever AZ, which, when depressed and latched on latch BE, raises assembly AN, through stud CA, so that bell cranks AJ, AL, AO, and AP fail to contact the studs of their respective bails BK, BO, BM, and BS. The disabling lever may be released by depressing latch pawl BA.

Lever AZ also indexes inner margin key AQ, through stud CA and lever AR, in machines which require this function. Outer margin key AW is then usually disabled by unhooking spring AU to permit the inner margin key to release when the disabling lever is released.

Carriage release lever CJ is designed to prevent manual movement of the carriage from right to left, which movement would index an automatic total, sub-total, or blank machine operation.

Adjustment

1. The rolls of the various control arms (AA, D, I, and J) should be aligned securely with their respective index cams (CF, E, U, and Q).

To adjust, form the control arm(s) at the right of bracket AB.

2. When the rolls of the various control arms are indexed by corresponding index cams, the control arms (AA, D, I, and J) should be free to rock without interference from the other index cams in the same control line.

To adjust, if the wire or the screw causes interference, reverse the interfering screw CE in the left end of the control arm and connect the wire to the other side of the control arm; if the control arm causes the interference, remove stock from along the upper edge of the control arm.

3. With the low point of index cam CF or E resting on the roll of its corresponding control arm AA or D, the respective control arm should be rocked to index the selected result linkage, and square stud BY of switch bail BV should be latched with approximately .010" latching lead on latch BX.

To adjust, shorten or lengthen the corresponding wire AF or AG.

4. With the low point of index cam U resting on the roll of control arm I, the latter should be rocked to latch square stud BY of switch bail BV with approximately .010" latching lead on latch BX.

To adjust, shorten or lengthen wire CC.

5. With the low point of index cam Q resting on the roll of control arm J, the latter should be rocked to index the sub-total index linkage at the same time that a total result linkage is indexed.

To adjust, shorten or lengthen wire CD.

6. Each bell crank (AJ, AL, AO, or AP) should contact the stud in its respective bail (BK, BO, BM, or BS) with a full hold, thus assuring indexing of the selected operation.

To adjust, bend the lower extremity of the bell crank (AJ, AL, AO, or AP).

7. When latched, disabling lever AZ should not bind inner margin key AQ against comb BG.

To adjust, remove stock from lever AR.

8. Index cams (CF, E, U, and Q) should be so positioned on control bar O that they will clear the rolls of the control arms by not more than .2" after tabulation into a carriage control position.

To adjust, position index cams (CF, E, U, or Q).

Note: This location of the index cams permits maximum delay in the indexing of selected automatic operations, thus providing the greatest possible time for register tabulating or returning.

9. In carriage positions in which this

For Form 3760

*(Plate 8-5A) Continued***Operation**

As the carriage tabulates into the cross-footer total position, index cam E in line 11, on front control bar C, moves over the roll of control arm A rocking latch AO through wire K and bell crank BB. The rocking of latch AO allows spring AZ to pull indexing slide AP forward to rock bail Y through stud P. The rocking of bail Y actuates the corresponding rocker arm Q through lug Z, thereby indexing the balance result linkage and rocking bail X to close the auxiliary switch to complete the cross-footer total operation as explained in Plate 8-1. Bail Y also, through hexagon post V, pulls slide T forward so that the step in the slot of slide T engages screw stud U in the power shaft arm, thereby indexing the Minus Balance Operation, Third Cycle Indexing Mechanism as explained in Plate 38-1.

Indexing slide AP is reset during the forward stroke of the machine cycle through stud AX rocking rocker arm AU.

Disabling of the carriage controlled cross-footer totals is accomplished by means of lever AC which when depressed and latched on latch AG, raises assembly BE, through stud O, so that bell crank BB fails to contact the stud on latch AO to release indexing slide AP. The disabling lever may be released by depressing latch pawl AD.

Adjustments

1. With the power off and the low point of the index cam in line 11 on the roll of the control arm, bell crank BB should position the lip of latch AO approximately $1/32''$ over the foot of index slide AP.

To adjust, shorten or lengthen wire K.

Note: When the index cam is moved off the roll, the rapid release of disabling lever AC must not release the index slide.

2. With the power on, tabulate the carriage index cam over the roll of the control arm in line 11. Index slide AP should move forward sufficiently to rock bail X on the power shaft to index the power.

To adjust, free index slide AP and assure that spring AZ is not defective.

3. With the power off, release index slide AP and manually operate the machine. Rocker arm AU should reset the index slide with slight latching lead on latch AO.

To adjust: The design of parts assures a generous amount of latching lead, however, index slide AP may be shortened by bending at the forms if necessary.

Caution: Do not create a limit for rocker arm AU on stud AX when the index slide is forward as this condition may result in failure to rock the bail on the power shaft sufficiently to index the power.

(Plate 8-5)—Continued

mechanism is active, the setting of the carriage tabulating stops is regulated by the minimum tabulating distance required for the setting of the index cams.

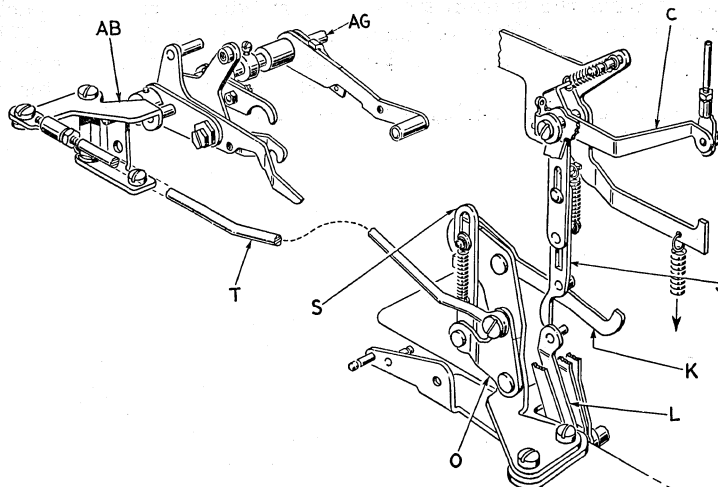
The tabulating stop for the first tabulating position following the outer or inner margin should be located .7" from the margin stops, and, the tabulating stops for other positions should be set .6" apart, when using just the carriage controlled totals.

When tripping two registers during one

carriage tabulation, the stops should be located 2.3" apart in machines with eight registers, 2.0" apart in machines with ten registers, and 1.8" apart in machines with twelve registers.

When returning registers from any register position to Register Position No. 1 or to an intermediate register position, the stops should be set .6" apart. When returning to an intermediate register position immediately following another register return operation, the stops must be .7" apart.

MINUS BALANCE OPERATION INDEXING MECHANISM, CARRIAGE CONTROLLED, DISABLING MECHANISM—SERIES M 800 MACHINES (Plate 8-6)



Minus Balance Operation Indexing Mechanism, Carriage Controlled, Disabling Mechanism—Series M 800 Machines (Plate 8-6)

Purpose

To permit disabling the indexing of a carriage controlled minus balance operation when a minus balance occurs in a balance position, so that the amount in the crossfooter may be altered or cleared manually.

Construction

This mechanism is contained in all Series M 800 machines containing the Crossfooter and Register Totals and Sub-totals Indexing Mechanism, Carriage Controlled (Plate 8-5). It is made inactive, unless otherwise specified, when the machine is manufactured. It may be activated in only those machines in which the operational requirements permit a tabulation jump of at least 2.0" to the carriage position following that in which this mechanism is active. This requirement is needed to permit shaft assembly AG sufficient time to return to its normal position and thereby allow slide J to return to its normal position in time so that a following balance operation may be indexed.

Operation

When an overdraft occurs in the cross-footer from a previous subtract operation, shaft assembly AG is positioned to the left, and through swivel AB, pulls wire T rearward. The latter rocks bell crank O, which, through link S, rocks arm K to lift slide J on bell crank C. Bell crank C, when rocked by an index cam passing over the roll of the minus balance control arm, then clears the stud of bail L and does not index the minus balance operation.

Since the minus balance operation is not indexed, the carriage will not tabulate from the carriage position in which the minus balance occurs. The minus balance may then be altered or cleared manually. Slide J remains in a raised position as long as shaft assembly AG remains in the overdraft position (to the left).

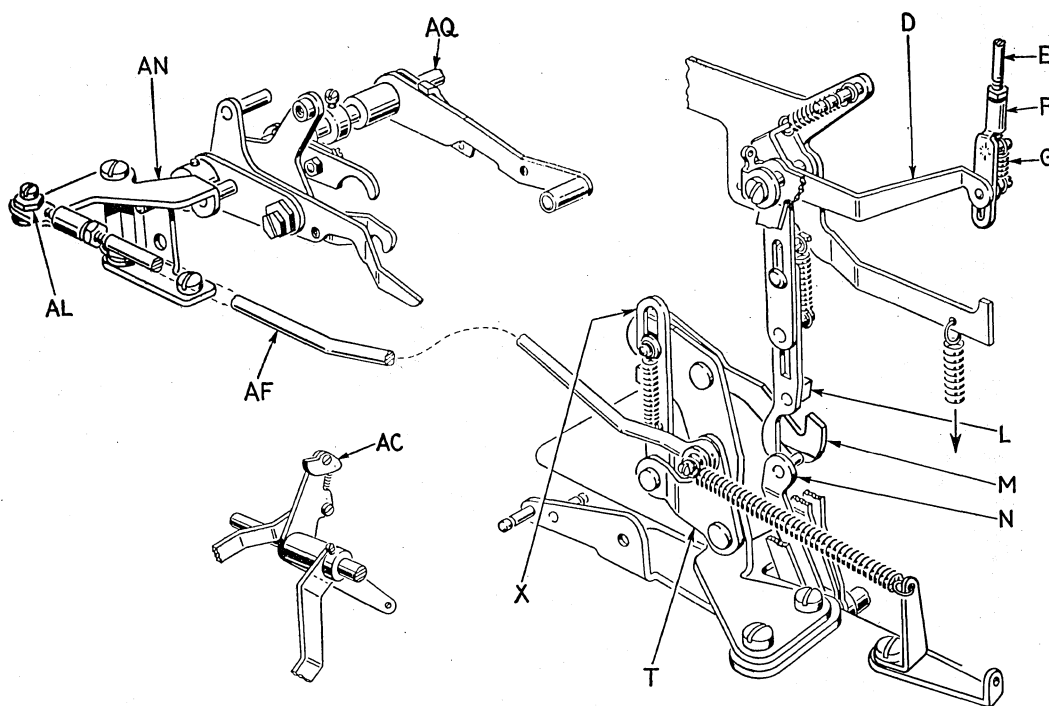
When the operational requirements specify that this mechanism be active, swivel AB is in the position illustrated. To make this mechanism inactive, turn swivel AB over so that its stud is rearward.

Adjustment

1. With shaft assembly AG in the overdraft position (to the left), arm K should position slide J so that it will clear the stud in bail L when bell crank C is rocked.

To adjust, shorten or lengthen wire T.

MINUS BALANCE OPERATION INDEXING MECHANISM, CARRIAGE CONTROLLED, DISABLING MECHANISM— IMPROVED—SERIES M 800 MACHINES (Plate 8-7)



Minus Balance Operation Indexing Mechanism, Carriage Controlled, Disabling Mechanism—Improved —Series M 800 Machines (Plate 8-7)

Purpose

To permit disabling the indexing of a carriage controlled minus balance operation when a minus balance occurs in a balance position, so that the amount in the crossfooter may be altered or cleared manually.

Basically this is the same mechanism as that described in Plate 8-6; however, alterations in design permit greater flexibility of machine operation and form settings than were possible with the earlier construction.

Construction

This improved mechanism functions with the minimum 0.6" distance between the tabulating stops required for a carriage controlled tabulation operation and eliminates the previous restriction of distance between stops made necessary by the earlier mechanism.

This improved mechanism is contained in all Series M 800 machines containing the Crossfooter and Register Totals and Sub-totals Indexing Mechanism, Carriage Controlled (Plate 8-5), beginning with serial number B240773. It is made inactive, unless otherwise specified, when the machine is manufactured. It may be activated when required.

Pass-by pawl AC has been changed to delay the tabulation operation as late as possible during machine operation. This is necessary to allow shaft assembly AQ sufficient time to restore to normal (following a subtract operation in which the amount in the crossfooter does not result in an overdraft); and to allow hook arm M to move out of the path of square stud L so that a subsequent balance operation may be indexed.

Operation

When an overdraft occurs in the cross-footer from a previous subtract operation, shaft assembly AQ is positioned to the left, and through swivel AN, pulls wire AF rear-

(Plate 8-7) Continued

ward. The latter rocks bell crank T, which through link X, rocks hook arm M and positions the forward end in front of square stud L to block the rocking of bell crank D. During a subsequent carriage tabulation when control wire E is raised by the index cam passing over the roll of the minus balance control arm, the minus balance is not indexed since bell crank D cannot rock forward to rock bail N. A broken joint is provided between bell crank D and control wire E so that spring G is expanded when rocking of bell crank D is blocked.

Since the minus balance operation is not indexed, the carriage will not tabulate from the carriage position in which the minus balance would occur. The minus balance may then be altered or cleared manually. Hook arm M remains in a blocking position as long as shaft assembly AQ remains in the overdraft position (to the left).

Swivel AN is in the position illustrated

when operational requirements specify that this mechanism be active. To make this mechanism inactive, turn swivel AN over so that its stud is rearward.

Adjustment

1. With shaft assembly AQ in the overdraft position (to the left) hook arm M should have 1/16" hold on square stud L.

To adjust, turn eccentric AL.

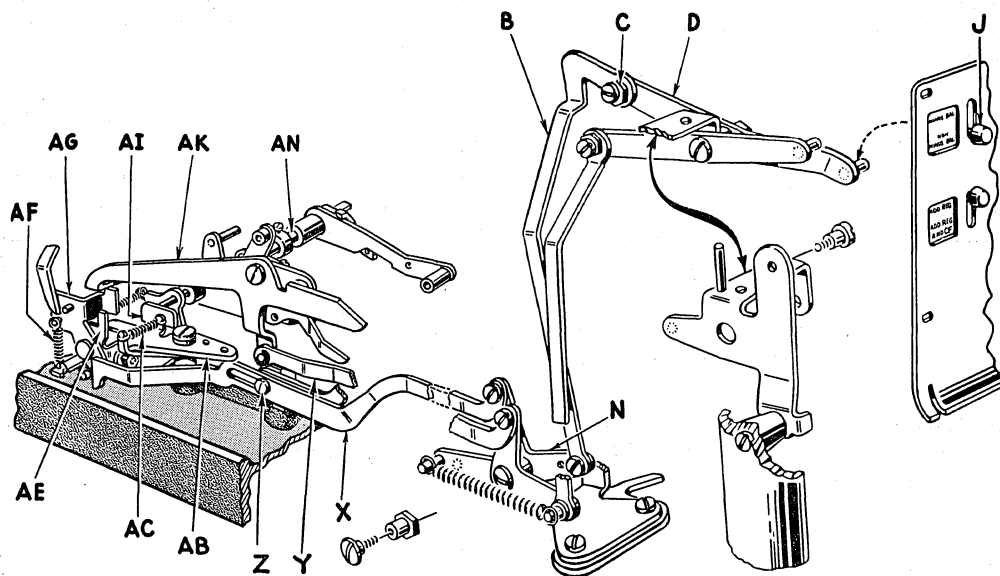
Note: With crossfooter clear, hook arm M should clear square stud L.

2. With the low point of the index cam resting on the roll of the minus balance control arm and with the crossfooter clear, spring G should not expand.

To adjust, turn turnbuckle F.

Note: After making this adjustment, recheck the switch bail adjustment as outlined under Adjustment 4, Plate 8-5, Keyboard Instruction Book.

MINUS BALANCE OPERATION, CARRIAGE CONTROLLED, DISABLING MECHANISM WITH MANUAL CONTROL ON FRONT PANEL, SERIES M 800 (Plate 8-8)



Minus Balance Operation, Carriage Controlled, Disabling Mechanism With Manual Control on Front Panel, Series M 800 (Plate 8-8)

Purpose

To permit disabling the indexing of a carriage controlled minus balance operation when the carriage locates in the balance posi-

tion; so that the amount in the crossfooter may be altered or cleared manually. Also, this mechanism may be readily activated or inactivated by means of a manual control button located on the front panel.

Construction

The design of this mechanism offers no resistance to the function of the Crossfooter

(Plate 8-8) Continued

Totals Indexing Mechanism, Carriage Controlled, with the Minus Balance Operation (Carriage Controlled) Disabling Mechanism active, and permits carriage controlled indexing of a following balance operation in the minimum tabulating distance of 0.6".

This mechanism is contained in all Series M 800 machines containing the Crossfooter Totals Indexing Mechanism, with Indexing Slide, Carriage Controlled (Plate 8-5A), beginning with Serial No. M6146D.

Operation

When an overdraft occurs in the crossfooter from a previous subtract operation, shaft assembly AN is positioned to the left rocking swivel assembly AE to an upright position through intermediate lever AI, spring AC, and lever AB. This action locates limit arm AG, of the swivel assembly, under the rearward extension of rocker arm AK.

During a subsequent carriage tabulation, as the index cam on the carriage rail passes over the roll of the balance control arm (to index the minus balance operation as explained in Plate 8-5A), limit arm AG blocking the rearward extension of rocker arm AK prevents indexing slide Y from moving forward, thereby preventing indexing a minus balance operation.

When the minus balance operation is not indexed, the carriage does not tabulate and the minus balance may be altered or cleared manually. Limit arm AG remains in a blocking position until the overdraft is cleared from the crossfooter.

Swivel assembly AE and limit arm AG are in the position illustrated when operational requirements specify that this mechanism be active.

The disabling mechanism may be made inactive by moving control button J (in posi-

tion No. 50B) from "non-minus balance" to "minus balance." This action, through lever D, link B, and bell crank N, positions slide X forward. This in turn allows spring AF to rock limit arm AG rearward out of alignment with the rearward extension of rocker arm AK when an overdraft occurs in the crossfooter.

Adjustments

1. With control button J located in either "minus balance" or "non-minus balance" position, the vertical slide containing button J should be firmly latched, and the ends of the slot in slide X should not limit on screw Z.

To adjust, turn eccentric C in link B.

2. With an overdraft in the crossfooter and the control button in position No. 50B in the "non-minus balance" position, slide X should swing limit arm AG so that it will have at least a $\frac{3}{4}$ hold on the foot of rocker arm AK when the latter is released, but will non-bind on the limit foot of swivel assembly AE.

To adjust, shorten or lengthen slide X.

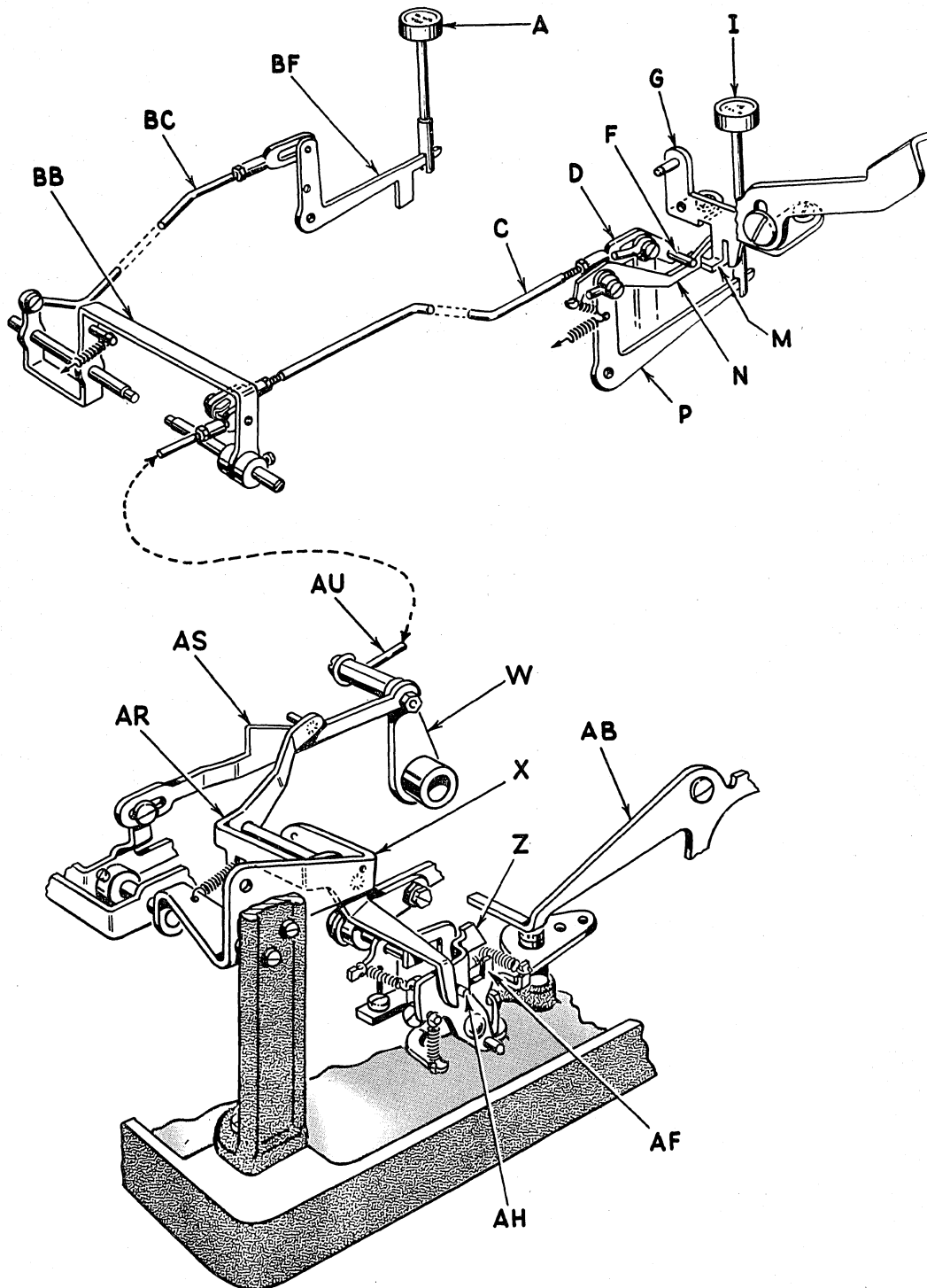
3. With the control button in position No. 50B in "non-minus balance" position and an overdraft in the crossfooter, swivel assembly AE should be perpendicular to insure its restoring.

To adjust, weave the extension of intermediate lever AI that contacts the overdraft shaft.

4. With the power on, an overdraft in the crossfooter, and the control button in position No. 50B set in "non-minus balance" position, tabulate the minus balance index cam in line 11 over the roll of the control arm. Limit arm AG should limit the forward travel of index slide Y sufficiently to prevent the bail on the power shaft from releasing the result linkage.

To adjust, weave the foot of the rearward extension of rocker arm AK.

**MINUS BALANCE OPERATION INDEXING SAFEGUARD
WITH NON-SUBTRACT KEY DEPRESSED,
SERIES M 800 (Plate 8-9)**



Minus Balance Operation Indexing Safe-guard With Non-subtract Key Depressed, Series M 800 (Plate 8-9)

Purpose

To prevent indexing of a minus balance operation from either the key or the carriage control while the Non-subtract Key Mechanism is indexed.

Construction

An interlock is provided in machines beginning with serial number M5066D to prevent depression of the minus balance key after the non-subtract key has been depressed. Palm tabulator bracket G contains foot M that prevents depression of minus balance key I when the step on interlock N, mounted on minus balance key bell crank P, is pushed downward by stud F on turnbuckle D.

In machines containing the Minus Balance Operation (Carriage Controlled) Disabling Mechanism with Manual Control on Front Panel, beginning with machine No. M6146D, depression of the non-subtract key prevents indexing of a carriage controlled minus balance operation. Non-subtract link AS contains a projection that rocks bail AR, mounted on bracket X, to position limit arm Z, of swivel assembly AF, thus preventing the indexing of a carriage controlled minus balance operation.

Operation

Depression of non-subtract key A rocks bail BB forward through bell crank BF and wire BC. This in turn, through wire C and stud F, pushes the step of interlock N down

in the path of foot M to prevent depression of the minus balance key.

Depression of the non-subtract key also pulls non-subtract link AS forward through bail BB, wire AU, and arm W. This in turn, through the projection on non-subtract link AS, bail AR, and stud AH, moves limit arm Z forward to block rocker arm AB, thus preventing the indexing of a carriage controlled minus balance operation, as explained in Plate 8-8.

The Non-subtract Key Mechanism may be restored by the error key to permit depression of the minus balance key.

Adjustment

1. With an overdraft in the crossfooter, depress the non-subtract key. The step on interlock N should have at least $\frac{3}{4}$ hold on foot M of bracket G. With the non-subtract key normal, the step of interlock N should have slight clearance over foot M.

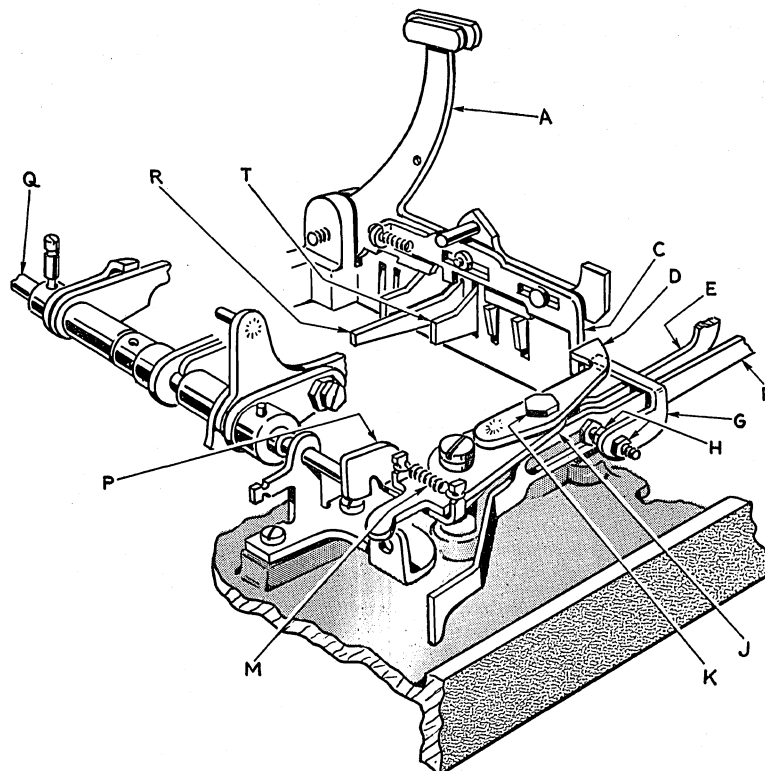
To adjust, weave the forward extension of turnbuckle D to raise or lower stud F.

2. With an overdraft in the crossfooter, locate the control button in position No. 50B to "minus Balance." The vertical projection of bail AR should clear stud AH by approximately $\frac{1}{64}$ ". Depress the non-subtract key. Bail AR should rock limit arm Z forward for at least a $\frac{3}{4}$ hold on the foot of rocker arm AB when the rocker arm is released.

To adjust, weave bail AR.

Note: With the non-subtract key depressed, limit arm Z should not bind on the limit foot of swivel assembly AF.

MINUS BALANCE OPERATION—NON-TRANSFER AND TRANSFER CONTROL—SERIES M 800 (Plate 8-10)



Minus Balance Operation—Non-transfer and Transfer Control—Series M 800 (Plate 8-10)

Purpose

To non-transfer during the first cycle of minus balance operations and to transfer or non-transfer during the third cycle when required by operational specifications.

Construction

Usually, Series M 800 machines transfer complements from the crossfooter to the active register during the first machine cycle, and non-transfer the minus balance total during the third machine cycle.

When it is desired to non-transfer the complements of a minus balance operation—in machines beginning with Serial No. M6146D—adjustable arm D is assembled to intermediate lever J. This will not affect the positioning of the twin cams for the minus balance total which will also non-transfer.

Should the operational requirements call for the minus balance total to transfer to the active register, limit G is assembled to the post carrying front panel control slides E and F. However, when limit G is used to permit the minus balance total to transfer to the

active register, adjustable arm D should also be used to non-transfer the complements.

Operation

When an overdraft occurs in the crossfooter from a previous subtract operation, shaft assembly Q is positioned to the left swinging intermediate lever J through lever P and spring M. Adjustable arm D, connected to the intermediate lever by screw K, also swings and moves slide C inward closing the balance slot in bell crank A. As balance linkage R is pulled forward during indexing of a minus balance operation, its tail is rocked upward contacting the projection on slide C to move the twin cams to non-add position through bell crank A.

When it is required to transfer the minus balance total to the active register, limit G is positioned through adjusting nuts H to hold slide C inward to open the minus balance slot in bell crank A. Thus, there will be no movement of bell crank A as the tail of minus balance linkage T is rocked upward.

Adjustment

(If "Complements of Minus Balance Operation to Non-Transfer" is contained.)

1. With an overdraft in the crossfooter, in-

(Plate 8-10) Continued

dex a minus balance operation and operate the machine manually. Arm D should position the projection of slide C over balance linkage R with at least a $\frac{3}{4}$ hold during the first machine cycle; and over minus balance linkage T with at least a $\frac{3}{4}$ hold during the third machine cycle.

To adjust, position arm D on intermediate lever J.

(If "minus Balance Totals to Transfer" is contained.)

2. With an overdraft in the crossfooter,

index a minus balance operation and operate the machine manually:

- a. Arm D should position the projection of slide C over the balance linkage with a full hold during the first machine cycle.

To adjust, position arm D on intermediate lever J.

- b. Limit G should position the projection of slide C with a slight clearance of minus balance linkage T during the third machine cycle.

To adjust, position limit G and secure with lock nuts H.

KEYBOARD PLATE AND INTERLOCKS, CLASSES 71, 72, 73, 74 (Plate 9)

(Plates 7 and 8 in Symbol Book only)

Keyboard Plate and Interlocks, Classes 71, 72, 73, 74 (Plate 9)

The keyboard consists of adding (red), multiplying (black), register total, fraction add CF, extend, first product, final product and full cent keys. Improper operation is prevented by interlocks.

To prevent depression of more than one adding key, a lower projection on the key lever passes between two of a row of steel balls. The total clearance between the balls is slightly more than the thickness of the lever, which prevents more than one key being depressed.

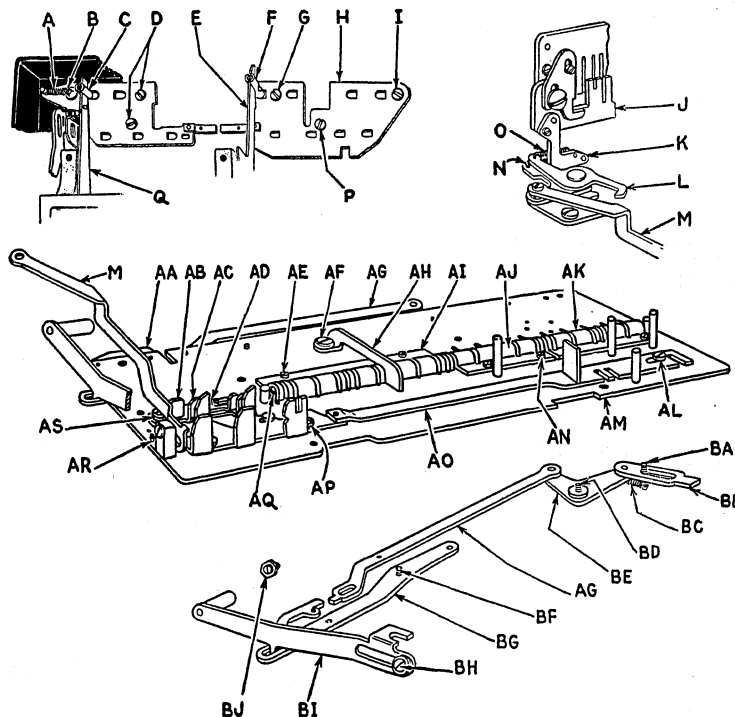
When the final product key is depressed, the extend key, fraction add CF, and the register total keys are locked by interlocks AB and AC. Interlock AC is cammed to the left to block the extend key, interlock AB being cammed toward the right to block the register total key and the fraction add CF.

Depressing the first product key blocks the register total and fraction add CF keys in the same manner as when the final product key is depressed. When any result key is partially depressed, the motor bars are blocked, interlock AO being cammed to the right, locating its vertical projections in the path of the lugs in the motor bars.

When the motor bar is depressed, its feet block the right and left projections of AO which prevents the depression of the result keys. The depression of the motor bar also locks the red and black keys through its rear foot entering the ball lock.

The result keys, when depressed, lock the multiplying keys by camming arrow H to the left which holds H in the cut-out of the multiplying keys and thereby prevents their depression.

Depressing the motor bar blocks the tabulator bar by moving part AG into its path through BB and BE. When the tabulator key is depressed, the movement of AG, BE and BB is blocked which prevents the depression of the motor bar.



When a multiplying key is depressed, arrow H is blocked, locating in the cut-out of the result keys, preventing their depression. The depression of the multiplying keys locks the adding keys by the foot of the multiplying key bell crank entering the ball lock.

The subtract key in Class 72 machines, when pushed in and latched, locks the adding keys through part BI rocking lever BG, which moves slide AH into the ball lock. The subtract key, when latched in, also locks the extend key and all result keys through the lip on BI moving into the path of the square stud in arrow H.

The extend key, when depressed, blocks the multiplying keys by camming arrow H into the cut-out of the multiplying keys.

During the machine operation, the result keys are locked by the lip of interlock M blocking the square stud in arrow H. Interlock M slides on a shoulder screw on the right side of square stud in AM; interlock BI slides on shoulder screw BH on the left side of square stud in AM, both interlocks blocking the square stud in arrow H.

Interlock M is pulled to active position by spring N when blocking bail J moves under the typewriter keys. Interlock M is restored by blocking bail J when the latter clears the typewriter keys.

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KEYBOARD PLATE AND INTERLOCKS, CLASSES 71, 72, 73, 74 (Plate 9)

(Plates 7 and 8 in Symbol Book only)

Keyboard Plate and Interlocks, Classes 71, 72, 73, 74 (Plate 9)

The keyboard consists of adding (red), multiplying (black), register total, fraction add CF, extend, first product, final product and full cent keys. Improper operation is prevented by interlocks.

To prevent depression of more than one adding key, a lower projection on the key lever passes between two of a row of steel balls. The total clearance between the balls is slightly more than the thickness of the lever, which prevents more than one key being depressed.

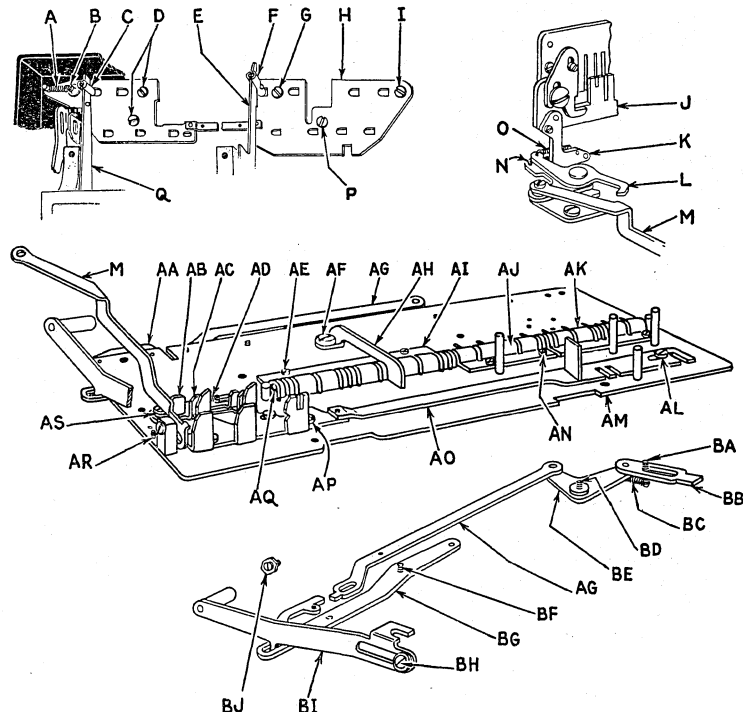
When the final product key is depressed, the extend key, fraction add CF, and the register total keys are locked by interlocks AB and AC. Interlock AC is cammed to the left to block the extend key, interlock AB being cammed toward the right to block the register total key and the fraction add CF.

Depressing the first product key blocks the register total and fraction add CF keys in the same manner as when the final product key is depressed. When any result key is partially depressed, the motor bars are blocked, interlock AO being cammed to the right, locating its vertical projections in the path of the lugs in the motor bars.

When the motor bar is depressed, its feet block the right and left projections of AO which prevents the depression of the result keys. The depression of the motor bar also locks the red and black keys through its rear foot entering the ball lock.

The result keys, when depressed, lock the multiplying keys by camming arrow H to the left which holds H in the cut-out of the multiplying keys and thereby prevents their depression.

Depressing the motor bar blocks the tabulator bar by moving part AG into its path through BB and BE. When the tabulator key is depressed, the movement of AG, BE and BB is blocked which prevents the depression of the motor bar.



When a multiplying key is depressed, arrow H is blocked, locating in the cut-out of the result keys, preventing their depression. The depression of the multiplying keys locks the adding keys by the foot of the multiplying key bell crank entering the ball lock.

The subtract key in Class 72 machines, when pushed in and latched, locks the adding keys through part BI rocking lever BG, which moves slide AH into the ball lock. The subtract key, when latched in, also locks the extend key and all result keys through the lip on BI moving into the path of the square stud in arrow H.

The extend key, when depressed, blocks the multiplying keys by camming arrow H into the cut-out of the multiplying keys.

During the machine operation, the result keys are locked by the lip of interlock M blocking the square stud in arrow H. Interlock M slides on a shoulder screw on the right side of square stud in AM; interlock BI slides on shoulder screw BH on the left side of square stud in AM, both interlocks blocking the square stud in arrow H.

Interlock M is pulled to active position by spring N when blocking bail J moves under the typewriter keys. Interlock M is restored by blocking bail J when the latter clears the typewriter keys.

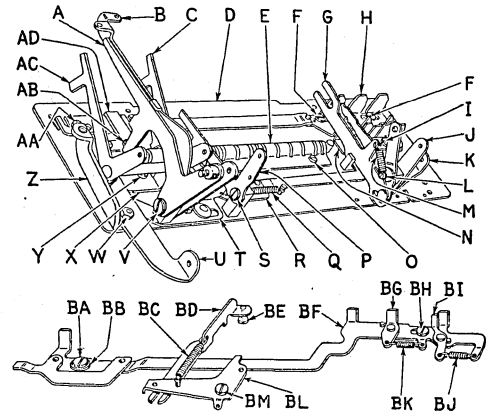
KEYBOARD PLATE AND INTERLOCKS, CLASSES 75, 77 (Plate 11)

(Plate 10 in Symbol Book only)

Keyboard Plate and Interlocks, Classes 75, 77 (Plate 11)

Interlock BF blocks balance, credit balance and sub-balance keys when the credit register key has been depressed, until released by a subtract operation. Depression of the credit register key cams interlock BF, locating its solid and flexible vertical projections under the balance, credit balance and sub-balance keys. Depression of the subtract key cams interlock BF to its normal position by contacting on the single vertical projection. When the balance key is depressed first, part BI permits depressing the credit register key. When the credit balance key is depressed first, part BG permits depressing the credit register key.

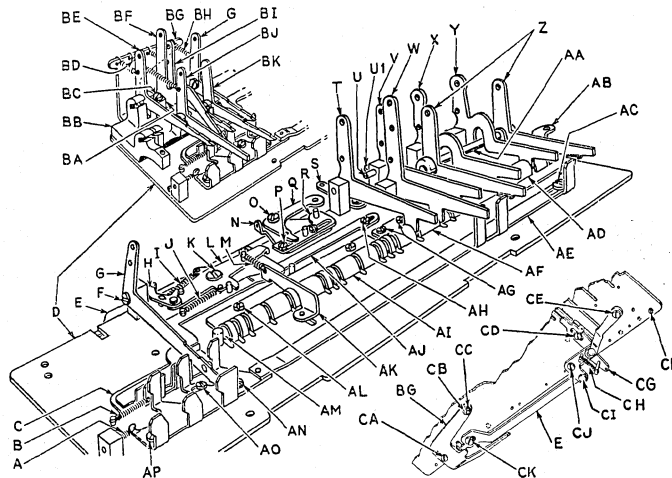
The keyboard, except the result keys, is locked by swinging bell-crank BL to push slide BD into ball lock E. Interlock H blocks the motor bar when balance, credit balance, sub-balance, credit register, crossfooter add crossfooter subtract, non-clear subtract or register subtract key is partially depressed, by camming under the arm of the motor bar. When the motor bar is depressed, interlock H is blocked and cannot be cammed by any



other key, which causes interlock H to block all keys. The motor bar, when depressed, also enters the ball lock and locks all red keys.

Depressing the crossfooter subtract, crossfooter non-clear or the register subtract key prevents depressing the result keys by blocking arrow H (Plate 9). When the result keys are depressed, arrow H (Plate 9) is cammed into the path of the crossfooter subtract, crossfooter non-clear and register subtract keys to prevent their depression.

KEYBOARD PLATE AND INTERLOCKS, CLASS 78 (Plate 12)



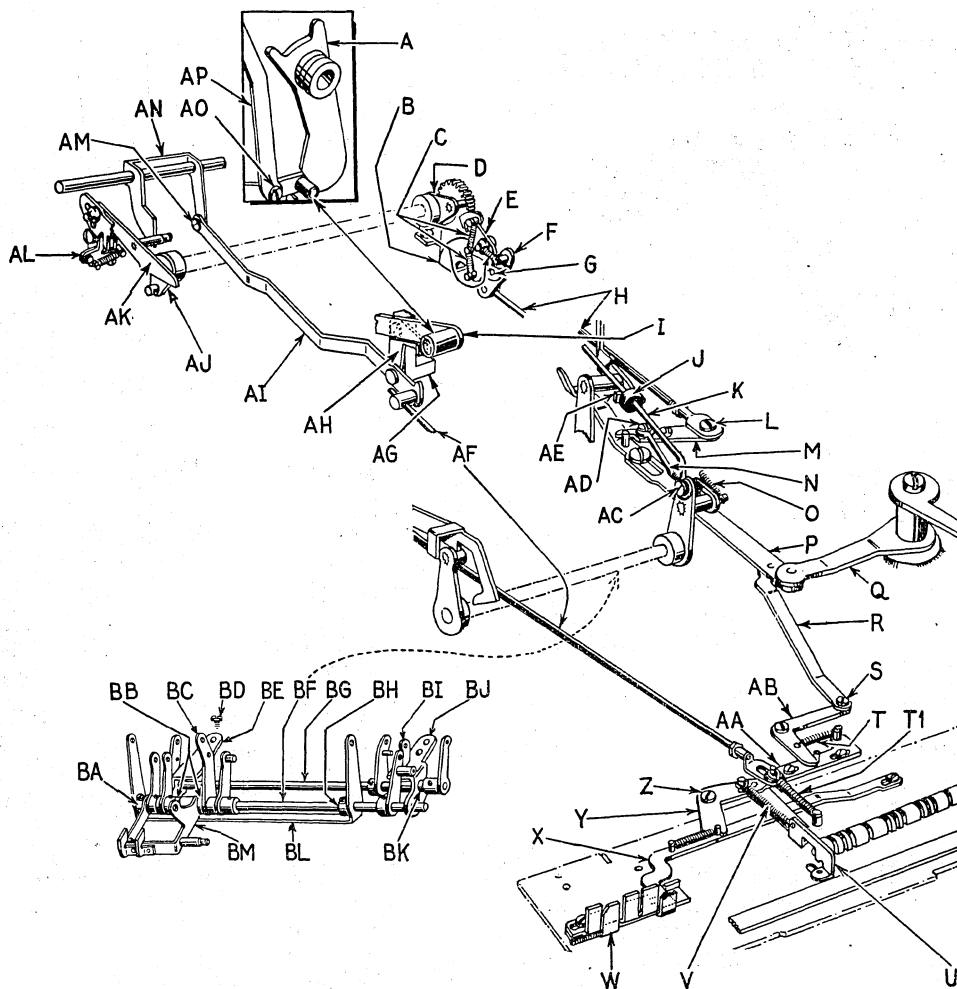
Keyboard Plate and Interlocks, Class 78 (Plate 12)

The purpose of arm H (in late machines) is to hold interlock assembly E in normal position to permit depressing the hand tabulating lever when the machine is in OD position.

When the motor bar is depressed, arm H is swung to the left which permits spring CH to move assembly E into the path of the hand tabulator lever, thereby preventing its depression.

Note: Early machines do not have arm H.

KEYBOARD LOCK MECHANISM, CLASS 78 (Plate 13)



Keyboard Lock Mechanism, Class 78 (Plate 13)

All keys except result keys are locked through the ball lock when the motor bar is depressed. The result keys are locked through machine operation as follows:

Part AJ raises arm AK which swings bail AN rearward, and through link assembly AI and wire AF swings bell-crank Y; the latter is connected to interlock U with spring V which expands due to interlock U not being able to enter the ball lock until the motor bar is released.

Bell-crank Y pulls interlock X to block the result keys.

The main purpose of interlock X is to block the credit balance key when the machine is normal with a debit balance.

When a credit balance occurs, interlock X

blocks the balance key when the machine is normal.

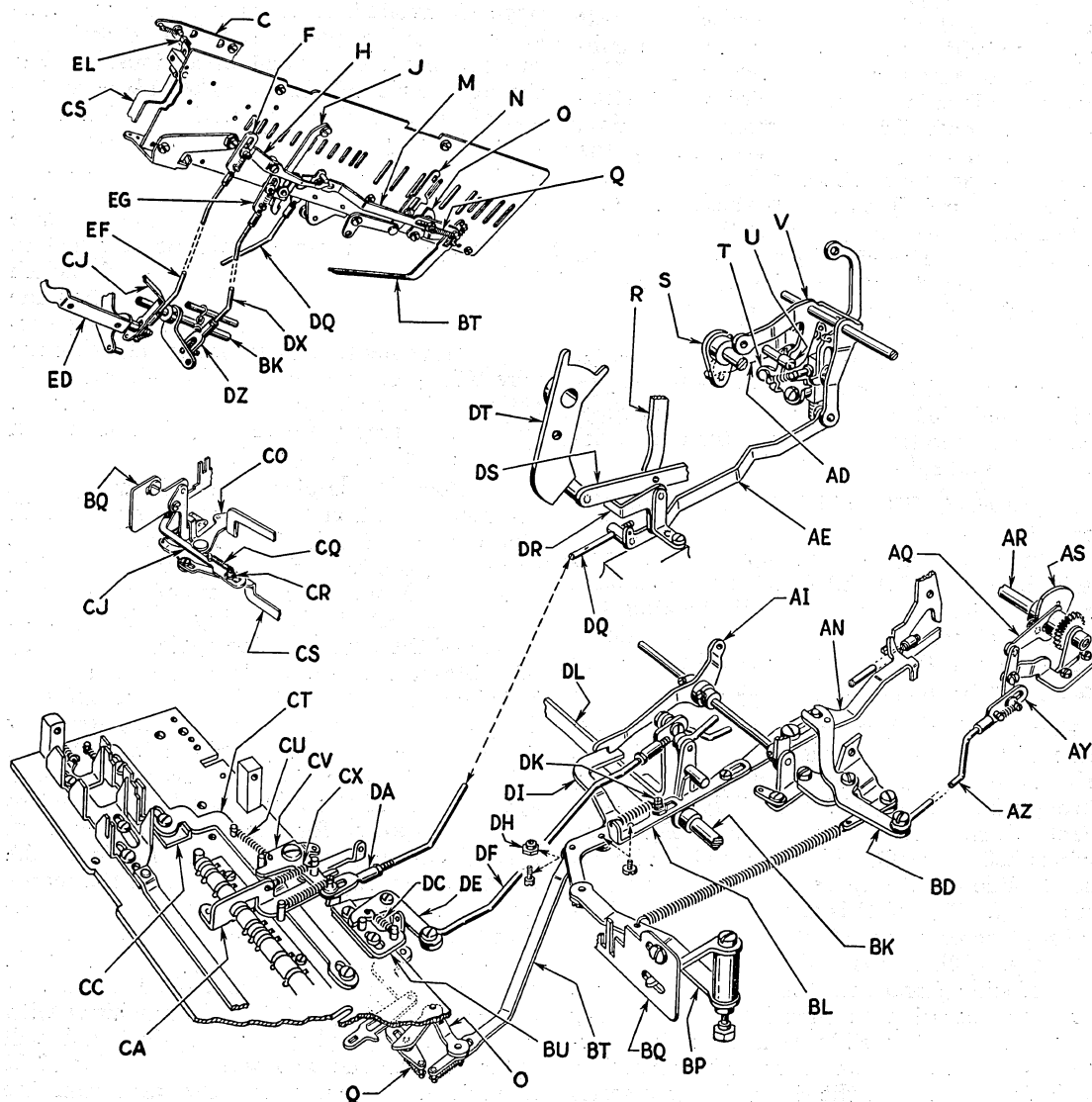
Interlock X is controlled by the credit balance mechanism as follows:

During each subtract operation, swinging cam A rocks arm I, the latter contacts on bell-crank AH which pivots on post AG, and being connected to link assembly AI, swings bell-crank Y still further.

When an OD occurs, arm I cannot completely return to its normal position due to being connected to the OD mechanism which also prevents interlock X from completely moving to normal position. The position of interlock X now blocks the balance key and provides an open space to permit depressing credit balance key.

Interlock X pulls interlock W to block the total and rear register keys. The motor bar is released before the end of the return stroke

KEYBOARD INTERLOCKS—SERIES M 800 MACHINES (Plate 13A)



Keyboard Interlocks—Series M 800 Machines (Plate 13A)

Purpose

To assure proper keyboard indexing functions.

Construction

Depression of a result key indexes not only a particular mechanism but also the power. Since the result keys do not remain depressed, some of the keyboard interlocks in these machines are necessarily designed to prevent subsequent key depressions during an indexed operation.

Palm tabulator depression during a series of carriage controlled total operations is

prevented by the Palm Tabulator Locked during Machine Operation Mechanism (Plate 44-1). This mechanism is held effective between carriage controlled total operations by latch H.

Operation

When a result key is depressed, the key-stem cams interlock C to the left, moving stud EL into the path of the lip on interlock CS; and switch bail ED, which is rocked to its latched position at the same time, pulls link CJ rearward thus expanding spring CQ.

When the result key is released, permitting interlock C to restore, stud EL moves out of the path of the lip on interlock CS, permitting spring CQ to contract and pull the

(Plate 13A)—Continued

lip of interlock CS into the path of stud EL, thus providing a temporary lock of the result keys, the add crossfooter key, and the sub-total index key through interlock C. This temporary lock is necessary prior to actuation of power shaft BK, and remains effective, after switch bail ED is released during the forward machine stroke, when typewriter keylock comb BQ moves to the right. Interlock CS returns to normal at the same time as comb BQ. The movement of comb BQ to its active (rightmost) position also prevents depression of the palm tabulator through swivel CO (see Plate 44-1). (**Note:** Interlock CS also locks the result keys, the add crossfooter key and the sub-total index key when switch bail ED is latched during carriage controlled operation of crossfooter and register totals and sub-totals.)

Power shaft BK, which is rocked by the oscillating power slide when switch bail ED is latched to close the auxiliary switch points, pulls interlock CA into the ball raceway, through wire DX and slide J, locking the operational control keys on the right side of the keyboard, the listing keys, and the motor bars prior to machine operation.

The rocking of power shaft BK, moves slide AN forward, through the arm of slide BL, to shift typewriter keylock comb BQ, through bell crank BP. The forward movement of slide AN, through link BT, also swings bell crank O, which, through spring Q, moves slide M into the return path of the step on slide J. Slide AN is then held forward by the subtractor power shaft when the machine operates. (Slide M is positioned in the return path of slide J and held there throughout the machine operation so that interlock H may engage the stud in slide M and retain interlock CA in the ball raceway, and typewriter keylock comb BQ to the right, during a series of carriage controlled total operations which will be explained later. Slide M, also retains interlock CA in the ball raceway after wire DQ begins to release bell crank CV, which is also explained later.)

The rocking of subtractor shaft AR rocks cam AS to cam slide AQ forward. The latter, through wire AZ and lever BD, holds slide AN forward to retain the typewriter and keyboard interlocks active until the end of the return machine stroke.

When an automatic tabulation operation is indexed, latch arm AI is rocked from the tabulation control shaft and engages latch plate DI, when slide AN is moved forward, to retain the interlocks active until the carriage movement is completed.

In machines containing the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, latch H retains the interlocks in active position during a series of carriage controlled total operations. When the automatic tabulation takes place at the end of an operation, the carriage indexes the succeeding operation, through the particular index cam and control arm for that operation, near the end of the carriage movement. The interlocks, being active until the carriage tabulation is completed, will be retained in active position through rocking of switch bail ED. The latter, being rocked when the succeeding operation is indexed during carriage movement, causes latch H, through wire EF, to engage the stud in slide M. This action holds slide M in the return path of slide J, thereby preventing interlock CA from returning to normal.

Interlock CA is also actuated during each machine operation by the rocking of bail V. The purpose of bail V is to provide a means of locking the ball raceway between the first and second machine cycles of a subtract operation. At the beginning of the forward stroke of the first machine cycle, the rocking of subtractor power shaft AR, through arm S, raises arm AD. The latter, through stud U, rocks bail V, which, through link assembly AE and wire DQ, swings bell crank CV to pull interlock CA into the ball raceway through spring CX. If the motor bar is depressed to index the power for the subtract operation, spring CX expands because interlock CA cannot enter the ball raceway until the motor bar is released during the return stroke of the first machine cycle. Should the subtract operation be indexed along with a result operation or a carriage controlled blank machine operation (contained in machines with carriage controlled totals) interlock CA will enter the ball raceway when power shaft BK is rocked. Then, when the first machine cycle begins, bail V is actuated to retain interlock CA in the ball raceway, through wire DQ and bell crank CV, as power shaft BK rocks to normal.

When arm AD is completely raised, it is latched in that position by latch T which is not released until the latter part of the second cycle of the subtract operation, thus locking the ball raceway, through interlock CA, from the time the interlock enters the ball raceway (depending on motor bar or result key depression) until near the end of the second machine cycle.

However, since slide M retains interlock CA in the ball raceway because slide AN is held forward either by cam AS or latch AI, interlock CA will not leave the ball raceway until near the very end of the second machine

(Plate 13A)—Continued

cycle, or, if the automatic tabulation has been indexed, until the tabulation is completed.

When a minus balance operation is indexed, the keyboard interlocks are actuated during the first and second machine cycles, as previously explained, and, in addition, interlock CA is retained in the ball raceway between the second and third machine cycles by slide BU. When power shaft BK is rocked during a minus balance operation, bail DL is latched forward, as explained in Plate 38-1. Bail DL, through wire DF, swings bell crank DE so that when bell crank CV is swung fully by bail V, tension of spring DC positions slide BU in the return path of bell crank CV. Near the end of the return stroke of the second cycle, the minus balance linkage is latched forward, rocking power shaft BK, which, through wire DX pulls interlock CA into the ball raceway. Also, near the end of the return stroke of the second cycle when the Minus Balance Operation Third Cycle Indexing Mechanism is released, bail DL is permitted to return to normal and pull slide BU from the return path of bell crank CV. But, at this time since power shaft BK is in its rocked position, interlock CA is retained in the ball raceway through wire DX. Power shaft BK is held forward until the minus balance linkage releases from the result linkage latch at the beginning of the return stroke of the third cycle, but by this time bail V, through wire DQ, has again pulled interlock CA fully into the ball raceway where it is retained by slide M until the end of carriage tabulation.

The purpose of interlock CT is to block depression of the minus balance key when the crossfooter contains a debit balance; and to block depression of the balance key when, after a subtract operation, the crossfooter contains a minus balance. In machines which contain the minus balance lock in the last active column, the transferring of an amount from the register to the crossfooter to create a minus balance also affects the position of interlock CT. Similarly, the addition of amounts which accumulate sufficiently to move the pinion wheel in the last active column to affect the minus balance lock also affect interlock CT.

The movement of interlock CT is controlled by the Minus Balance Lock Mechanism through link R. The purpose of swinging cam DT is to actuate the minus balance lock during every machine operation in anticipation of a minus balance occurring in the crossfooter. As the machine operates, cam DT rocks arm DS. The latter rocks bell crank DR and moves link assembly AE rearward to swing bell crank CV which, through

spring CU, pulls interlock CT to the right. When a minus balance occurs, arm DS cannot completely return to its normal position because of being connected to the Minus Balance Lock Mechanism through arm R, thereby preventing interlock CT from completely returning to its normal position. In this position, interlock CT blocks depression of the balance key and provides an open space to permit depressing the minus balance key.

During a machine operation, when cam DT mounts the roll of arm DS (or when bail V is rocked) to swing bell crank CV, interlock CT is positioned so that depression of both the balance and minus balance keys is blocked. The movement of interlock CT to the right moves interlock CC to the right also, blocking depression of the register total and add crossfooter keys. However, this latter action is superfluous, since depression of the total and add crossfooter keys (during machine operations) is blocked by interlock C when interlock CS is actuated either through rocking of the switch bail or movement of comb BQ. (*Note:* Interlock CC primarily functions to block depression of the total and the add crossfooter keys when the balance or minus balance key is depressed and cams it to the right.)

Slotted turnbuckle F provides a broken joint which permits switch bail ED to function when slide M is normal, the stud of slide M being in the path of the hook of latch H.

Slotted turnbuckle DA provides a broken joint which permits bell crank CV to function when power shaft BK is rocked, and also permits bail V to return to normal when bell crank CV is retained in active position by slide BU between the second and third machine cycles of a minus balance operation.

Slotted turnbuckle DZ provides a broken joint which permits power shaft BK to return to normal during the time that interlock CA is retained in the ball raceway, and also permits bell crank CV to function when it is actuated by bail V when power shaft BK is normal. Slotted turnbuckle EG provides a broken joint which permits power shaft BK to function should interlock CA be prevented from entering the ball raceway.

The slots in slide BL provide a means for adjusting the position of slide BL, and also provide a broken joint which permits the power shaft to function should a typewriter key be depressed and prevent the forward movement of slide AN.

Slotted turnbuckle AY provides a broken joint which permits shaft AR to function should the forward movement of slide AN be prevented.

(Plate 13A)—Continued**Adjustment**

1. With interlock C normal, the lip of interlock CS should clear stud EL to permit free movement of interlock C.

To adjust, turn eccentric CR.

2. With a minus balance in the crossfooter (minus balance lock active), wire DQ should hold bell crank CV in such a position that interlock CT permits depression of the minus balance key but does not hold interlock CA in the ball raceway so as to prevent easy depression of the listing keys; and with the crossfooter clear (minus balance lock inactive), interlock CT should permit balance key depression.

To adjust, shorten or lengthen wire DQ.

3. When power shaft BK is rocked, slide J should move interlock CA into the ball raceway as soon as possible.

To adjust, shorten or lengthen wire DX.

Note: When making this adjustment, first check Adjustment No. 2. Then, with power shaft BK normal, shorten or lengthen wire DX so that the normal position of slide J is not affected, since this will affect the normal position of interlock CT and may prevent depression of the balance key.

4. With the motor bar held depressed, typewriter keylock comb BQ should be positioned fully to the right without bind; and with the machine normal, comb AB should not prevent typewriter key depression.

To adjust, bend the upper arm of bell crank BP.

5. Power shaft BK should move typewriter keylock comb BQ fully to the right without binding.

To adjust, position slide BL by turning eccentric bushing DK.

6. Auxiliary typewriter keylock cam AS should hold slide AN fully forward until the latest possible moment of the machine operation.

a. With the machine normal and slide assembly AQ limiting on shaft AR, cam AS should have a non-binding contact on the roll of slide assembly AQ.

To adjust, position cam AS on shaft AR.

b. During a machine operation, with the roll of slide assembly AQ on the high portion of cam AS, typewriter keylock comb BQ should be held to the right as far as possible without binding.

To adjust, shorten or lengthen wire AZ.

6. During a result key operation, when slide AN is held forward by cam AS and after wire DQ releases bell crank CV, slide M should have a full hold on the step of slide J.

To adjust, turn eccentric bushing DH.

Note: Eccentric bushing DH also controls the hold of bell crank O on the step of slide N, thereby preventing depression of the motor bar until the automatic tabulation operation is completed.

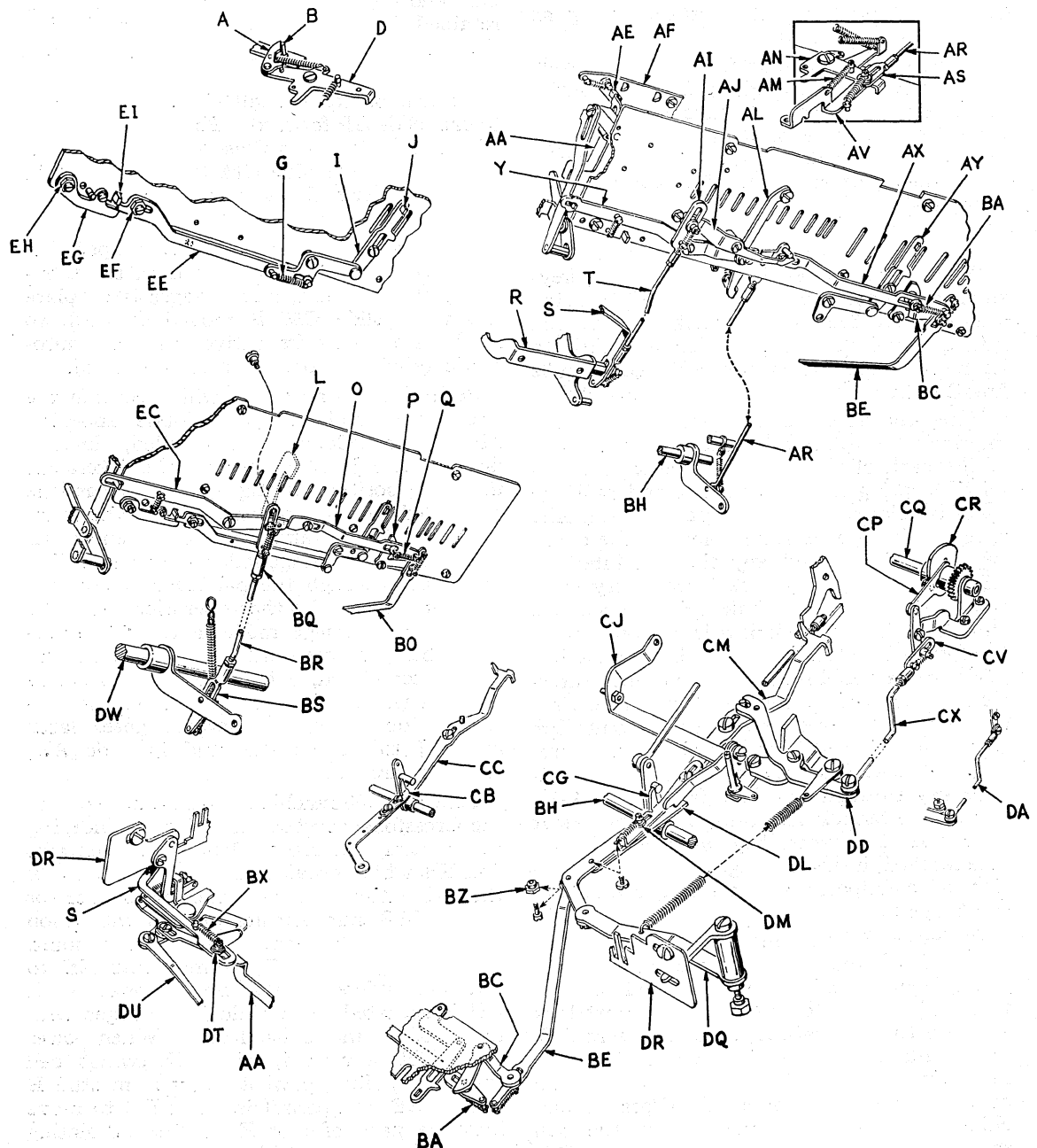
7. With switch bail ED normal, the hook of latch H should just clear the stud of slide M so that latch H will engage the stud of slide M immediately when switch bail ED is rocked and slide M is in active position.

To adjust, shorten or lengthen wire EF.

8. When bail DL is latched forward during a minus balance operation, slide BU should be held positioned in the return path of bell crank CV so that interlock CA is retained in the ball raceway until wire DX moves rearward sufficiently, near the end of the second machine cycle, to retain it (interlock CA) there; and when bail DL is normal slide BU should just clear bell crank CV.

To adjust, shorten or lengthen wire DF.

KEYBOARD INTERLOCKS—FOR SERIES M 200 MACHINES, AND CLASS 72 MACHINES CONTAINING EASY DEPRESSION POWER RESULT KEYS (Plate 13-1)



**Keyboard Interlocks — For Series M 200
Machines, and Class 72 Machines
Containing Easy Depression Power
Result Keys (Plate 13-1)**

Purpose

To assure proper keyboard indexing functions.

Printed in U. S. America 1-7-52

Construction

Depression of a result key or the clear multiplier key (Position No. 67), in all Series M 200 machines and in those Class 72 machines containing the Easy Depression Power Result Keys Mechanism, indexes not only a particular mechanism but also the power.

Replaces print 207-1/M

For Form 3760

(Plate 13-1) Continued

Since these keys do not remain depressed, some of the keyboard interlocks in these machines are necessarily redesigned to prevent subsequent key depressions during an indexed operation.

In Series M 200 machines which contain the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, interlock AJ is used to prevent a palm tabulator depression (or key depressions) during a series of carriage controlled total operations (see Plate 44-1).

Operation

When a result key is depressed, the key-stem cams interlock AF to the left, moving stud AE into the path of the lip on interlock AA; and switch bail R, which is rocked to its latched position at the same time, pulls link S rearward thus expanding spring BX.

When the result key is released, permitting interlock AF to restore, stud AE moves out of the path of the lip on interlock AA, permitting spring BX to contract and pull the lip of interlock AA into the path of stud AE, thus providing a temporary lock of the result keys and the extend key through interlock AF. This temporary lock is necessary prior to actuation of power shaft BH, and remains effective, after switch bail R is released during the forward machine stroke, when typewriter keylock comb DR moves to the right. Interlock AA returns to normal at the same time as comb DR. The movement of comb DR to its active (rightmost) position also prevents depression of the add reg-clear multiplier key through link DU (see Plate 19-1). (*Note:* Interlock AA also locks the result keys and the extend key when switch bail R is latched during carriage controlled operation of crossfooter and register totals and sub-totals.)

In Series M 200 machines, power shaft BH, which is rocked by the oscillating power slide when switch bail R is latched to close the auxiliary switch points, pulls interlock AV into the ball raceway, through wire AR, bell crank AN, and spring AM, locking the multiplying and the listing keys, and the full cent and the motor bars. In Class 72 machines, interlock L is pulled into the ball raceway, through wire BR and lever EC, when power shaft DW is rocked.

In Series M 200 machines, power shaft BH, through the arm of slide CG, moves slide CM forward to shift typewriter keylock comb DR, through bell crank DQ, and also to swing bell crank BC, through link BE. Bell crank BC, through spring BA, moves slide AX into the path of lever Y which

retains interlock AV in the ball raceway, through link AL, during the early part of the machine operation. In Class 72 machines, comb DR is shifted through slide CB, slide CC, and bell crank DQ, and interlock L is retained in the ball raceway through link BO, bell crank P, spring Q, slide O, and lever EC.

Subtractor power shaft CQ rocks cam CR to cam slide CP forward. The latter, through wire CX (wire DA in Class 72 machines) and lever DD, holds slide CM forward to retain the typewriter and keyboard interlocks active during the machine operation.

When an automatic tabulation operation is indexed, bail CJ is rocked from the tabulation control shaft, and engages latch plate DL when slide CM is moved forward, to retain the interlocks active until the automatic tabulation operation is completed.

Series M 200 machines which contain the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, include latch arm AJ which retains the interlocks in active position during a series of carriage controlled total operations. When the automatic tabulation takes place at the end of an operation, the carriage indexes the succeeding operation, through the particular index cam and control arm for that operation, near the end of the carriage movement. The interlocks, being active until the carriage tabulation is completed, will be retained in active position when bail R, rocked when the succeeding operation is indexed, causes latch arm AJ to engage the stud in slide AX, through wire T.

Series M 200 machines that do not contain the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, contains link EE which provides an interlock between the tabulating bar and the motor bar or power shaft but permits manual tabulation during multiplication. The spring joint, provided by spring G, permits link EE to function independently when power shaft BH is actuated, since slide I is engaged with foot J of the motor bar frame. When power shaft BH is rocked, wire AR swings bell crank D, pulling pawl A away from stud B in link EE and permitting link EE to move into the path of foot EI of the tabulating bar bell crank. This pawl arrangement permits link EE to function without swinging bell crank D when the motor bar is depressed. Series M 200 machines containing the carriage controlled totals contain an interlock that blocks the tabulating bar during all machine operations (see Plate 44-1) and do not contain link EE.

In Series M 200 machines slotted turn-

(Plate 13-1) Continued

buckle AI provides a broken joint which permits switch bail R to function when slide AX is normal, the stud of slide AX being in the path of the hook of latch arm AJ.

Slotted turnbuckle AS provides a broken joint which permits interlock AV to function when the subtract key is used, since interlock AV is connected to lever Y by link AL.

The slots in slide CG not only provide a means for adjusting the position of the slide, but also provide a broken joint which permits the power shaft to function should a typewriter key be depressed and prevent the forward movement of slide CM.

Slotted turnbuckle CV provides a broken joint which permits shaft CQ to function should the forward movement of slide CM be prevented.

In Class 72 machines, slotted turnbuckle BS provides a broken joint which permits power shaft DW to return to normal during the time that slide O retains interlock L in the ball raceway, and also permits lever EC to function when using the subtract key. Slotted turnbuckle BQ provides a broken joint which permits power shaft DW to function should interlock L be prevented from entering the ball raceway.

Adjustment

1. With interlock AF normal, the lip of interlock AA should clear stud AE to permit free movement of interlock AF.

To adjust, turn eccentric DT.

2. With shaft BH or DW normal, respective interlock AV or L should have minimum clearance with the ball raceway to permit easy key or motor bar depression and yet move into the ball raceway as soon as possible upon operation of shaft BH or DW.

To adjust, shorten or lengthen wire AR or BR.

3. Power shaft BH or DW should move typewriter keylock comb DR fully to the right without binding.

To adjust, in Series M 200 machines, position slide CG by turning eccentric DM; in Class 72 machines, position slide CB in slide CC.

4. Auxiliary typewriter keylock cam CR should hold slide CM fully forward until the latest possible moment of the machine operation.

a. With the machine normal and slide assembly CP limiting on shaft CQ, cam CR should have non-binding contact on the roll of slide assembly CP.

To adjust, position cam CR on shaft CQ.

b. During a machine operation, with the roll of slide assembly CP on the high portion of cam CR, typewriter comb DR should be held to the right as far as possible without binding.

To adjust, shorten or lengthen wire CX or DA.

5. During a result key operation when slide CM is held forward by cam CR, slide AX should have a full hold on lever Y.

To adjust, turn eccentric BZ.

Note: Eccentric BZ also controls the hold of bell crank BC on the step of slide AY which prevents depression of the motor bar until the automatic tabulation operation is completed.

6. With switch bail R normal, the foot of interlock AJ should just clear the stud in slide AX.

To adjust, shorten or lengthen wire T.

7. Link EE, when moved to the left, should have minimum clearance with foot EI of the tabulating bar bell crank.

To adjust, turn eccentric EF.

8. Brace EG should have minimum clearance with link EE.

To adjust, turn eccentric EH.

(Plate 13)—Continued

at which time interlock U enters the ball lock which continues the locking of the keyboard until arm AJ returns to normal position at the end of the return stroke.

During the first stroke of subtract operations (extending) the keyboard is locked as explained previously. However, when arm AK is completely raised, it is locked by lock AL which is not released until the latter part of the subtract operation, thus locking the keyboard through interlock U in the ball lock from the latter part of the first operation until the latter part of the second operation.

The locking of the keyboard is continued from the latter part of the subtract stroke and throughout the entire third stroke of the credit balance operation by slide AA blocking bell-crank Y.

Slide AA is permitted to be pulled in the path of bell-crank Y when bell-crank AB is rocked through the action of the typewriter key lock when the motor bar is depressed. The motor bar pulls the motor trip slide, moving part P forward which rocks bell-crank AB in order to permit slide AA to block bell-crank Y when the latter swings rearward.

Part P of the typewriter key lock which holds bell-crank AB is released slightly before the end of the return stroke of the subtract operation.

The keyboard and typewriter keys are also locked during the entire third operation as follows:

During the early part of the forward stroke of the second operation, link AE contacts on collar J which rocks shaft assembly BF. The latter, through wire N, swings lever M which blocks part P to retain bell-crank AB in active position. Lever M is latched by assembly E, the latter is released at the end of the return stroke of the third operation by arm AK contacting on the passby pawl on E.

Typewriter Key Lock Mechanism

When the motor bar is used, the typewriter keys are locked in the usual manner (covered in Plate 20). However, when the balance, credit balance or total keys are depressed, the drive is tripped and the keyboard lock actuated through shaft assembly BF, as explained in detail in Credit Balance Key Mechanism (Plates 38-39) under the heading of Typewriter Key Lock.

**Fraction, Crossfooter Add and Crossfooter Non-add Key Mechanism
(Plate 14)**

The crossfooter add key found in all classes of machines, when depressed, indexes the crossfooter add mechanism.

In Class 72 machines, in addition to indexing the crossfooter add mechanism, the crossfooter add key is also known as the fraction key and is used to index fractions.

The crossfooter add key, when depressed, is latched in Classes 77 and 78 machines and also latched in Class 72 machines when so ordered.

In order to add fractions in the registers in Class 72 machines having latch down fraction keys, the fraction and limit keys are held down at the time when the red key is depressed in order to prevent latching. The fraction and the limit keys must not be held during the machine operation.

The crossfooter add key in Class 78 machines also indexes the non-subtract mechanism

to disable the subtract mechanism when the latter is indexed by carriage position. The non-subtract mechanism is covered in Plate 37.

The non-add key mechanism in Class 78 machines is not indexed through the crossfooter add key, but through the non-add key, which is covered in Plate 36.

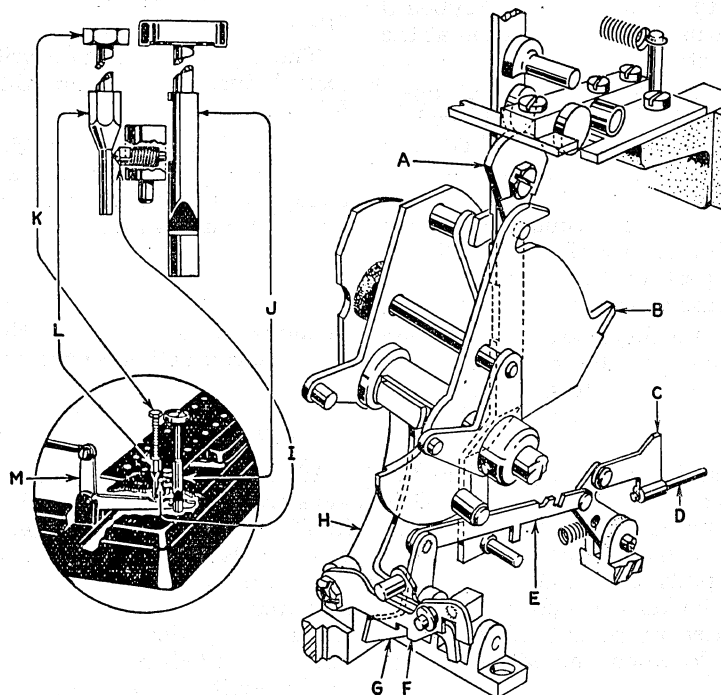
Fractions

When key J is depressed and held down, flapper I (Plate 2) is raised to disable the intermediate keyboard escapement mechanism which permits a fraction to be set up with a red key.

Crossfooter Add

When, after an amount has been set up with the red keys, key J is depressed, the crossfooter meshing mechanism is indexed through wire D and linkage C rocking part G which, by contacting arm F, swings add con-

FRACTION, CROSSFOOTER ADD AND CROSSFOOTER NON-ADD KEY MECHANISM (Plate 14)



(Plate 14)—Continued

trol H to locate twin cam B in line with cross-footer meshing cam A.

Crossfooter Non-add

When, after an amount has been set up with the red keys, key J is depressed in conjunction with limit key K, the movement of part H is limited, resulting in locating twin cam B in neutral position, i. e., not in line

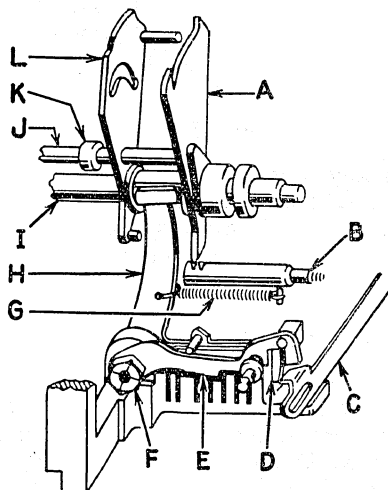
with either crossfooter or register meshing cams, resulting in non-adding the amount.

The depression of limit key K cams plunger I into a cut-out in key J which prevents full depression of J.

When key J is fully depressed, link E should have sufficient lead over trap to insure proper latching. Wire D is adjusted.

Register and crossfooter add control H is covered in detail under Plate 15.

REGISTER AND CROSSFOOTER ADD CONTROL (Plate 15)



Register and Crossfooter Add Control (Plate 15)

The meshing of adding wheels and rack bars is secured through the operation of the twin cams in conjunction with the meshing mechanisms and the depression of result keys. The twin cams have one of three positions: adding in registers, non-adding, and adding in crossfooter.

The register adding position is the normal position of the twin cams, i. e., when they are to the extreme left. Cams A and L are moved to non-add or crossfooter add position by bell-crank H which is given a differential movement from result keys and also from carriage control.

For non-adding, the twin cams are given a partial movement by one of the following

(Plate 15)—Continued

keys: total key, first product key, non-add key, extend key, or by carriage control.

For adding in the crossfooter, the twin cams are moved to their extreme right position by crossfooter add key, the early style multiplying keys, and also by carriage control.

In order to add or non-add in the registers when the extend key is depressed, bell-crank H is slotted for adding and has sliding plate D which is cammed over the slot for non-adding. Sliding plate D is controlled by shifting part C.

When the machine is normal, the twin cams clear shaft B. However, as soon as the machine operation begins the lower edge of cam A enters one of the two slots in shaft B.

Tests and Adjustments

When the twin cams are in normal position (register add), the lower edge of cam A must enter centrally the slot in shaft B as the machine operation begins.

Adjustment: The lower end of cam A is aligned with a bender.

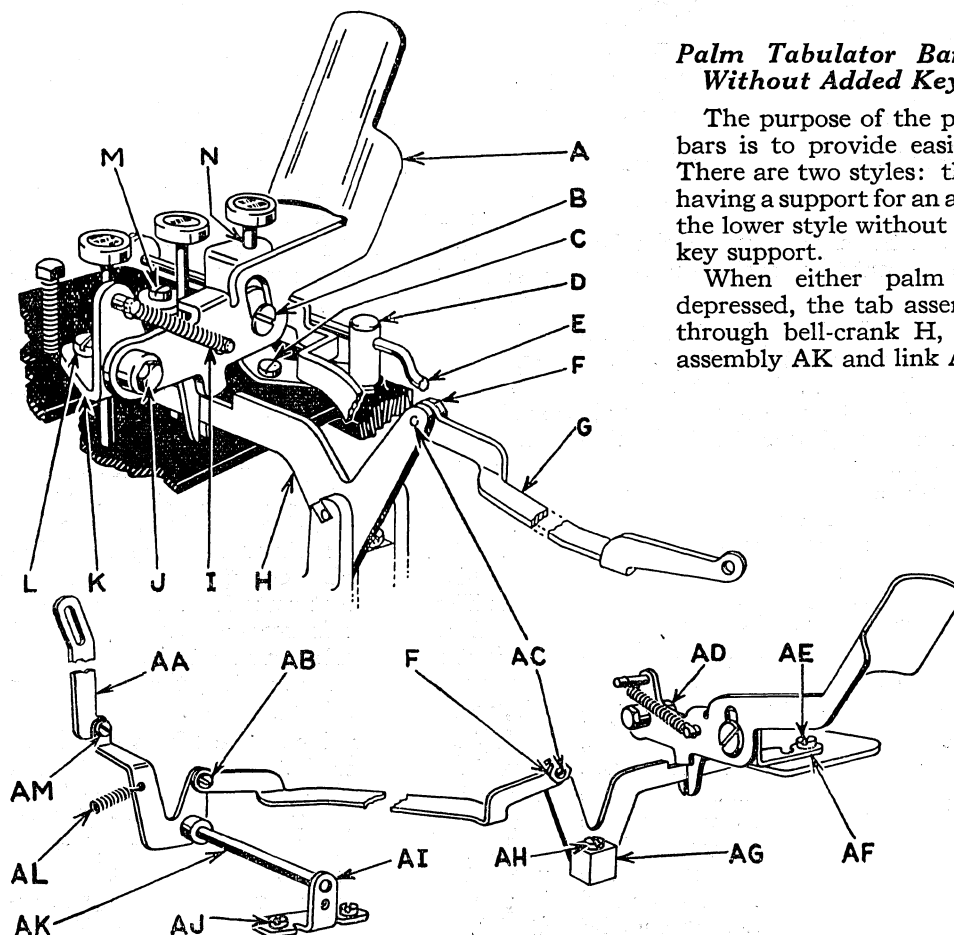
The adjustment of bell-crank H begins with its extreme end positions respectively, extend (non-add) and subtract.

When adding on extend, the lower edge of cam A enters the first slot of shaft B. When non-adding on extend, cam A enters the middle slot of shaft B and when subtracting, cam A clears end of shaft B.

Bell-crank H must be sufficiently raised for one or more of its three positions so that it will centrally enter the slots in shaft B. If it fails to do so, it is spread by peening at crotch.

When H raises too high for one or even two positions, the two contact points are ground off to reduce the lift. When H raises too high for all positions, it is peened at the opposite side above the crotch.

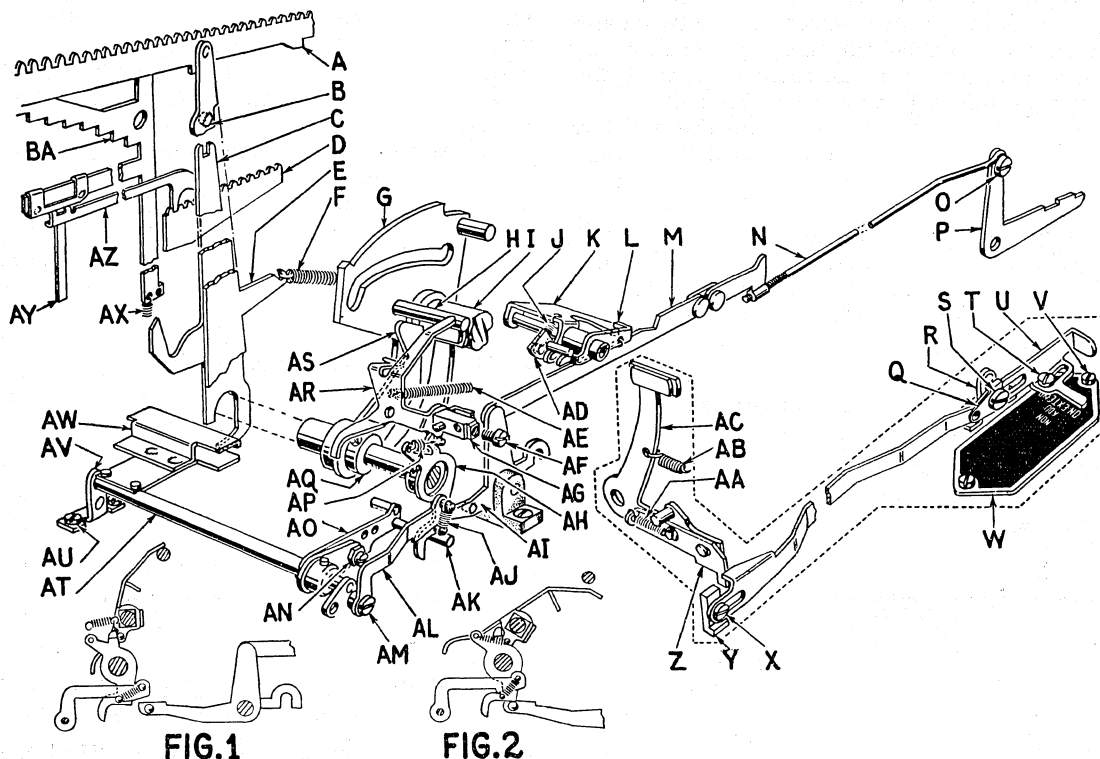
Arm E is used in the late machines having easier depression multiplying keys, as shown and explained on Plate 20.

PALM TABULATOR BAR WITH AND WITHOUT ADDED KEY (Plate 16)**Palm Tabulator Bar With and Without Added Key (Plate 16)**

The purpose of the palm tabulator bars is to provide easier tabulation. There are two styles: the upper style having a support for an additional key; the lower style without the additional key support.

When either palm tabulator is depressed, the tab assembly is raised through bell-crank H, link G, shaft assembly AK and link AA.

EXTEND KEY AND KEY LOCK MECHANISM, CLASSES 71, 72, 73 (Plate 17)



Extend Key and Extend Key Lock Mechanism, Classes 71, 72, 73 (Plate 17)

The purpose of the extend key mechanism is to index the amount to be multiplied in the multiplier section.

Add or Non-add Control: When extended amounts are not to be added, slide U is set at non-add on extend. When the extend key is depressed (U set at non-add), lever P through wire N moves link assembly M forward. The rear arm of AI rocks add control bell-crank AC which locates the twin cams to non-add position. Part AI, contacting arm AO, rocks shaft assembly AT, channel bail AW raising detent arms AZ out of the pocket of detent D through link C, the vertical slot of C meshing stud B in rack bar driver E, thus coupling index arms AY to rack bar drivers E.

When the extend key is fully depressed, it is held by latch L. On the forward stroke, spring F drives rack bars A to limit on the rack bar stops that are indexed through the red keys. Index arms AY are drawn to the relative position of the rack bar stops. Just before the end of the forward stroke, the roller on twin cam G contacts passby pawl AD, rocking latch L which releases linkage M

and thereby allows shaft assembly AT to restore, and detent arms AZ to seat in the pocket of detent D.

The purpose of the extend key lock mechanism is to prevent more than one amount being indexed in the multiplier section.

Depression of the extend key indexes the extend key lock through stud AK raising arm AL which places spring AJ under tension. Spring AJ connects arm AL and blocking arm AH.

At the beginning of the forward stroke, spring AJ swings blocking arm AH over stud AK, which blocks the extend key. Blocking arm AH, through spring AP, swings restoring arm AR forward. On the return stroke, shaft H moves past restoring arm AR. The extend key lock is restored during a final product operation by arm AS swinging restoring arm AR rearward which, through spring AP, restores blocking arm AH.

Adjustment: Eccentric AN is turned to provide clearance between C and B, and between AZ and D when the final product key is depressed, with clearance between AZ and D, and maximum hold of C on B when the extend key is depressed, and AZ to seat in pockets of D when the extend key is restored.

(Plate 17)—Continued

When the extend key is depressed, it should latch with slight lead of L. The adjustment is made from wire N.

With slide U set at non-add, and extend key depressed, twin cams should move to the non-add position. If the twin cams do not move to the non-add position,peen lever AC in the crotch near the pivot point; if the twin cams move beyond the non-add position, remove stock from slide Z at contact point of bell-crank AI.

Limit AG (Plate 26) for links C is adjusted to allow a full seat of AZ in D. To adjust, bend limit AG (Plate 26).

Detents D should have minimum side clearance with links C. To adjust bend detents D at the division comb.

Index arms AY should be straight, and align centrally over cross arms of the multiplier section.

When the extend key is depressed, the pocket in link AL should clear stud in AH.

Adjustment: Stud AK is raised or lowered by bending arm AI.

When part AH is reset, stud in AH should have 1/64" lead over arm AL. Lead is increased by advancing arm AR toward arm AS.

When it is necessary to make this adjustment, the vertical projection of part AR should be inspected for sufficient contact on shaft H to move AR slightly rearward as the machine becomes normal.

Extend Mechanism, Automatic, Classes 71, 72, 73 (Plate 18)

The purpose of the automatic extend mechanism is to eliminate the depression of the extend key by indexing the extend mechanism through the red keys, the carriage control and the machine operation.

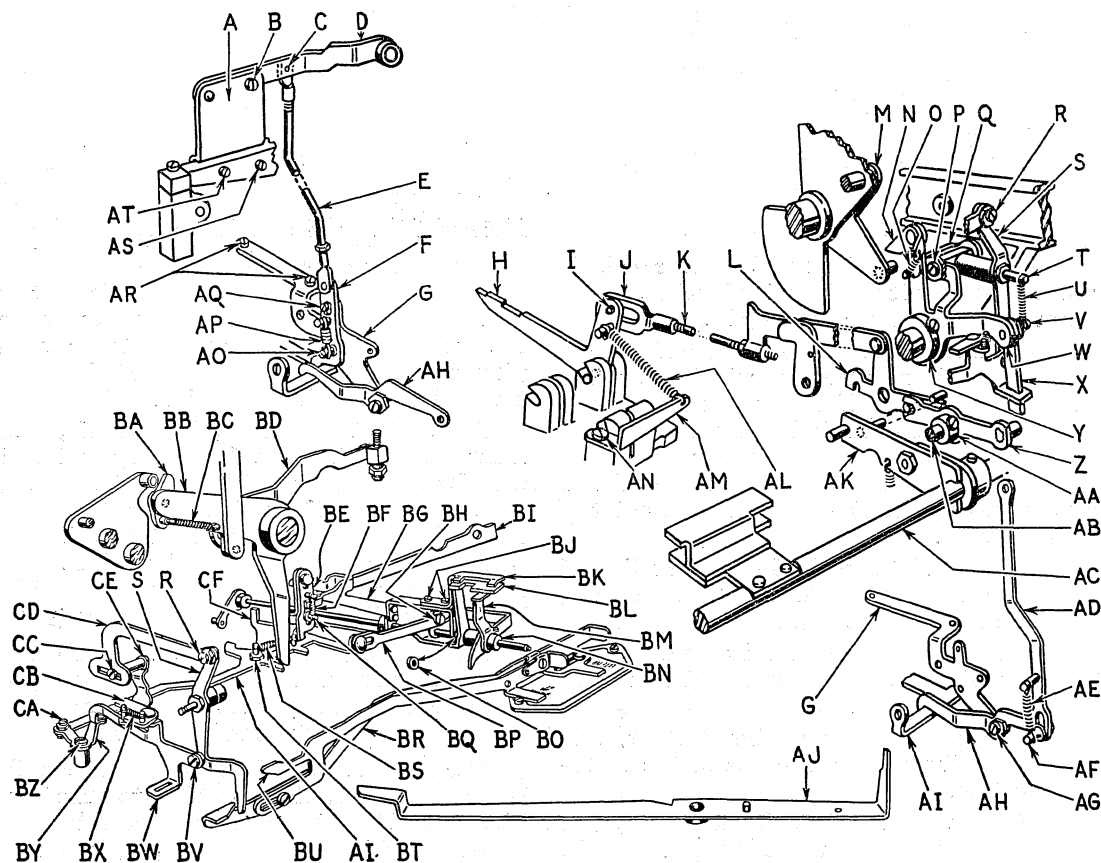
There are two latches, F and BE, both must be raised. The latch on the left is raised when a control block on the carriage locates on arm D, which through wire E, raises latch F. The other latch, BE, is raised when a red key rocks lever BG. The automatic extend mechanism can be disabled by pulling slide BR which blocks part BW.

Turnbuckle J is slotted to allow the machine operation to function independently of key lever H, which permits manual extending in columns not under carriage control.

When a red key is depressed, key lever BI is rocked, which swings part BG to raise latch BE, spring BS pulls link AI rearward to swing bell-crank BY which moves part BW sideways to locate link X over the stud in arm Z.

During the machine operation, the stud in part M, contacting passby pawl N, rocks assembly W which through link X, rocks arm Z. The fork of Z being meshed with the stud in bell-crank L, rocks the latter which contacts the stud in arm AK, raising assembly AC which indexes the extend mechanism, covered in detail under the Extend Mechanism (Plate 17).

EXTEND MECHANISM, AUTOMATIC, CLASSES 71, 72, 73 (Plate 18)



(Plate 18)—Continued

The purpose of the foot of BB is to restore link AI when the carriage is tabulating from a carriage controlled extend column. Link AI is restored by the keyboard restoring during each machine operation.

The purpose of link CD is to prevent extending when the final product key is depressed by insuring that vertical link X will clear the stud in lever Z. Extending more than one amount is prevented by passby pawl CB which, when blocked by part AR (Plate 17), causes CB to block the movement of link X.

Automatic extending from the first product and the register total keys is secured through part BK. Automatic extending is disabled from the crossfooter add key through bail BM and link BP.

Tests and Adjustments

The extend key linkage should latch down with slight lead when the extend key is depressed. The adjustment is made from wire K.

With a control block under lever D, the nose of latch F should clear control slide AI

about $1/64''$. The adjustment is made from wire E.

When an adding key is depressed, the key lever swings bail BG to raise latch BE to clear control slide AI by about $1/64''$. The adjustment is made by swinging bail BG.

If a result key is depressed, latch BE is raised by bail BK to clear control slide by $1/64''$. Adjust bail BK for clearance.

Bail BM should reset control slide AI on latch BE to disable the extend operation when the add crossfooter key is depressed. Adjustment is made from bail BM.

The error key operation should reset control slide AI on latch BE. To adjust, bend the back ear on control slide AI.

The machine operation should reset control slide AI by the lower prong of hub assembly BD. To adjust, bend the front ear of control slide AI.

Eccentric AG in link AH is adjusted with minimum clearance on control slide AI to prevent extending on the carriage return operations.

Eccentric CA in control slide AI is adjusted to obtain full side hold of link X on stud in rocker arm Z.

Eccentric in link X is adjusted to latch the

(Turn to page 17)

EXTEND MECHANISM, AUTOMATIC, WITH ADJUSTABLE INTERLOCKS, CLASS 72 (Plate 18-1)

Purpose

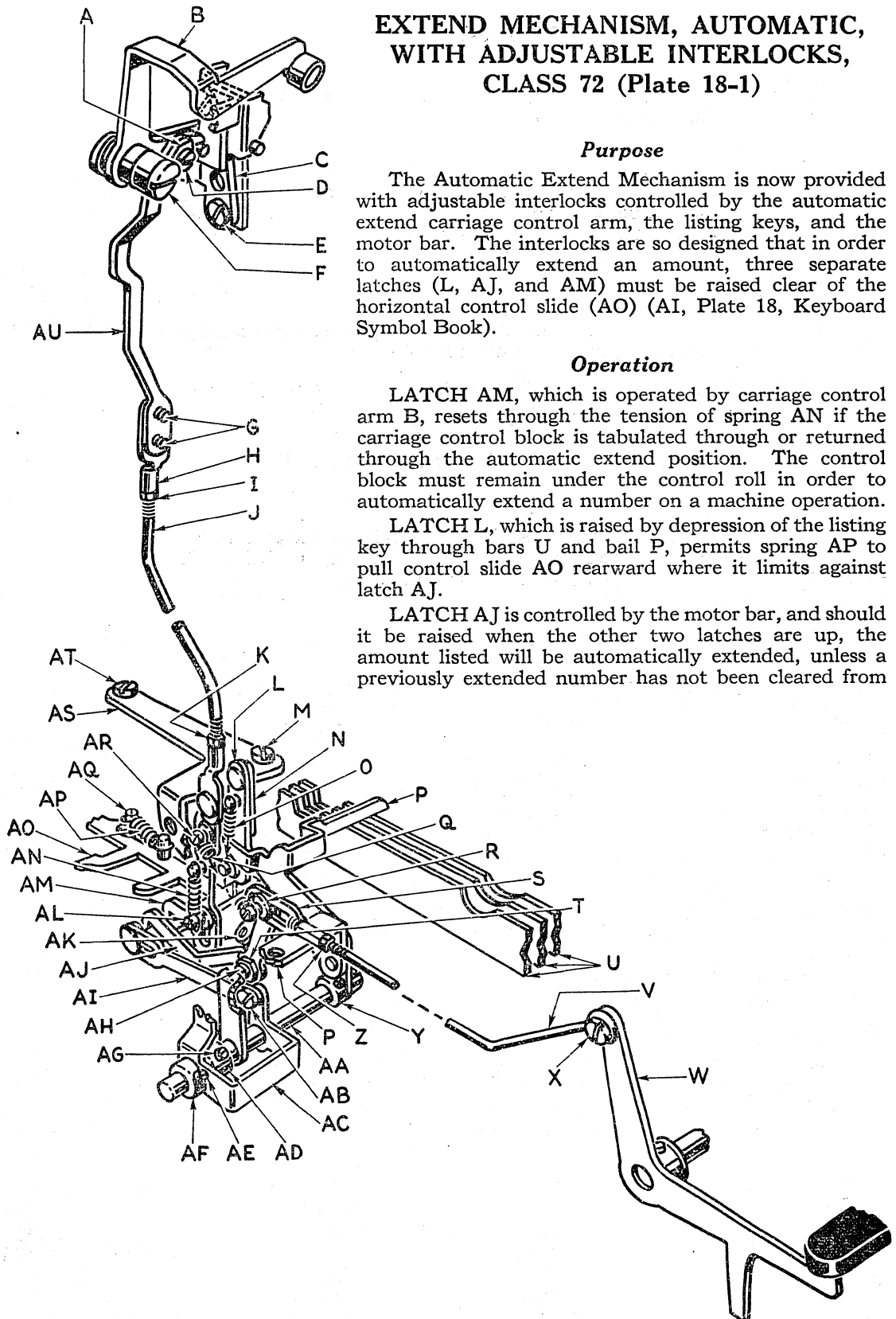
The Automatic Extend Mechanism is now provided with adjustable interlocks controlled by the automatic extend carriage control arm, the listing keys, and the motor bar. The interlocks are so designed that in order to automatically extend an amount, three separate latches (L, AJ, and AM) must be raised clear of the horizontal control slide (AO) (AI, Plate 18, Keyboard Symbol Book).

Operation

LATCH AM, which is operated by carriage control arm B, resets through the tension of spring AN if the carriage control block is tabulated through or returned through the automatic extend position. The control block must remain under the control roll in order to automatically extend a number on a machine operation.

LATCH L, which is raised by depression of the listing key through bars U and bail P, permits spring AP to pull control slide AO rearward where it limits against latch AJ.

LATCH AJ is controlled by the motor bar, and should it be raised when the other two latches are up, the amount listed will be automatically extended, unless a previously extended number has not been cleared from



(Plate 18-1)—Continued

the multiplier (see Extend Lock Mechanism, Plate 17, Keyboard Instruction Book).

Adjustment

1. In order that latch AM may reset freely, latch AJ should be so adjusted that it will limit control slide AO after latch L has been raised.

To adjust, turn eccentric T.

2. Latch AM should clear control slide AO by about $1/64''$ with a control block under arm B.

To adjust, turn eccentric A; if further adjustment is necessary, turn turnbuckle H.

3. Latch L should clear control slide AO by about $1/64''$ with any listing key held depressed.

To adjust, swing the arm of bail P.

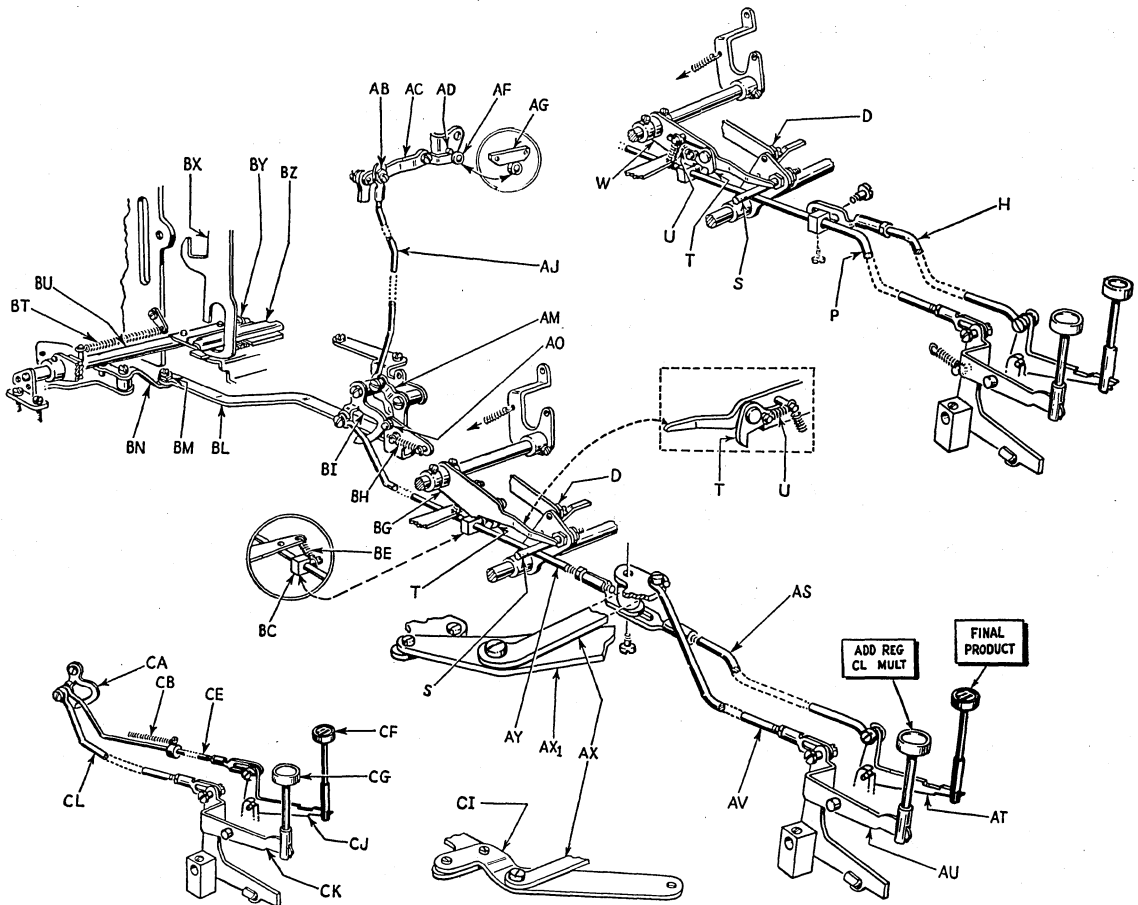
4. Latch AJ should clear control slide AO by about $1/64''$ when the motor trips.

To adjust, turn turnbuckle S.

5. When latch AJ is active, its lower horizontal edge should have minimum clearance over the top of slide AO.

To adjust, shift anchor AK.

NON-EXTEND, SPECIFIED COLUMNS, CARRIAGE CONTROLLED—IMPROVED, CLASS 72 AND SERIES M 200 MACHINES (Plate 18-2)



Non-Extend, Specified Columns, Carriage Controlled—Improved, Class 72 and Series M 200 Machines (Plate 18-2)

Purpose

To prevent the extension of amounts in specified columns.

Construction

Channel bail BZ is provided with a number of slots on the bottom side in accordance with the operational requirement of the machine. Each slot when aligned with its respective extend arm BX, effects the non-extension of the amount in that column. Intermediate arm AX has been added and latch assembly BG has been re-designed to eliminate interference with wire AY and to provide better adjustment and more positive latching when the clear multiplier key or the final product key is depressed. This provides

a more positive restoring of extend arms BX and lessens the possibility of bending the extend restoring bail assembly (B, Plate 19-1 Keyboard Symbol List).

Operation

As control rail AG moves onto roll AF, control arm AC, through wire AJ and bell crank AM, moves link BL rearward. This rocks bell crank BN to shift shaft BU and channel bail BZ to the left, aligning the slots of the channel bail with their respective extend arms. When channel bail BZ, thus positioned, is raised during an extend operation, the extend arms BX, which are aligned with the various slots of channel bail BZ, will not be raised—thus effecting non-extension in the specified columns.

Even though this mechanism is active, an extended amount may be cleared from the machine by the clear multiplier key operation

(Plate 18-2) Continued

or the final product key operation (if this feature is contained in the machine).

In machines that contain power result keys, depression of the clear multiplier key or final product key moves intermediate arm AX forward through bell crank AU or AT and wire AV or AS. Forward movement of intermediate arm AX rocks lever BI, through wire AY, to cam link BL forward (expanding spring BH), thus restoring channel bail BZ to its normal position where it is retained by collar BC on wire AY being latched forward by latch BG.

At the end of the forward machine stroke, restoring shaft S raises latch BG from collar BC, releasing wire AY and permitting lever BI to return to its normal position through tension of spring BE. Pawl T, under tension of spring U, swings rearward to prevent re-latching should the clear multiplier or final product key be held depressed during machine operation.

Note: In machines that contain power result keys, the channel bail will shift to the left (active) before the clear multiplier or final product linkage is released since collar BC is released from latch BG at the end of the forward stroke.

In machines without power result keys, depression of clear multiplier key CG rocks lever CA, through bell crank CK and wire CL, to cam link BL forward (expanding spring BH), thus restoring channel bail BZ to its normal position where it is retained by the result linkage latch. Depression of final product key CF restores channel bail BZ to normal in the same manner, through bell crank CJ and wire CE. When the linkage of either key is released to its normal position, lever CA is permitted to return to its normal position through tension of spring CB, and channel bail BZ is returned to active position through tension of spring BH.

Spring BT restores shaft BU to normal when control rail AG moves off roll AF.

In machines without power result keys and without the improved subtract mechanism, twisting of the extend restoring bail (B, Plate 19-1 Keyboard Symbol List) may occur because of improper normalizing of the non-extend mechanism during an extend clearing operation. This trouble will be reduced by installing the improved non-extend mechanism. Since these machine bases are not drilled and tapped to accommodate regular bracket AX1, the use of repair bracket CI

is required. The correct consistency of parts required for this change is included in Plate 18-2 Keyboard Symbol List.

Adjustment

1. With wire AJ detached from control arm AC and with shaft BU limiting on bracket BY (normal position), depression of the clear multiplier key (or the final product key when contained) should not expand spring BH.

To adjust, turn eccentric BM.

2. With shaft BU limiting on bracket BY (normal position), and with the high point of eccentric AB up, control arm AC should limit without bind on stud AD.

To adjust, shorten or lengthen wire AJ.

3. With control rail AG located on roll AF, the slots in channel bail BZ should align with their respective extend arms A.

To adjust, turn eccentric AB.

4. With control rail AG located on roll AF and the clear multiplier key (and the final product key, when contained) normal, there should be minimum clearance between lever BI and roll AD.

To adjust, shorten or lengthen wire AV and/or wire AS; wire P and/or H. In machines without power result keys, shorten or lengthen wire CL and/or wire CE.

Note: Wire AY is set for slight clearance between the end of the wire and the hub in intermediate arm AX. This is the basic starting point for other wire adjustments.

In machines containing power result keys, the following additional adjustments are also required:

5. With control rail AG on roll AF, depression of the clear multiplier key or final product key should move collar BC forward to be latched by latch BG just prior to the closing of the auxiliary switch which is indexed by the key depression.

To adjust, position collar BC on wire AY.

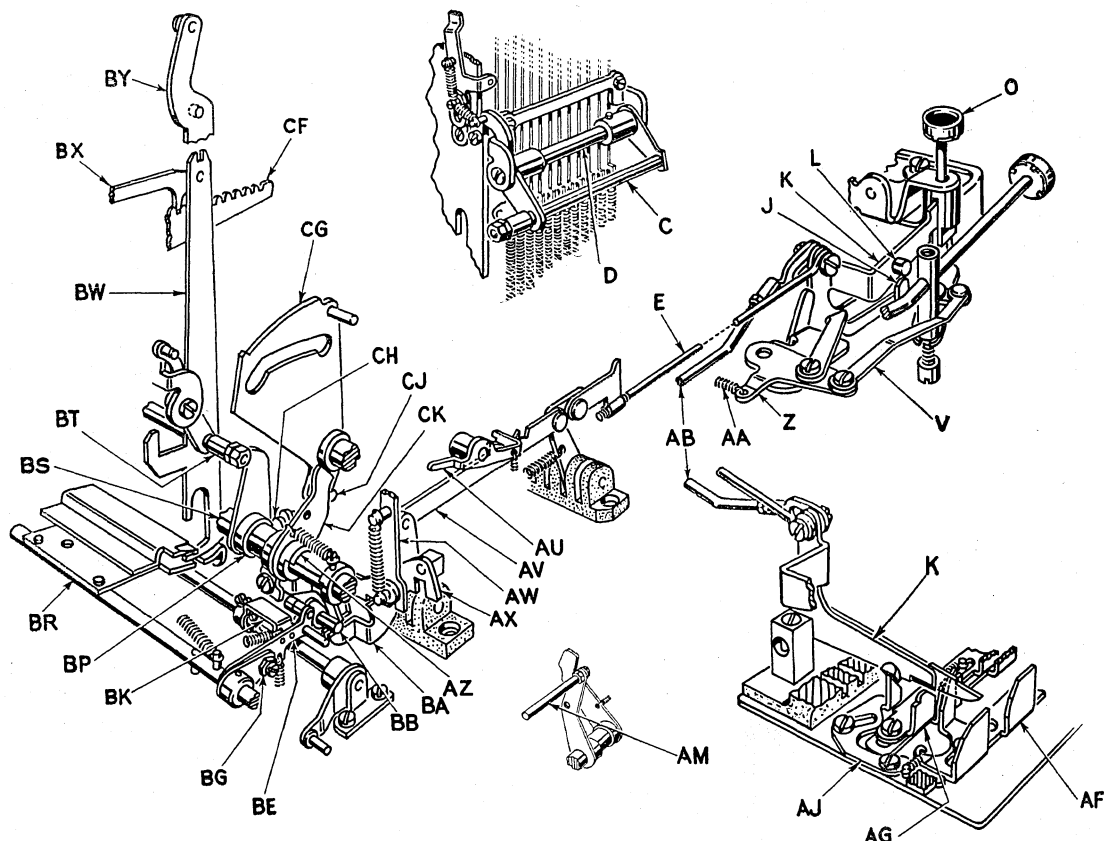
Important: Check this adjustment for the clear multiplier and final product key separately.

6. Latch BG should release square collar BC at the latest possible moment of the forward machine stroke.

To adjust, bend the arm of latch BG.

Note: Any adjustment of eccentric D for the restoring of the forward end of the result linkages affects the above adjustment.

CLEAR MULTIPLIER MECHANISM INDEXED FROM ADD REGISTER—CLEAR MULTIPLIER KEY POSITION NO. 67 CLASS 72 (Plate 19-1)



Clear Multiplier Mechanism Indexed From Add Register—Clear Multiplier Key Position No. 67 Class 72 (Plate 19-1)

Purpose

—To permit clearing an extended amount without disturbing the crossfooter total; and to permit adding in the register only with the control slide set for simultaneous addition.

Operation

Indexing of the Clear Multiplier Mechanism is accomplished when depression of key O, through wire E, pulls linkage AV forward. Bell crank BA of linkage AV contacts roll BB of bail BK, rocking the latter, to rock channel bail BR, through arm BE. Channel bail BR

raises vertical extend arms BW to raise detent arms BX clear of retaining racks CF.

The rocking of bail BK also rocks bell crank CH to position assembly BP so that arm CK aligns with stud CJ in twin cam assembly CG. Linkage AV then latches on latch AU, maintaining detent arms BX clear of retaining racks CF, and arm CK in alignment with stud CJ.

During the forward machine stroke, stud CJ contacts arm CK rocking assembly BP which returns vertical extend arms BW to their normal positions through shaft C of restoring bail assembly D. Machines not containing bail assembly D restore the vertical extend arms to normal through shaft AM.

Linkage AV is released from latch AU toward the end of the forward machine stroke, permitting detent arms BX to enter retaining

(Plate 19-1) Continued

racks CF, and permitting assembly BP to restore to its normal limit, collar AZ.

The raising of detent arms BX out of retaining racks CF takes place prior to the alignment of arm CK with stud CJ to safeguard against an attempt to restore vertical extend arms BW while the detent arms are in mesh with retaining racks CF should the machine be operated through interlock failure.

Bell crank BA of linkage AV disengages the simultaneous addition pawls (O and AO, Plate 12, Accumulation Instruction Book) through arm AX and link AW, permitting addition in the register only.

Interlock AJ prevents depression of the motor bar during partial depression of key No. 67, and prevents depression of key No. 67 when the motor bar is depressed. During depression of key No. 67, bell crank K cams interlock AJ, swinging the latter to gradually move interlock AF to the right until full depression of key No. 67 has positioned the vertical projections on interlock AF beyond the lugs of the motor bar frame, permitting depression of the motor bar. When the motor bar is depressed, depression of key No. 67 is blocked since interlock AJ cannot move interlock AF, the latter being blocked by the lugs on the motor bar frame.

Interlock AG blocks depression of the extend key when key No. 67 is depressed (or when the final product key is depressed) by being moved to the left under the extend key bell crank. When the extend key is depressed, its bell crank blocks the leftward movement of interlock AG, thereby blocking depression of key No. 67 and the final product key.

Interlock J prevents depression of key No. 67, during machine operations, when the typewriter keylock comb, through spring AA, swings swivel Z, which, through link V, positions the upright projection on interlock J under stud L in bell crank K.

Key No. 67 restores the extend lock in the same manner as that of the final product key; i.e., during the forward machine stroke, arm CK rocks the restoring arm (AR, Plate 17, Keyboard Instruction Book) rearward, which through the spring (AP, Plate 27) restores the blocking arm (AH, Plate 17) to normal.

Key No. 67 normalizes the Automatic Extend Mechanism through the link (CD, Plate 18), thereby permitting the clearing of extended amounts with the Automatic Extend Mechanism active.

Key No. 67 normalizes the Non-Extend of Specified Columns Mechanism through wire

AB and the bell crank (AO, Plate 18-2, Keyboard Instruction Book).

Adjustment

1. Linkage AV should have slight latching lead (approximately .010") on latch AU with key No. 67 fully depressed.

To adjust, shorten or lengthen wire E.

2. With key O normal, arm CK of assembly BP should have 1/64" clearance with stud CJ when the machine is operated.

To adjust, position collar AZ.

3. With linkage AV latched forward and the twin cams in a non-add position, stud CJ should have 1/32" hold on arm CK during the forward machine stroke without binding assembly BP on the adding rack restoring frame hub on shaft BS. Machines containing the copper plated assembly BP, which is narrower, should have approximately .025" clearance between assembly BP and the adding rack restoring frame hub on shaft BS.

To adjust, weave bail BK.

Note: The movement of assembly BP should be the same from both key No. 67 and the final product key, and there should be sufficient movement from each key to permit adjusting of the link (CD, Plate 18, Keyboard Instruction Book). To get the same movement from each key, either raise or lower the rear extension of bell crank BA, or tip roll BB.

4. Detent arms BX should clear retaining racks CF, and vertical extend arms BW should clear the studs in adding rack actuating arms BY.

To adjust, turn eccentric BG.

Note: Eccentric BG is also used to adjust the lift of the vertical extend arms from extend key depression (see Plate 17, Keyboard Instruction Book). To equalize the lift from both keys, arm BE may be weaved. However, caution must be observed to assure that detent arms BX leave retaining racks CF before arm CK aligns with stud CJ.

5. Vertical extend arms BW should be restored to their normal positions without bind.

To adjust, turn eccentric BT or eccentric shaft AM.

6. Interlock AJ prevents depression of the motor bar when key No. 67 is partially depressed, and permits depression of the motor bar when key No. 67 is fully depressed. With the motor bar depressed, interlock AJ blocks key No. 67.

To adjust, bend forward arm of interlock AJ.

(Plate 18)—Continued

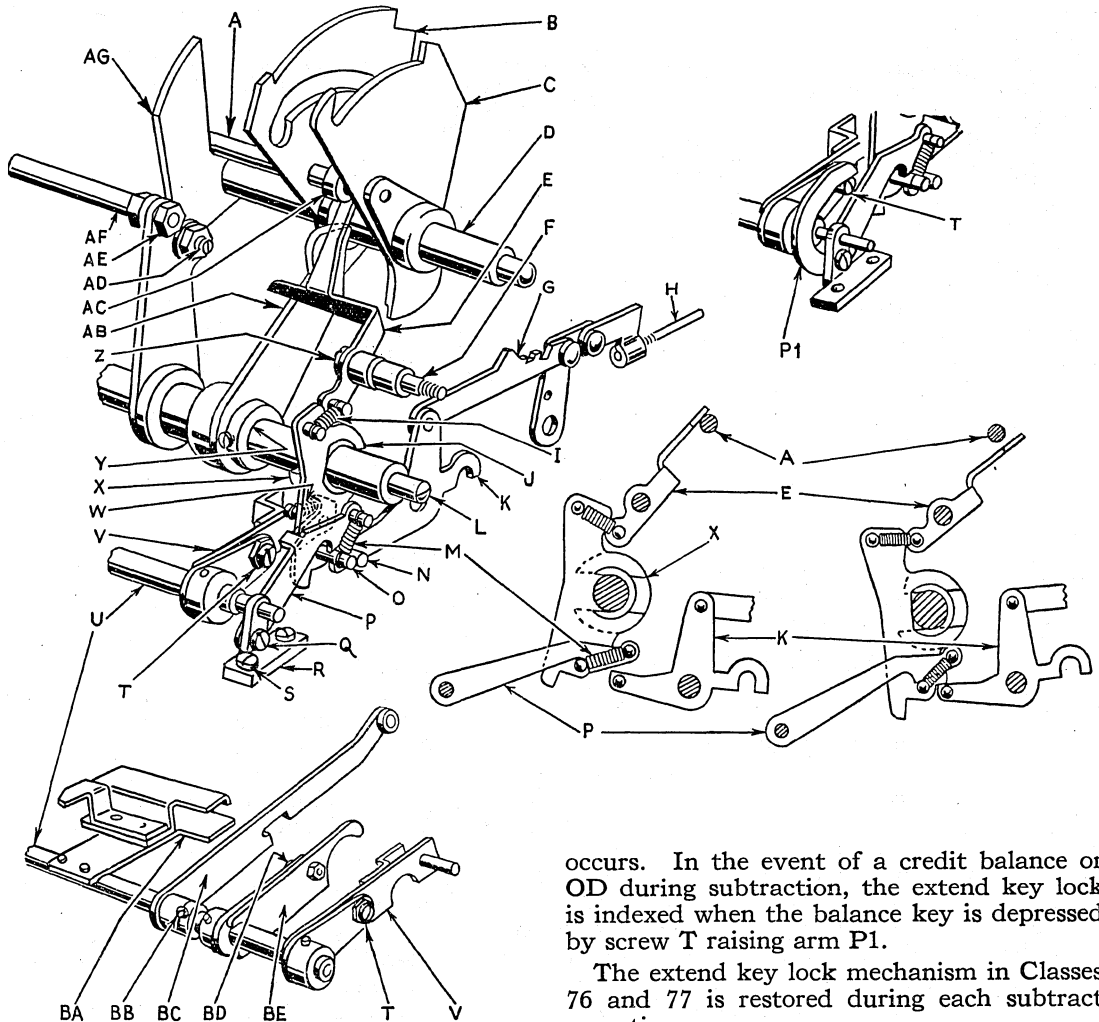
extend linkage with slight lead from the high point of passby pawl N.

Eccentric R in link CD is adjusted to prevent link X moving over stud in rocker arm Z when the final product or clear key is depressed under an extend control block.

Pawl CB should have minimum clearance to reset on lower projection of the extend lock restoring arm.

Latch BE is the limit for control slide AI, and in this position, latch F should have about 1/64" clearance on control slide AI. To adjust, remove stock from latch F.

EXTEND, OR CREDIT REGISTER KEY LOCK MECHANISM, CLASSES 76, 77 (Plate 19)



Extend, or Credit Register Key Lock Mechanism, Classes 76, 77 (Plate 19)

The extend mechanism in Classes 76 and 77 machines functions identically as the extend mechanism in Classes 72, 73 and 74, which is covered in detail under its heading.

The extend key lock mechanism in Classes 76 and 77 has the additional function of locking the extend key when a credit balance

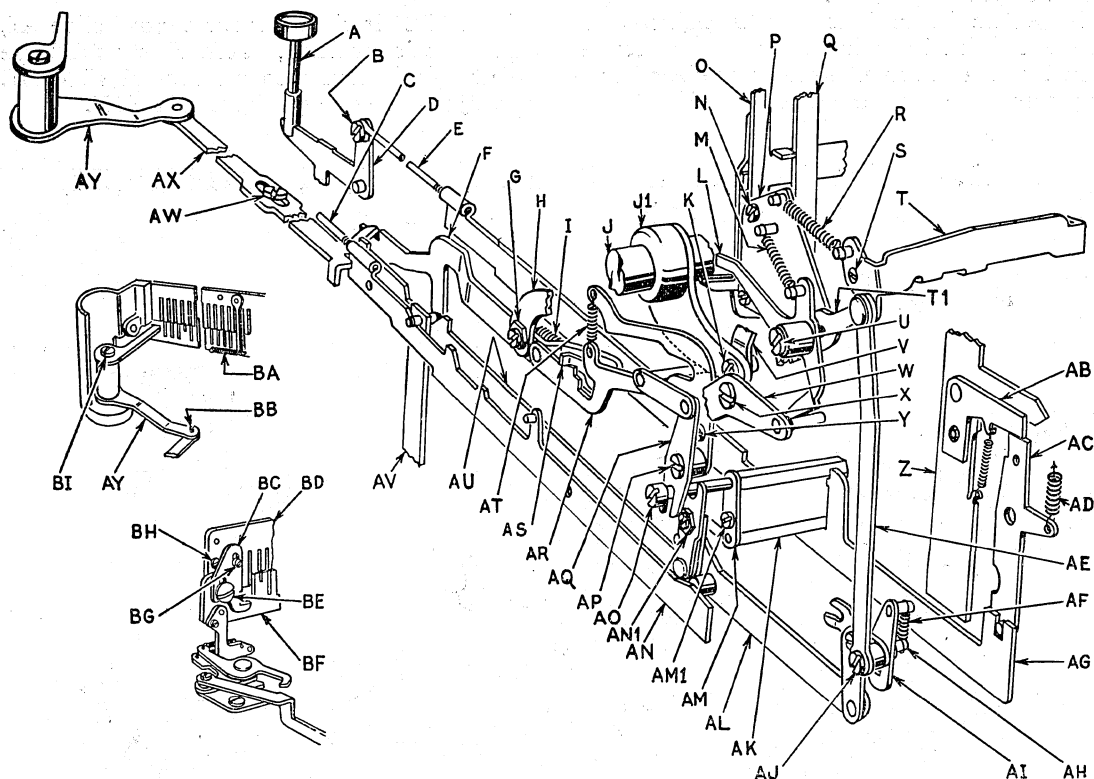
occurs. In the event of a credit balance or OD during subtraction, the extend key lock is indexed when the balance key is depressed by screw T raising arm P1.

The extend key lock mechanism in Classes 76 and 77 is restored during each subtract operation.

When blocking arm J is being reset, stud D should have lead over arm P or P1. Lead is secured by advancing the arm of part E toward arm AB. When making this adjustment, the vertical projection of E should be tested for sufficient contact on shaft A to move J slightly rearward.

In earlier machines, the extend key lock is secured by screw T under the projection of arm P.

MULTIPLYING KEYS (EASY DEPRESSION) AND TYPEWRITER KEY LOCK MECHANISM (Plate 20)



Multiplying Keys (Easy Depression) and Typewriter Key Lock Mechanism (Plate 20)

The purpose of the multiplying keys is to select and release the multiplying plates, to trip the drive and switch, and to index the mechanism which causes the machine operation to shift the add control cams and set the typewriter key lock.

The subtract key, cipher key and full cent bar function the same as multiplying keys, i. e., releasing plates and tripping drive and switch, the machine operation completing the indexing including the typewriter key lock.

The purpose of the full cent key is to add 5 mills (1 half cent) to the accumulated product in the crossfooter. In the event that the accumulated product has more than 5 mills, the 5 mills added by the full cent operation causes a carry to take place.

The purpose of the cipher multiplying key is to space the adding wheels one column to the left for each cipher in the multiplying number.

When key A is depressed, bell-crank D, through wire E and bar AG, releases multiplying plate Z by swinging latch AC from under pawl AB. The drive and switch are

tripped through vertical arm of bar AG swinging toggle plate AK forward and over its center which holds the clutch tripped and the switch open until released by the completion of the multiplying mechanism. The forward movement of toggle plate AK trips the clutch through screw AO moving trip slide AU which raises trip link AV. Trip slide AU also swings toggle latch bail T through link assembly AL and link AE. Bail T is latched by pawl T1 and latch L.

The purpose of bail T is to insure two strokes. Bail T in late machines is directly indexed from all multiplying keys, full cent and subtract keys in order to secure positive action of bail T.

Bail T is released from three sources:

Vertical Q raising latch L when black keys have been depressed.

Vertical O raising latch L when the full cent key has been depressed.

Lever W raising latch L when the subtract key has been depressed.

Tests and Adjustments

Wire E is adjusted to limit keystem against the keyboard plate, and arm AC to limit against shaft Y (Plate 25), machine normal.

Eccentric AN1 is adjusted to trip the drive clutch as late as possible on the key depression.

With the multiplying key depressed, front part of pawl AI blocks screw P (Plate 25) preventing operation of full cent bar.

With full cent key depressed, pawl AI should have sufficient clearance to pass over screw P (Plate 25).

The typewriter key lock mechanism is indexed by motor bar depression and by multiplying key depression. When the motor bar is depressed, trip slide AN, through link AX and bell-crank AY, moves slide BF to block the typewriter keys. When the motor bar restores, spring BA restores blocking slide BF, bell-crank AY and link AX.

The typewriter key lock is indexed during

the multiplying operation by the movement of slide H which moves slide F; the latter contacts link AX to swing bell-crank AY to move blocking slide BF under the typewriter key levers.

The typewriter key lock is held in active position during the two multiplying strokes by the step of latch AR seating in front of the projection on AS. The typewriter key lock is restored by arm J1 contacting the long stud in release arm assembly AQ. In order to retain the typewriter key lock during the two multiplying strokes, release arm assembly AQ is swung rearward to clear arm J1 by long shoulder screw AO when trip slide AU trips the clutch and the switch.

When trip slide AU restores during the second operation, release arm assembly AQ moves in line with arm J1. At the end of the stroke, arm J1 contacting on the stud in AQ lowers latch AR below AS, permitting slide F and the typewriter key lock mechanism to restore.

Latch AR should latch over AS with lead.
Eccentric G is turned as required.

[illegible]

The earlier style multiplying keys, full cent and subtract keys have a harder key depression due to the fact that these keys shift the add control cams and set the typewriter key lock, in addition to tripping the drive and releasing the plates, the machine

operation not affecting the indexing.

When key O is depressed, bell-crank M through wire P and bar H, rocks lever G to allow bell-crank F to swing into the path of raise-bail E.

Bar H also swings toggle plate I forward to cause screw J to move trip slide K forward raising clutch release link L. The forward

(Plate 21)—Continued

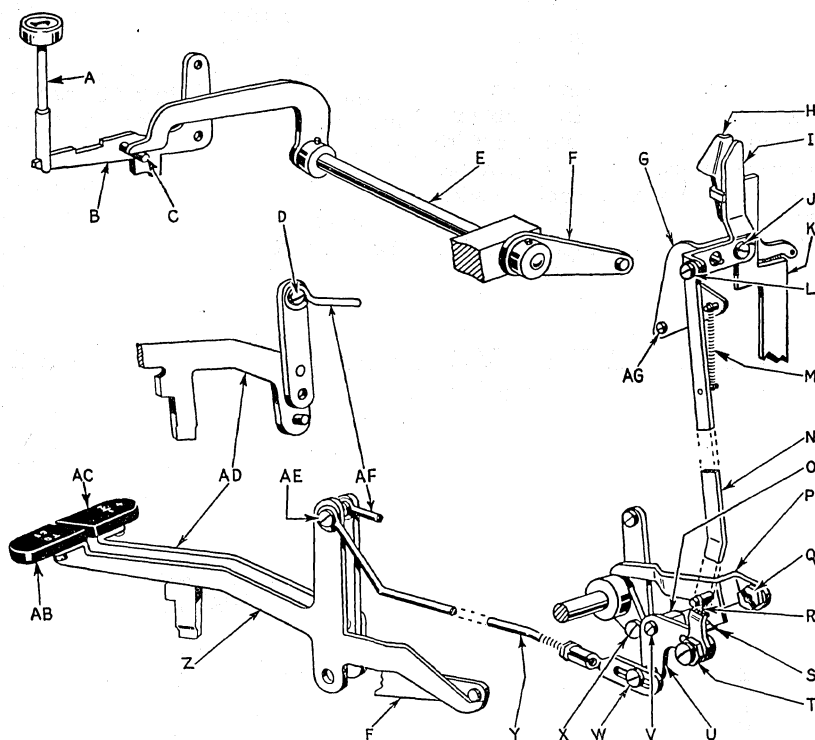
movement of toggle plate I rocks shaft assembly R which swings bell-crank C to shift twin cams A in crossfooter add position.

When twin cams are shifted, printing actuating arm T is disengaged from cam A which disables the printing mechanism, preventing printing of the partial products. The early style multiplying key depression also sets the typewriter key lock as shown on Plate 31.

Tests and Adjustments

Wire P is adjusted to permit lever G to limit against the multiplier section shaft, and the keystem to limit against the keyboard plate.

With toggle plate I over center, twin cams A and B should move to the crossfooter add position. The adjustment is made by bending arm D.

MULTIPLIER TO CROSSFOOTER SUB-TRANSFER BAR (Plate 22)**Multiplier to Crossfooter Sub-transfer Bar (Plate 22)**

The purpose of this mechanism is to transfer (add) to the crossfooter the amount indexed in the multiplier and also to disable the step-over mechanism.

Sequence and Construction

When bar AB is depressed, lever Z is rocked, which through wire Y, bell-crank U, link N and part I, swings cam H which disables the step-over mechanism. When bar AB is fully depressed, bell-crank U is latched by part P moving over stud S. Lever Z also

releases the No. 1 multiplying key mechanism by contacting on the stud in arm F and rocking shaft assembly E; the latter contacts on stud C.

Tests and Adjustments

When bar AB is fully depressed, latch P should pass over stud S with slight clearance between latch P and stud S.

Adjustment: Wire Y is adjusted.

When bar AB is depressed, cam H should clear the lever (not shown) of the crossfooter.

Adjustment: Eccentric T is turned.

Note: Step-over mechanism is covered in Plate 23.

POINT OFF AND DECIMAL DISCOUNT KEY MECHANISM (Plate 23)

*Point Off and Decimal Discount Key Mechanism (Plate 23)**Point Off Key Mechanism*

The purpose of the point off key is to eliminate one or more unnecessary decimal figures before printing the product. When point off key AE is depressed, lever AF rocks bell-crank AG which is connected to bell-

crank Y by wire Z. Bell-crank Y is fastened to one end of shaft Q, arm O1 being fastened to the other end. Arm O1 raises cam link E. When cam link E is raised, first the front upper part of E enters the tooth space of rack A, then the rear upper part of E disengages feed pawl AS and check pawl AT. At this moment a slight movement or drop of rack A takes place which is due to the space between cam link E and the crossfooter side plate. Then spring AU pulls shaft D and limits rack A against E and the side plate.

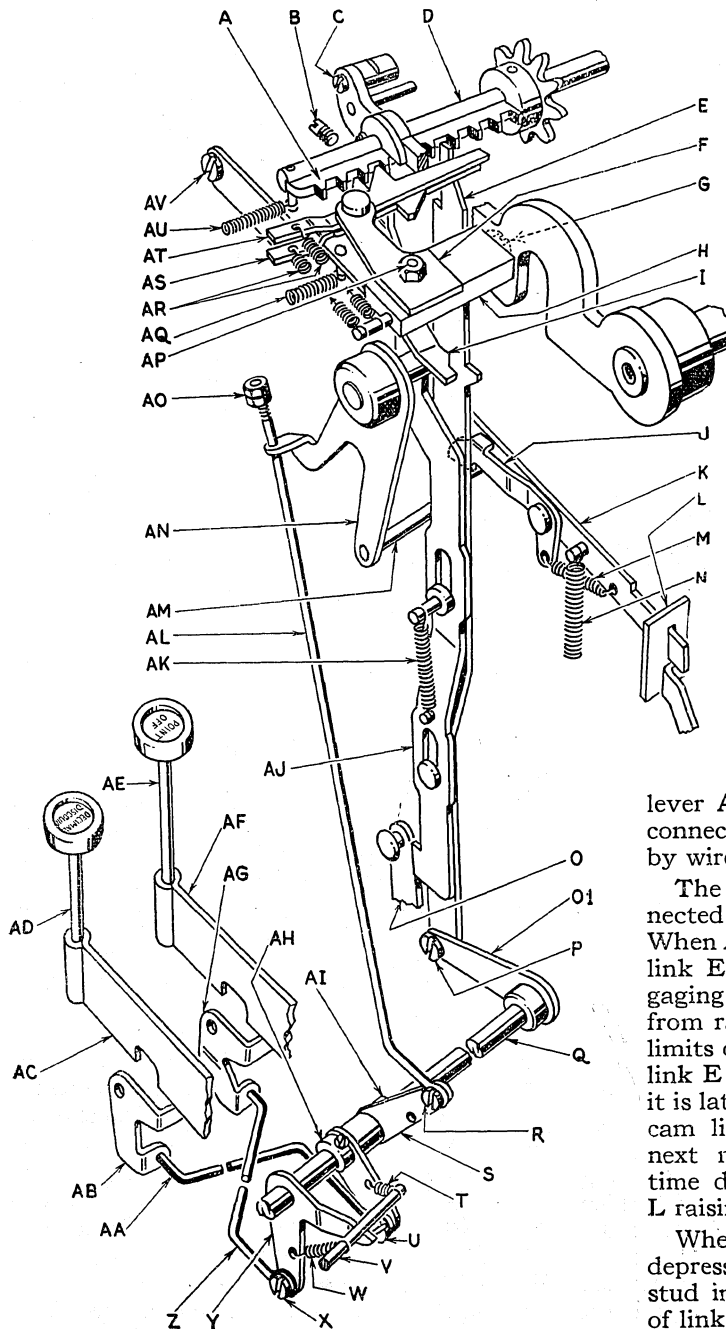
When the point off key is released, cam link E moves downward first releasing feed pawl AS and check pawl AT. When the latter seats in one space toward the center of the machine, and as cam link E moves entirely out of rack A, spring AU moves shaft D which carries rack A until it limits against check pawl AT thereby spacing the adding wheels one column to the right. The relative position of feed pawl AS is important in order to insure its seating in the next space of rack A when the point off key is released.

The purpose of the decimal discount key is to release feed pawl AS and check pawl AT so as to allow spring AU to move the adding wheels to their extreme right positions. When discount key AD is depressed,

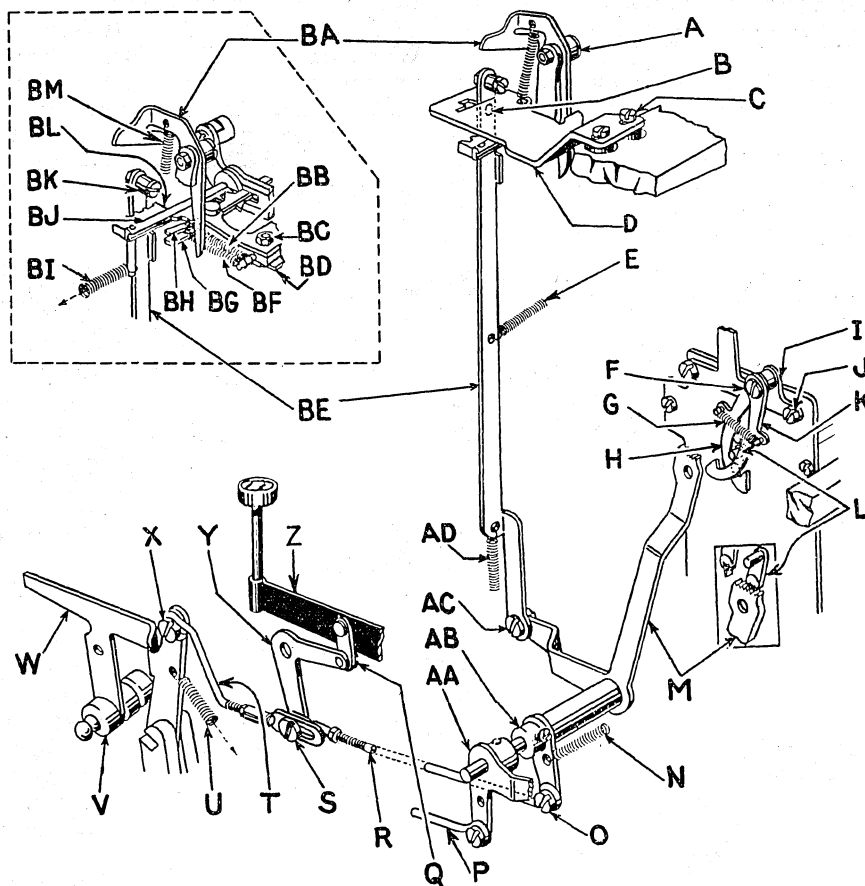
lever AC rocks bell-crank AB which is connected to lower arm of bell-crank S by wire AA.

The upper arm of bell-crank S is connected to bell-crank AN by wire AL. When AN is swung, stud AM moves cam link E backward, its upper end disengaging feed pawl AS and check pawl AT from rack A until screw BD (Plate 27) limits on the left side plate. When cam link E is moved backward by stud AM it is latched in that position by detent J; cam link E remains latched until the next multiplying operation, at which time detent J is released through link L raising K.

When the decimal discount key is depressed, latch J should pass over the stud in E. To increase the movement of link E, nuts AO are adjusted.



DECIMAL DISCOUNT KEY TO POINT OFF TWO OR MORE PLACES (Plate 24)



Decimal Discount Key to Point Off Two or More Places (Plate 24)

This key replaces the decimal discount key when the "point off" is based on two or more places and when the complete elimination of decimals is not required. The point off key is used only when a single decimal is involved.

Sequence

When decimal discount key Z is depressed, bell-crank lever Y through wire assembly R rocks assembly M, the arm of the latter raises link BE, its lip entering one of the tooth spaces of the front rack of assembly BJ rocks part BA, which swings pawls BG and BH to clear the rear rack of assembly BJ allowing spring BI to pull assembly BJ back two or more places, depending on the width of the projection on D.

When decimal discount key Z is depressed, all other keys are locked through the arm of

part W being swung into ball lock V by wire assembly T. Complete depression and return of decimal discount key Z is compelled by passby pawl L engaging the tooth spaces of arm M. Passby pawl L is directed by arms H and K to be active in either direction.

Tests and Adjustments

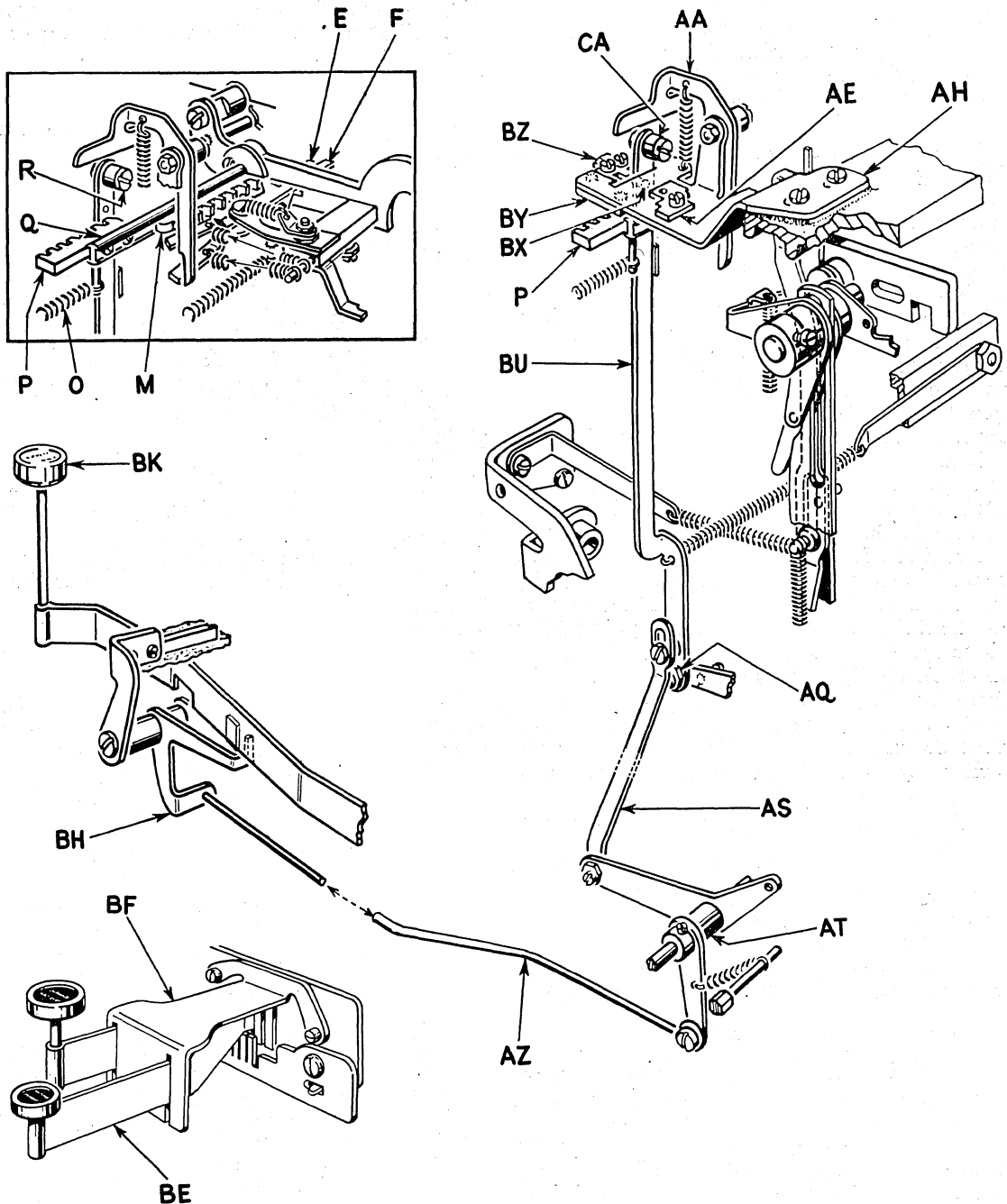
When pawl L engages the tooth spaces of M, the foot of part W should seat in ball lock V.

Adjustment: The turnbuckle of wire assembly T is adjusted. When, during the depression of decimal discount key Z, pawl L leaves the teeth of M, stud B should clear the top surface of part D.

Adjustment: The turnbuckle of wire assembly R is adjusted. When decimal discount key Z is depressed part BA should swing pawls BG and BH sufficiently to clear the rear racks of assembly BJ.

Adjustment: Eccentric BK is turned.

DECIMAL DISCOUNT KEY MECHANISM TO POINT OFF NO, ONE, TWO, OR THREE PLACES—WHEN INDEXED BY DECIMAL DISCOUNT KEY OR FULL CENT BAR (Plate 24-1)



Text on Back

Decimal Discount Key Mechanism to Point Off No, One, Two, or Three Places —when Indexed by Decimal Discount Key or Full Cent Bar (Plate 24-1)

Purpose

To provide a uniform point-off of no, one, two, or three places when the complete elimination of decimals is not required.

Construction

This mechanism was designed to permit indexing the decimal discount from either decimal discount key depression or from full cent bar operation (see Plate 25-1, Keyboard Instruction Book). But, it is also contained in machines that do not require the decimal discount from full cent bar depression. When the decimal discount is indexed from both sources, the number of places stepped back must be the same. However, one or the other sources of indexing may be inactivated, as specified by operational requirements, through mechanical modification.

Limit plate BZ is used when the mechanism is to point off either two or three places, and plate AE is used in place of plate BZ when the mechanism is to point off no or one place.

Bracket AH contains hardened limit plate retaining strap BY which extends across the right end of the slot in bracket AH and acts as the limit for link BU when stepping back three places. This prevents wear of the slot in bracket AH, which would prevent link BU from restoring to normal.

Extended keylever BE is used in machines that contain a form holder over the type-writer keys to make the key more accessible.

Brace BF keeps the extended keylever from weaving.

Operation

When decimal discount key BK is depressed, bell crank BH rocks hub assembly AT, through wire AZ, to raise links AS and BU. The lip on link BU enters a tooth space of rack P and roll CA rocks bell crank AA. The latter swings pawls E and F clear of the teeth of rack M, thereby permitting spring O to move pinion shaft Q to the right where it is limited by link BU in the slot of bracket AH.

Upon release of key BK, link BU moves downward permitting check pawl F to re-enter a tooth space of rack M to provide a limit for pinion shaft Q as the lip of link BU clears rack P. The relative position of feed pawl E to check pawl F insures its reseating in the tooth space of rack M.

Adjustment

1. With key BK fully depressed, stud BX should have slight clearance over the top of plate BZ.

To adjust, turn eccentric bushing AQ.

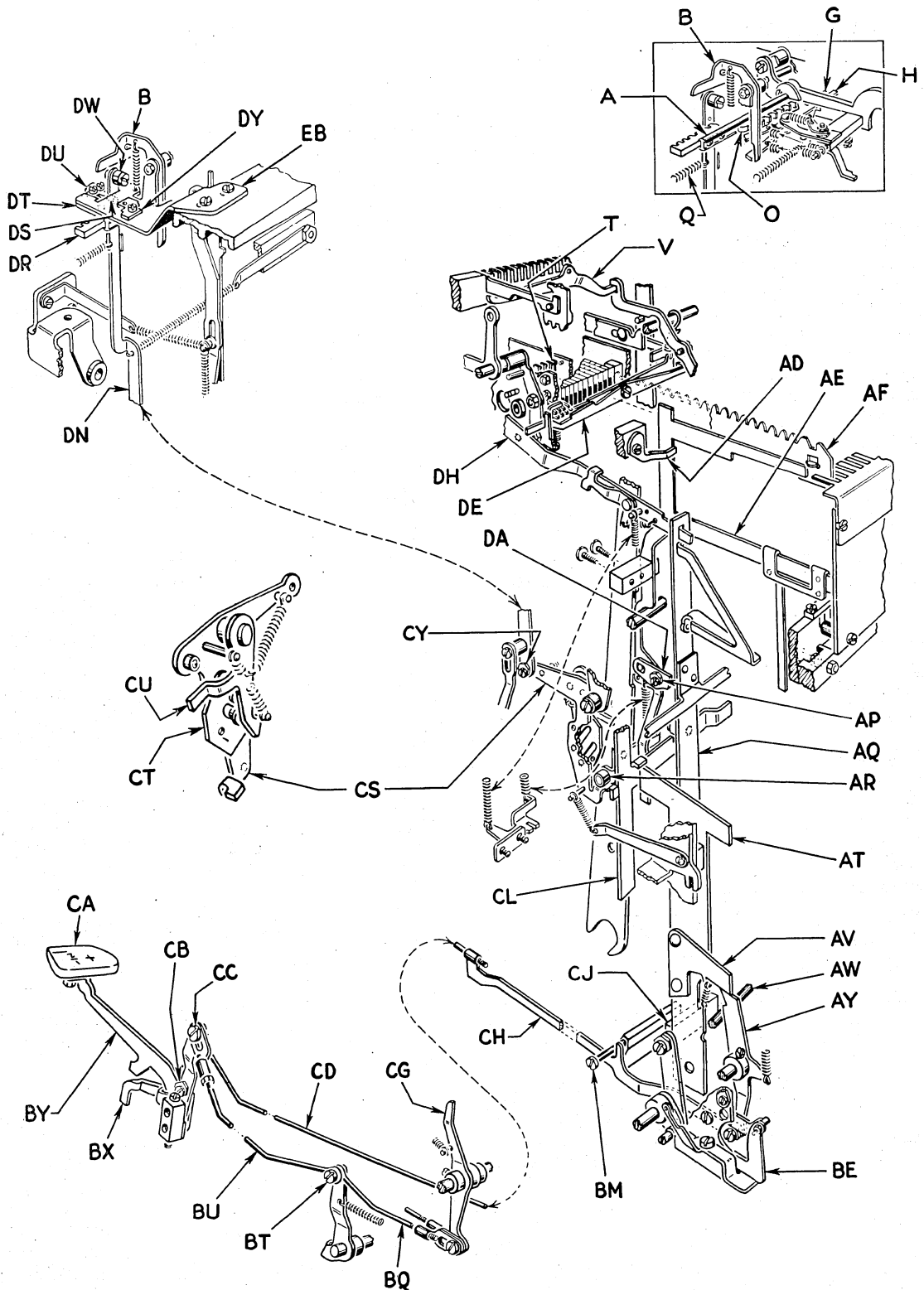
2. With key BK fully depressed, pawls E and F should have approximately .010" clearance with the teeth of rack M.

To adjust, turn eccentric screw R.

3. Bracket AH should be so positioned that when key BK is released slowly after the step-back has taken place pawls E and F are permitted to re-enter the tooth spaces of rack M.

To adjust, position bracket AH, making sure that the lip of link BU will enter a tooth space of rack P without interference during a subsequent decimal discount operation.

FULL CENT BAR TO ADD .005 (OR .009); POINT OFF NO, ONE, TWO, OR THREE PLACES; AND TABULATE CARRIAGE (Plate 25-1)



Text on Back

Full Cent Bar to Add .005 (or .009); Point Off No, One, Two, or Three Places; and Tabulate Carriage (Plate 25-1)

A. Full Cent Bar to Add .005

Purpose

To provide for the addition of 5 mills to the accumulated product in whole number construction machines.

Construction

The Full Cent Mechanism is altered to eliminate the cipher multiplying operation with its subsequent point-off operation when adding 5 mills (.005) or 9 mills (.009) in machines containing whole number construction beginning with Serial No. A915672.

Automatic one release arm V is made longer to permit the complementary nine added to the crossfooter in the full cent column during a subtract operation to clear or carry from the column.

Operation

When the full cent bar is depressed, lever BY, through bell crank BX and wire CD, moves slide CH forward to rock latch AY, permitting pawl AV to locate over raise bar CJ. Slide CH also releases slide BE to engage the drive clutch and close the switch points. During the forward machine stroke, raise bar CJ raises plate AT through pawl AV. Plate AT, through full cent slide CL and adjustable lug DA, raises adding rack limit AE.

Fraction release slide AQ, which is raised by full cent slide CL, actuates control arm DE, through lever DH, to raise adding rack cipher stop T and release adding rack AF. The latter, which moves forward during the forward machine stroke, limits on the 5 mill step of limit AE and is thus positioned to accumulate 5 mills in the crossfooter.

Adjustable lug DA may be reversed so that the long straight edge is downward to raise adding rack limit AE higher. This permits adding rack AF to move completely forward and accumulate 9 mills in the crossfooter.

Adjustment

1. With full cent bar CA normal, lever BY should limit on the keyboard, and latch AY should limit on shaft AW.

To adjust, shorten or lengthen wire CD.

2. With the machine normal, the vertical projection of slide CH should have minimum clearance with screw BM.

To adjust, bend the projection of slide CH.

3. With the full cent bar depressed (not held) bell crank BX should engage the balls

in the ball raceway sufficiently to prevent depression of the listing and multiplying keys or the motor bars.

To adjust, turn eccentric CB.

4. With raise bar CJ fully raised and adding rack AF forward, the lug of adding rack AF should limit centrally on the step of limit AE when adding 5 mills and should clear the step when adding 9 mills.

To adjust, turn eccentric AP.

5. Brace AD should hold limit plate AE from tipping to assure a central location of the adding rack lug on the cipher position of limit AE.

To adjust, bend the arm of brace AD.

6. With raise bar CJ fully raised, arm DE should be raised fully without bind.

To adjust, bend arm DE where it contacts lever DH.

B. Full Cent Bar to Point-Off No, One, Two, or Three Places

Purpose

To provide a means of indexing a uniform point-off of no, one, two, or three places from depression of the full cent bar.

Construction

This added function of the full cent bar is used in machines containing whole number construction beginning with Serial No. A915672 that require a specified decimal discount to be indexed from both the decimal discount key depression (see Plate 24-1) and the full cent bar operation. Either of the two sources that index the specified decimal discount may be modified so that the other is the sole means of indexing.

Limit plate DU is used when the Decimal Discount Mechanism is to point-off two or three places; and limit plate DY, when used in place of plate DU, limits the pointing off to either no or one place.

Bracket EB contains hardened limit plate retaining strap DT which extends across the right end of the slot in bracket EB and acts as the limit for link DN when stepping back three places. This prevents wear of the slot in bracket EB, which would prevent link DN from restoring to normal.

Operation

Full cent slide CL, being raised during a full cent operation, rocks bell cranks CS through roll AR and cam CT. Bell crank CS raises link DN moving its lip into a tooth space of rack DR in order to control the movement of pinion shaft A. Further upward movement of link DN rocks bell crank B to swing pawls G and H clear of the tooth of rack O, thereby permitting spring Q to move

(Plate 25-1) Continued

pinion shaft A one, two, or three places to the right. Movement of pinion shaft A is then limited when link DN contacts limit plate DU or DY or the end of the slot in bracket EB.

As roll AR moves upward off the high part of cam CT, link DN is permitted to restore, releasing bell crank B and permitting check pawl H to re-enter a tooth space of rack O limiting pinion shaft A as the lip of link DN clears rack DR. Feed pawl G is assured of reseating in the tooth space of rack O because of its relative position to check pawl H.

Near the end of the upward movement of full cent slide CL, roll AR contacts hook CU releasing cam CT so that it may idle in its slots when contacted by roll AR during the return of full cent slide CL to normal. This prevents indexing the decimal discount during the return machine stroke.

Disabling of the point-off from the full cent operation is accomplished by raising cam CT so that its hole aligns with the threaded hole in bell crank CS and by securing the cam in this position with a 73548 screw which is assembled from the inside of the machine.

Adjustment

1. With roll AR on the high part of cam CT during a forward machine stroke, guide stud DS should have slight clearance over the top of limit plate DU.

To adjust, turn eccentric CY.

2. With roll AR on the high part of cam CT

during a forward machine stroke, pawls G and H should clear the teeth of rack O by approximately .010".

To adjust, turn eccentric screw DW.

3. Bracket EB should be so positioned that pawls G and H are permitted to enter the tooth spaces of rack O as roll AR leaves the high part of cam CT during a forward machine stroke.

To adjust, position bracket EB, making sure that the lip of link DN will enter a tooth space of rack DR without interference during a subsequent full cent operation.

C. Full Cent Bar to Tabulate Carriage**Purpose**

To provide a means of indexing the Carriage Tabulating Mechanism from depression of the full cent bar..

Operation

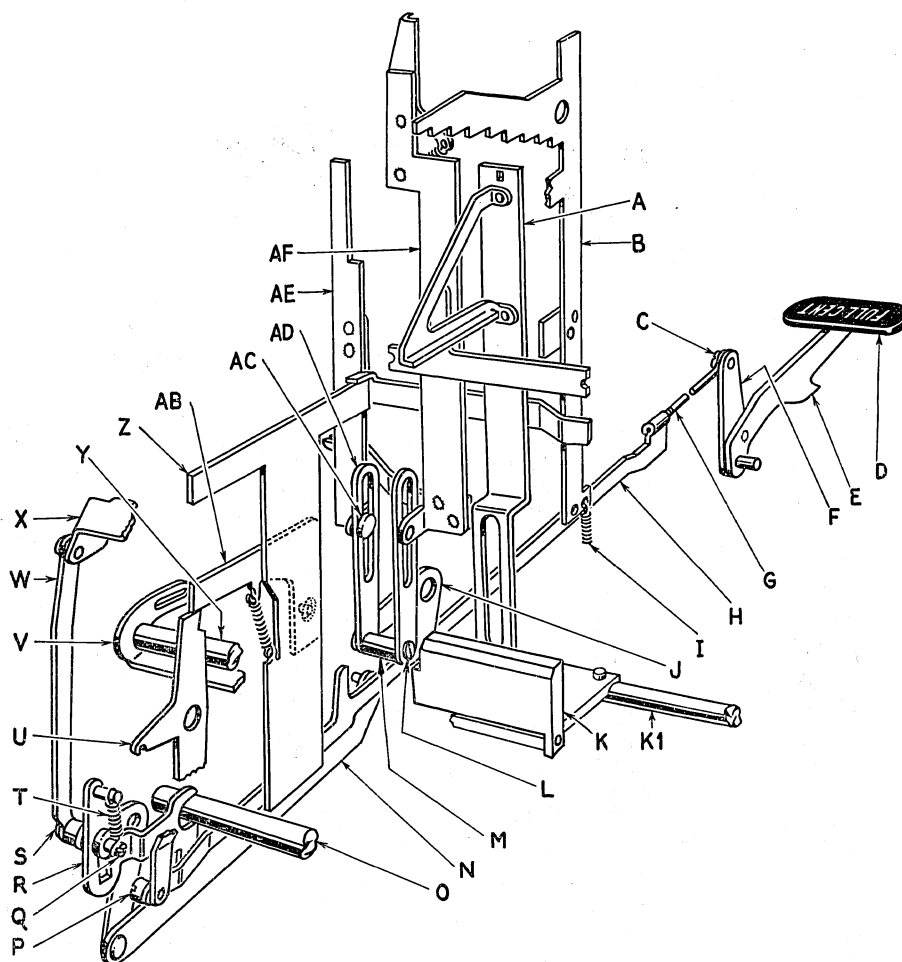
Depression of full cent bar CA, through wires BU and BQ, rocks lever CG to index the Automatic Tabulation Control Mechanism. Disabling of the indexing of carriage tabulation from the full cent bar is accomplished by removing wire BU and replacing screws CC and BT with 72572 No. 1 screws.

Adjustment

1. The Automatic Tabulation Mechanism should be indexed from the full cent bar just prior to engagement of the drive clutch.

To adjust, shorten or lengthen wire X.

FULL CENT KEY MECHANISM (Plate 25)

**Full Cent Key Mechanism (Plate 25)**

The purpose of the full cent key is to add 5 mills (half cent) to the accumulated product in the event that the accumulated product consists of 5 or more mills; the 5 mills added by the full cent operation causes a carry to take place in the unit or cent column.

When the full cent key is depressed, bell-crank F, through wire G and bar H, rocks lever U which releases plate Z. During the machine operation, plate Z raises vertical AE, the arm of the latter raises index plate B to

index the rack bar to accumulate 5 mills.

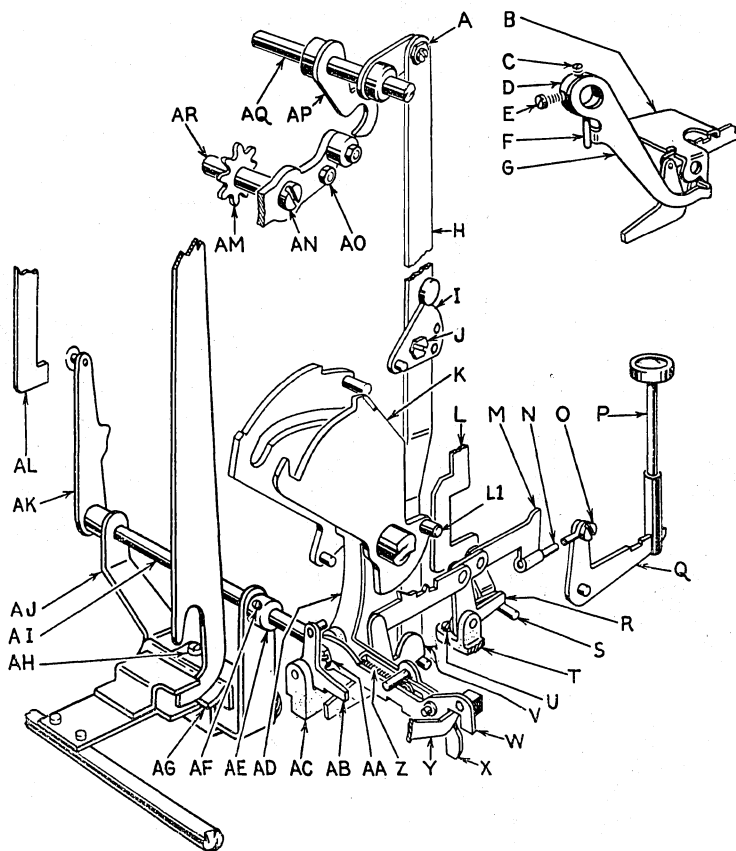
Tests and Adjustments

When the full cent key is in normal position, it should limit on the keyboard and lever U should limit on shaft Y.

Adjustment: Wire G is adjusted.

Note: When this adjustment is made, check for slight play of the vertical projection on bar H with toggle screw AO (Plate 20). When there is no play, bend projection slightly.

FIRST PRODUCT KEY MECHANISM (Plate 26)

**First Product Key Mechanism (Plate 26)**

The purpose of the first product key is to index the mechanism and print the accumulated amount in the crossfooter without clearing and transferring to any front register. The amounts are retained in the crossfooter and multiplier until cleared out by the final product key.

When the first product key is depressed, lever Q through wire N and link assembly M, causes part V to pull link H downward to mesh adding wheels with the rack bars.

In late machines, the crossfooter mechanism is indexed by the depression of the first product key, the meshing of adding wheels and rack bars is accomplished by the machine operation, as explained in Plate 29.

Part R pulls link L downward to disable the intermediate keyboard and allows the adding wheel to index the rack bars. The rear arm of part V rocks add control bell-crank AD which locates twin cam assembly K in non-add position to prevent transferring the crossfooter total to the registers.

Bell-crank AB pushes shaft AI to align arm AK with link AL to cause the crossfooter adding wheels to restore (covered in Final Product Key, Plate 27). **Note:** In late machines, bell-crank AB is raised by intermediate AD (Plate 27) to push shaft AI. This illustration shows the earlier style.

The fractional rack bars are released as shown under Final Product Key. When the first product key is fully depressed, it is latched by B engaging the notch in linkage M.

(Plate 26)—Continued

During the machine operation, on the forward stroke, the rack bars are indexed to printing position through the adding wheels limiting on the trip pawls, and the amount is printed.

At the beginning of the return stroke, the first product key is released by roller L1 contacting passby pawl CJ (Plate 27) to raise the latch.

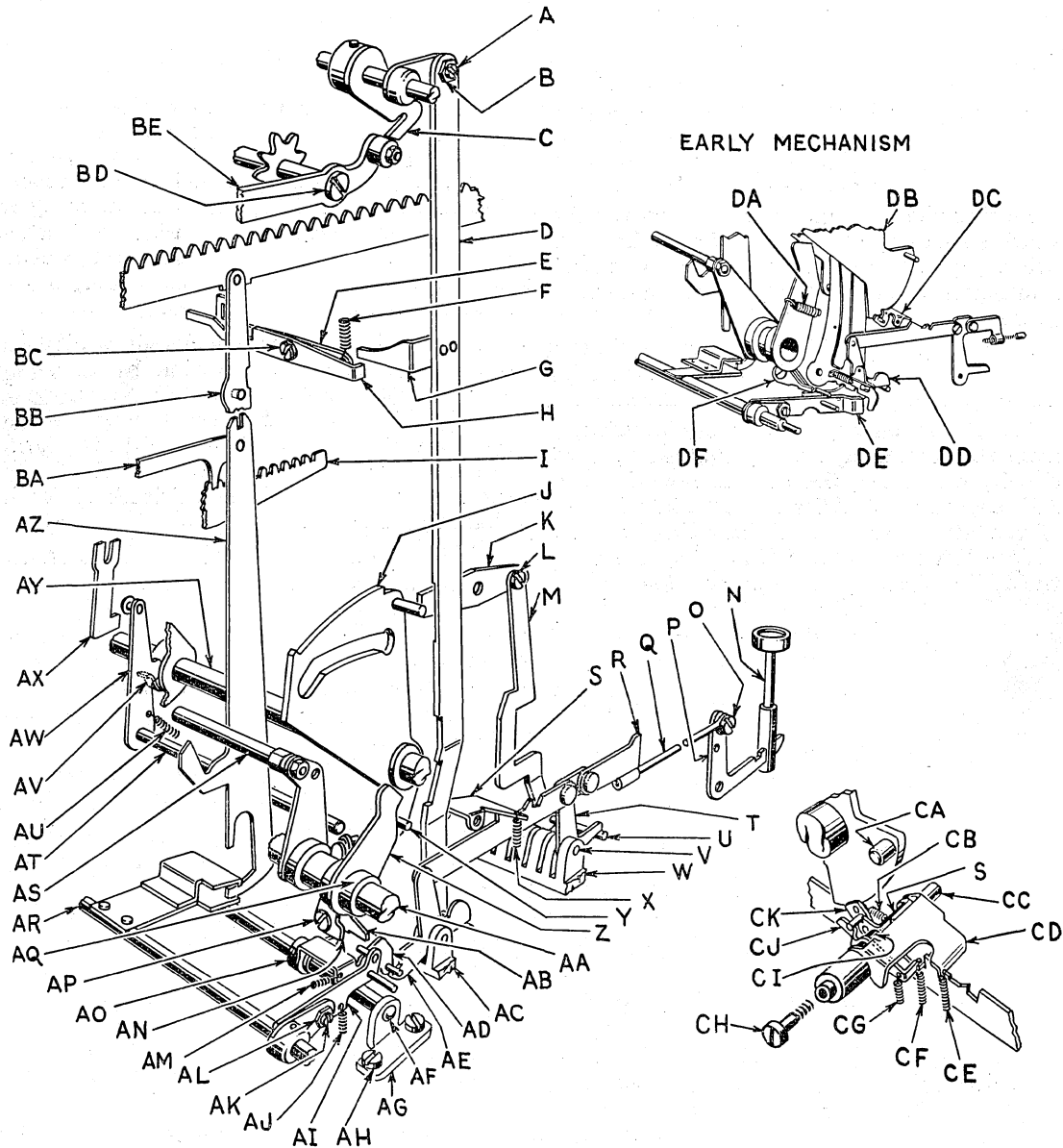
When the adding wheels are disengaged from the rack bars, link AL follows upward, and by contacting the stud in restoring arm AK, swings pawls AS and AT (Plate 23) out of the notches in pinion shaft D (Plate 23) which allows spring AU (Plate 23) to restore the adding wheels to normal position.

The purpose of limit AG is to prevent detent arms BA (Plate 27) from wearing in the pockets of detents I (Plate 27) when detent arms BA (Plate 27) engage the pockets of detents I (Plate 27) when the extend or the final product keys are released.

Interlocking flapper B locks all result keys during the machine operation by dropping into the notches of all links M. Flapper B is raised to clear link M near the end of the return stroke by stud F raising arm G. With the machine in normal position, flapper B should clear links M by at least .015" in Class 72 machines.

Adjustment: Screws C and E are loosened and collar D located as required.

FINAL PRODUCT KEY MECHANISM (Plate 27)



Final Product Key Mechanism (Plate 27)

The purpose of the final product key is to index the mechanisms to print the accumulated products, clear the crossfooter, clear the multiplier, restore the adding wheels, and transfer the product to a register.

When the final product key is depressed, linkage R is given a forward movement through wire Q. Bell-crank T contacting on stud U pulls link M downward, tilting lever K above the stud in twin cam J which disables

the intermediate keyboard in order to permit the adding wheel cams to index the rack bars. The downward movement of link D through arm G swings levers E and H to release the fractional rack bars.

The front arm of part AE moving downward by contacting on the stud in link D pulls the latter downward swinging cam C to mesh the adding wheels with the rack bars.

In late machines, the crossfooter meshing mechanism is indexed by the depression of

the final product key, the meshing being done by the machine operation. This subject is covered under Plate 29. The downward movement of the crossfooter, to mesh with the rack bars, pushes link AX downward to move its foot out of the range of the stud in restoring arm AW to prevent its action on the forward stroke. The rear arm of part AE raises intermediate bail AD, its left high arm rocking shaft assembly AR, its channel arm raising verticals AZ to raise arms BA out of detents I.

Note: The left high cam arm of bail AD raises arms BA out of detents I before assembly Z is moved in line with the stud in twin cam J in order to prevent a juggle, possible in the earlier style, viz.: attempt to restore verticals AZ before raising arms BA out of detents I which results in locking the machine or bending restoring shaft AS.

The right low cam arm of AD rocks bell-crank AN to slide the cam arm of assembly Z in line with the stud in twin cam J. The right cam arm of AD also rocks bell-crank AB to move shaft AT, locating the stud in arm AW in line with link AX in order to restore the adding wheels to normal position. Linkage R is held in active position by latch S.

Forward Stroke: Stud Y in twin cam J swings assembly Z rearward, shaft AS restores verticals AZ and arms BA backward to normal. The rack bars are indexed through the adding wheels and the product is printed. Before the end of the forward stroke, one of the registers is meshed with the rack bars.

At the beginning of the return stroke, the final product key is released by roller CA on the outside twin cam contacting passby pawl CK to raise latch S. As the rack bars are being restored to normal position, the adding wheels in the registers accumulate the product.

When the adding wheels disengage from the rack bars due to unlatching of the final product key mechanism, link AX moves upward and by contacting the stud in restoring arm AW, swings pawls AS and AT (Plate 23) out of the notches in pinion shaft D (Plate 23) which allows spring AU (Plate 23) to restore the adding wheels to normal position. Sub-final product operation is secured by holding the final product key depressed during both strokes, which prevents disengaging the adding wheels and also prevents disengaging pawls AS and AT (Plate 23) which allows the adding wheels to remain in position to retain the complete product. Arms BA, however, are restored, clearing the multiplier section. The lower latch assembly shows the latches used in standard Class 72 machines.

Tests and Adjustments

When the final product key is depressed, linkage R should have lead over latch S.

Adjustment: Wire Q is turned.

Arms BA should clear detent I, and vertical AZ should clear stud in BB.

Adjustment: Eccentric AL is turned.

Assembly Z should have full hold on stud Y with key depressed.

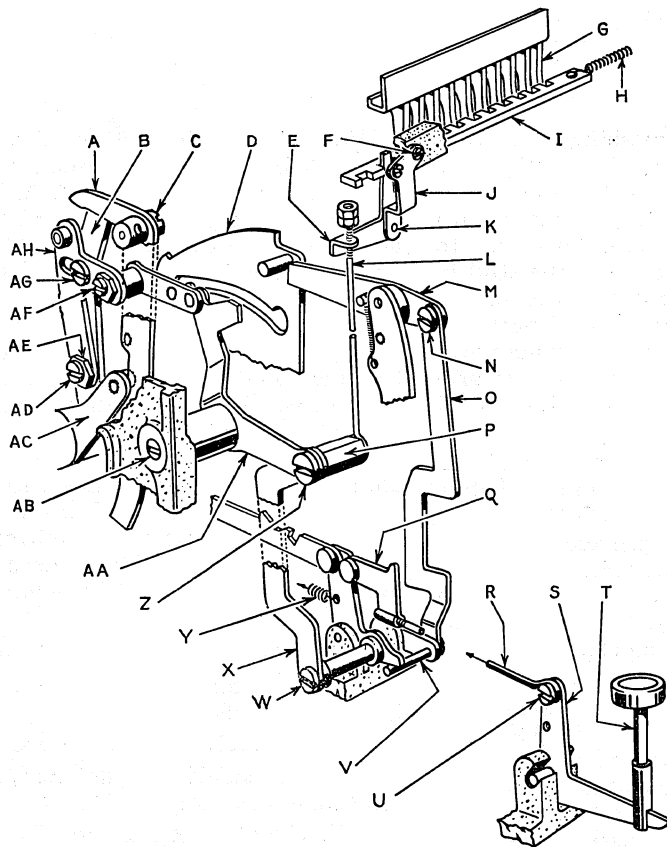
Adjustment: The horizontal arm of AB is peened.

With final product key depressed, arm G should completely raise fraction release arms E and H. To adjust, bend arm G.

When verticals AZ are being restored, there should be minimum play between restoring shaft AS and verticals AZ. The nut holding shaft AS is loosened and shaft AS, which is eccentric, is turned.

Tests and adjustments applicable to arms BA will be found under subject "Extend Key and Extend Key Lock Mechanisms" (Plate 17).

REGISTER TOTAL KEY MECHANISM (Plate 28)



crank J which moves comb I to block trip arms G.

At the beginning of the machine operation, drive arm AC rocks intermediate drive arm A which contacts the roller on AH, pulling link B downward, which meshes the adding wheels and the rack bars. The downward movement of link B also releases the decimal bar through arm G (Plate 27).

On the forward stroke, the rack bars are indexed to printing position through the

Register Total Key Mechanism (Plate 28)

The purpose of the register total key is to index the register meshing mechanism, index the non-add control, disable the intermediate keyboard and release the decimal rack bar.

When the register total key is depressed, bell-crank S, through wire R pulling linkage Q, rocks the front bell-crank of linkage Q, which rocks bell-crank AA through link X. Bell-crank AA swings part AH into the path of intermediate driving member A to index the power meshing mechanism.

In earlier machines, the register is meshed directly by the rear bell-crank of linkage Q pulling link B downward. The rear bell-crank of linkage Q shifts twin cam assembly D to non-add position.

The front bell-crank of linkage Q contacts long screw V, pulling link O downward to rock lever M to clear the stud in cam D which disables the intermediate keyboard in order to allow the rack bars to move forward and the wide teeth of the adding wheel to index the total.

Bell-crank AA, through wire L, rocks bell-

wide teeth of the adding wheels limiting on the carry pawls, and the total is printed.

At the beginning of the return stroke, the total key mechanism is released by roller CA (on twin cam J, Plate 27) contacting passby pawl CK (Plate 27) to raise latch S (Plate 27).

Tests and Adjustments

When the register total key is depressed, linkage Q should have lead over latch S (Plate 27).

Adjustment: The length of wire R is adjusted as required.

When the register total key is depressed, the roller on AH should locate in the center of the high point of intermediate driver A. When the register total key restores, part AH must move clear of A.

Adjustment: Upper eccentric AF is turned as required.

The adding wheels should mesh with the rack bars with minimum backlash.

Adjustment: Lower eccentric AE is turned as required.

CARRY BLOCKING MECHANISM—POWER OPERATED (Plate 28-1)

Carry Blocking Mechanism— Power Operated (Plate 28-1)

Purpose

This power-operated mechanism, which is indexed from the depression of the register total key, shifts the carry blocking comb U to the left to block the carry trip bell-cranks V on a register total operation.

Being power rather than manually operated, as was formerly the case, comb U is not shifted until the machine starts the forward stroke of the register total operation. Sufficient time is thus allowed for the normal functioning of the Carry Mechanism during a listing or transfer operation, when followed closely by the depression of the register total key.

Operation

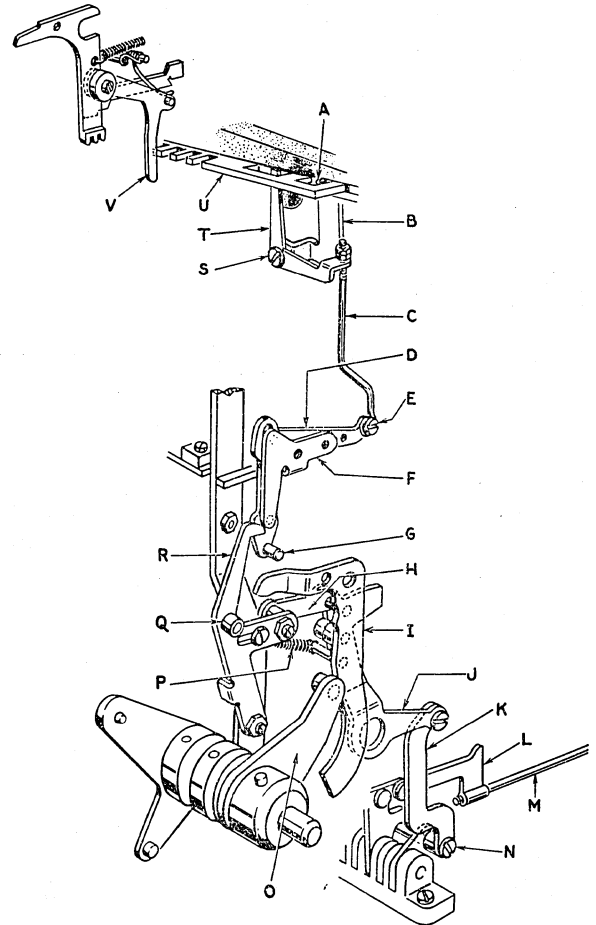
THE INDEXING of this mechanism is accomplished through the depression of the register total key, which, through wire M, linkage L, bell-crank J, and link H, moves pawl R forward—positioning the hook of pawl R over stud G, and roller Q beneath the rearward portion of bell-crank I.

THE SHIFTING of the carry blocking comb U is accomplished on the forward stroke of the machine operation. The stud in arm O rocks and holds bell-crank I lowering its rearward portion, which, through roller Q, pawl R, stud G, slide D, wire C, and bell-crank T, shifts comb U to align its teeth with the carry trip bell-cranks V.

Restoration of the register total key to normal position permits the various parts of this mechanism to release and return to normal.

Adjustment

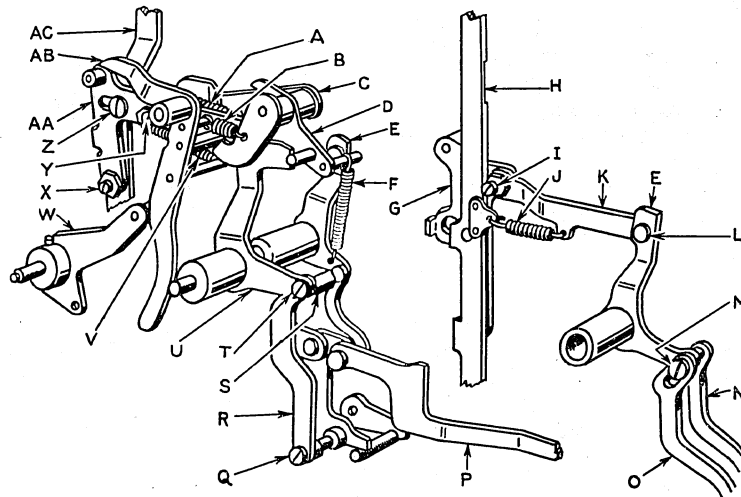
Note: The Register Total Mechanism should meet the requirements outlined in Plate 28, Keyboard Instruction Book before this mechanism is adjusted.



With the machine at normal, slide U should be in its right-hand position, limited on stud A; and, with pawl R in its lowered position (on a register total operation) comb U should be in its left-hand position, with the teeth of comb U aligned with the bell cranks A.

To adjust, lengthen or shorten wire C as required.

BALANCE, PRODUCT AND REGISTER KEYS, POWER MESHING MECHANISM, CLASSES 72, 78 (Plate 29)



Balance, Product and Register Keys, Power Meshing Mechanism Classes 72, 78 (Plate 29)

Balance or product key depression, through links O and N, rocks bell-crank E which swings arm G into the path of arm C, the latter is actuated by intermediate AB when it is swung by power arm W during the machine operation.

The register total key depression, through link R, rocks assembly U which swings arm AA into the path of intermediate AB.

In Class 72 machines, links N and O are located on the right side of bell-crank E, and are separated by space collars.

In Class 77 machines, the register power meshing mechanism is also used and indexed by the total key in the same way. However, the crossfooter power meshing mechanism is not used, the meshing being manual from key depression.

In Class 78 machines, links N and O are on either side of bell-crank E as shown in the illustration.

During the machine operation, power arm W swings intermediate AB to lower link AC to mesh the register, or lowers link H to mesh the crossfooter.

Tests and Adjustments

When the balance key or the product key is depressed, the roller on arm G should locate in the center of the high point on the arm of C.

Adjustment: Upper eccentric Y is turned as required.

During the machine operation, drive arm C should pull link H downward to secure correct mesh of adding wheels and rack bars.

Adjustment: Lower eccentric X is turned as required. The same tests apply to the register key depression.

Note: Part D is inactive in Class 72 machines. It is used in Class 78 machines to index the register interlock, as explained in Plate 42.

SUBTRACT KEY MECHANISM, LATER (Plate 30)

Subtract Key Mechanism, Later (Plate 30)

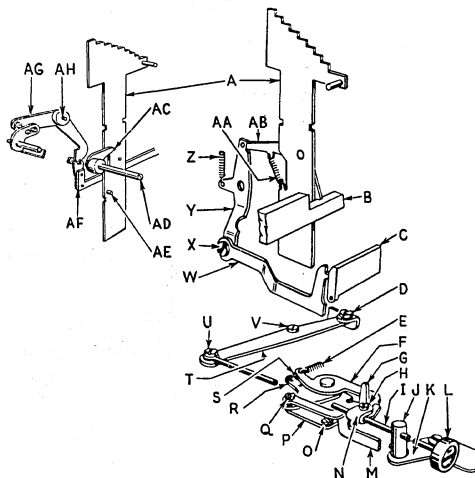
Subtraction is accomplished in Type 70 machines by adding the complements of the amount to be subtracted to the amount from which the subtraction is made. In general practice, when subtracting on adding machines not having subtracting mechanism, we determine the complements by subtracting the first figure (unit) from 10 and the balance of the figures from 9. However, in Type 70 machines, the complements are automatically indexed by plate A, plus 1, by the automatic one mechanism.

When the subtract key is depressed, wire I swings lever T which pulls bar W forward; the latter swings latch Y from under pawl AB which allows spring AA to pull the foot of pawl over lift bail B to raise plate A during the machine operation.

Bar W also swings toggle plate C forward to trip the clutch and switch with the same results as when a multiplying key is depressed.

The upward movement of subtract plate A, through stud AE, rocks bail AC; the latter swings lever AG to restore trip slide AF.

In order to provide sufficient time for the carrying mechanism when the complements are accumulated, the entire keyboard is locked until released by the typewriter key lock.



When the subtract key is depressed, clamp N swings lever G which moves part BI (Plate 9) rearward to lock the entire keyboard. Lever G is latched by part F and released by typewriter key lock slide J (Plate 9) at the end of the return stroke.

Additional subtract key interlocks are covered in Plate 9.

Tests and Adjustments

When key L is fully depressed, part F should latch lever G with lead. Screw H is loosened and clamp N located as required.

Subtract Key and Typewriter Key Lock Mechanisms, Early (Plate 31)

Subtract Key Mechanism, Early

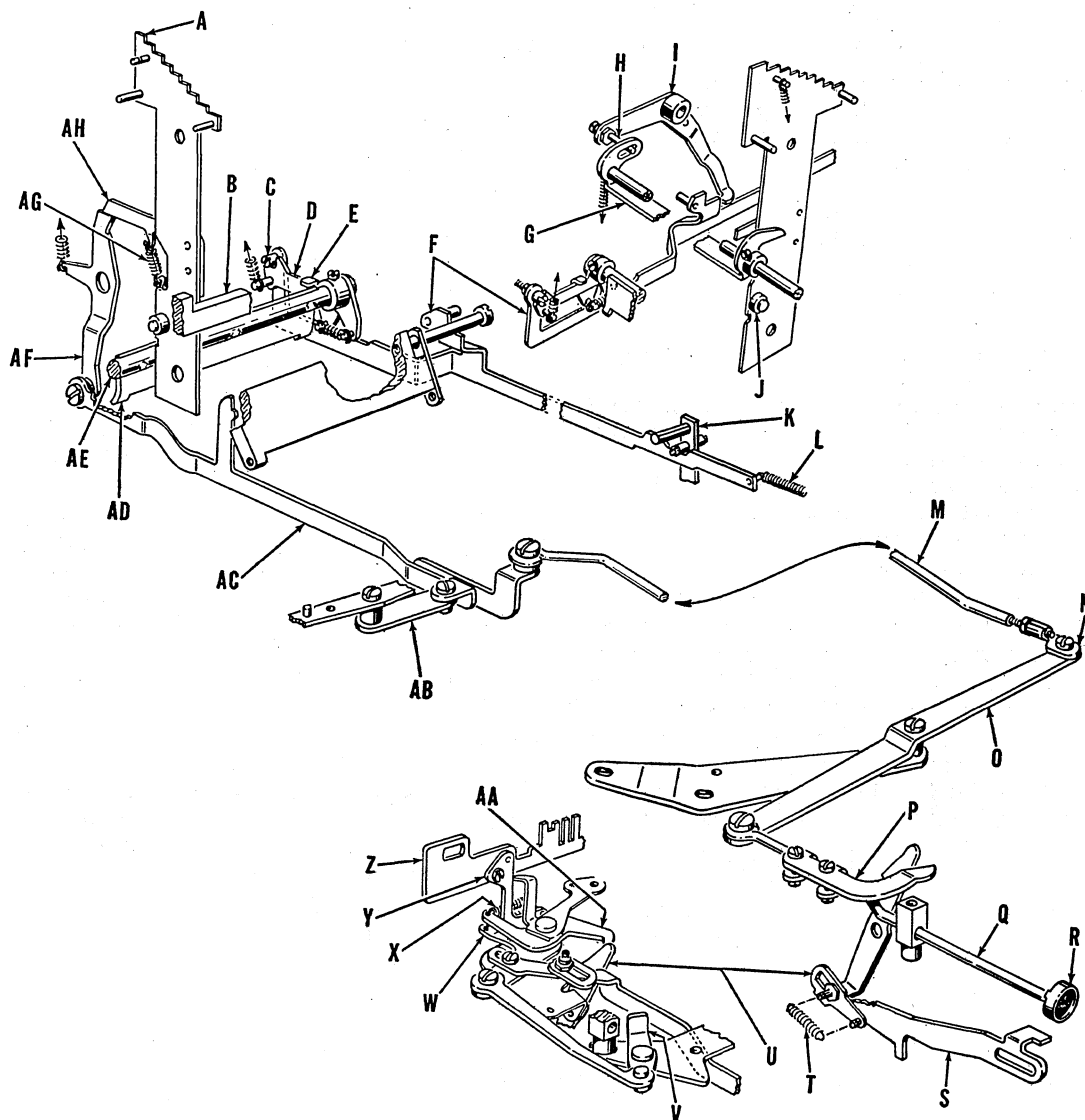
The early style subtract key mechanism indexes the add control cams and the typewriter key lock directly by the key depression.

The depression of the subtract key releases subtract plate A through wire AK, lever AL and bar AJ; the latter rocks toggle plate AN. Toggle shaft assembly I is rocked by toggle plate AN which swings bell-crank AP to index the add control cam in crossfooter position. The drive is tripped by screw H moving trip slide K forward.

When the subtract key is depressed, it rocks lever X through clamp AE which pulls detent Z into one of the spaces in the ball lock to prevent depression of the adding and multiplying keys. Link AD moves into the path of the square stud in arrow AB which blocks the extend and all result keys. Lever X is latched in rear position by latch V in order to maintain the keyboard interlocks until the typewriter key lock is released. The subtract mechanism interlocks are covered in Plate 9.

The functions of subtract plate A are the same as in the late style mechanism and are covered in Plate 30.

SUBTRACT KEY MECHANISM, EASY DEPRESSION, SERIES M 200 (Plate 30-1)



Subtract Key Mechanism, Easy Depression, Series M 200 (Plate 30-1)

Purpose

To provide lighter key depression and effective keyboard locking during a subtract operation.

Construction

Depression of the subtract key trips latch D to release spring-driven power slide F which raises clutch trip K instead of tripping the drive clutch directly from the subtract key.

Lever U is made in bail form and is connected to interlock slide S through spring T. This construction permits clamp P being adjusted to maintain ball raceway interlock slide Z (Plate 31) in active position without interfering with the full depression of the subtract key to index the power.

Cross lever O is longer, thus providing more leverage, and is located farther forward on the machine base, thus requiring the addition of wire M. Pivot arm AB acts as both a guide and a brace permitting freer movement of link AC without excessive weaving.

Cross lever O, pivot arm AB, and the fact that the drive clutch is not directly tripped

(Plate 30-1)—Continued

by the key depression combine to effect lighter key depression.

Key wire Q is shorter and contains less forming, thus making it more rigid to effectively hold lever U, through clamp P, in a position to maintain the keyboard interlocks in active position.

Operation

When the subtract key is depressed, clamp P swings lever U and through spring T moves keyboard interlock slide S forward locking the entire keyboard—except the add register/clear multiplier key. Also, wire Q rocks lever O which pulls wire M and link AC forward. Forward movement of link AC moves the upper portion of rocker arm AF rearward permitting subtract plate pawl AH to position over raise bar B, through spring AG. With pawl AH thus positioned, subtract plate A will be raised when raise bar B moves upward during machine operation. Also, the rearward portion of the pawl becomes a latch holding the subtract key indexed through rocker arm AF to retain the keyboard interlocks temporarily.

As the lower portion of rocker arm AF moves forward, it contacts plate AD to rock shaft AE which lowers latch D, through lip E, to release power slide F. The power slide moves forward through tension of spring L in the same manner and with the same results as when a multiplying key is depressed (Plate 25-1, Accumulation Instruction Book).

During machine operation when the subtract plate moves upward, roll J rocks bail G to restore power slide F through eccentric stud H and lever I.

Prior to the release of the subtract key during machine operation, typewriter keylock comb Z is moved to the right. This action

swings latch AA, through arm Y and spring X, into position to retain lever U rearward and moves the vertical projection of link V under the stud in the add register/clear multiplier key bell crank through bell crank W. Thus, a complete keyboard lock is effected until typewriter keylock comb Z restores at the completion of the machine operation.

Adjustments

1. With the subtract key normal, the rear of subtract key button R should align with the front edge of the splash guard around the front edge of the keyboard.

To adjust, shorten or lengthen wire M using turnbuckle N.

2. Clamp P should be adjusted as follows:

- a. With the power off and the subtract key fully depressed and released, the keyboard should be locked (except the Add Register/Clear Multiplier key).
- b. With the subtract key normal, clamp P should not hold lever U far enough rearward to interfere with the keyboard interlocks or cause hard key depression.
- c. With the power off and the subtract key fully depressed, lever U should non-bind.

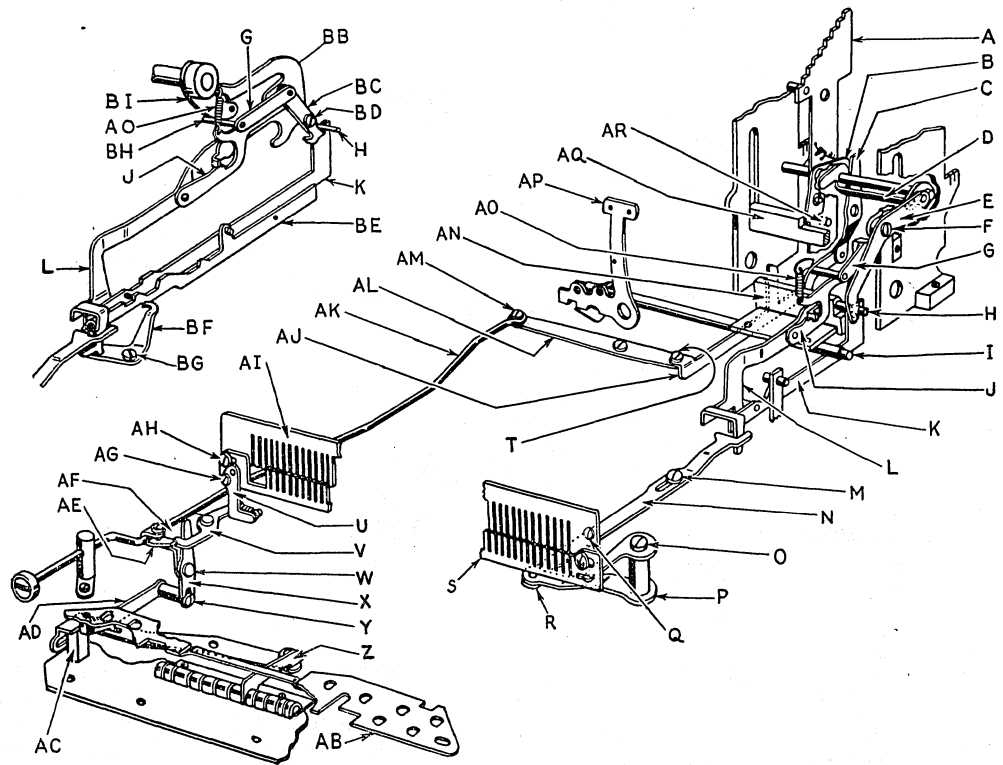
To adjust, loosen the clamp screws and position clamp P.

3. With the subtract plate raised in its uppermost position, lever I should restore power slide F—without bind—with at least .020" latching lead between eccentric stud C and latch D.

To adjust, starting with the high point of eccentric stud H forward, turn eccentric stud H.

Note: Any adjustment of eccentric stud C for the multiplying section will affect this adjustment.

SUBTRACT KEY AND TYPEWRITER KEY LOCK MECHANISMS, EARLY (Plate 31)



(Plate 31)—Continued

Typewriter Key Lock Mechanism (Early)

When a multiplying key is depressed, a stud in the front end of trip slide K moves part L forward, which through link N, swings P to move interlock S into the path of the typewriter key levers. Part L also swings part BF to lock the error key during the machine operation.

Part L is locked by latch J which is released by arm G when it is lowered by arm BI near the end of the second return stroke in order to allow the typewriter key lock to remain in active position after the multiplier mechanism is released.

Tests and Adjustments

Latch J has two steps for BB. The purpose

of the upper step is to insure that part L will be latched when single stroke keys are slowly depressed. When double stroke keys are slowly depressed so as to seat latch J on the upper step, toggle latch bail T (Plate 20) must be adjusted to push part L sufficiently forward to seat the second step of J.

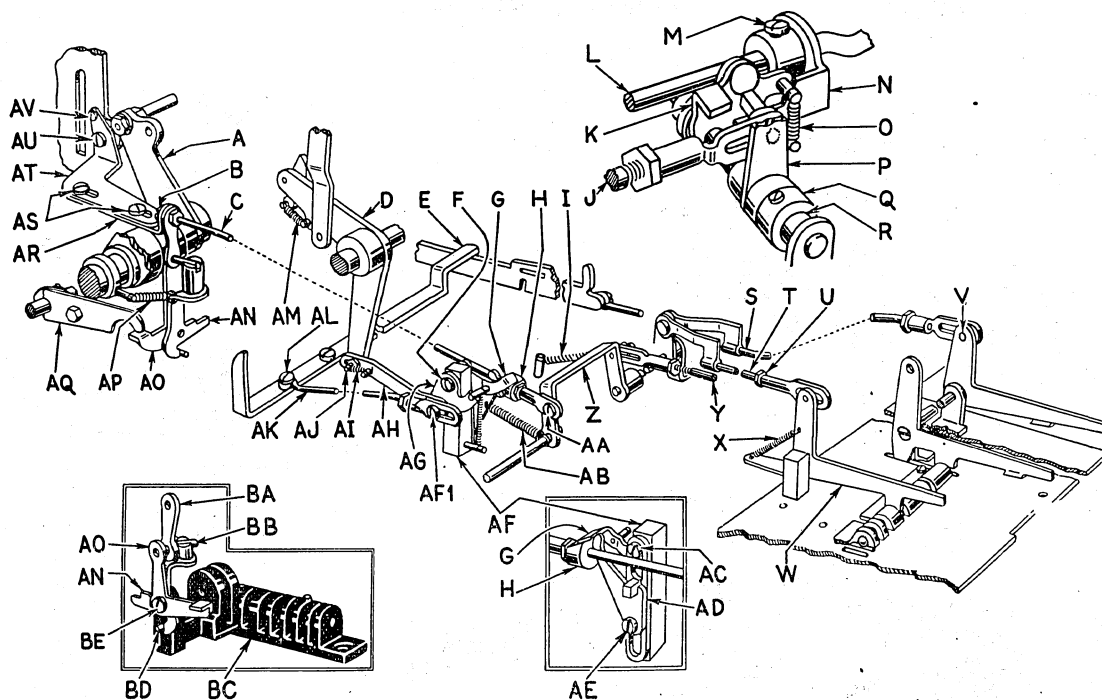
When a multiplying key is quickly depressed so as to seat the second step of latch J the upper arm of P should have a non-binding contact on interlock S.

Adjustment: The upper arm of P is advanced or retarded toward S.

Stud BH should release latch J with about .020" clearance of BB. The curved end of latch J must be formed downward so as to prevent it from getting on top of the stud in anchor plate BB; this condition could cause a lock.

Adjustment: Bend stud BH.

NON-CLEAR SUBTRACT KEY MECHANISM, CLASSES 76, 77 (Plate 32)



Non-clear Subtract Key Mechanism, Classes 76, 77 (Plate 32)

The purpose of this mechanism is to permit an amount to be subtracted more than once. The non-clear key must be depressed before the subtract key is used.

This mechanism, when indexed, disables the subtractor clearing mechanism, thereby retaining the indexed amount in the subtractor.

Classes 76 and 77 machines have the non-clear mechanism which is connected to the motor bar. The non-clear mechanism is required in Classes 76 and 77 machines in order to prevent clearing the subtractor on the return stroke of a balance key extend operation when the machine is in OD position. **Note:** When in OD position, the subtractor clearing mechanism is indexed and unless the restoring shaft in A is disabled, the complements that are indexed on the forward stroke of the balance key operation will be cleared on the return stroke.

Classes 76 and 77 machines having register subtract mechanism are equipped with the non-clear key in order to permit subtracting the same number in crossfooter and register.

Class 77 machines which use the motor bar with the register subtract key have the non-clear mechanism disabled by the register subtract key depression. However, when the

motor bar is depressed without the register subtract key, the non-clear mechanism is indexed. When the non-clear key or the motor bar is depressed, Z is rocked forward through wire S, T or Y.

Bail Z pulls slide AR and coupler BA forward, the latter clearing the hub of part A.

When the non-clear key or the motor bar is fully depressed, the mechanism is latched by part G blocking H.

During the subtract operation, part AN and coupler BA merely idle, not actuating the restoring shaft in A.

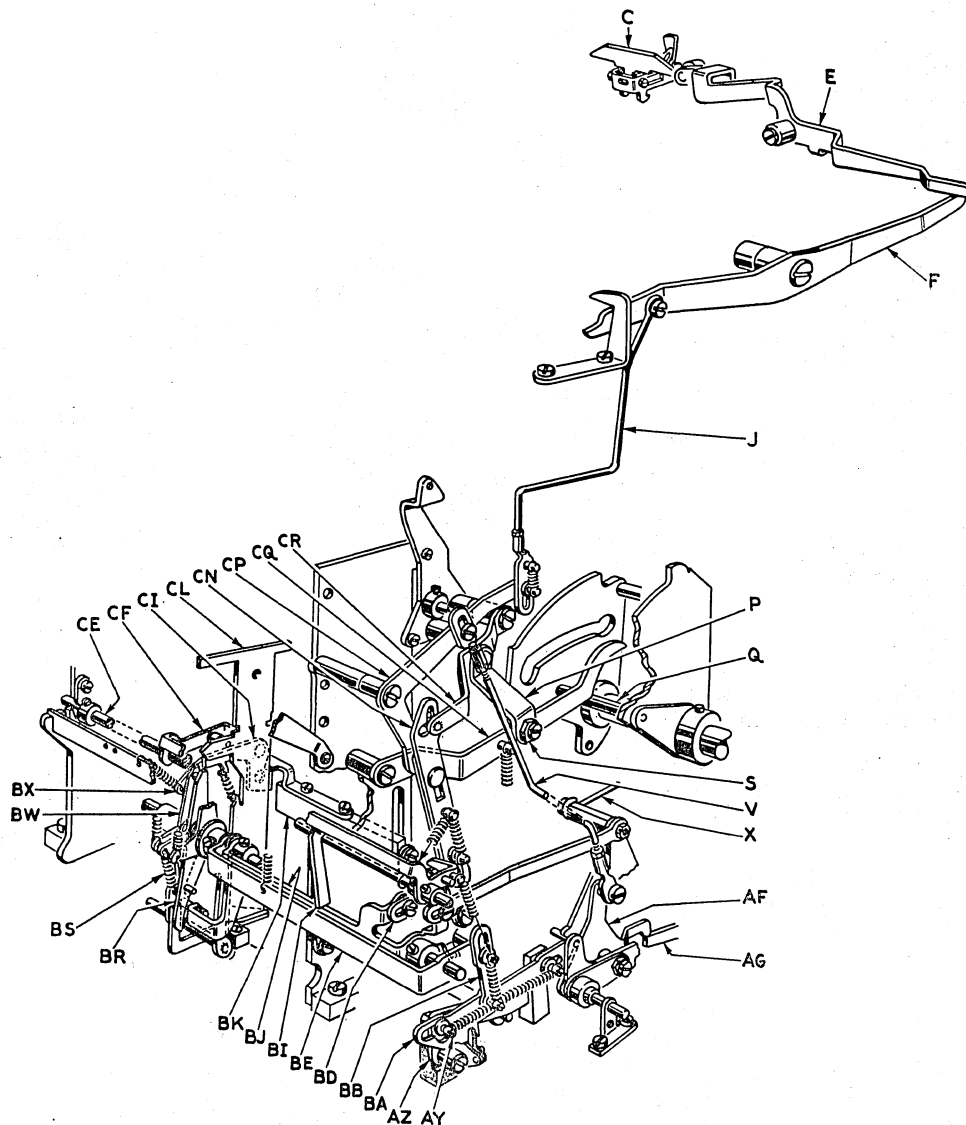
Tests and Adjustments

When this mechanism is released, it is restored by springs I and AP. Spring AP which restores AN must overcome spring I which restores bail Z. When spring AP lacks the correct tension, part AN may fail to locate, which can cause non-clearing of the subtractor during the following subtract operation.

When the machine is in normal position, there should be slight clearance between part AO and arm AQ; this clearance is necessary to allow index links BA (Plate 27) to fully seat in detents I (Plate 27).

Clearance between AO and AQ is secured by removing stock from AN where it contacts on stud BD.

CROSSFOOTER SUBTRACT—INDEXED BY CARRIAGE AND MAIN OPERATING SECTION, CLASS 78 (Plate 33-1)



Crossfooter Subtract—Indexed by Carriage and Main Operating Section Class 78 (Plate 33-1)

Purpose

To permit a freer carriage movement when tabulating or returning through a carriage controlled subtract position, and to provide easier depression of control keys which normalize the carriage controlled subtract mechanism.

Construction

Carriage tabulation into a crossfooter subtract control position connects the crossfooter subtract indexing mechanism to the Main Operating Section, which will then index and operate the subtracting mechanism upon machine operation.

Operation

When the carriage tabulates into a crossfooter subtract control position, control rail

(OVER)

(Plate 33-1)—Continued

C, through levers E and F and wire J, rocks bellcrank CP which positions the horizontal slot of link assembly CN over the stud in arm CR.

At the beginning of the forward machine stroke, shaft Q cams arm CQ upward which, through link P, raises arm CR. The latter, through its stud being in the horizontal slot of link CN, raises link CN rocking bails BJ and CF.

Bail BJ, through rocker arm BW, spring BS, and rocker arm BR releases flipper pawl CI to be positioned over raise bar BK, thus indexing a crossfooter subtract operation.

Bail CF raises crossfooter subtract latch BX to clear shaft CE so that idle movement of the carriage through crossfooter subtract control positions will not cause the Subtract Mechanism to remain indexed.

Bail BE, which is rocked by a stud in rocker arm BW, raises link BB to locate the vertical slot of extend arm BA around screw AY to index the Extend Mechanism.

When the Minus Balance key is depressed with no control rail active, bellcrank AG, of the balance key result linkage, rocks arm AF locating the horizontal slot of link assembly CN, through wire V and bellcrank CP, over the stud in arm CR to index the crossfooter subtract operation.

When the Minus Balance key is depressed with a control rail in active position, subtract bail BJ is normalized at the beginning of the

third machine operation through link BD.

Adjustment

1. With control lever E located on rail C, the stud in arm CR should be positioned fully to the rearward end of the horizontal slot of link CN without expanding the turnbuckle spring of wire J.

To adjust, shorten or lengthen wire J.

2. With control lever E located on rail C, link assembly CN should raise immediately as the machine begins its forward stroke.

To adjust, turn eccentric S.

Note: Link assembly CN must be raised immediately in order to assure immediate release of cycle plate pawl CI and engagement of screw AY in the vertical slot of slide BA.

3. When link assembly CN is raised, latch BX should clear shaft CE.

To adjust, weave the ear of bail CF that contacts the projection on link assembly CN.

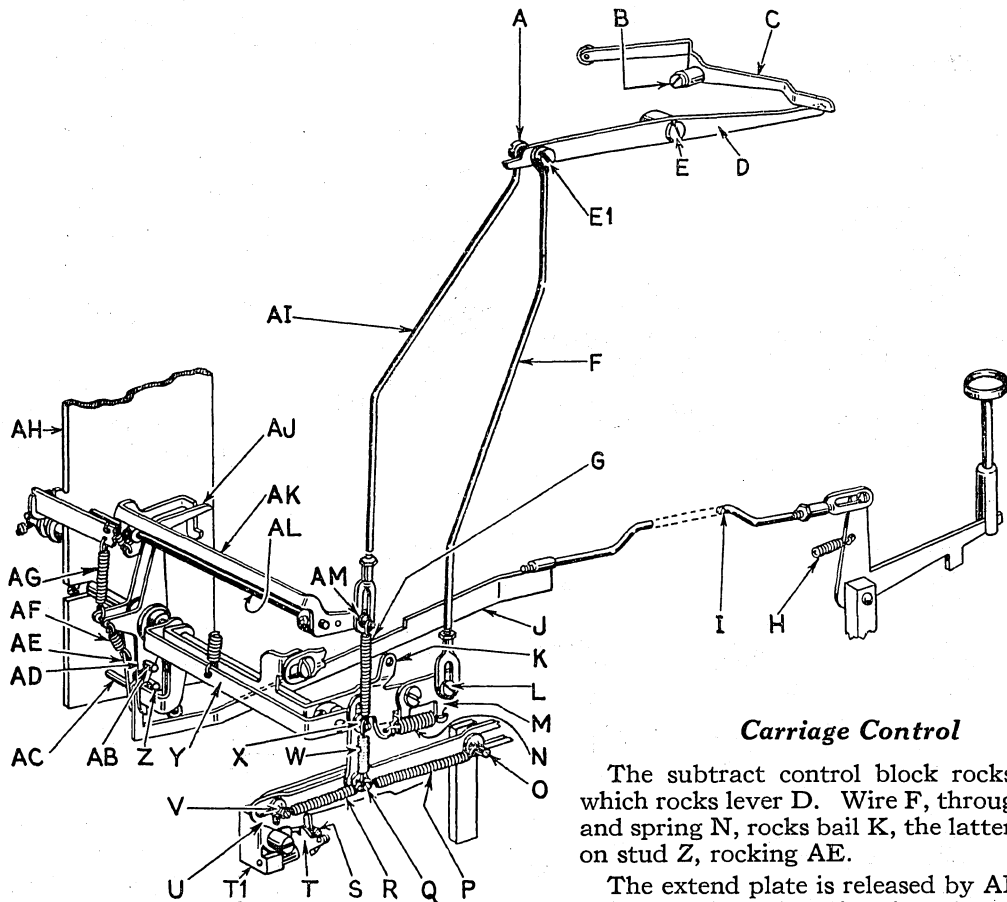
4. With control lever E located on rail C, bail BJ should remain normal (limit against arm BI) and the spring joint on link assembly CN should expand when the register subtract, non-subtract, or add CF key is depressed.

To adjust, shorten or lengthen wire X.

5. With no rail under the roll of control lever E, depression of the Minus Balance key should locate the horizontal slot of link assembly CN full length, without bind, over the stud in arm CR.

To adjust, shorten or lengthen wire V.

KEY AND CARRIAGE CONTROLLED CROSSFOOTER SUBTRACT, CLASS 78 (Plate 33)



Key and Carriage Controlled Crossfooter Subtract, Class 78 (Plate 33)

The extend and the subtract mechanism in Class 78 machines is partially indexed from key or carriage, the indexing being completed by the machine operation.

Key Control

The crossfooter subtract key through wire I pulls slide J, the latter rocks part AE and bail Y. Part AE, through spring AF, rocks pawl AD to release the extend plate. Bail Y, through spring W, rocks part U, locating its vertical slot in mesh with shoulder screw V.

When fully depressed, the subtract key is held by latch AJ, dropping in front of shaft AL.

Note: When the extend-subtract mechanism is indexed through key or carriage, the motor bar is depressed; the subtract key is not a power key.

Carriage Control

The subtract control block rocks lever C which rocks lever D. Wire F, through arm M and spring N, rocks bail K, the latter contacts on stud Z, rocking AE.

The extend plate is released by AE rocking pawl AD through spring AF. Part AE contacting stud AC rocks bail Y, the latter through spring W, rocks part U locating its vertical slot in mesh with shoulder screw V.

Wire AI rocks bail AK to raise latch AJ, the latter is raised in order to prevent a subtract operation when the carriage tabulates over the control block. Latch AJ is not necessary, the subtract mechanism being held by the control block on lever C.

Tests and Adjustments

When the crossfooter subtract key is depressed, AJ should latch over the shaft.

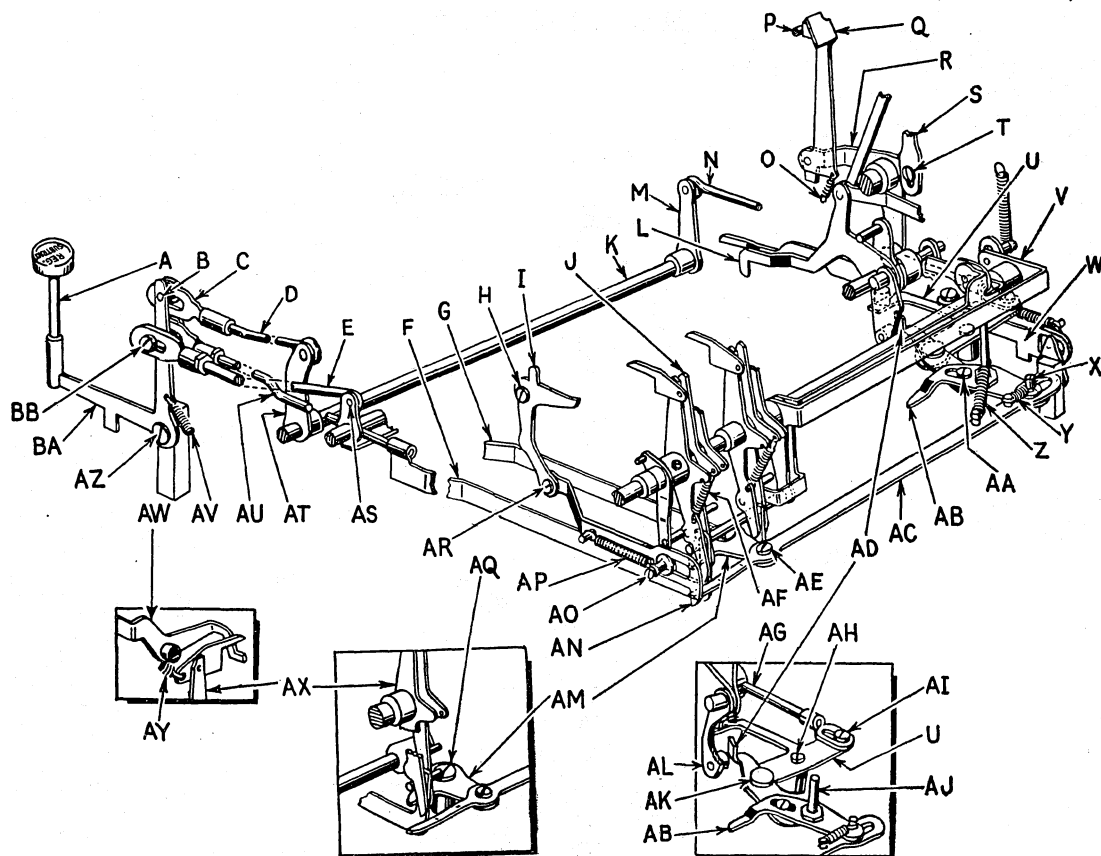
Adjustment: Wire I is adjusted. This adjustment is limited to allow play of slide J with stud AC.

Control block on arm C.

Wire F is adjusted to raise part U for full hold, but not to bottom. This adjustment is limited by non-expansion of spring N.

Wire AI is adjusted for minimum clearance of latch AJ over the shaft.

REGISTER SUBTRACT KEY MECHANISM, CLASS 78 (Plate 34)



Register Subtract Key Mechanism, Class 78 (Plate 34)

Depressing the register subtract key indexes the non-add and the extend-subtract mechanisms. The subtract key also disables the crossfooter subtract carriage control through the non-subtract mechanism.

Non-add Mechanism

Wire D from lever BA to arm AT rocks shaft K. Arm M, through wire N, latches the non-adding linkage which places the twin cams in non-add position.

Crossfooter Subtract Carriage Control Disabling

Wire E connects lever BA to bail T (Plate 37). Wire J (Plate 37) moves link G (Plate 37) forward which swings bail AN (Plate 37) to normal position.

This mechanism is latched by V (Plate 37) being blocked by W (Plate 37).

Extend Mechanism

Wire AU pulls slide F forward which rocks bail V. The latter raises part W to locate its vertical slot in the path of shoulder screw V (Plate 33). Slide F rocks part AX which

through spring AF, rocks pawl J which releases the extend plate.

Slide F swings bell-crank AM which swings bell-crank AB through link AC and spring Y. Link AC moves into the path of part AN. The latter is connected to part I which is thereby disabled.

Note: Part AN controls the mechanism which shifts the twin cams to crossfooter position.

Bell-crank AB rocks lever AD to contact lower stud in AL. Lever AD pivots on part U.

Tests and Adjustments

When the register subtract key is depressed, it is latched and the extend mechanism is indexed in the same way as when the crossfooter subtract key is depressed (Plate 33). Wire AU is adjusted.

When the register subtract key is depressed, the non-add linkage should latch. Wire D is adjusted.

When the register subtract key is depressed, the non-subtract mechanism should latch. Wire E is adjusted.

When the register subtract key is depressed, link AC should move in front of part AN.

Adjustment: Link AC is bent.

CROSSFOOTER AND REGISTER SUBTRACT KEY MECHANISM, CLASS 78 (Plate 35)

Crossfooter and Register Subtract Key Mechanism, Class 78 (Plate 35)

The purpose of the crossfooter and register subtract key mechanism is to permit subtracting amounts from the crossfooter and from the register with one key depression and a single machine operation.

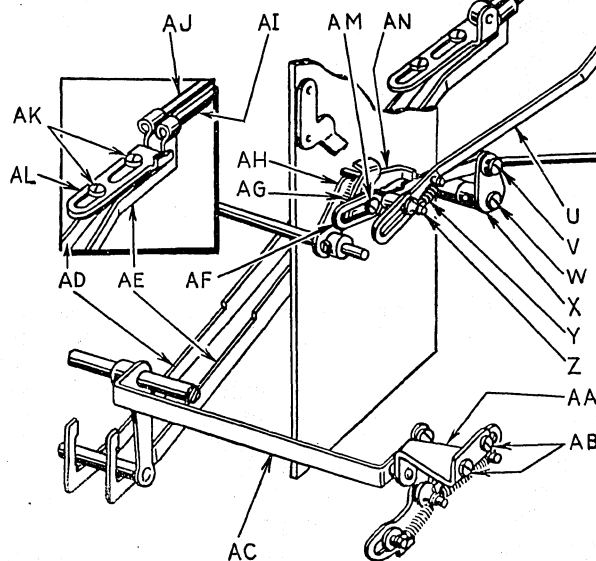
Depressing the crossfooter and register subtract key indexes the extend-subtract and the non-add mechanism. Simultaneous addition which controls the crossfooter subtraction is not disabled by the register subtract mechanism.

When key lever F is depressed, wire H to arm AP rocks shaft assembly L. Wire AO to assembly AL pulls slides AD and AE. The function of slide AD is covered under Register Subtract Mechanism (Plate 34), and slide AE is covered under Key and Carriage Controlled Subtract Mechanism (Plate 33).

Simultaneous Addition

Bail K on shaft L, through wire N, swings arm X which pulls link AF. The latter is latched by AN.

Link AF moves link U which moves part S,



rocking shaft assembly O (Plate 36). The latter, through wire X (Plate 36) pulls in non-add linkage AB (Plate 36).

locating its vertical slot in line with shoulder, screw P in order to retain the simultaneous couplers during the subtract operation, which would be disabled by the register subtract key depression.

Non-add Mechanism

The depression of the crossfooter and register subtract key latches the non-add mechanism through wire G to arm C (Plate 36),

Tests and Adjustments

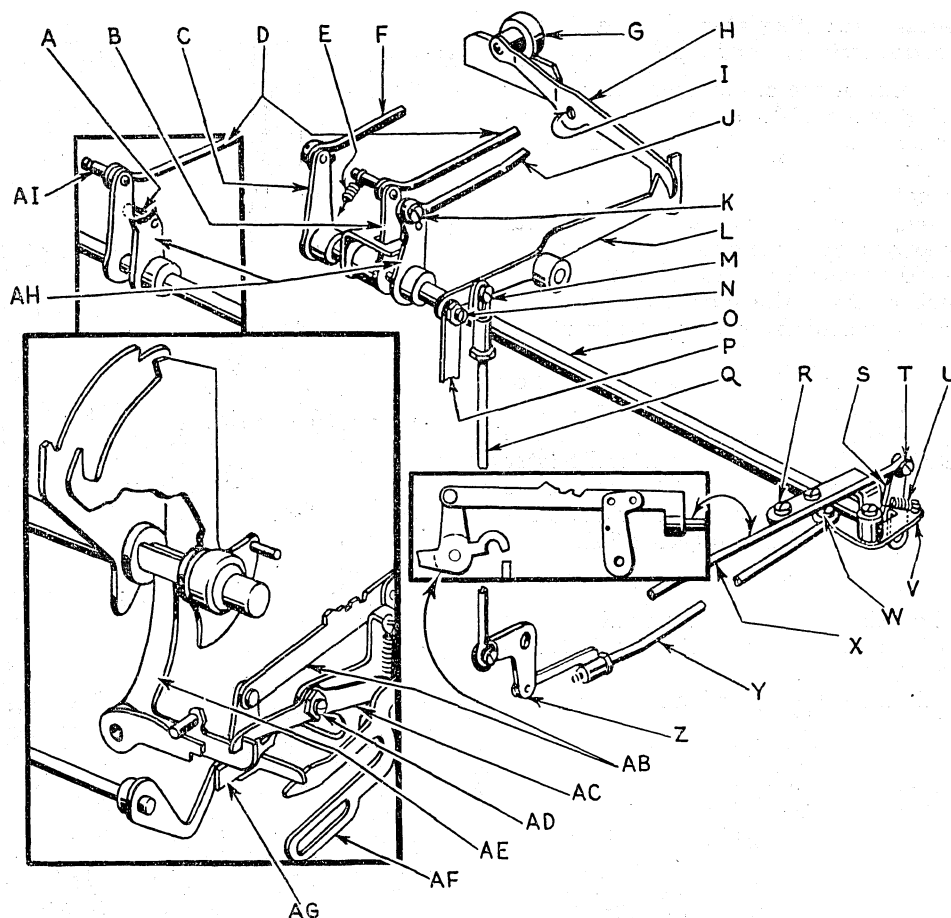
When the crossfooter and register subtract key is depressed, bail K should move over center. Adjustment is made with wire H.

When the crossfooter and register subtract key is depressed, link AF should be latched by latch AN. Wire N is adjusted as required.

When the error key is pushed rearward, bell-crank AH should release latch AN.

Adjustment: Bell-crank AH is located on shaft as required.

SUBTRACT MECHANISM TO DISABLE POSITIVE REGISTER CONTROL, CLASS 78 (Plate 36)



Subtract Mechanism to Disable Positive Register Control, Class 78 (Plate 36)

When the carriage moves a control block on the positive register lever indexing cross-footer add, the depression of the subtract key shifts the twin cams into non-add position.

When a crossfooter control block moves on positive register control lever H, lever L is rocked which swings bell-crank assembly Z through wire Q. Bell-crank Z swings bell-crank V through wire Y. The foot of bell-crank V shifts to the right shaft O, placing stud A in the path of arm B (free on shaft O). When the crossfooter subtract key is depressed, wire D swings arm B and shaft O. Arm S and wire X pull linkage AB forward. The front arm of part AB rocks reverse control AC which rocks control AE to shift the twin cams to non-add position.

Tests and Adjustments

When a crossfooter control block is resting on the positive register lever, stud A should have full hold on arm B.

Adjustment: Wire Y is adjusted.

Non-add Key Mechanism

The non-add mechanism is indexed from four different keys, viz.: register subtract, crossfooter and register subtract, non-add keys, and crossfooter add key when crossfooter add is indexed by the carriage.

The non-add key swings lever C through wire F to rock shaft O. Arm S, through wire X, pulls non-add linkage AB which swings add control lever AE to locate the twin cams in non-add position.

Tests and Adjustments

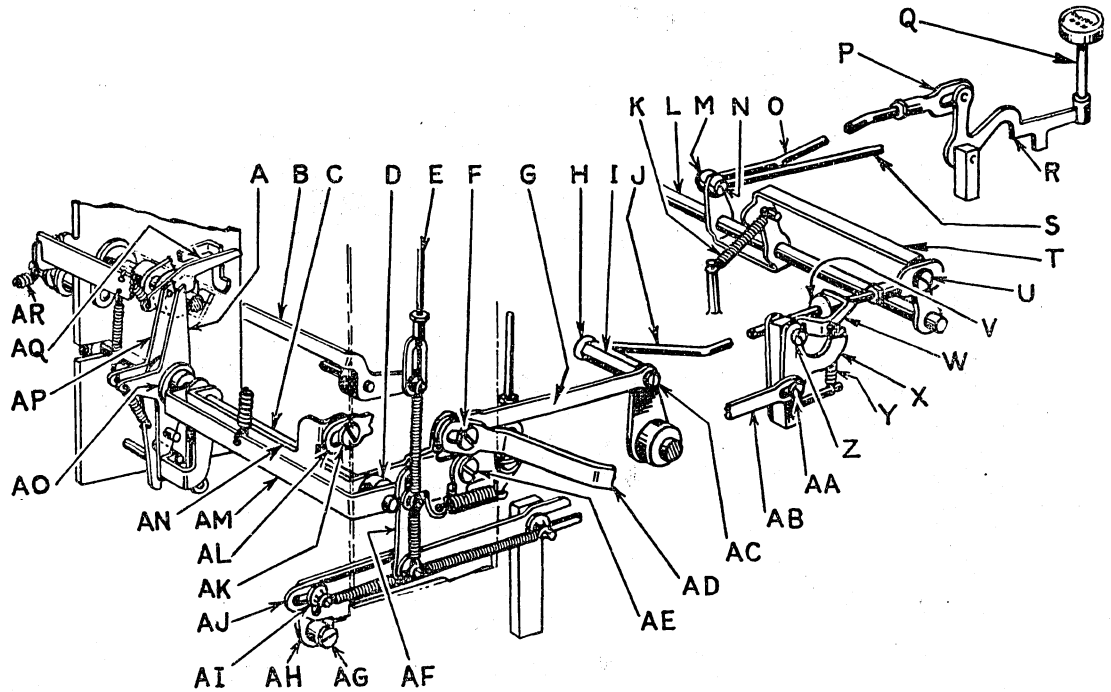
Test for position of shaft O. When shaft O is manually moved to the right, there should be minimum clearance between stud A and arm B to insure latching of non-add mechanism when the crossfooter subtract key is depressed.

Adjustment: Wire J is adjusted.

Test: When the non-add key is depressed, non-add linkage AB should latch.

Adjustment: Wire F is adjusted.

NON-SUBTRACT KEY MECHANISM, CLASS 78 (Plate 37)



Non-subtract Key Mechanism, Class 78 (Plate 37)

The purpose of the non-subtract key is to disable the crossfooter subtract mechanism when the carriage is in subtract control position.

Key Q depressed, lever R and wire O rock bail T, and wire J, moving link G forward, swings bail AN to normal position.

The swinging movement of bail T restores pawl A under latch AQ on the extend plate. The movement of bail T restores part AJ.

The non-subtract key, when completely depressed, is latched by collar V moving in front of latch W.

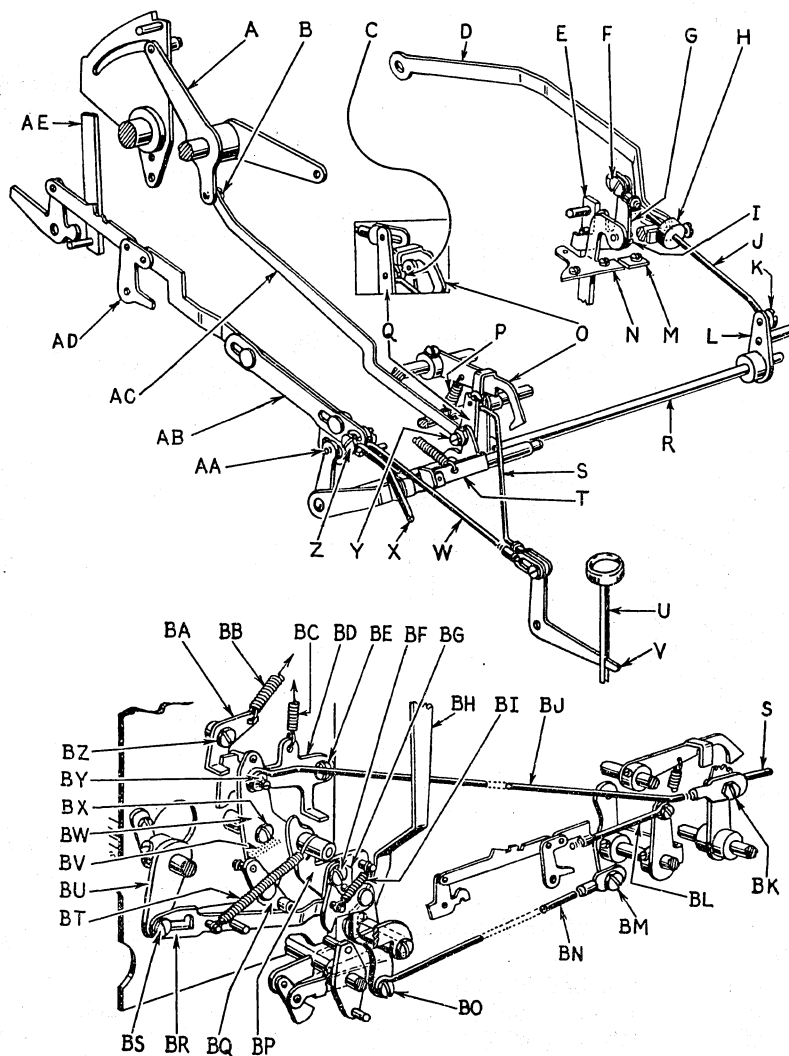
Tests and Adjustments

Test to insure restoring of bail AN.

When the non-subtract key is depressed, the pocket of part AJ should clear shoulder screw AI.

Latching Test: Collar V is located to just allow latch W to move over collar V.

CREDIT BALANCE KEY MECHANISM, CLASS 78 (Plate 38)



Credit Balance Key Mechanism, Class 78 (Plates 38 and 39)

When the credit balance key is depressed, the balance key linkage is pulled forward and latched. In addition to the regular balance key functions, the rear bell-crank of the balance key linkage indexes the extend subtract mechanism. The depression of the credit balance key also indexes the credit balance control mechanism and trips the motor.

The subtract operation pulls in the credit balance linkage and trips the motor for the third operation.

Credit Balance Control Mechanism (Plate 38)

Lever V, through wire S to arm Q, rocks

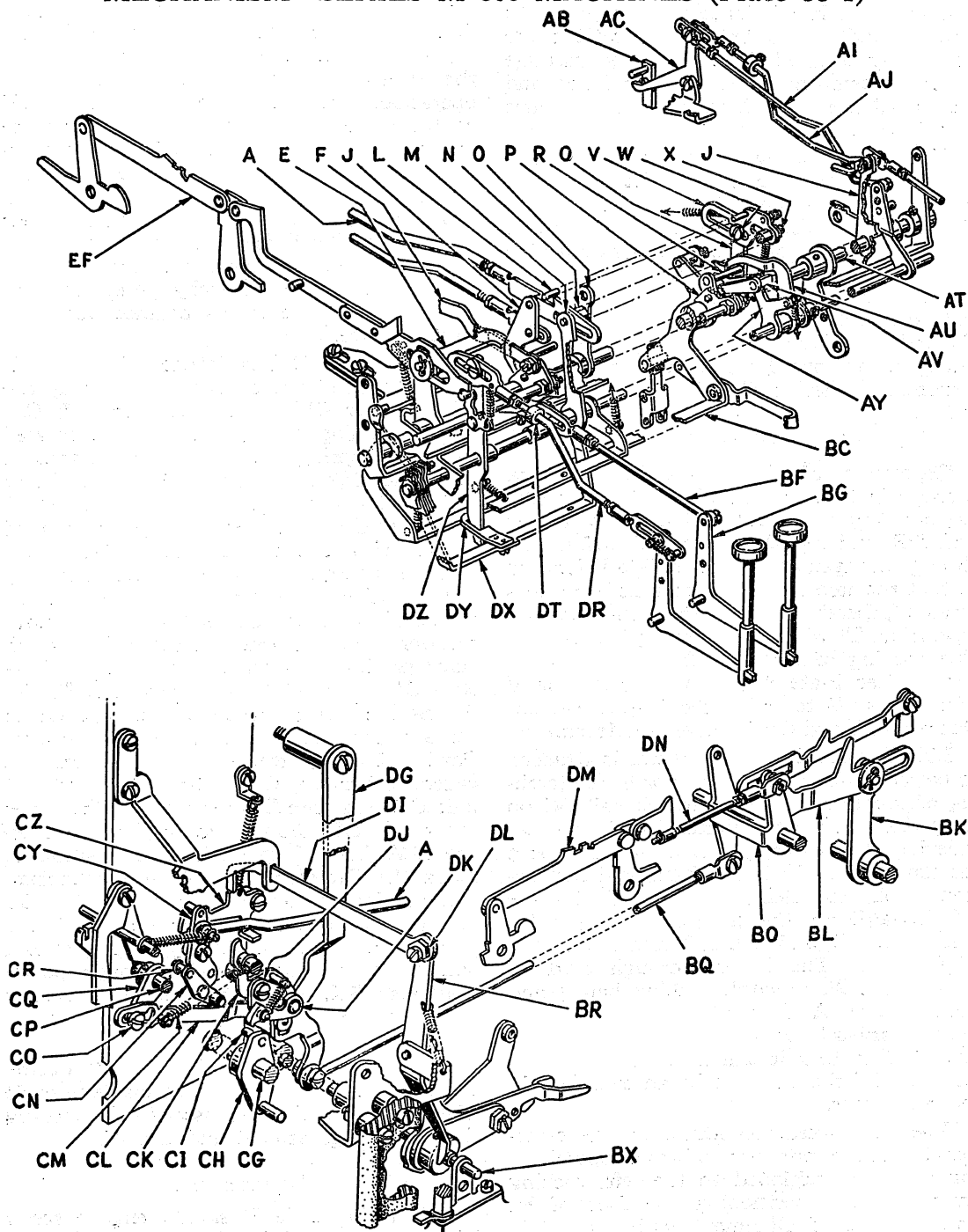
the latter. Wire BJ pulls lever BQ (of assembly BW) over link BR. Assembly BW is latched by pawl BD. The credit balance control mechanism indexing is completed during the forward stroke of the subtract mechanism and becomes active during the return stroke of the subtract operation and also during the third operation.

Meshing the Crossfooter (Plate 38)

In earlier machines, wire W from lever V to balance key linkage AD, pulls link AE downward to mesh the crossfooter.

In late machines, the crossfooter meshing mechanism is indexed and actuated by the machine operation, covered in Plate 29.

MINUS BALANCE OPERATION, THIRD CYCLE INDEXING MECHANISM—SERIES M 800 MACHINES (Plate 38-1)



Minus Balance Operation, Third Cycle Indexing Mechanism—Series M 800 Machines (Plate 38-1)

Purpose

To permit indexing the third cycle of a minus balance operation from either the carriage or the keyboard should an overdraft occur in the crossfooter.

Construction

This mechanism is contained in all Series M 800 machines and was primarily designed to permit carriage control of the minus balance operation in those machines containing the Crossfooter and Register Totals and Sub-totals Indexing Mechanism, Carriage Controlled, but it is also indexed by the

(Plate 38-1) Continued

balance and minus balance result keys. Both balance and minus balance operations are necessarily indexed from the same carriage control inasmuch as both the balance and minus balance result keys index the balance key linkage.

The Third Cycle Indexing Mechanism remains basically the same as that contained in Class 78 machines (see Credit Balance Control Mechanism, Plate 38) except that it now indexes the power for the third machine cycle at the beginning of the minus balance operation rather than toward the end of the subtract cycle. Also, it now contains arm DI and lever BR which, through the occurrence of an overdraft in the crossfooter, determines whether the third cycle will be indexed.

Operation

Depression of the minus balance key, through bell crank BG, wire BF, collar DT, balance key wire DR, balance key rocker arm DZ, and lug DY rocks bail DX which, through hexagon post N, pulls slide V forward so that the step in the slot of slide V engages screw W, thereby indexing the Minus Balance Operation, Third Cycle Indexing Mechanism. The rocking of bail DX from the carriage control (see Plate 8-5) also engages slide V with screw W to index the Minus Balance Operation, Third Cycle Indexing Mechanism.

Slide V engages screw W, which is attached to power shaft arm O, just prior to the latching of square stud AV of switch bail BC on latch AY. When the switch bail is latched, indexing the power, power shaft AT rocks (as explained in Plate 8-1, Keyboard Instruction Book) to latch balance result linkage EF forward, trip the drive through wire AI, bell crank AC, and link AB, and move slide V forward. The latter, through stud L, moves slide M forward, rocking bail J and pulling wire A forward. Wire A, when pulled forward, rocks third cycle control lever CY so that it will be latched forward on latch CZ should there be an overdraft in the crossfooter.

When an overdraft occurs in the crossfooter from a previous subtract operation, shaft BX is positioned to the left, rocking lever BR and positioning the foot of an arm DI out of alignment with latch CZ. This permits lever CY to be latched forward, thereby indexing the third cycle of the minus balance operation. The foot of arm DI remains positioned over latch CZ when there is no overdraft in the crossfooter (since shaft BX remains in its normal position) thus permitting indexing a balance operation without indexing the third cycle.

When bail J is rocked and latched forward by the rocking of power shaft AT, it retains link AB in a raised position, through wire AJ and bell crank AC, until near the end of the subtract cycle of the minus balance operation. At that time, rocker arm CK contacts the foot on latch CZ, rocking the latter and releasing lever CY, thus permitting wire A and bail J to restore to normal and release link AB. At the moment link AB is released, the roll (Y, Plate 12, Power Instruction Book) is positioned directly beneath link AB so that the clutch members are not disengaged, thereby permitting the third cycle of the minus balance operation to take place.

When lever CY is latched forward, its lower portion moves rearward placing the roll of lever CN in contact with link CL, and expanding spring CR. This increased tension of spring CR overcomes the tension of spring CM and permits the vertical slot in link CL to engage screw CO when shaft assembly CP is rocked during the forward stroke of the subtract cycle of a minus balance operation. When shaft assembly CP is rocked to normal during the return stroke of the subtract cycle, link CL is drawn rearward, rocking arm DJ, the roll of which cams pawl DK downward into the path of stud CI in arm CH. Rotation of shaft CG during the return stroke causes stud CI to contact pawl DK and drive it rearward. Pawl DK being attached to rocker arm CK causes rocker arm CK to be rocked and pull link DG and wire BQ rearward. The latter rocks bail BO, drawing minus balance linkage DM forward to its latched position to index the Crossfooter Meshing Mechanism. The rocking of bail BO also moves link BL forward to index the Automatic Tabulation Mechanism (through the upper projection), and rocks the power shaft, through power shaft arm BK, to maintain the ball raceway lock between the second and third machine cycles.

Slide V is disengaged from screw W during the forward stroke of the first machine cycle when link F rocks hub assembly P, raising slide V through stud R and arm AU.

Adjustment

1. Indexing slide V should engage screw W in power arm O just prior to the latching of switch bail BC.

To adjust, turn eccentric bushing X.

2. With the balance key or the minus balance key held depressed, stud L in indexing slide V should have minimum clearance of slide M.

To adjust, position limit E.

(Plate 38-1) Continued

Note: Limit E serves as the normal limit for slide M and bail J and should be checked before making adjustments 3 and 4.

3. Lever CY should have approximately $\frac{1}{64}$ " latching lead on latch CZ.

To adjust, shorten or lengthen wire A.

4. With lever CY latched on latch CZ (bail J forward), link AB should have approximately $\frac{1}{64}$ " clearance over the roll (Y, Plate 12, Power Instruction Book).

To adjust, shorten or lengthen wire AJ.

Note: When checking the clearance of link AB over the roll, latch lever CY on latch CZ, force wire AJ rearward, and observe the distance that link AB recedes before coming to rest on the roll.

5. With shaft BX to the left (overdraft in the crossfooter) the foot of arm DI should clear latch CZ; and when shaft BX is normal,

the foot of arm DI should have a full hold on latch CZ.

To adjust, turn eccentric bushing DL.

6. The shoulder of screw CO should be in the vertical slot of link CL when the forward stroke of the subtract cycle is completed to assure that pawl DK has a secure hold on stud CI during the return stroke.

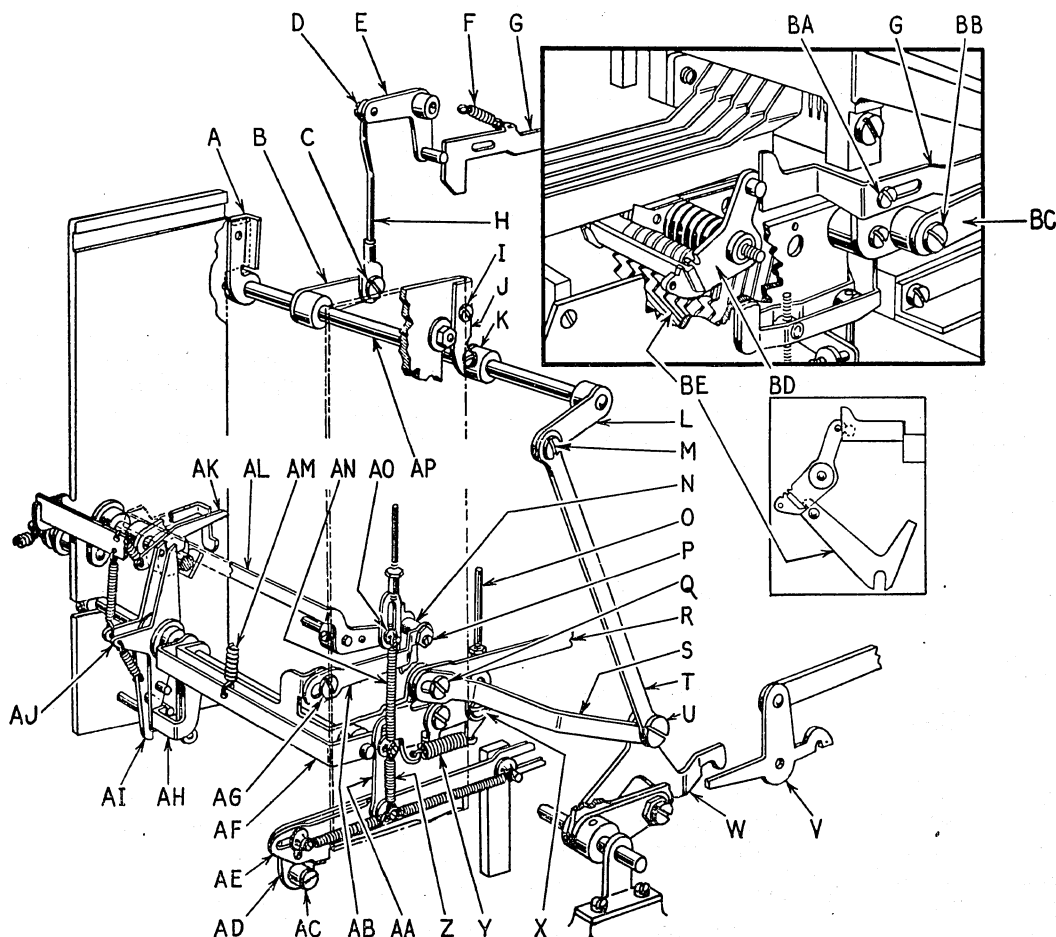
To adjust, position arm CQ on shaft CP during the forward stroke of the second cycle of a subtract operation.

7. For detailed adjustment of bail BO, which is adjusted by shortening or lengthening wire BQ, see Plate 40A.

8. Minus balance linkage DM should be latched forward at the end of the return stroke of the subtract cycle (of a minus balance operation) with slight latching lead (approximately .010").

To adjust, shorten or lengthen wire DN.

CREDIT BALANCE KEY MECHANISM, CLASS 78 (Plate 39)

**Drive Trip (Plate 38)**

Shaft assembly R, through wire J, rocks bell-crank G to raise drive link E, tripping drive and switch.

Typewriter Key Lock (Plate 13)

Arm L (Plate 38), through wire N, swings lever M to contact stud in part P, moving the latter.

Typewriter Keyboard Latch (Plate 13)

Wire H connects lever M to latch assembly E. Link R rocks bell-crank AB which allows slide AA to block bell-crank Z. The stud in Q moves over the step of pawl O (Plate 38).

Indexing the Extend Mechanism (Plate 39)

Part V of the balance key linkage contacts part W which, through link S, rocks bail AF and AH. Link AA and spring Z rock part AE, locating its vertical slot in the path of shoulder screw in AD.

Printing Control (Plate 39)

Part W, through link T to arm L, rocks shaft assembly AP. Arm B through wire H swings bell-crank E which moves slide G to locate printing control assembly BD to non-print the complements. The printing control indirectly disables the red ribbon mechanism that is indexed on the forward extend stroke. The red ribbon mechanism is indexed for the third operation by the credit balance linkage on the return subtract stroke.

Tests and Adjustments (Plate 38)

When assembly BW is manually latched (not key depressed) there should be $1/32''$ clearance between the formed lip on pawl O and screw C. Clearance is increased or decreased by adjusting wire BJ. Credit balance key depressed, there should be $1/64''$ clearance between stud in BW and latch BD. Wire S is adjusted.

(Plates 38 and 39)—Continued

Credit balance key depressed, balance key linkage should latch with .010" clearance. Wire W is adjusted. When the credit balance key is depressed, part G (Plate 39) should have non-binding contact on the stud in hammerblock assembly BD (Plate 39).

Adjustment: Arm E is located as required.

Result Key Mechanism, Single Stroke (Plate 38)

The balance and total keys cannot be sub-totalled by holding one of these keys depressed in Class 78 machines. This construction is necessary in order to use the total key with the carriage subtract control or the subtract key which requires the disengagement of the register for the subtract operation.

Balance key linkage AD and the register total key linkage are connected to their respective keys with links AB which have a vertical and horizontal slot.

Assembly T is actuated by part A through link AC.

During the forward stroke of a balance or total operation the lug of assembly T raises link AB locating the guide studs in the horizontal slot on link AB which allows linkages AD and the register total linkage to restore to normal even though the keys are held down.

Tests and Adjustments

With any result key depressed, machine at rest, end of forward stroke, the horizontal slot of link AC should have a non-binding contact on the guide studs.

Adjustment: The eccentric in link AC is turned.

Sub-total Indexing Mechanism, Result Key Linkages and Latches, Class 78 (Plate 40)

When the sub-total indexing key is depressed together with the balance, credit balance or register total key, the crossfooter or the registers remain in mesh during the return stroke, thereby retaining the total.

When this key is used with the credit balance key, the total is retained, however, the credit balance key cannot be again depressed. The amount in the crossfooter only can be printed in black by depressing the balance key.

In this mechanism, interlock A is effective only when the sub-total indexing key is depressed. Horizontal link E has no front notch for interlock A to engage. When any other than the sub-total indexing key is depressed, interlock A cannot enter either notch in the result key links due to interlock A being blocked by link E which has no front notch.

When the sub-total indexing key is depressed, the notch of link E is in line with interlock A, consequently, when any other result key is depressed, interlock A can enter all notches of the horizontal links during the machine operation.

The linkages cannot restore until interlock A is released at the end of the return stroke due to the angle of the notch.

Note: In machines not having the sub-

total indexing key, the angle of the second slot allows the links to pass under interlock A when the linkages are released at the beginning of the return stroke.

The sub-total indexing mechanism can only be effective in the third operation after the credit balance key has been depressed in order to prevent sub-totaling the complements. For that reason the sub-total indexing mechanism is connected to the OD mechanism through bail N and link Q and becomes operative only when the credit balance is printed during the third operation.

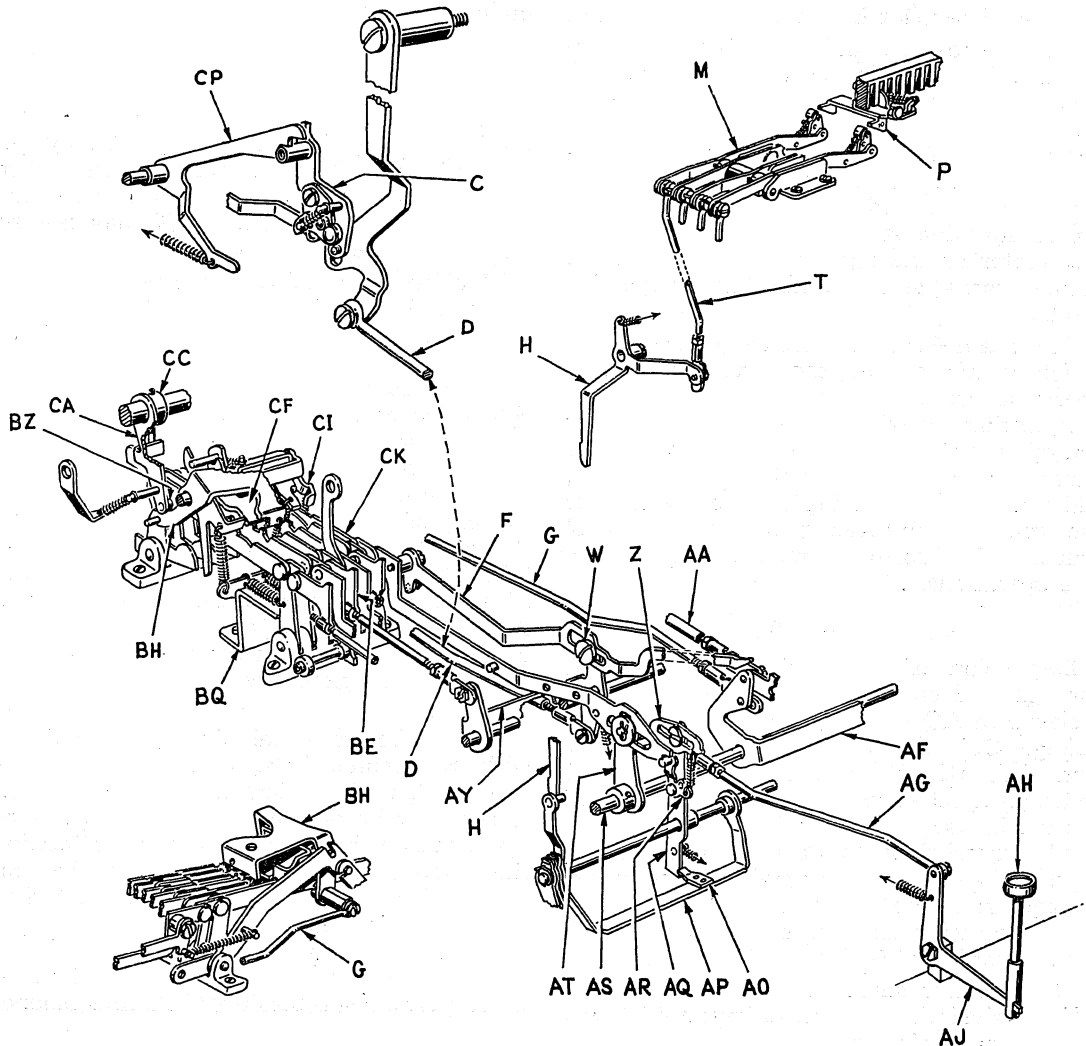
When the sub-total indexing key is depressed, wire S pulls linkage E forward which is latched by pawl AC. Link Q, which pivots on E, moves the step in its slot forward clearing guide screw K, but is held upward by its end being blocked by arm Q (Plate 38).

When the credit balance key is depressed, arm Q (Plate 38) moves forward which allows link Q to drop downward, the step in its slot moving in front of guide screw K. During a credit balance operation, linkage E is released from pawl AC on the end of the first stroke of the first operation. However, link Q is latched by bail N.

Toward the end of the return stroke of the second (subtract) operation, bail N pulls link Q and sub-total linkage E forward, again latching pawl AC.

When the sub-total linkage is latched, the cam end of link Q contacting on arm Q

SUB-TOTAL INDEXING MECHANISM—KEY AND CARRIAGE CONTROLLED—SERIES M 800 MACHINES (Plate 40A)



Sub-Total Indexing Mechanism—Key and Carriage Controlled— Series M 800 Machines (Plate 40A)

Purpose

To retain the total in either the register or crossfooter after printing the amount.

Construction

The Sub-total Indexing Mechanism remains basically the same as that contained in Class 78 machines except that sub-total linkage CK is only indexed (not latched forward) from key depression, it being latched forward by the power of the result operation that is being sub-totaled. In machines con-

taining the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled (Plate 8-5), sub-total linkage CK is also indexed through a carriage control.

The accumulator cannot be sub-totaled by holding the particular result key depressed. The release of the result linkage at the end of the forward stroke, even though the key is held depressed, is necessary in order to use the register total key with a subtract operation (either key or carriage controlled) in order to disengage the register during the subtract cycle of the subtract operation.

Interlock BH, which is the means of holding result linkages forward during sub-totaling operations, is effective only when

(Plate 40A)—Continued

sub-total linkage CK is latched forward. Linkage CK, having no front slot for interlock BH to enter (when linkage CK is not latched forward), prevents interlock BH from entering either slot in the result key linkages.

When sub-total linkage CK is latched forward, its slot is in line with interlock BH, permitting the latter to enter the rearward slot of the result linkage to be sub-totaled and the forward slot of the other result linkages. The result linkage to be sub-totaled is then held forward until near the end of the return machine stroke, retaining either the crossfooter or the register in mesh with the adding racks and retaining the respective total.

Index cam P contains two camming surfaces which permit indexing the particular totaling operation, as well as the sub-totaling operation, during a carriage tabulation. The outer camming surface passes over the roll of the particular totaling operation control arm, while the inner camming surface passes over the roll of sub-totaling operation control arm M, simultaneously indexing the respective operations.

Operation

Depression of sub-total index key AH, through bell crank AJ and wire AG, rocks rocker arm AQ to engage the vertical slot in linkage CK with the stud in power shaft arm AT, thereby indexing the Sub-total Indexing Mechanism. Sub-total linkage CK is then latched forward when the particular result key that is to be sub-totaled is depressed and indexes the particular result key linkage and the power—to complete the result operation and the sub-totaling operation, as explained in Plate 8-1.

When power shaft AS is rocked, linkage CK and the indexed result linkage are latched forward on their respective latches CF and CI, positioning the slot in linkage CK and the rearward slot in the result linkage in alignment with interlock BH. During the forward machine stroke, roll BZ of rocker arm CA leaves the arm of interlock BH, permitting the latter to enter the rearward slot of the indexed result linkage (indexed in conjunction with key AH) and the forward slot of the idle result linkages. During the return stroke, after latch CF releases the indexed result linkage, interlock BH holds the indexed result linkage forward, retaining the crossfooter or register in mesh with the adding racks until roll BZ mounts the arm of the interlock and permits both the result linkage and the sub-total linkage to restore to their normal limit BQ. The restoring

movement of the result linkage is timed to occur after the adding racks have returned to normal and just prior to carriage tabulation.

The forward end of linkage CK is raised during the forward machine stroke, as explained in Plate 8-1, so that the stud in rocker arm pawl AR may reset under the linkage prior to its release from latch CI to keep the linkage disengaged from the stud in power arm AT. Since depression of the sub-total index key indexes linkage CK by engaging it with the stud in power arm AT so that it may be latched forward when the power shaft rocks, linkage CK may not be released by the error key.

Machines containing the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled (Plate 8-5), index the Sub-total Indexing Mechanism through index cam P passing over the roll of control arm M. When the carriage is tabulated so that the inner camming surface of index cam P passes over the roll of control arm M, bail AP is rocked through wire T and bell crank H. The rocking of bail AP rocks rocker arm AQ, through lug AO, to index sub-total linkage CK. The other (outer) camming surface of index cam P indexes the result operation that requires sub-totaling, through its respective control arm, thereby providing the power to complete the sub-totaling operation.

When the sub-total linkage is indexed with the minus balance operation (either through key depression or carriage control), it does not become effective until the third machine cycle in order to prevent sub-totaling the amount being extended during the first cycle. For this reason the Sub-total Indexing Mechanism is connected to the Minus Balance Operation, Third Cycle Indexing Mechanism through bail AY and link F, which permits sub-totaling the minus balance only. When a minus balance is sub-totaled, the minus balance operation may not be indexed again since the amount retained in the crossfooter is not a complementary amount and may only be cleared by indexing a balance operation.

When the Sub-total Indexing Mechanism is indexed with the minus balance operation, linkage CK is latched forward when power shaft AS is rocked. The rocking of the power shaft also rocks third cycle indexing bail AF forward permitting link F to engage screw W in bail AY. Bail AF is retained in its rocked position, through wire AA, as explained in Plate 38-1, until near the end of the second cycle of the minus balance operation.

During the forward stroke of the first machine cycle, while bail AF is in its rocked

(Plate 40A)—Continued

position, interlock BH is held in its normal position through wire G. This prevents interlock BH from entering the rearward slot of the balance linkage and sub-totaling the amount that is extended. Linkage CK is released to normal at the beginning of the return stroke, but since bail AF remains in its rocked position, link F remains engaged with screw W.

Note: Bail AF is also rocked during a balance operation, but it is not latched forward. Therefore, when sub-totaling a balance operation, link F is disengaged from screw W by bail AF when it rocks back to its normal position.

Near the end of the return stroke of the subtract cycle of the minus balance operation, bail AY is rocked, through wire D, thereby latching linkage CK and minus balance linkage BE forward on their respective latches CI and CF to permit interlock BH to enter the rearward slot of minus balance linkage BE during the following machine cycle. The latching of linkage CK and minus balance linkage BE is timed to occur just prior to the returning of bail AF to normal, thus assuring the latching forward of linkage CK before link F is released from screw W. When bail AF rocks to its normal position near the end of the return stroke of the subtract cycle, it contacts the cam end of link F to raise link F and disengage it from screw W; and also releases wire G to permit interlock BH to enter the slots of the linkages and retain the minus balance in the crossfooter.

Adjustment

1. Depression of the sub-total index key should move turnbuckle Z forward approximately .010" before rocking rocker arm AQ.

To adjust, shorten or lengthen wire AG.

Note: Any bending of wire AG which would raise or lower the rearward extension of turnbuckle Z should be followed by checking Adjustment 11, Plate 8-1.

2. Sub-total linkage CK, as well as other power result linkages, should have slight

latching lead, without bind (approximately .010"), on latch CI or CF when the linkage is moved to its maximum forward position by power shaft AS.

To adjust, turn the eccentric bushing (BD, Plate 8-1).

3. With the low point of index cam P resting on the roll of control arm M, the latter should be rocked to index the sub-total linkage at the same time that a total result linkage is indexed.

To adjust, shorten or lengthen wire T.

4. Bell crank H should contact the stud in bail AP with a full hold.

To adjust, bend the lower extremity of bell crank H.

5. Interlock BH should release the result linkage, during a sub-totaling operation, after the adding racks have been restored to normal but prior to carriage tabulation.

To adjust, position collar CC to locate the stud in the lower portion of collar CC forward or rearward.

6. Wire G should retain interlock BH in its normal position while bail AF is latched forward and when roll BZ leaves the arm of interlock BH.

To adjust, shorten or lengthen wire G.

7. With linkage CK in its normal position (limiting on limit BQ) and the hub on arm C limiting in the lower notch of latch CP, wire D should position bail AY so that the step of the slot in link F is located centrally on the shoulder of screw W. This is necessary to prevent link F from moving forward when minus balance linkage BE is latched forward by bail AY when the Sub-total Indexing Mechanism has not been indexed.

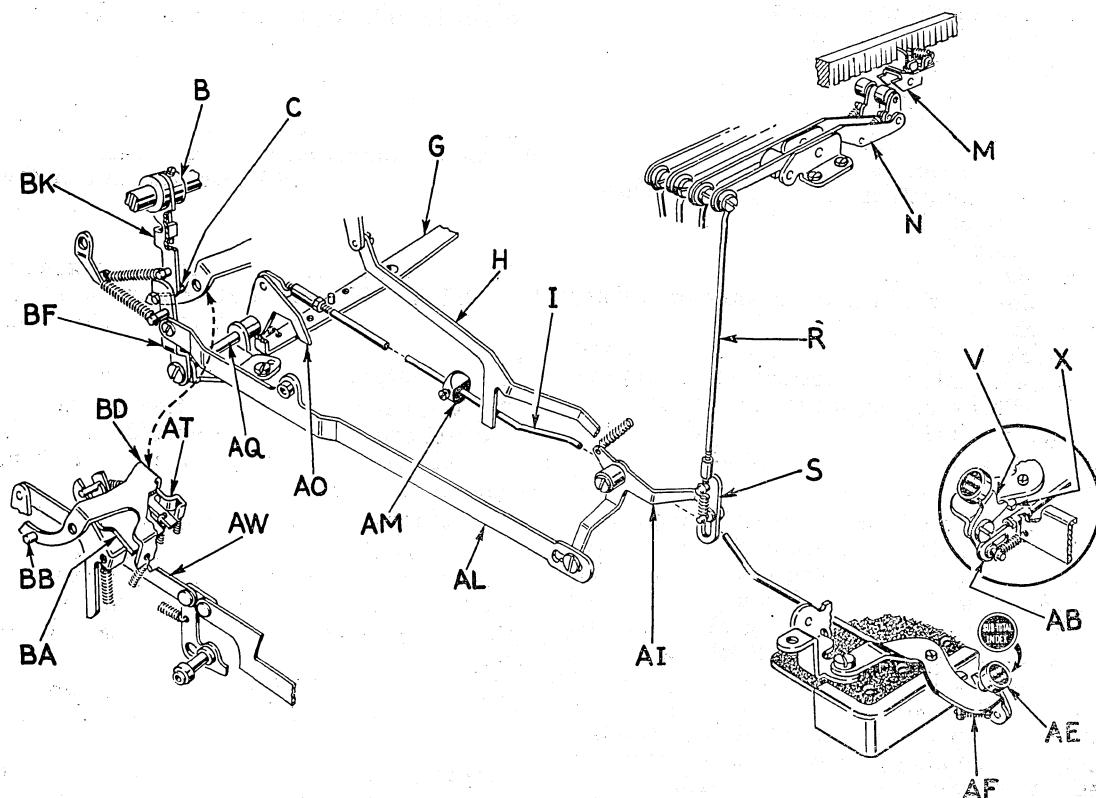
To adjust, shorten or lengthen wire D.

8. During the minus balance operation, sub-total linkage CK should latch on latch CI at the end of the subtract cycle before link F is released from screw W.

To adjust, bend the forward end of link F up or down.

Note: There should be no bind between link F and bail AF when the latter is normal and linkage CK is latched forward.

SUB-TOTAL INDEXING MECHANISM—KEY AND CARRIAGE CONTROLLED—SERIES M 200 MACHINES (Plate 40-1)



Sub-Total Indexing Mechanism—Key and Carriage Controlled—Series M 200 Machines (Plate 40-1)

Purpose

To retain the total in either the register or crossfooter after printing the amount.

Construction

The Sub-total Mechanism is indexed through the sub-total index key in Position No. 100A (to the left of motor bar No. 113) in all Series M 200 machines beginning with Serial No. B197641. In Series M 200 machines containing the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, the Sub-total Mechanism is also indexed through a control lever.

Interlock BD is made square on its lower forward edge so that it holds forward the linkage of any result key that may be used in conjunction with the sub-total index key. (**Note:** In machines containing easy de-

pression power result keys, prior to the introduction of Series M 200 machines, and since those machines contain keys that may be individually sub-totaled the interlock similar to interlock BD contains a square forward edge only in those positions specified to be used for sub-totaling. The forward edge in all other positions is beveled to permit the related result key linkages to restore to normal upon release by the latch similar to latch BA.)

Latch BF, which is contained only in Series M 200 machines, permits interlock BD to function only during sub-totaling operations.

Index cam M contains two camming surfaces which permit indexing the particular totaling operation as well as the sub-totaling operation during a carriage tabulation. The inner camming surface passes over the roll of the particular totaling operation control arm while the outer camming surface indexes the sub-totaling operation by coming to rest on the roll of control arm N when tabulating into a particular carriage position.

*(Plate 40-1) Continued***Operation**

Depression of sub-total index key AE, prior to a result key depression, rocks shaft assembly AQ through lever V and wire I, disengaging latch BF from stud BB in interlock BD. During the forward machine stroke, roll C of rocker arm BK leaves the arm of interlock BD, permitting the latter to enter the slot of result linkage AW (indexed in conjunction with key AE). During the return stroke, after either latch BA or AT releases the indexed result linkage, interlock BD holds the result linkage forward, maintaining either the crossfooter or register in mesh, until roll C mounts the arm of interlock BD and raises the latter to permit the result linkage to restore to its normal limit. This restoring movement of the result linkage is timed to occur after the adding racks have returned to normal and just prior to carriage tabulation.

When sub-total index key AE is depressed, it is latched down by plate X entering the notch in lever V and being held there by the tension of spring AF. The key is released during the forward machine stroke, after roll C leaves the arm of interlock BD, when the projection of link H contacts collar AM on wire I. The key is released by the error key, prior to indexing a result key, through lever G camming arm AO of shaft assembly AQ and rocking the latter rearward.

Machines containing the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, index the Sub-total Mechanism through index cam M mounting the roll of control arm N. When the carriage is tabulated so that index cam M rests on the roll of control arm N, latch BF is disengaged from stud BB through wire R, bell crank AI, and link AL. This permits interlock BD to function as explained previously.

Slotted turnbuckle AB provides a broken joint which permits carriage control of the Sub-totaling Mechanism without affecting key AE, since both AE and control arm N actuate shaft assembly AQ. Conversely, the slot in link AL permits depression of key AE without affecting control arm N.

Slotted turnbuckle S provides a broken joint which permits link H to function without interference when index cam M rests on the roll of control arm N, since cam M does not leave the roll until near the end of the machine cycle.

Adjustment

1. With sub-total index key AE depressed, latch BF should clear stud BB, and arm AO should have non-binding clearance with lever G.

To adjust, shorten or lengthen wire I.

2. With index cam M resting on the roll of control arm N, latch BF should clear stud BB, and arm AO should have non-binding clearance with lever G.

To adjust, shorten or lengthen wire R.

3. Interlock BD should release the result linkages, during a sub-totaling operation, after the adding rocks have restored to their normal positions but prior to carriage tabulation.

To adjust, position collar B to locate the stud in the lower portion of collar B forward or rearward.

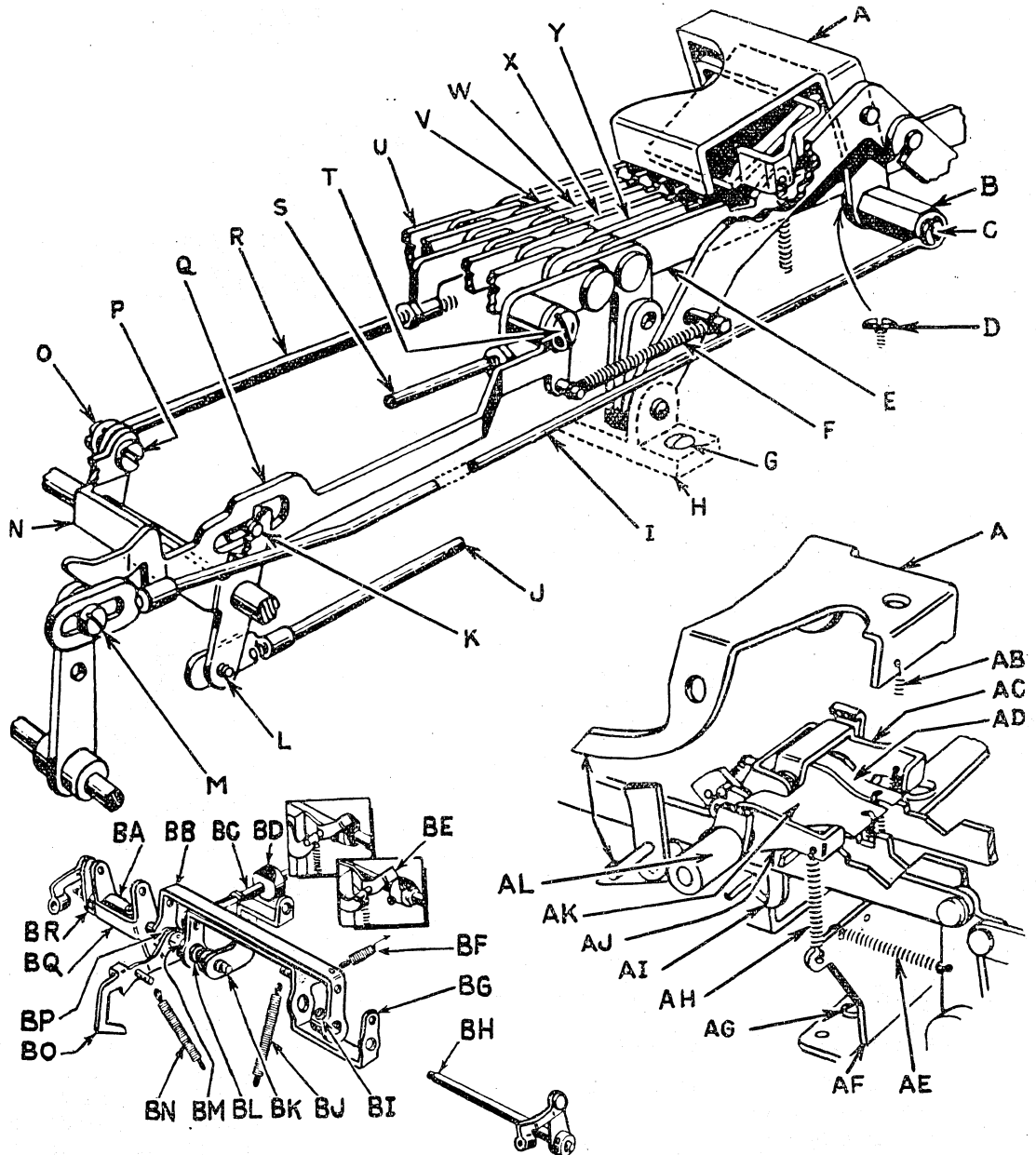
Note: This is the only adjustment made for the Sub-totaling Mechanism on machines prior to Series M 200 machines.

4. Sub-total index key AE should be released to normal by link H just prior to the end of the forward machine stroke.

To adjust, position collar AM.

Note: Should collar AM be positioned too close to the projection on link H, latch BF will bind on stud BB during the forward machine stroke.

SUB-TOTAL INDEXING MECHANISM, RESULT KEY LINKAGES AND LATCHES, CLASS 78 (Plate 40)



(Plate 40)—Continued

(Plate 38) raises the link releasing it from screw K.

At the end of the forward stroke (third operation) the release of arm Q (Plate 38) allows interlock A to block all linkages.

Tests and Adjustments

When sub-total indexing key is depressed, its linkage should latch with .010" clearance.

Adjustment: Wire S is adjusted.

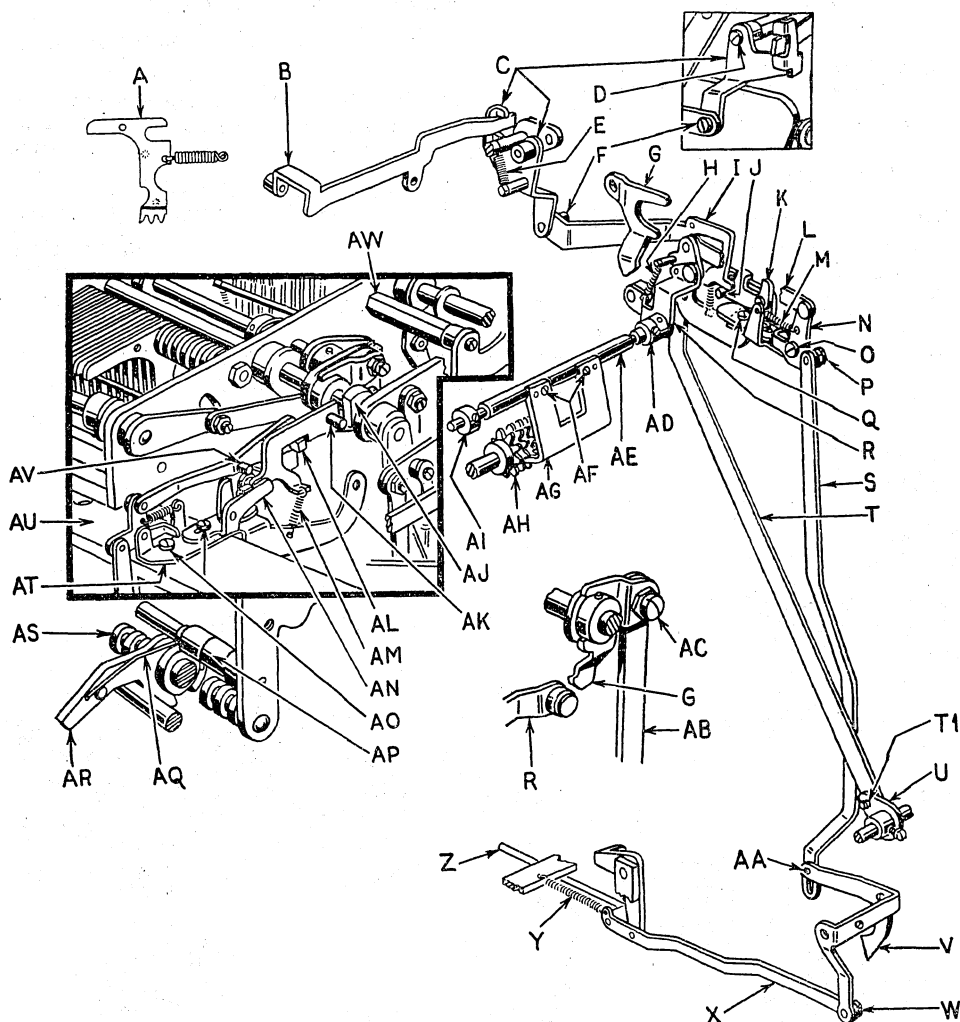
Interlock A should clear linkage E when the sub-total key is depressed.

Adjustment: Wire I is adjusted.

When sub-total linkage E is latched by part AC, the cam end of link Q should release the link from bail N.

Adjustment: The end of link Q is bent downward for earlier, and upward for later release.

KEYBOARD LOCKED FROM CROSSFOOTER NON-CLEAR LOCK MECHANISM, CLASSES 75, 77, 78 (Plate 41)



Keyboard Locked From Crossfooter, Non-clear Lock Mechanism, Classes 75, 77, 78 (Plate 41)

The purpose of this mechanism is to lock the keyboard and the motor bar in predetermined carriage positions when the crossfooter is not clear.

When a control block contacts on the roller on lever B, bell-crank C pushes link I rearward. The step on link I contacts square stud AL which swings comb AG, through spring H, toward pinions AH. Simultaneously, with the swinging of comb AG, link L rocks bell-crank N, which, through link S, bail V, part X, wire Z and spring V (Plate 13), pulls interlock U (Plate 13) into the ball lock.

Pinions AH have pockets that are in line

when the crossfooter is clear which allows the teeth of comb AG to enter, and stud AV (in link L) to contact and swing part K, which raises link I above square stud AL to allow the keyboard lock mechanism to restore.

When the crossfooter is not clear, the pockets of pinions AH are not in line with comb AG which limits the movement of comb AG, not swinging part K, and thereby retaining interlock U (Plate 13) in the ball lock.

Cam G

The purpose of cam G is to swing comb AG rearward when, through a juggle, a non-clear crossfooter is meshed with the rack bars.

When link AB is pulled downward, cam G through arm R, rocks shaft AE and comb AG to clear pinions AH.

*(Plate 41)—Continued***Special Carry Racks A and Rack Bar Detents AR**

Carry rack A has stock removed to clear comb AG. Detents AR have studs and special springs to clear comb AG.

Keyboard Release

When the keyboard is locked due to pinions AH not being clear, the keyboard can be released as follows:

When the error key is pushed, link T contacts stud AK, raising link I to clear stud AL which allows the keyboard lock mechanism to restore.

Tests and Adjustments

When a control block moves from under the roller on lever B, the step of link I should clear the front face of stud AL.

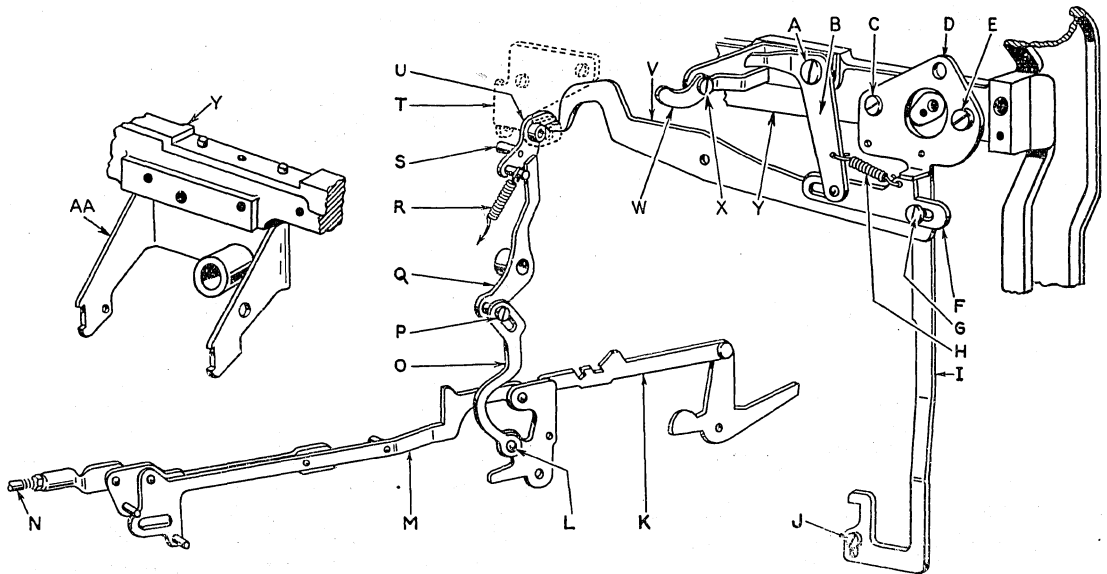
Adjustment: The lower front arm of N is bent.

When one or more prongs of comb AG are not in line with pinions AH, interlock U (Plate 13) should be past center of the ball lock.

Adjustment: Eccentric P is turned.

When a control block moves under the roller on lever B (crossfooter clear) the step of link I should ride off stud AL with least clearance.

Adjustment: Screws AO are loosened and bracket AN is shifted as required.

RESULT KEYS TO INDEX REGISTER INTERLOCK (Plate 42)**Result Keys to Index Register Interlock (Plate 42)**

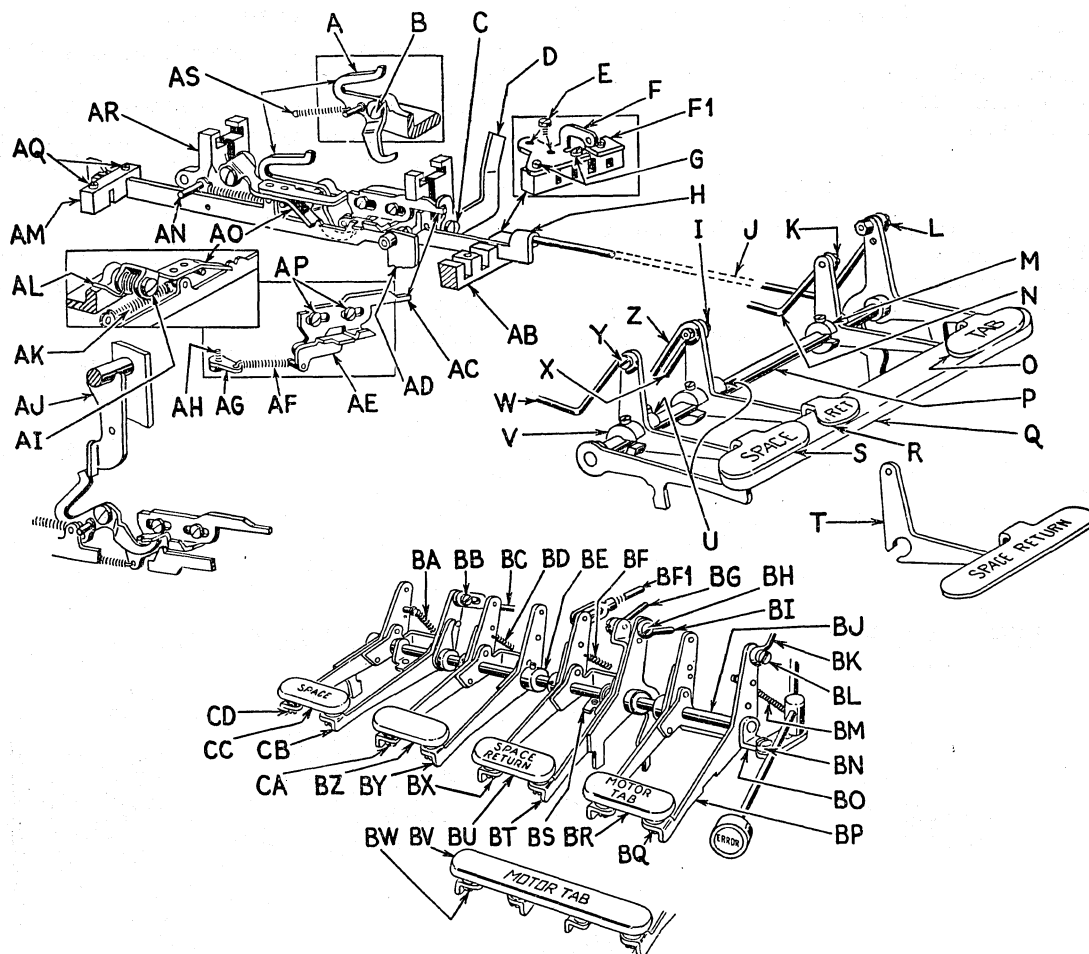
The purpose of this mechanism is to lock the registers when the balance or register total key is depressed.

This mechanism is used in Class 78 machines in which the drive and switch are tripped by key depression, and also in Class 72 machines in connection with the register total key.

When the balance key is depressed, linkage K rocks lever Q which through lever U rocks lever V, raising part I to block the error key and to index the register interlock.

When the register total key is depressed, linkage Q (Plate 28) and link X (Plate 28) rock bell-crank AA (Plate 28) which, by contacting stud S, rocks levers U and V to block the error key and index the register interlock.

MOTOR BARS AND SINGLE STROKE MECHANISM (Plate 43)



Motor Bars and Single Stroke Mechanism (Plate 43)

The purpose of the single stroke mechanism is to prevent more than one machine operation when the motor bar is held depressed. When the motor bar is depressed, a step on slide H contacts on arm AE and moves assembly AC forward. The incline of AC raises drive trip stem AD which permits the engagement of the clutch to operate the machine. The motor bar is held by latch AO. The front end of slide AC cams link D upward to set the register interlock.

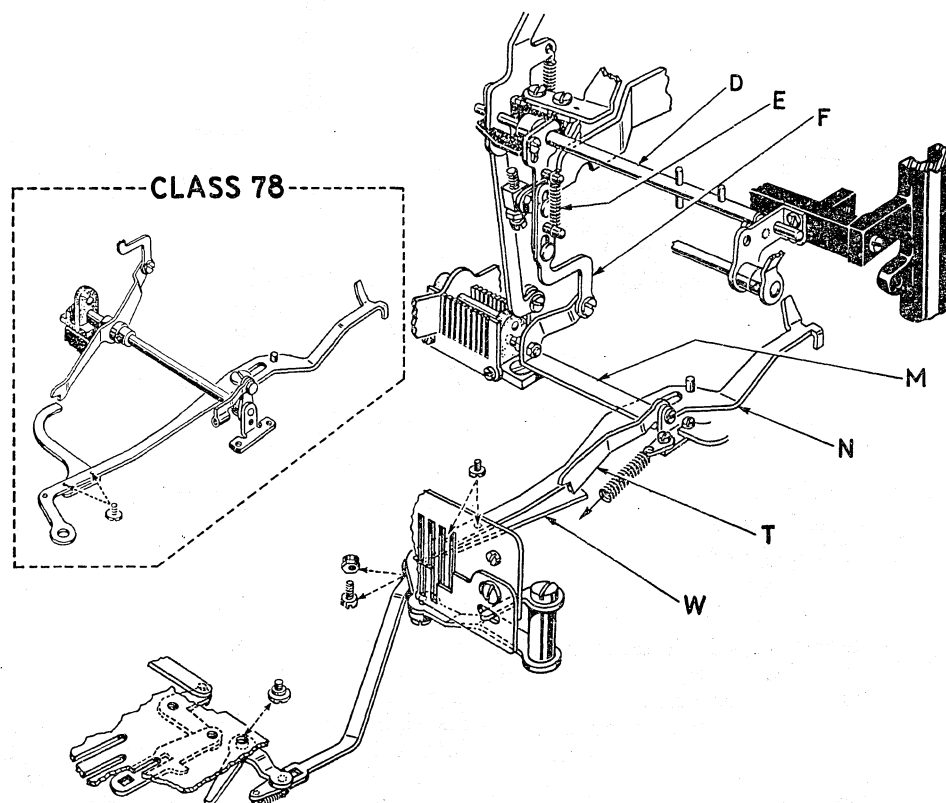
During the forward stroke of the machine, arm AJ moves latch A rearward, its lower arm raising AE above the step on H, thereby

breaking the connection between the motor bar and slide AC. The raising of arm AE allows slide AC to move rearward and limit on the horizontal portion of latch A.

On the return stroke of the machine, arm AJ moves latch assembly A forward to raise AO above slide assembly H, and AC to allow H and AC to return to normal, and AE to locate in front of step on H.

When the motor bar is held depressed, the step on slide H is held forward, then arm AE cannot drop in front of this step until the motor bar is released which permits H to move rearward so as to locate its step in the rear of arm AE, thereby connecting the motor bar with slide assembly AC.

KEYBOARD INTERLOCK TO RETAIN MOTOR BAR, RESULT KEY, AND TYPEWRITER KEY LOCKS DURING CARRIAGE TABULATION FROM MOTOR BAR (New Wide Base) (Plate 43-1)



Keyboard Interlock to Retain Motor Bar, Result Key, and Typewriter Key Locks During Carriage Tabulation from Motor Bar (New Wide Base) (Plate 43-1)

Purpose

The purpose of this mechanism (during a motor tabulating operation) is to retain the keyboard interlocks in an active position after the release of the motor bar and until the carriage tabulation is completed. This lessens the possibility of trapping the registers through rapid, successive motor tabulating operations. Operational control keys and adding keys—other than motor bars, result

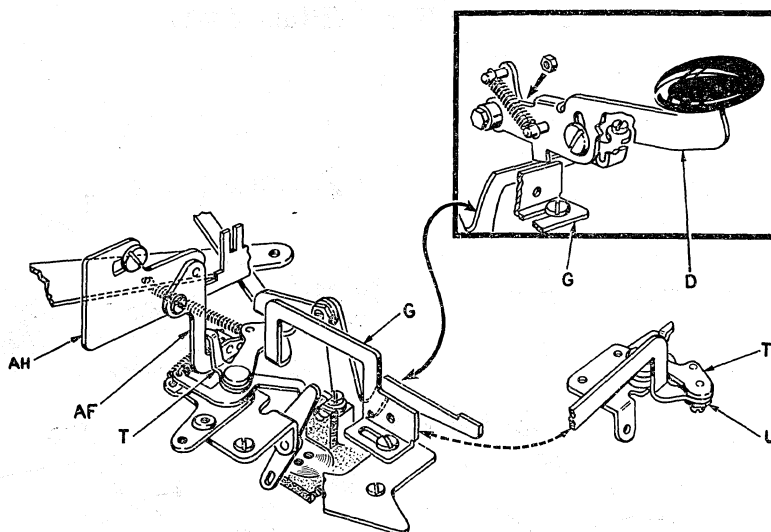
keys, and typewriter keys—are open for indexing during the carriage tabulation.

Operation

As shaft D is raised, it rocks bail M through link assembly F. Arm T (of bail M) is placed in the return path of limit arm W to prevent the restoring of link N when, at the end of the return stroke, the keyboard latch mechanism is released. This assures the retention of the engaged keyboard interlocks until the completing of the carriage tabulation permits bail M to restore to normal, releasing link N to release the keyboard interlocks.

Spring joint E permits shaft D to be raised during a palm tabulating operation when arm T comes against the top of arm W.

PALM TABULATOR LOCKED DURING MACHINE OPERATION— SERIES M 200 AND M 800 MACHINES (Plate 44-1)



Palm Tabulator Locked During Machine Operation—Series M 200 and M 800 Machines (Plate 44-1)

Purpose

To prevent depression of the palm tabulator bar during a series of carriage controlled total operations, thus preventing possible indexing of two different carriage controlled total operations—one automatically and one manually.

Construction

This mechanism is contained in those Series M 200 machines that contain the Crossfooter and Register Totals Indexing Mechanism, Carriage Controlled, and in all Series M 800 machines. It is not included in Series M 200 machines that do not contain the carriage controlled totals so as to permit tabulating manually while multiplying. It is included in all Series M 800 machines, irrespective of carriage controlled totals, because it is more effective than the previously used interlock (E, Plate 12).

Operation

As typewriter keylock comb AH moves to the right during a machine operation, anchor plate AF, through bell crank T, positions slide G in the path of tabulator arm D, thereby preventing depression of the tabulator bar during machine operation. Typewriter keylock comb AH is retained in its rightmost (active) position, through the interlock (AJ, Plate 13-1), throughout a series of carriage controlled total operations as explained in Plate 13-1, thus preventing possible indexing of more than the designated carriage controlled operation.

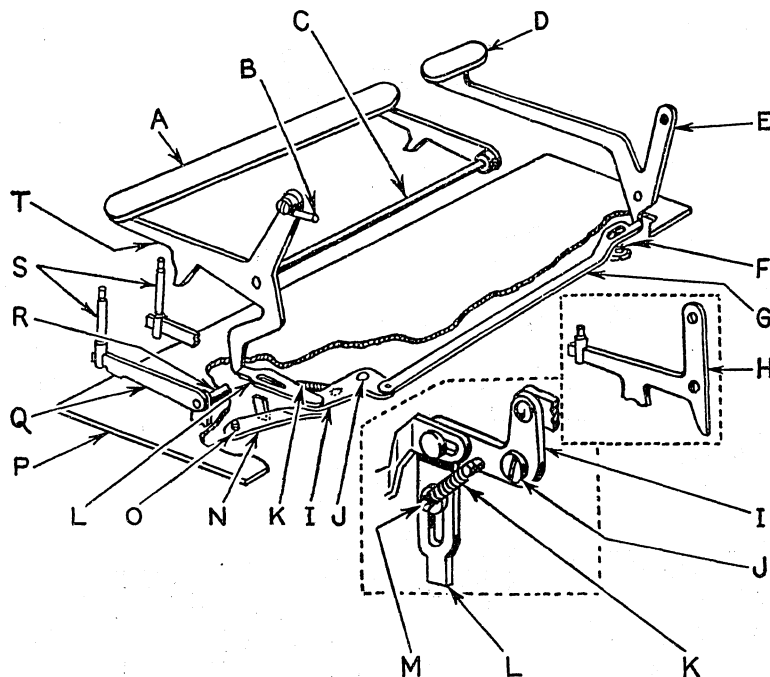
Interlock (AJ, Plate 13-1) is also contained in Series M 800 machines.

Adjustment

1. Slide G should have minimum clearance with tabulator arm D when the latter is depressed.

To adjust, turn eccentric U.

MOTOR BAR AND TABULATOR INTERLOCK (Plate 44)



Motor Bar and Tabulator Interlock (Plate 44)

The purpose of this interlock is to prevent a simultaneous depression of the motor bar and the tabulator key.

Sequence and Construction

When the motor bar is depressed, arm T contacts on slide L which swings bell-crank I and moves link G toward the left, blocking the tabulator key. When the tabulator key is depressed, it blocks link G which prevents depression of the motor bar. This interlock is fastened to the bottom side of lower keyboard Plate P.

In Styles 7600 and 7400, this interlock is actuated by the lower projection on H con-

tacting on N which swings link G to the left, blocking the tabulator key.

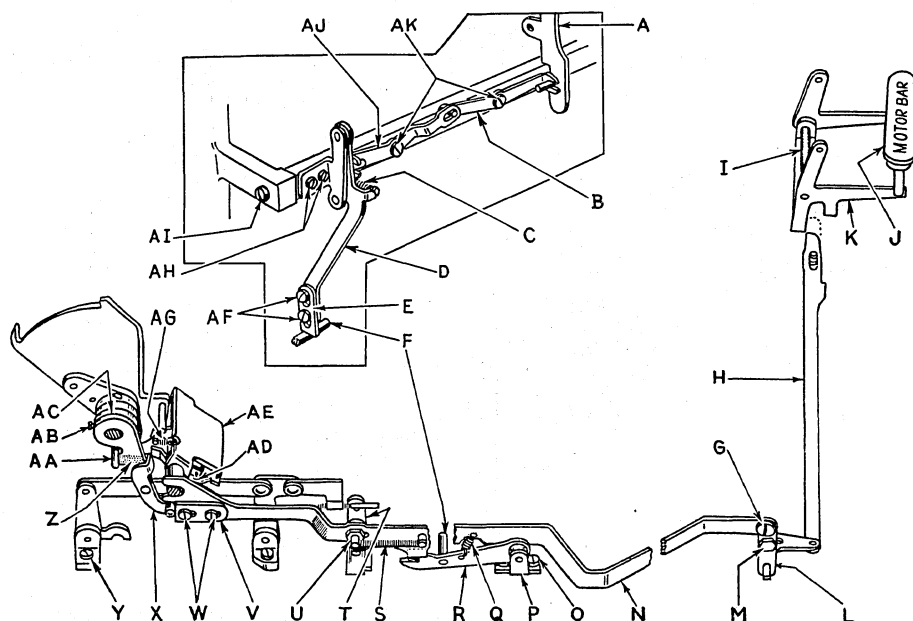
Tests and Adjustments

There should be about $1/32''$ clearance between the foot of T and L. To adjust, stock is removed from L. The end of link G should have about $1/64''$ side clearance with the foot of the tabulator key. To secure this clearance, stock is removed from link G.

With motor bar depressed, the foot of tabulator key E should have about $1/64''$ clearance with the front edge of link G. This adjustment is made by removing stock from the front edge of link G. The lower projection of part H should have about $1/32''$ clearance from part N.

To adjust, stock is removed from N where H contacts N.

TABULATOR MOTOR BAR DELAYED FROM RESTORING, TABULATOR CONTROLLED, CLASS 77 (Plate 45)



Tabulator Motor Bar Delayed From Restoring, Tabulator Controlled, Class 77 (Plate 45)

The purpose of this mechanism is to retain the keyboard in locked position by holding the motor bar depressed until the completion of the carriage tabulation. If a red key could be depressed during tabulation, the same register would shuttle in the wrong column, the carriage being locked by the blade entering the carriage rack.

Sequence and Construction

During the early part of the machine operation, stud AA allows assembly X to release interlock AE which locks all result keys during machine operation. Part X allows spring S to pull link N rearward; in this position it is blocked by latch R. The rearward movement of assembly N rocks part L, which moves interlock H to block the tab motor bar and the register subtract key. The latched position of N blocks assembly X on the return stroke of the machine, causing spring Z which

connects the two members of X to expand, thus retaining the locking effect of interlocks AE and H.

When tabulator arm A is rocked, arm D is raised above stud F through levers B and AJ.

When tabulator arm A is released, its downward movement lowers latch R which permits spring Z to restore interlocks AE and H.

Tests and Adjustments

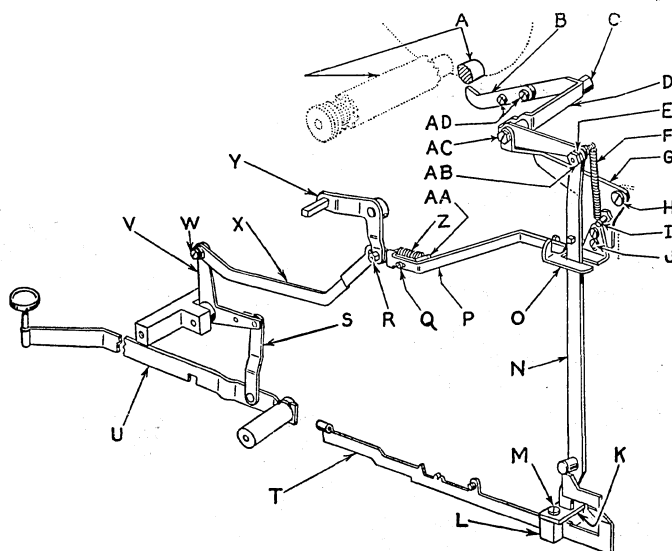
Machine normal, there should be about $1/64''$ side clearance between the step of H and the register subtract key. When the machine operation is started, H must have sufficient hold on the tab motor bar.

This adjustment is made by shifting slide V on the rear of part N. Part N should not limit on stud U if slide V adjustment is correct for motor tab bar and subtract key.

Adjustment: Bracket T is bent.

Part D should swing latch R $1/64''$ below the step on N. This adjustment is made by shifting slide E upward or downward.

TABULATOR MOTOR BAR DELAYED FROM RESTORING, REGISTER CONTROLLED, CLASS 77 (Plate 46)



Tabulator Motor Bar Delayed From Restoring, Register Controlled, Class 77 (Plate 46)

The purpose of this mechanism is to lock the keyboard in order to prevent shuttling a register while the rotary register assembly is turning, which can occur during a short carriage tabulation. This mechanism locks the keyboard through blocking the tab motor bar.

Sequence and Construction

When the motor bar is in depressed position, the foot of link N is in line with the lower edge of slide T. Now, when the carriage trips the register selecting mechanism, register pin A moves and permits spring F to rock bail D which causes the foot of link N

to move below the upper edge of slide T, blocking the latter until the rotary register assembly has become normal. Register pin A when normal, contacts on part B rocking bail D and raising link N, which allows the motor bar to restore.

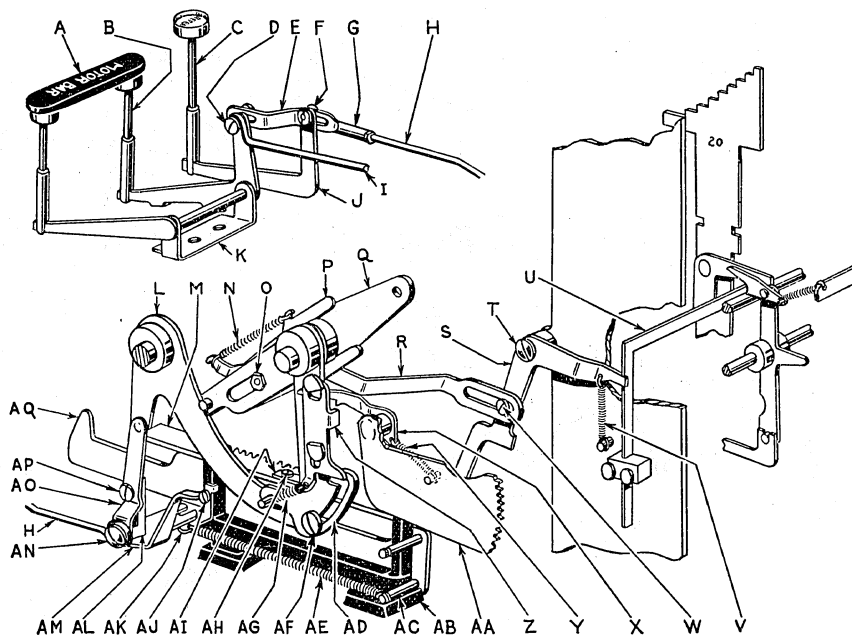
When slide T is blocked by link N, the square stud in the latter blocks part P, which locks the register return key. When the register return key is depressed, part P moves into the path of link N.

Tests and Adjustments

When the machine is in normal position, the edge of part B should have minimum clearance from pin A.

Adjustment: Eccentric E is turned.

REPEAT OF ITEMS MECHANISM (Plate 47)



Repeat of Items Mechanism (Plate 47)

The purpose of this mechanism is to retain in the intermediate keyboard section the amount set up with the red keys.

Sequence and Construction

When repeat key C is depressed, bell-crank AO is rocked through wire H. The movement of bell-crank AO swings arm L upward, the latter latching on the step of the closed slot in part AD. The movement of arm L raises slide P sufficiently to clear part AI which prevents restoring the stops in the intermediate keyboard. Arm L also raises slide Z into the path of arm X.

Arm L is held in latched position during the forward stroke and is released on the return stroke after slide P has moved past part AI.

This mechanism is restored to normal by

arm X contacting on the step of slide Z (carried by AD) and moving the latter forward from under arm L.

Spring N restores slide P and also arm L.

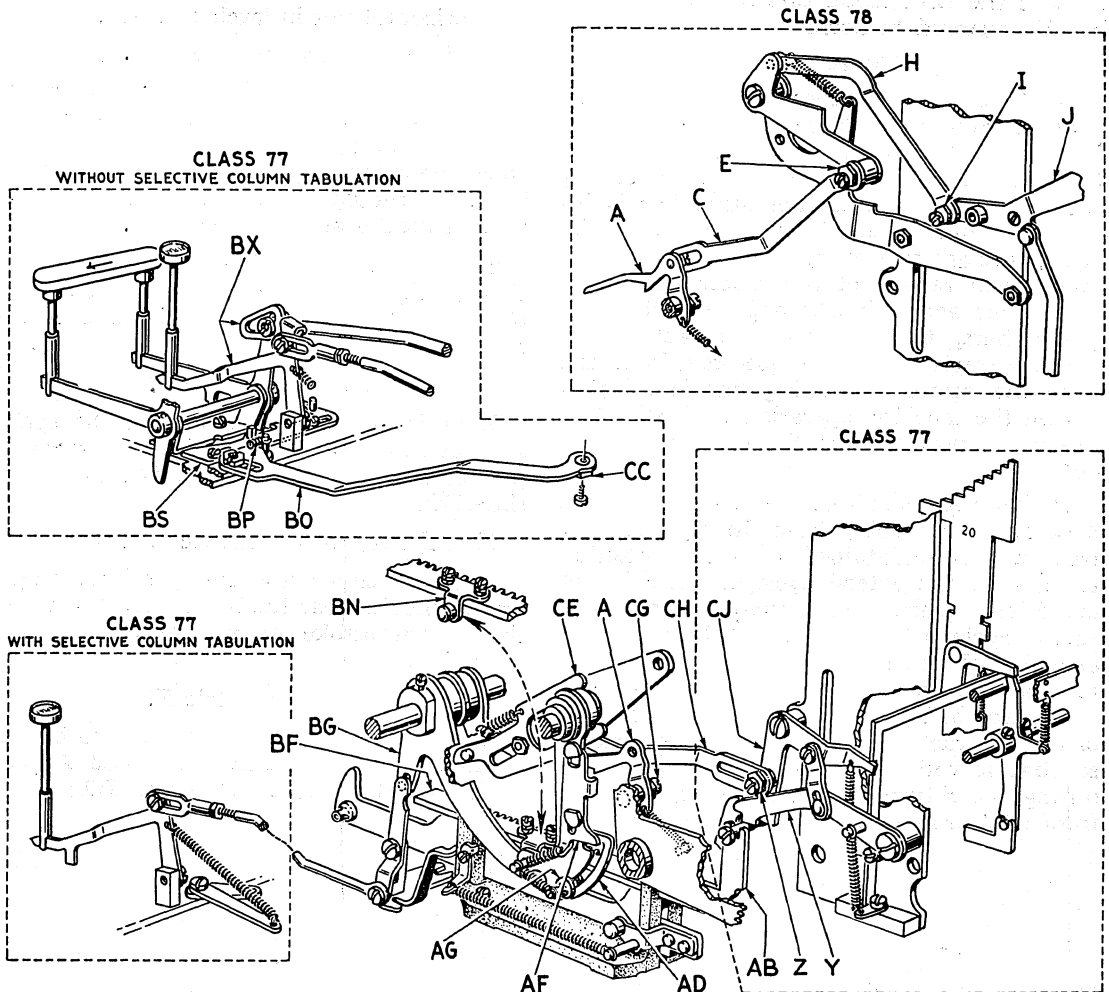
Slide Z

The purpose of slide Z is to prevent latching the repeat mechanism when the repeat key is held down; in this case arm X holds arm AD forward. When the repeat key is released, slide Z is pulled out of the path of arm X by spring AG which allows arm AD to restore to normal.

Tests and Adjustments

Arm L should latch on AD before the clutch is tripped. This is to insure retaining the amount in the intermediate keyboard. This adjustment is made with turnbuckle on wire H. Arm L should clear part AI by $1/32''$.

REPEAT OF ITEMS MECHANISM, IMPROVED—CLASSES 77 AND 78 (Plate 47-1)



Repeat of Items Mechanism, Improved —Classes 77 and 78 (Plate 47-1)

Related Knowledge

General functioning of the Repeat of Items Mechanism, as described in Plate 47, remains unchanged. However, some modifications were necessitated by the increased listing capacity which is included in later machines.

Purpose

This improved mechanism delays resetting of the intermediate keyboard stops, during normal operations in machines containing 14 digit listing capacity, until the intermediate keyboard has been lowered after indexing the adding rack limit stops. This prevents an attempt to restore the intermediate key-

board stops while they are in contact with the adding rack limit stops.

Construction

This improved mechanism is used in Classes 77 and 78 machines beginning with Serial Nos. B83102 and B97847, respectively.

Roll assembly BN, which replaces the lug (AI, Plate 47), and the point on slide CE are designed to contact each other later, thus delaying the restoring of rack BF when full capacity has been indexed.

Arm BG has stock removed from the surface which contacts the stud in slide CE to permit slide CE to fully contact the roll of roll assembly BN.

(Plate 47-1) Continued

Eccentric Z is added, in Class 77 machines, to permit adjusting the throw of link CH so that the Crossfooter Subtract Mechanism is fully restored to normal.

Operation

In Class 77 machines without selective column tabulation, depression of the repeat key indexes the motor tabulating bar through bell crank BX. Slide BO, which moves forward when the motor tabulating bar is indexed, permits interlock BS to move to the right, through tension of spring BP, immediately upon release of the motor tabulating bar. This action blocks depression of both motor bars, the non-clear subtractor key, and the register trip release key from the time the motor tabulating bar is released during the machine operation until slide BO returns to normal after the register shuttles out.

In Class 78 machines, the Repeat of Items Mechanism is indexed from the repeat motor bar, and is maintained in active position throughout the extend cycle of the subtract operation. During the forward stroke of the extend cycle, subtractor bail J, through latch assembly H and link C, raises release arm A to clear the lip on slide AF. Restoration of subtractor bail J to normal at the beginning of the subtract cycle positions release arm A so that it will contact the lip of slide AF during the return stroke, releasing arm BG from latch arm AD.

Adjustment

1. Release arm A should swing latch arm AD, during the return machine stroke, sufficiently to release screw AG in arm BG from the horizontal slot in latch arm AD.

To adjust, turn eccentric CG.

Note: The high side of eccentric CG should be positioned upward so that there will be slight up and down play in slide AF when the repeat key is held depressed. That is, there should be clearance between the lip on slide AF and release arm A.

2. With the machine forward, link CH should fully restore slide AB without binding toggle shaft interlock Y on the hub of bell crank CJ.

To adjust, turn eccentric Z:

3. With the machine normal, the spring stud of interlock BS should be on the high part of the projection on the forward end of slide BO.

To adjust, turn eccentric CC.

4. With subtractor bail J raised, release arm A should clear the lip of slide AF during the return stroke of the extend machine operation.

To adjust, turn eccentric E.

Note: This adjustment is affected by any readjustment of eccentric I. (See Adjustment 6, Plate 19-2, Carriage Instruction Book.)

Mr M R Lovejoy
Buffalo N Y Branch

10-5

REGISTER AND CARRIAGE RETURN KEY INTERLOCK, SKIP TABULATOR, CLASS 77 (Plate 48)

Register and Carriage Return Key Interlock, Skip Tabulator, Class 77 (Plate 48)

The purpose of this mechanism is to block the register return and carriage return mechanism when one of the skip tab keys is depressed and vice versa.

Sequence

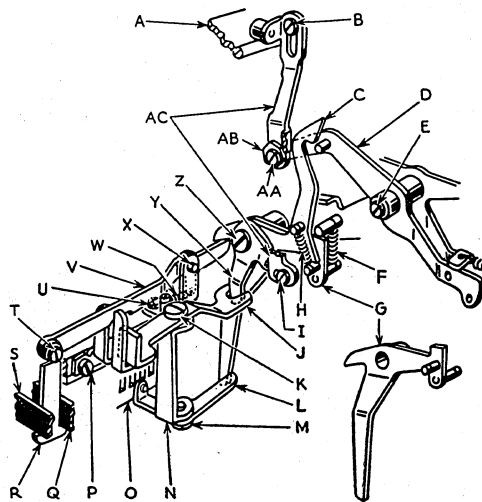
When one of the skip tab keys is depressed, bail A raises link AC, the latter swings bell-crank lever Y, which in turn swings interlock J into the path of lever V, thereby blocking the register return and carriage return keys.

When either register or carriage return key is depressed, lever V rocks part G, which through spring H swings hook of interlock C over the stud in lever D which prevents depressing any skip tab key.

When motor bars are depressed, the movement of comb O swings bell-crank lever L, which by contacting on the foot of part G, swings interlock C to block part D to prevent depressing the skip tab keys.

Tests and Adjustments

When register or carriage return keys are depressed, hook of interlock C should have full hold on the stud in part D. Also the face of interlock C should clear the stud in part D



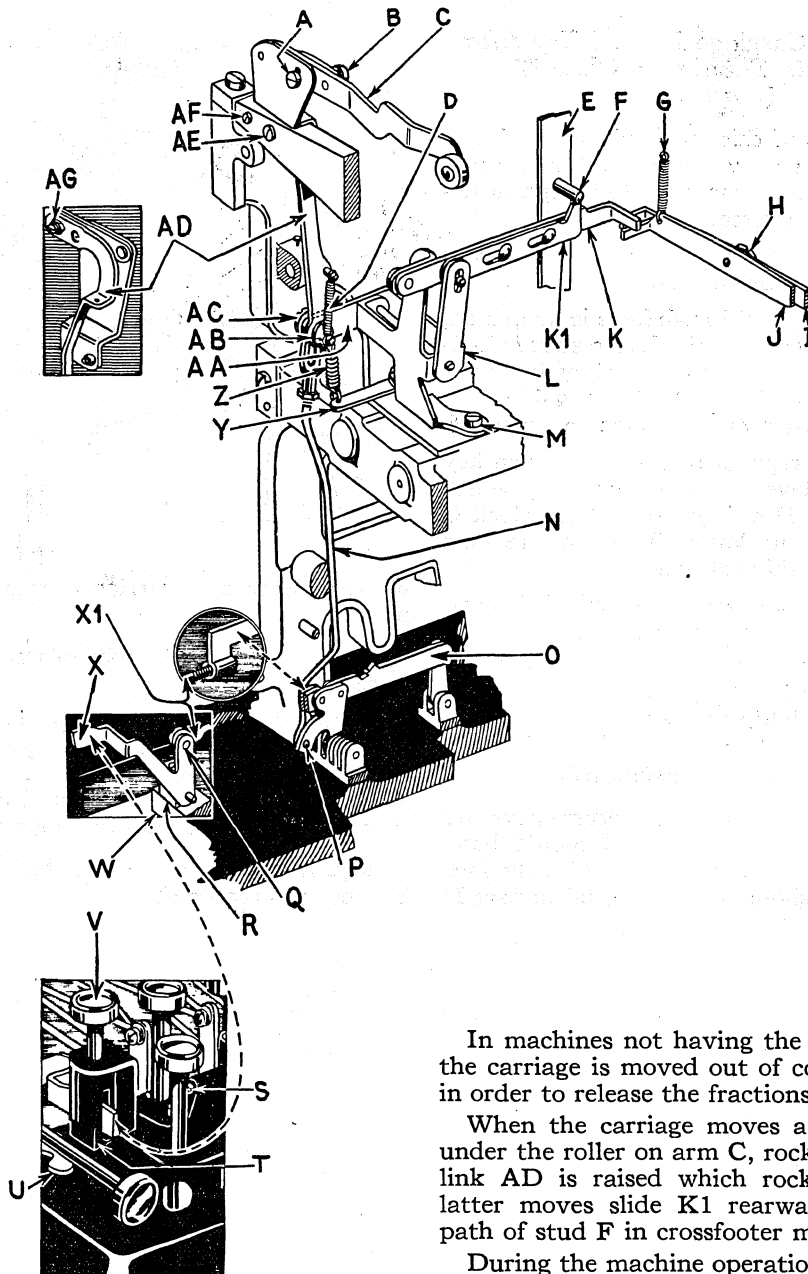
when register and carriage return keys are normal.

Adjustment: The foot of part G is bent as required.

When one of the skip keys is depressed, interlock J should completely block the register and carriage return keys. Also, interlock J should clear register and carriage return keys when the skip tab keys are normal.

Adjustment: The foot of bell-crank lever Y is bent as required.

PRO-RATING MECHANISM WITH DISABLING KEY, CARRIAGE CONTROLLED (Plate 49)



Pro-rating Mechanism With Disabling Key, Carriage Controlled (Plate 49)

The purpose of this mechanism is to retain the fractional accumulation in the crossfooter except when the disabling key is depressed, which permits the depression of either the final product or first product key to release the fractions.

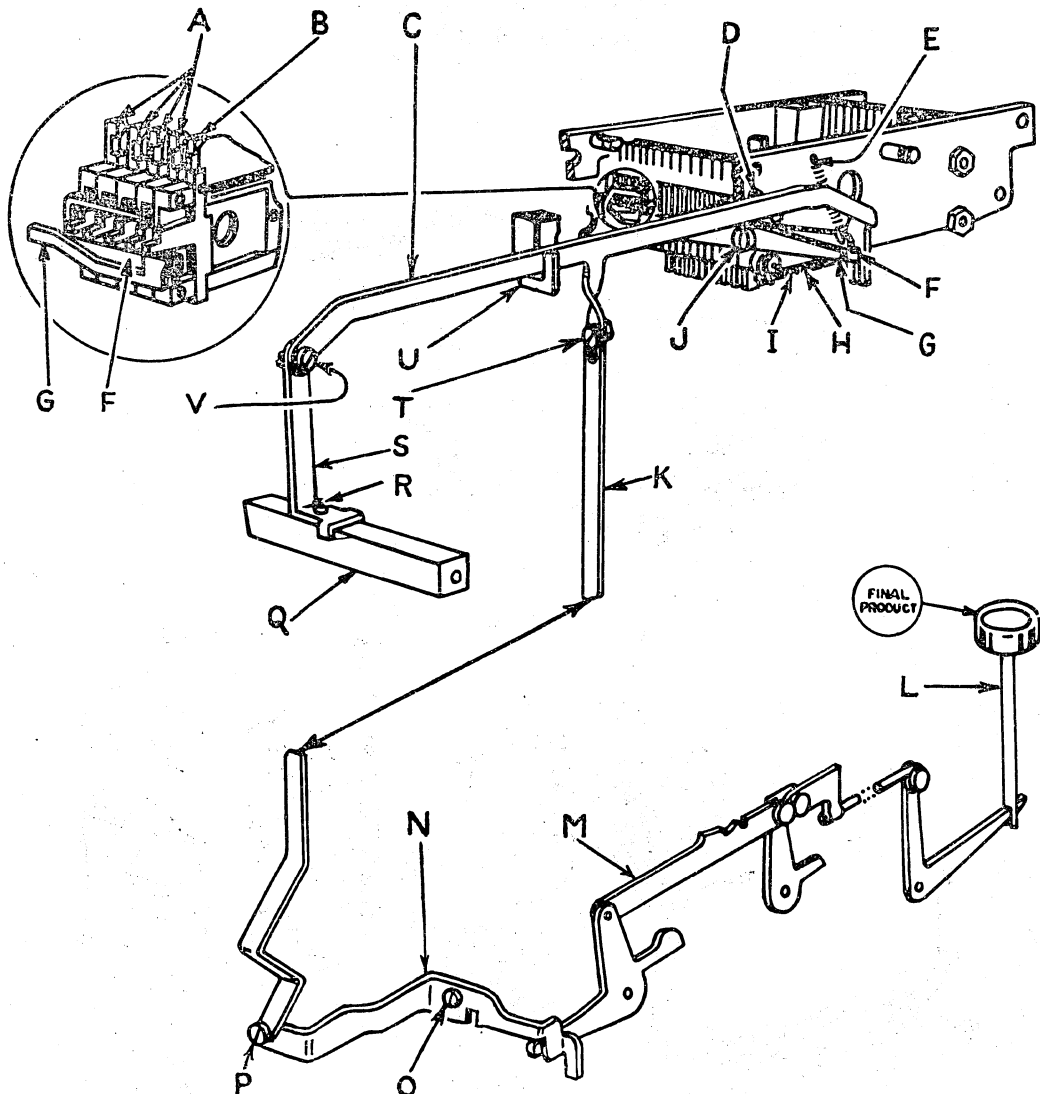
In machines not having the disabling key, the carriage is moved out of control position in order to release the fractions.

When the carriage moves a control block under the roller on arm C, rocking the latter, link AD is raised which rocks bail L; the latter moves slide K1 rearward out of the path of stud F in crossfooter meshing link E.

During the machine operation, or when the final product or the first product key is used, lever I will not raise the fractional stops.

When disabling key V is depressed, the arm on linkage O pulls wire N downward to restore bail L, locating its rear arm in the lower slot of link AD which expands spring D. When the final product or the first product key is depressed, stud F rocks lever I to raise the fractional detents to release the fractional rack bars.

PRO-RATING MECHANISM, KEY CONTROLLED (Plate 50)



Pro-rating Mechanism, Key Controlled (Plate 50)

The purpose of this feature is to retain the fractional accumulation in the crossfooter until the final product key and motor bar are depressed. These results are secured by eliminating arm G (Plate 27) from vertical link D (Plate 27) and controlling N only with the final product key.

When the final product key is depressed, part N is rocked, this movement is applied to arm C through link K. Arm C which swings on brace S contacts on and rocks lever F raising stops A and B to release the fractional rack bars.

Construction

Part N is used in addition to part AN

(Plate 27). Brace S is fastened to bar Q. Vertical link K has a slot where it is fastened to arm C.

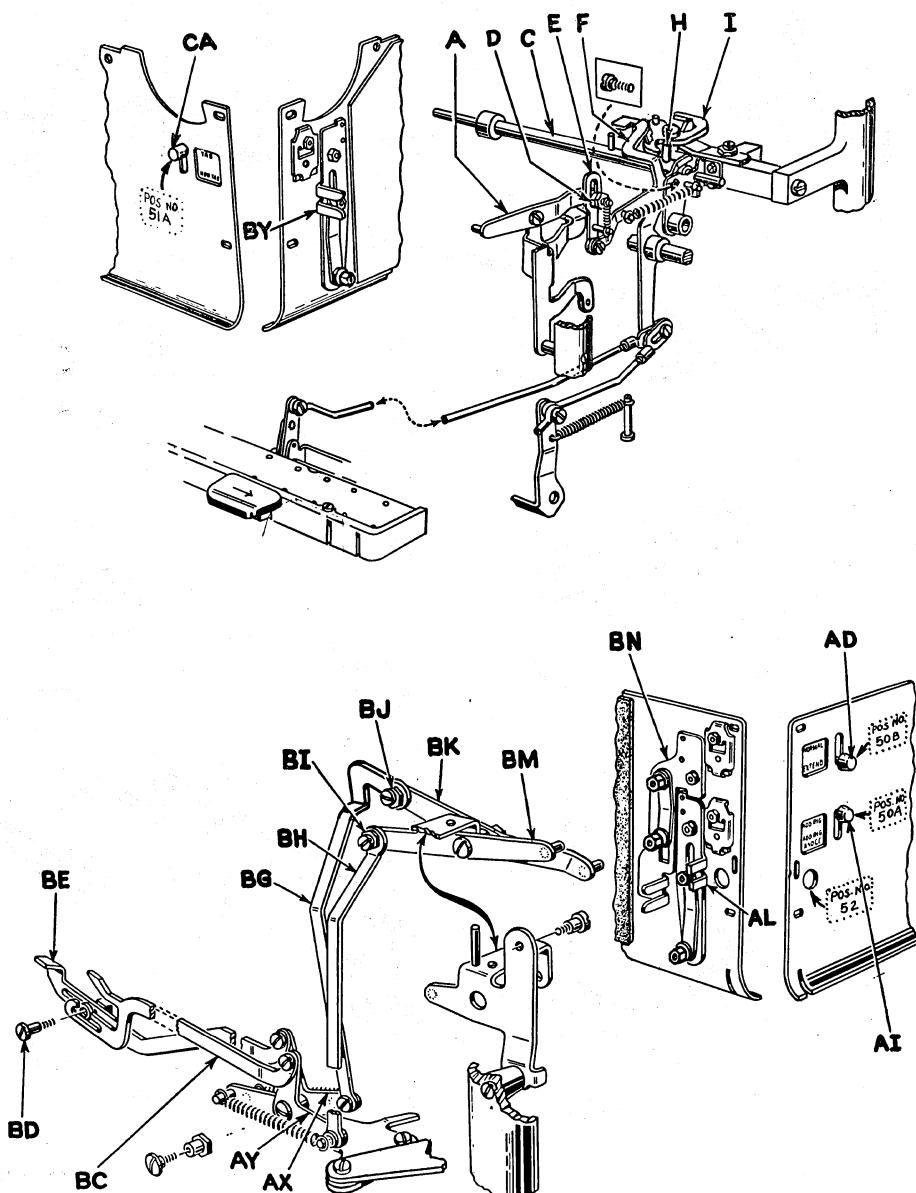
Installing Feature

Remove bar 74000 and replace with Q. Install part N. Connect arm C to brace S with screw V. Connect arm C and part N with link K using screws P and T. Remove arm G (Plate 27).

Tests and Adjustments

When the final product key is depressed, lever F should raise decimal stops A and B sufficiently high to allow the fractional rack bars to move forward. In this position, F should have about 1/16" play. Play of F can be increased or decreased by bending the front part of C.

FRONT PANEL CONTROLS (Plate 51)



Front Panel Controls (Plate 51)

Note: Since the typewriter is enclosed by panels on all new wide base machines, it is necessary to affix certain manual controls to the front panel. The manual controls on the front panel, their purpose and operation are described below.

I. Automatic Tabulation Control

(Position No. 51A)

Purpose

To provide manual control for rendering the Automatic Tabulating Mechanism either active or inactive.

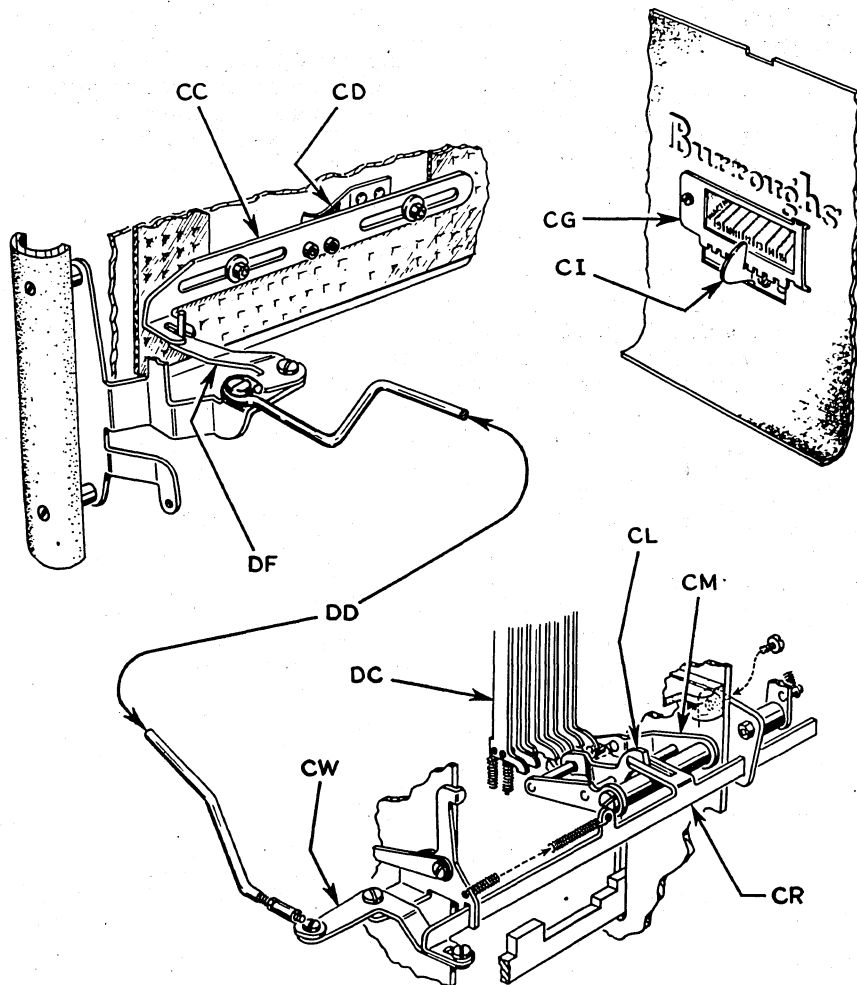
Construction

This mechanism is contained in all new wide base machines containing power result keys.

Operation

When control button CA in Position No. 51A is located upward, slide BY, lever A, and link E position latch F above the slot in shaft C—permitting shaft C to move to the left and permit automatic tabulation; when the button is located downward, latch F is positioned in the slot of shaft C—preventing shaft C from moving to the left and preventing automatic tabulation.

(Plate 51) Continued



The broken joint provided by the slot in link D permits shaft C to restore to normal if the control button is moved to non-tabulating position while shaft C is active.

The formed projection of latch F prevents pawl I from latching on stud H should a key or motor bar which indexed the Automatic Tabulating Mechanism be used when the control button is set in non-tabulating position. This prevents tabulation from a following non-tabulating operation with the manual control shifted to a tabulating position.

Adjustment

Latch F should fully engage the groove of shaft C (without bind) when the control button is latched in non-tabulating position.

To adjust, turn eccentric D.

II. Simultaneous Adding Control (Position No. 50A)

Purpose

To provide manual control for rendering the Simultaneous Adding Mechanism either active or inactive.

Operation

When control button AI in Position No. 50A is located upward, slide AL, lever BM, link BH, and bell crank AY position slide BC forward—permitting addition in the register only; when the button is located downward, slide BC is positioned rearward to permit addition in both the register and crossfooter.

Adjustment

When control button AI is located in either its upward or downward position, slide AL should be firmly latched and the ends of the slot in slide BC should not limit on screw BD.

To adjust, turn eccentric BI.

*(Plate 51) Continued***III. Automatic Extend Control****(Position No. 50B)****Purpose**

To provide manual control for rendering the Carriage Controlled Extend Mechanism either active or inactive.

Operation

When control button AD in Position No. 50B is located upward, slide BN, lever BK, link BG, and bell crank AX position slide BE forward to prevent carriage controlled extension; when the button is located downward, slide BE is positioned rearward to permit carriage controlled extension.

Adjustment

With control button AD in either its upward or downward position, slide BN should be firmly latched, and the ends of the slot in slide BE should not limit in screw BD.

To adjust, turn eccentric BJ.

IV. Extend Column Control (For Multiplier Factor to Print Mechanism)**Purpose**

To provide an easy means of locating the extend column for the Multiplier Factor to Print mechanism to any desired column left of the cipher split—in machines containing a single cipher split; or to the left of the left-most cipher split in machines containing more than one cipher split.

To provide a means of manually disabling the Multiplier Factor to Print mechanism (when it is indexed by carriage control) for an indefinite number of operations, after which it may be enabled again.

Construction

This feature is contained in all Class 72 and Series M 200 machines which contain the Multiplier Factor to Print mechanisms, beginning with Serial No. B100122. Positioning of the extend column from the front panel eliminates necessity of removing the case if operations require a change in the extend column.

Operation

Location of indicator CI to a particular column position on indicator plate CG actuates slide CC which through bell crank DF, wire DD and bell crank CW, imparts the same movement (in the opposite direction) to slide CR.

Slide CR then positions left arm CL of lift bail assembly CM, under the foot of adding rack limit DC in the column in which indicator CI is positioned. Lift arm CL is latched under the foot of adding rack limit in the desired column through tension of spring CD, which holds indicator CI in the notch of indicator plate CG.

Location of indicator CI in the "inactive position" on indicator plate CG locates lift arm CL in a column that does not contain an adding rack limit with a foot on it. This disables the Multiplier Factor to Print mechanism and permits repeated multiplying operation, with the Multiplier to print control rail active, without printing the factor when the product is taken. This also dispenses with the need for using the normalizing key in Position No. 52 after each first or final product operation (whichever releases the normalizing key in Position No. 52).

Adjustment

With indicator CI in a specific column position on indicator plate CG, lift arm CL should have full hold on the adding rack limit DC in the same column.

To adjust, shorten or lengthen wire DD.

V. Other Controls

The Multiplier Factor to Print Normalizing Key (See Plate 22-4, Accumulation Instruction Book) is located in the opening provided in Position No. 52.

Replaces General Prints 209-1/M and 213-1/M

TYPE 70 MACHINES PRINTING

Instruction Book

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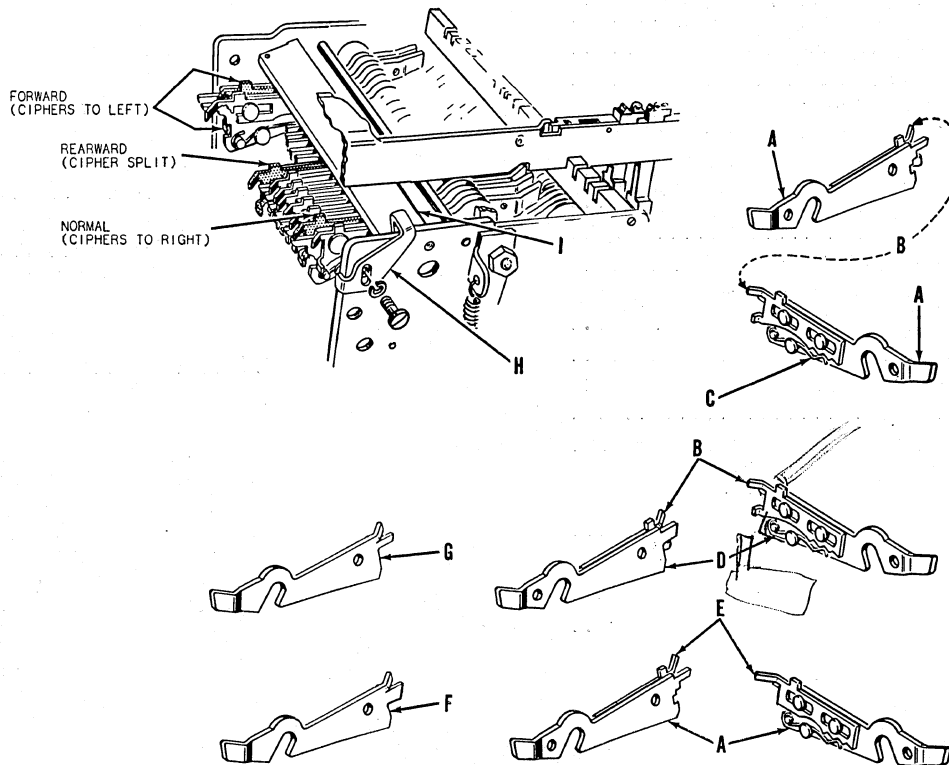
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VARIABLE CIPHER SPLIT AND CIPHER(S) TO PRINT TO LEFT OF AMOUNT—SERIES M (Plate 2-A)



Variable Cipher Split and Cipher(s) to Print to Left of Amount—Series M (Plate 2-A)

Purpose

(1) To permit variation in the location of a cipher split; (2) To permit variation in the location of a cipher or ciphers to print to the left of an amount, left of the cipher split; (3) To make optional the feature Cipher to Print to the Left of Units of Cents.

Construction

Hammer driver latch A, containing slide B, is used in the last column of the register capacity and in all columns to the left of the capacity in all Series M 200 machines (after Serial No. B197677) containing the Multiplier Factor to Print Mechanism.

Slide B may be set in any one of three positions where it is retained by spring C locating in one of the three notches on the lower edge of the slide. An upright projection on top of the slide facilitates positioning of the slide with a spring hook.

When slide B is positioned rearward, as shown in the assembly illustration, the overlapping tail on the slide clears the rearward portion of the driver latch to the left, thus effecting a cipher split between the two columns.

When slide B is in normal position (center), as illustrated, the overlapping tail on the slide overlaps the driver latch to the left to automatically print ciphers to the right of the amount in the normal manner.

When slide B is positioned forward, as illustrated, the lip on the lower rear portion of the slide enters the cutout in the driver latch to the left, thus connecting the two driver latches to print a cipher to the left of the amount. With the slide positioned forward, the overlapping tail on the slide also overlaps the driver latch to the left.

Driver latches A, D, and G are used in Series M machines between Serial No. B197677 and M3658D that have Domestic or European monetary punctuation, except those Series M 700 machines having the Register Designation Indexing Mechanism.

Plate 2-A (Continued)

Driver latch D is used in the units of cents column, driver latch A in the tens of cents column, and driver latch G in the first dollar column. Driver latches D and A are used in the designated columns of the printing section to provide an easy means of connecting or disconnecting the two driver latches, through slide B, thereby permitting the unit of cents to print with or without a cipher printing to the left. Driver latch G has stock removed from the underside of its rear extremity to prevent its being raised by the lip of slide B on driver latch A.

Beginning with Serial No. M3658D, slide B on driver latch A, which is used in the tens of cents column, has been altered. The overlapping tail is made longer and the lower lip has been removed as illustrated on slide E.

Removal of the lip on the slide permits using regular driver latch F in the first dollar column in place of driver latch G.

OVERTHROW LIMIT H, used in Series M 200 and M 800 machines, through plate I, prevents overthrow of the hammer driver latches, as the adding racks move forward to print. Overthrow of the driver latches may result in printing cipher(s) to the left of the desired figures.

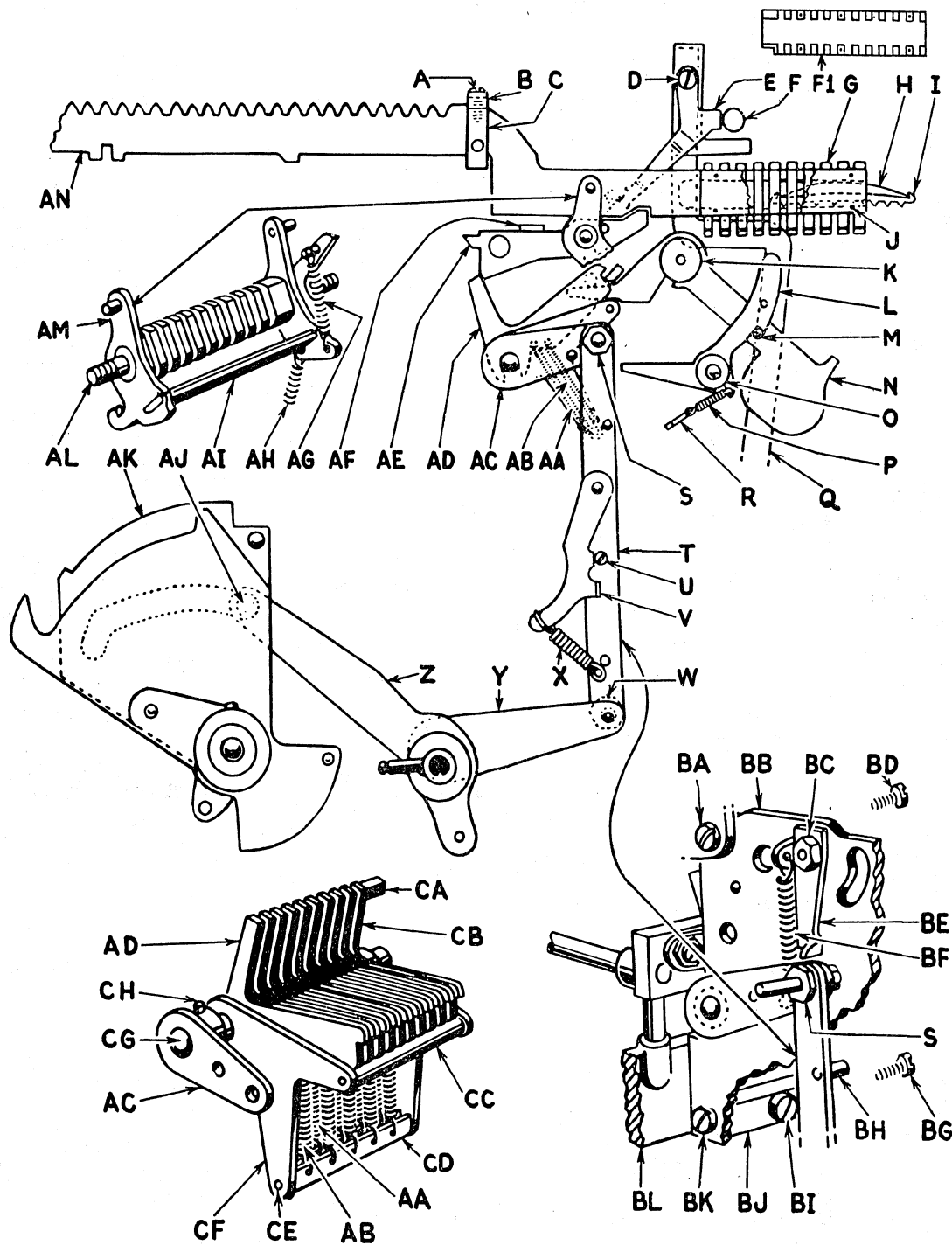
Adjustment

1. Depress the crossfooter subtract key and operate the machine manually until the adding racks reach their forward limit. Test for minimum clearance between overthrow limit H and plate I, and for the adding racks to be free.

To adjust, raise or lower overthrow limit H.

PRINTING MECHANISM (Plate 3)

(Plates 1 and 2 in Symbol Book Only)



Printing Mechanism (Plate 3)

Printing is accomplished by hammers striking type G. Hammers N are actuated by drivers AD which are operated by springs AA and AB.

Springs AA and AB are connected from drivers AD to spring clip CD, the latter is carried by side plates CF. Springs AA and AB are placed under tension when twin cam AK through bell-crank Z and link T rocks arm AC. As springs AA and AB are being placed under tension, hammers N are held by latches L, the latter are released by roller CC to allow springs AA and AB to actuate drivers AD which, by contacting on the arm of hammers N, drive the hammers to strike the type.

The normal position of rack bars AN is the cipher position. In that position, the front arms of levers AE are located in the cut-out of rack bars AN which allows the rear arms of levers AE to locate in the path of drivers AD. When rack bars move out to limit on stops that were indexed through the keyboard, levers AE are rocked to clear drivers AD which allows printing to take place. Ciphers are automatically printed through the overlapping arms of levers AE which raise levers AE to the right where the rack bars have not rocked levers AE to clear drivers AD.

Hammers N are prevented from striking the type in columns in which no keys are depressed by levers AE blocking drivers AD. Levers AE are restored and held in blocking position by plate AF. Hammers N are disabled when the carriage is raised or when the carriage is moved forward by the shift key

through bail assembly AI blocking drivers AD.

When the carriage is lowered to printing position or when the shift key restores to normal position, shaft F swings bell-crank E to raise bail assembly AI which clears drivers AD to permit normal printing.

Tests and Adjustments

Excessive clearance between the teeth of the rack bars and straps B can reduce the cam action of the rack bars on levers AE which can cause drivers AD to remain blocked by levers AE. Clearance between straps B and rack bars AN can be reduced by removing stock from the contact surface of straps B.

Eccentric W is adjusted to prevent roller AJ binding in the slot of twin cam AK.

Type G are located in slots of magazine F1 which is riveted to the rack bar.

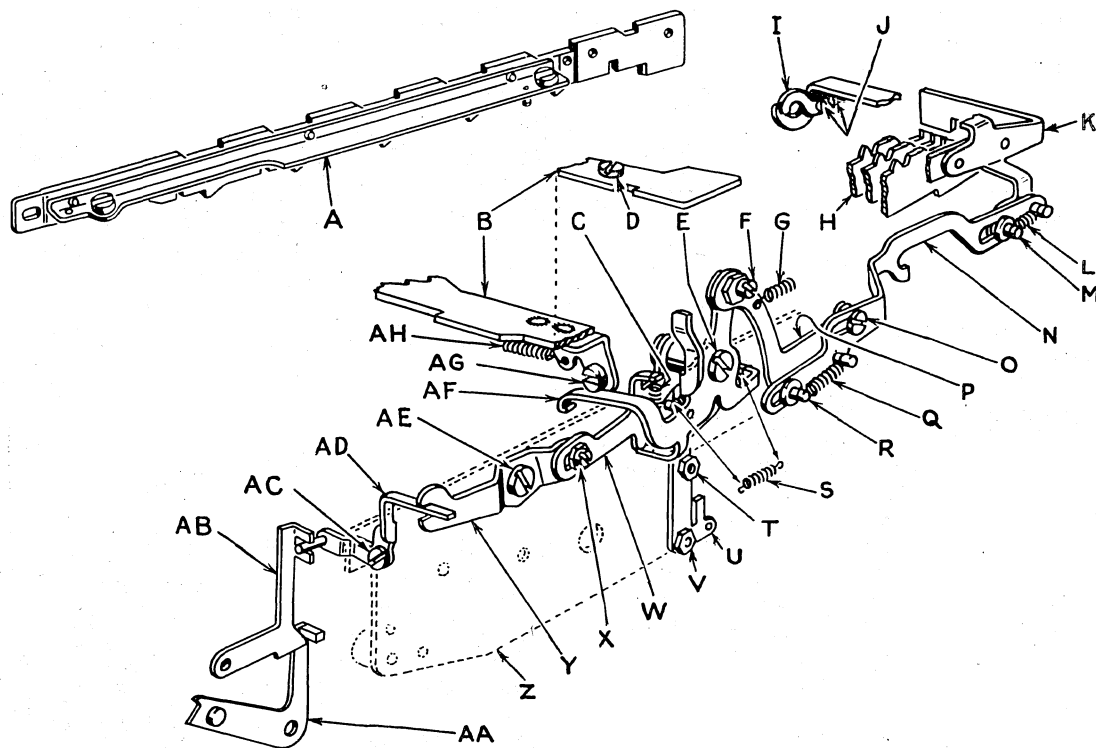
Type G are held in downward position by springs H. The purpose of springs H is to quickly restore the type when the hammers strike the type. Springs H contact on the upper edge of magazine F1. The ends of springs H contact on the hook ends of spring anchor I. The tension of springs H is applied to the type by contacting a projection of type G.

Class 72 machines have a space between the figures instead of punctuation.

Classes 74 to 78 have standard monetary punctuation.

Springs H and anchor I can be readily removed with a small spring hook or another anchor I.

FRACTION PRINTING MECHANISM, LATER (Plate 4)



Fraction Printing Mechanism, Later (Plate 4)

This mechanism, which supersedes the earlier style, prevents the printing and totaling of fractions in registers other than in register No. 1.

When register No. 1 moves out of adding position, part AG depresses the horizontal arm of AF. The latter, through spring C, rocks arm W which, through lever Y and bell-crank AD, swings arm AB to block the stud in driver AA and thereby prevents printing.

When register No. 2 moves out of adding position, the wide end of escapement rack B contacts vertical arm of AF which blocks driver AA as explained in the previous paragraph.

In machines having more than three registers, the rail on the under side of escapement rack A contacts AF to block driver AA.

When register No. 1 is in adding position, the cut-out in the rail of rack A prevents blocking driver AA. The advantage of the

late style mechanism (in machines having more than three registers) is that selected registers can be controlled to print by cutting out portions of rail A.

When registers are meshed during the total operation, AF is further depressed, and through spring Q, link N is pulled forward which rocks bail K into the notches of fractional bars H, and thereby prevents fractional bars H from moving outward during the totaling operation.

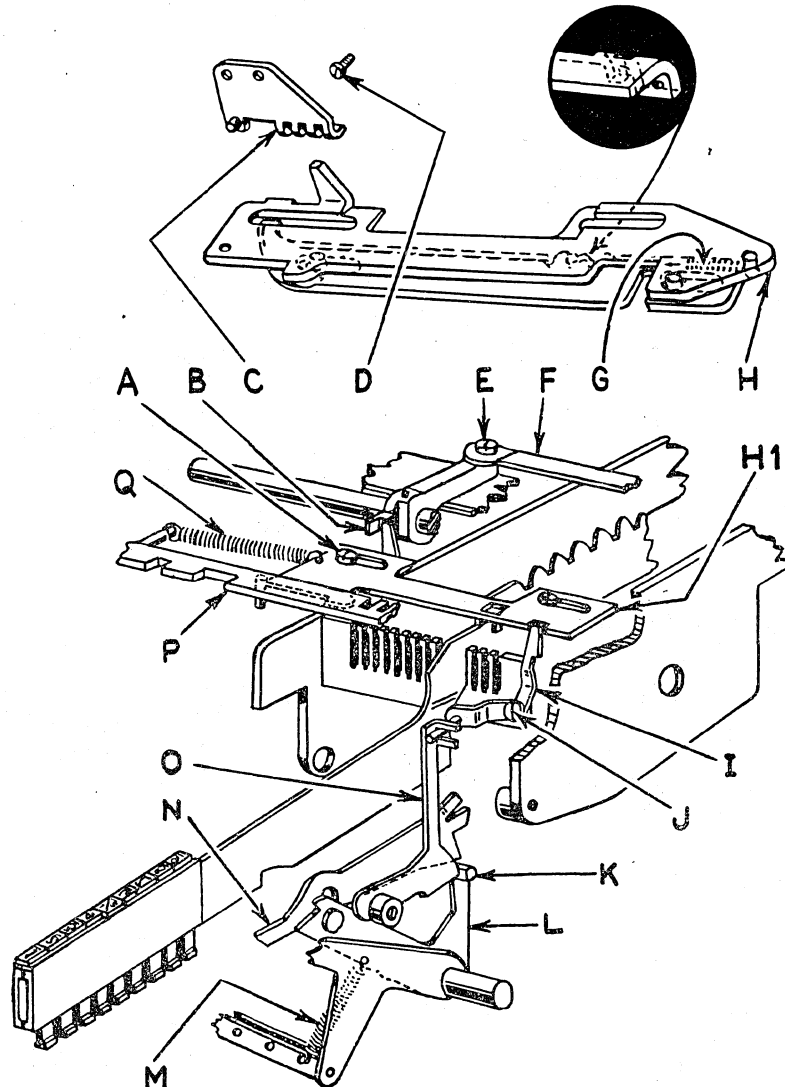
During a final product operation, when fractions are transferred from the crossfooter, the inclined ends of the fractional bars raise bail K, which is permitted by the expansion of spring Q, to allow the fractional rack bars to restore to normal position.

Tests and Adjustments

The hold of arm AB on the stud in driver AA is secured by turning eccentric X.

The hold of bail K in the notches of rack bars H is adjusted by turning eccentric F.

FRACTION PRINTING MECHANISM, EARLY (Plate 5)

*Fraction Printing Mechanism, Early
(Plate 5)*

Fractions can be added and printed only in register No. 1.

When register No. 1 moves into active position, lip B contacts the vertical projection of plate H1, moving the latter to swing bell-crank I to clear driver L. The movement of plate H1 places spring Q under tension.

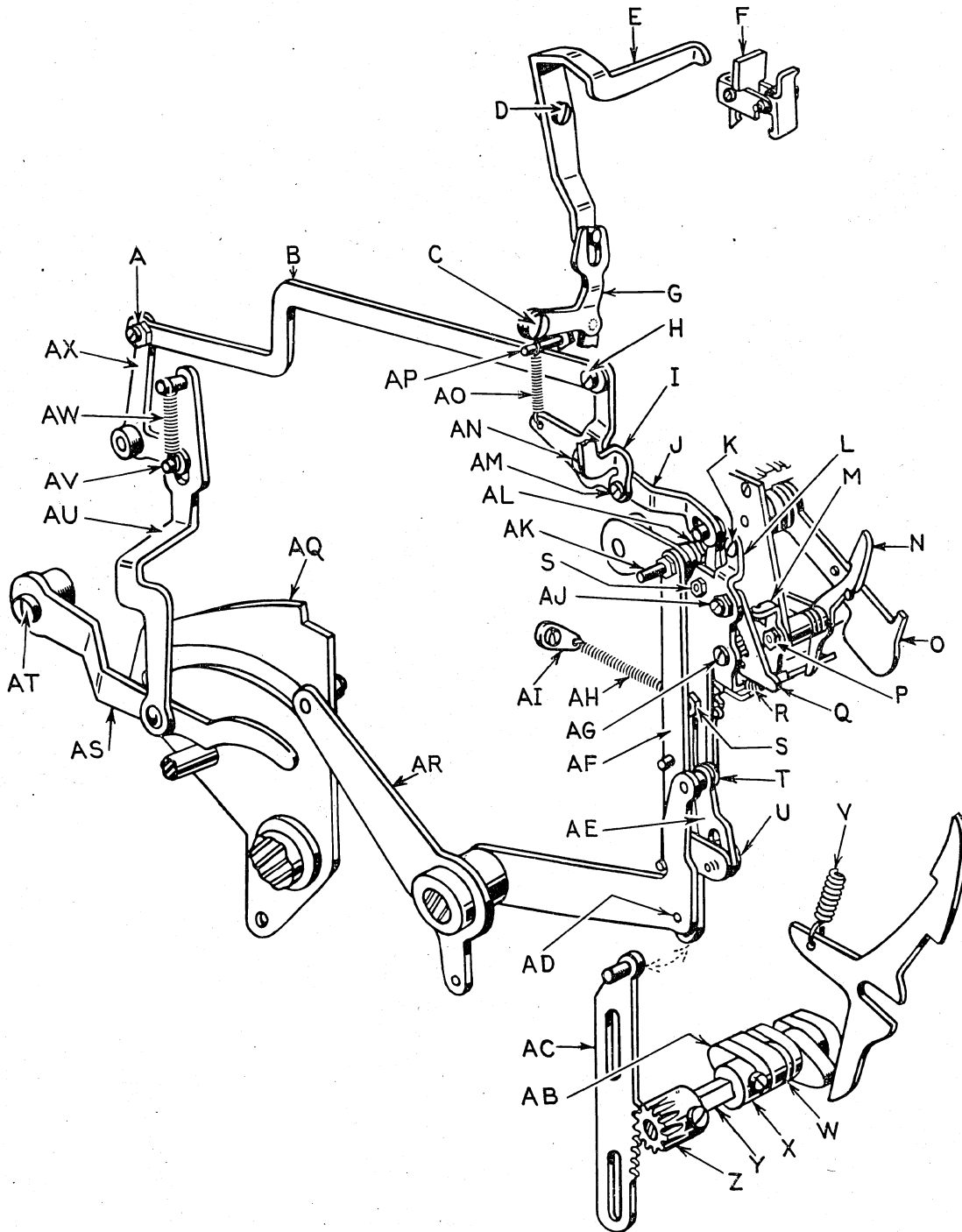
When register No. 2 moves into active position, spring Q pulls plate H1 toward the left which rocks bell-crank I to swing part O to block square stud K, in driver L, and thereby prevents printing in either register or crossfooter.

Registers other than register No. 1 have no adding wheels in the fractional column.

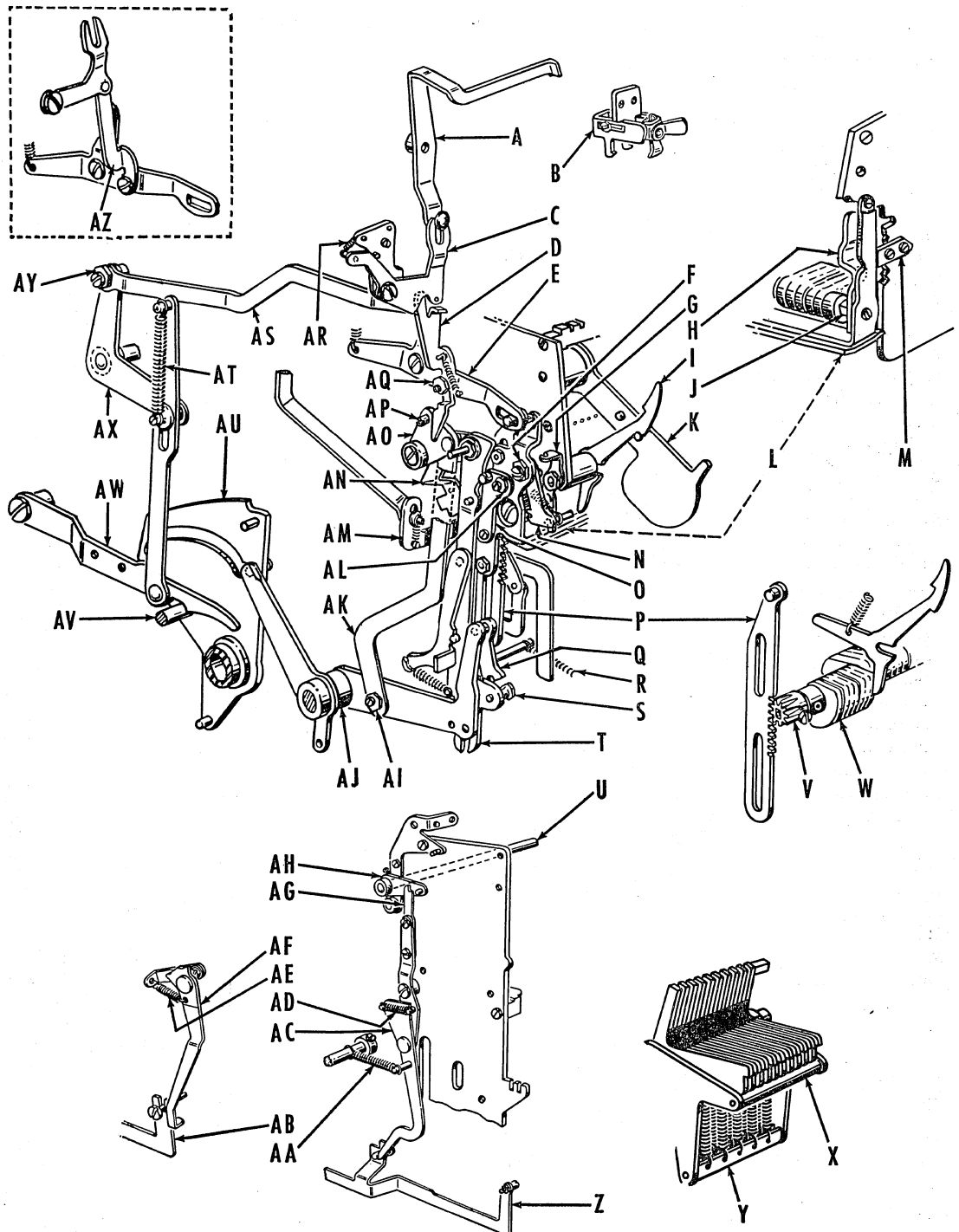
When the register total key is depressed with register No. 2, or registers other than register No. 1 in active position, the movement of comb P, through spring Q, locates the projection on the underside of plate H1 to block the fractional rack bar to prevent transferring the fraction to the crossfooter and also to prevent extending the fraction in the multiplier.

Flexible plate assembly H is used in machines having motor returned register mechanisms. Plates H1 and H are not used in the late fractional rack bar printing control (Plate 4).

FOUR POSITION PRINTING MECHANISM (Plate 6)



FOUR POSITION PRINTING CONTROL MECHANISM, CARRIAGE CONTROLLED—WITH POSITIVE NORMALIZING (Plate 6-1)



Four Position Printing Control Mechanism, Carriage Controlled—*with Positive Normalizing* (Plate 6-1)

Purpose

To provide four carriage controlled printing combinations, three of which are selected through carriage control rails.

Construction

General functioning of the Four Position Printing Control Mechanism is not changed, but refinements in design produce more positive means of normalizing the mechanism. In Series M 200 and M 800 machines these refinements provide a means of disabling the printing control sensing lever during the forward machine stroke.

Cam arm AW is relieved on its lower horizontal surface, where it contacts shaft AV, to permit increased clearance between sensing lever A and control rails B when the sensing lever is normalized during machine operation.

Shaft U is increased in diameter to lend greater stability, thus assuring that the mechanism is fully normalized during multiplying or subtracting operations. The greater stability afforded by thicker shaft U plus the increased clearance between sensing lever A and control rail B are necessary in Series M 200 machines to avoid collision of the sensing lever and the control rails should the carriage be returned during multiplying operations. In Series M 700 machines without selective column tabulation, these improvements reduce the possibility of collision between the sensing lever and the control rails should the subtract key (a power key) be depressed before carriage tabulation is completed.

In Series M 200 and M 800 machines, swinging lift arm D is assembled to lift lever E and actuates rocker arm C through its formed lip. This construction permits disconnecting the four position printing control sensing lever from the four position printing control mechanism, allowing the sensing lever to restore to normal during the forward machine cycle and thereby relieving the possibility of the control rails colliding with the sensing lever during carriage tabulation. In Series M 700 machines, lift lever E and rocker arm C are linked together solidly, through link AZ.

Also, in Series M 200 and M 800 machines, normalizing assembly AO is assembled to the left end of the printing section power shaft assembly and includes date disabling arm AN and long link AK. The assembly is actuated independently of the printing section power

shaft, through hub assembly AJ and link AK, during every machine operation and rocks swinging lift arm D, through eccentric stud AP, to disconnect sensing lever A from the four position printing control mechanism.

Bail L contains a supporting arm on the right side for contact with roller shaft X to support the right end of the bail during the machine cycle.

The four control positions provide four combinations which are standard to machines of a particular series and style. For example, in a Series M 215 machine, the standard printing combinations are:

Position No. 1	No rail	Full print
Position No. 2	Low rail	Non-print columns 11-15
Position No. 3	Medium rail	Non-print columns 1-10
Position No. 4	High rail	Full non-print

However, combinations other than standard are permitted depending upon operational requirements.

Slotted link Q in Series M 200 and M 800 machines has the forward side of the slotted portion removed to provide a means of disabling the printing section as explained in Plate 13-1. The link is held in active (normal) position by spring R attached to the type-writer spring beam.

Operation

During the forward machine stroke as the twin cam assembly moves forward, shaft AV raises cam arm AW which, through bell crank AX and link AS, rocks lift lever E. The latter raises swinging lift arm D which, through its formed lip, swings rocker arm C to position sensing lever A to one of four positions, three of which are determined by the height of the control rails.

Lever E also raises rack P which, through gear V, turns camshaft J to the position determined by sensing lever A. Camshaft J positions cams W to subsequently actuate hammer latches I for non-printing.

Movement of twin cam assembly AU actuates hub assembly AJ to place the hammer driver springs under tension through link T. Link T moving downward cams bail assembly L forward, through the roll of bracket O, to swing camshaft J.

For printing, the hammer latches release the hammers through roller shaft X placing the latches clear of both studs in hammers K; while for non-printing, the hammer latches are moved through cams W to engage the rear studs of hammers K.

Detent N engages gear V to lock camshaft J in position as bail assembly L is swung forward.

(Plate 6-1—Continued)

Actuation of hub assembly AJ also lowers link AK which actuates assembly AO, the stud in which swings lift arm D to move the formed lip of the lift arm from under rocker arm C and permit spring AR to rock sensing lever A to normal.

The purpose of the slot in link T is to delay the timing to permit positioning camshaft J and swinging bail assembly L prior to placing the hammer driver springs under tension. This delay assures that hammers in columns to be non-printed will be latched by the respective latches I.

Slotted link Q compensates for the delay brought about by the slot in link T, due to the fact that the pivot point of link Q on the arm of hub assembly AJ effects a lengthening of the arm on the hub assembly.

Normalizing of the mechanism in Series M 200 and in Series M 700 machines is effected by the release of power slide Z or AB, respectively. Release of the power slide permits assembly AC (or AF) to be swung by tension of spring AA (or AE) to place limit AG under the stud in arm AH of shaft assembly U. Shaft assembly U is then locked in normal position, causing expansion of yielding joint spring AT.

When slide Z or AB restores to normal, spring AD is expanded, thus permitting limit AG to continue to block the movement of shaft U until the machine cycle has been completed. Pressure caused by expansion of yielding joint spring AD retains the upper portion of assembly AC (or AF) under the stud in arm AH.

Adjustment

Note: Before making any adjustments, and with the machine normal, assure that the horizontal portion of the cutout in the lower edge of cam arm AW rests solidly on shaft AV. If the arm does not rest solidly on shaft AV, and the machine is fully restored, cam arm AW should be lengthened.

1. With the forward machine stroke completed and no control rail under sensing lever A, rack P should be raised the full length of its lower slot without expanding spring AT.

To adjust, turn eccentric bushing AY.

2. With rack P raised the full length of its lower slot (no rail position) cams W should be pointed straight forward (for non-print) or straight up or down (for print).

To adjust, remesh gear V with rack P.

3. Cams W should have slight passing clearance with the tails of latches I and hammer driver spring anchor plate Y when bail assembly L is normal.

To adjust, reposition limit M.

4. Detent N should clear gear V approximately .030" with bail assembly L normal.

To adjust, grind or peen limit arm G where it limits the stud in detent N.

5. When bail assembly L moves forward, the teeth of gear V should mesh with detent N without turning camshaft J.

To adjust, turn eccentric bushing F.

6. With cams W in print position and the forward machine stroke completed, latches I should clear the upper and lower studs in hammers K.

To adjust, turn eccentric bushing S.

Note: Failure to clear both studs may cause non-printing or light printing.

7. With cams W in non-print position, eccentric AL turned inactive, and the forward machine stroke completed, latches I should have full hold without bind on the rear studs in hammers K of the right-hand columns.

To adjust, bend arm H toward or away from roller shaft X.

8. With cams W in non-print position and the forward machine stroke completed, latches I should have full hold without bind on the rear studs in hammers K.

To adjust, turn eccentric bushing AL.

9. With slide Z or slide AB forward, limit arm AG should have minimum clearance under the stud in arm AH.

To adjust, position limit AG.

10. With an automatic date control active, date disabling arm AN should rock cross arm AM sufficiently to permit bumper arm P (Plate 24) to clear drive stud Q (Plate 24) with slight clearance when the symbol prints or when the carriage platen is in a raised or shifted position.

To adjust, turn eccentric bushing AI. (Series M 200 and M 800 machines.)

11. With sensing lever A normal, there should be minimum clearance between lift arm D and rocker arm C.

To adjust, turn eccentric bushing AQ.

12. During the forward machine stroke, eccentric stud AP should disengage lift arm D from rocker arm C after gear V engages detent N.

To adjust, turn eccentric stud AP.

Four Position Printing Mechanism ***(Plate 6)***

The purpose of this mechanism is to provide four printing control positions, three of which are selected through control blocks.

- Position 1: Full non-print.
- Position 2: Units and cents print.
- Position 3: Dollars print only.
- Position 4: Full print, no block.

This mechanism which is operated by the machine operation, blocks combinations of hammers O by swinging latches N over the upper studs in hammers O. At the beginning of the machine operation, the stud in cam AQ raises lever AS which, through link AU and spring AW, rocks bell-crank AX, the upper arm of AX moving rearward, rocks lever J through link B. The front end of lever J raises rack AC which turns pinion Z on shaft Y to select combinations of cams AB according to the style of control block F.

The arm of lever J rocks bell-crank G to swing bell-crank E which is limited by control blocks F. When no control block F is used, bell-crank E can make a complete movement which causes cams AB to clear latches N, resulting in full printing. The movement of cam AQ rocks lever AR which, through slotted link AE, pulls link AF to place the driver springs under tension.

The purpose of slotted link AE is to delay the expanding of the driver springs in order to permit swinging latches N over the upper studs in hammers O.

The movement of link AF is later accelerated due to the arm on link AF, which increases the length of the arm of lever AR and thereby recovers the movement lost by slotted link AE. The downward movement of link AF, through roller AL, rocks assembly L which swings selected latches N over the upper studs in hammers O, blocking them and thereby preventing printing. As assembly L is moving forward, pinion Z engages detent Q to hold cams AB in position. Assembly L swings on screw K in the hammer section side plate.

Tests and Adjustments

When control block F is blocking bell-crank lever E, cams AB should contact at the longest point from center of cam.

Adjustment: Arm of bell-crank E is bent.

When pinion Z is being turned, there must be clearance between L and detent Q.

Adjustment: Limit arm M is located.

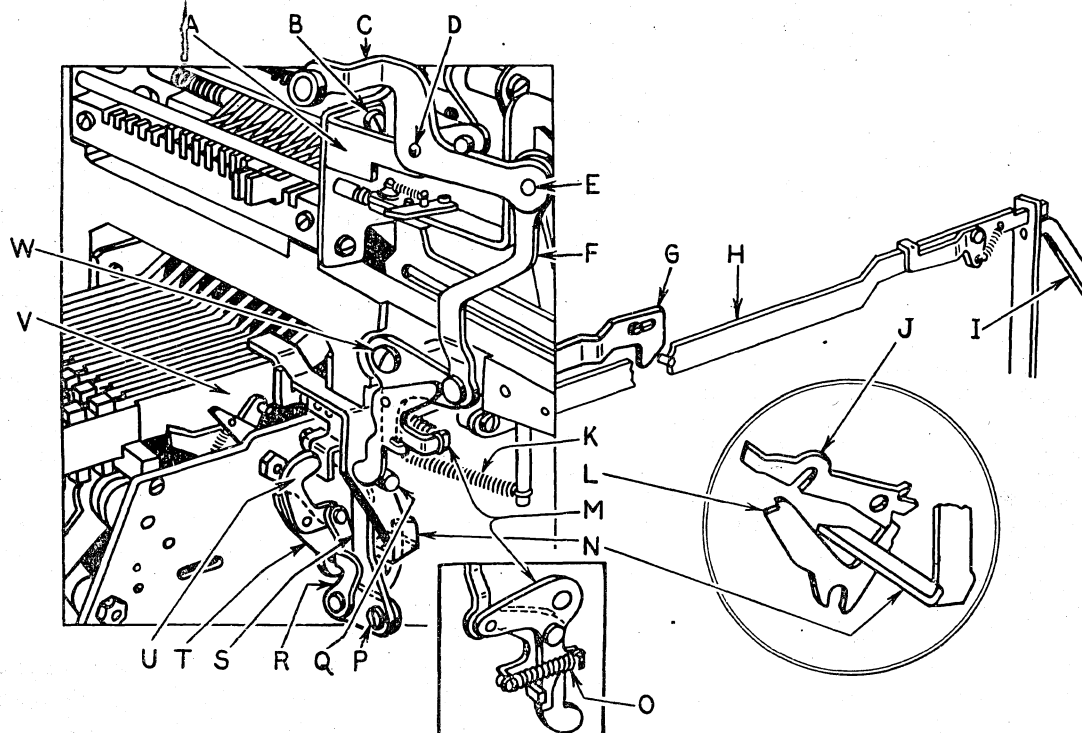
When assembly L moves forward, detent Q must correctly mesh teeth of pinion Z.

Adjustment: Eccentric AJ is adjusted as required.

When latches N are completely rocked rearward, they must clear front and rear studs in hammers O in all columns other than the non-print columns. Failure to clear can cause non-print or light print.

To secure clearance, the eccentric on screw U is adjusted.

NON-ADD, NON-PRINT MECHANISM, TENS AND UNITS COLUMNS, CARRIAGE CONTROLLED (Plate 7)



Non-add, Non-print Mechanism, Tens and Units Columns, Carriage Controlled (Plate 7)

The purpose of this mechanism is to non-add and non-print in the units and tens columns when the carriage locates a control block under the roller on lever C, raising the latter. Link F, through spring connected assembly M, moves part N to block rack bars V and drivers L.

When multiplying or subtracting, part I raises H which contacts the cam surface of slide G, moving the latter forward which rocks parts U, R and S to move part N out of

the path of rack bars V, the non-printing being secured through printing control assembly Q (Plate 9) in the usual manner.

For non-printing only, the upper arm of N is not used.

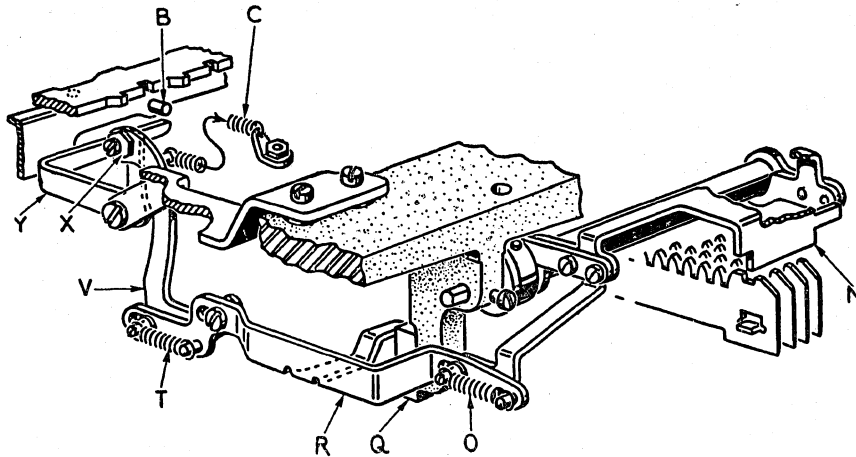
Tests and Adjustments

When a control block is under the roller of lever C, part N should completely block rack bars V and drivers L.

Adjustment: Eccentric on screw E is turned as required.

Note: The eccentric is located on the rear of linkage F.

NON-PRINT LEFT SIDE OF REGISTER TOTAL IN CONJUNCTION WITH MULTIPLIER FACTOR TO PRINT—CLASS 72 (Plate 9-1)



Non-print Left Side of Register Total in Conjunction with Multiplier Factor to Print—Class 72 (Plate 9-1)

Purpose

The purpose of this mechanism is to prevent the printing, during a register totaling operation, of the multiplier factors previously printed and transferred to the register on crossfooter clearing operations.

This mechanism is used only in conjunction with the Multiplier Factor to Print Mechanism, Plate 22-2, Accumulation Instruction Book.

Operation

As the register is engaged with the adding racks, stud B contacts and rocks bellcrank Y downward. The upper arm of bellcrank Y pulls links V and R forward, lowering bail M into the notches of the adding racks. With bail M in this position, the forward travel of the adding racks is blocked, and, as a result, the accumulated amounts on the left side of the register are non-printed and non-cleared during the register total operation.

Spring C restores the non-print mechanism to normal as the register is meshed with the carry racks.

Spring T permits the joint between links R and V to be broken when, on a listing or crossfooter clearing operation, the register is engaged with the adding racks in a non-print position, and the adding racks are being restored to normal under bail M.

Spring O, on the joint between link R and bail M, permits the breaking of the joint when bail M is actuated by the Four Position Add and Non-add Mechanism, Plate 6-1, Accumulation Instruction Book.

Adjustment

When the register is engaged with the adding racks, bail M should seat in the bottom of the notches in the adding racks with no expansion of spring T.

To adjust, turn eccentric X.

The adding racks should pass under bail M with $1/32''$ clearance when bail M is normal.

To adjust, bend the projection on link R to limit earlier or later on cross support Q.

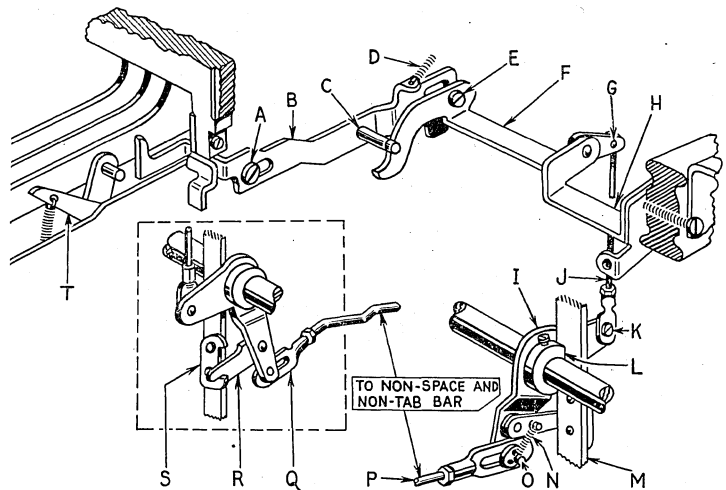
Mr M R Lovejoy
Buffalo N Y Branch 10-5

PRINTING CONTROLLED FROM MOTOR BAR (Plate 8)

Printing Controlled from Motor Bar (Plate 8)

The purpose of this mechanism is to permit adding without printing. This mechanism can be connected to any of the motor bars.

When the motor bar is depressed, lever I is rocked which, through wire J, rocks part F. The cam arm of part F moves slide B forward which swings non-print control T to block the drivers and thereby prevents printing. This mechanism is latched by the step of part R seating over part S. The latter is carried by interlock M. Part R unlatches when interlock M restores to normal position.



Tests and Adjustments

When the motor bar is depressed, part R should have lead over part S.

Adjustment: Turnbuckle Q is adjusted.

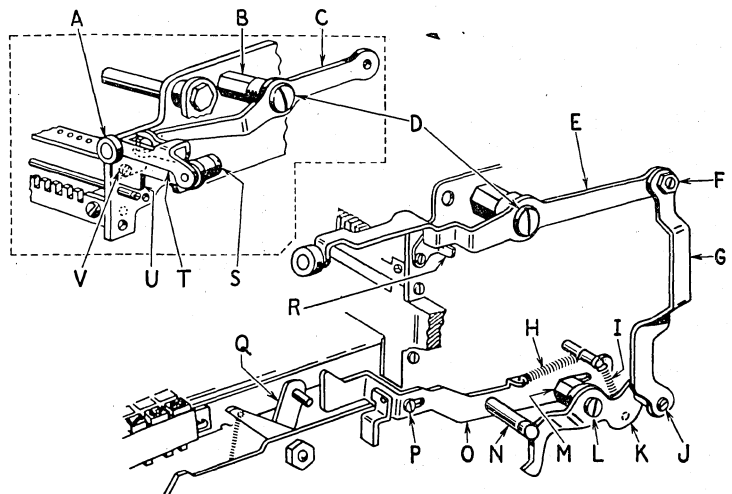
Depression of the motor bar should locate slide B with minimum clearance between slide B and assembly T. Wire J is adjusted.

NON-PRINT, CARRIAGE CONTROLLED (Plate 9)

Non-print, Carriage Controlled (Plate 9)

The purpose of this mechanism is to secure non-printing of items in selected carriage positions.

When the carriage locates a control block under roller A, lever E through link G rocks cam lever K which moves slide O to index non-print mechanism Q to block the drivers.



Single Line Control

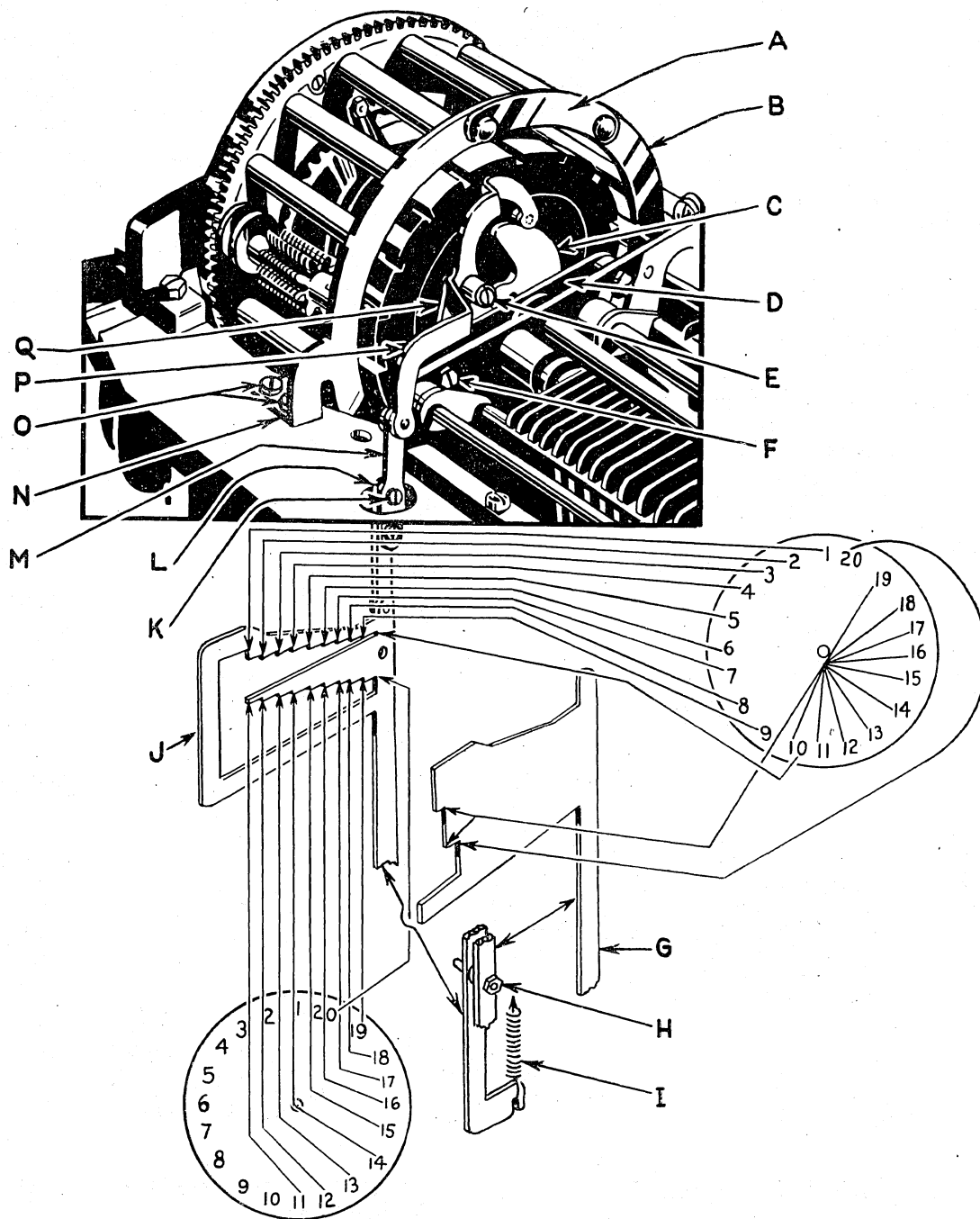
When the carriage locates a control block under roller A, arm T rocks lever C which, through link G, lever K and slide O, indexes the non-print mechanism. Arm T is required for No. 1 line of control since the latter is so close to the carrying section that the front

arm of lever E would be too short to provide the required leverage.

Tests and Adjustments

When a control block is located under roller A, indexing the non-print mechanism, slide O should not bind.

REGISTER DESIGNATION INDEXING MECHANISM, STYLE NO. 1, TWO COLUMN (Plate 10)



Register Designation Indexing Mechanism, Two Column (Plate 10)

The purpose of this mechanism is to index the number of the active register. The indexed number is printed during the machine operation.

The rack bars are indexed by stop plates G and J, the latter are raised by spring I. The upward movement of G and J is controlled by lever P contacting cam C. Lever P is connected to the link on stop plate J by link M. Link L on stop plate J is slotted to

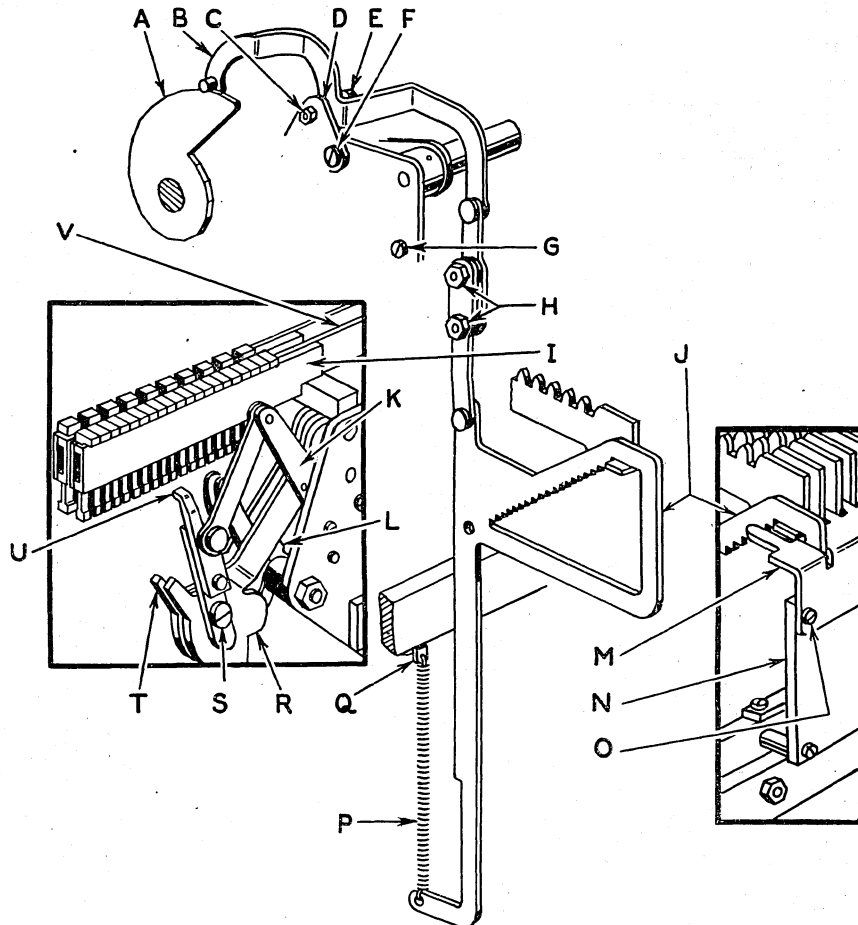
permit adjusting the contact of the rack bar lug on stop plates G and J.

The type arrangement of the unit column begins with 1 instead of 0, the 0 having the 9 position of the standard rack bars. The index positions of the type are shown on the diagram.

Stop plate G has steps for 0, 1 and 2 positions.

The register designating number is printed when a register amount is added and also printed on register total operation.

REGISTER DESIGNATION INDEXING MECHANISM, STYLE NO. 2, SINGLE COLUMN (Plate 11)



Register Designation Indexing Mechanism, Single Column (Plate 11)

This mechanism indexes the number of the active register which is printed during the

machine operation. This mechanism secures the same results in the same manner as the two column mechanism, covered in Plate 10. The adjustments for the one and two column mechanisms are the same.

PRINTING CONTROL FOR REGISTER DESIGNATION INDEXING MECHANISM (Plate 12)

Printing Control for Register Designation Indexing Mechanism (Plate 12)

The purpose of this mechanism is to non-print the designating number of the active register when amounts are non-added. When the registers are totaled, this mechanism is disabled by the depression of the total key. During listing operations, the position of the twin cams determines whether or not drivers AB and AC shall be blocked.

Sequence and Construction

At the beginning of the machine operation (non-add), arm AM moves upward which permits arm AL to follow and spring AO to pull part AI, which rocks bell-crank AR, raising link J. Bell-crank K, which is connected to part G, moves the latter into the path of drivers AB and AC. Spring I is hooked from stud in AI to the stud in bracket AQ.

Spring I which connects link J and bell-crank K permits part GAU to be controlled by the carriage.

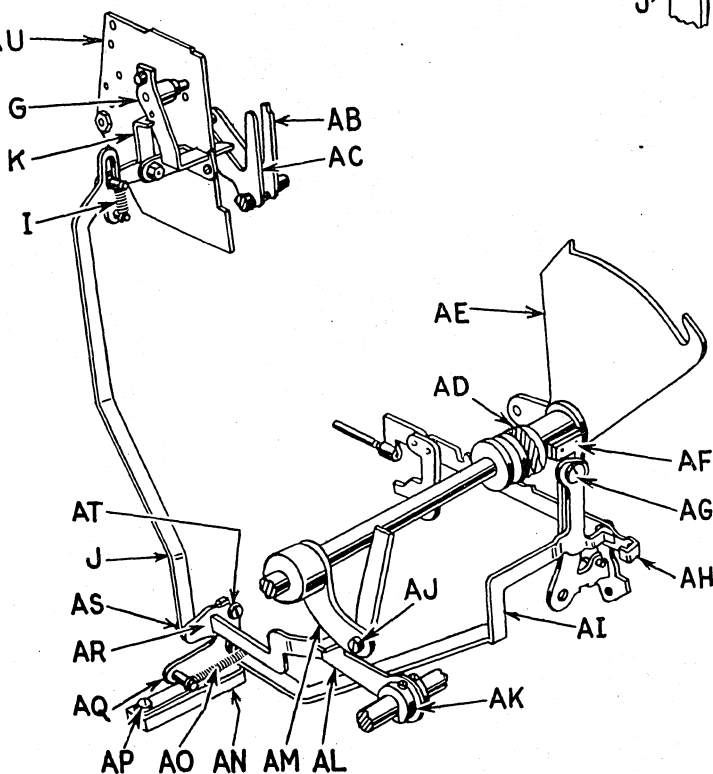
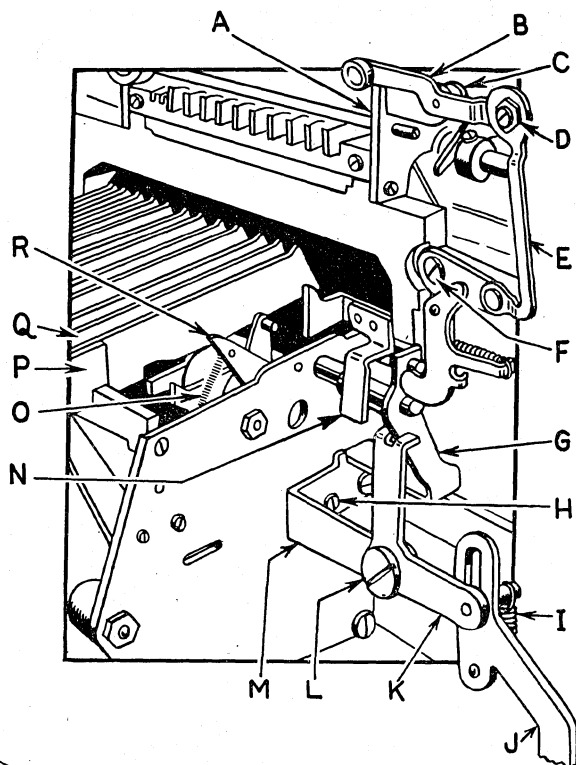
During a machine operation, with the twin cams in add position, part AI is blocked by shoulder screw AG which prevents spring AO exerting a pull on part AI and thereby allows drivers AB and AC to actuate the hammers in the designation columns.

During totaling operations, although the twin cams are in non-add position, the designating number is printed.

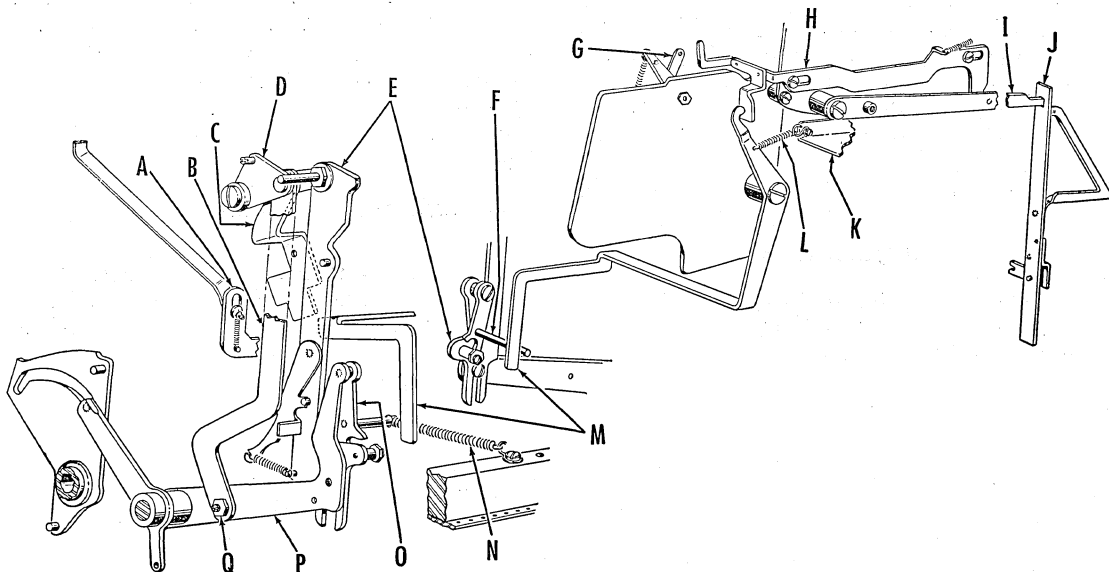
When the total key is depressed, part AH is pulled into the path of the projection on part AI, which blocks the latter in the same way as when the twin cams are in add position.

Carriage Control

When the carriage moves a cam under the roller on lever B, link assembly E moves part G into the path of drivers AB and AC.



PRINTING SECTION DISABLING MECHANISM SERIES M 200 AND M 800 (Plate 13-1)



**Printing Section Disabling Mechanism
Series M 200 and M 800 (Plate 13-1)**

Purpose

To provide a means of inactivating the printing section during multiplying and subtract operations in Series M 200 machines and during subtract operations and the first two cycles of minus balance operations in Series M 800 machines.

Use of this mechanism reduces the work load of the machine and unnecessary strain on the printing section, as the printing section now is actuated only about 30% of the time in most Series M 200 machines and about 60% of the time in most Series M 800 machines. As a result, wear on printing section parts is reduced and, in particular, life of the hammer driver springs is prolonged.

Construction

Slotted link O has the forward side of the slotted portion removed and is held in active (normal) position by spring N attached to the typewriter spring beam, and rocker arm M is held in normal position through spring L anchored to the front screw of intermediate keyboard dust plate K.

Assembly D normalizes the four position printing control sensing lever in Series M 200 and M 800 machine (see Plate 6-1, revised 10-4-55) and disables the automatic date in Series M 800 machines. The assembly in-

cludes date disabling arm C and link B. It is actuated independently of the printing section power shaft through power arm assembly P and link B during each machine operation.

In Series M 800 machines when the automatic date is active, assembly D, through arm C, disables the date printing mechanism during a subtract operation when the inner carriage is raised or shifted. Also, when the automatic date is active during a minus balance operation and it is desired to print the four aligning periods, assembly D, through arm C, again disables the date printing mechanism.

Non-print bail G does not contain a stud since it is no longer necessary to position the bail to block the hammer drivers during multiplying and subtract operations. Also, the slot at the bottom of the printing section drive link E has been opened to enable the power arm assembly to be rocked downward fully, without giving any movement to the printing section drive link, during multiplying and subtract operations.

Operation

During the forward machine stroke of multiplying or subtracting operations, vertical arm J is moved upward raising arm I. The stud in arm I cams non-print slide H forward to swing rocker arm M which, through stud F, moves slotted link O rearward away from the eccentric in printing section drive link E.

(Plate 13-1)—Continued

Movement of the twin cam assembly rocks power arm assembly P and slotted link O downward, but since rocker arm M is holding the slotted link rearward, printing section drive link E is not actuated. However, downward movement of power arm assembly P actuates assembly D, through long link B, lowering date disabling arm C to disable the automatic date through arm A and normalizing the four position printing control sensing lever as described in Plate 6-1, revised 10-4-55.

Adjustment

1. There should be minimum play between rocker arm M and stud F at the end of the forward machine stroke during multiplying and subtract operations.

To adjust, weave the formed lip of non-print slide H.

2. With an automatic date control active, date disabling arm C should rock cross arm A sufficiently to permit bumper arm P (Plate 24) to clear drive stud Q (Plate 24) with slight clearance when the symbol prints or when the carriage platen is in a raised or shifted position.

To adjust, turn eccentric bushing Q.

Note: Any adjustment of eccentric bushing Q in machines containing Four Position Printing Control Mechanism will necessitate rechecking of Adjustment No. 12, Plate 6-1, revised 10-4-55.

(Plate 12) Continued**Tests and Adjustments**

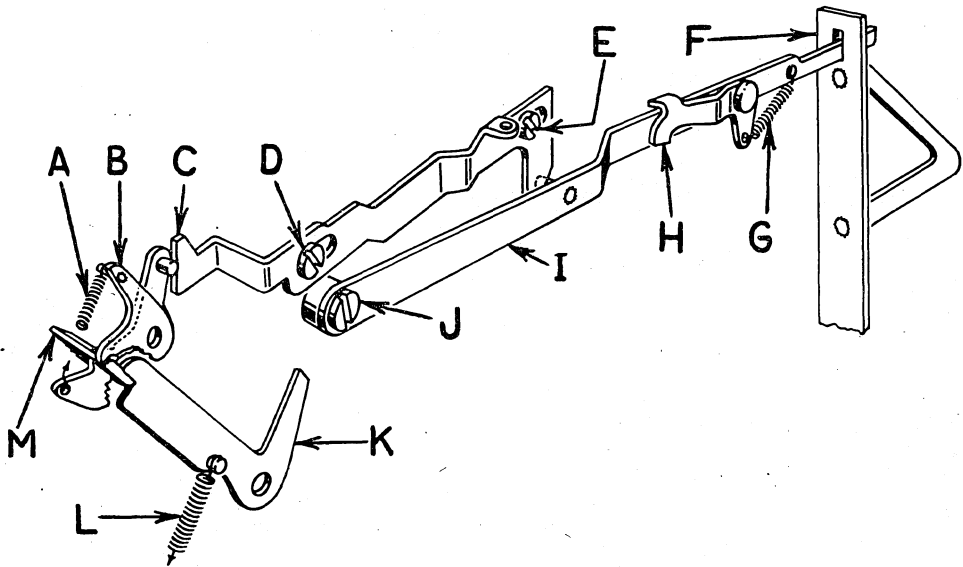
Vertical link J is adjusted by lengthening or shortening its offset to allow part G to block drivers for non-print and to clear drivers for printing.

Eccentric D is adjusted to secure full

movement of part G to block drivers when a control block is under the roller of B.

When the machine is in normal position, arm AM resting on AL, part AI should have a non-binding contact on screw AG.

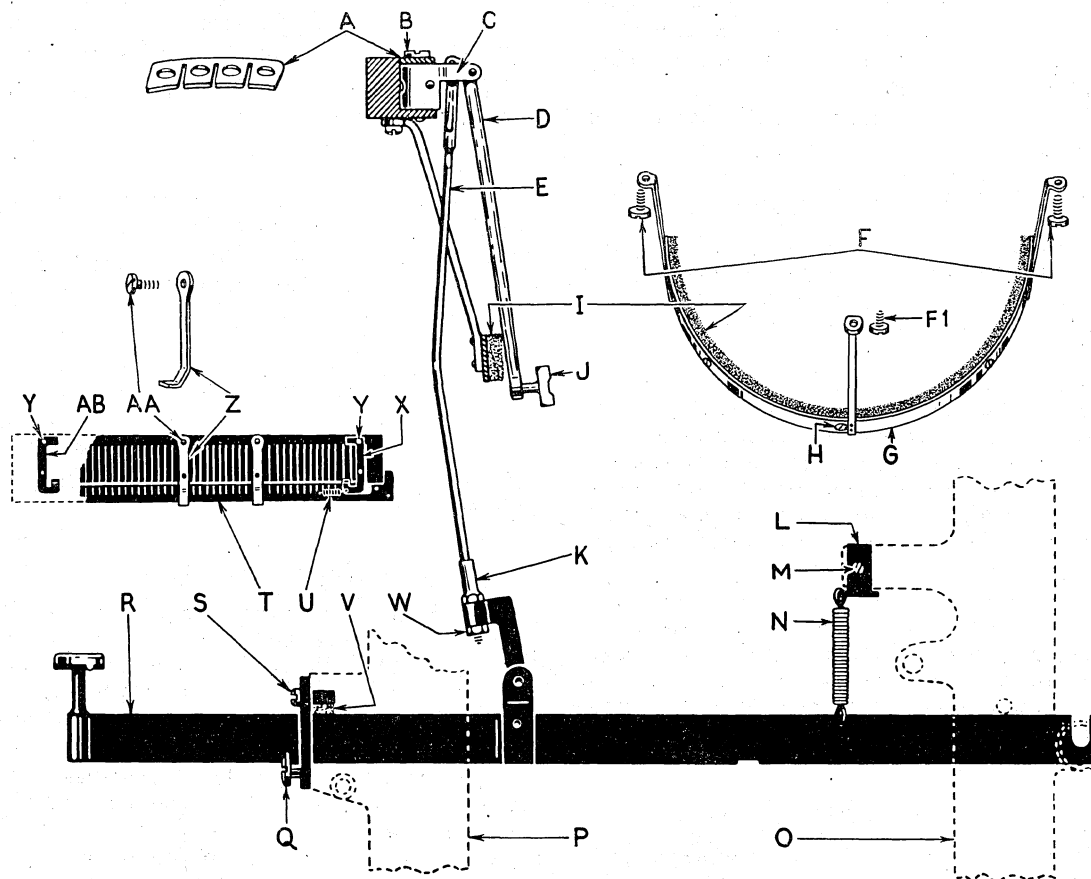
Adjustment: The formed lip on arm AL is bent.

PRINTING CONTROL TO NON-PRINT PARTIAL PRODUCTS (Plate 13)**Printing Control to Non-Print Partial Products (Plate 13)**

During multiplying operations, only the complete product is printed, the partial products are not printed. The printing mechanism is disabled by the multiplying mechanism.

When a multiplying key is depressed, part F moving upward, raises arm I; the stud in arm I, contacting the cam of part C, moves the latter forward which swings blocking bail assembly M to block drivers K, thereby preventing printing.

KEY LEVER AND TYPE BAR ASSEMBLY (Plate 14)



*Key Lever and Type Bar Assembly
(Plate 14)*

Type Aligning

The capital N is the standard letter which is used for aligning all other letters. Letter N is aligned with respect to the adding machine type for position and non-interference. The letter N position is determined by printing N, space, N, space, depressing adding key 2, and motor bar (N2N). Letter N is aligned so that it will be on a line with, and equidistant from figure 2.

The method of aligning consists of loosening hanger screws B and moving the complete type bar forward or backward, or swinging hanger C, also by bending type bar D with a 9 prong bender.

(Plate 14) Continued

Type J is centered by applying Kit 56 $\frac{3}{4}$, swinging the type in the taper hole of type bar D. **Caution:** When making this adjustment, type should always be tightened with Kit 38 $\frac{1}{4}$.

When type prints light on top, bottom, right or left side, it is an indication that the type face is not parallel to the platen, and the part of the type printing light must be brought higher. To align type for full impression (putting type on its feet) bend with a 9 prong bender, or twist the type bar with a straight bender.

Note: When a new set of type is installed, the type should be aligned in the consecutive order as the type is found in the basket. After alignment is completed, test type bars to drop freely when they are slowly depressed. Also test type for colliding (see heading Type Clearance).

Installing Type Wires

There are seven different lengths of type wires E used:

- No. 1 for C D J M K L ,
- No. 2 for 3 4 E R I O 9 -
- No. 3 for A Z 5 6 T U 8 1 S Y 7
- No. 4 for B F G H V N
- No. 8 for Q W 2 P
- Date or " or overscore
- Extra key 39

When keys are normal, type bars D should

rest on leather basket I and key lever R should contact on felt pad V.

Adjustment: Wire E is formed for approximate length and adjusted by turning nuts K and W as required.

Platen Shift Motion

Before beginning to align type, the platen shift motion should be adjusted. This subject is covered on page 6, Instruction Book on Carriages.

Type Clearance

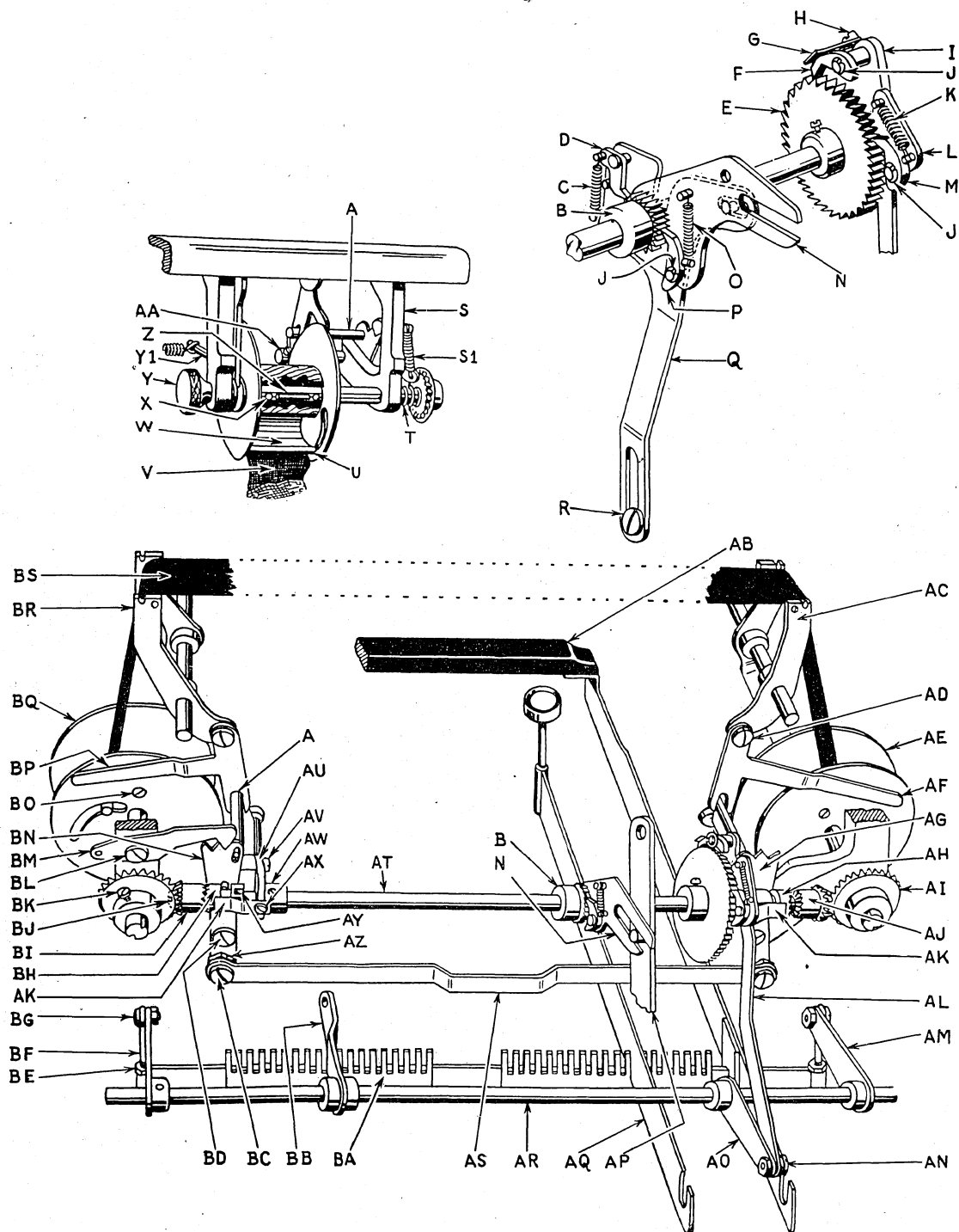
On account of all type being located in a semicircle, the available clearance between type bars is limited which sometimes results in interference or collision of type when type is used consisting of several letters or has a wide character symbol.

Adjustment: Screw B is loosened and hanger C is swung in the direction of the interference and, with the 9 prong, a bend is placed in the type bar to eliminate the interference. The alignment of the type is completed as explained under the subject of type aligning.

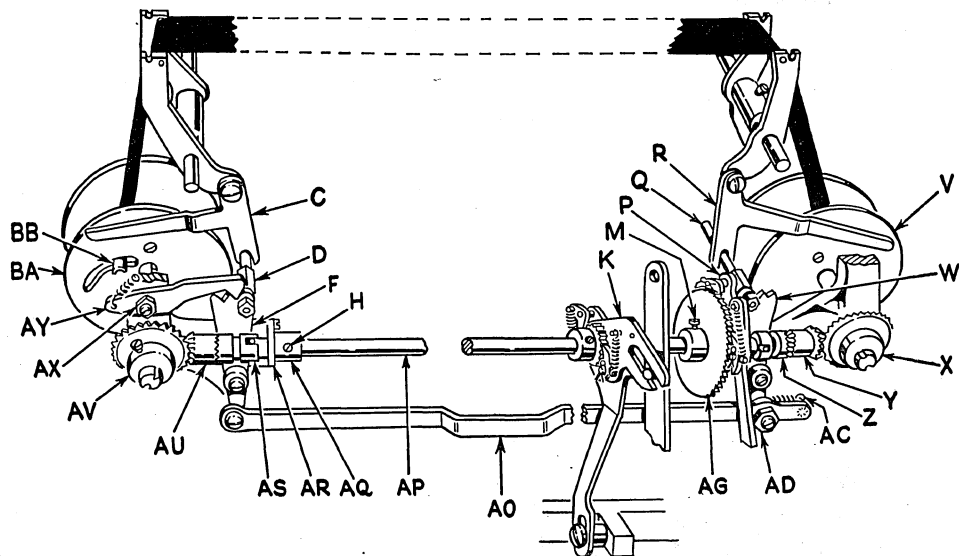
When the form requires that the character shall print further to the right in positions No. 35 and No. 38, shorter type bars D are used. These type bars are 1/10, 2/10, 3/10 and 4/10 inches shorter than the standard type bar D.

RIBBON FEED AND REVERSE MECHANISM (Plate 16)

(Plate 15 in Symbol Book Only)



RIBBON REVERSE MECHANISM—IMPROVED (Plate 16-1)



Ribbon Reverse Mechanism—Improved (Plate 16-1)

Purpose

—To provide continuous ribbon feed when either ribbon spool is unwound.

Construction

This improved mechanism is in all styles of Series M machines, beginning with Serial No. B12825. General functioning of the Ribbon Reverse Mechanism (Plate 16) is not changed, but refinements in design produce an easier and more positive reverse action and simplify adjusting.

Clutch members Z and AS have wider slots and fit on shaft AP with more freedom to permit all their teeth to mesh evenly with all of the teeth of gears Y and AU, thus providing an even pressure around the entire clutch. This results in an easier clutch disengagement when the ribbon pull pressure is against the clutch teeth. Reverse arms W and F have hubs added to provide a better bearing, and also carry screw studs Q and D connecting arms W and F to bell cranks R and C, respectively, thus reducing lost motion in the mechanism. Spring AC on reverse bar AO holds the play in the parts in one direction to make the reverse action more positive.

Operation

When the ribbon is completely unwound from spool BA, the projection on shutter BB rocks bell crank C which through stud D rocks arm F positioning detent AY in the inside notch of arm F. The movement of arm F through its stud being in the channel of clutch member AS engages the latter with

gear AU. Also, the movement, of arm F through bar AO, rocks arm W which disengages clutch member Z from gear Y, thus permitting spool BA to wind the ribbon.

When the ribbon is completely unwound from spool V, the respective parts at this end of the mechanism function in the same manner to reverse the ribbon in the opposite direction.

Adjustment

1. Shaft AP should be located so that the teeth of gears Y and AU have a full hold on the teeth of gears X and AV, respectively.

To adjust, loosen screw H of collar AQ and screw M of ratchet AG, and position shaft AP. After positioning the shaft, set collar AQ and ratchet AG against brackets AR and P, respectively, so that shaft AP has minimum end play. Reposition ribbon feed arm K, if necessary.

2. With detent AY in the inside notch of reverse arm F, clutch member AS should fully mesh with gear AU.

To adjust, turn eccentric AX.

3. With detent AY in the outside notch of reverse arm F, clutch member Z should fully mesh with gear Y.

To adjust, turn eccentric AD.

Note: Both clutches AS and Z should fully mesh with gears AU and Y, respectively, to provide a full disengagement of detent AY from either notch of reverse arm F when the reversing action takes place.

4. Beveled gears AV and X should fully mesh, without bind, with gears AU and Y, respectively.

To adjust, position gears AV and X.

Instructions for Plate 16 contained on page 17.

Ribbon Feed and Reverse Mechanism **(Plate 16)**

The ribbon feed mechanism is actuated from three sources, viz., from machine operation, typewriter keys and universal bar depressions.

During machine operations the upward and downward movement of link AP, through its stud meshing the fork of N, oscillates the latter, pawl P engaging and turning ratchet B and shaft AT on the return stroke.

The spools are alternately revolved by shaft AT through shift ratchet gears AJ and bevel gears AI.

When typewriter keys, or the universal bar, are depressed arm AO, through link AL and ratchet assembly E, turns shaft AT to feed the ribbon in the same way as the machine operation.

Ribbon Reverse

When the ribbon is completely unwound from either spool, shutter W is raised by the pull of the tape; rod U which extends through the rear flange of the spool moves upward and lifts reverse lever BP which moves reverse arm BN, allowing locking detent BM to seat in the other notch of BN.

The movement of reverse arms BN through their studs seating in the channel of reverse

ratchets BH and AH, moves the latter in the opposite direction, engaging one bevel gear BI and disengaging the other level gear BI. Reverse arms BN are connected to link AS with screws BC.

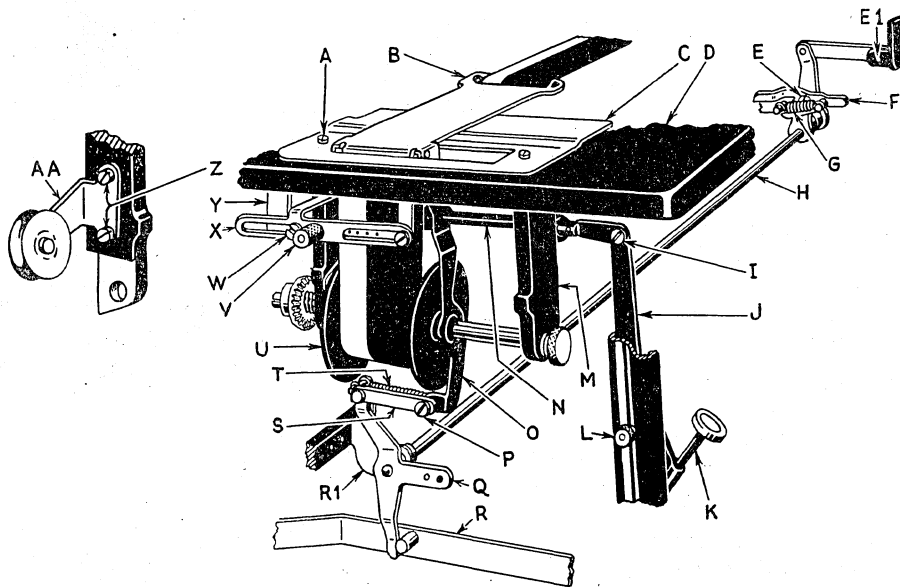
Wide base machines are equipped with double acting feed mechanism, i. e., the ribbon feed taking place on both strokes of the machine. This mechanism prolongs the life of the ribbon by reducing the number of typing strokes on the same spot.

Pawl D turns ratchet B on the downstroke, and pawl P turns ratchet B on the upstroke. Pawl D pivots on sliding link Q, the latter is carried downward by the stud in arm N seating in the slot of Q.

Tests and Adjustments for Ribbon Reverse

With assembly E free on shaft AT (set screw loose), reverse arm BN is set to seat detent BM in the inside notch of BN; collar AW is set so that BI on the right side will have $\frac{1}{2}$ hold with BH on the same side. Now, assembly E is set so that shaft AT will be free with minimum end play. Reverse arm BN is shifted to seat pawl BM in the outside notch of BN, and eccentrics AZ in the right and left ends of link AS are adjusted to provide half hold of BI and AJ.

RIBBON SHIFT MECHANISM, LATER (Plate 17)



Ribbon Shift Mechanism, Later (Plate 17)

When key K is depressed, lever J through shaft N and arm O, shifts left spool assembly U, locating the red portion of the ribbon in printing position. The right spool assembly is shifted by link S to part Q of shaft assembly H. The spool assemblies can be held in forward position by withdrawing knob L, turning it sufficiently to allow its pin to enter the pocket which locates the long stud of L into the path of lever J and thereby prevents its return to normal position.

Ribbon Wear Control

The purpose of the ribbon wear control mechanism is to distribute the wear of the ribbon across its width. This mechanism is operated by pulling knob V outward, disengaging its pin from Y and sliding X to engage another locating hole when knob V is released.

Ribbon Shift Mechanism, Early (Plate 18)

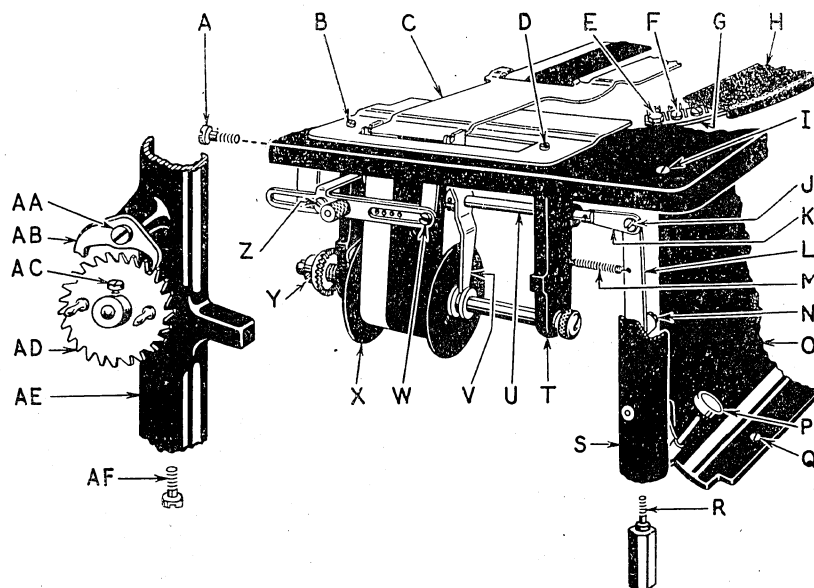
This mechanism is similar to the late mechanism (Plate 17) but differs in so far that when the shift key is depressed, only the left spool assembly is moved forward. The right spool assembly is moved through ribbon guide C which connects the right spool assembly with the left.

Drum Spring Adjusting Mechanism, Early

To increase drum spring tension, wheel AD is turned clockwise. To decrease drum spring tension, escapement arm AB is oscillated.

Late drum spring adjusting mechanism is shown on Plate 25, Carriage Instruction Book.

RIBBON SHIFT MECHANISM, EARLY (Plate 18)



RIBBON SHIFT MECHANISM, AUTOMATIC (Plate 19)

Ribbon Shift Mechanism, Automatic (Plate 19)

The purpose of this mechanism is to shift the ribbon spools. This mechanism is indexed from several sources and is actuated by the machine operation.

When the balance key is depressed, linkage R rocks bail assembly O which lowers link S to allow hook arm V to engage stud U in drive link W.

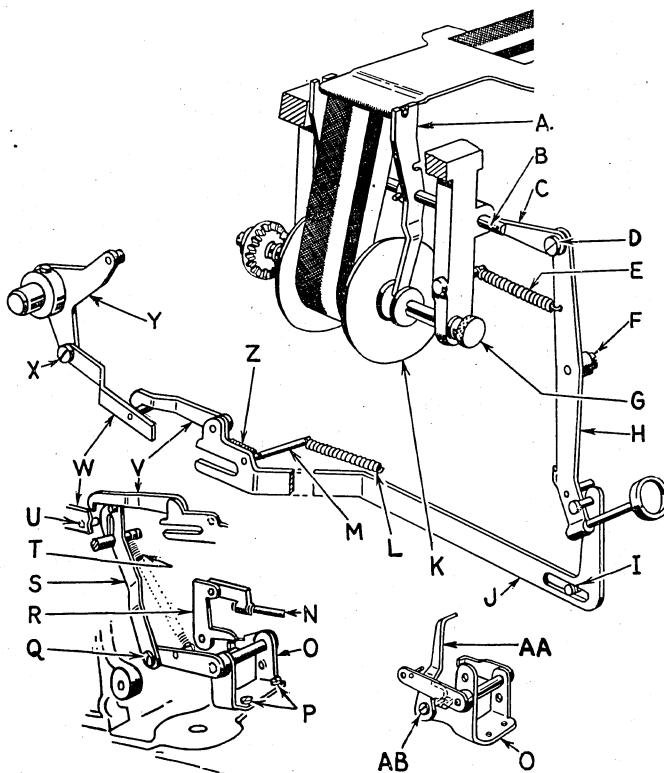
When the credit register key is depressed, its linkage contacts arm AA which rocks the bail of assembly O to lower link S to allow hook arm V to engage stud U in drive link W.

This mechanism is also found in Class 72 machines to index the ribbon shift mechanism from the extend key.

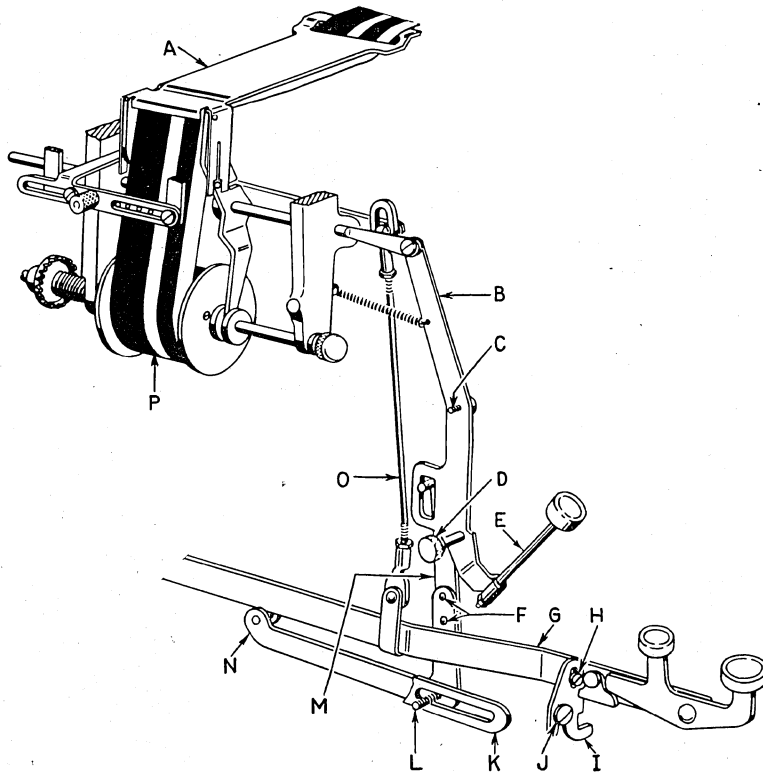
When the extend key is depressed, arm AA rocks bail assembly O with the same results as when the credit register key is depressed in Class 77 machines. The right arm of bail assembly O is not used in Class 72 machines.

During the machine operation, lever Y, through drive link W and hook arm V, pulls link J rearward, which rocks ribbon shift

lever H to shift the ribbon in the same manner as when the ribbon shift key is depressed.



RIBBON MECHANISM TO PREVENT PARTIAL IMPRINT OF UPPER CASE TYPE (Plate 20)

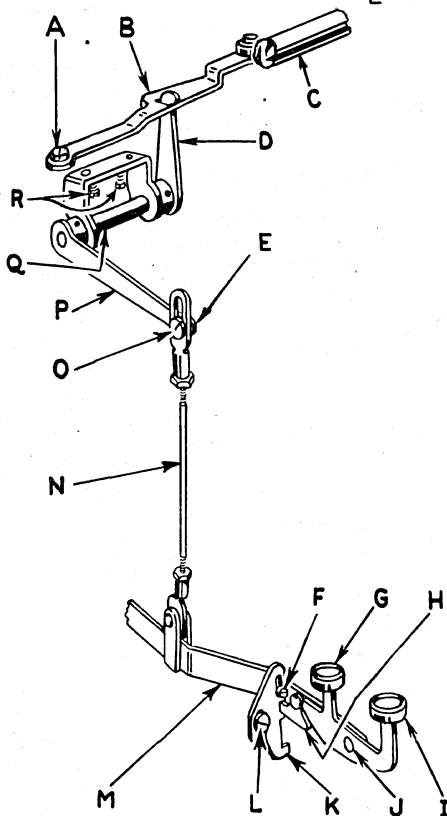


Ribbon Mechanism to Prevent Partial Imprint of Upper Case Type (Plate 20)

The purpose of this mechanism is to prevent partial imprint of upper case type when multiple carbon copies are made. This mechanism affects only the black portion of the ribbon. The ribbon consists of a black stripe and a full red portion.

When shift key G is depressed, arm N is rocked which rocks ribbon shift arm B, the latter pulls the ribbon forward locating the black stripe in line with the upper case type.

Link M is slotted for screws F in order to permit adjusting for full movement of the ribbon shift when the shift key is depressed.



PLATEN SHIFT, NON-PRINT MECHANISM (Plate 21)

Platen Shift, Non-print Mechanism (Plate 21)

The purpose of this mechanism is to locate the platen forward in line with the upper case type and also to cause printing control assembly AI (Plate 3) to block drivers AD (Plate 3) to prevent printing when the platen is in raised position.

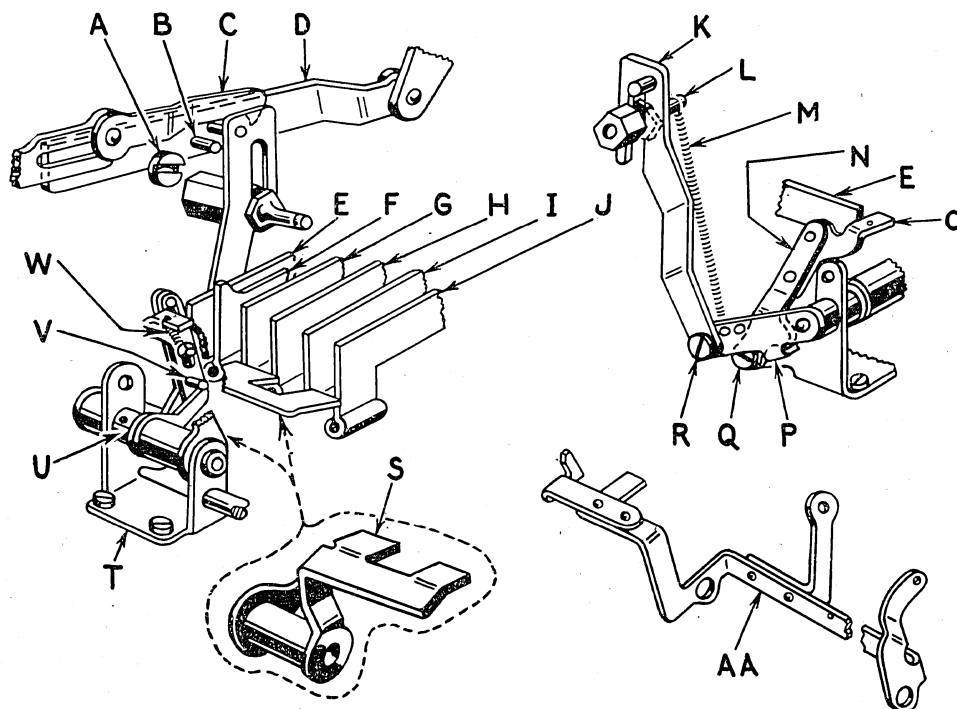
When shift key I is depressed, lever M, through wire N, arms P and D, swings arm B, the latter contacts shaft C and pushes the inner carriage forward which lines the platen with the upper case type.

The forward movement of shaft C allows printing control assembly AI (Plate 3) to block the drivers in order to prevent printing.

When shift lock key G is depressed, it pivots on stud J, swinging part H to lock under part K which holds lever M depressed.

Shift lock key G is released by depressing shift key I.

RIBBON SHIFT FROM CREDIT REGISTER KEY DISABLED FROM RESULT KEYS, CLASSES 72 AND 77 (Plate 22)



Ribbon Shift from Credit Register Key Disabled from Result Keys (Plate 22)

The purpose of this mechanism is to index the ribbon shift mechanism and to disable the ribbon shift when a result key is depressed together with the credit register key.

When the credit register key is depressed, link E contacting passby pawl slide O, rocks lever N which by contacting the lip of arm P pulls link K downward to allow hook of arm C to locate over the stud in power arm D. During the machine operation, the ribbon is shifted, as covered in Plate 19.

When the balance key is depressed with the credit register key, links G and I, contacting assembly S, rock the latter, its arm contacting on the stud in passby pawl slide O

raising it to clear link E, thereby preventing the credit register key from lowering part K to index the ribbon shift mechanism.

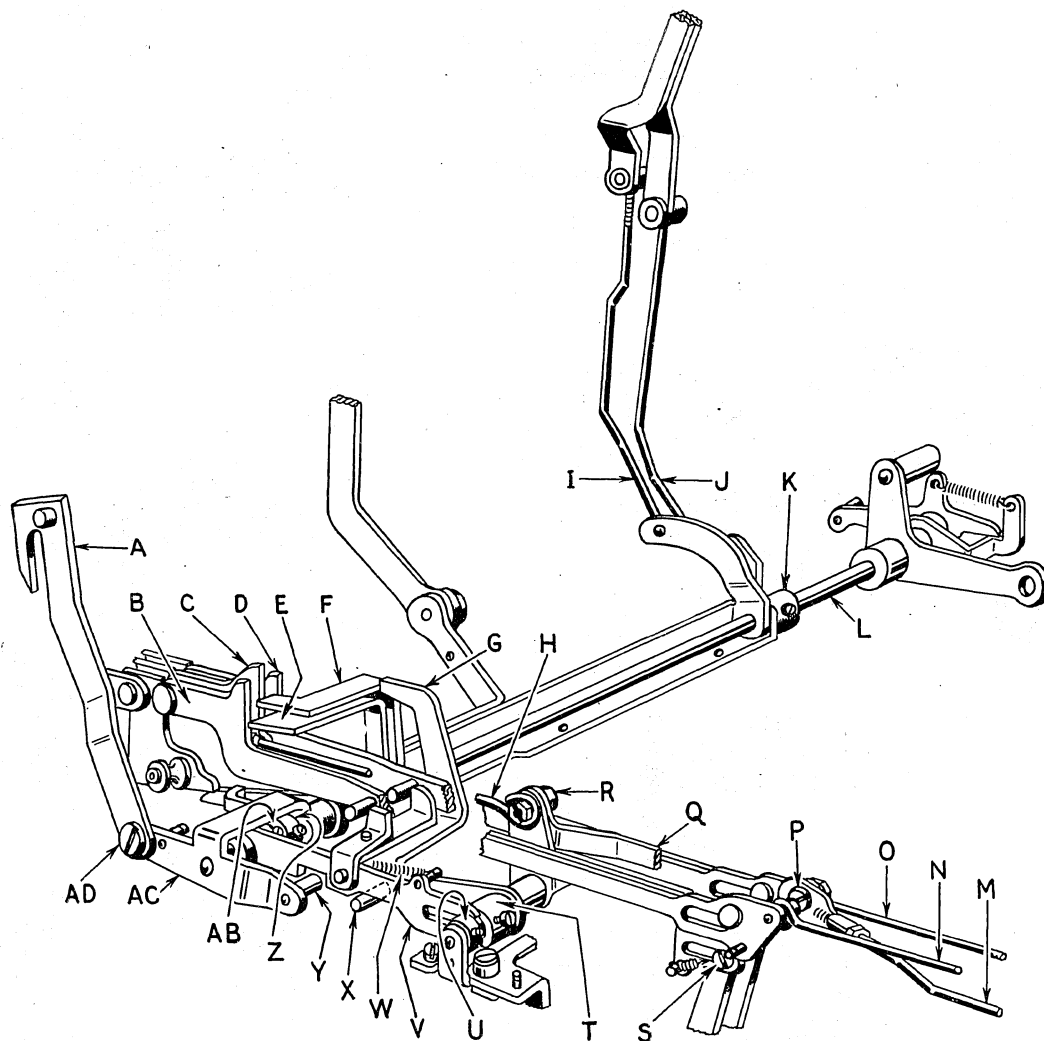
Tests and Adjustments

When the credit register key is depressed, the horizontal projection of O should have flush hold on link E. When the balance or credit register key is depressed, O should amply clear link E.

Adjustment: The horizontal projection of O is bent down for hold, and up for clearance.

Note: This mechanism is also used in Class 72 machines to index the ribbon shift mechanism from the extend key and to disable it from the result keys.

RIBBON SHIFT DISABLED FROM BALANCE AND REGISTER TOTAL KEYS, CLASS 78 (Plate 23)



Ribbon Shift Disabled from Balance and Register Total Keys (Plate 23)

The purpose of this mechanism is to prevent printing in red, and also to prevent printing the subtract symbol during either the balance or the register total operation when the subtract mechanism is under carriage control.

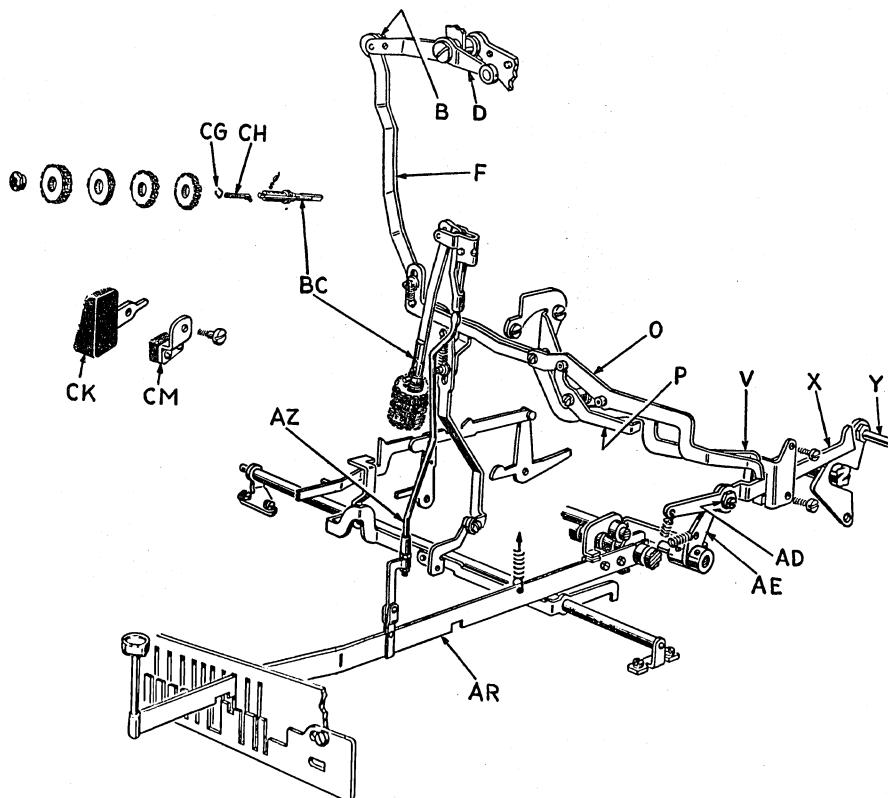
When the balance key is depressed, the stud in link C pushes part V forward. Part V, locating over stud Y, prevents arm A moving

downward to index the ribbon shift during the subtract operation. The cam surface of part V contacts stud X, swinging part G to block part F which prevents symbol printing during the subtract operation.

When the register total key is depressed, the stud in link B pushes part V forward to prevent ribbon shift and symbol printing, as explained under balance key operation.

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ROTARY CALENDAR MECHANISM, CARRIAGE CONTROLLED— IMPROVED (NEW WIDE BASE) (Plate 24-1)



Rotary Calendar Mechanism, Carriage Controlled—Improved (New Wide Base) (Plate 24-1)

Related Knowledge

Rotary Calendar Disabling Mechanism,
Plate 25.

Purpose

This mechanism, when indexed by a carriage control block, automatically prints a date during a machine operation.

Operation

As the carriage moves into a predetermined position, lever D, being rocked by a control block, raises link F to rock lever O which depresses arm X. The rear vertical surface of arm X is thus aligned with stud Y of the main camshaft assembly.

Stud Y rocks with the machine operation to drive arm X forward and rock bail AE. The formed lip of bail AE depresses type bar AR which, through wire AZ, swings the rotary calendar assembly BC to print the date.

Stud Y recedes from arm X on the return stroke allowing the mechanism to restore and the rotary assembly to limit on plastic bumper CK.

Locking slide CH, which is held in both active and inactive positions by spring CG, prevents the printing wheels of the rotary assembly from turning after the desired date is set on the assembly.

The small, leather-faced bumper CM limits the type bar in position No. 39.

Adjustment

Wire AZ is adjusted for length, and the type bar of assembly BC is adjusted for alignment and uniform printing as explained in the Key Lever and Type Bar Assembly (Plate 14).

With a control block on the roll of lever D, stud Y should align with the center of the rear vertical surface of arm X.

To adjust, turn eccentric B.

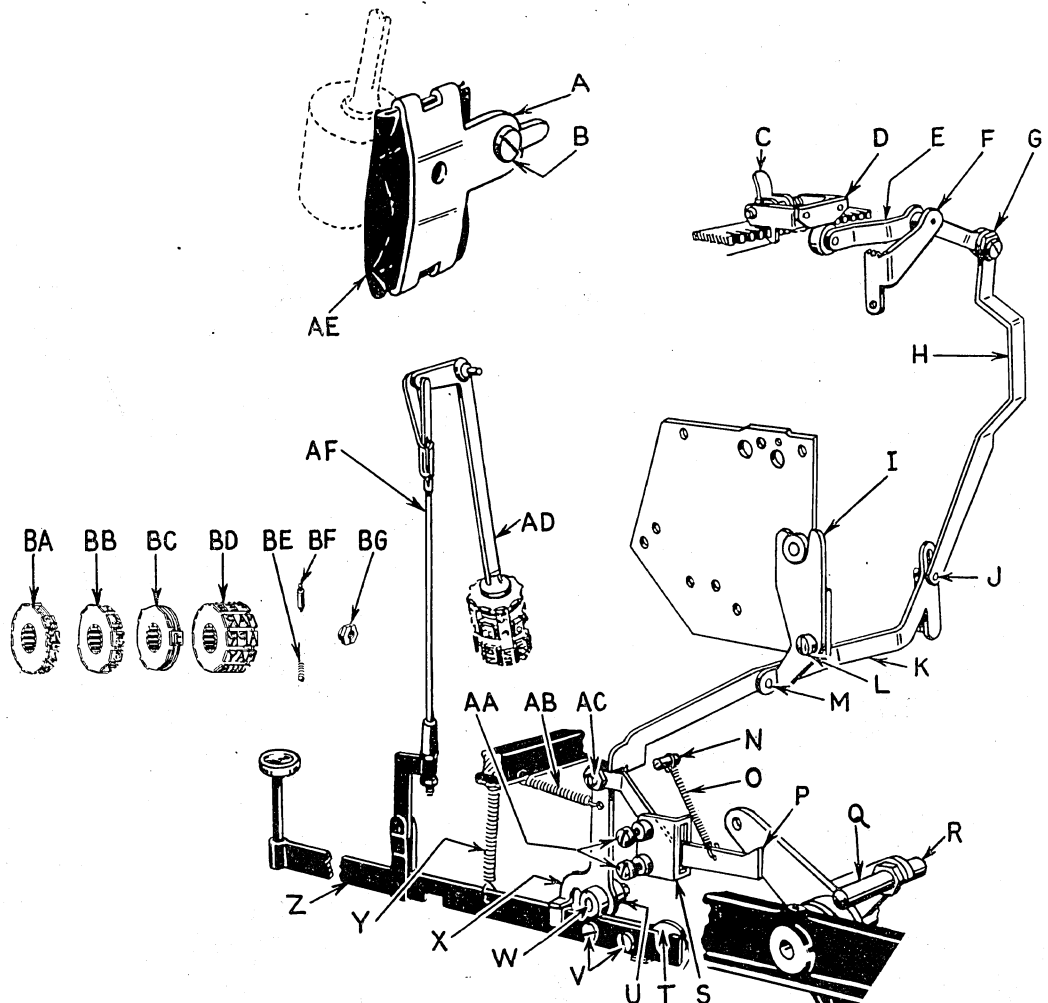
Arm X should rock bail AE to print a distinct impression of the date.

To adjust, turn eccentric AD.

With a control block on the roll of lever D, lever O should rock lever P to block the movement of lever V and prevent indexing the Four Period Type Mechanism (Plate 27-1).

To adjust, bend lever P to raise or lower its formed lip.

ROTARY CALENDAR MECHANISM, CARRIAGE CONTROLLED (Plate 24)



Rotary Calendar Mechanism, Carriage Controlled (Plate 24)

The purpose of this mechanism is to automatically print the date when the carriage tabulates into certain columns, and the motor bar is depressed.

Sequence and Construction

When the carriage tabulation carries cam D on roller of lever E, the latter is rocked which, through links H and K, lowers arm P into the path of stud Q.

During the machine operation, stud Q contacts arm P which swings bell-crank X;

the front arm of the latter, pushing key lever Z downward, swings type bar AD causing the type to strike the platen.

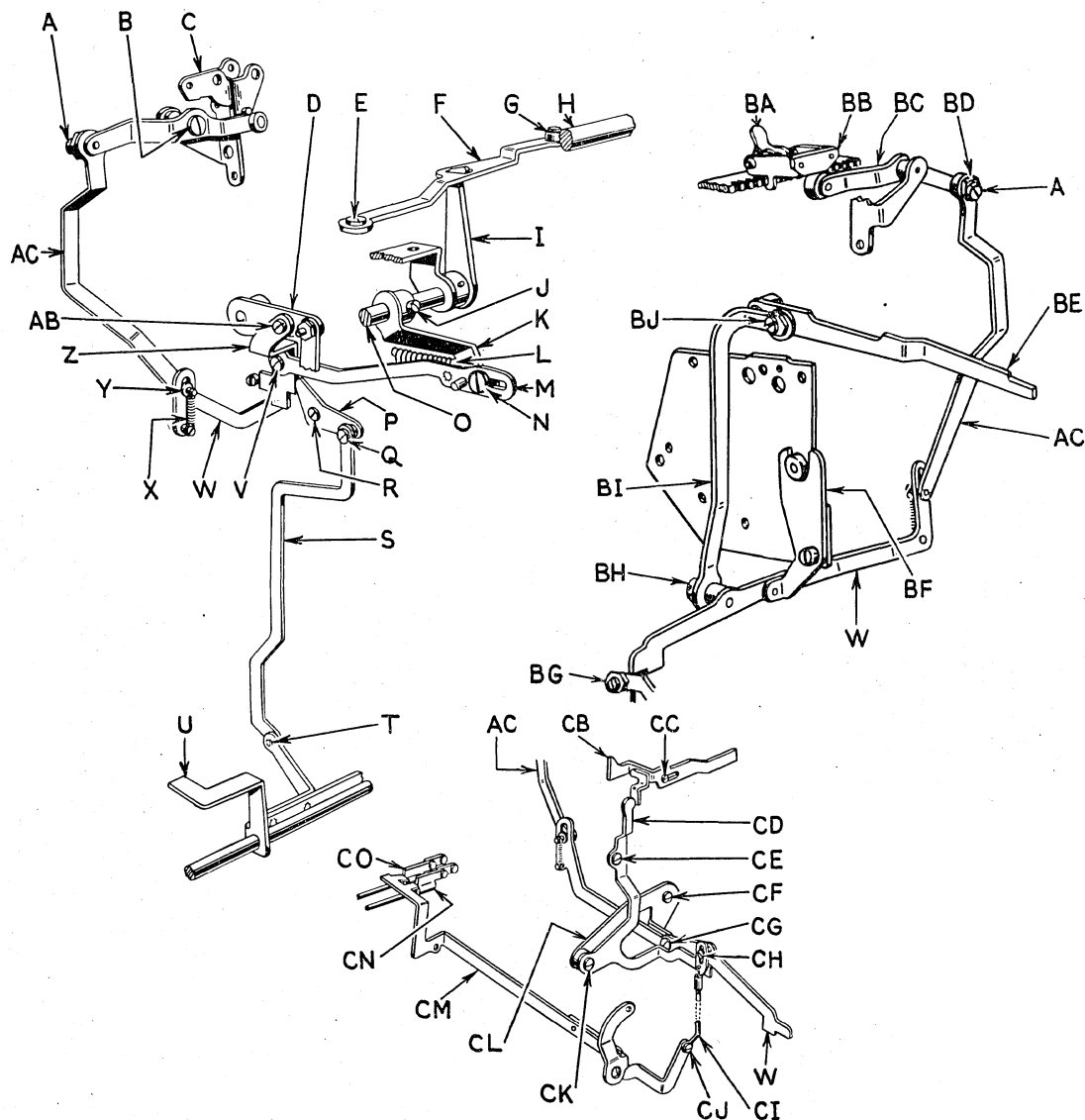
Bouncing of the rotary type assembly when it leaves the platen is prevented by limiting on shot bag AE.

Tests and Adjustments

When cam D is on the roller of lever E, arm P should align in the center of stud Q when the latter contacts it. To adjust, eccentric G is turned.

The necessary impact to insure distinct type impression is secured by turning eccentric AC.

ROTARY CALENDAR DISABLING MECHANISM (Plate 25)



Rotary Calendar Disabling Mechanism (Plate 25)

This mechanism disables the rotary calendar from three sources: when the carriage is raised, when the credit balance key is depressed, and during subtract machine operations.

When the carriage is raised out of printing position, arm F, through arms I and K and link M, swings part Z over lever W.

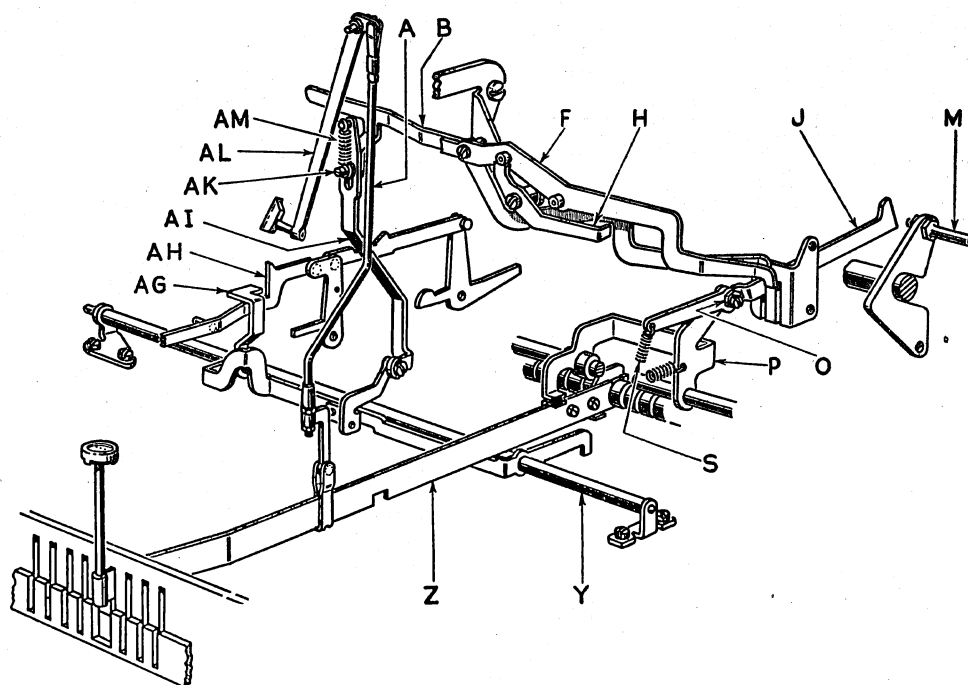
During the machine operation, arm D pushes part Z downward which swings arm P (Plate 24) upward in the event that it is in line with stud Q (Plate 24).

When the credit balance key is depressed, bail U, through link S and lever P, swings part Z over lever W which causes the machine operation to disable the rotary calendar mechanism.

During the subtract operation in late machines, part F (Plate 13) raises arm BE which through link BI raises arm P (Plate 24) when the latter is in line with stud Q (Plate 24). During the subtract operation in earlier machines, slide CB swings part CD to raise arm P (Plate 24) when the latter is in line with stud Q (Plate 24).

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FOUR PERIOD TYPE MECHANISM (IMPROVED) (Plate 27-1)



Four Period Type Mechanism (Improved) (Plate 27-1)

Purpose

This mechanism prints four periods from a balance or a minus balance operation.

Operation

THE INDEXING of this mechanism is accomplished when the balance or the minus balance key is depressed. Result linkage AH moves bail AG, link AI, and lever B which is rocked downward on arm J, lowering it into the path of stud M.

THE PRINTING occurs near the end of the forward stroke when stud M moves arm J forward, rocking bail P and key lever Z to swing type bar AL through wire A.

THE DISABLING of this mechanism results from the shifting or the opening of the

carriage, and from the carriage indexing of the rotary calendar mechanism. When the carriage is shifted or opened, the bail (H, Plate 25) through the lever (F, Plate 25) and its linkage, swings the blocking arm (Z, Plate 25) over lever B. During the machine operation, the arm (Z, Plate 25) rocks lever B permitting spring S to raise arm J out of the path of stud M.

When the Rotary Calendar Mechanism is indexed from the carriage, the control lever (BC, Plate 25) through the link (AC, Plate 25) and lever F, rocks lever H to block lever B. Depressing the balance or the minus balance key will then expand spring AM.

Adjustment

There should be a distinct impression when the type is swung during a machine operation.

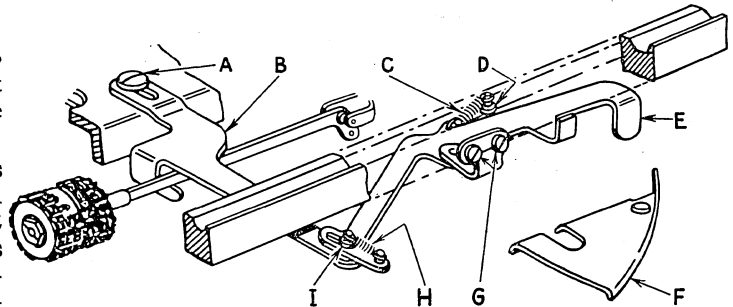
To adjust, turn eccentric O.

ROTARY CALENDAR CLAMPING LEVER FOR CHANGING DATES (Plate 26)

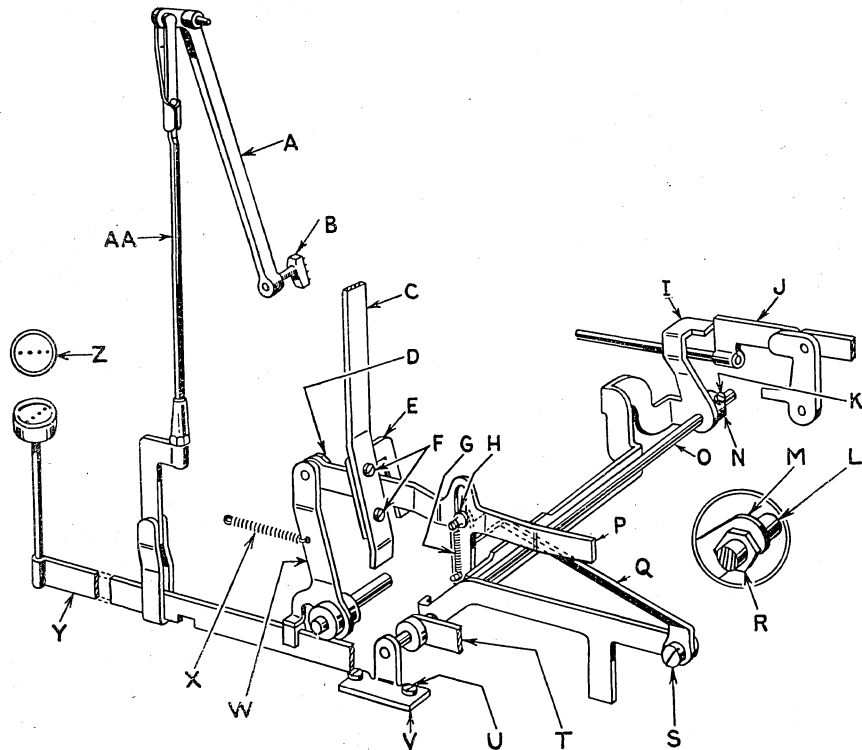
Rotary Calendar Clamping Lever for Changing Dates (Plate 26)

The purpose of this lever is to permit changing dates without placing the hand in the type basket.

The rotary type assembly is held upward by depressing and holding the date key. Lever E is pushed rearward which latches the rotary type assembly in upward position and permits releasing the date key and turning the date wheel.



FOUR PERIOD TYPE MECHANISM (Plate 27)



Four Period Type Mechanism (Plate 27) Controlled by Balance Key

The purpose of this mechanism is to print four periods when the balance key and the motor bar are depressed. This mechanism can be used only in the hyphen position.

When the balance key is depressed, bail I is moved forward which raises arm P in line with stud R. Bail I is connected to arm P by link Q.

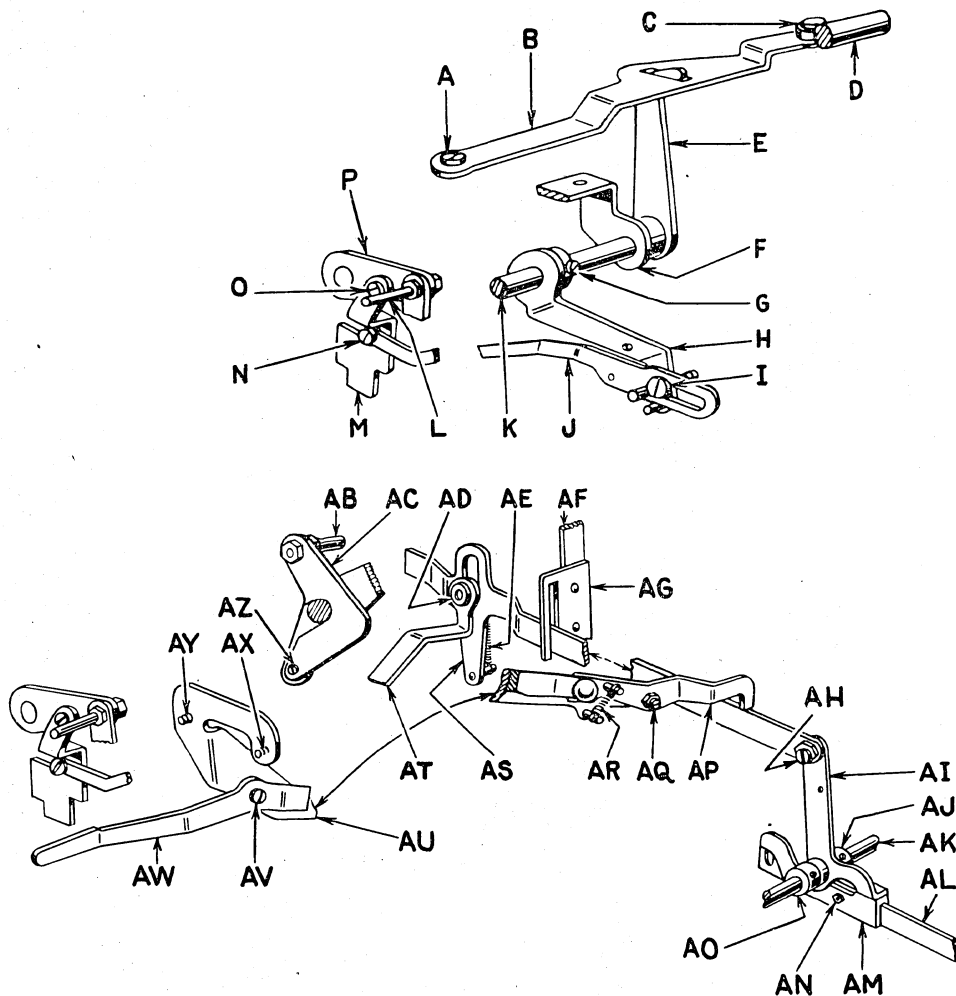
During the machine operation, stud R contacts arm P moving it forward which rocks

bell-crank W; the lower arm of bell-crank W moves lever Y downward which swings type bar A, and thereby causes type B to strike the platen.

Tests and Adjustments

During the machine operation, with the balance key depressed, arm P should contact centrally on stud R. To align arm P, its offset is adjusted. The necessary impact to insure distinct type impression is secured by turning eccentric D.

FOUR PERIOD PRINTING MECHANISM DISABLED WHEN PLATEN IS SHIFTED (Plate 28)



Four Period Printing Mechanism Disabled When Platen is Shifted (Plate 28)

This mechanism is used in machines having four period type (Plate 27) and is similar to rotary calendar disabling mechanism (Plate 25); both subjects should be referred to.

When the platen is raised, shaft D allows arm B to rock arms E and H which, through link J, swings part M over the left arm of lever AW.

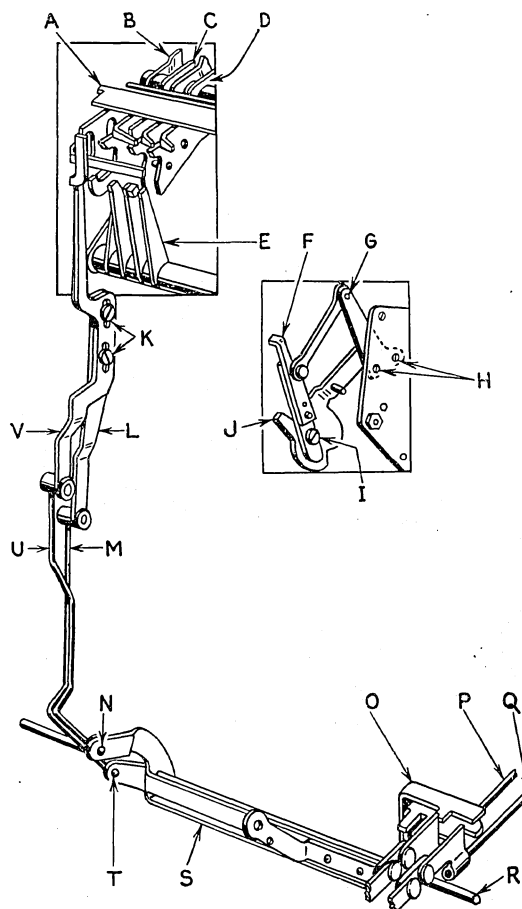
During the machine operation, arm P through part M, rocks levers AW and AP to lower part AS in the event that the balance key is depressed.

Tests and Adjustments

When the movement of lever AW is insufficient to cause arm AS to clear stud AB, eccentric AQ is adjusted to increase the downward movement of lever AP.

RESULT SYMBOL AND CLEAR SIGNAL MECHANISM, CLASS 77 (Plate 30)

(Plate 29 in Symbol Book Only)



Result Symbol and Clear Signal Mechanism (Plate 30)

The purpose of this mechanism is to print CR from credit balance key depression and also to print two ciphers from balance, sub-balance or total key depression.

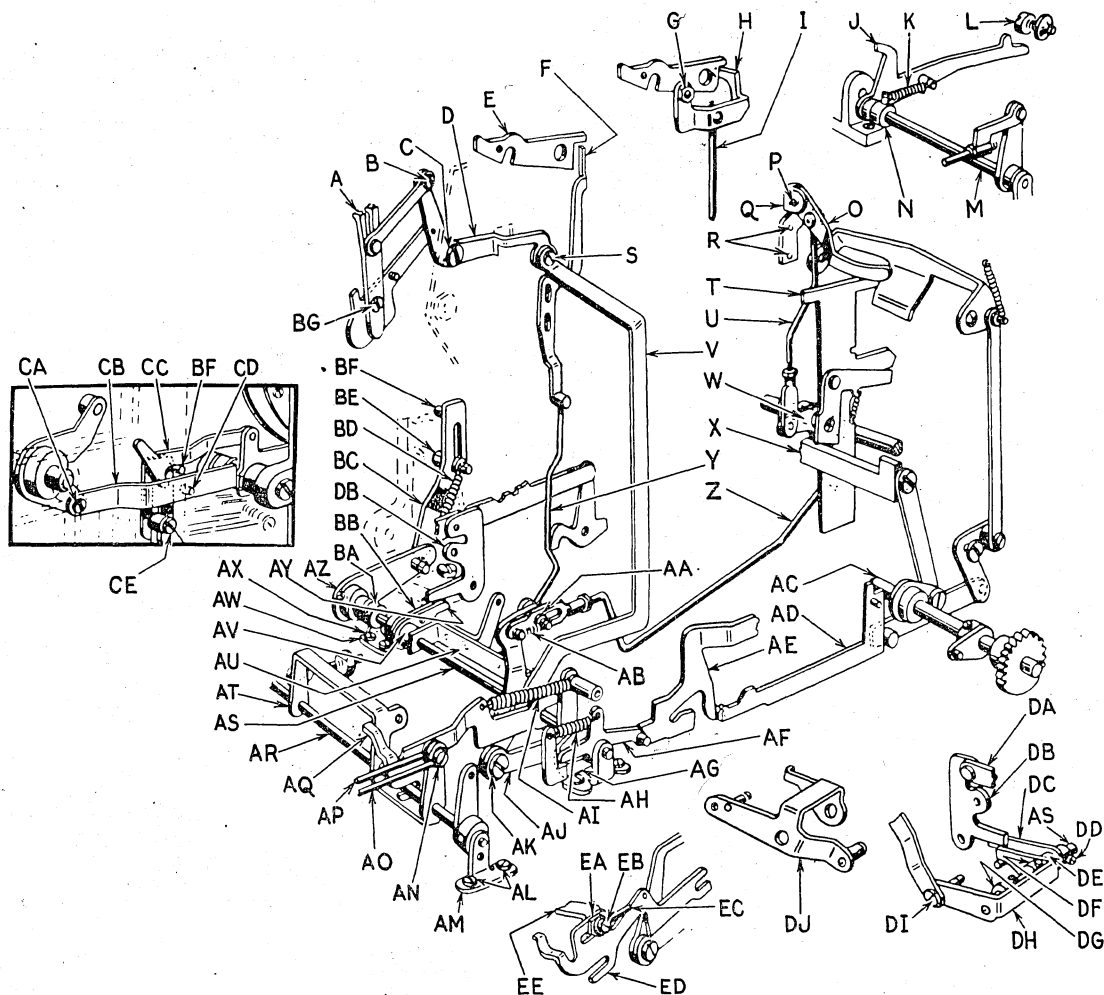
When the credit balance key is depressed, bail O is rocked which, through wire U and

link V, rocks latch B to allow driver E to actuate hammer J.

When balance, sub-balance or total key is depressed, bail S, through rod M and link L, raises latch assembly D to allow the drivers to actuate the hammers to print ciphers.

Note: This plate shows a section equipped for two column register designation.

RED RIBBON AND RESULT SYMBOL MECHANISMS, CLASS 78 (Plate 31)



Red Ribbon and Result Symbol Mechanisms (Plate 31)

CR Symbol Type Indexing—Extended Mechanism

Slide AE rocks arm AF which, through spring AH and arm AG, rocks shaft assembly AS. Arm AJ raises link V which through bell-crank D swings CR type to printing position.

CR Symbol Printing

Shaft assembly AC raises bail X which raises extend plate T, the latter lifts arm O and through wire U, rocks bell-crank W, which, through wire Z, bail AU, wire Y and link F, rocks lever E, thus releasing the driver to actuate the hammer to strike the type.

Ribbon Shift from Slide AE: Slide AE rocks shaft assembly AS, arm AZ pulls link BC downward to allow pawl CC to engage stud CD in link CB to shift the ribbon, covered in Plate 19.

Ribbon Shift from CR Bal. Linkage: Arm DB of the credit balance linkage contacts arm BB to rock shaft assembly AS which through arm AZ, pulls link BC downward to allow pawl CC to engage stud CD in link CB to shift the ribbon. Ribbon shift, automatic, is covered in Plate 19.

Ribbon Shift and CR Type Disabling from Register Subtract Key: Link AQ moves forward over screw head AK to block shaft assembly AS, causing spring AH to expand when slide AE rocks arm AF which retains the register symbol type and disables

the ribbon shift mechanism. Link AQ causes the crossfooter and register subtract key operation to print the same symbol as the crossfooter subtract and to print it in red.

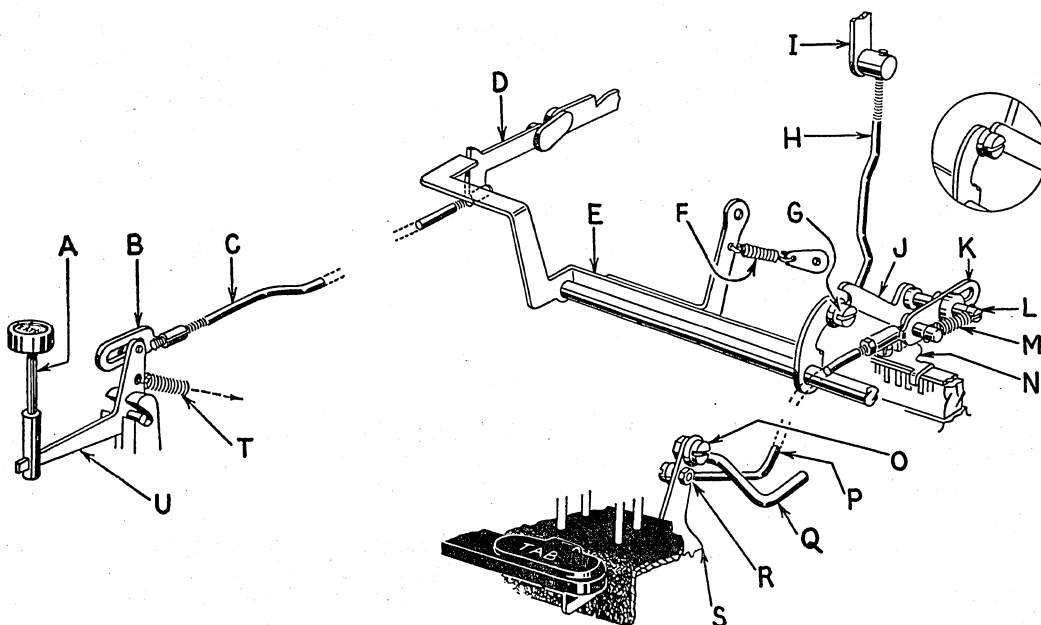
Part ED is used in place of part AQ when the crossfooter and register subtract key operation prints the same symbol as the register subtract key operation.

Bail EE pulls part ED over screw head AK which blocks shaft assembly AS to disable the type and ribbon shift.

Credit Items to Print in Black: Bail DH swings freely on shaft AS. When the credit balance linkage rocks bail DH, part BC remains normal, thereby preventing ribbon shift taking place.

Crossfooter and Register Subtract Operation Not to Print Symbol: When the crossfooter and register subtract key is depressed, spring K swings lever J to block threaded collar L which prevents symbol printing. The upward movement of extend plate T expands spring AB. The ribbon shift remains the same.

EXTEND KEY TO PRINT SYMBOL (Plate 32)



The purpose of this mechanism is to maintain the symbol indexing when the extend key is released in machines having four position printing control.

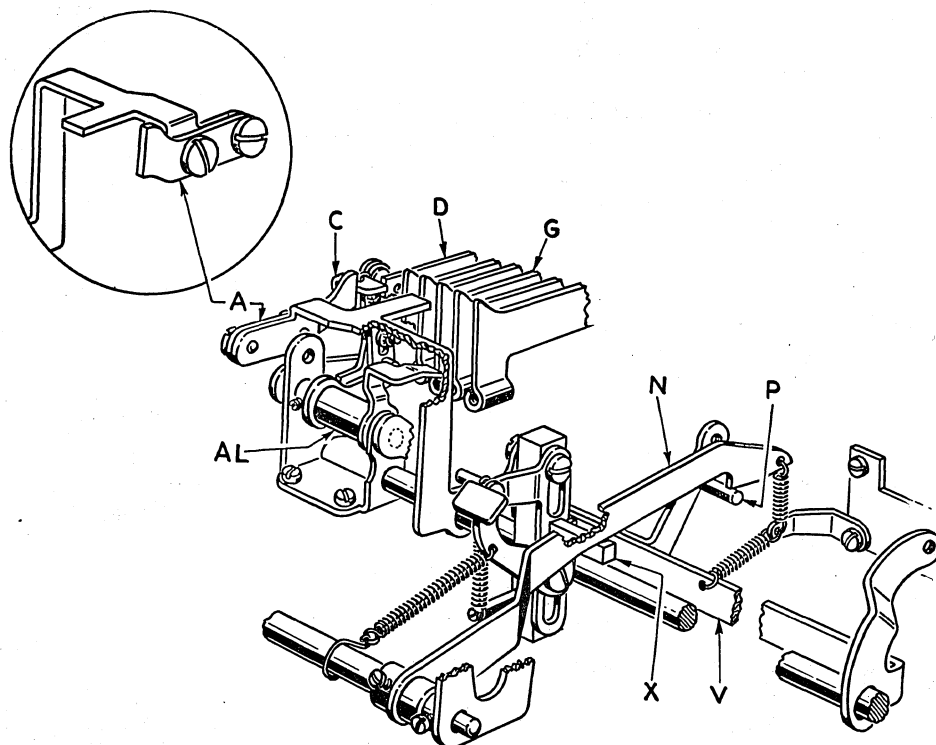
When the extend key is depressed, bellcrank U through wire C pulls linkage assembly D forward, which rocks bail E to index the symbol mechanism through wire H and link I. When the motor bar is depressed,

bell-crank S through wire P swings arm J to contact screw G, thereby blocking bail E to prevent its return to normal when the extend key is released.

When normal, arm J should just clear screw G.

Adjustment: Wire P is adjusted by turn-buckle K.

MINUS BALANCE SYMBOL TO PRINT FROM CREDIT REGISTER KEY No. 68—INACTIVE FROM BALANCE KEY—CLASS 77 (Plate 33)



Minus Balance Symbol to Print from Credit Register Key No. 68—Inactive from Balance Key—Class 77 (Plate 33)

Purpose

To index the printing of the minus balance symbol from depression of the credit register key.

Construction

This mechanism functions in conjunction with the Ribbon Shift from Credit Register Key—Disabled from Result Keys Mechanism (Plate 22, Printing Instruction Book).

Operation

When the credit register key is depressed, linkage D, through pass-by pawl slide C and lug A, rocks bail assembly V forward to index the Symbol Printing Mechanism.

Latch arm N engages stud P (in bail assembly V) to assure that the Symbol

Printing Mechanism remains indexed until the hammers are fired, since the credit register linkage restores to normal toward the end of the forward machine stroke.

Bail assembly V is released near the end of the return machine stroke through the raising of stud X in the Non-Clear Subtract Release Mechanism.

In order to omit the printing of the symbol during a Balance-Credit Register operation, the balance key must be depressed before the credit register key. Balance key linkage G, moving forward, rocks bail AL to raise pass-by pawl slide C out of alignment with credit register key linkage D.

Adjustment

Latch arm N should engage stud P at approximately the same time as linkage D is latched forward.

To adjust, shorten or lengthen latch arm N.

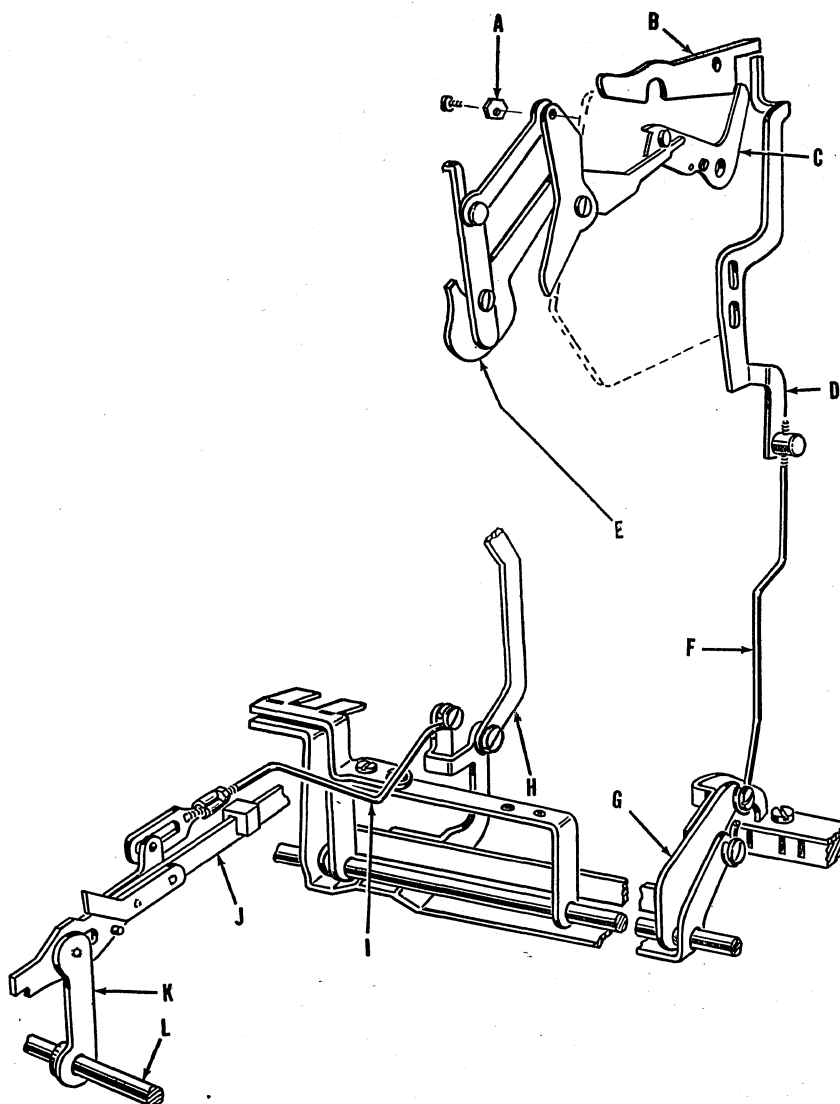


C

C

C

SYMBOL TO PRINT DURING MINUS BALANCE OPERATION SERIES M 200 (Plate 34)



Symbol to Print During Minus Balance Operation Series M 200 (Plate 34)

Purpose

To permit printing a CR symbol during minus balance operations.

Construction

The symbol prints in the first (fraction) column.

The Symbol Printing Mechanism is indexed through the result linkage as the latter is moved forward through the rocking of power shaft L.

Symbols are used mostly in multi-purpose accounting machines—with bookkeeping being one of the more common applications—since it is necessary to distinguish minus balances, particularly if there are carbon copies.

Operation

When a minus balance operation is indexed, power shaft arm K pulls minus balance linkage J forward rocking bail G, through wire I. Rocking of bail G rocks driver latch B, through wire F and link D to allow driver C to fire symbol hammer E.

(Plate 28)—Continued**Adjustment**

1. With the machine normal there should be .010" clearance between link D and hammer driver latch B.

To adjust, shorten or lengthen wire F.

2. With result linkage J latched forward on the result latch, hammer driver latch B should have at least .025" clearance over hammer driver C.

To adjust, shorten or lengthen wire I.

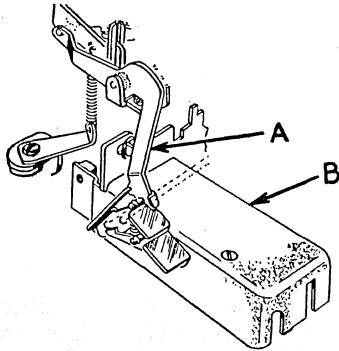
3. With result linkage J latched forward on the result latch, lever P (Plate 25) should non-bind on date disabling arm Z (Plate 25).

To adjust, shorten or lengthen link H.

4. During a minus balance operation the symbol should print in alignment with the adding machine type. Inasmuch as the symbol type is smaller than the adding machine type the alignment should be central.

To adjust, turn eccentric bushing A.

TYPEWRITER REMOVAL AND INSTALLATION, CLASS 72 AND SERIES M 200 MACHINES (Plate A)



Remove the following parts:

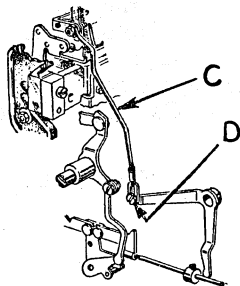
1. Highback.
2. Rear Carriage Control Bar.
3. Case.
4. Right and Left Covers B.

Machines containing Easy Depression Power Result Keys—

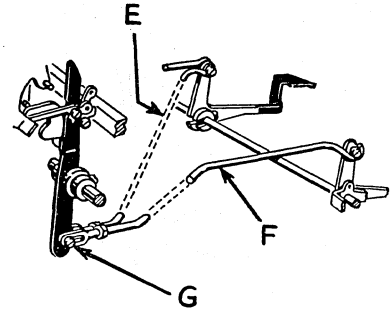
Disabling Lever A should be in normal position to remove the Left Cover.

5. Front Typewriter Panel.
6. Register Position Indicator Panel.
7. Right and Left Typewriter Panels.

Aligning and Overdraft Lights, if contained, should be removed before removing the panels.

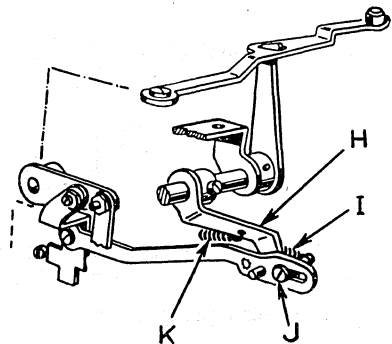


8. Remove Screw D from Pro-rate Mechanism Normalizing Wire C.



9. Remove Screw G from the turnbuckle at the rearward end of Vertical Space Indexing Wire F.

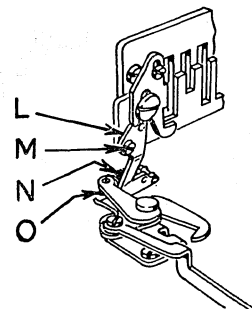
Remove the Nut from Screw G, if Wire E for Space and Return from the Motor Bar is contained.



10. Unhook Spring K (on arm H) from the Anchor on the left side of the Printing Section.

11. Unhook Spring I from Screw J.

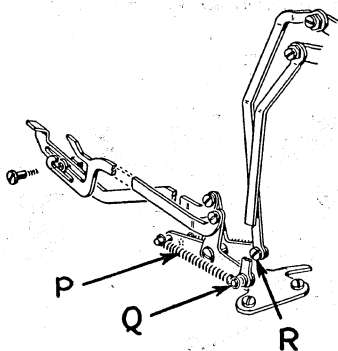
12. Remove Screw J.



13. Unhook Springs N and O.

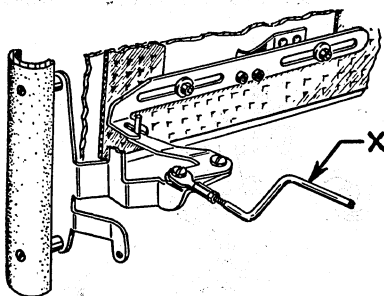
14. Remove Screw M and Anchor Plate L.

(Plate A)—Continued



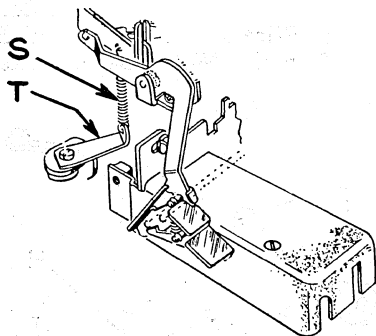
15. Unhook Spring P.

16. Remove Screws Q and R.



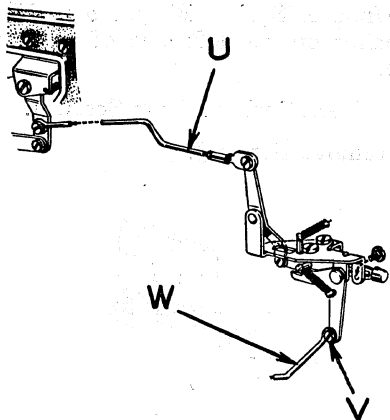
Machines containing Extend Column (For Multiplier Factor to Print Mechanism) Selected from Front Panel Mechanism—

Remove Wire X.



Machines containing Easy Depression Power Result Keys—

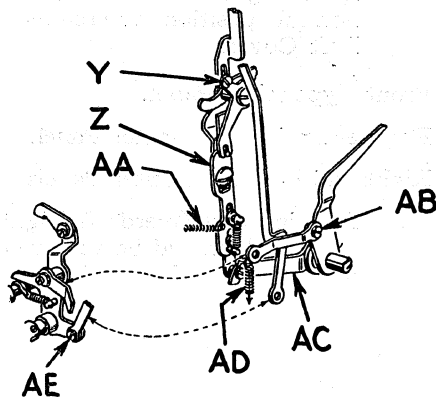
Unhook Spring S from Anchor T.



Machines containing Multiplier Factor to Print—Normalized by Key No. 52—

Remove Wire U.

Remove Screw V from the forward end of Wire W.



Machines containing Carriage Return—Carriage Controlled Mechanism or Rotary Calendar Feature—Carriage Controlled Mechanism (Replacing the Carriage Return—Carriage Controlled Feature)—

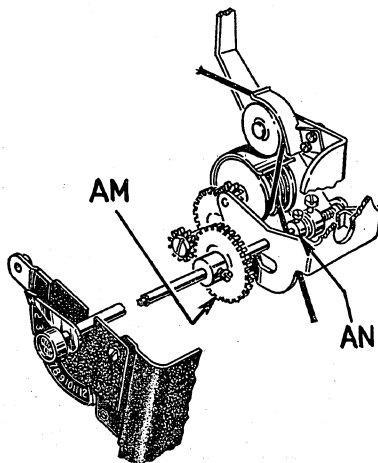
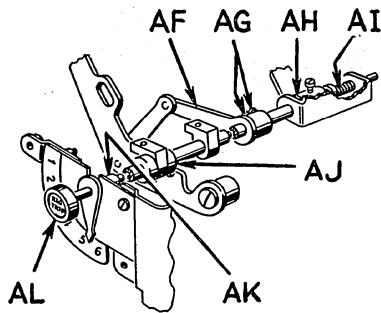
Remove Screw AB.

Remove Screw AE, if contained.

17. Remove Screw Y.

18. Unhook Spring AA from Link Z.

19. Unhook Spring AD from ear on Arm AC.

(Plate A)—Continued

Disable the Manual Register Escapement as follows:

20. Loosen Screws AG.

When installing the Typewriter, align the Indicator and tighten Screws AG after the Front Type-writer Panel has been installed.

21. Loosen the Screw in Collar AJ.

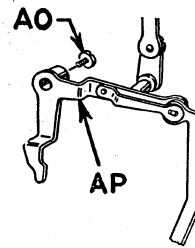
22. Remove Spring AI and Collar AH if loose.

23. Pull Register Trip Rod AL and Hollow Shaft Assembly AK forward until their rearward extremities are clear of Arm AF, and tighten the Screw in Collar AJ.

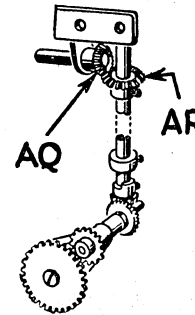
Machines containing 100 Pinion Register Construction—

Remove Gear AM.

Remove Collar AN if contained.

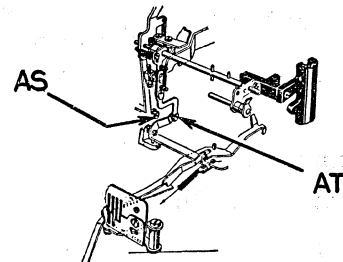


24. Remove Screw AO holding Bell Crank AP.

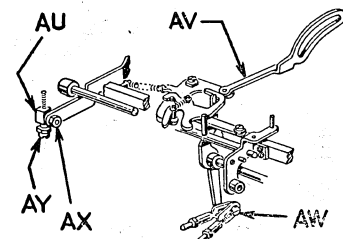


25. Loosen the Screw in Register Return Gear AR.

When reassembling, check Gear AR for non-binding mesh with Gear AQ.

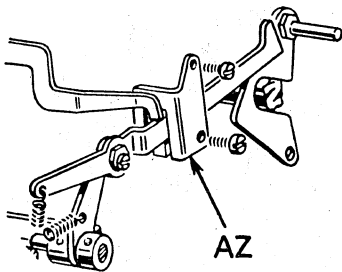


26. Remove Screw AT.
27. Remove Screw AS.

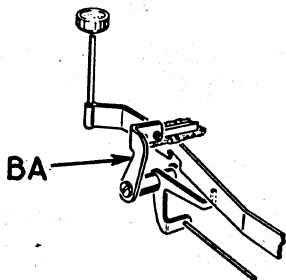


28. Loosen Nut AX and turn Square Hub AU so that the head of Screw AY is forward.
29. Disconnect the forward end of Link AV.
30. Remove Screw AW.

(Plate A)—Continued



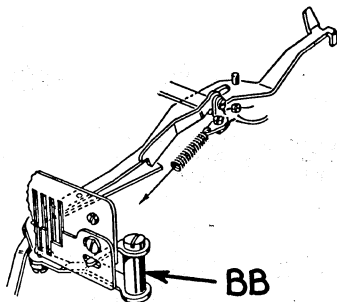
31. Remove Rotary Calendar Feature Drive Arm Guide AZ.



32. Remove Bracket BA.

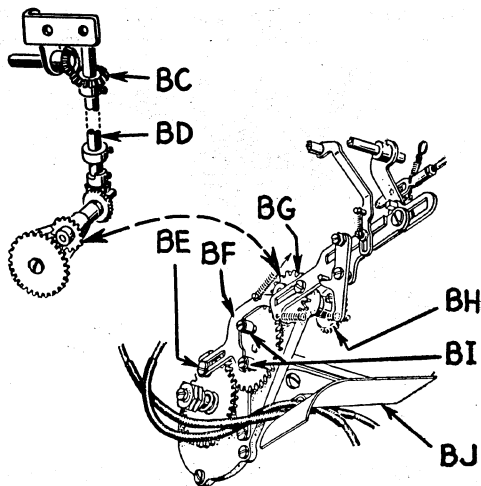
Tilt the machine rearward.

33. Remove the Oil Shield beneath the base.



34. Remove the Hexagon Posts holding the front Typewriter Legs to the base, and swing Rocker Arm BB rearward.

35. Remove the Drive Cover.



36. Remove Shield BJ covering the Motor Governor.

37. Loosen the Setscrew in Gear BH and remove the Gear and Shaft Assembly BG.

Machines containing Easy Depression Power Result Keys—

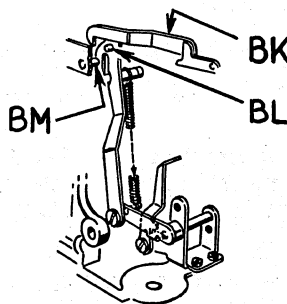
To Remove Gear BH and Shaft Assembly BG, remove Screw BE and swing Slide BF and its assembled parts downward around Rolls BI. Then, back Shaft Assembly BG out of the casting and reassemble Slide BF with Screw BE.

38. Carriage Return Shaft BD is a Split Shaft. Unscrew the Shaft and remove the lower part and Gear BC from the machine.

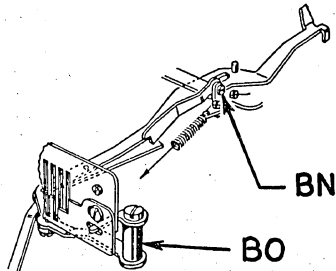
39. Remove the Screws holding the rear Typewriter Legs to the base.

Lower the machine to normal.

40. Remove the right and left Screws that hold the Typewriter Top Plate to the Side Frames.

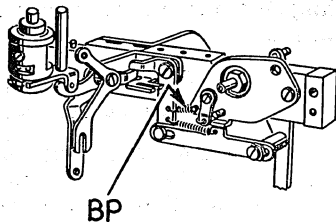


41. Prevent Ribbon Shift Hook Arm BK from catching on Studs BL and BM, and remove the Typewriter from the machine.

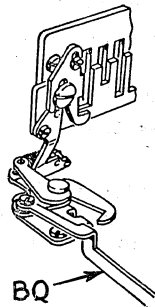
*(Plate A)—Continued****Preparing the Machine for Operation
after the Typewriter has been Removed.***

42. Replace Typewriter Keylock Rocker Arm BO using a Roller 71394A as a seat.

43. Replace Screw BN with a Screw with less shoulder to prevent the Interlock from holding the Keyboard Interlocks in active position.



44. Unhook Spring BP.



45. Retain Link BQ in its forward position to hold open the Result Key Interlocks in the Adding Keyboard.

Installing the Typewriter

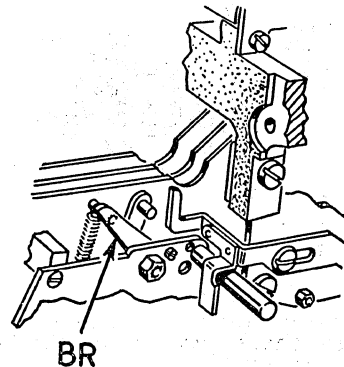
46. Shift Register One into active position.

47. List full capacity of 9's in the Cross-footer.

48. List full capacity of 2's in the Cross-footer.

49. Depress a Crossfooter Total Key.

50. Depress the Motor Bar (on machines without Easy Depression Power Result Keys).

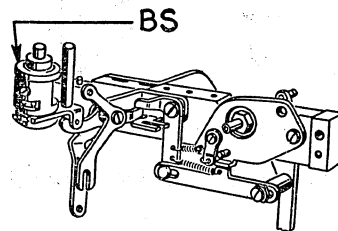


51. Hold Non-Print Latch BR rearward.

52. Manually operate the machine until the Hammers fire.

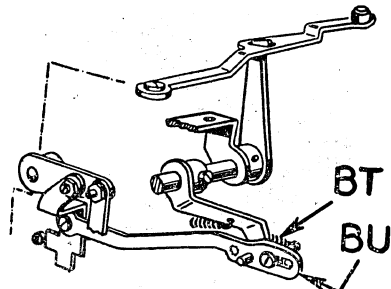
Machines containing the Four Position Printing Mechanism—

Hold the Carriage Control Arm in a position to permit a full print.

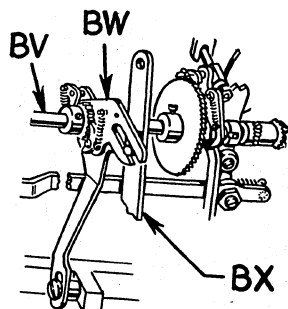


53. See that Carriage Return Clutch BS is in its proper place.

54. Reverse the procedure of Items 42, 43, and 44.



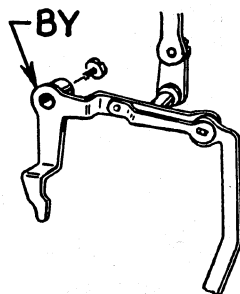
55. Hook Spring BT to the Anchor on the left side of the Printing Section to hold Arm BU in position for installing the Typewriter.

(Plate A)—Continued

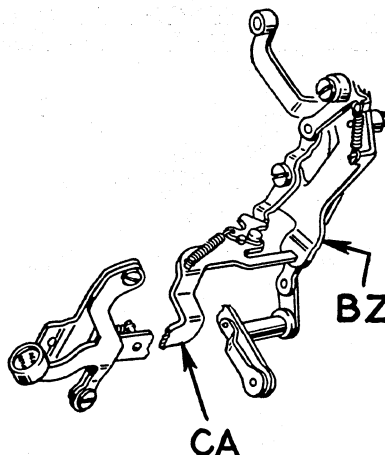
56. Place the Typewriter on the base in a position so that Ribbon Reverse Shaft BV is rearward of the Hammers.

57. Restore the machine to normal.

58. Place Ribbon Feed Fork BW on the Stud in Hammer Fire Arm BX.



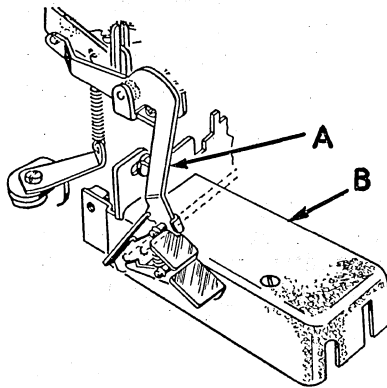
59. Place Bell Crank BY in position.



60. Place the end of Register Return Key Slide CA into the Slot of Guide Plate BZ.

61. Connect the Typewriter to the machine by reversing the procedure beginning with Item 41.

TYPEWRITER REMOVAL AND INSTALLATION, CLASS 78 AND SERIES M 800 MACHINES (Plate B)



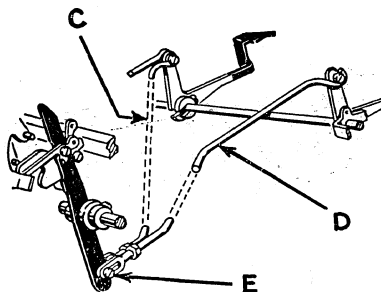
Remove the following parts:

1. Highback.
2. Rear Carriage Control Bar.
3. Case.
4. Right and Left Covers B.

Machines containing Easy Depression Power Result Keys—

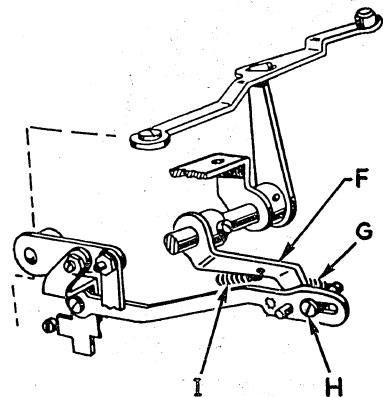
Disabling Lever A should be in normal position to remove the Left Cover.

5. Front Typewriter Panel.
6. Register Position Indicator Panel.
7. Aligning Lights.
8. Right and Left Typewriter Panels.



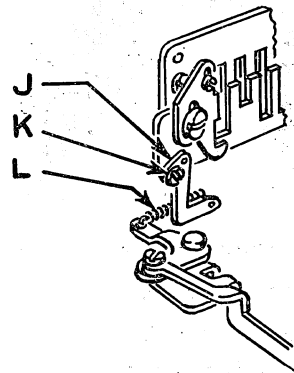
9. Remove Screw E from the Turnbuckle at the rearward end of Vertical Space Indexing Wire D.

Remove the Nut from Screw E, if Wire C for Space and Return from the Motor Bar is contained.

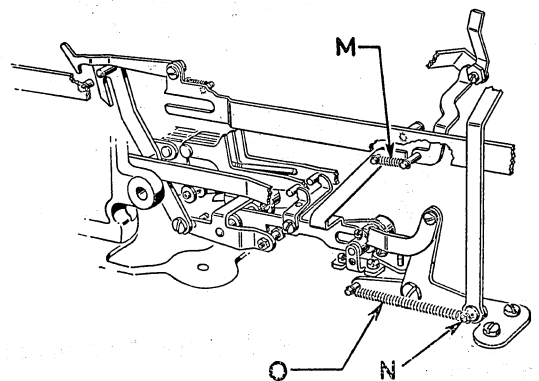


10. Unhook Spring I (on Arm F) from the Anchor on the left side of the Printing Section.

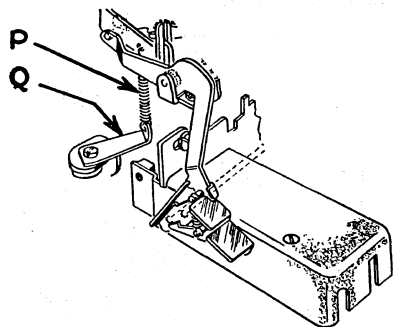
11. Unhook Spring G from Screw H.
12. Remove Screw H.



13. Unhook Spring L.
14. Remove Screw K and Anchor Plate J.

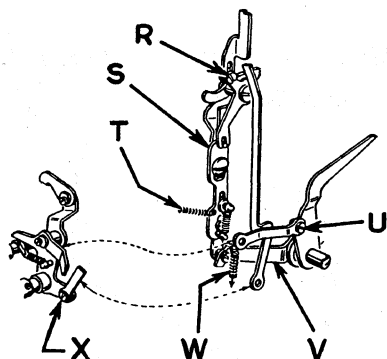


15. Remove Springs M and O and Screw N.

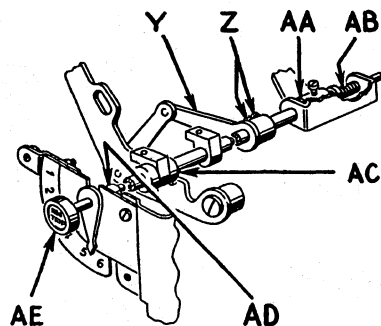
(Plate B)—Continued

Machines Containing Easy Depression Power Result Keys—

Unhook Spring P from Anchor Q.



16. Remove Screw U.
17. Remove Screw X.
18. Remove Screw R.
19. Unhook Spring T from Link S.
20. Unhook Spring W from ear on Arm V.

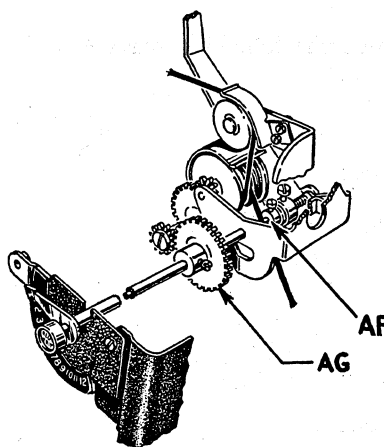


Disable the Manual Register Escapement as follows:

21. Loosen Screws Z.

When installing the Typewriter, align the indicator and tighten Screws Z after the Front Typewriter Panel has been installed.

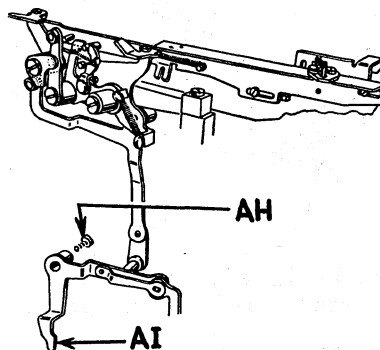
22. Loosen the Screw in Collar AC.
23. Remove Spring AB and Collar AA if loose.
24. Pull Register Trip Rod AE and Hollow Shaft Assembly AD forward until their rearward extremities are clear of Arm Y, and tighten the Screw in Collar AC.



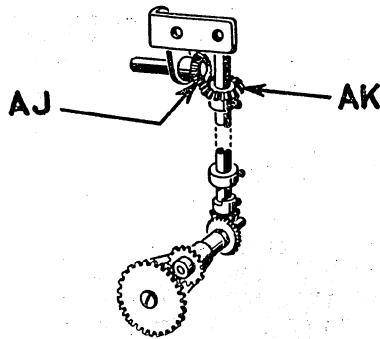
Machines containing 100 Pinion Register construction—

Remove Gear AG.

Remove Collar AF if contained.

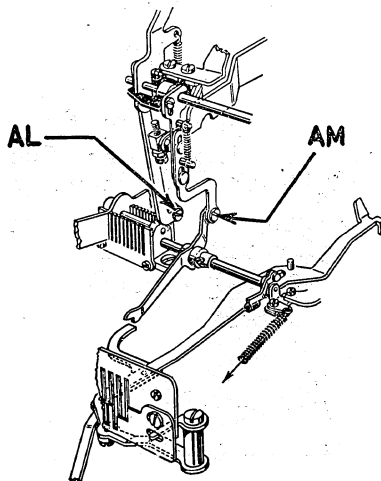


25. Remove Screw AH holding Arm AI on Hub.

(Plate B)—Continued

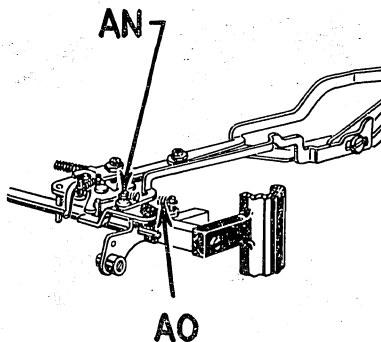
26. Loosen the Screw in Register Return Gear AK.

When reassembling, check Gear AK for non-binding mesh with Gear AJ.

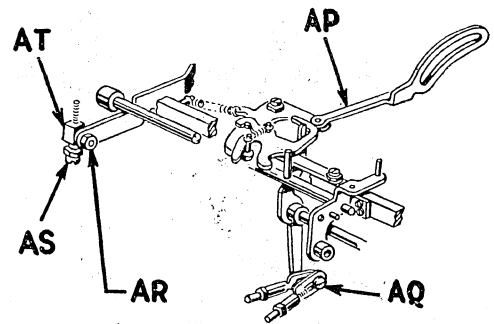


27. Remove Screw AM.

28. Remove Screw AL.



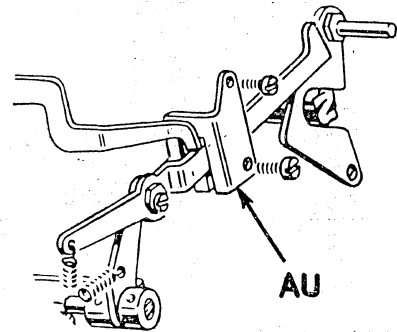
29. Unhook Spring AO and remove Screw AN.



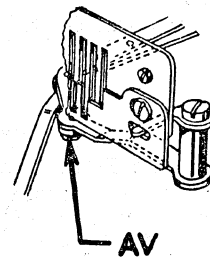
30. Loosen Nut AR and turn Square Hub AT so that the head of Screw AS is forward.

31. Disconnect the forward end of Link AP.

32. Remove Screw AQ.



33. Remove Rotary Calendar Feature Drive Arm Guide AU.



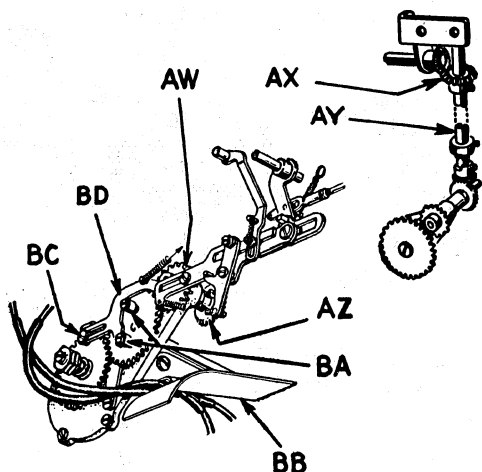
Tilt the machine rearward.

34. Remove the Oil Shield beneath the base.

35. Remove the Hexagon Posts holding the front Typewriter Legs to the base.

36. Remove Screw AV and the Rocker Arm.

37. Remove the Drive Cover.

(Plate B)—Continued

38. Remove Shield BB covering the Motor Governor.

39. Loosen the Setscrew in Gear AZ and remove the Gear and Shaft Assembly AW.

Machines containing Power Result Keys—

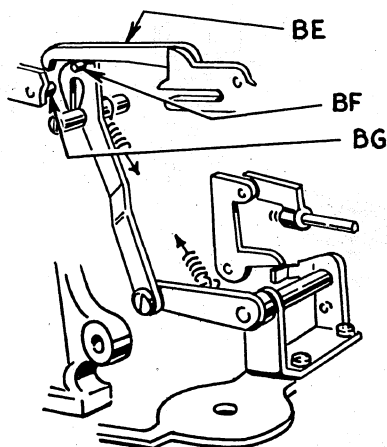
To remove Gear AZ and Shaft Assembly AW, remove Screw BC and swing Slide BD and its assembled parts downward around Rolls BA. Then, back Shaft Assembly AW out of the casting and reassemble Slide BD with Screw BC.

40. Carriage Return Shaft AY is a Split Shaft. Unscrew the Shaft and remove the lower part and Gear AX from the machine.

41. Remove the Screws holding the rear Typewriter Legs to the base.

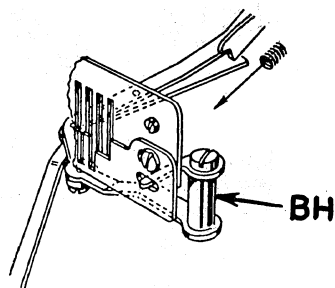
Lower the machine to normal.

42. Remove the right and left Screws that hold the Typewriter Top Plate to the Side Frames.

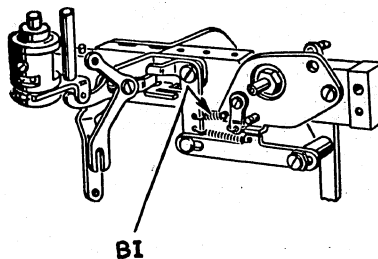


43. Prevent Ribbon Shift Hook Arm BE from catching on Studs BF and BG, and remove the Typewriter from the machine.

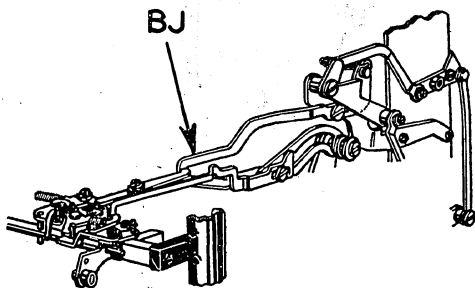
Preparing the Machine for Operation after the Typewriter has been Removed.



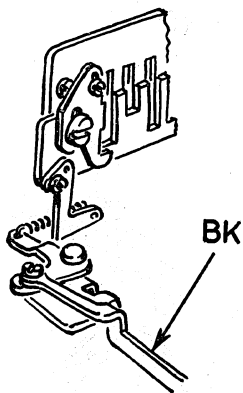
44. Replace Typewriter Keylock Rocker Arm BH, using a Roller 71394A as a seat.



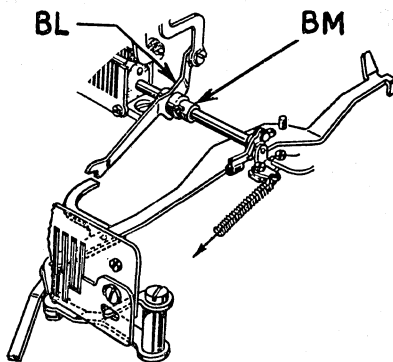
45. Unhook Spring BI.

(Plate B)—Continued

46. Tie up Link BJ to prevent locking the machine as it returns to normal.



47. Retain Link BK in its forward position to hold open the Result Key Interlocks in the Adding Keyboard.



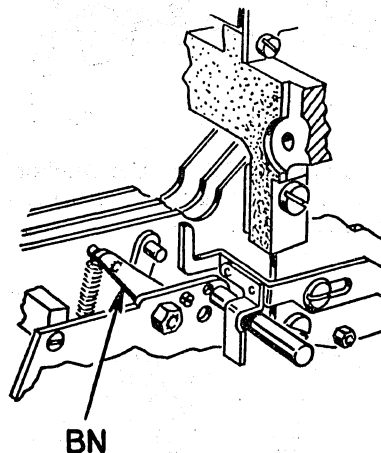
48. Place Collar BM tight against Interlock Arm BL to prevent Arm BL from holding the Keyboard Interlocks in an active position.

Installing the Typewriter

49. List full capacity of 9's in the Cross-footer.

50. List full capacity of 2's in the Cross-footer.

51. Depress a Crossfooter Total Key.

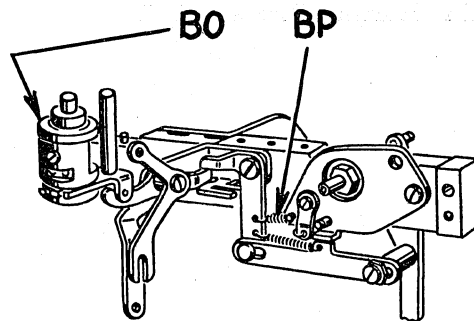


52. Hold Non-Print Latch BN rearward.

53. Manually operate the machine until the Hammers fire.

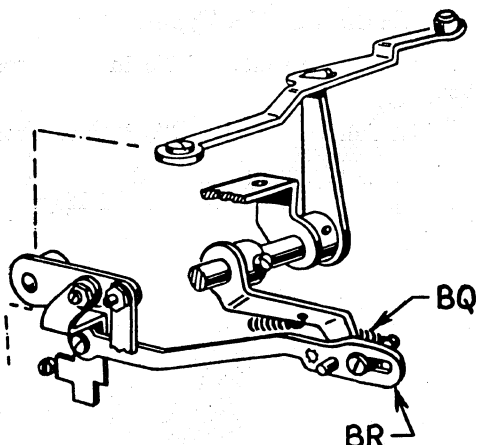
Machines containing the Four Position Printing Mechanism—

Hold the Carriage Control Arm in a position to permit a full print.

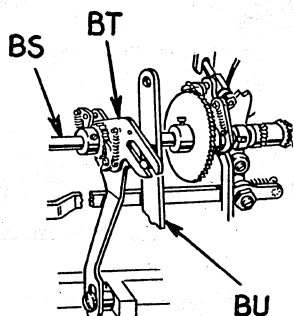


54. See that Carriage Return Clutch BO is in its proper place.

55. Reverse the procedure of Items 44 through 48.

(Plate B)—Continued

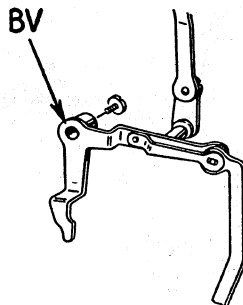
56. Hook Spring BQ to the Anchor on the left side of the Printing Section to hold Arm BR in position for installing the Typewriter.



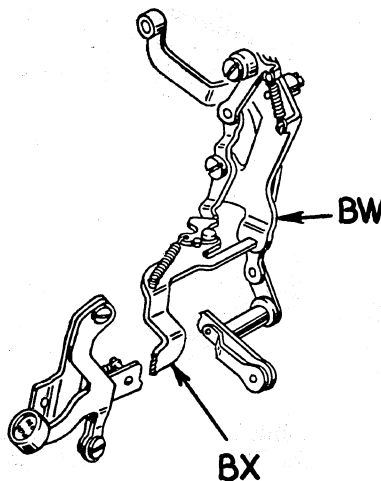
57. Place the Typewriter on the base in a position so that Ribbon Reverse Shaft BS is rearward of the Hammers.

58. Restore the machine to normal.

59. Place Ribbon Feed Fork BT on the Stud in Hammer Fire Arm BU.



60. Place Bell Crank BV in position.

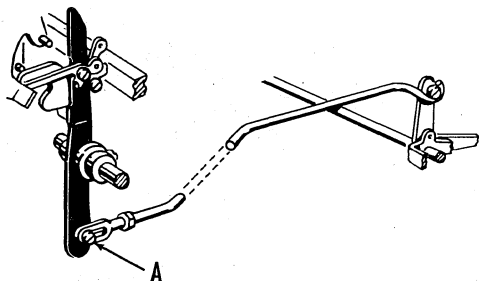


61. Place the end of Register Return Key Slide BX into the slot of Guide Plate BW.

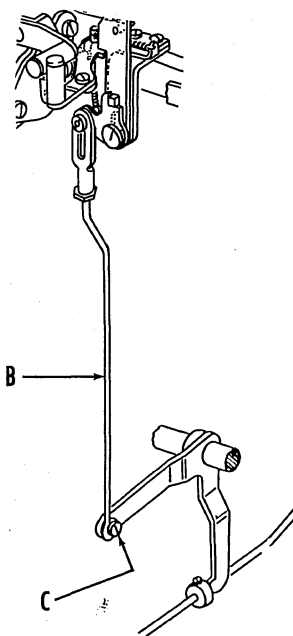
62. Connect the Typewriter to the machine by reversing the procedure beginning with Item 43.

TYPEWRITER REMOVAL AND INSTALLATION, CLASS 77 AND SERIES M 700 MACHINES (Plate C)

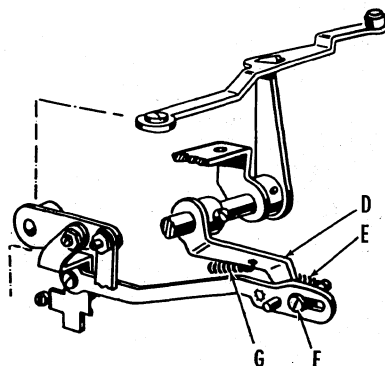
1. Remove the following parts:
 - a. Highback.
 - b. Rear Carriage Control Bar.
 - c. Case.
 - d. Aligning Table.
 - e. Collating Table.
 - f. Aligning Light from Bracket.
 - g. Aligning Light Bracket.



2. Remove Screw A from the Turnbuckle at the rearward end of the Vertical Space Indexing Wire.

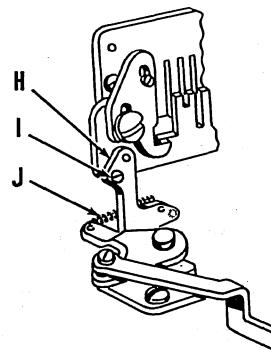


3. Remove Screw C from Consecutive Numbering Wire B.

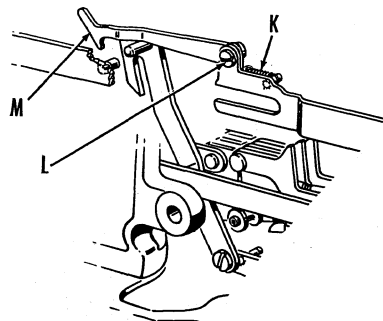


4. Unhook Spring G (on Arm D) from the Anchor on the left side of the Printing Section.

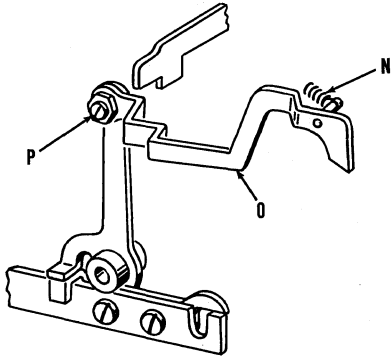
5. Unhook Spring E from Screw F.
6. Remove Screw F.



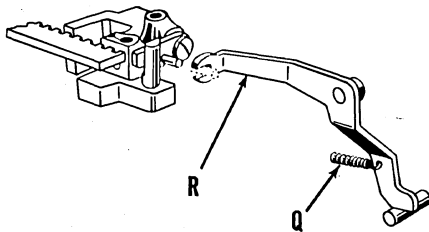
7. Unhook Spring J.
8. Remove Screw I and Anchor Plate H.



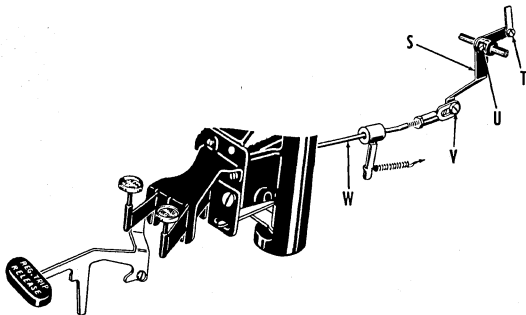
9. Unhook Spring K.
10. Remove Screw L and Ribbon Hook M.

(Plate C)—Continued

11. Unhook Spring N.
12. Remove Screw P and Eccentric.
13. Remove Rotary Calendar Feature Drive Arm O.

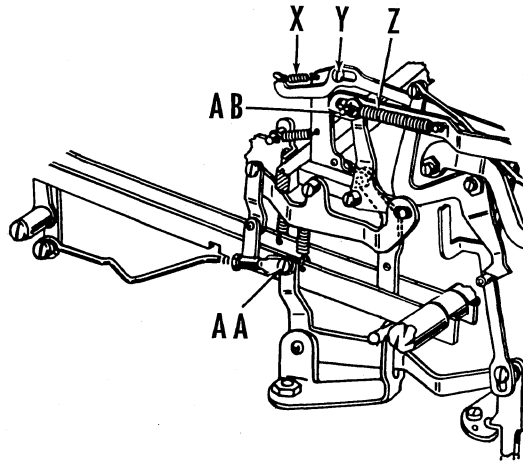


14. Unhook Spring Q from the Carriage Interlock Arm R.

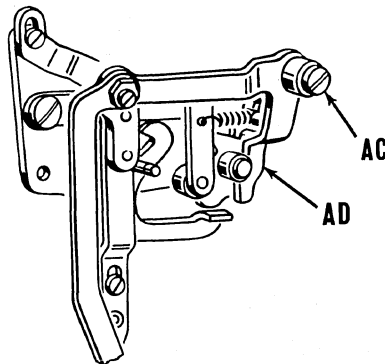


15. Remove Screw V from Register Trip Wire W.
16. Remove Screw T from Register Trip Bell Crank S.

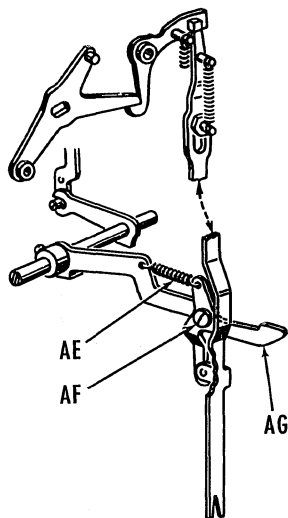
In machines with Selective Skip Tabulation loosen Screw U and move Bell Crank S to the right.



17. Remove Screw AA.
18. Unhook Spring X.
19. Remove Screw Y.
20. Remove Spring Z.
21. Remove Screw Stud AB.

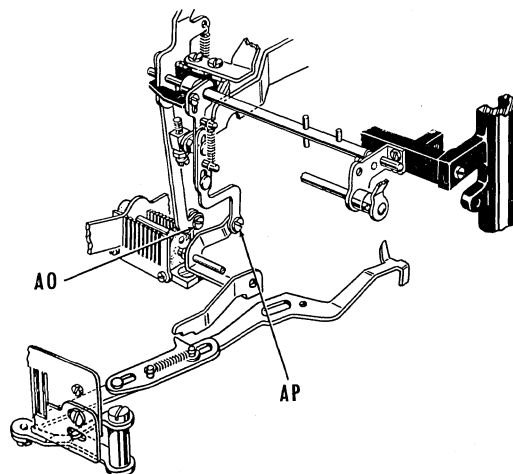


22. Remove Screw AC holding Bell Crank AD.

(Plate C)—Continued

23. Unhook Spring AE.

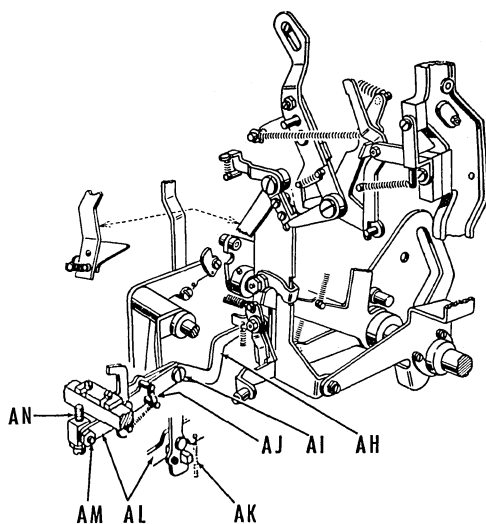
24. Remove Screw AF and Latch AG.



28. In machines without Selective Column Tabulation.

Remove Screw AP.

Remove Screw AO.

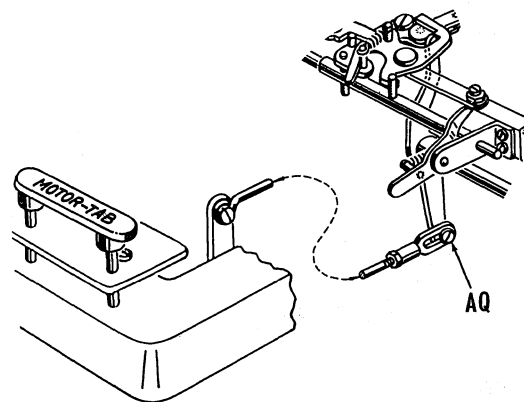


25. Unhook Spring AJ.

26. Remove Screw AI and Part AH.

27. Unhook Spring AK from the forward projection of Arm AL.

In machines without Selective Column Tabulation, loosen Nut AM and turn the Square Hub so that the head of Screw AN is forward.



Remove Screw AQ.

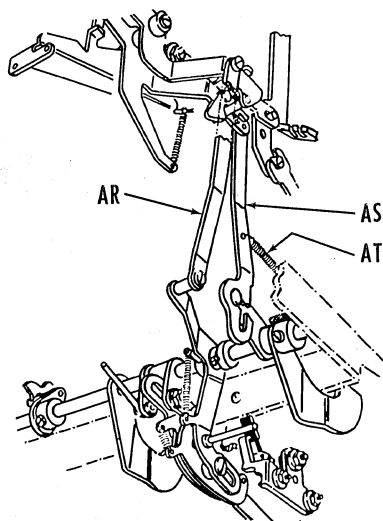
Tilt the machine rearward.

29. Remove the Oil Shield beneath the base.

30. Remove the Drive Cover.

(Plate C)—Continued

37. Remove the Hexagon Posts holding the front Typewriter Legs to the base.



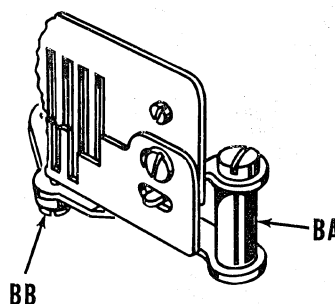
31. In machines containing Selective Column Tabulation.

Remove Link AR.

Unhook Spring AT.

Remove Link AS.

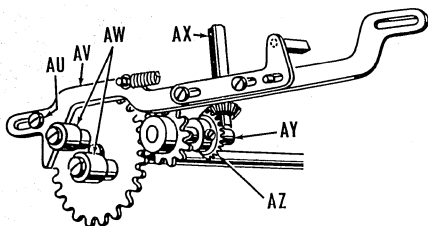
32. Remove the Shield covering the Motor Governor.



38. Remove Screw BB and Rocker Arm BA.

39. Remove the Screws holding the rear Typewriter Legs to the base.

Lower the machine.

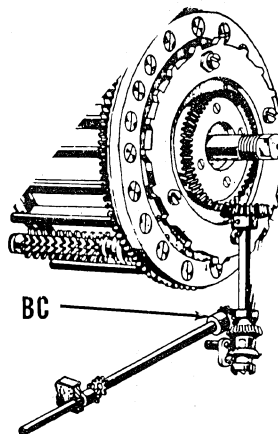


33. Remove Screw AU and swing Slide AV and its assembled parts downward around Rolls AW.

34. Loosen the Setscrew in Gear AZ and remove Shaft Assembly AY.

35. Carriage Return Shaft AX is a split Shaft. Unscrew the Shaft and remove the lower portion from the machine.

36. Reposition Slide AV and replace Screw AU.



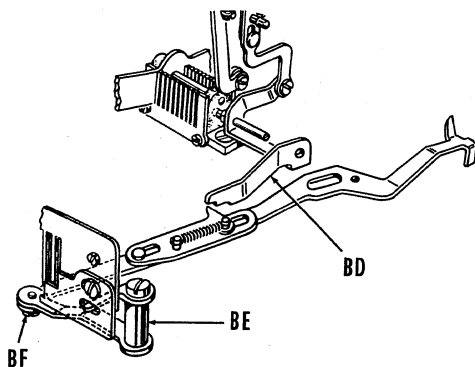
40. Loosen the Setscrew in Gear BC.

41. Remove the right and left Screws that hold the Typewriter Top Plate to the Side Frames.

Remove the Typewriter from the machine.

(Plate C)—Continued

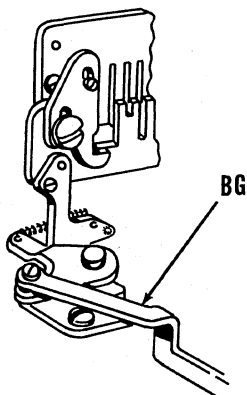
*Preparing the Machine for Operation
after the Typewriter has been removed.*



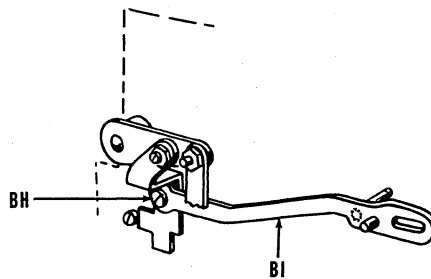
42. Replace Typewriter Keylock Rocker Arm BE using Roller 71394A as a seat.

43. Replace Screw BF.

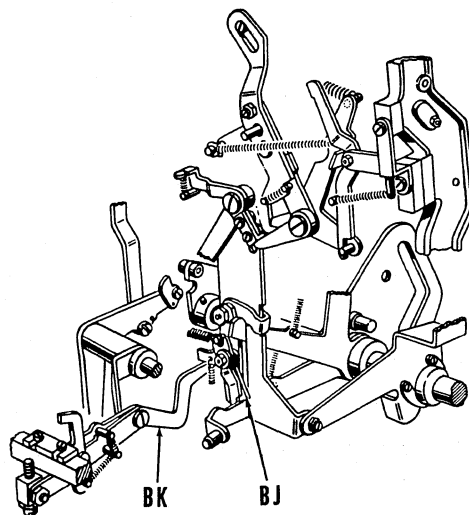
44. In machines without Selective Column Tabulation, prevent Interlock Bail BD from positioning downward to retain the Keyboard Interlocks in active position.



45. Retain Link BG in its forward position to hold open the Result Key Interlocks in the Adding Keyboard.



46. Remove Screw BH and Arm BI.



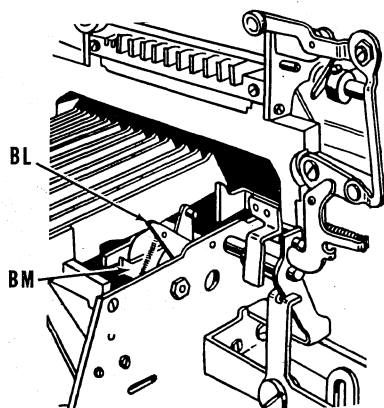
- Notes: (1) With a register in accumulating position, Latch BJ must be actuated manually at the completion of the machine operation to allow the register to be returned to the R.M.R. Assembly.
- (2) With the Typewriter installed on the machine, Latch BJ is actuated when Lever BK is rocked near the very end of the return operation.

Installing the Typewriter

47. Reverse the procedure of Items 42 through 46.

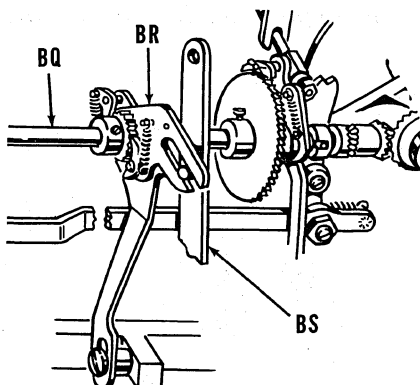
48. Locate the R.M.R. Assembly at the No. 11 position.

49 List full capacity of 1's.

(Plate C)—Continued

50. Hold Non-print Latch BL rearward and the front end of Symbol Hammer Driver Latch BM downward.

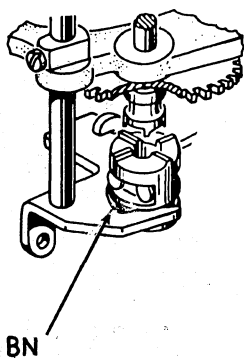
51. Depress the Motor Bar and manually operate the machine until the hammers fire.



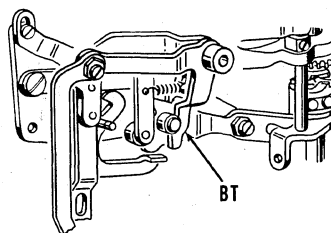
54. Place the Typewriter on the base in a position so that Ribbon Reverse Shaft BQ is rearward of the Hammers.

55. Place Ribbon Feed Fork BR on the Stud in Hammer Fire Arm BS.

56. Restore the machine to normal.

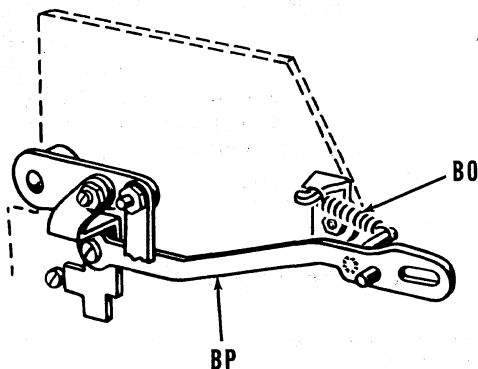


52. Observe that Carriage Return Clutch BN is in its proper place.



57. Place Bell Crank BT in position.

58. Connect the Typewriter to the machine by reversing the procedure beginning with Item 41 through Item 1.



53. Hook Spring BO to the Anchor on the left side of the Printing Section to hold Arm BP in position for installing the Typewriter.

TYPE 70 MACHINES ACCUMULATION

Instruction Book

September, 1944

Reprinted—May, 1948

Issued _____

To _____

Of _____

Property of and to be returned to
**BURROUGHS ADDING
MACHINE COMPANY**
DETROIT, MICHIGAN

ACCUMULA

FOREWORD

This instruction book has for its subject the mechanisms which function during the machine operation to accumulate the amounts that are indexed by the keyboard through adding, subtracting, multiplying, and result keys.

Construction, functions, tests, and adjustments are covered in this book. General and special prints frequently used, and mecano-gram subjects are included.

INDEX OF MECHANISMS

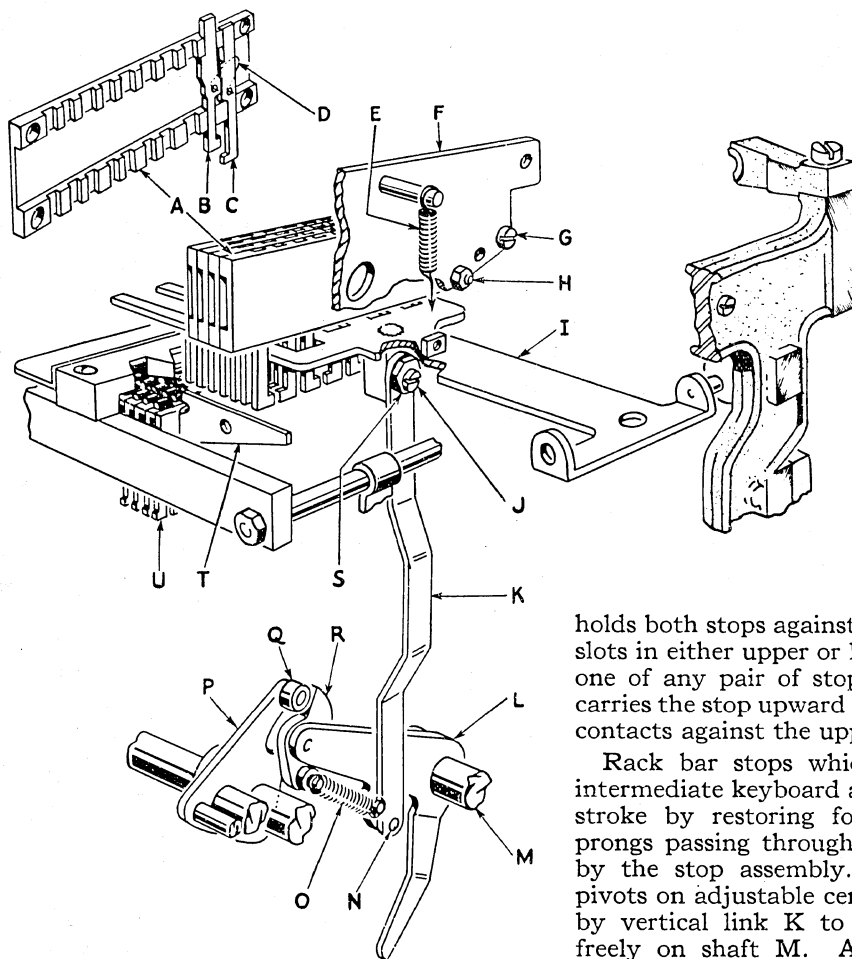
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RACK BAR STOP CONTROL (Plate 2)

(Plate 1 in Symbol Book Only)



Rack Bar Stop Control (Plate 2)

Rack bar stops B and C are arranged in the same order as index stops U of the intermediate keyboard. Stops B and C are located in the slots of magazine A, the latter are assembled on tie shafts H which pass through and hold together the left and right side plates of the rack bar section.

The guide slots are on the upper and lower edges only of the magazine. The remainder of the magazine is milled out to provide clearance for the stop control spring. The movement of the rack bar stops is limited by their shoulders contacting against the upper and lower separators of the guide slots.

Rack bar stops are held in upward or downward position by V-shaped control springs D. One control spring operates two stops, the L-shaped feet of which face together. The tension of the control spring

holds both stops against the sides of the guide slots in either upper or lower position. When one of any pair of stops is raised, spring D carries the stop upward until its limit shoulder contacts against the upper slot separator.

Rack bar stops which are raised by the intermediate keyboard are reset on the return stroke by restoring fork I which has five prongs passing through the openings formed by the stop assembly. The restoring fork pivots on adjustable centers and is connected by vertical link K to arm L which moves freely on shaft M. Arm L carries passby pawl R which is engaged on the return stroke by roller Q. Roller Q drives the passby pawl R downward resetting the rack bar stops through link K. Near the end of the main camshaft stroke, the restoring fork returns to its upper normal position.

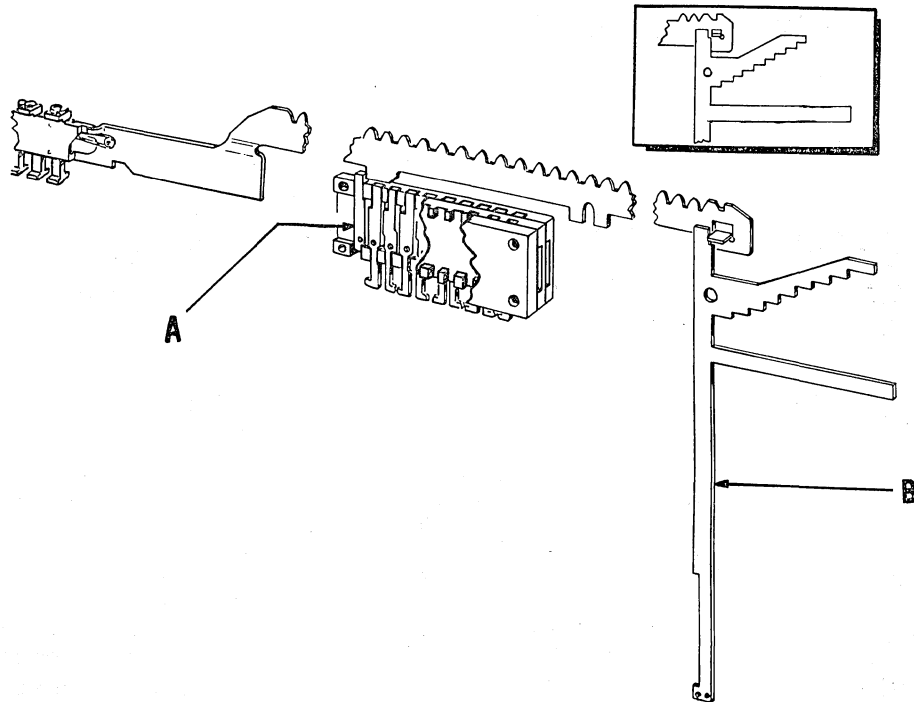
Adjustment: The restoring fork prongs are located centrally in the openings formed by the rack bar stop assembly by moving the adjustable pivot centers.

The restoring fork should also completely reset the rack bar stops. It is adjusted with the eccentric in link K.

A weak or broken stop control spring usually results in the stop failing to remain in its upper position and printing a nine. The restoring fork prong rubbing against the side of the rack bar stop may result in a premature reset of the stop.

Arm L should clear the roller Q to prevent the stops being reset on the forward stroke. To adjust, swing arm L.

RACK BAR STOP IN NO. 9 POSITION PERMANENTLY INDEXED, SERIES M (Plate 2-1)



Rack Bar Stop In No. 9 Position Permanently Indexed, Series M (Plate 2-1)

Purpose

To obtain uniform type alignment when printing nines during listing operations.

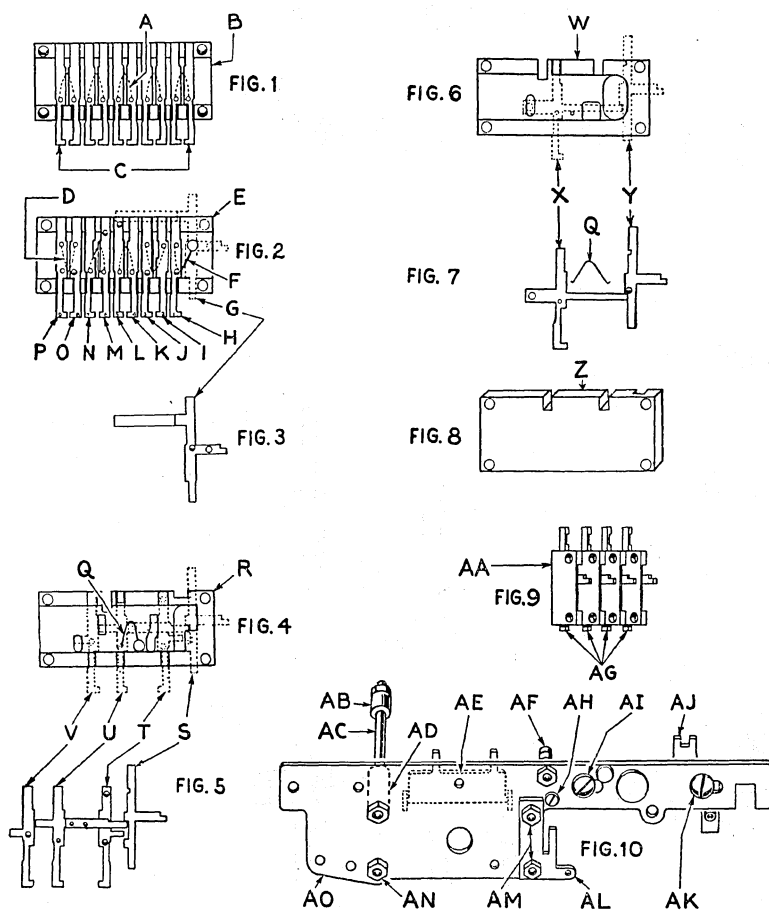
Construction

A single limit, rack bar stop A, is provided for each rack bar at the No. 9 position during a listing or subtract operation. The rack bar stop is in active (indexed) position at all times. It is used in all columns in Series M machines except the fraction column

in Series M200 machines and the pence column in Sterling machines.

Rack bar limit plates B, in the columns containing rack bar stop A, are notched on the upper rearward edge to prevent limiting of the rack bars when printing nines. Therefore, with one limit provided for the rack bars in No. 9 position during a listing or subtract operation, uniform alignment of the type is obtained.

In Sterling machines rack bar limit plate B in the pence column, which contains a permanently indexed 11d rack bar stop, is also notched to prevent limiting the rack bar when printing 11.

STOP ASSEMBLY, $\frac{1}{8}$ FRACTION, NO. 1 (Plate 3)

General Information

To add, multiply or tabulate the register with $\frac{1}{8}$ fractions, decimal equivalents are used because the pitch of the adding pinions, carry racks, and the rack bars, must be the same. Three banks of stops and rack bars are required to make up the necessary decimal equivalents, as $\frac{1}{8}$ equals .125. The whole number capacity of the machine is correspondingly reduced with this construction. Each bank has an auxiliary cipher stop. Decimal equivalents are set up by a single red key depression. Index stop U (Plate 2) raises one stop C (Plate 2), the latter raises the other stops which make up the decimal equivalent. The first left rack bar of the decimal equivalent has the fraction type, the other rack bars of the decimal equivalent have no type.

To list a fraction from the keyboard, the fraction add key is held depressed while the fraction red key is depressed. The stop indexed in the intermediate keyboard section contacts the rack bar stop in the highest-value column on the upward movement of the inter-

mediate keyboard section during the machine operation.

Fraction Rack Bar Stops

In the highest value bank, column No. 3, there are nine stops, Nos. 1 to 9, inclusive. Stops No. 4 and No. 9 are inactive, their purpose being to balance stops No. 5 and No. 8. Some of these stops have cut-outs to provide room for connecting arms, and others have studs for automatically raising stops in the second and first columns.

The second column has three stops which are located in the second, fifth and seventh positions.

The first column has one stop located in the fifth position.

Stop Assembly, $\frac{1}{8}$ Fraction, No. 1 (Plate 3)

The method of placing and assembling the fraction stops is shown in the order in which the work is done. The highest value stops of the third column are placed in magazine E (Fig. 2). The assembled magazine is placed alongside a standard magazine B, and held together with the regular tie shaft AC.

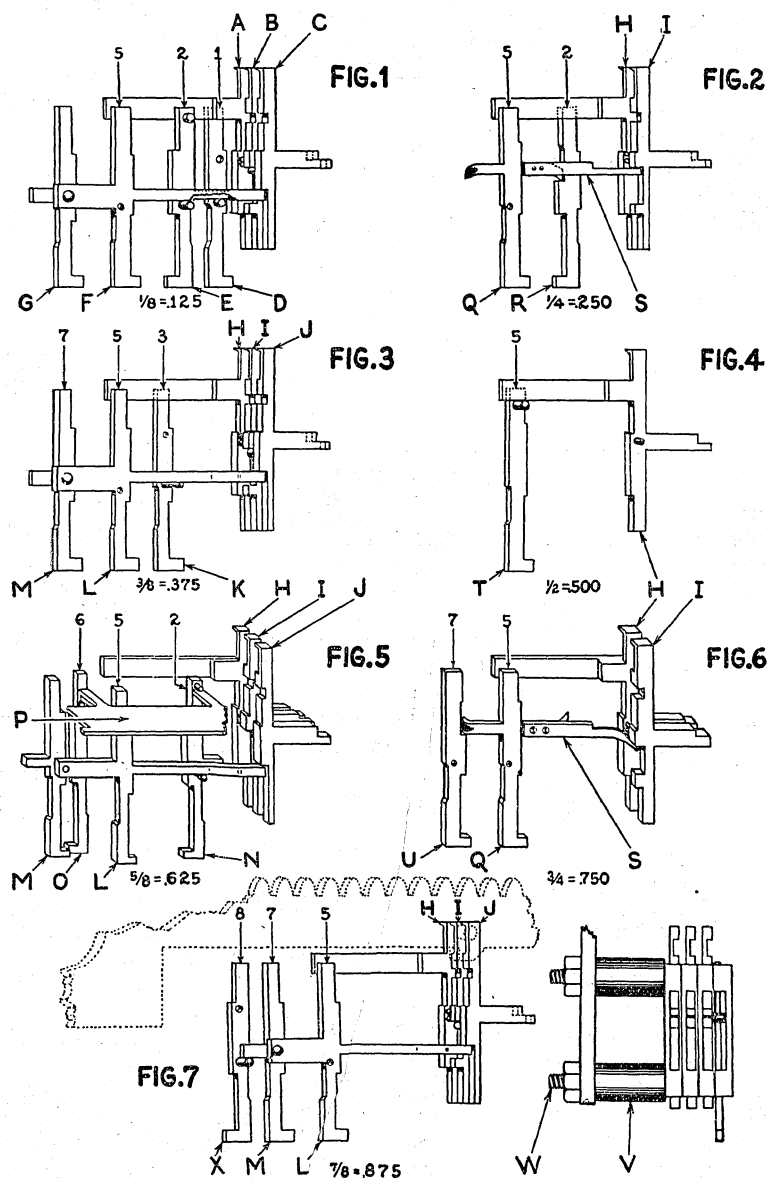
Cipher stop G (Fig. 3) is placed on magazine E with the extended arm resting on the small stud in the top of the No. 5 stop (L).

The second bank stops in magazine R (Fig. 4) are assembled after it has been placed next to magazine E. Cipher stop S is placed in the right corner of magazine R.

The first bank magazine W is placed next to magazine R, and stops X and Y are then located (Fig. 6). Magazine Z is then placed next to magazine W to bind the stop assembly.

Four cipher magazines AA and stops AG are placed successively on magazine Z. Space collars AB are placed on the front left side of magazine Z. Section side plate AO is placed against space collars and magazine AA. Locate the rear arm of fraction control plate AE under the stud in the No. 2 stop T of the second bank and the front arm on top of the stud in the No. 6 stop M of the third bank.

The fraction control plate is required for the $\frac{5}{8}$ fraction, decimal equivalent .625.

STOP ASSEMBLY, $\frac{1}{8}$ FRACTION, NO. 2 (Plate 4)

Stop Assembly, $\frac{1}{8}$ Fraction, No. 2
(Plate 4)

Functions of $\frac{1}{8}$ Stop (Fig. 1)

When $\frac{1}{8}$ fraction red key is depressed, the machine operation causes stop No. 1 (D) in the third column, to be raised. The stud in stop D raises stop No. 2 (E) in the second column. A stud in E raises stop No. 5 (F) in the first column. The arm of stop F raises

cipher stop C in column one and, by connecting studs, the cipher stops B and A in second and third columns are raised.

A fourth stop No. 7 (G) is also raised on the decimal equivalent .125 because the No. 7 stop is stud connected to the No. 5 stop. It remains inactive, however, as the figure 2 being a lower denomination than 7, will limit the rack bar.

Result: Three rack bars are indexed for .125.

*(Plate 4) Continued***Functions of $\frac{1}{4}$ Stop R (Fig. 2)**

When $\frac{1}{4}$ fraction red key is depressed, the machine operation causes stop No. 2 (R) to rise in column three, a step on R raises stop No. 5 (Q) in the second column. The rear arm of Q raises cipher stop I in the second and third columns. The cipher stop in column one remains inactive.

Result: Two rack bars are indexed for .250.

Functions of $\frac{3}{8}$ Stop K (Fig. 3)

When the $\frac{3}{8}$ fraction stop No. 3 (K) moves upward, its stud contacts a rearward arm on the No. 5 stop, a forward arm of which, has a hole fitting over a stud in the No. 7 stop, raising both stops. The rearward arm on the No. 5 stop carries the three cipher stops to the upper position.

Result: Three rack bars are indexed for .375.

Functions of $\frac{1}{2}$ Stop T (Fig. 4)

The upward movement of the $\frac{1}{2}$ fraction stop No. 5 (T) raises the cipher stop H through a stud in stop No. 5 contacting the arm of the cipher stop. The cipher stops in columns one and two remain down or inactive.

Result: One rack bar is indexed for .500.

1/10 Fraction Rack Bar Control
(Plate 6)

Standard billing machine construction permits adding and printing of fractions in the first register position. Other registers have the fraction adding pinions omitted and the fraction printing is blocked. However, a fraction can be added in the crossfooter regardless of which register is in position as the crossfooter always contains a complete set of adding pinions.

The $\frac{1}{10}$ fraction requires one rack bar, $\frac{1}{4}$ fractions—two rack bars, and $\frac{1}{8}$ fractions—three rack bars. Billing machines have four additional fractional clearing rack bars to clear out of the crossfooter, accumulations of less value than $\frac{1}{10}$ fraction after the point off operation in multiplication.

Cipher stop D retains the fraction rack bar C in the cipher position by the blocking stud B in the rack bar. When one of the adding keys is depressed with the fraction add key held down, the figure is indexed in the intermediate keyboard.

Functions of $\frac{5}{8}$ Stop O (Fig. 5)

The upward movement of the $\frac{5}{8}$ fraction stop No. 6 (O) raises the fraction control plate P by a stud in the No. 6 stop contacting the forward ear, the rearward ear raises the No. 2 stop which in turn carries a stud to raise the No. 5 stop.

A fourth stop No. 7 (M) is also raised on the decimal equivalent .625 as in the equivalent .125. Three cipher stops are raised by the No. 5 stop.

Result: Three rack bars are indexed for .625.

Functions of $\frac{3}{4}$ Stop U (Fig. 6)

The upward movement of the $\frac{3}{4}$ stop No. 7 (U) carries up the No. 5 stop Q by a formed ear on the forward arm extending to a shoulder on the No. 7 stop. The rearward arm raises the cipher stops in columns two and three.

Result: Two rack bars are indexed for .750.

Functions of $\frac{7}{8}$ Stop X (Fig. 7)

The upward movement of the $\frac{7}{8}$ stop No. 8 (X) raises the No. 7 stop by a stud contacting a forward projection, the No. 5 stop also moves upward since it is connected to the No. 7 stop with a stud. The three cipher stops are raised.

Result: Three rack bars are indexed for .875.

Fraction Cipher Stop Control

At the beginning of the forward stroke, the main camshaft moves vertical link T upward, raising the restoring arm V to release the cipher stop and the fraction rack bar. Link T has a cam angle which contacts a stud in arm V to swing it upward. On the return stroke, the fraction restoring arm is pulled to the normal position by its spring U to reset the cipher stop.

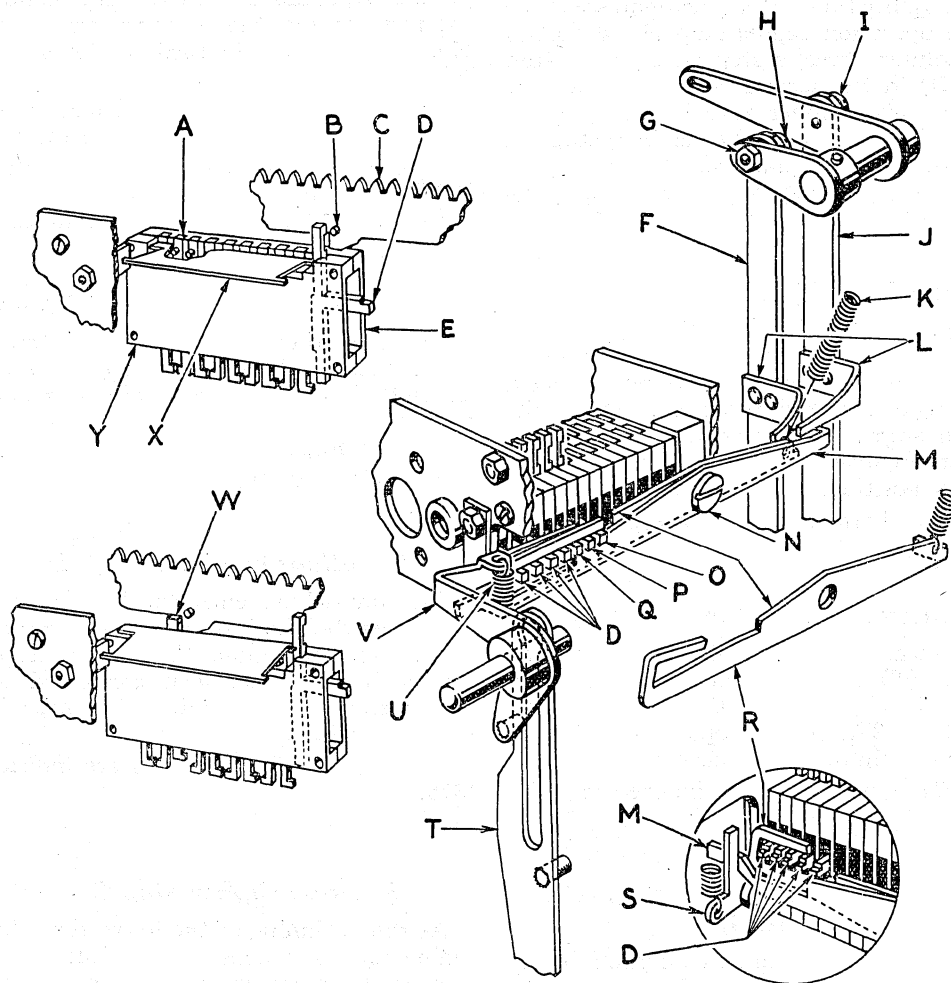
Adjustment: The restoring arm should rest on all the cipher stops. Bend arm V.

Insufficient tension of spring U may result in partial reset of the cipher stop and an over-addition of the fraction.

On the total key operation, the register meshing link J moving downward rocks the fraction clearing plate M, raising cipher stop D to release the fraction rack bar. On the first or final product key operation, the cross-footer meshing link F moving downward, rocks fraction clearing plate R, raising all cipher stops to release the fraction rack bars.

FRACTION RACK BAR CONTROL (Plate 6)

(Plate 5 in Symbol Book Only)



(Plate 6) Continued

Tests and Adjustments

With meshing links J and F in the lower or meshed position, the fraction control plates M and R should have slight play. The adjustment is made by bending wings L.

The adjustment as given should align the slots in cipher stops D with studs B in the rack bars to permit clearing the accumulator sections.

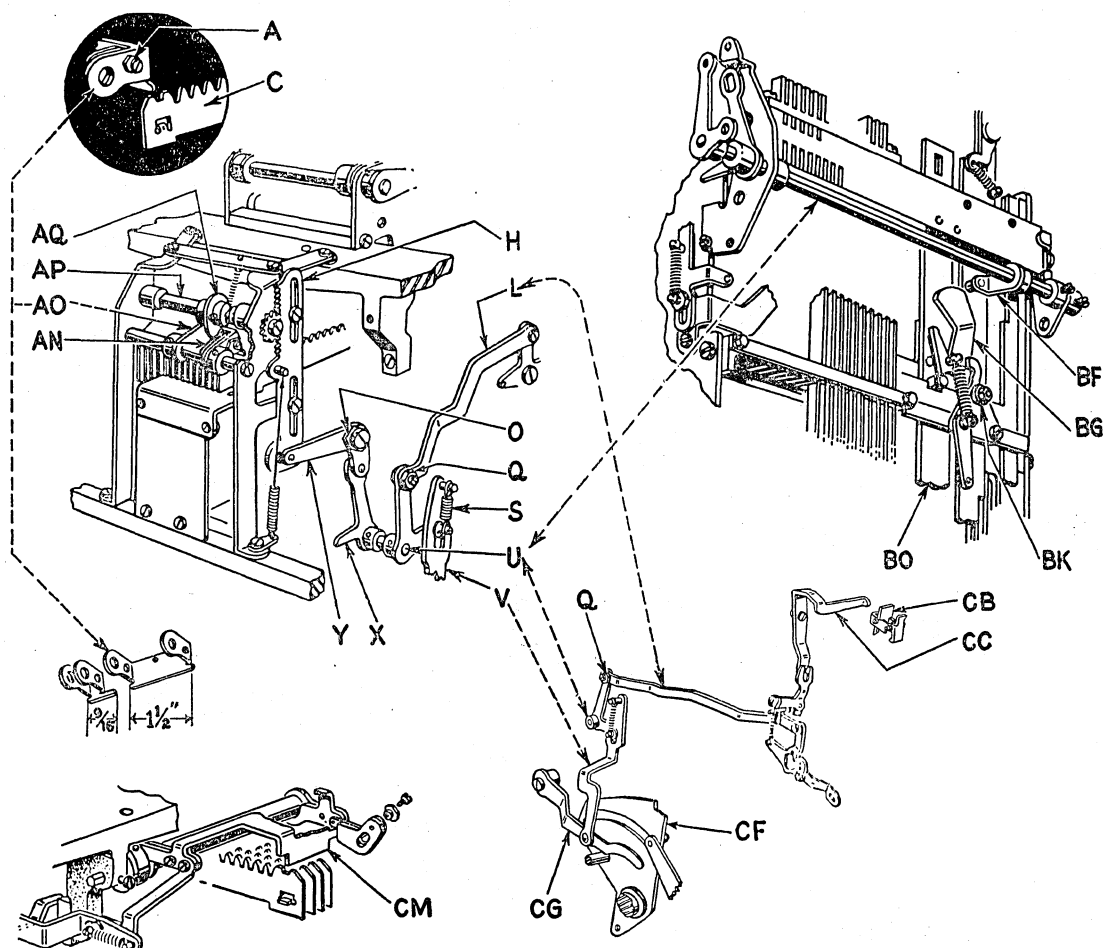
A further test that should always be considered, is that the fraction cipher stop must hold the rack bar until detent J (Plate 7) drops into the rack bar teeth to prevent a premature release of the rack bar on a listing stroke. Make the test in a register that does not add the fraction.

Rack Bar Control (Plate 7)

The rack bars are indexed from the keyboard to print and accumulate the amounts. The rack bar section in billing machines has four short rack bars without type which are located to the right of the regular bars. The short rack bars are not controlled from the keyboard as their function is to act as clearing bars for the crossfooter adding pinions which are pointed off to the right of the printing capacity during multiplying operation.

The rack bars are driven forward by springs AC through actuating arms U and T. Springs AC are connected from projections on the actuation arms to spring anchor BC. In order to provide clearance for springs, the projections on the actuating arms are higher in every other column.

FOUR POSITION ADD AND NON-ADD MECHANISM (Plate 6-1)

**Four Position Add and Non-add Mechanism (Plate 6-1)****Purpose**

This mechanism affords four, carriage controlled, add and non-add combinations by blocking the movement of pre-selected adding racks.

Operation

This mechanism is indexed and actuated in conjunction with the Four Position Printing Control Mechanism (Plate 6, Printing Instruction Book).

Indexing of three of the four positions is provided by carriage control blocks CB of various heights, and the fourth is provided by using no block. The positions and their corresponding blocks are as follows:

Position No. 1	No Block
Position No. 2	Low Block
Position No. 3	Medium Block
Position No. 4	High Block

As main camshaft assembly CF rocks forward, lever CG raises link V to rock shaft assembly U which, through link L, is limited by control lever CC on carriage control block CB.

Shaft assembly U, through its arm X, swings bellcrank Y to raise rack H which rotates camshaft AP and cam AQ. Cam AQ, contacting intermediate arm AN, lowers bail AO into the notches in adding racks C, thereby blocking the movement of the adding racks in the columns to be non-added.

Bail AO is provided in different widths, and one or more bails may be used to obtain various combinations of add and non-add control.

Bail CM, normally actuated by a stud in the register section to non-print the multiplier factor during a register total operation, may also be actuated by cam AQ for non-adding amounts.

Normalizing of the non-add mechanism during a subtract or multiplying operation is accomplished as follows: Slide BO, being

raised by a subtract or multiplying plate, cams limit arm BG under the stud in arm BF thereby blocking the rotation of shaft assembly U and expanding spring S.

Adjustment

With a non-add operation indexed by control block CB and lever CG fully raised by machine operation, cam AQ should impart maximum throw to bail AO.

To adjust, turn eccentric O.

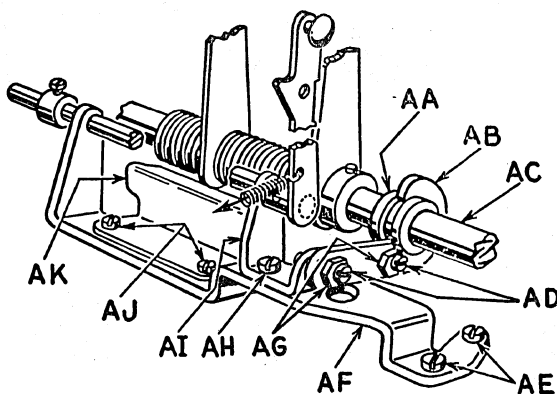
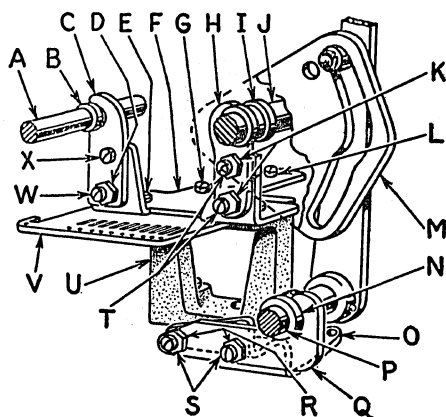
Bail AO should have full hold in, but not limit in, the notches of adding racks C.

To adjust, turn eccentric A.

With slide BO fully raised during a subtract or multiplying operation, limit arm BG should hold shaft assembly U to provide at least $1/32''$ clearance between bail AO and adding racks C.

To adjust, turn eccentric BK.

SUPPORTS FOR MAIN OPERATING SHAFTS (Plate 7-1)



Supports for Main Operating Shafts (Plate 7-1)

Purpose

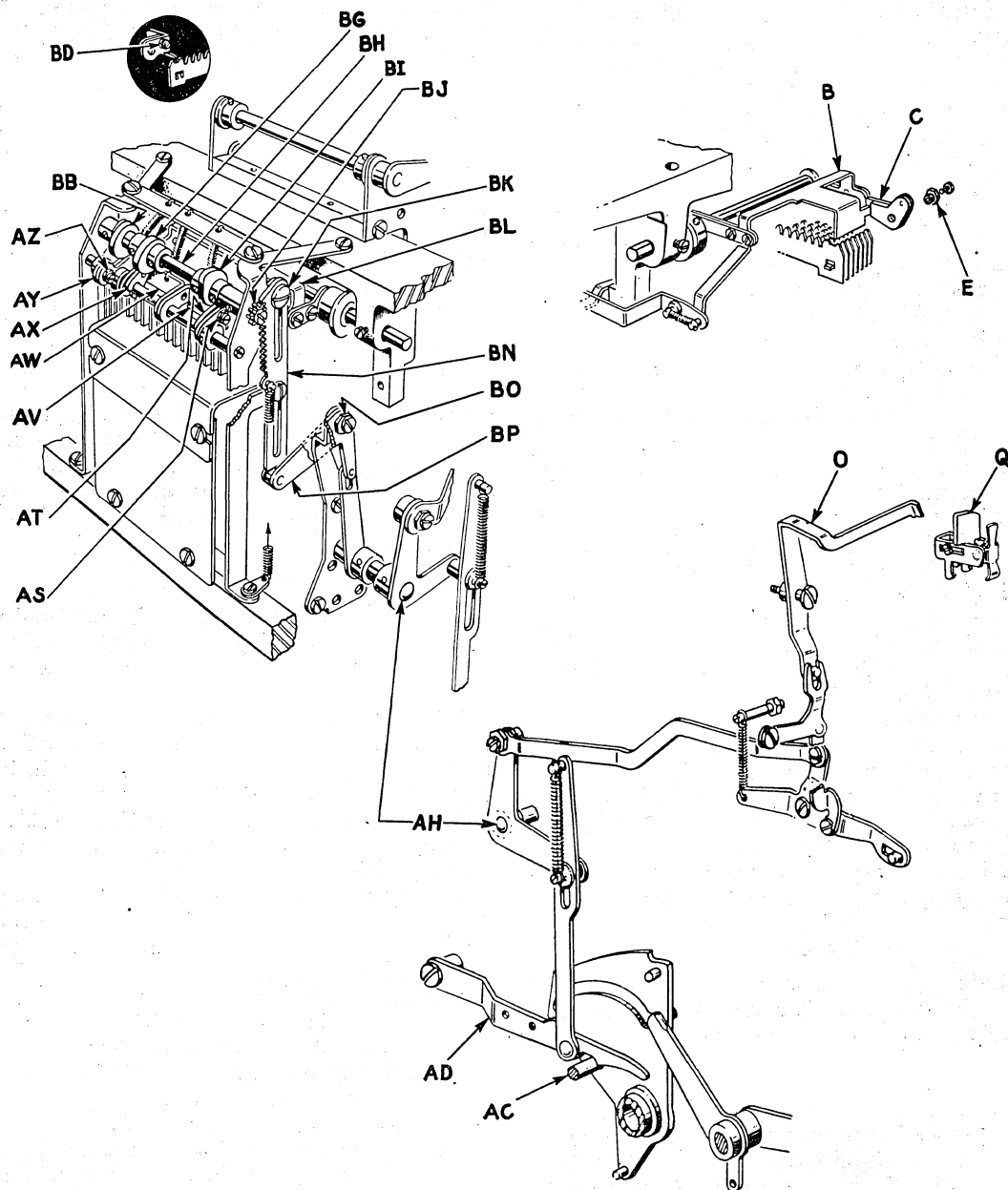
In late style machines, the contour of the driving cam M is designed to obtain a uniform thrust of the adding racks against the adding rack stops, and thus reduce the possibilities of stop breakage. In such machines, the main operating shaft is braced against weaving or bowing to insure complete revolution of the adding wheels.

Adjustment

Brace C should fit downward on shaft A; brace H should fit rearward and upward on shaft J; and brace Q (AB on wide base machines) should fit forward and downward on shaft P.

To adjust, remove all tension from the affected shaft, and turn the eccentric D, K, R, or AG until the desired brace fits snugly around the shaft.

FOUR POSITION ADD AND NON-ADD MECHANISM, CARRIAGE CONTROLLED—WITH POSITIVE NORMALIZING (Plate 6-2)



Four Position Add and Non-add Mechanism, Carriage Controlled—with Positive Normalizing (Plate 6-2)

Note: This mechanism was introduced in Style 72XX22 machines beginning with Serial No. A915672, and was included in other Class 72 and Series M 200 machines beginning with Serial No. B100107.

Printed in U. S. America 7-24-52

Purpose

To provide four carriage controlled add or non-add combinations.

Construction

This mechanism works in conjunction with the Four Position Printing Control Mechanism (Plate 6-1, Printing Instruction Book).

For Form 3762

(Plate 6-2) Continued

It also is indexed by the same controls and actuated from the same source as the Four Position Printing Control Mechanism. General functioning of the Four Position Add and Non-add Mechanism (Plate 6-1, Accumulation Instruction Book) is not changed. However its design has been refined to correspond with design changes made in the Four Position Printing Mechanism (Plate 6, Printing Instruction Book) which now has more positive normalizing (see Plate 6-1, Printing Instruction Book).

Cam arm AD is relieved on its lower horizontal surface, where it contacts shaft AC, to permit increased clearance between sensing lever O and control rail Q when sensing lever O is in its normal position.

Also, rack BN is altered on its lower extremity to accommodate the change in cam arm AD. When the movement of sensing lever O is limited by a high rail or by the normalizing assembly (BF, Plate 6-1, Printing Instruction Book) rack BN will remain inactive in order to assure that bails AW, AV, and BL or B do not interfere with normal movement of the adding racks during multiplying or subtracting operations.

The four control positions provide four control combinations. The combinations generally provide adding and non-adding as follows: Position No. 1, no rail, provides full add; Position No. 2, low rail, provides non-add of the left side; Position No. 3, medium rail, provides non-add of the right side; and, Position No. 4, high rail, provides full add.

Combinations other than the above are permitted—except in Position No. 4—depending upon operational requirements.

Operation

Shaft AH, which is rocked by shaft AC through cam arm AD, actuates bell crank BP to raise rack BN and rotate gear BJ. Gear BJ, mounted on camshaft BH, positions cams BI, BG, and BB to locate bails AV, AW, and BL or B in (to non-add) or out (to add) of the notches in the adding racks. The bails, being located in the adding racks, thus prevent adding in the respective columns.

Bails AW and AV (one or more of which may be used in combination) are available in various widths thus affording numerous combinations for non-add control.

Bail BL, which is part of the Fraction Printing Mechanism (Plate 4, Printing Instruction Book) is utilized in machines containing fractions to control the fraction bar when non-

adding is desired. Bail BL is actuated by cam BB, through intermediate arm AY and its attached rocker arm.

Bail B is used in machines that total the full machine capacity in the register. In these machines, when in register No. 1, it is necessary to prevent the adding racks that do not have an adding wheel to mesh with from moving forward; or to prevent the adding racks in the entire left side from moving forward. The bail is actuated by a stud (B, Plate 9-1, Printing Instruction Book) in the register escapement blade. The bail is then utilized when in register positions other than register No. 1 position to control the specific adding racks (other adding racks are controlled by bail AW) or the adding racks on the entire left side. Bail B is actuated by the Four Position Adding Mechanism through a cam BI and rocker arm assembly C.

This mechanism is normalized during multiplying and subtracting operations to permit movement of the adding racks. Rotation of shaft assembly AH is blocked through the normalizing assembly (BF, Plate 6-1, Printing Instruction Book).

Adjustment

Note: Adjustments on this mechanism should be preceded by a thorough check of the adjustments set forth in Plate 6-1, Printing Instruction Book.

1. With rack BN positioned downward to limit on screw BK so that the high portions of cams BI, BG, and BB are not pointing down, bails AV, AW, and BL or B should clear the adding racks not less than 1/32".

To adjust, remove screw BK and remesh gear BJ with rack BN.

2. With no rail under sensing lever O and cam arm AD fully raised during the forward machine stroke, rack BN should travel the full distance of its upper slot, without bind, and rotate camshaft BH to utilize all cam positions. This should position the high portion of cam BI, BG or BB on the respective intermediate arm AT, AX, or AY (depending on operational requirements).

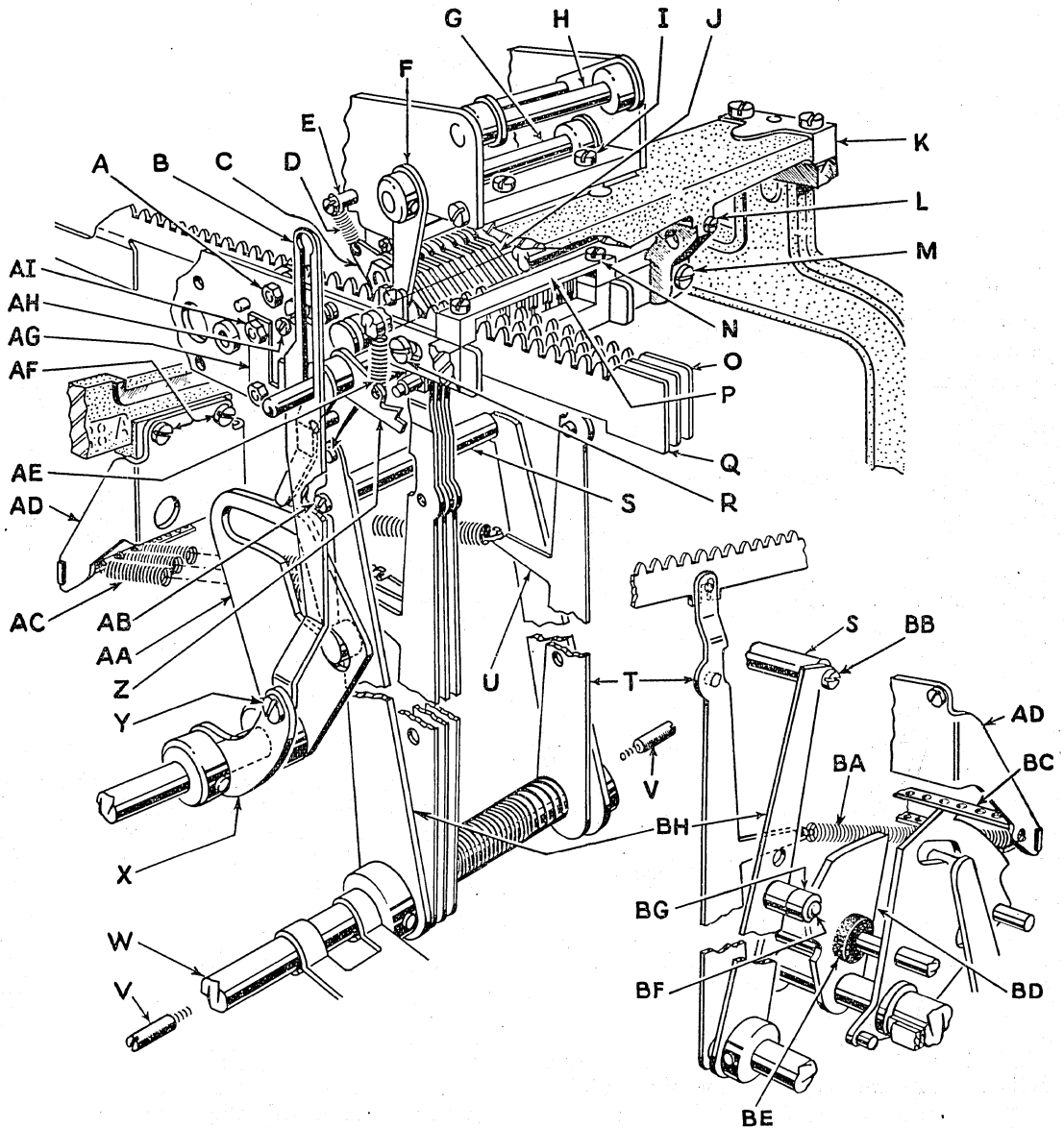
To adjust, turn eccentric BO.

Note: The high portions of cams BI, BG, or BB will then be positioned on intermediate arms AT, AX, or AY when the high, medium, and low rails are active (depending on operational requirements).

3. Bails AV, AW, and BL or B should bottom without bind, in the notches of the adding racks when the high portions of the cams are on the intermediate arms.

To adjust, turn eccentrics AS, AZ, BD or E.

RACK BAR CONTROL (Plate 7)

*(Plate 7) Continued*

The rack bars are cam driven rearward by eccentric shaft S which is suspended between the two main actuating arms BH, the latter being rocked by the main cam AA and auxiliary cam BD to obtain a parallel movement.

Rack bar detents J prevent the rack bars moving forward when the accumulator section is disengaged from the rack bars during totaling. Rack bar detents are released during each machine operation by the stud in link B contacting the arm of latch Z, and are raised to clear the rack bars at the end of the return stroke by the stud in the main actu-

ating arm BH rocking bail F through slide AJ (Plate 3).

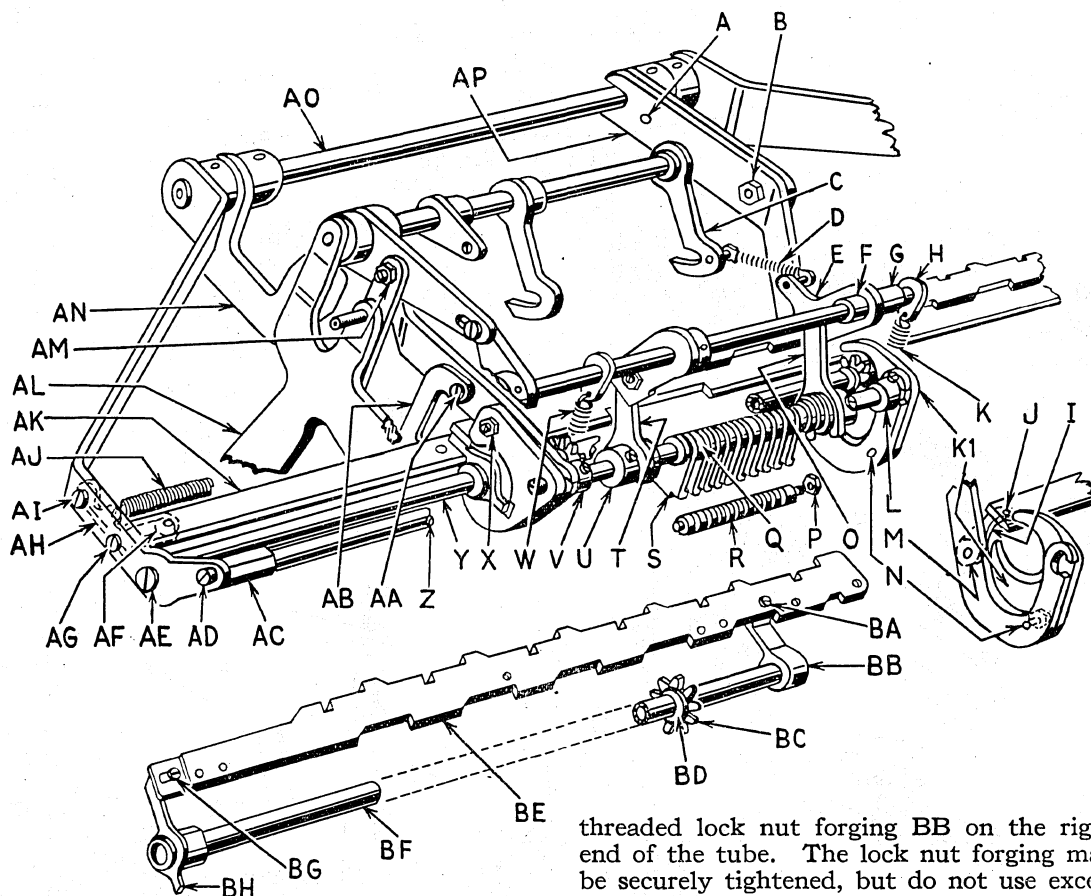
The forward rack bar speed is controlled from the slot in the main cam AA, but the machine stroke speed is motor controlled.

Tests and Adjustments

The eccentric shaft S provides adjustment to secure a complete restoration of the rack bar to insure full rotation of the adding pinion. Always try each rack bar.

The stud in slide AJ (Plate 3) should have 1/64" reset clearance with latch Z. To adjust, swing the lower extension on slide AJ.

REGISTER ASSEMBLY (Plate 8)

**Register Construction (Plate 8)**

Register sections are carried in two sizes, 30 and 60 pinion. The thirty pinion construction accommodates thirty pinions and is used for three or less registers as 1 x 10, 2 x 10, or 3 x 10. The figure ten indicates the machine capacity.

When four registers and more, up to and including ten are required, the sixty pinion construction is used. The maximum number of adding pinions is sixty and the section is standardly divided into a 4 x 10, 5 x 10, 6 x 10, 7 x 8, 8 x 7, and 10 x 6. The first figure of the divisions listed indicates the number of registers and the second, the register capacity.

Adding pinions BC revolve on the shoulders of space collars BD. In the thirty pinion construction the space collars are assembled on the pinion shaft and the collars are interlocked with a tongue and slot arrangement to prevent turning.

In the sixty pinion construction, the space collars are assembled on tube BF which slides on shaft Y, which is supported by the register frame. The space collars are clamped together on the tube as an assembly with the

threaded lock nut forging BB on the right end of the tube. The lock nut forging may be securely tightened, but do not use excessive force as it is possible to buckle the tubing.

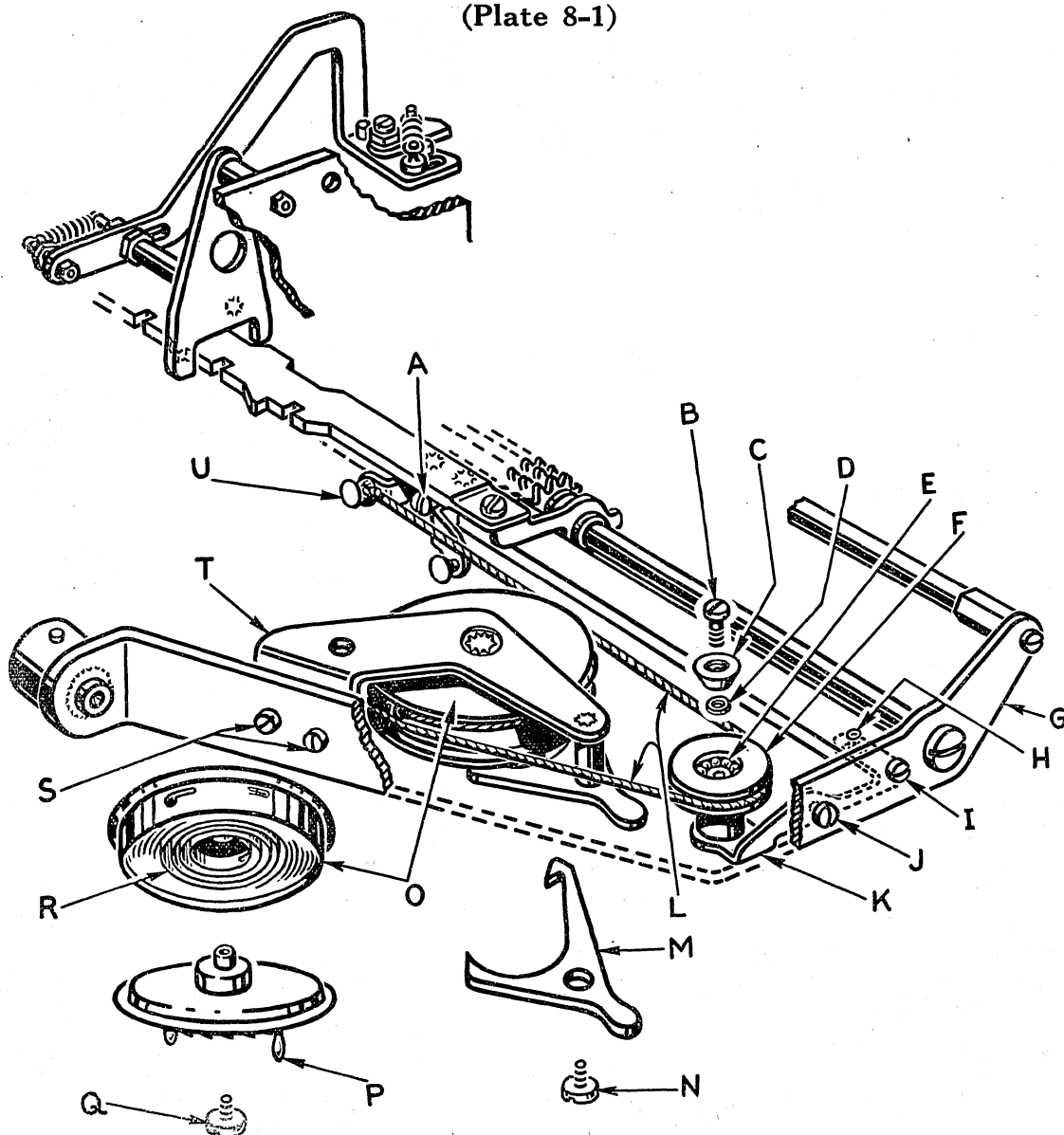
Space collars BD have either .025" or .026" shoulders. In each group of ten collars, three of the .026" shoulder collars are used. The assembly arrangement given is necessary to maintain an accurate alignment of the adding pinions with the rack bars and the carry pawls S over the entire group of sixty pinions. When replacing an adding pinion, the space collars should be replaced in the exact order removed to retain this alignment.

To obtain rigid construction, the register section carry pawl shaft Z, pinion tube assembly BF, and pinion guide blade AK, are supported with adjustable braces AN and AP. The forked front end of the adjustable braces fit on set collars V and L to permit removing the carry pawl shaft.

Tests and Adjustments

The eccentric in each adjustable brace is used to obtain the correct length of the brace to hold carry pawl shaft Z straight. Be very careful in this adjustment, as slightly over adjusting the eccentric will bow the carry pawl shaft and change the length of the register section.

REGISTER WITH SPRING BARREL ASSEMBLY, CLASSES 72 AND 78 (Plate 8-1)



Purpose

The clock spring permits faster tabulation of the pinion section through all register positions, with a more uniform spring tension.

Operation

When the Register Escapement Mechanism is actuated (see Plates 16 and 17, Accumulation Instruction Book), the expansion of clock spring R (in drum O), tabulates the register section through drawband L, which is assembled to drum O and bracket U.

Construction Notes

1. This mechanism is used on all sixty

pinion machines and all machines containing the Motor Returned Register Mechanism.

2. The drawband on the Motor Returned Register Mechanism is assembled to the outside stud of bracket U.

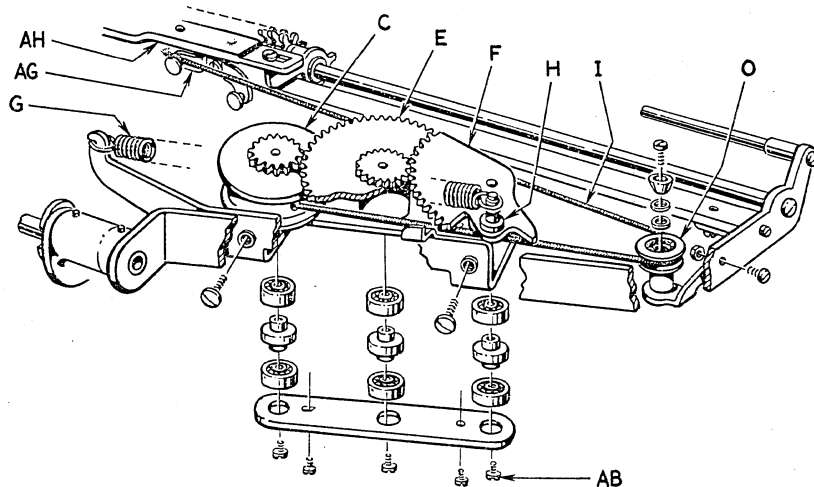
3. Frame G is redesigned to accommodate drum O, bracket T, bracket K, and pulley F.

Adjustments

The tension of clock spring R should be as light as possible and still be sufficient to insure a smooth and easy action when the register section is located in the last position.

TO INCREASE the tension, turn ratchet P counterclockwise.

REGISTER TABULATING MECHANISM—100 PINION CONSTRUCTION—SERIES M 200 AND M 800 MACHINES (Plate 8-2)



**Register Tabulating Mechanism—100
Pinion Construction—Series M 200
and M 800 Machines (Plate 8-2)**

Purpose

To provide uniform tension for a fast, uniform tabulation of the registers to all positions.

Operation

When the Register Escapement Mechanism is actuated (see Plate 17), the contraction of spring G tabulates the register pinion assembly through segment gear F, intermediate gear E, cord drum C, and cord I. Cord I, which is attached to cord drum C and looped around pulley O, is attached to the inside stud of bracket AG.

Construction

Heavy coil spring G is required to tabulate the registers because of the increased travel of the one hundred pinion register assembly. Uniform tension for each tabulation is obtained by stud H being located in such a position on segment gear F that the leverage of gear F increases as the tension of spring G decreases during each successive tabulation, thus compensating for a gradual loss of power and providing uniform tension on cord drum C.

Cord drum C requires approximately two revolutions to take up the cord length when tabulating from the first register position to the last. This is accomplished, while maintaining the leverage action of segment gear

F, through compound reduction gear E, which reduces the movement required of segment gear F to approximately one-quarter turn.

Adjustment

With the register pinion assembly in the last register position of escapement rack AH (remove register escapement limit D, Plate 17-1, if contained), segment gear F should have one tooth out when meshed with the small gear of intermediate gear E.

To adjust, position segment gear F.

Note: To position segment gear F, first move the register pinion assembly to the last register position, remove spring G and hold intermediate gear E stationary to keep cord I taut. Then remove screw AB and lift and position segment gear F.

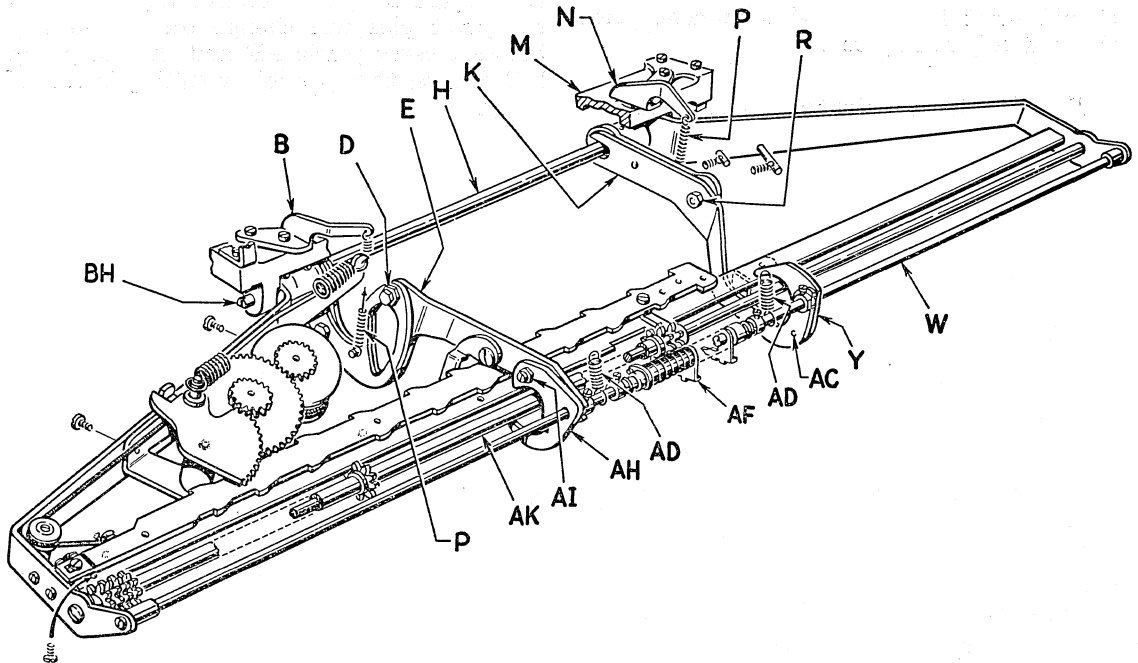
Installation Note

Register tabulating cord I may be installed as follows:

- a. Fasten one end of cord I to the inside stud of bracket AG with a slip knot.
- b. Move the register pinion assembly to the first position.
- c. Unhook spring G.
- d. Tie a knot in the other end of the cord; lead the knotted end of the cord around pulley O, and insert the knot into the slot of drum C.

Note: After installing a cord, check segment gear F for proper meshing with intermediate gear E.

REGISTER ASSEMBLY—100 PINION CONSTRUCTION—SERIES M 200 AND M 800 MACHINES (Plate 8A)



Register Assembly—100 Pinion Construction—Series M 200 and M 800 Machines (Plate 8A)

Purpose

To provide more registers in some styles of standard machines and, in some instances, more individual register capacity.

Construction

General construction of the one hundred pinion register assembly is basically the same as that of the sixty pinion but with allowances being made for difference in size.

The one hundred pinion assembly is standardly divided into the following styles: 8 x 12, 10 x 10, and 12 x 8, thus permitting a maximum of twelve registers.

Frame assembly H is wider in order to accommodate the additional pinions.

Pressure required for engaging and disengaging the one hundred pinion section from the adding racks is approximately the same as that needed for the sixty pinion section, even though the former is considerably heavier. This fact is due to counterbalance springs P, which are placed near the pivot points of the section, assisting springs AD on carry pawl shaft W. Counterbalance springs P are hooked to brackets B and N

which are fastened to rear head section casting M.

Eccentric pivot pins BH are used to provide better printing alignment of listed and totaled amounts. The slotted end of the pin is beveled to indicate the high point. These pins are also used for the crossfooter section.

The Register Tabulating Mechanism, as explained in Plate 8-2, The Register Indicator Mechanism, in Plate 46-1, and the Register Return Mechanism, in Plate 19-1 (Power Instruction Book) are redesigned to meet the requirements of the increased travel of the pinion assembly.

Adjustment

1. Braces E and K should hold carry pawl shaft W straight by holding the screw holes in the ends of the shaft aligned with the screw holes in frame H.

To adjust, turn eccentrics D and R.

Note: Caution should be used in making this adjustment, as excessive turning of the eccentrics without aligning the holes may bow the carry pawl shaft and change the length of the register section.

2. Pinion assembly AK should freely tabulate and return through braces Y and AH.

To adjust, turn eccentrics AC and AI.

(Plate 8A)—Continued

3. Listed amounts and totaled amounts should print in horizontal alignment when the platen is not spaced.

To adjust, turn right and left pivot pins

BH, keeping the slots and beveled cuts parallel.

Note: Caution should be used in making this adjustment, as excessive adjustment of the pivot pins will change the relationship between carry pawls AF and the carry trip bell cranks, thus possibly resulting in loss of carry.

(Plate 8) Continued

Bracket AF is used to tilt the pinion blade AK to line up the teeth of the inactive adding pinions with those of the active. The bracket has a slot for adjustment. Brackets AB and I hold the pinion blade straight by tying it to adjustable braces AN and AP. These two brackets have enlarged screw holes to permit adjustments.

Supports K1 have eccentric adjustment to swing them to minimum clearance with the outside edge of the adding pinions to prevent the pinion shaft bowing during adding or totaling operations.

Threaded adjusting nuts AC on each end of the carry pawl shaft locate the carry pawls S with equal side clearance between the active adding pinion teeth. After this adjustment is made, carry pawls are swung centrally in the tooth space of the adding pinion.

Caution: It is of extreme importance when adjusting the various braces, brackets, and eccentrics to avoid cramping the parts as the screws are tightened. Therefore, always observe as each part is tightened that it is free from any bowing action. A cramped or sprung register section will not tabulate or add correctly and could be the basic cause of much trouble.

REGISTER MESHING MECHANISM (Plate 9)**Register Meshing Mechanism (Plate 9)**

The normal position of the adding pinions is in the carry racks A and they are pulled from this position at the end of the forward stroke to accumulate the amounts that were set up on the keyboard. As the forward stroke nears completion, the hook of main cam U moves over the stud in the meshing cam V, swinging it to the working position. The meshing cam motion causes link Z to move downward, rocking the toggle shaft through arms H and J to swing toggle arms D and E on center meshing the adding pinions with the rack bars. The meshing cam swings against roller S to ease the action.

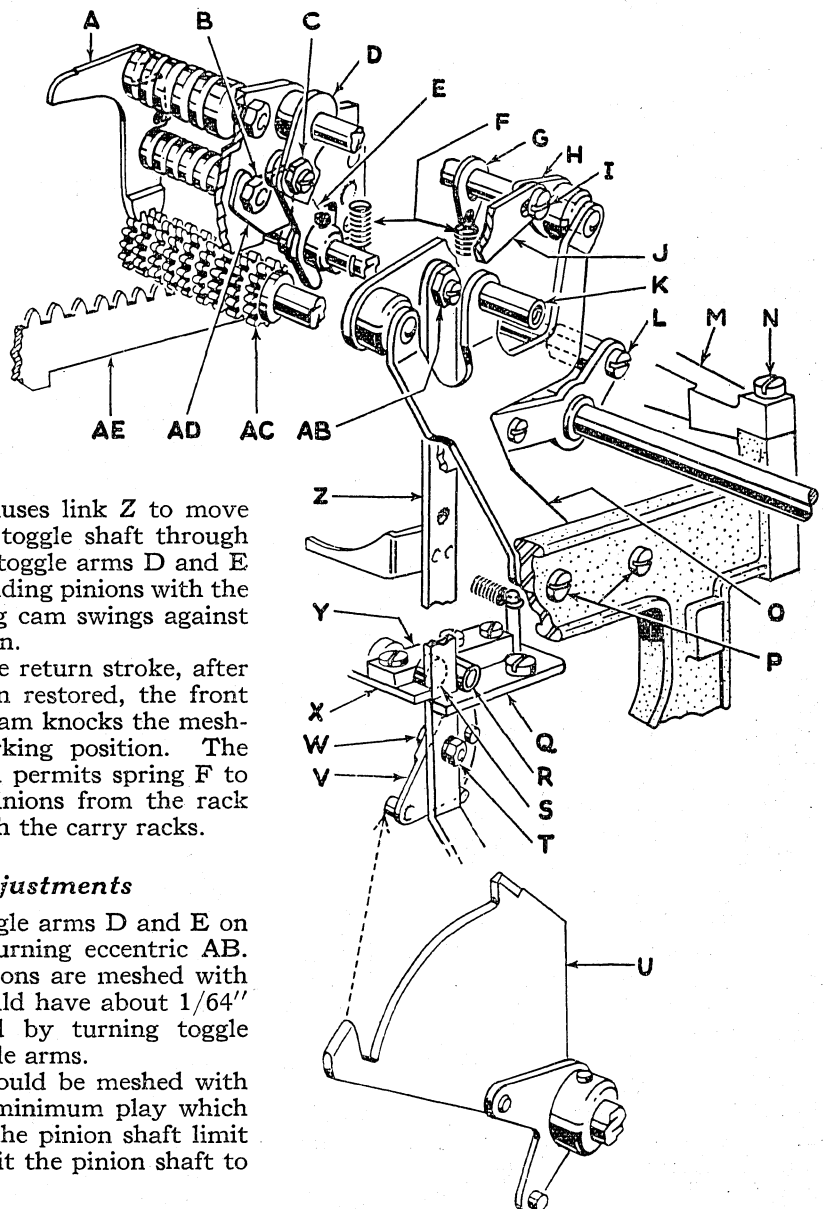
Toward the end of the return stroke, after the rack bars have been restored, the front projection of the main cam knocks the meshing cam from the working position. The toggle is restored, which permits spring F to disengage the adding pinions from the rack bars and mesh them with the carry racks.

Tests and Adjustments

The movement of toggle arms D and E on center is adjusted by turning eccentric AB.

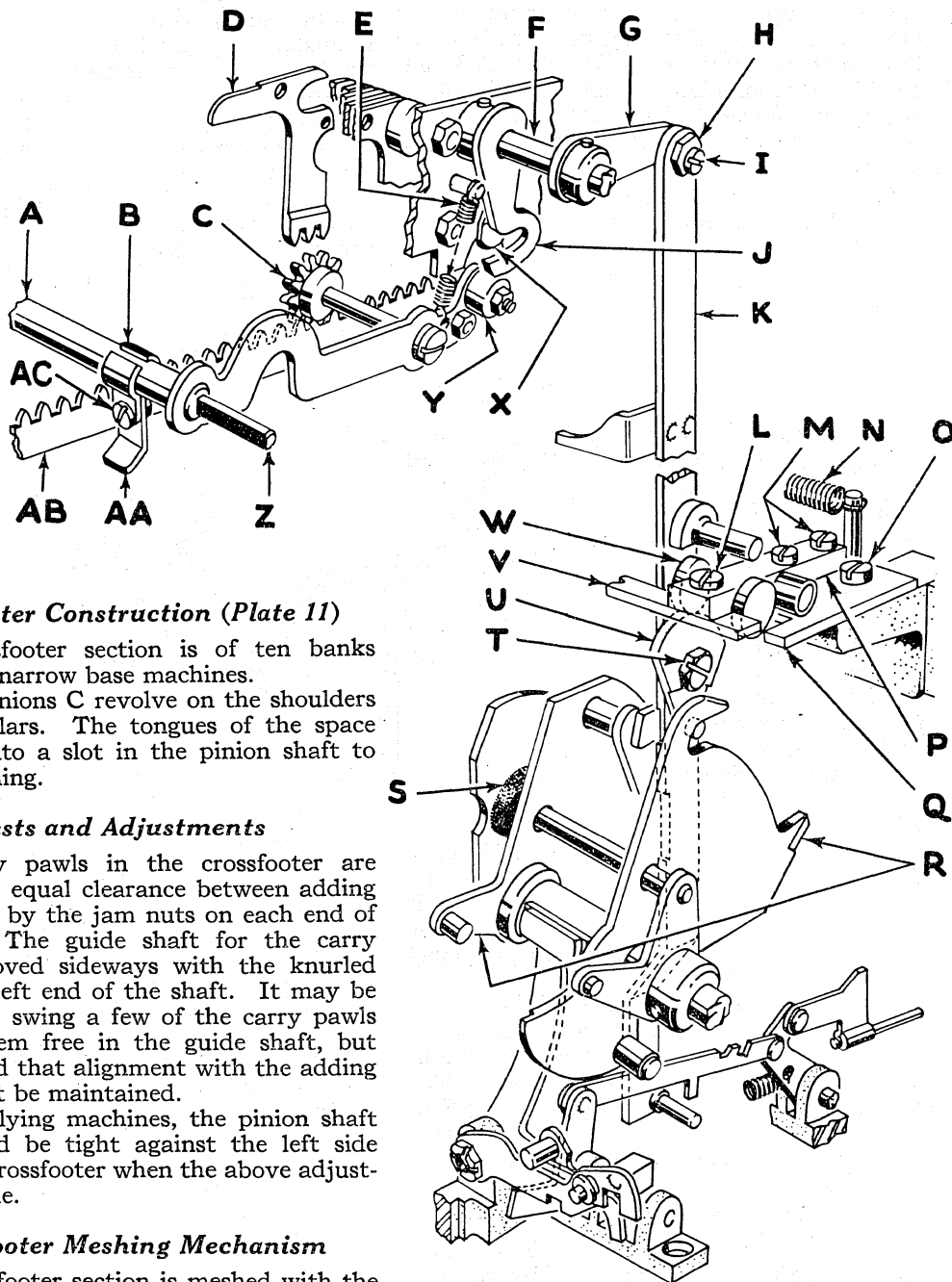
When the adding pinions are meshed with the rack bars, they should have about $1/64''$ play which is adjusted by turning toggle eccentric C in both toggle arms.

The adding pinion should be meshed with the carry rack A with minimum play which is secured by swinging the pinion shaft limit AD as required to permit the pinion shaft to tabulate.



CROSSFOOTER MESHING MECHANISM (Plate 11)

(Plate 10 in Symbol Book only)



Crossfooter Construction (Plate 11)

The crossfooter section is of ten banks capacity on narrow base machines.

Adding pinions C revolve on the shoulders of space collars. The tongues of the space collars fit into a slot in the pinion shaft to prevent turning.

Tests and Adjustments

The carry pawls in the crossfooter are aligned with equal clearance between adding pinion teeth by the jam nuts on each end of the shaft. The guide shaft for the carry pawls is moved sideways with the knurled nut on the left end of the shaft. It may be necessary to swing a few of the carry pawls to make them free in the guide shaft, but keep in mind that alignment with the adding pinions must be maintained.

In multiplying machines, the pinion shaft screw should be tight against the left side arm of the crossfooter when the above adjustment is made.

Crossfooter Meshing Mechanism

The crossfooter section is meshed with the rack bars near the end of the forward stroke at the same time period as that of the meshing of the register section.

As the forward stroke nears completion, the hook on main cam R moves over the stud in meshing cam U, swinging it to the working position. The meshing cam motion causes link K to move downward, swinging cam arm J, which contacts collar Y meshing the

adding pinions with the rack bars. Shaft F carries a right and left cam arm J for parallel meshing of the adding pinions.

Toward the end of the return stroke, the front projection on the main cam knocks the meshing cam from the working position permitting the spring E to disengage the crossfooter from the rack bars.

(Plate 11) Continued

The crossfooter and register linkage is restored from the same spring connected to the right cam arm J and the right register toggle.

Tests and Adjustments

Locate arm J over center of the carry pawl shaft with eccentric H.

**Simultaneous Addition Mechanism
(Plate 12)**

Simultaneous adding in register and crossfooter is accomplished by coupling the meshing and carry pawl resetting mechanism of the crossfooter to the register. The couplers are flexible and can be moved into or out of active position so that either single or simultaneous addition is available. The couplers are controlled from three sources: A control slide AU passing over a plate on the base marked "Add Register" and "Crossfooter and Register"; a positive register control block, and a result key.

When the control slide is moved rearward, the couplers are in position to add simultaneously. When the control slide is in the forward position, the machine adds in the register only. When a positive register control block is active or a result key is depressed, with the control slide in rearward position, the couplers are disengaged.

Meshing coupler AO which pivots on register link AS, swings over stud I in crossfooter link B. As the meshing cam swings to the working position, the register link is pulled downward meshing the crossfooter.

Carry reset coupler O which pivots on the register carry reset link C, swings under the stud in crossfooter carry reset link R. As main cam BD moves the register carry reset

The adding pinions should have about $1/64''$ play when meshed with the racks. To adjust, bend the lower hook of the cam arm J.

Limit cam X is adjusted to provide minimum play of the adding pinions in the carry racks.

Guide AA on shaft Z is located with minimum side clearance on the end rack bar to prevent it weaving sideways when it limits against the multiplier index arms.

arm upward, it carries up the crossfooter arm resetting the carry racks.

The couplers are held against their respective studs by the fingers of bail D which is placed under tension from spring M. When the couplers are disengaged, bail D swings rearward permitting the couplers to swing clear of the studs.

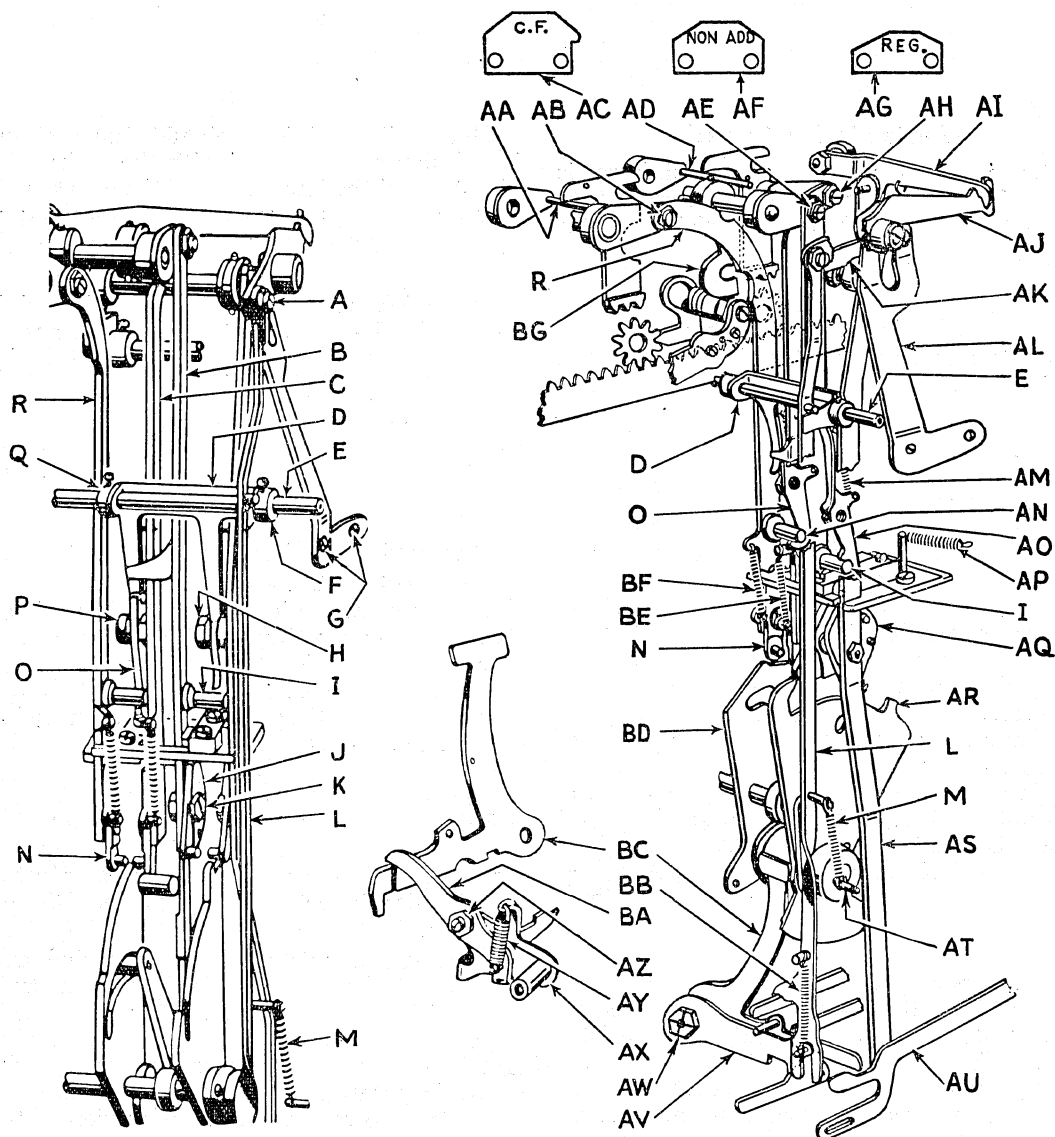
Tests and Adjustments

Before adjusting the couplers, the mesh of the register and the crossfooter, and the resetting of the carry racks must be adjusted individually from the meshing cams AQ and main cam BD.

Since the couplers are made active and inactive, clearance is required between studs I and AN and the couplers. This clearance is important to secure the correct mesh timing and resetting of the carry racks, as the coupled operation of the accumulators must correspond to the individual operation of the register or crossfooter sections.

Meshing coupler AO should have about $.010''$ clearance over stud I to insure full meshing of the crossfooter section from the working position of the meshing cam AQ. Excessive meshing coupler clearance will result in a partial mesh of the crossfooter and a tendency to disengage prematurely. The adjustment is made from the eccentric in coupler AO.

SIMULTANEOUS ADDITION MECHANISM (Plate 12)



(Plate 12) Continued

Carry reset coupler O should raise the crossfooter carry reset arm R the same distance that the main cam BD moves the register carry reset arm C to insure a like reset action. Excessive clearance of the coupler under the stud AN would result in a partial carry rack reset. The adjustment is made from the eccentric in coupler O.

When any result key is depressed, bail D is raised, permitting the couplers to disengage from their respective studs by the result key linkage contacting arm AV, which in turn raises link L. The clearance between the top

of arm AV and the stud in BC is fixed and is sufficient to permit the couplers to disengage without moving the main twin cams. If the cams move, on the depression of a result key which adds forward, it indicates the result key linkage is raising arm AV too high.

Adjustment: Remove stock from the bottom of arm AV.

Bail D should be formed with a straight bearing on the couplers and the inside finger should rest against the carry reset coupler O. This is done to insure the full tension of spring M retaining the coupler O on stud AN to prevent it dropping off from the jar of the

(Plate 12) Continued

carry rack reset action. The outside finger of bail D should have about .005" clearance with the meshing coupler AO, to insure that it does not interfere with the full tension of spring M being applied to the inside finger of the bail. Link L should not limit on control slide AU nor on the total key linkage, but it should rest well into the V pocket of each part to obtain maximum cam action when the control slide is operated or the manual mesh, register total key is depressed. The adjustment is made by forming bail D.

The fingers of bail D are aligned with the couplers by shifting the set collars on shaft E. The wing on link B is a disengaged limit for bail D.

Positive Register Control (Plate 12)

This mechanism permits adding the amount in the register, crossfooter, or non-adding from a control block placed on the carriage. Each control block is marked relative to its purpose as crossfooter or register add or non-add.

When a control block moves under the roller in the control arm AI, it rocks lever AJ, raising link L which is spring connected to arm AV. The upward movement of arm AV contacts the stud bell-crank BC, shifting the twin cams to add crossfooter or non-add positions.

With a crossfooter add block active, the lower part of the twin cam AR should clear the guide shaft in the left side frame. The non-add block should align the twin cams with the center slot of the guide shaft. The register add block does not move the twin cams, but it does disengage the simultaneous addition couplers.

The adjustment is made from the eccentric in link L.

Reverse Positive Register Control

When the crossfooter add block is in active position, the depression of a result key will select a non-add, register add, or leave the

twin cams in the crossfooter add position. The result key linkage contacts the arm of hub assembly AX and through link BA contacting on BC, the twin cams are pulled back from the crossfooter position to non-add or register add position.

Tests and Adjustments

Eccentric AZ is adjusted to the result key requiring the most movement to align the twin cams in the add register or non-add position with a crossfooter add control block active.

Spring AY should break only slightly to lessen the load on the key depression. Excessive expanding of spring AY on a certain result key depression indicates the result linkage is contacting too heavily on the arm of hub assembly AX. To adjust, remove stock at the contact point of the result key linkage.

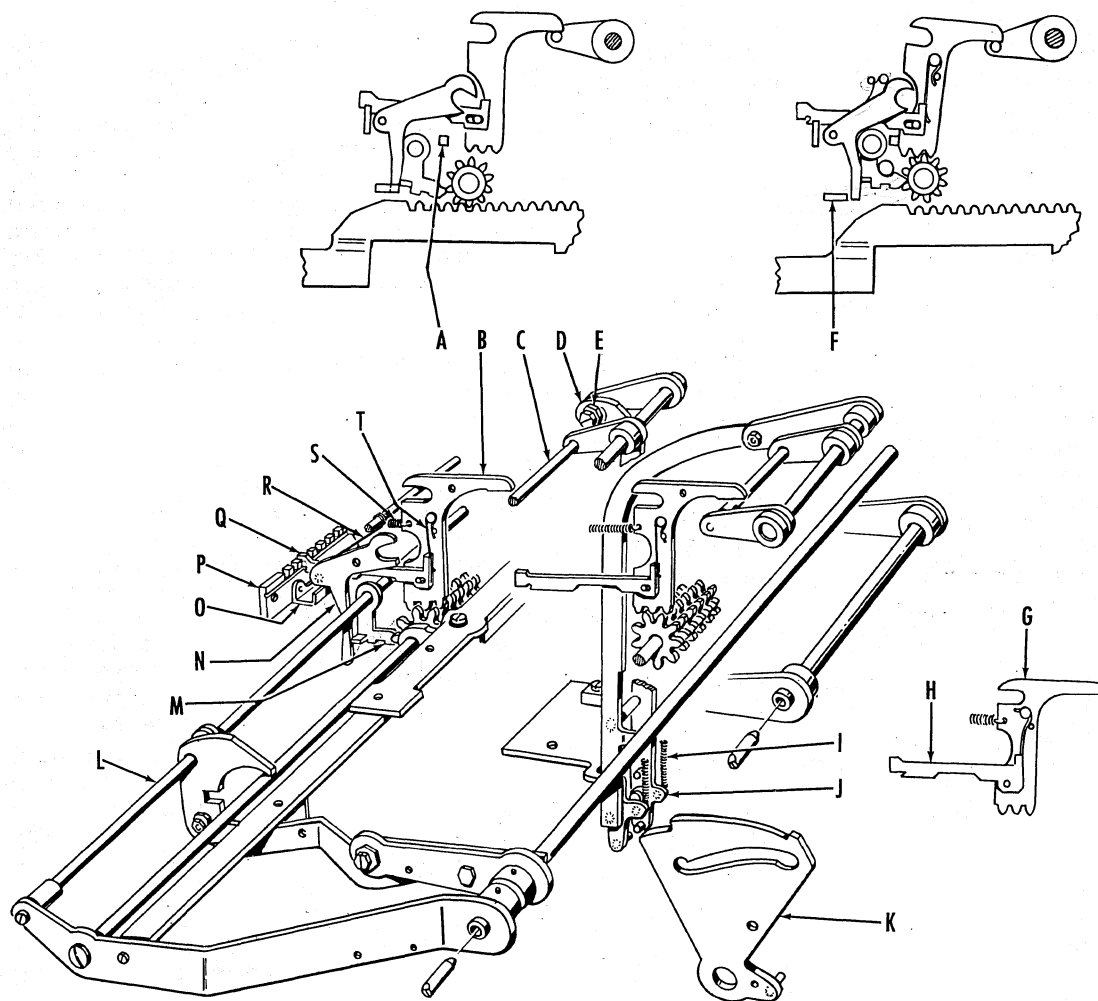
Be very careful when removing stock from the arm of hub assembly AX, as the leverage of the parts is such that very little stock removed at the linkage contact point makes a considerable difference in twin cam movement.

To permit the depression of the crossfooter add and register total keys together with a crossfooter add control block active, arm BA is spring connected to hub assembly AX. The register total key moves the cams from the crossfooter add to the non-addition, but the crossfooter add key forces them back to the crossfooter add position at which time the spring joint yields.

To obtain an automatic transfer of the register total key from a crossfooter add control block, a slot is filed in the arm of hub assembly AX at the linkage contact point. The high land on the arm of the hub assembly AX in the crossfooter add key position draws the twin cams to non-add position when the non-add key is depressed on the 7200 machines. This is necessary because the non-add key stroke is only half as long as a normal result key depression.

CARRY MECHANISM, SERIES M (Plate 15)

(Plates 13 and 14 in Symbol Book Only)



Carry Mechanism, Series M (Plate 15)

The carry mechanism functions in the register and the crossfooter are identical. This subject, therefore, will be confined to the register section.

Carry racks B have two positions. The normal position is rearward, latched by carry rack latches Q on comb P; the carry position is forward, limiting against square shaft A. The square shaft has three different dimensional sides for adjustment to align the teeth of carry racks in carried position with teeth of carry racks in normal position.

Channel O fastened to comb P limits carry trip bell cranks N so that they will not place pressure against carry pawls M when the pawls are normal. Comb P is also milled

on the inside to assist the carry operation. This construction is only in the register section.

Carry rack latches Q, which contain an elongated hole, replace carry rack latches H in Classes 72 and 78 machines beginning with Serial No. A624105 and in Class 77 machines beginning with Serial No. A625431. The elongated hole permits carry rack latches Q to move forward .015"—during an initial carry—without disturbing the position of carry racks B.

Shaft C connected to carry reset arm D resets the carry racks from the reset point on twin cam K.

The carry rack latches and the carry trip bell cranks have small light springs T and R located in a slot on the edge of each part.

(Plate 15)—Continued

Defective springs or slots will affect the re-setting of the parts and result in overaddition.

Carry rack springs S should all be of uniform tension so that each rack will complete its operation during a progressive carry operation.

Carry Operation

During the return stroke of an adding operation, the adding rack revolves the adding pinion. The adding pinion wide tooth cams carry pawl M forward rocking carry trip bell crank N. A stud in the carry bell crank raises carry rack latch Q out of the slot in comb P allowing the carry rack latch spring to move the carry rack latch forward to the initial carry position. Since the adding pinion is in mesh with the adding racks, the carry rack is held in the initial carry position by shaft C until the adding pinion is disengaged from the adding rack and meshed with the carry rack to receive the carry. The carry is completed when arm D drops from the dwell of twin cam K near the end of the return stroke, dropping shaft C and permitting the carry rack to move forward and limit against square shaft A.

Carry racks that have moved forward during an adding operation are reset by carry reset arm D during the return stroke of the following adding operation. Reset arm D is inactive during the forward stroke of this subsequent operation because of passby pawl J, but near the end of the forward stroke, spring I pulls the pawl to a vertical position to become active for the carry reset and initial carry operation.

Adjustments

1. With carry racks B latched in normal position, manually raise reset shaft C and check for even lift of carry racks B (except the Sub-Product Deduction Feature carry rack).

To adjust, bend the tails of carry racks B.

2. With carry reset arm D resting on the dwell or just past the reset point of twin cam K, carry reset shaft C should have non-binding contact on the tails of carry racks B. In machines prior to Serial No. A624105 containing carry rack latches H—without elongated holes—carry reset arm D should be adjusted for .015" play between reset shaft C and tails of carry racks G.

To adjust, turn eccentric bushing E in carry reset arm D.

Note: In machines prior to Serial No. A624105, the .015" initial clearance provides a safe lead for latch H over comb P to ensure that the latch is not reset when the adding pinions disengage from the adding racks and mesh with the carry racks. Excessive clearance not only reduces the carry rack reset motion but it also permits too much forward movement of the carry rack to initial carry position, which is likely to cause a point to point lock between the carry rack and the adding pinion.

3. With sixes in the adding pinions and carry racks B tripped to the carry position, the wide part of carry rack B should be in perfect alignment with the wide tooth of the adding pinion.

To adjust, carefully bend the lower portion of carry rack B sideways.

4. With nines in the adding pinions, list twos and operate the machine manually. Carry rack latches Q should have .015" forward movement and 1/64" excess rise clearance over the slot in comb P on the return machine stroke when the adding pinion wide tooth passes the nose of carry pawl M.

Note: The 1/64" rise clearance is a fixed adjustment but the test should be made to be sure that the adjustment is maintained to ensure that the carry can be completed. The .015" forward movement is obtained through adjustment No. 2.

5. Carry trip bell crank N should have .005" clearance with blocking comb F to permit the comb to move sideways on a register total operation.

Note: Channel O on comb P provides this clearance and it is quite accurate, but if necessary, channel O may be adjusted up or down to obtain clearance.

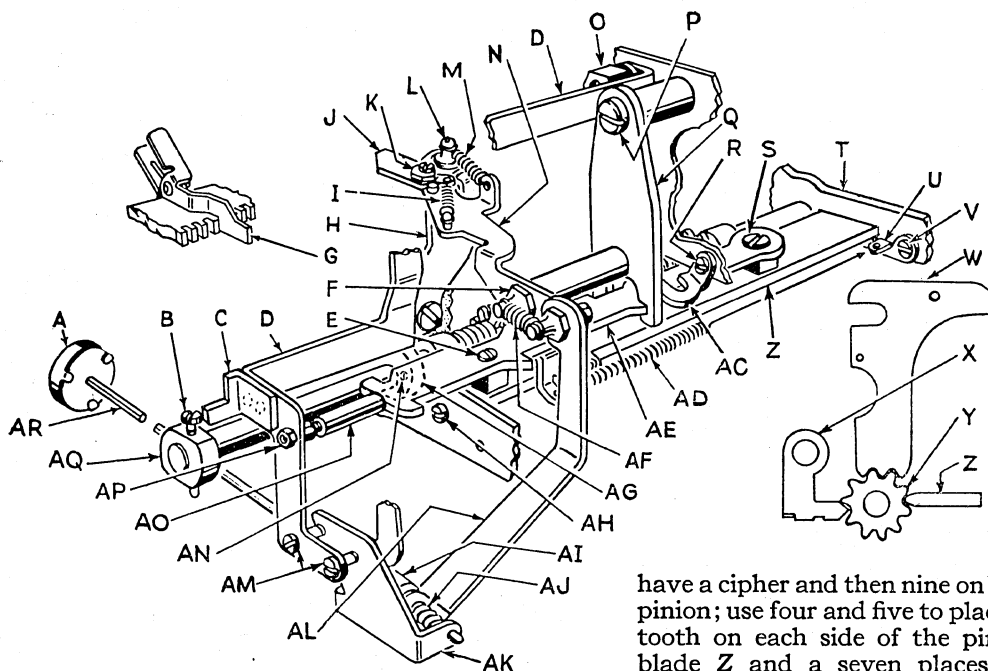
6. Carry trip bell cranks N should non-bind on carry pawls M, and pawls M should align centrally between the teeth of the adding pinions.

To adjust, turn carry pawl shaft L.

7. With sevens in the adding pinions and every other carry rack tripped to the carry position the teeth of the carry racks should align to permit the adding pinions to tabulate through freely during a register trip operation.

To adjust, turn square shaft A to the desired side and stake it to hold it in position.

REGISTER ESCAPEMENT MECHANISM, THIRTY PINION (Plate 16)



Register Escapement Mechanism, Thirty Pinion (Plate 16)

Registers are tabulated from the carriage movement through a register trip block G and from the depression of the register trip key A. When the carriage tabulates the register trip block through passby pawl J, register escapement fork Q is moved rearward by arm N to clear the rear limit tooth on register escapement rack AE.

In the escapement motion, the front prong of fork Q limits the escapement rack and when the fork moves forward, the escapement rack rear tooth limits against the fork. Spring AD tabulates the registers and spring M restores arm N to normal.

When register trip key is depressed, rod AR moves assembly N rearward to tabulate the registers.

Tests and Adjustments

Adding pinions must align centrally with the rack bars in all register positions. Register escapement rack AG must limit against escapement fork Q when the test is made. Sight along the rack bar teeth from the rear of the machine as the adding pinions are manually meshed. The adjustment is made by spreading or closing hook AC. If the adding pinion and rack bar alignment is changed, the carry test alignment (Plate 15) must be checked.

To test the adding pinion teeth for being true when the registers are tabulated, place the wide tooth on each side of carry pawl X,

have a cipher and then nine on the adding pinion; use four and five to place the wide tooth on each side of the pinion guide blade Z and a seven places the wide tooth vertical in the carry rack W.

When the register trip block G is on the high point of passby pawl J, the rear prong of the escapement fork Q should clear the limit tooth of escapement rack AE to insure tabulating the register. The adjustment is made from the eccentric on F. If this is insufficient, adjust eccentric K.

Return collar AQ should have minimum clearance on register section side arm to insure that it does not act as a limit for the pinion shaft in the last register position. Locate collar as required and tighten set screw.

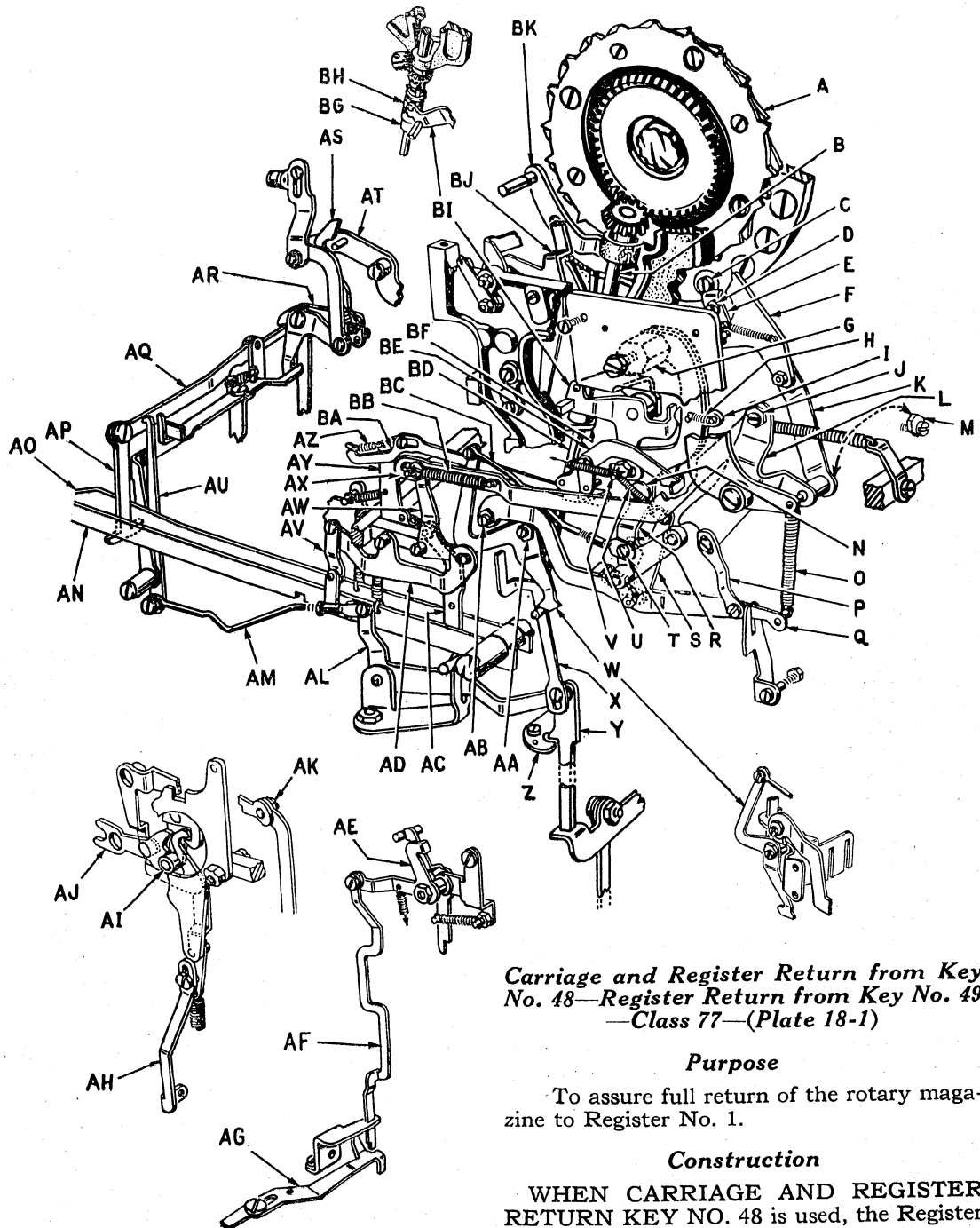
Limit post AO is adjusted to allow about $1/16''$ reset clearance for the escapement rack on fork Q in the normal position. This is to insure the register remaining in the No. 1 position on the power or manual return. The limit post has two nuts for adjustment.

Spring AF acts as a yielding joint to prevent damage to part N, should the trip block G be forcibly moved past the passby pawl J while full part of the escapement rack is opposite the forward prong on fork Q. This is apt to happen on a very fast manual movement of the carriage to the left through several tripping blocks.

Upper guard D prevents damage to the adding pinion shaft if the operator attempts to depress the motor bar between register positions.

Manual register trip arm AL is located on the trip rod AR to trip the register, but its position should not interfere with carriage register trip operation.

**CARRIAGE AND REGISTER RETURN FROM KEY NO. 48
REGISTER RETURN FROM KEY NO. 49
CLASS 77 (PLATE 18-1)**



*Carriage and Register Return from Key No. 48—Register Return from Key No. 49
—Class 77—(Plate 18-1)*

Purpose

To assure full return of the rotary magazine to Register No. 1.

Construction

WHEN CARRIAGE AND REGISTER RETURN KEY NO. 48 is used, the Register Return Mechanism latches and is not released until after stop pawl BK is pulled in front of the tooth of register limit gear A when the rotary magazine reaches register No. 1 position.

REGISTER RETURN KEY NO. 49 is a "hold-down" key, and the register return clutch becomes disengaged when the key is released. Thus, selection of registers, during register return operations, is possible by quickly releasing the key. However, when the rotary magazine reaches the No. 1 register, the register return clutch is automatically disengaged.

Operation

WHEN CARRIAGE AND REGISTER RETURN KEY NO. 48 is depressed the Carriage Return Mechanism is indexed as explained in Plate 27, Carriage Instruction Book, except that keylever AO contacts the stud in bell crank AL which lowers link Y to close the switch points. Link Y is latched in this lowered position when detent roll AI enters the upper pocket of latch arm AJ to assure power to complete the return of the carriage should the rotary magazine return first.

Depression of key No. 48 causes keylever AO, through link AC, bell crank AY, and spring AZ, to move link BA and drive pawl BE rearward. Drive pawl BE swings arm I which, through shoulder screw N, swings assembly R. The rearward movement of assembly R swings arm S, through the shoulder nut on screw T, placing spring U under tension to initiate the rocking of bell crank BI which engages clutch member BH with clutch member BG. Further rearward movement of assembly R then fully engages the clutch members through screw V in bell crank BI. The tension of spring U holds the clutch members fully engaged, taking up the play between screw V and assembly R. This arrangement permits sure engagement of the clutch members should they come together tooth to tooth.

As the lower roll on assembly R moves slightly beyond the center land between the notches on latch arm Q, a hook on the forward portion of assembly R contacts the stud in drive pawl BE, disengaging the latter from the formed ear of arm I. The tension of spring O then causes the roll to seat in the rearward notch of latch arm Q, completing the travel of assembly R and latching the Register Return Mechanism.

The movement of assembly R to its latched position positions the cam foot of rocker arm W, through wire BC, over the roll on link X, holding the switch points closed in order to assure power to return the rotary magazine should the carriage return first.

The movement of assembly R to its latched position also positions its upper arm F into

the path of the head of screw C in the rotary magazine. When Register No. 1 is fully returned, screw C contacts arm F, restoring assembly R to the forward notch of latch arm Q, the normal position of the mechanism. Stop pawl BK is pulled in front of the tooth of register limit gear A, through spring tension, just prior to screw C contacting arm F, thus assuring full return of the rotary magazine. When the rotary magazine drops back to limit on limit pawl BK, pawl E is positioned under the shoulder of screw C, thereby preventing engagement of the clutch members when the rotary magazine is returned to Register No. 1 position.

The restoration of the roll on assembly R to the forward notch of latch arm Q permits the clutch members to disengage, releases the cam foot of rocker arm W from the roll on link X, and resets pawl BE in front of the formed ear of arm I.

WHEN REGISTER RETURN KEY NO. 49 IS DEPRESSED, keylever AN, through bell crank AL, lowers link Y to close the switch points. Depression of key No. 49 also, through link AV and lever AD, rocks bell crank AW, which, through spring BB and link AX, rocks lever L. The rearward arm of lever L, through link K, rocks assembly R, through its upper arm F. The rocking of assembly R engages upper clutch member BH with lower clutch member BG, through bell crank BI and spring U, as explained previously.

The lower arm of lever L, through link P, lowers latch arm Q to prevent latching the Register Return Mechanism since only the rotary magazine is being returned.

When the register return key is released, the point on lever L cams on the rearward roll of assembly R to speed the disengaging of the clutch members and the opening of the switch points, thus permitting stopping the rotary magazine at a desired register position.

The purpose of arm I and spring connection H is to assure holding the register return clutch members disengaged should key No. 49 be held depressed after the rotary magazine has returned to Register No. 1.

Arm I, which idles in the slot (for screw N) in assembly R, is barely moved rearward when key No. 49 is depressed. Thus, when the rotary magazine is returned to Register No. 1 and assembly R is restored forward, arm I immediately contacts the ear on bell crank BI, causing a drag on the bell crank and tending to hold the clutch members apart.

INTERLOCK AF prevents depression of keys No. 48 and No. 49 during motor bar or selective column tabulation operations. When the register shuttles in, interlock AF is positioned in the path of typewriter keylock slide AG, preventing the latter from returning to its normal position until the register shuttles out.

INTERLOCK BJ prevents engagement of register return clutch members BG and BH should the register be out of its normal position in the rotary magazine. (See Plate 44, Accumulation Instruction Book for interlock function and earlier style interlocks.)

INTERLOCK AS prevents depression of a selective column tabulation key when either key No. 48 or No. 49 is depressed. Depression of either key rocks lever AQ and bell crank AR, through keylever AN or AO and link AP, to position the hook of interlock AS over the stud in rocker arm AT. Also, from depression of either key, bell crank AL is rocked, which, through wire AM, rocks latch AU to engage lever AQ, thus maintaining the hook of interlock AS over the stud in rocker arm AT until power indexing link Y is released.

Adjustment

1. Arm F should limit screw C in the last register position of the rotary magazine so that the register support pin aligns with the pilot shaft in the register frame, thus insuring free shuttling action of the register. This position should correspond with the tooth on register limit gear A. That is, with the rotary magazine in the last register position, limit pawl BK should just clear the tooth on register limit gear A.

To adjust, turn eccentric pivot post G.

Note: This is the basic adjustment for the Register Return Mechanism and any alterations will affect the adjustments pertaining to the actuating or positioning of assembly R.

2. With the lower roll of assembly R seated in the forward notch of latch arm Q, the latter should position arm F in the path of screw C sufficiently to prevent the rotary magazine from returning beyond Register No. 1; and with the lower roll of assembly R seated in the rearward notch of latch arm Q, screw C should impart sufficient movement to assembly R to return the roll forward beyond the center land between the notches on latch arm Q.

To adjust, turn eccentric AB.

3. Shaft BD, which floats in bracket BF to permit the lower clutch member to align

with upper shaft B, should have slight end play to assure its being free, and to assure free and full travel of clutch member BH.

To adjust, weave the lip on bracket BF.

4. With the lower roll on assembly R in the forward notch of latch arm Q, clutch member BH should be fully disengaged from clutch member BG without binding; and with the roll on assembly R in the rearward notch of latch arm Q, clutch member BH should be fully engaged with clutch member BG without binding.

To adjust, turn the eccentric nut on screw V.

Note: The non-binding of clutch member BH, when either engaged or disengaged, is indicated by slight play in screw V.

5. Shoulder screw N on arm I should have minimum play in the rearward end of the slot in assembly R when the lower roll on the latter is in the forward notch of latch arm Q.

To adjust, bend the rearward ear on bell crank BI.

6. Drive pawl BE should have just sufficient clearance to reset in front of the formed ear on arm I when the roll on assembly R returns to the forward notch of latch arm Q; and should move the roll beyond the center land between the notches on latch arm Q when key No. 48 is depressed.

To adjust, weave the formed ear on arm I.

7. Drive pawl BE should remain in contact with the formed ear of arm I long enough to assure that the lower roll on assembly R travels beyond the center land between the notches on latch arm Q; and should have clearance over the formed ear of arm I after leaving the latter when key No. 48 is fully depressed.

To adjust, swing the stud in drive pawl BE.

8. With both keylevers AN and AO normal, there should be minimum clearance between the roll on bell crank AL and the keylevers; and the forward projection on link Y should have clearance over interlock Z.

To adjust, bend the limit arm of the hub assembly (BG, Plate 27, Carriage Instruction Book) which limits the arm (BE, Plate 27).

9. When the switch is open, there should be a gap of approximately $1/32''$ between two of the contact points with the other two contact points held together.

To adjust, loosen the screw (BD, Plate 27) and shift the switch arm (AX, Plate 27).

10. With only the carriage return clutch engaged, the switch points should have a full wiping action without binding.

To adjust, turn eccentric AK.

11. With the lower roll of assembly R in the rear notch of latch arm Q, the cam foot of arm W should be centrally located on the roll on link X.

To adjust, shorten or lengthen wire BC.

12. With only the register return clutch engaged, the switch points should have a full wiping action without binding.

To adjust, turn eccentric AA.

13. The rearward roll on assembly R should clear the point on lever L when key No. 48 is depressed.

To adjust, turn eccentric J.

14. With key No. 49 fully depressed, the rearward roll on assembly R should not bind on the point of lever L.

To adjust, turn eccentric M.

15. The carriage return and the register return clutches should mesh simultaneously.

To adjust, bend link AH at its form to delay or speed up engagement of the carriage return clutch.

16. With the rotary magazine in register No. 1 position, there should be minimum clearance between pawl E and screw C to prevent the register return clutch members from engaging should either key No. 48 or No. 49 be depressed.

To adjust, turn eccentric D.

17. Interlock AF should have approximately 1/64" clearance over slide AG with a register in the rotary magazine.

To adjust, weave the upper arm (with the lip) of bell crank AE.

18. When key No. 48 or No. 49 is depressed, the hook of interlock AS should have full hold on the stud of rocker arm AT. Also, the face of interlock AS should clear the stud in rocker arm AT when both keys are normal.

To adjust, bend lever AQ at the end where it contacts the foot of bell crank AR.

19. When key No. 48 or key No. 49 is depressed, the hook on latch AU should be positioned over lever AQ; and when link Y is released to normal, latch AU should leave lever AQ.

To adjust, shorten or lengthen wire AM.

REGISTER ESCAPEMENT MECHANISM, SIXTY PINION (Plate 17)

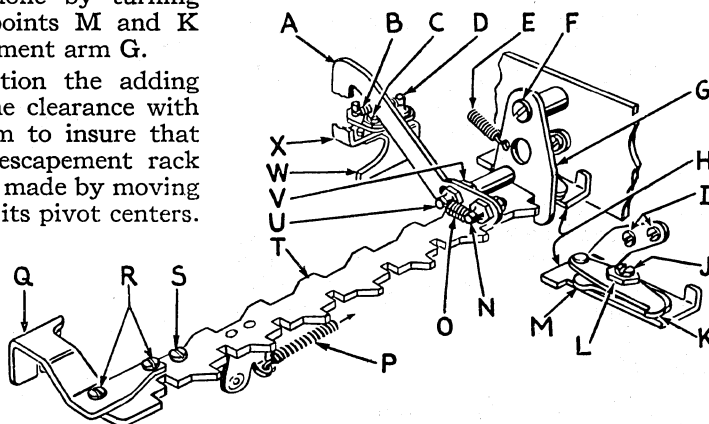
Register Escapement Mechanism, Sixty Pinion (Plate 17)

The escapement mechanism of sixty pinion construction functions exactly as explained under "Register Escapement Mechanism, Thirty Pinion." Aligning the adding pinions and the adding racks is done by turning eccentric L which moves points M and K toward or away from escapement arm G.

In the last register position the adding pinion cob should have some clearance with the register section side arm to insure that the register limits on the escapement rack tooth T. The adjustment is made by moving the register section frame in its pivot centers.

It is necessary to check the carry pawl clearance between the adding pinions if the register section frame is moved (Plate 15).

Other tests and adjustments are the same as specified under the subject, "Register Escapement Mechanism, Thirty Pinion."



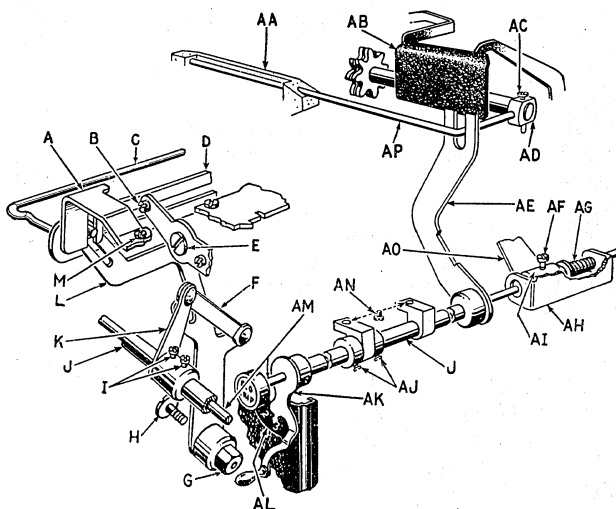
REGISTER RETURN MECHANISM, MANUAL (Plate 18)

Register Return Mechanism, Manual (Plate 18)

The No. 1 register is restored to active position by the carriage being returned. It can also be restored manually by swinging indicator arm AK from right to left.

When the carriage is being returned, the margin block contacts on rod AP, its right end, being seated in collar AD on the adding pinion shaft assembly, moves AD to locate the No. 1 register in active position.

When indicator arm AK is swung toward the right, forked arm AE moves rod AP similarly as when the latter is moved by the carriage. On machines having more than three registers, the indicator arm on shaft J swings forked arm L through links F and K.



Tests and Adjustments

When the carriage is moved to its extreme right-hand position, there should be slight clearance between rods C or AP and the mar-

gin block on the carriage, and the register should reset with about 1/32" lead. Clearance can be secured by bending the right angle of rods C or AP.

REGISTER INTERLOCK, THIRTY PINION (Plate 20)

(Plate 19 in Symbol Book Only)

The purpose of the register interlock is to prevent depressing the motor bar between register positions, and also to prevent depressing the motor bar when the carriage is being returned. When the motor bar is depressed with the register correctly located, it permits slide O to cam link K upward; the latter raises interlock D to the right or left of the stud in B, or in the slot of D.

When link K moves upward, it enters the notch of error key slide M, preventing the depression of the error key.

When the register is not correctly located, the motor bar cannot be depressed, due to interlock D being blocked by the stud in B.

When the carriage return key is depressed, the upward movement of the carriage return clutch allows spring W to pull slide Q under the formed lip of part H which blocks the upward movement of link K to prevent the depression of the motor bar.

Tests and Adjustments

Interlock D should clear the stud in B when any one of the three registers are in active position.

Adjustment: Interlock D is moved sideways by adjusting nuts E.

Slide Q should have minimum clearance under the lip of H to prevent raising interlock D high enough to engage the stud in B. This permits the return of the adding pinion shaft.

To adjust, bend the lip on H.

Register Interlock, Sixty Pinion (Plate 21)

This mechanism serves the same purpose as the "Register Interlock, Thirty Pinion."

When the motor bar is depressed, parts O and J are raised which rocks arm G to raise interlock D into one of the spaces of the escapement rack W.

When carriage return clutch V is engaged, spring R rocks bell-crank S which locates slide Q under the lip of part K1, thus preventing depression of the motor bar.

Tests and Adjustments

Interlock D should clear escapement rack W by .010" when the machine is normal.

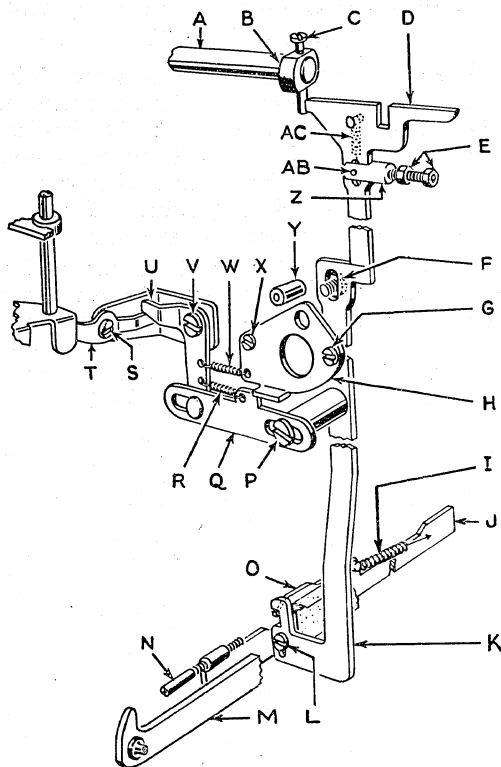
Adjustment: Eccentric F is adjusted.

Brace B should have minimum clearance with rack W.

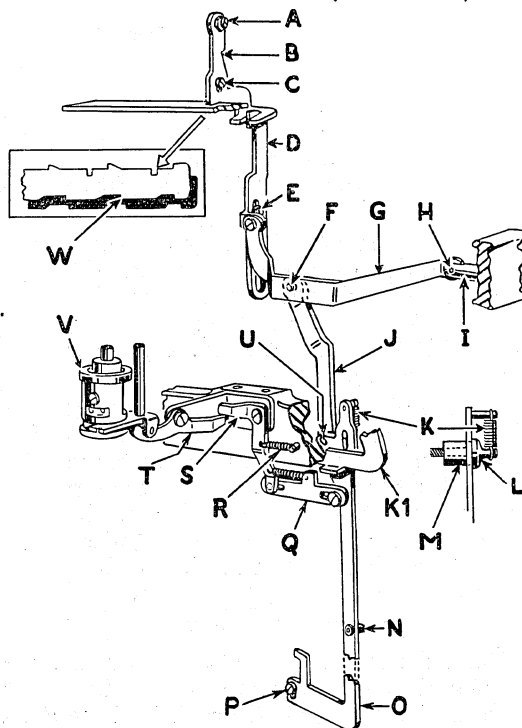
Adjustment: Screws A and C are loosened and the eccentric on A is turned as required.

When carriage return clutch V is raised, part Q should have minimum clearance under part K1.

Adjustment: The lip on K1 is bent.

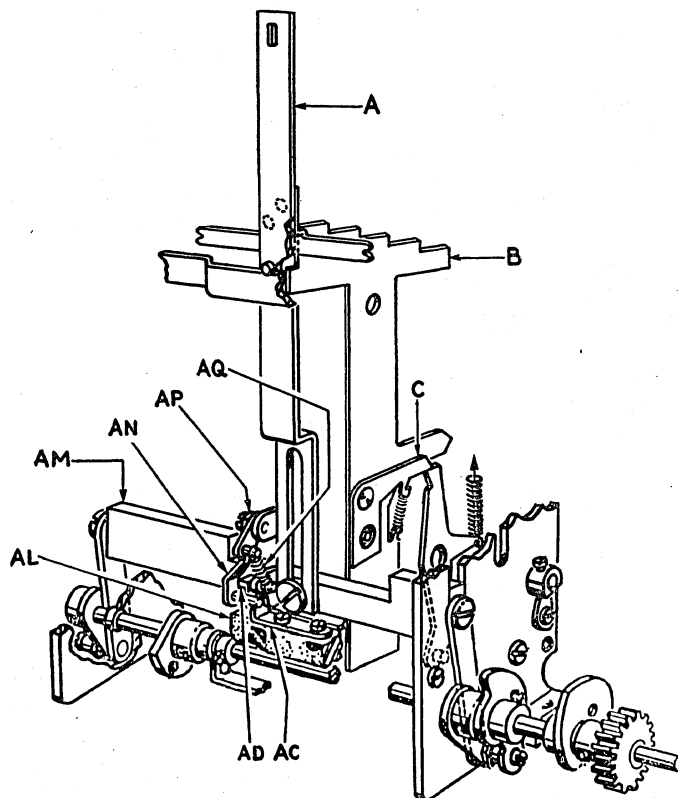


REGISTER INTERLOCK, SIXTY PINION (Plate 21)



MULTIPLIER LATCH PAWL, CLASS 72 MACHINES (Plate 22-1)

(Plate 22 is in Symbol Book Only)



Multiplier Latch Pawl
Class 72 Machines (Plate 22-1)

Purpose

The purpose of this mechanism is to reduce the possibility of overthrowing a multiplier or a subtract plate. Such an overthrow might result in wrong multiplication or subtraction or, due to premature reset of plate pawl C, continuous machine operation with repeated nines.

Construction

Vertical link A is redesigned to include hook pawl AN.

Raise bar AM contains square stud AD.

Casting AL includes plate AC.

Operation

Hook pawl AN is held by plate AC to clear square stud AD when the machine is normal.

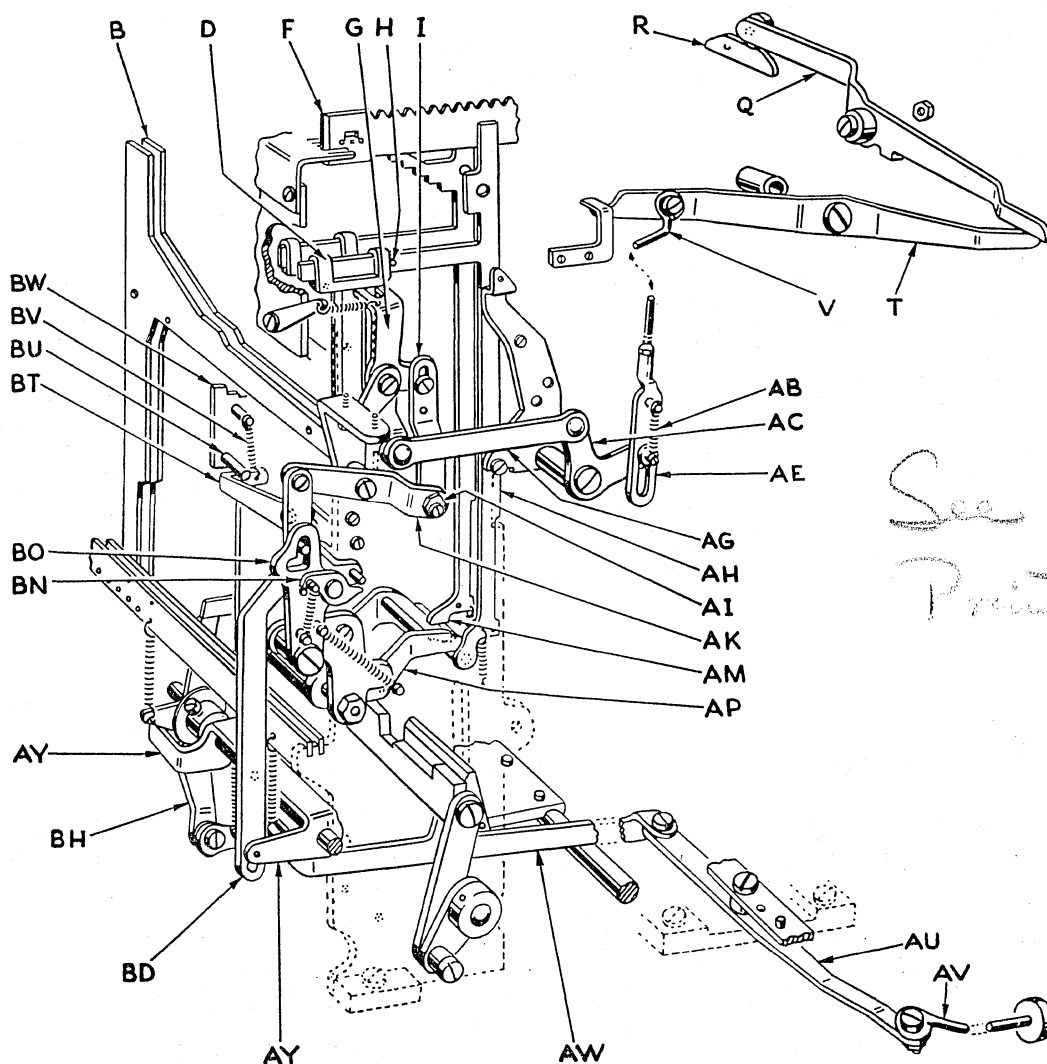
During the forward stroke of a multiplying or subtracting operation, plate B raises link A and hook pawl AN upward. Hook pawl AN, moving upward, clears plate AC and, through tension of spring AQ, swings under square stud AD to tie raise bar AM and vertical link A together. Overthrow of plate B, due to the sudden impact of raise bar AM on plate pawl C, is thereby prevented.

Adjustment

Near the end of the return stroke of a multiplying or subtracting operation, with pawl C about to release from raise bar AM, plate B should have minimum vertical play.

To adjust, turn eccentric AP.

MULTIPLIER FACTOR TO PRINT—EXTENSION OF ONE IN SPECIFIED COLUMNS—CARRIAGE CONTROLLED (Plate 22-2)



Multiplier Factor to Print—Extension of One in Specified Columns—Carriage Controlled (Plate 22-2)

Purpose

The purpose of this mechanism is to provide for the printing of the multiplying factor (multiplier) on the posting media, along with the regular product.

Operation

Only machines having fourteen columns capacity can accommodate this feature. Since up to and including seven columns are required to accumulate the factor, the mul-

tiplying capacity is necessarily reduced; however, when the factor control block is inactive, the multiplying capacity is normal.

The carriage controlled extension of 1 is independent of the regular extend key operation, but both may be active at the same time. Both partial products are accumulated simultaneously in the crossfooter (the amount in the columns to the right and the multiplier factor in the columns to the left), and both products are printed simultaneously through the product keys.

When control block R is moved into active position, bellcrank AC is rocked through levers Q and T and wire V. The upper arm

of bellcrank AC moves link AG rearward, rocking bellcrank G, and moving indexing arm D over lift arm B.

During the multiplying operation, as the units multiplying plate is moved upward, lift arm B raises index limit plate AH through the vertical portion of arm D. A stud in the lower extremity of limit plate AH raises bail AP which raises index limit plate AM to a position where it limits adding rack F to the number indexed from the units plate of the multiplying key depressed.

If the subtract key is depressed while control block R is in active position, the automatic extension of the digit 1 must be normalized and vertical indexing arm D restored to cipher position; otherwise, the complementary number 8 would be added in the crossfooter accumulating wheel instead of 9, and there would be no carry to clear the section.

Depression of the subtract key, through wire AV lever AU and link AW, rocks vertical arm BH which rocks bail AY. The rocking of bail AY pulls link BD downward, and, through arm AK and link I, throws bellcrank G rearward to reset vertical index arm D.

As link BD moves downward, a stud above its offset aligns with the lateral pocket of arm BO, allowing arm BO to be pulled forward

through spring tension.

On the forward stroke of the subtract cycle, as subtract plate BW moves upward, stud BU releases rocker arm BT, and spring BV causes arm BT to by-pass pawl BN.

On the return stroke, as subtract plate BW moves downward, stud BU rocks arm BT. The stud in arm BT contacts pawl BN and cams latch arm BO rearward to unlatch link BD. The automatic extension of 1 mechanism is thus permitted to again become active.

Note: Index limit plate AH is located to the extreme left of the adding racks and is used only as a means of raising bail AP when 1 is extended by the carriage control.

Adjustment

The following adjustments are made when a factor control block is active:

1. Spring AB should limit indexing arm D on stud H with no expansion of spring AB.

To adjust, turn turnbuckle AE.

2. Latch arm BO should positively latch on the stud in vertical link BD to disengage the feature when a subtract key is depressed.

To adjust, bend the ear of bail AY.

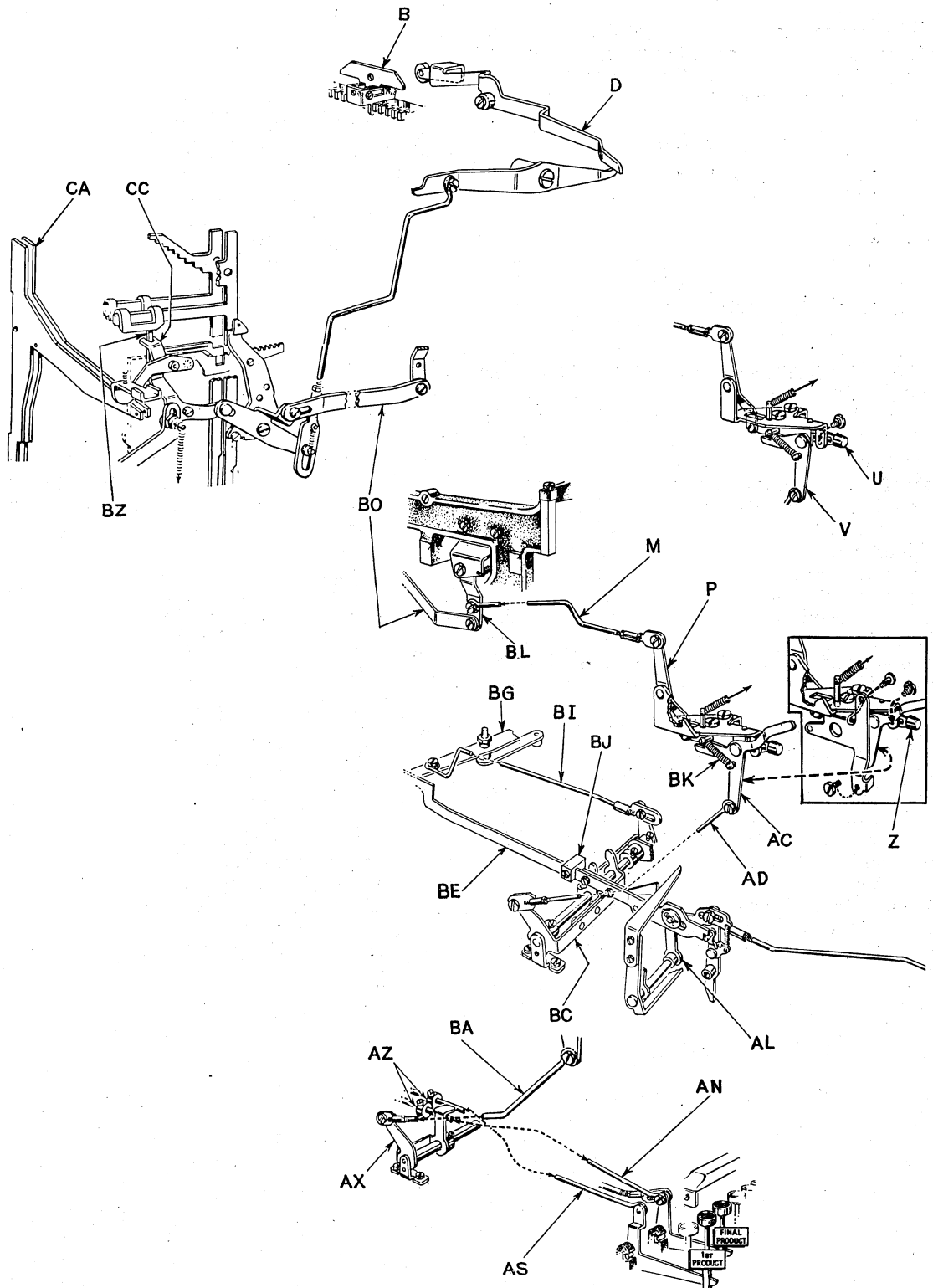
3. Indexing arm D should fully restore when link BD is latched down.

To adjust, turn eccentric AI.

MULTIPLIER FACTOR TO PRINT—NORMALIZED BY KEY NO. 52

(Plate 22-4)

(Plate 22-3 in Symbol Book Only)



Multiplier Factor to Print—Normalized By Key No. 52 (Plate 22-4)

Purpose

To restore the carriage controlled extension of one to normal when it is desired to operate the machine without printing or accumulating the multiplier factor.

Operation

When control rail B rocks control lever D to index the Multiplier Factor to Print Mechanism, index arm BZ is moved forward to align with lift arm CA.

Depression of normalizing key Z rocks lever P, which through wire M pivots arm BL. The latter pulls link BO to rock bell crank CC and restore index arm BZ to normal.

Key Z is held depressed by latch AC under tension of spring BK.

Key Z is released when latch AC is released: Latch AC may be released manually from an extension that protrudes through the front panel in machines containing power result keys beginning with Serial No. B197641.

Latch AC may also be released in all machines containing power result keys by any product operation (first product, final product, product, or sub-product—depending on operational requirements). During a product operation, linkage BE moving forward rocks bail BC through collar BJ. Bail BC, through wire AD rocks latch AC to release the normalizing mechanism.

In machines containing power result keys, prior to Serial No. B197641, normalizing key U may be released by the error key, since latch V does not contain the extension required for manual release. Depression of the error key rocks bail BC through lever BG and wire BI, thus rocking latch V.

In machines not equipped with power result keys, only a depression of the final product key or the first product key (depending on operational requirements) is required to re-

lease the normalizing key. Depression of the final product key pulls wire AN which, through collar AZ, rocks bail AX to release latch V, through wire BA. Depression of the first product key releases latch V through wire AS and collar AZ.

Adjustment

1. With control rail B active and with key Z latched, index arm BZ should be fully restored without bind.

To adjust, shorten or lengthen wire M.

In machines containing power result keys, the following adjustments also apply:

2. With key Z latched, bail BC should have slight clearance below the result linkage when the result linkage is engaged with the stud in power arm AL.

To adjust, shorten or lengthen wire AD.

3. As the result linkage moves forward, collar BJ should rock latch AC sufficiently to release latch AC from the spring stud in key Z with slight lead.

To adjust, position collar BJ.

Note: Should the machine contain a long subtract key wire, check for no interference between bail BC and the wire just when key Z is released.

4. In machines prior to Serial No. B197641, full depression of the error key should rock latch V the same distance clear of the spring stud in key U as does the result linkage.

To adjust, shorten or lengthen wire BI.

In machines not equipped with power result keys, the following adjustments also apply:

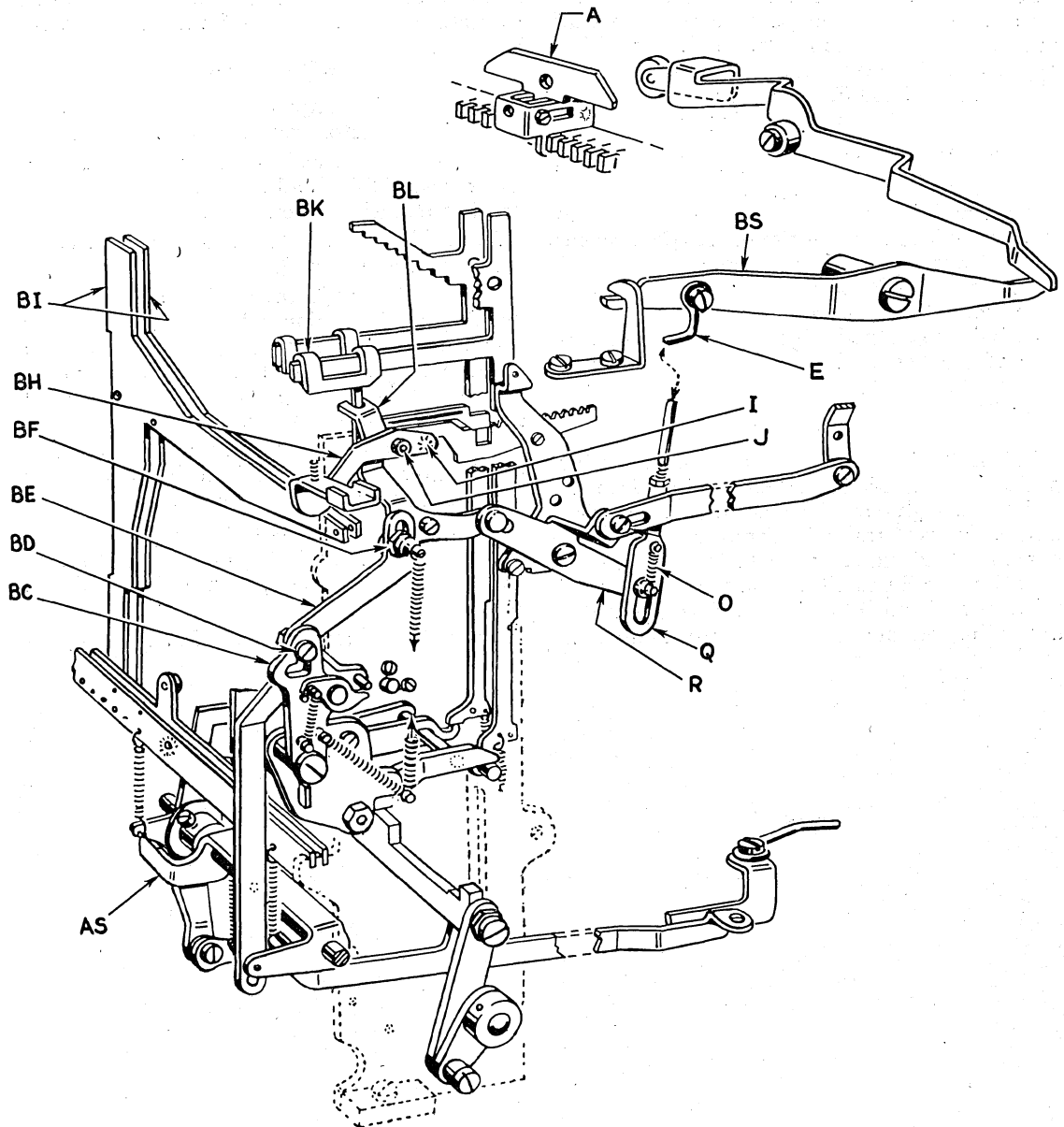
5. With latch V normal (key U normal), the right arm of bail AX should be approximately perpendicular to the machine base.

To adjust, shorten or lengthen wire BA.

6. When the final product key (or the first product key, depending on operational requirements) is depressed, wire BA should hold latch V slightly clear of the spring stud in key U.

To adjust, position collar AZ.

MULTIPLIER FACTOR TO PRINT—EXTENSION OF ONE OR FIVE (ADJUSTABLE) IN SPECIFIED COLUMNS—CARRIAGE CONTROLLED (Plate 22-5)



Multiplier Factor to Print—Extension of One or Five (Adjustable) in Specified Columns—Carriage Controlled (Plate 22-5)

Purpose

To provide for the printing of either all or half of the amount used as the multiplying factor (multiplier) on the posting media.

Printed in U. S. America 12-10-52

Construction

General functioning of the Multiplier Factor to Print Mechanism (Plate 22-2) is not changed.

The Extension of One or Five (Adjustable) Mechanism is included in the Multiplier Factor to Print Mechanism—Improved (Plate 22-3, Accumulation Symbol List) in all

Replaces General Print 609-1/M

For Form 3762

(Plate 22-5) Continued

styles of Class 72 and Series M 200 machines that contain the Multiplier Factor to Print Feature, beginning with Serial No. B135726. The extension of five permits printing half of the amount of the multiplier factor, either by mechanical alterations which are established Field Modifications, or by a pre-determined change in the multiplier factor.

The added feature consists of adjustable limit screw J (in bracket BH) which limits index arm BK for an extension of one (when the screw head is positioned inside bracket BH). Bracket BH also contains stud I which is the limit for index arm BK when an extension of five is required (limit screw J inactive—positioned with screw head on outside of bracket BH).

Operation

When control rail A moves into active position, arm BS is rocked raising wire E, which through lever R and bell crank BL, moves index arm BK forward. Forward movement of index arm BK is then limited over lift arm BI in either the "one" or "five" lift arm position by limit J or I, respectively, depending on the operational requirements.

Normalizing of the extension during a subtract operation is accomplished as explained in Plate 22-2, except that link BE is designed to restore the index arm from either extend position.

Adjustment

The following adjustments are made when a multiplier factor control rail is active:

1. With the "five" extend position active, index arm BK should limit on stud I in bracket BH without expanding spring O.

To adjust, shorten or lengthen wire E through turnbuckle Q.

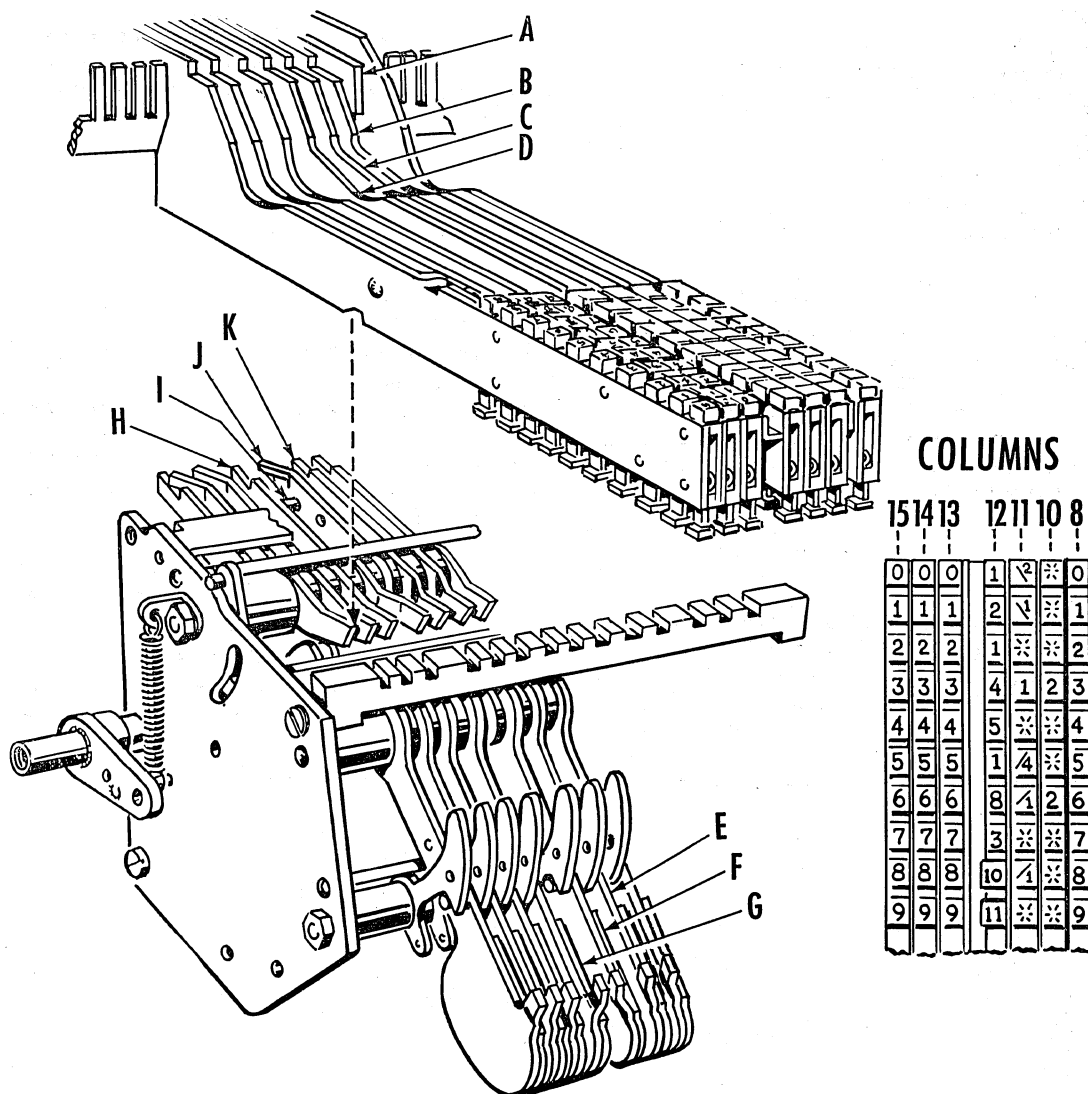
Note: This adjustment is made for the "five" extend position with no regard for the expansion of spring O when the "one" extend position is active. This avoids the necessity of readjusting the length of wire E each time the extend position is altered.

2. Latch arm BC should latch on screw BD in link BE prior to indexing the power when the subtract key is depressed.

To adjust, bend the ear of bail AS.

3. Index arm BK should fully restore to normal, without bind, when link BE is latched down.

To adjust, turn eccentric BF.

MULTIPLIER FACTOR WITH 1/12 FRACTIONS TO PRINT, SERIES M 200 (Plate 22-5A)**Multiplier Factor With 1/12 Fractions To Print, Series M 200 (Plate 22-5A)****Purpose**

To enable the printing of a multiplying factor containing 1/12 fractions when printing the regular product.

Construction

Although the "Multiplier Factor to Print—Extension of One" mechanism is the same as covered in Plate 22-2, three adding racks B, C, and D, in columns 10, 11, and 12 are utilized to print 1/12 fractions. Type for the 1/12 frac-

tions correspond to the decimal equivalents of the multiplying factors.

Example: Multiply by 0 8 3 3

"0" type in column 12 replaced by

1	/	1	2
---	---	---	---

"8" type in column 11 replaced by

"3" type in column 10 replaced by

Adding rack in column 9 non-prints

Factor to print on total operation

1	/	12
---	---	----

(PLATE 22-5A)—CONTINUED

The additional space required for $1/12$ fraction type has been provided by cutting off the forward portion of adding rack A in column 9 and offsetting adding racks B, C, and D, in columns 10, 11, and 12 to the right. This change does not interfere with accumulation in column 9 of the crossfooter as the adding rack is still active except for printing. Also, as there are only ten type positions on each adding rack, one of the fractions ($7/12$) has been omitted.

Because of the offsetting of the adding racks in columns 10, 11, and 12 and the design of hammer driver latches H, J, and K, and hammers E, F, and G, in columns 9, 10, and 12, printing of fractions occurs as follows:

- (a) Hammer E in column 9 drives the type in column 10.
- (b) Hammer F in column 10 drives the type in column 11.
- (c) Hammer G in column 12 drives the type in column 12.

The printing section parts in column 11 not being needed, have been omitted, and hammer driver latches J and H in columns 10 and 12 are coupled by stud I.

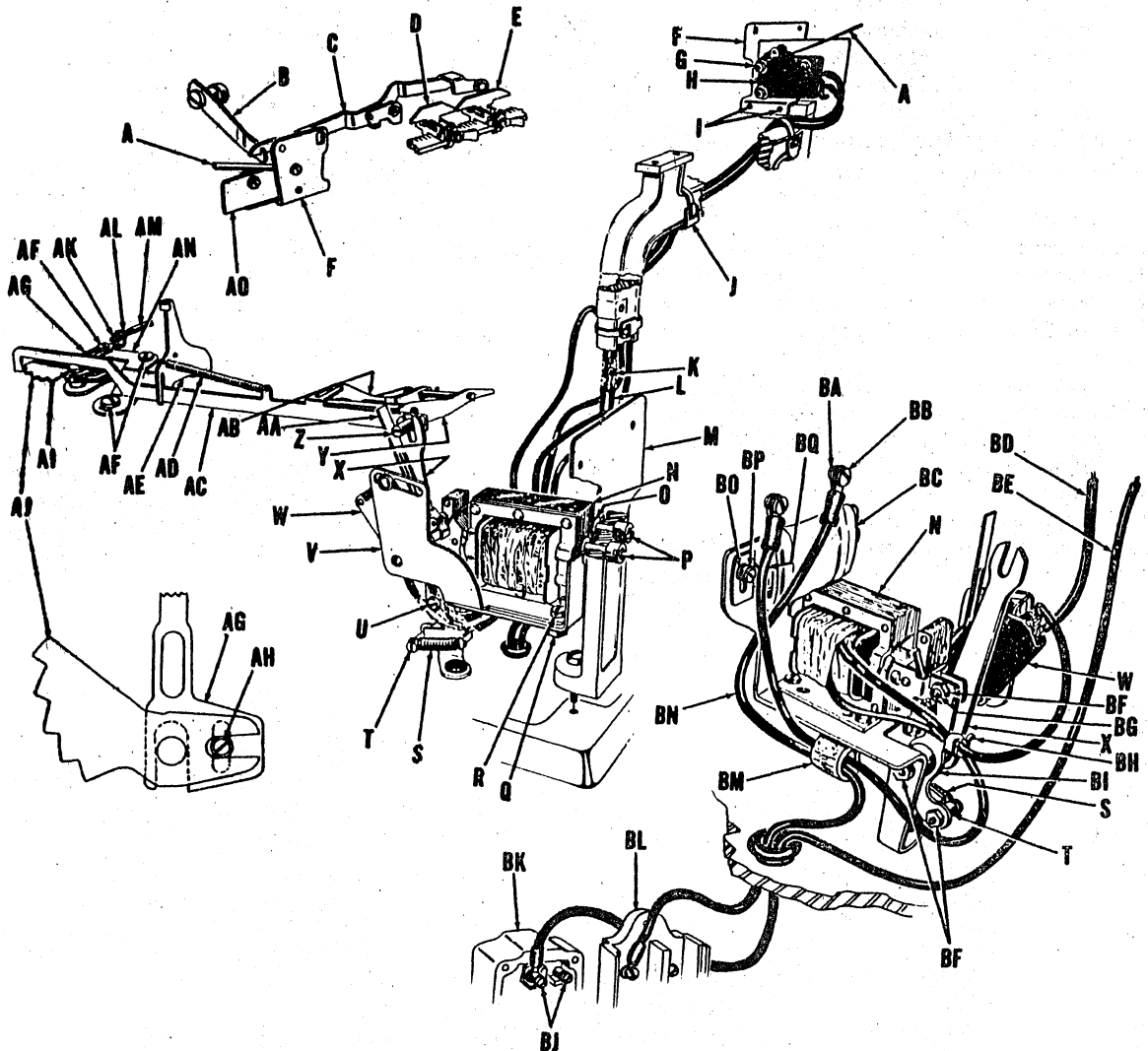
Multiplication Chart for 12th Fractions

Multiply by .0833 point off-prints	$1/12$
Multiply by .1667 point off-prints	$2/12$
Multiply by .25 point off-prints	$1/4$
Multiply by .3333 point off-prints	$4/12$
Multiply by .4167 point off-prints	$5/12$
Multiply by .5 point off-prints	$1/2$
Multiply by .6667 point off-prints	$8/12$
Multiply by .75 point off-prints	$3/4$
Multiply by .8333 point off-prints	$10/12$
Multiply by .9167 point off-prints	$11/12$

Lovejoy

MULTIPLIER FACTOR EXTEND COLUMN SELECTION, CARRIAGE CONTROLLED

Plate 22-5B



PURPOSE

To provide a means of automatically positioning the multiplying factor extend column to permit handling variations in the value of the multiplying factor easier and faster.

CONSTRUCTION

General functioning of the Multiplier Factor to Print Mechanism (Plate 22-2, Accumulation Instruction Book) is not changed.

This mechanism is intended for use

in machines where the application requires frequent changing of the multiplier factor extend column to comply with the change in factor values. As an example, multiplication by a unit price or a price per hundred, or, a unit price or a discount, may be accomplished on the media merely by tabulating to the respective carriage control position.

The extend column may be shifted automatically, through solenoid N, either one, two, or three columns apart depending on the variation in the values used in the factor. However, the choice of columns must be limited to the two most

predominant values since just two columns may be selected automatically. That is, since two carriage control rails, D and E, are used, two extend columns may be selected. The lowest order column is selected manually through setting of the front panel selector and the alternate extend column is selected automatically through a carriage control in a predetermined column.

Switch W, which is normally closed, is included in the circuit with solenoid N to inactivate the solenoid and disable the mechanism when the front panel selector is located in the inactive position.

This mechanism is intended for use on alternating current only and on voltages ranging from 100V to 175V and from 200V to 270V. Resistor BC is wired in Series with solenoid N and is required on voltages ranging from 136V to 175V. When the resistor is not required, wire BQ leading from the solenoid is connected directly to wire BN leading to terminal block BL and covered with sleeve L.

Multiplication should not be attempted during carriage return with the multiplier factor mechanism active, since a portion of the factor would accumulate as rails D, or E rocks lever C.

Two carriage positions must be utilized when setting control rails D and E since they are of varying height and index their own respective factors.

Use of this mechanism will prohibit the use of more than two left side controls of the Register Return, Controlled from Left side Mechanism, (General Release Print 611-1/M.

OPERATION

Selecting of the lowest order extend column is accomplished by manually moving the selector knob on the front panel, as explained in Plate 51, Item IV, Keyboard Instruction Book. As wire AM is moved rearward, through manual movement of the selector knob on the front panel, adjustable slide AG also moves rearward positioning lift arm AB, through bellcrank AN and locating slide AC, to the lowest order extend column. Rearward movement of adjustable slide AG, through wire AM, also swings alternate column limit AJ, through adjustable stud AH, placing one

of the steps of the alternate limit in alignment with the foot of locating slide AC.

When control rail D is moved into active position, levers C and B are rocked to extend a 1 in the factor side of the multiplier - subtractor, as explained in Plate 22-5, Accumulation Instruction Book. During a multiplying operation, the factor will accumulate in the factor column that was manually selected from the front panel.

When higher control rail E is moved into active position, levers C and B are rocked to extend a 1 in the factor side of the multiplier - subtractor the same as from control rail D. In addition, higher rail E actuates switch arm A, through levers C and B, to close switch H which will energize solenoid N when the motor is energized during a multiplying operation. Energizing of solenoid N rocks lever X to the left, through arm BI and spring S. Rocking of lever X moves locating slide AC to the left, through stud Z, where it is limited by the step on alternate limit AJ. Movement of locating slide AC to the left in turn, positions lift arm AB to the selected alternate column.

ADJUSTMENT

1. Solenoid N should be positioned all the way to the left on retaining bracket M.
To adjust, loosen solenoid retaining screws and move solenoid N to the left.
2. Resistor BC, when contained, should clear solenoid N at least $3/32"$.
To adjust, loosen screws BO and position resistor BC.
3. Rocker arm X should clear the screws holding switch W to bracket V by $1/32"$.
To adjust, position switch bracket V.
4. With locating slide AC in its left most position (column 15), there should be .010" to .015" further inward movement in the solenoid plunger.
To adjust, turn eccentric stud T.
5. With column selector on the front panel set in each column position, lift arm AB should have a full hold on the foot of the rack bar limit plate in the corresponding column.
To adjust, shorten or lengthen wire AM.
6. With the column selector set in the

manually selected column, the foot of locating slide AC should limit centrally on the step of alternate column limit AJ.

NOTE: The highest step of limit AJ is the limit for column 10 and the lowest step is the limit for column 14.

To adjust, loosen screw AH and position alternate column limit AJ.

7. With the column selector in the inactive position, stud Z should depress switch arm AA just sufficiently to open the circuit; and when the column selector is in the first active position,

stud Z should permit the circuit to close.

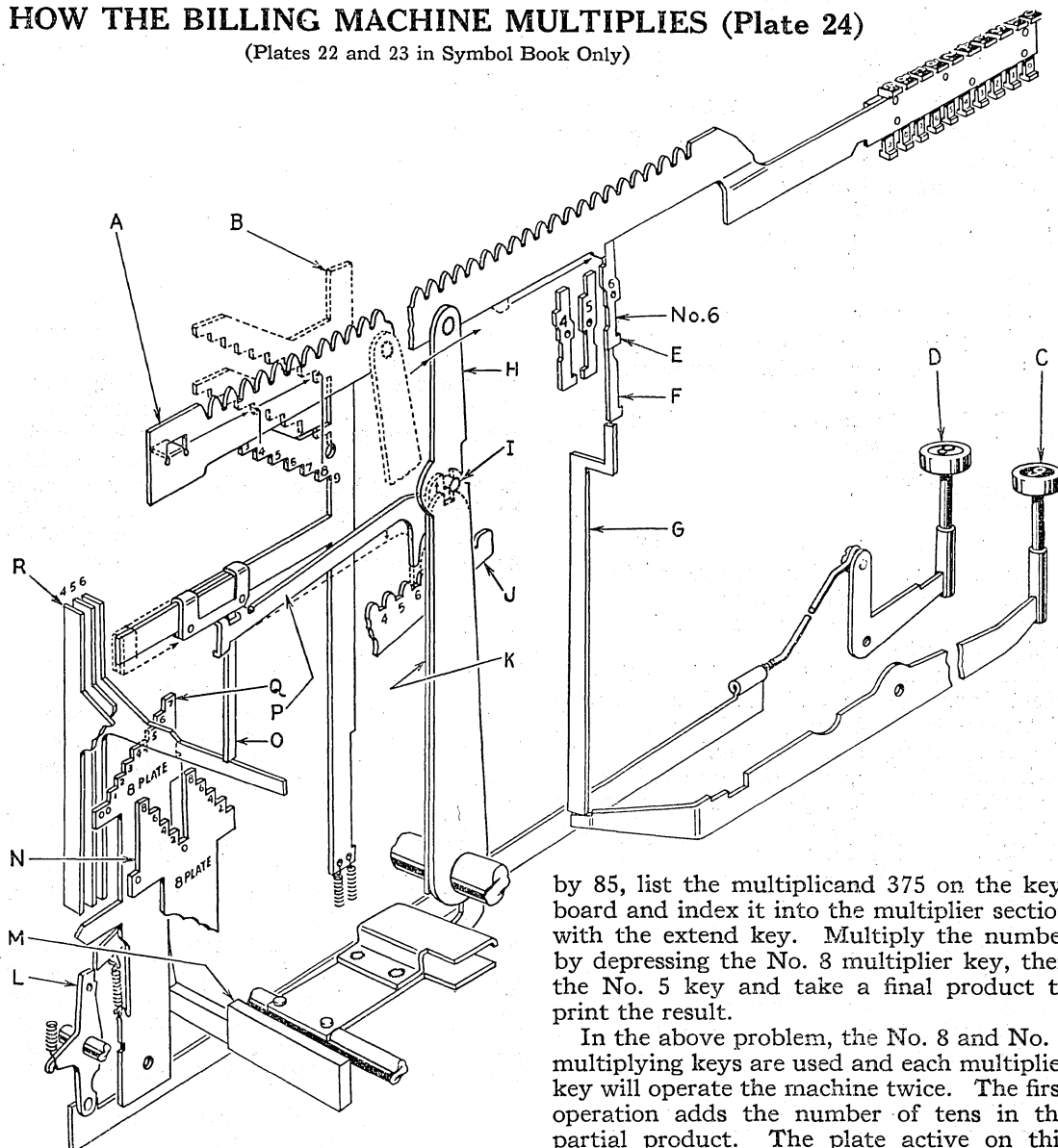
To adjust, position switch W on bracket V.

8. With multiplier factor control arm C on high rail E switch arm A should be depressed sufficiently to close the circuit with slight lead movement; and when the control arm is on low control rail D, the circuit should remain open. To adjust, position switch H on retaining bracket F.

NOTE: Carriage control switch H opens the circuit when switch arm A is normal.

HOW THE BILLING MACHINE MULTIPLIES (Plate 24)

(Plates 22 and 23 in Symbol Book Only)



Multiplication (Plate 24)

The purpose of the multiplier section is to index rack bars and step over the adding pinions to increase the value in order to add the amount in the correct column. The actual adding and carrying operations are performed by the crossfooter and carry sections.

The machine and regular multiplying methods are similar since both are founded on a multiplying table.

Multiplier keys two to nine require two machine operations to complete the multiplication because the table involves figures greater than nine. The cipher and one keys make only a single operation because only unit figures enter into the multiplying table.

To multiply a number, as 375 multiplied

by 85, list the multiplicand 375 on the keyboard and index it into the multiplier section with the extend key. Multiply the number by depressing the No. 8 multiplier key, then the No. 5 key and take a final product to print the result.

In the above problem, the No. 8 and No. 5 multiplying keys are used and each multiplier key will operate the machine twice. The first operation adds the number of tens in the partial product. The plate active on this operation is called the tens plate. The second operation adds the units in the partial product and the plate which operates is called the unit plate. The same operation is repeated with the No. 5 multiplier key.

To find the value of the multiplication above, multiply each digit in the multiplicand by 8, as 8×3 equals 24, containing two tens and four units. Place the tens figure down first, stepped over one space to the left, and the units underneath. 8×7 equals 56, containing five tens and six units. Place the five to the right of the figure 2 and the six to the right of the figure 4. 8×5 equals 40, or four tens and no units. Place the four to the right of the figure five and the cipher to the right of the figure six. This completes the multiplication of the No. 8 multiplier key. The

(Plate 24) Continued

tens partial product is 254, and the units partial product is 460.

The same procedure is followed in the multiplication by 5. The tens partial product 132 is placed under the 460, after which the amount is stepped over one place to the left and the unit partial product of 555 added. The partial product layout of the problem would appear as follows:

375	Multiplicand
85	Multiplier
254	First stroke No. 8 key partial product
460	Second stroke No. 8 key partial product
132	First stroke No. 5 key partial product
555	Second stroke No. 5 key partial product
31875	Final product

Multiplier Section Indexing

The multiplier section consists of twenty indexing plates. These plates have steps which index the rack bars to the multiplication tables of number 1 through 9.

The extension of the multiplication is selected through the red keys. The multiplier plates are selected through the black keys. The number (6) to be multiplied is set up with the red keys, and the extend key depressed, which raises parts K, meshing the top slot with stud I in rack bar actuating arm H, thus coupling index assembly O to the rack bars. When the motor bar is depressed the intermediate keyboard, through stops F, raises rack bar stops E to permit the rack bar to limit on stop.

The forward movement of the rack bar carries the index arm O six points, placing it over the No. 6 lift arm R. Near the end of the forward stroke, the extend key is released, allowing part K to drop arm P into the No. 6 tooth of rack J. When the number 8 multiplier key is depressed, rocker arm L releases the pawl of the tens plate over the raise bail M which moves upward and, through lift arms R and assembly O, raises the index arm B to limit the rack bar to add 4. The spear point of the tens plate trips the unit plate, the latter moves upward on the next machine operation to step over the adding pinions one column to the left on the forward stroke and add 8 on the return stroke.

To print the result, the final product key and the motor bar are depressed.

**Multiplying Keys (Easier Depression) and
Typewriter Key Lock Mechanisms
Indexed from Machine
Operation (Plate 25)**

When the multiplying key is depressed, the twin cams are shifted to the crossfooter add

position. Toggle plate AI and its shaft are rocked to index the vertical slot of link K over the shoulder of screw L through slide AM which is connected to the multiplying key by a wire. As multiplier raise bail shaft AK starts its upward movement, screw AC contacts passby pawl on rocker arm W, moving link K forward, and the front arm of bell-crank I shifts the twin cams to the cross-footer position. Rocker arm W is held in the forward position by latch S to retain the twin cams in the crossfooter add position.

The writer keys are blocked against depression during the multiplying operation to prevent the writer type bar being lodged into the rack bar type and resultant damage to parts. Multiplier raise bail shaft AK carries cam AN, which contacts on drive pawl AV, swinging key lock comb B under the writer key lever through hub assembly C, slides E, and AR. The forward movement of slide AR disables the intermediate keyboard.

When the motor bar is depressed, link AJ, contacting on slide E, swings the hub assembly C to block the writer keys during the machine operation. Slide AR remains inactive during the motor bar operation to permit normal intermediate keyboard operation. Drive pawl AV is disabled by the forward movement of link AJ which swings the drive pawl upward to clear the stud in slide AR.

Interlock plate AF blocks the multiplier key after it is restored to normal until the second stroke has started and the toggle plate AI is restored by the unit multiplier plate. Interlock AF falls in front of the vertical projections of slide AM to block the multiplier keys, as the writer keylock slide AR moves forward. The interlock is wire connected to slide AZ to hold it inactive in the normal position and to obtain its motion for dropping in front of the vertical projections of slide AM.

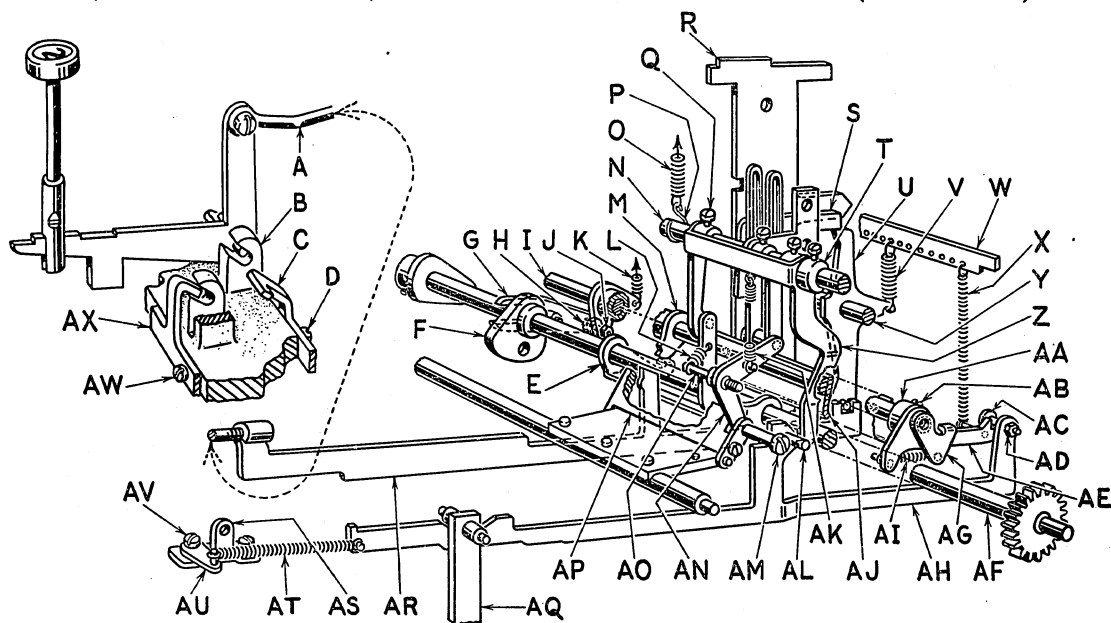
Tests and Adjustments

Passby pawl AG should have minimum clearance with the screw head AC to obtain maximum movement from rocker arm W. The adjustment is made by bending the limit ear of the rocker arm.

The eccentric in link K is adjusted to secure sufficient movement to shift the twin cam assembly to the crossfooter add position. The cams should not limit tightly against the leather cushion overthrow washer Q, but they must clear the end of the guide shaft in the side frame.

The shoulder of screw L should align with the vertical part of the slot in link K to insure free movement when the toggle shaft AE lowers the link. To adjust, the upper limit arm of bell-crank I is bent at the contact point with square post H.

MULTIPLYING FUNCTION AND CLUTCH ENGAGEMENT INDEXED (NOT ACTUATED) FROM MULTIPLIER KEYS (Plate 25-1)



Purpose

This mechanism insures positive indexing of the pawl on the multiplier plate over the raise bail, prior to the tripping of the drive clutch to start the motor. The drive clutch is not directly tripped by the multiplier key depression, instead, a latch is tripped which releases a spring-driven power slide. The key action is light since the key depression only indexes the mechanism.

Operation

When a multiplier key is depressed, slide AR, being pulled forward by wire A, indexes the multiplier by rocking the vertical indexing rocker arm U from under the first cycle plate flipper pawl S. Simultaneously, slide AR rocks toggle AP forward. After indexing the multiplier and rocking the toggle past center, slide AR contacts plate AJ and rocks shaft I. Arm AG, located on the end of shaft I, is rocked downward, and, by contacting detent AE, releases power slide AH, which is pulled forward by spring AT to raise drive link AQ and to trip the motor.

ON THE FORWARD stroke of the first machine operation, as raise bail shaft AF is turned, cam F, through the stud in pawl G, rocks shaft I and restores the multiplier key slide through plate AJ.

Detent M, which is assembled to shaft I, is rocked rearward, permitting bail E, through spring L, to position its lip in front of detent M, holding plate AJ against the multiplier key slides and blocking the multiplier keys against further depression during the operation.

AS THE TOGGLE rocks rearward over center on the forward stroke of the second machine operation, screw AM contacts the vertical projection of power slide AH and restores the slide rearward where it is re-latched by detent AE.

As the power slide is restored, stud AL rocks bail Z rearward, and the inside arm of bail Z contacts the stud in bail E, rocking bail E rearward and dropping its lip below the normal position of detent M which is being held rearward by cam F on the raise bail shaft.

ON THE RETURN stroke of the last machine operation, as cam F rocks forward, detent M is permitted to move over the lip of bail E, thus rocking plate AJ away from the multiplier key slides and allowing subsequent depression of the multiplier keys.

Note: Lock brackets C and AX are being used to hold the multiplier key bell-cranks in the slots of keyboard casting B, to retain a positive keyboard lock.

Adjustments

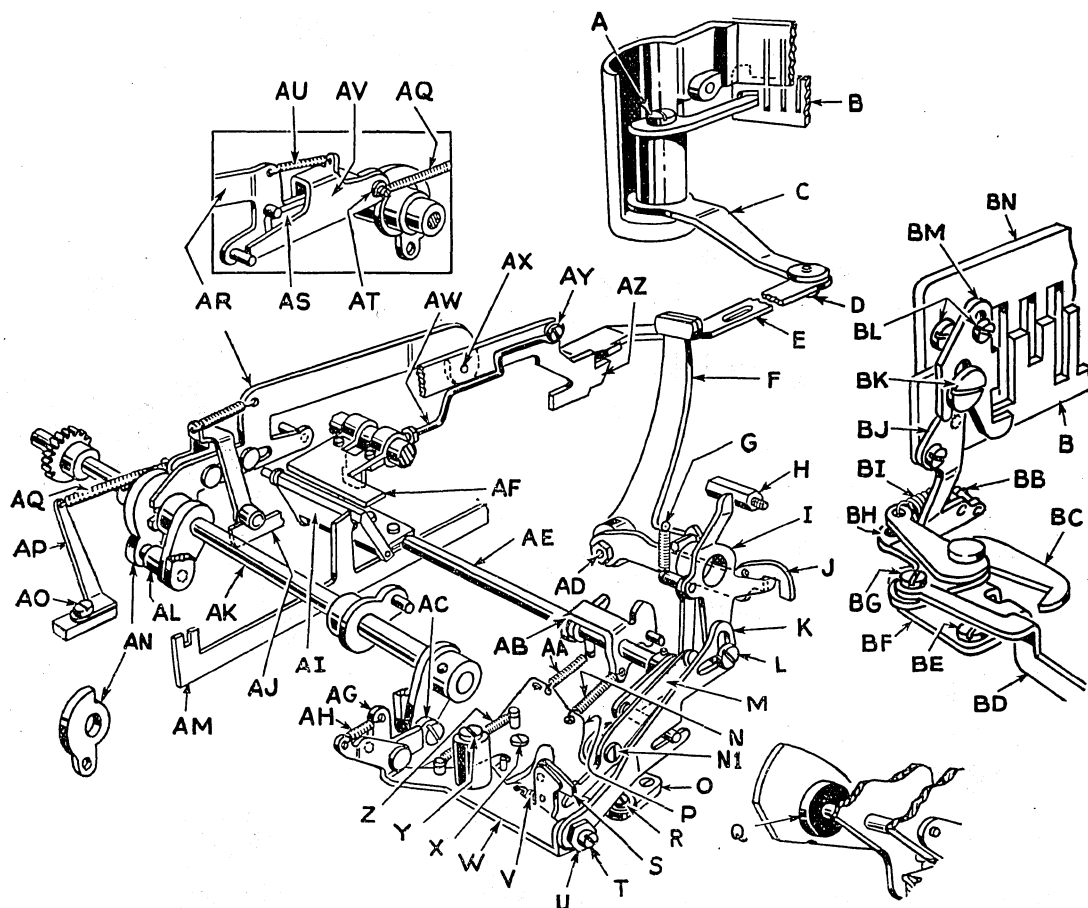
1. When the multiplier raise bail is in the upper position, there should be minimum clearance between plate AJ and slide AR.

To adjust, turn eccentric H.

2. Spring K must be of sufficient tension to balance spring AI so that the sudden contact of arm AG on detent AE, when plate AJ restores to normal, does not release the power slide and cause a continuous machine operation and a repeat of nines.

Spring X has been added to further insure that detent pawl AE will retain its latching hold.

MULTIPLYING KEYS (EASIER DEPRESSION) AND TYPEWRITER KEY LOCK MECHANISMS INDEXED FROM MACHINE OPERATION (Plate 25)



(Plate 25) Continued

Pawl S should latch on the step of link M with slight lead, which is secured by bending the vertical projection of rocker arm W. Latching rocker arm W forward retains the twin cams in the crossfooter add position to eliminate shifting the cams on the second multiplying stroke. Pawl S has a spring joint V to permit the pawl yielding as the latching operation takes place.

Base plate P has an adjustable limit screw, the head of which rests tightly against the machine base to prevent the base plate weaving during the twin cam shifting operation. Keep in mind that a solidly positioned base plate insures maximum shifting motion.

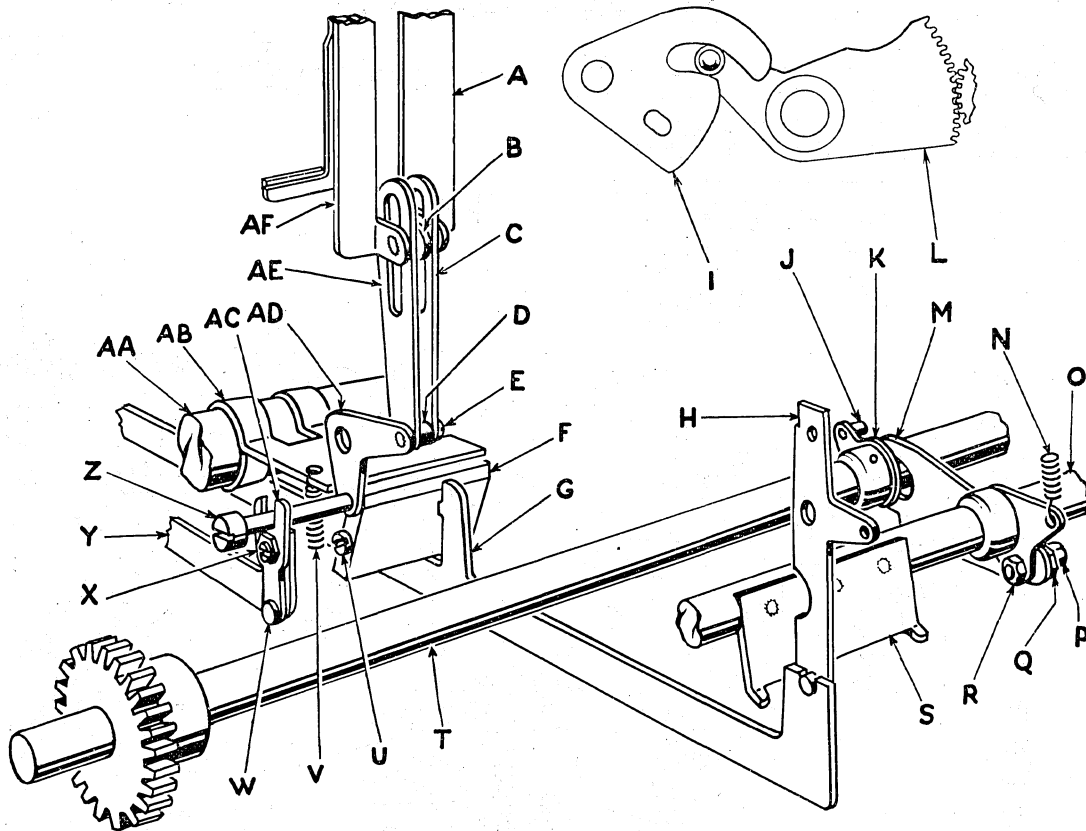
With the motor bar held fully depressed, the writer key lever locking comb B should have minimum play in its slots. The adjustment is made by bending the upper arm of hub assembly C. This is done to obtain full

movement of the locking comb and insure a key lever block from the latched position of the motor bar.

Eccentric AX is adjusted to block the key lever from the high point of cam AN during the multiplying operation. Because of the speedy operation of the multiplier raise bail shaft AK, there is a tendency to overthrow the key lever locking comb. Overthrow reacts against safe latching of the mechanism, therefore, use only sufficient movement to obtain a good key lever lock.

Interlock plate AF, in the normal position, is held inactive and it should have a slight clearance on the toggle plate AI. The adjustment is made from the turnbuckle on wire AW. This clearance is necessary to permit the toggle plate moving forward without the interlock falling in front of slide AM if the multiplier key is partially depressed and then allowed to restore to normal.

MULTIPLYING AND SUBTRACT KEY CONTROL LOCKS (Plate 26)



Multiplying and Subtract Key Control Locks (Plate 26)

When a multiplying key is depressed, slide G rocks toggle plate F which drives slide Y forward to trip the drive clutch. The upward movement of the tens multiplier plate allows rocker arm H and slide G to be restored to normal by the spring on the rocker arm. If the multiplier key is held depressed, it is forcibly restored by raise bail shaft T swinging the pin in hub assembly K against pawl M, which, in turn, rocks shaft O, its plate S driving slide G rearward to restore the key.

As the multiplier key is restored, interlock plate AB drops in front of the projection on slide G to block the multiplier key between the first and second plate operation and until the writer key lock is restored.

The upward movement of the unit multiplier plate carries up link A which restores toggle plate F and the slide for tripping the drive clutch Y through bell-crank AD and screw Z. Vertical link AF restores the same parts on the full cent key operation.

Cam I of the main camshaft is the means of transferring the motion to segment gear L

which is meshed with the gear on raise bail shaft T for rotating this shaft. During the multiplying strokes, plate S is held against slide G while roller in segment gear L is on the dwell of cam I, and at this time it also is blocking the multiplier key depression. During the time that the unit multiplier plate is in the upper position to restore the toggle plate, this plate prevents the depression of the multiplier key.

Tests and Adjustments

Interlock plate AB should have about .050" clearance with the nose of the projection on slide G. The adjustment is made by removing stock from the edge of the interlock plate. This is necessary to insure that the interlock plate has sufficient clearance to drop in front of the projection on slide G if the multiplying key is held depressed, causing the parts to spring or bow. If the clearance is taken up due to springing the parts, a multiplying key could be depressed after the tens plate stroke; thus two multiplier plates would raise at the same time resulting in a lock on the double stroke bail. Disregard the lock up on the double stroke bail, the important

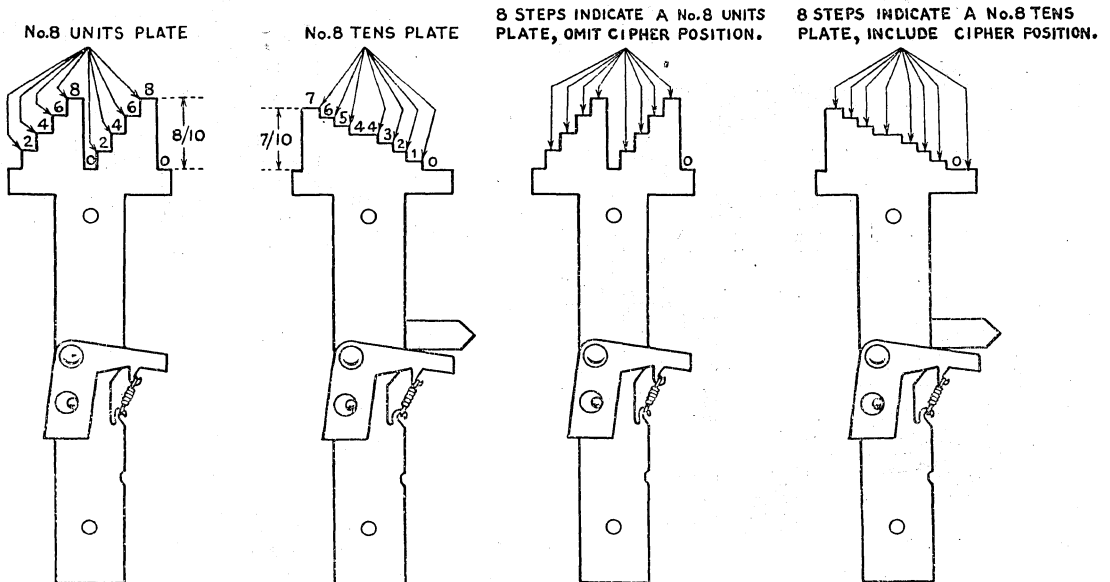
(Plate 26) Continued

point to know is that the machine will not multiply correctly if any two plates operate at the same time.

When the multiplier raise bail shaft T is in the upper position, there should be minimum clearance between slide G and plate S. The adjustment is made from eccentric Q.

This insures the complete restoring of the multiplying key and maintains the essential clearance for the interlock plate AB.

The drive clutch should trip as late as possible on the depression of the multiplying key to safely trip the multiplier plate prior to the machine operation. This adjustment is made from eccentric X.

MULTIPLYING PLATES (Plate 27)**Multiplying Plates (Plate 27)**

The multiplying plate head and its steps are determined from the multiplying tables from one to nine inclusive. The heights of the steps are graduated in tenths of an inch and the base of the plate is the cipher position. The tens plate has a spear point on the rearward side to trip the unit plate and it can be used to distinguish the difference between the tens and units plates of any table.

In the following, the number eight multiplying table is used to demonstrate the principle:

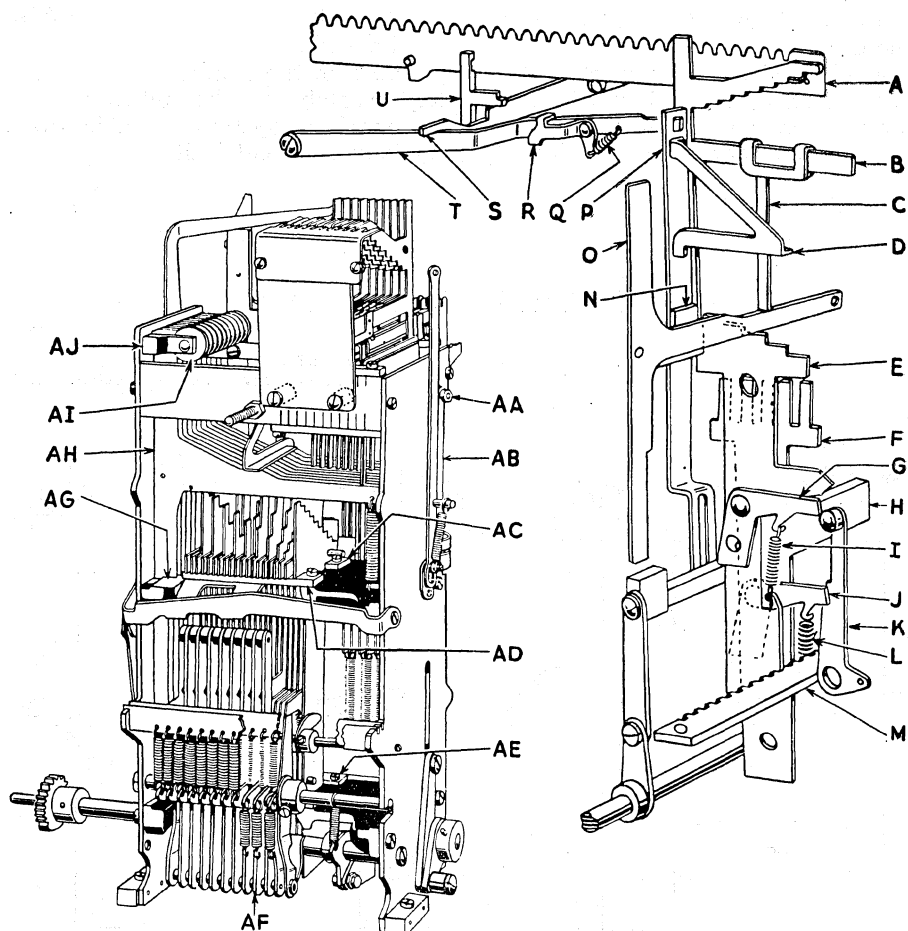
1 x 8 equals	08
2 x 8 equals	16
3 x 8 equals	24
4 x 8 equals	32
5 x 8 equals	40
6 x 8 equals	48
7 x 8 equals	56
8 x 8 equals	64
9 x 8 equals	72

The number eight multiplier tens plate must have a step for each figure in the tens column, and the figures in the table indicate the number of steps on the head of the plate. The highest denomination in the eight table is 9×8 equals 72, thus the highest step on the tens plate must be seven-tenths of an inch high. The table shows two 4's in the tens column following each other, hence, the number four step is twice as wide as the other steps.

In a like manner the figures in the unit column indicate the height and number of steps on the unit plate. The first multiplication 1×8 equals 8, the first rear step must be eight-tenths high as determined by the table.

To identify the multiplying plates by counting the steps, the rule for the tens plate is to count all steps facing rearward including the cipher, this plate would have eight steps, indicating it is the number eight tens plate. For the unit plate, the rule is to count all steps facing forward omitting the cipher, this plate would have eight steps indicating it is the number eight units plate.

MULTIPLYING PLATES (TENS) AND CONTROLS (Plate 28)



Multiplier Section Construction (Plate 28)

Lift arms O extend over all multiplier plates and are spaced to align with the steps on each plate. The up and down movement of the lift arms is guided by slots in the multiplier section side plate AB, slots in the casting AG near the center and slotted guide roller AI at the top. The construction is such as to allow just sufficient clearance for the parts to drop free of their own weight. Bearing brackets AJ must be located squarely to permit the roller to rotate.

Index limit plates B carry index arms C which are located just above the lift arms. Each index arm has a flat friction spring to control the sliding motion, the tension of which should be just sufficient to hold them snug without interfering with the forward movement of the rack bar extending movement or the restoring action of the index arms.

Index limit plates B have nine consecutive

steps to limit the rack bars during multiplication in order to add the partial products. The highest step is cipher and the vertical stem of the index limit plate is the nine position. The cipher limit is the smallest step because the rack bar limit lug must pass over it during subtraction.

The index limit plates fit in guide slots on the back plate. They should have minimum play which is adjusted from the eccentric shaft AA. Be sure that the springs controlling these parts are in first class condition to prevent them overthrowing as the multiplier plate moves them upward.

Multiplier plates are supported within four brackets, three of which are slotted to guide the plates. The two bottom brackets AE and the top rearward bracket AD have slots. Since the multiplier plates do not have springs, they must be free to drop.

The notch on the lower rearward edge of the multiplier plates acts as a detent to lessen

(Plate 28) Continued

the tendency of the inactive plates to bounce during the multiplying operation, due to the plates not being spring controlled. The plates are forcibly restored by the screw in the center of raise bail H contacting the bottom of the slot in link P.

Each multiplier plate has a trip lever AF or K. These levers have space washers between them and are held together by a jam collar on each side of the assembly. The levers are aligned sideways with the trip pawls on the plates by moving the jam collars. The levers should have minimum side play to insure resetting of the trip pawl as each multiplying plate completes its operation.

The front step of the multiplier plates, corresponding to the cipher position, is longer on the unit plate than it is on the tens plate. This is because the tens plate raises only AE while unit plate raises AE and AF. Plate 29.

Tens plate E is released by the depression of the multiplying key; the upward movement of tens plate releases the unit plate through the spear point swinging trip lever K. When the tens plate moves upward, its front lower step raises vertical link P. The other steps raise lift arms O which through index arms C raise index limit plates B to index the rack bars to the partial product.

Fraction cipher stop U must be raised to release the fraction rack bar on all multiplying operations. It is raised by the upward movement of the vertical link P swinging horizontal arm T which moves fraction control arm S upward. Fastened to vertical link P is bracket D, which insures that lift arms O are restored to normal.

Tests and Adjustments

There should be approximately .020" clearance between the cipher step on the index limit arm and the rack bar lug in the normal position to permit raising the index limit arm. This clearance should be present if the index limit arm has been adjusted with minimum play from eccentric AA and if the rack bar is completely restored.

The top of the multiplier section is supported by a square bar extending between the machine side frame. This bar has an adjusting screw to hold index limit arms B with minimum clearance on the rear guide comb for the rack bars.

Index limit arm should be parallel with the rack bar to insure full hold on the rack bar lug. The adjustment is made by swinging the index limit arm with a bender placed on the vertical stem.

A guide comb for the index limit arms is fastened to the bottom edge of the rear guide comb for the rack bars. This guide comb should not interfere with the free movement of the index limit arms, but it should help stabilize them.

The distance the index limit arm is raised by the main camshaft, is fixed for about central contact of the rack bar lug, this is very important since the partial product is added from this limit.

In analyzing an incorrect multiplication, always lay out the partial products of the problem to determine where the rack bars should limit and then be sure to check the various contact points between the parts to see that these limits are maintained.

MULTIPLYING PLATES (UNITS) AND ADDING WHEEL SPACING MECHANISMS (Plate 29)

Multiplying Plates (Units) and Adding Wheel Spacing Mechanisms (Plate 29)

Unit multiplier plate S which is released by the spear point of the tens plate, is carried upward by raise bail AC during the forward stroke of the second operation. The lower front step of the unit plate being longer than the corresponding step of the tens plate, raises both vertical links AE and AF. All other steps raise lift arms Q to raise index limit plate M for indexing the rack bars to the partial product.

The unit multiplier plates step over the crossfooter adding pinions one space to the left through vertical link AF. The vertical link carries angle step-over cam AH which is controlled by spring AG to hold it vertical in the normal position and to pass by after the step-over operation.

On the upward stroke of the vertical link AF, the angle surface of the step-over cam contacts pawl AI, swinging its auxiliary feed pawl AK, which is meshed in rack B, one space to the left. At the end of the upward stroke of the vertical link, the step-over cam clears pawl AI which returns to normal to permit the passby effect from spring AG on the downward stroke.

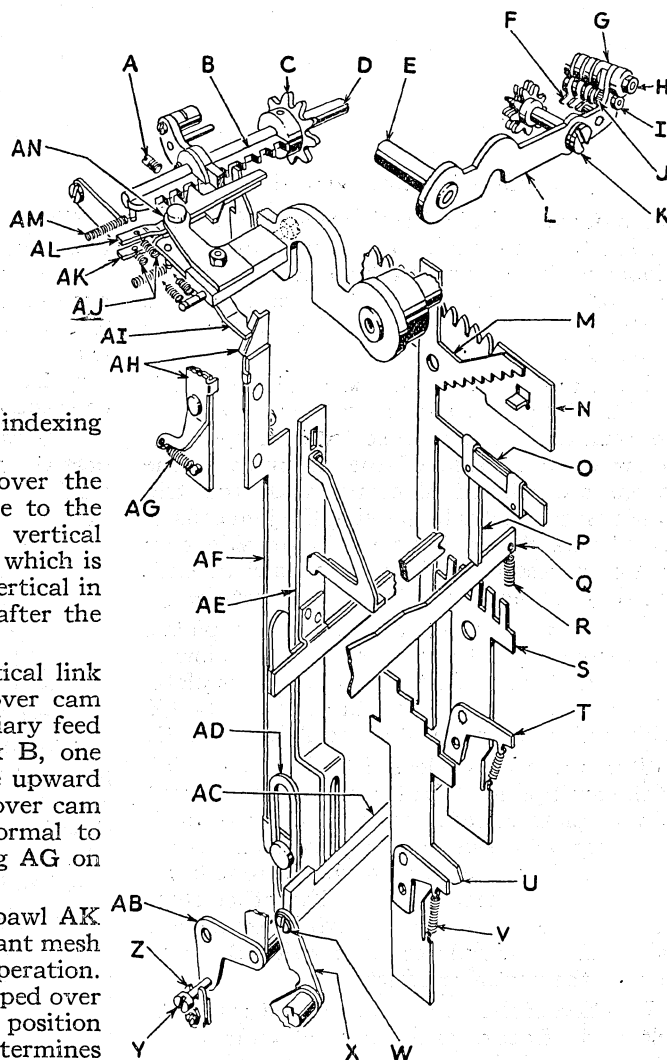
The step-over assembly has feed pawl AK and limit pawl AL which are in constant mesh with rack B during the multiplying operation. As the crossfooter pinion shaft is stepped over by the feed pawl, it is retained in this position by the limit pawl. The limit pawl determines the relative position of the adding pinions and the rack bars from seven stepped over positions on rack B.

Each unit multiplier plate restores the toggle plate to stop the machine operation. Vertical link AF and slotted link AD rock bell-crank AB which draws slide Z rearward through screw Y.

Tests and Adjustments

Limit pawl AL should contact on the tooth of rack B when screw K in the adding pinion shaft is against crossfooter section plate L. This is to insure that the adding pinions have the same relative position with the rack bars in the normal and stepped over positions. To adjust, bend the arm supporting the limit pawl.

Feed pawl AK is located about in the center



of the tooth space of rack B to obtain the step-over and the step-back from the point off key. This position is usually fixed, but to alter it, the contact point of pawl AI on the pivot block is peened or filed off.

Be sure the tension spring AM is sufficient to check the tendency of the pinion shaft to overthrow in the rapid step-over operation. This spring also restores the pinion shaft to normal on the point off and either product key operation.

The pinion shaft should have about .010" lead on pawl AL to insure the step-over operation. The adjustment is made by bending vertical link AF to increase the movement from step-over cam AH. Have the vertical link in the normal position in the bending operation to prevent binding the link.

SUB-PRODUCT DEDUCTION MECHANISM (Plate 30)

Sub-product Deduction Mechanism (Plate 30)

Usually a subtraction is made with the crossfooter pinion shaft in the normal position, which permits a complete cancellation of the nines to take place since an adding pinion is not located beyond the last rack bar.

This mechanism will prevent a carry of the eleventh carry rack B during the subtract operation, and thereby prevent an accumulation of a "1" in the first adding pinion which may be stepped over beyond the last rack bar due to a previous multiplying operation.

Pawl A which blocks carry rack B, is inactive and latched rearward at all times except on the subtract operation. On the upward movement of the subtract plate, spring AC swings rocker arm AB to release hook pawl K, (which is connected to bell-crank AF) allowing vertical link H to move upward through spring AJ, and pawl A to limit against the tail of the carry rack. When the carry rack is reset, pawl A moves forward under the carry rack to block it from moving forward in the carry operation.

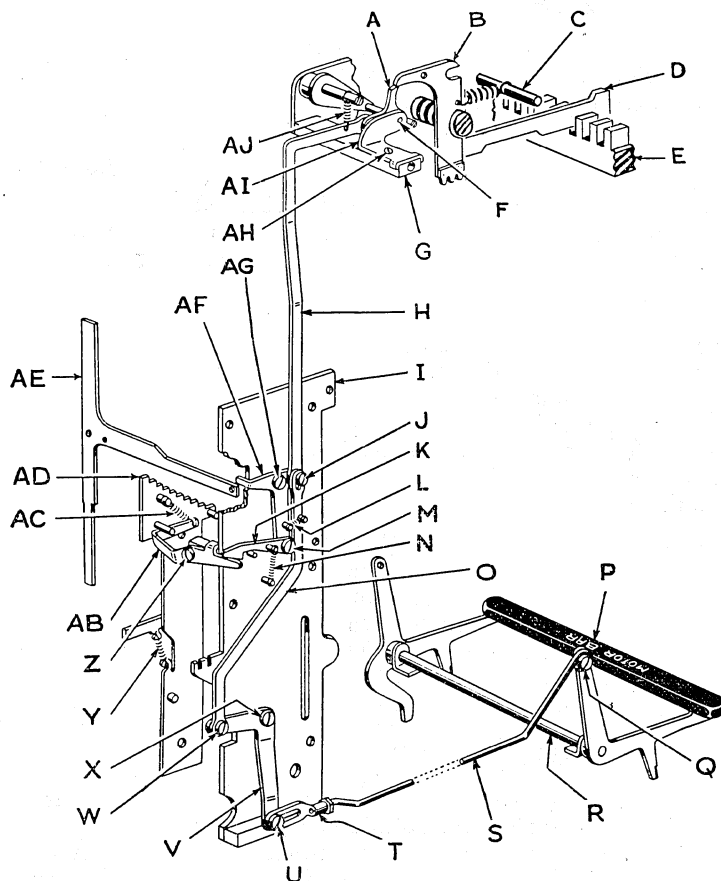
Pawl A is latched rearward in the inactive position on both the motor bar and multiplying operations to permit the full carry capacity of the crossfooter to be effective.

When the motor bar is depressed, bell-crank V is rocked by wire S, which lowers links O and H to swing pawl A from under the carry rack; hook pawl K is latched over the rocker arm AB as link O is drawn downward.

On the multiplying operation, lift arm AE contacts the formed ear of bell-crank AF producing the same results as when the motor bar is depressed.

Tests and Adjustments

Hook pawl K should latch over rocker arm AB at the same time as or just prior to the trip of the drive clutch. The adjustment is



made from turnbuckle T. After adjustment is made, the formed ear of bell-crank AF should not bind against the top of the slot in the multiplier section side plate.

When pawl A is blocking the carry rack, it should have minimum clearance on the carry rack reset shaft. The adjustment is made from the formed ear of bell-crank AF which is resting on top of the lift arm AE. After making this adjustment, hook pawl K should have ample clearance to latch over rocker arm AB with a multiplier plate in the upper position.

With the carry rack B resting on top of pawl A, the step of carry link D should have minimum clearance on comb E. The adjustment is made by altering the height of pawl A. Since the step-over operation during multiplication takes place prior to pawl A disengaging, the eleventh carry rack tooth must be in reasonable alignment with the other carry racks.

Constant Factor, Automatic Point Off, and Automatic Full Cent Key Mechanism (Plate 31)

The constant factor multiplying mechanism is special to each factor involved, and it eliminates the regular multiplying keyboard. Depressing the factor key releases the first factor plate and thereafter, the machine operates once for each plate in the factor. The full cent plate controls the point off operation and the restoring of the toggle to stop the machine operation, and this plate is tripped from the last factor plate.

Multiplier plates are grouped for each factor and the factor multiplying table determines the number of steps on the head of the plate. The table also determines the number of plates in a factor, as a plate is required for each column of figures. In the following, the constant factor .625 is used to demonstrate the procedure:

Multiplication Table of Constant Factor .625

625 x 1 equals	0625
625 x 2 equals	1250
625 x 3 equals	1875
625 x 4 equals	2500
625 x 5 equals	3125
625 x 6 equals	3750
625 x 7 equals	4375
625 x 8 equals	5000
625 x 9 equals	5625

The first factor plate would have a step for each figure in the thousands column, the height of the steps is graduated in tenths. In a like manner, the second, third, and fourth plates would cover the figures in their respective columns.

To lay out the partial products for a problem as 7525 multiplied by factor .625, select from the table (see .625 table) the result of 625 x 7, 625 x 5, 625 x 2, and 625 x 5, the results of these multiplications are grouped under each other in the order given. Each column of figures represents a partial product, reading down from the top. To increase the value, the partial product is stepped over to the left one space. Indexing of the amount in the multiplier section is the same as in the regular multiplying mechanism.

7525	multiplicand
.625	multiplier
625 x 7 equals	4375
625 x 5 equals	3125
625 x 2 equals	1250
625 x 5 equals	3125

Example: Problem as added in machine.

7525	multiplicand
.625	multiplier

- 4313 first plate partial product stepped over one place
- 3121 second plate partial product stepped over one place
- 7252 third plate partial product stepped over one place
- 5505 fourth plate partial product stepped over one place
- 47.03125 product after pointing off three places

The most commonly used point off mechanism is that which steps back the crossfooter adding pinion shaft the full distance similar to the manual decimal discount key operation.

To point off a specified number of places after multiplication, the regular step-over feed pawls are disengaged from the rack on the adding pinion shaft and a vertical link with a lip AN engages a front rack on the adding pinion shaft to control the number of places to be pointed off.

Limit plate A has a slot which corresponds to the number of places to be pointed off and it has two openings to permit the passage of a stud in vertical link AN on its upward and restoring movement. The stud in the full cent plate P contacts bail O which swings bell-crank V upward, rocking bell-crank AI. Bell-crank AI, through BD and BB, raises vertical link AN, the lip of which moves into the front rack of the adding pinion shaft. The continued upward movement of the vertical link swings feed pawls BA and AQ clear of the rear rack on the adding pinion shaft, allowing spring AP to pull the adding pinion shaft until vertical link AN limits in the slot of plate A.

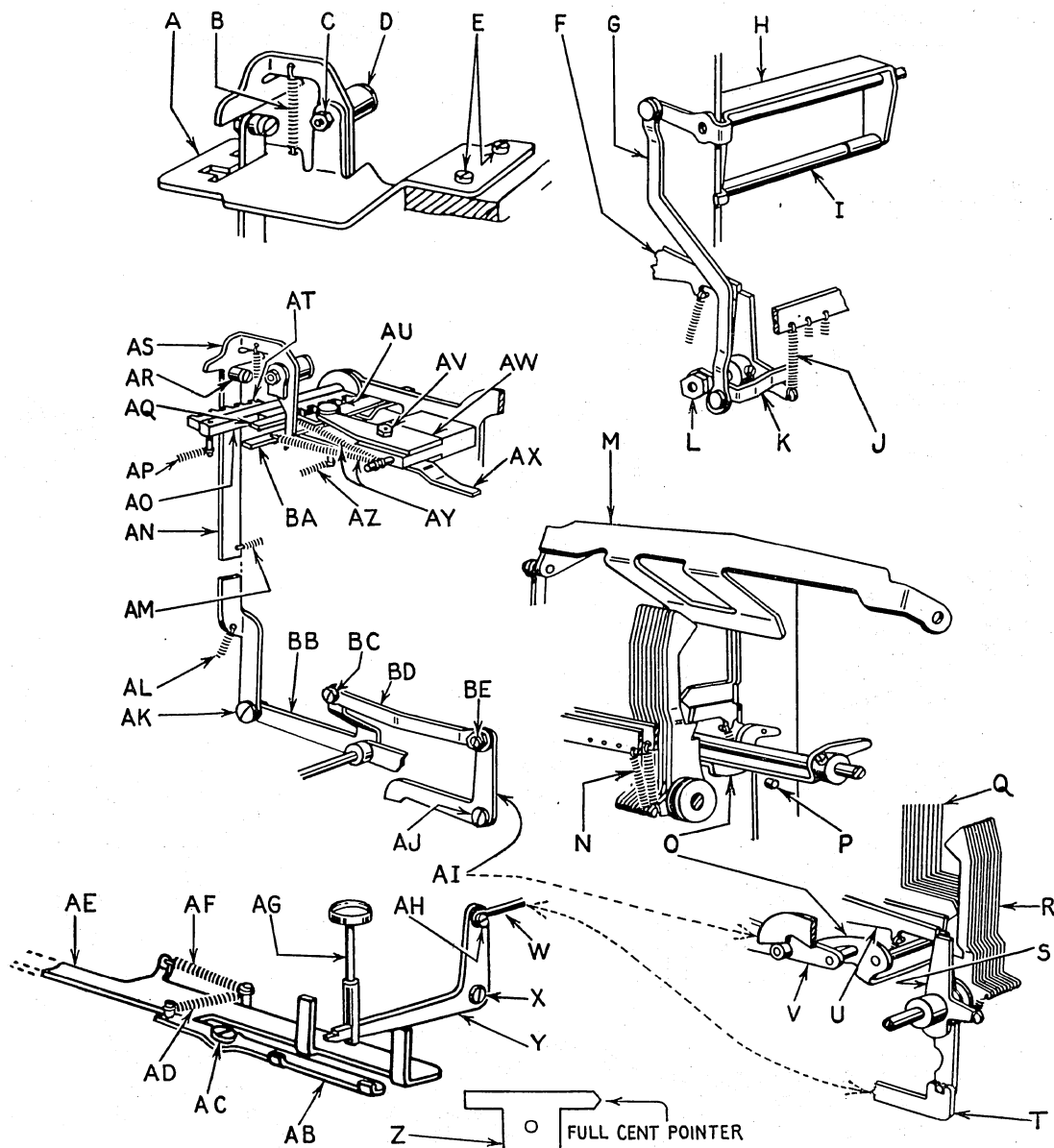
The downward movement of the vertical link AN permits the feed pawls to again limit the adding pinion shaft.

Interlock AE prevents a second depression of the factor multiplier key until the final product key depression. Keystem bell-crank Y contacts pawl AB, releasing interlock AE, and through spring AF it is drawn to the right, placing the interlock projection under the keystem bell-crank. When the final product key is depressed, the interlock is moved to the left to relatch it on the pawl and clear the keystem bell-crank.

Tests and Adjustments

When vertical link AN is in the upper position, feed pawls BA and AQ should clear the rack teeth on the adding pinion shaft. The adjustment is made from the eccentric roll in the top of link AN. The object of this adjustment is to insure that the regular feed pawls do not interfere with the back movement of the adding pinion shaft while vertical

CONSTANT FACTOR, AUTOMATIC POINT OFF, AND AUTOMATIC FULL CENT KEY MECHANISM (Plate 31)



(Plate 31) Continued

link AN blocks the shaft movement in its upper position.

Vertical link AN has a guide stud which should clear the bottom side of plate A to permit the vertical link to swing the full length of the slot in plate A. The adjustment is made from eccentric BE.

The lip on vertical link AN must align with the tooth spaces of the front rack on adding pinion shaft to permit a free mesh on its upward movement. The adjustment is

made by shifting plate A sideways in the holes for screws E.

Arm K is adjusted to trip the pawl on the

(Plate 31) Continued

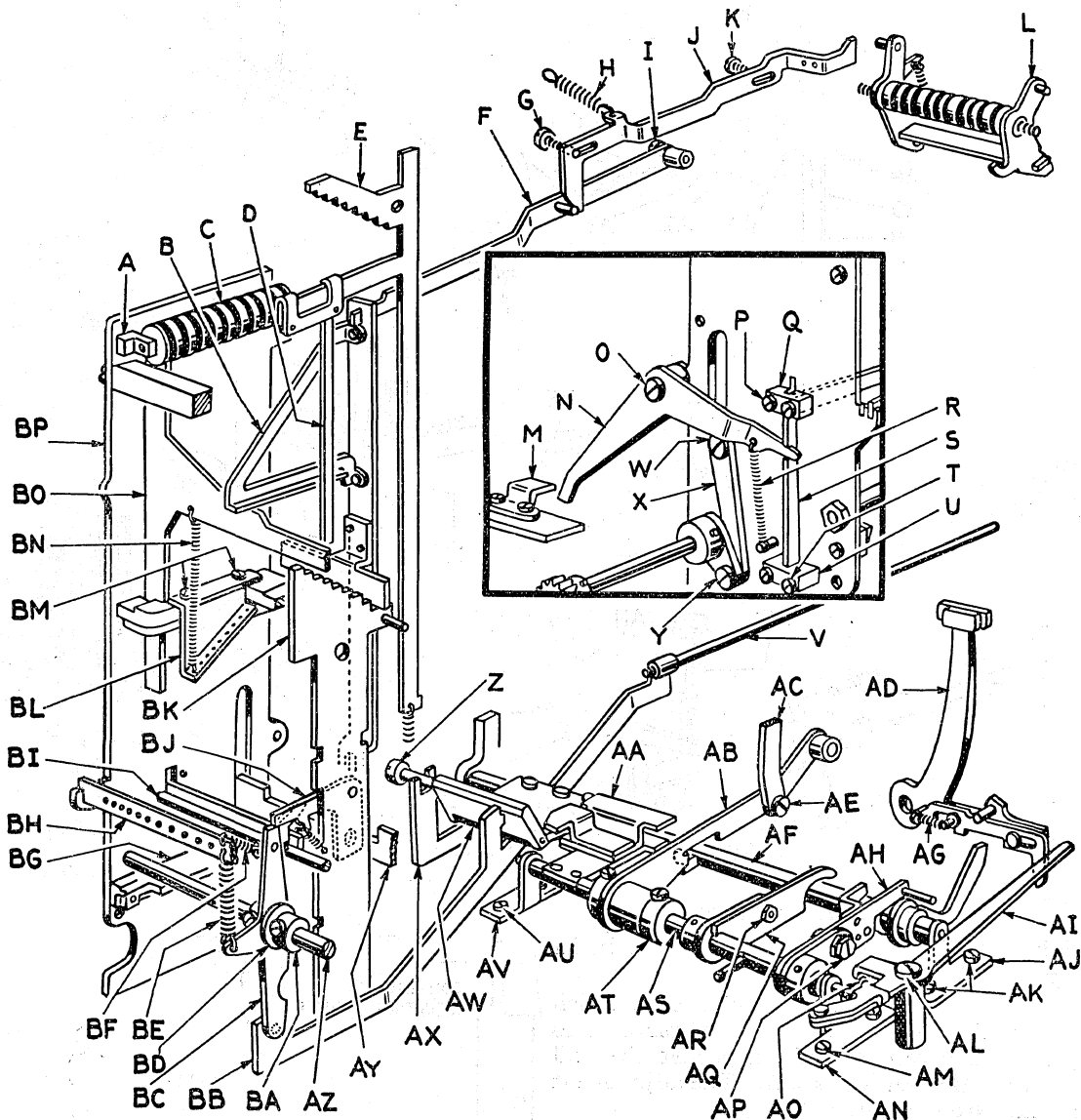
full cent plate F with slight lead when the full cent pointer on the last factor plates passes roller I. Adjust by bending arm K.

When interlock AE is latched by pawl AB,

the vertical projection of the interlock should clear the factor key bell-crank. When the interlock is released, the bell-crank should be blocked. Adjust by bending the vertical projection on the interlock.

CROSSFOOTER, SUBTRACT MECHANISM, CLASSES 76 AND 77 (Plate 33)

(Plates 32 in Symbol Book Only)



Crossfooter Subtract Mechanism (Plate 33)

Subtraction is accomplished by adding the complement of the number to be subtracted to the amount in the crossfooter plus an automatic one. The complement of a number is the difference between it and a nine plus the automatic one.

Indexing the rack bars in the subtractor section is the same as the indexing of a partial product on multiplication. The height of the subtract plate steps is graduated in tenths in much the same manner as the multiplier plates.

The subtract plate has eight consecutive steps for indexing rack bars from 1 to 8. The position of the steps on the subtract plate in the subtractor is in the opposite order of those on the No. 1 multiplier plate; the highest step (8) corresponds to the No. 1 step. When 1 is extended, the rack bar is indexed to 8 which is the complement of 1. When the subtractor is clear, index arms D are beyond the first lift arm BO so that in a clear machine, the depression of the subtract key causes all rack bars to index 9's, the adding pinions accumulate 9's and are cleared to ciphers through the automatic 1.

To subtract a smaller number from a larger, as 1256 minus 273, the 1256 is added in the crossfooter by listing the amount on the keyboard and depress the crossfooter add key and the motor bar. The smaller amount is listed on the keyboard, the credit register key and motor bar depressed to extend the amount in the subtractor. Depress the subtract key, then the balance key and the motor bar to print the result.

Subtract problem and complement layout:

1256	minuend, added in the cross- footer
273	subtrahend, extended in the subtract
9999999726	complement, indexed by sub- tract plate
1	automatic one, tripped from the subtract plate
983	balance

The minuend 1256, complement 9999999-726, and automatic one are added together to obtain the true balance. The condition to keep in mind is that a carry is always produced in the last active bank which is the means of cancelling the nines to the cipher position.

Depressing the subtract key trips the subtract plate BK through wire V and slide BB swinging rocker arm BC. A vertical projec-

tion on slide BB rocks the toggle plate AW forward to trip the drive clutch through slide AX. The forward movement of the toggle rocks shaft assembly AF and the arm on this shaft shifts twin cams to the crossfooter add position through bell-crank AD. Rocker arm BC is latched by its pawl falling over shaft BI when the subtract key is depressed to retain the mechanism on the forward stroke.

Toggle plate AW moving forward, contacts cam AA to move the shaft assembly AS sideways to align the roller in arm AB with double eared cam to clear out the extension and to align the offset arm of AH with the balance key linkage to index a negative balance in the event of an overdraft.

The upward movement of the subtract plate carries up lift arm BO, which contacts and raises index arm D to locate index limit plate E, limiting the rack bar for the complement of the extended amount.

Vertical link B and horizontal arm F are carried up by the subtract plate to block the printing of the complement. A stud in the horizontal arm cams hammerblock slide J forward to swing hammerblock bail L into the hammer driver.

The subtract key mechanism is released near the end of the forward stroke by bracket M rocking bell-crank N which raises the pawl on rocker arm BC through bracket S.

Non-transfer Control AI

Rocker arm AI controls the slide on twin cam shifter bell-crank AD on an overdraft operation to non-transfer a negative balance. The side movement of shaft AS swings rocker arm AI, the forward end of which contacts the slide, closing the balance slot in bell-crank AD. The depression of the balance key to extend the negative balance moves the twin cams to the non-add position.

When the negative balance non-transfers into the register, the overdraft amount is not subtracted from the register total. To subtract an overdraft from the register total, rocker arm AI is removed. A negative balance will then transfer into the register.

Tests and Adjustments

Depressing the subtract key should latch rocker arm BC with slight lead over shaft BI to insure the key latching prior to the trip of the drive clutch. The adjustment is made from wire V.

Toggle plate AW should move forward beyond the angle on channel bail assembly AA when the subtract key is depressed. This is to obtain maximum movement from the

(Plate 33) Continued

angle cam on AA. To adjust, bend the vertical projection on slide BB.

If the side movement of shaft AS is not sufficient to align the offset ear of arm AH with the balance key linkage, swing the angle cam on AA toward the toggle plate. This is done to insure raising the channel bail lift shaft AA to extend the negative balance when the balance key is depressed.

Arm AB has a formed ear which should be adjusted to minimum side clearance with the square stud in shaft AF with the toggle plate forward. Locate set collars AT as required. This is done to retain the alignment between

the formed ear on AH and the balance key linkage as secured from the toggle plate.

Twin cams should shift to the crossfooter position and clear the guide shaft in the side frame when the subtract key is depressed. The adjustment is made by bending the arm on toggle shaft AF. Always check the twin cams for restoring to normal after making this adjustment. Keep in mind that the cam shift should be completed when the drive clutch trips.

With the subtract plate in the upper position, hammerblock shaft assembly L should have minimum play to insure a hammerblock of the subtract complement. The adjustment is made in the offset on the front end of slide J.

SUBTRACTOR CLEARING MECHANISM (Plate 34)

Clearing Extension (Plate 34)

Near the end of the forward subtract stroke, arm H is swung downward by the double eared cam E1. The downward movement of arm H swings hub assembly G in line with restoring cam E through rocker bell-crank I. The formed ear on the rocker bell-crank swings channel lift bail L to lift index detents P out of the teeth in rack D.

On the return stroke, the restoring cam swings hub assembly G and shaft N rearward, and the shaft contacts index links M, restoring them to the normal position.

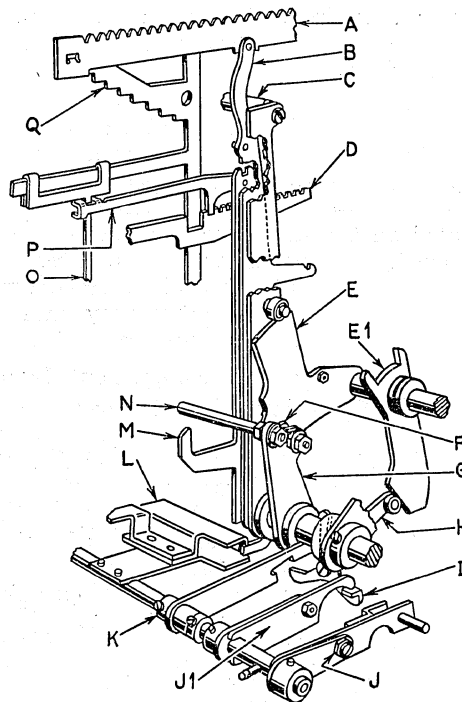
Tests and Adjustments

With cam E1 resting on top of the roller in arm H, index detent P should clear the teeth in rack D and the top of index link M should clear the stud in rack bar actuating arm B. Adjustment is made from the eccentric in arm J1. This is done to permit clearing the extension.

The inside edge of screw head F in hub assembly G should align with restoring cam E when cam E1 is resting on top of roller in arm H.

Adjustment: Washers of varying thickness, .040", .050", and .060" are placed on screw F to build its head toward the restoring cam. If these washers fail to give the desired line up, arm G may be slightly bent sideways.

Screw F and restoring cam E have angled edges. The screw head angle should be located to meet the angle on the restoring cam.



The alignment of the parts should be good enough to function without any cam action from the angle on the parts, thus the angle edge remains as a means of safely engaging the parts if a side variation develops.

Index link M should be completely restored to insure clearing the extension. Shaft N is eccentric for adjustment.

AUTOMATIC ONE MECHANISM (Plate 35)

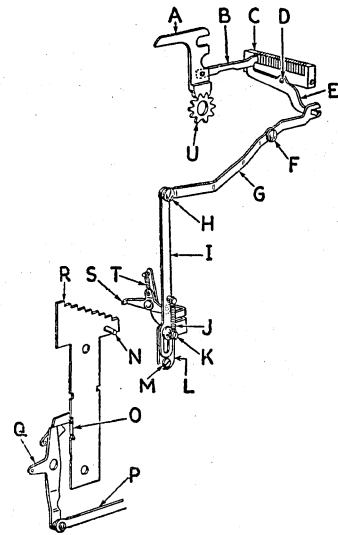
Automatic One Mechanism (Plate 35)

The automatic one mechanism adds a one on the unit adding pinion where the complement is being accumulated in the crossfooter during subtract operation.

When subtract plate R moves upward on the forward stroke, stud N rocks and moves above passby pawl S. On the return stroke as subtract plate R moves downward, stud N contacts passby pawl S, rocking it and raising link I which rocks levers G and E, the latter tripping carry link B, causing one to be added on the unit adding pinion.

Tests and Adjustments

When carry link B is tripped, it should have about .010" excess lift, which can be increased or decreased by bending the rear arm of lever G. After this adjustment is made, it is essential that lever E have slight clearance with the carry link while the latter is latched on comb C. The bending of lever G should be equalized to meet both conditions.



Overdraft Mechanism, Later (Plate 36)

An overdraft develops if a larger number is subtracted from a smaller. The overdraft mechanism blocking the depression of the balance key, warns the operator that an amount is overdrawn in the crossfooter.

To subtract a larger number from a smaller, as 376 minus 8493, the 376 is added in the crossfooter, the 8493 is extended into the subtractor. Depression of the subtract key indexes the complement of the extended amount. The balance release key is depressed to permit a depression of the balance key to extend the negative balance from the crossfooter to the subtractor. A second depression of the subtract key finds the complement of the negative balance. The credit balance key is then depressed to print the overdraft amount.

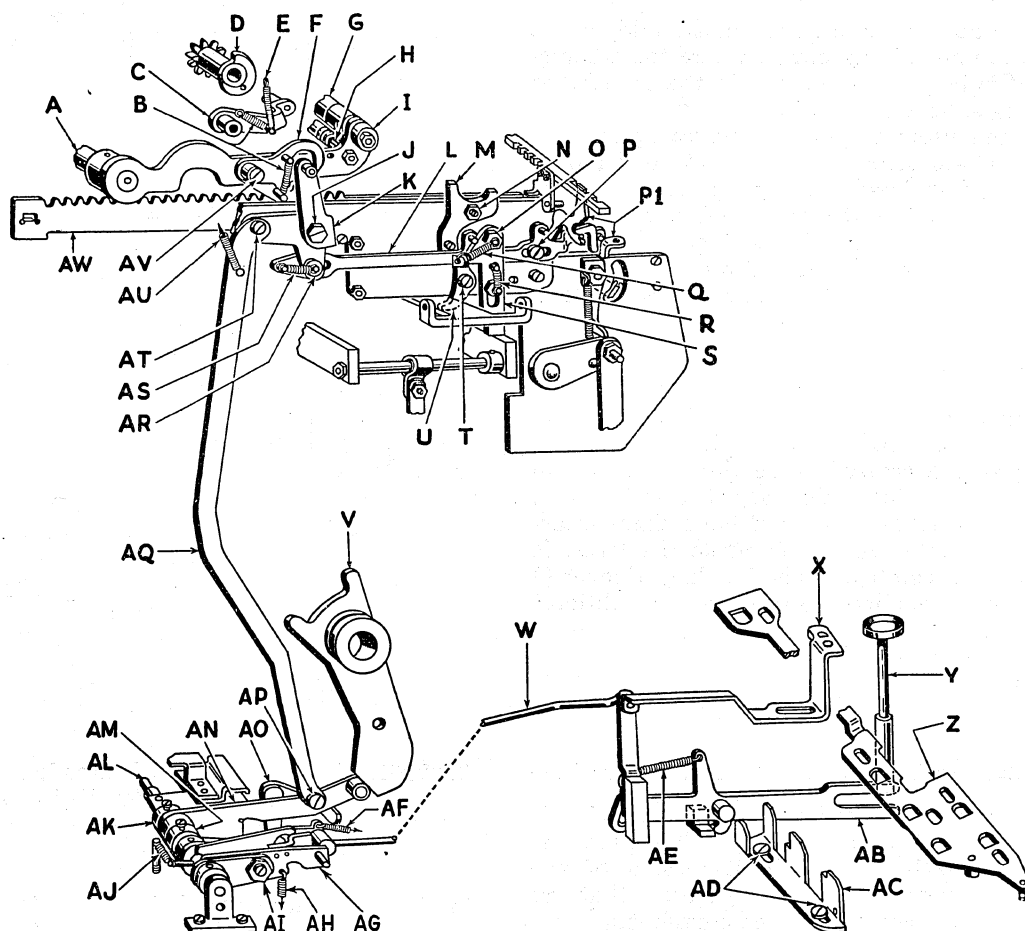
Layout of Overdraft Problem as Computed in the Machine

376	added in crossfooter
8493	extended in subtractor

9999991506	complement of extended amount indexed by subtract plate
1	automatic one
9999991883	negative balance, total in crossfooter to be extended
0000008116	complement of negative balance indexed by subtract plate
1	automatic one
8117	credit balance or overdraft

The condition to keep in mind on an overdraft problem is that a carry is never produced in the last active column of the extended amount which retains the nines to the left. Since the nines are not canceled to cipher, they are the means of retaining the subtract mechanism in the overdraft position. The overdraft mechanism is actuated on each subtract operation. It restores to normal if a carry is produced to cancel the nines to the left of the problem, but remains in overdraft position if a carry is not produced to cancel the nines.

OVERDRAFT MECHANISM, LATER (Plate 36)



(Plate 36) Continued

Cam D is a part of the last adding pinion assembly in the crossfooter. When the adding pinion is at cipher, the roller in arm C seats in the pocket of the cam and hook pawl F clears the roller in bell-crank K. This takes place when the nines are canceled out on subtraction.

When an overdraft occurs, the nines are not canceled, thus the roller in arm C seats on the rim of cam D which lowers the hook pawl F to block bell-crank K in its rearward position, preventing the overdraft mechanism from restoring to normal, and blocking the depression of the balance keys.

Rack bar AW is used only on the subtract operation, and it always travels to the nine position. It is an added rack bar without type and teeth in only the crossfooter section.

It controls the overdraft mechanism, thus permitting the full capacity of the machine to be retained for computation. This rack bar is the means of revolving cam D when its adding pinion is meshed on the subtract operation.

As the main camshaft moves forward, the double eared cam V, lowers arm AN, drawing vertical link AQ downward and bell-crank K rearward. The vertical end of bell-crank K swings under hook pawl F, latching it rearward, the lower projection moves hammerblock arm L forward to block the printing of the negative balance when it is extended. The front end of the hammerblock arm has a formed ear which contacts a stud in the hammerblock bail to lower it into the patch of hammer drive. Follow up pawl N, Plate 37, continues to retain the hammerblock position until near the end of the return stroke.

(Plate 36) Continued

When arm AN is cammed downward, a formed ear on it moves past a square stud in the toggle plate shaft. This square stud is the means of holding shaft assembly AL to the left in the overdraft position.

Disabling of the Hammerblock

To permit printing an amount when the crossfooter contains a negative balance, the bell-crank K and hammerblock arm L are spring connected by spring AS. This spring joint will yield as the intermediate keyboard section rises, allowing the hammers to fire. The upward movement of the intermediate keyboard section raises arm S which contacts a stud in the hammerblock arm, camming it rearward to be latched by pawl U. The downward movement of the rack bar stop restoring fork releases the pawl U, allowing the hammerblock to be effective until the negative balance is extended.

To permit printing a register total while the crossfooter contains a negative balance, pawl P1 disables the hammerblock arm L by camming rearward on the depression of the key.

Balance Key Lock and Flash Signal

The balance key lock and signal mechanism moves rearward to the overdraft position on every subtract operation. If an overdraft occurs, it is latched rearward by pawl F, blocking the balance keys and holding the signal visible. The motor bar is not blocked, permitting additional amounts to be added or subtracted.

As arm AN moves downward, it lowers bell-crank AO, drawing flash signal X rearward. The vertical pivot arm connecting X and blocking slide AB moves AB forward. The blocking slide has a stud which locates in the path of a vertical projection of interlock AC, blocking depression of the balance keys.

Blocking slide AB extends into a slot of keystem Y and is released by a depression of this key. The blocking slide rocks on its center pivot ear causing the rearward end to move upward in its L shaped slot, allowing spring AE to draw it rearward removing the stud in AB from the path of interlock AC. The blocking slide, when released, moves rearward against a limit lug on the bottom keyboard plate in order that it can be reset in its L shaped slot when the signal restores to normal.

Tests and Adjustments

Wire W is adjusted to hold the stud in blocking slide AB in the path of the vertical projection of interlock AC, when arm AN is held down by cam V.

When the balance key is depressed, with the shaft assembly AL latched in the overdraft position, index link M, Plate 34, should have a full hold on the stud in the rack bar actuating arm. The adjustment is made by bending the formed ear on link AG, up or down. Be sure this adjustment does not interfere with the side movement of the formed ear over the balance key linkage. Further, do not adjust eccentric AI in arm AG, as this is adjusted to obtain the same condition from the extend key. In making this adjustment, keep in mind that the balance key acts as an extend key to extend a negative balance into the subtractor.

Hook pawl F should have about $\frac{3}{4}$ hold on the roller in bell-crank K when latched, to insure its holding the bell-crank. To adjust for more hold, remove stock from the lower edge at point of contact with the limit stud.

Hammerblock link L should block the hammers when it is latched forward by bell-crank K. The front offset end of the hammerblock link is bent. This adjustment should always be checked with the disabling of the hammerblock by cam S moving the hammerblock link rearward.

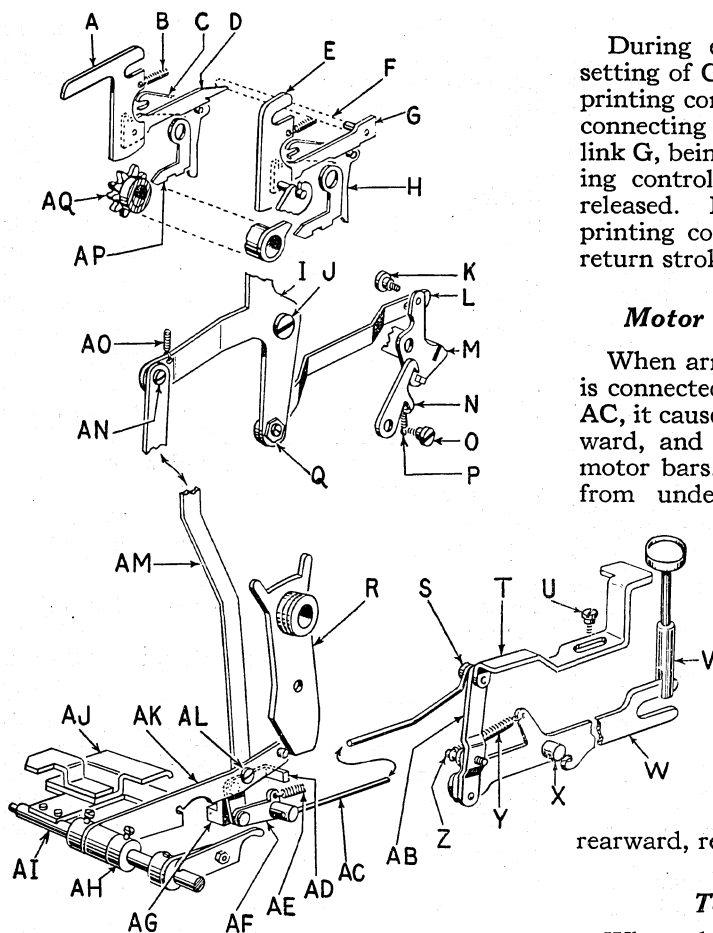
Overdraft Mechanism, Early (Plate 37)

The tenth carry rack A has no teeth. It is tripped by the wide tooth of adding wheel AQ which is meshed with the last rack bar. In addition to a wide tooth, AQ also carries a cam for tripping link pawl G during a balance key operation when an O. D. is in the cross-footer. Link pawl D on A has a bevel on the upper end where it locks on the guide comb. This bevel controls part E which is directly connected to the O. D. mechanism. Link pawl D raises pawl G by contacting on the stud in G when a carry takes place, thus preventing G from resetting, and thereby making the O. D. mechanism inactive.

When a carry does not occur, link pawl D remains reset, the low point on its bevel allows link pawl G to reset. This rearward movement of G permits the O. D. mechanism to function, locking the motor bar and making the extend mechanism operable by the balance key.

The resetting of E through link AM takes place on the forward stroke of each machine

OVERDRAFT MECHANISM, EARLY (Plate 37)



(Plate 37) Continued

operation. However, when G fails to carry, arm AK locates against the square stud in the toggle shaft. In this position, arm AK is held downward by link pawl G locking on the guide comb. The locking effect of link pawl G is applied to arm AK as follows:

Link G pivots on E. The stud in E seats in the slot of I which is connected to arm AK by link AM. Link G is released during the balance key operation by the cam of AQ after the adding pinions have been cleared and are being meshed with the carry racks.

It will be noted that although the cam of AQ will be point to point with AP, it will not trip G when the adding wheels are in mesh with the rack bars due to the chamfered lower part of C. The purpose of this delay of the release of G is to avoid overcoming the tension of the spring on the rack bar in this column.

The lower arm of I operates the printing control as follows:

During each subtract operation, the resetting of G on the forward stroke makes the printing control inoperative through link AM connecting I and E. When an O. D. occurs, link G, being in reset position, holds the printing control active until the balance key is released. Follow-up pawl N continues the printing control until the completion of the return stroke.

Motor Bar Lock and Signal Device

When arm AK rocks bell-crank AF, which is connected to the upper end of AB by wire AC, it causes the lower end of W to travel forward, and move the interlock to block the motor bars. Flash signal T moves rearward from under the motor bar release key.

Unless the result of the subtraction produces an O. D., arm AK and its connecting parts move back to normal position. On the other hand, when an O. D. is present, the parts do not return to normal; the motor bars are blocked, however, only as a warning signal. Depressing the motor bar release key V, allows spring Y to pull W rearward. Part W sliding downward and rearward, releases the motor bars.

Tests and Adjustments

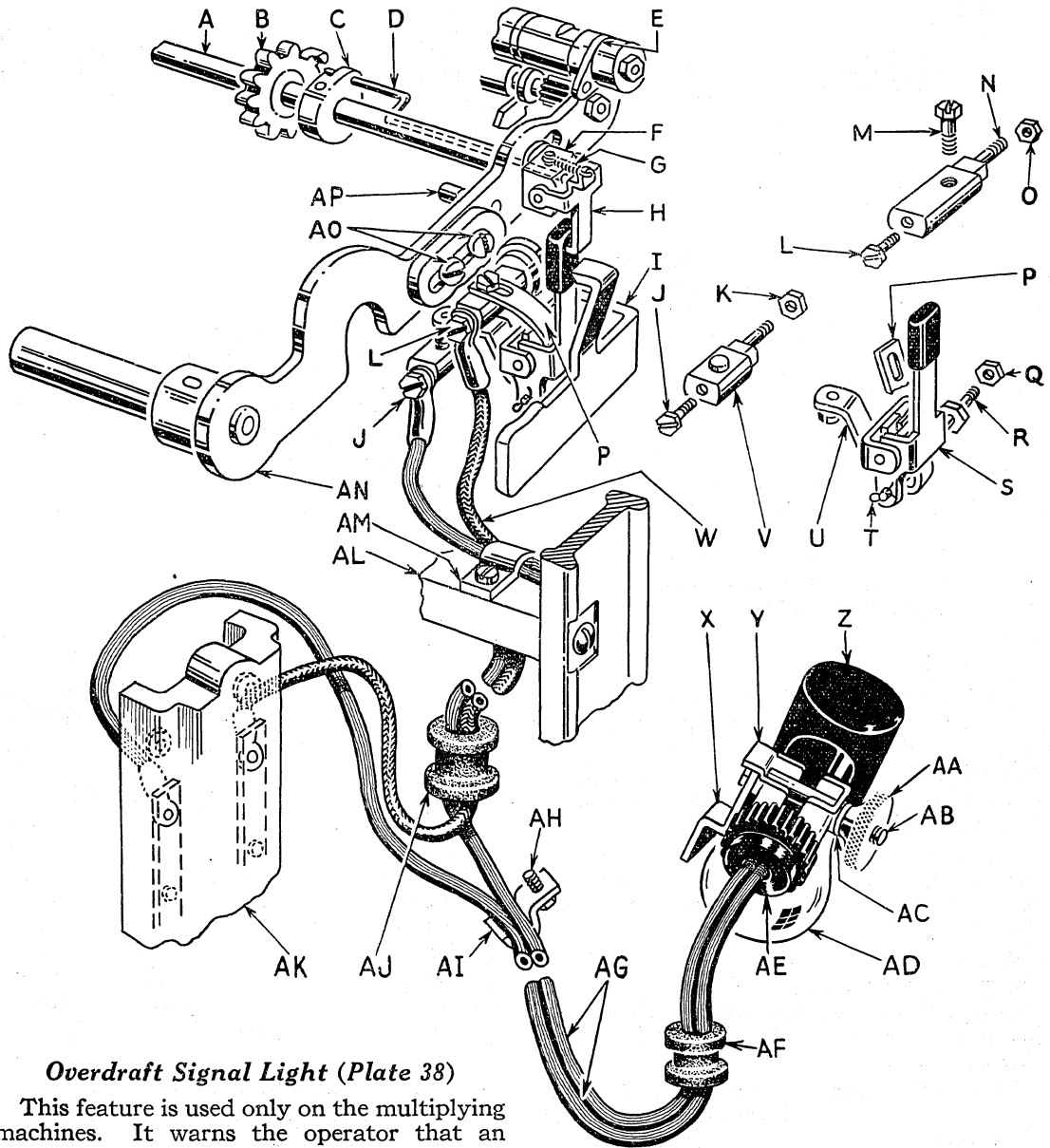
When the subtract key is depressed and the machine is in forward position, O. D. signal T should have $1/16''$ clearance in its slot. Wire AC is turned into and out of AF.

With the subtract key depressed and the machine in forward position, link L should have about .002" play to prevent a bind when cam R lowers arm AK.

Eccentric Q is turned to secure play.

With the crossfooter clear, release D and the next standard link. Depress subtract key and turn machine partially forward. Push O. D. signal rearward with one hand and with the other, move AM downward. G must not reset. If it should, examine bevel edge of D and stud in G. Reset D using spring hook, again holding signal rearward, move AM downward, G should now reset. Should it fail to reset, examine its bottom corner at point of contact with the guide comb. Slowly restore the carry rack next to A and observe whether or not G is tripped when cam of AQ is at the high point of AP. Should G fail to trip, examine the stud in G, bevel on C and AQ.

OVERDRAFT SIGNAL LIGHT, CLASS 72 (Plate 38)

**Overdraft Signal Light (Plate 38)**

This feature is used only on the multiplying machines. It warns the operator that an overdraft is in the crossfooter by a signal light mounted on the left front writer leg. The signal light continues to burn until the negative amount in the crossfooter is extended into the multiplier section. The mechanism can function only when the crossfooter adding pinion shaft is in the normal position.

The listing capacity of the machine having this feature is reduced one bank to prevent listing a nine in the last bank, thus preventing the signal light burning.

When the signal indicates an overdraft has occurred, the operation is completed as follows:

Machines Having First and Final Product Keys

The final product key and motor bar are depressed, clearing the multiplier and transferring the negative amount to the register.

The total, extend, and the motor bar are depressed, extending the negative amount into the multiplier.

The subtract key is depressed, accumulating the complement of the negative amount plus the automatic one in the crossfooter.

The final product key and motor bar are

(Plate 38) Continued

depressed, printing the overdraft and clearing the extension.

Machines Having Product and Clear Multiplier Keys

The clear multiplier key and motor bar are depressed to clear the multiplier.

The product and extend keys and motor bar are depressed to extend the negative amount into the multiplier.

The subtract key is depressed to accumulate the complement of the negative amount plus the automatic one in the crossfooter.

The product, clear multiplier, and motor bar are depressed to print the overdraft and clear the extension.

Sequence of Operation

When an overdraft occurs, a nine is accumulated in the last adding pinion and its wide tooth cams rod D to the left, rocking bracket H, which in turn rocks the switch arm S to permit the contact points to close and the signal light to burn.

Tests and Adjustments

With a nine on the last adding pinion, the contact points should be firmly closed. The parts should not bind, as this would interfere with carry when the wide tooth passes the nose of rod D. The adjustment is made by bending switch arm S.

With the last adding pinion at cipher position, try to obtain at least .020" clearance of the contact points, and this condition is considered when adjusting switch arm S.

After the above adjustment is completed, the arm of bracket I, should be adjusted by bending, to limit switch arm S. Proper adjustment is indicated by bracket H having slight play.

Locate the signal switch bracket on the crossfooter section to obtain maximum clearance with the fraction control arms of the crossfooter and register meshing links, still maintaining sufficient hold of bracket H on switch arm S. The signal switch bracket has a slot for adjustment.

When the subtract key is depressed with the machine clear, the signal light will flash on and off as the wide tooth on the adding pinion passes rod D on the carry operation, canceling the nines to cipher.

Register Subtract Mechanism (Plate 39)

The register subtract feature permits subtracting directly from an amount in the

register. This mechanism is restricted to subtracting smaller from larger amounts as it does not have an overdraft mechanism. The subtract complement and automatic one are indexed from a separate subtract plate. The extension is cleared from the subtractor on the return stroke and part of the crossfooter clearing mechanism is used in this operation. The register subtract key does not trip the drive clutch.

Depressing the register subtract key draws slide AB forward through wire AM, swinging the rocker arm AA to trip subtract plate pawl S over the raise bail. The pawl on the rocker arm falls over shaft AF, latching slide AB forward as the register subtract keystem restores to normal to permit a motor bar depression.

Slide AB has a block fastened to it which swings rocker arm W through wire AE. The opposite end of the rocker arm has wire T which swings hub assembly Q to latch this mechanism by pawl K moving downward under stud L in the machine side frame. Rocker arm W has square stud which contacts a similar stud in shaft assembly AF to shift it sideways, and place arm AT over the bell-crank for shifting hub assembly to clear the extension.

Hub assembly Q swinging, raises vertical link H to disable the simultaneous addition couplers. The hub assembly moves the twin cams to the register add position in the event a crossfooter add or non-add control block is active through the reverse positive register control mechanism.

The intermediate keyboard is disabled on a depression of the register subtract key to permit the rack bars to travel to nine or limit on the index limit plates. Rocker arm W has wire AQ extending to arm AT which lowers link AW rocking lever AY above the stud in the twin cam assembly.

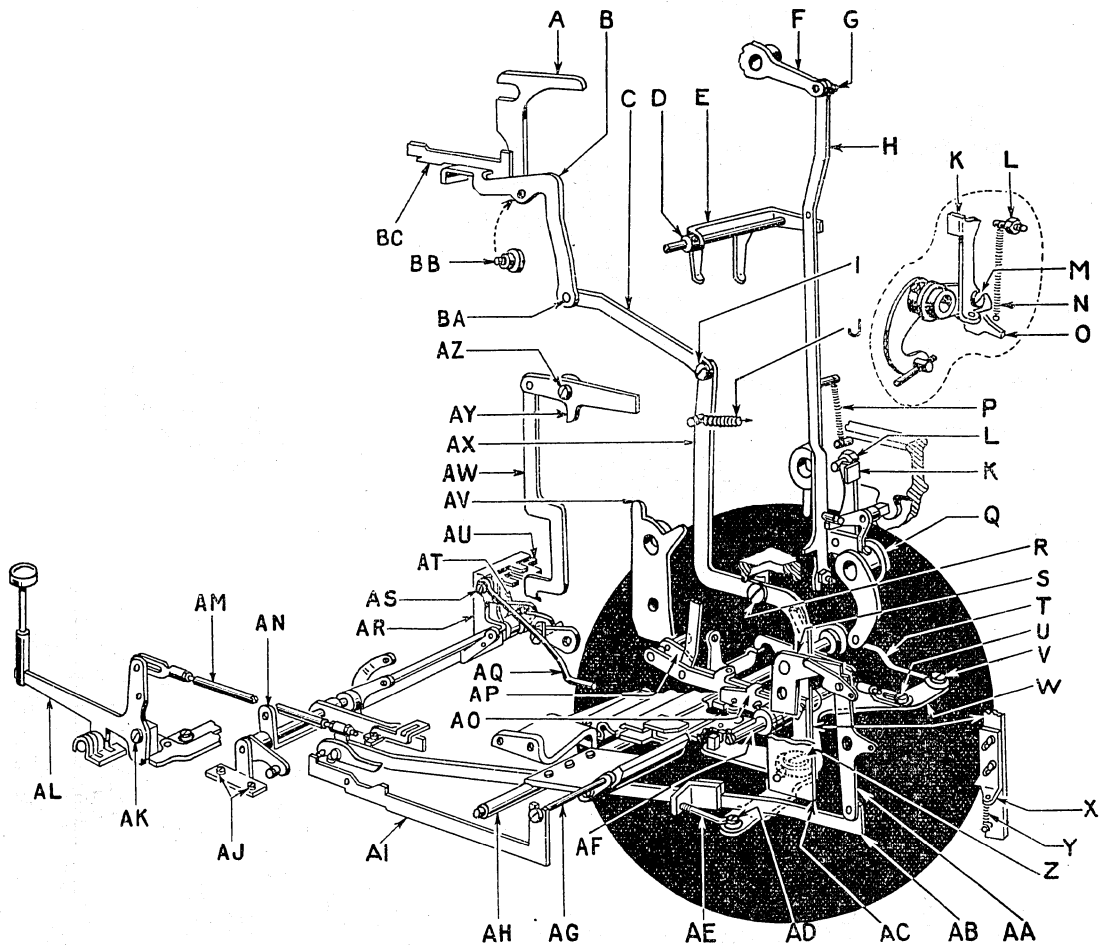
Automatic One Mechanism

On the upward movement of subtract plate AC, its stud moves passby slide X, the latter idles in the angle slots without swinging lever AX. On the return stroke, the stud in the subtract plate contacts on top of the projection on the passby slide, rocking lever AX, and through link C and bell-crank B, the carry rack A is tripped, adding one on the unit adding pinion.

Tests and Adjustments

When the subtract key is depressed, the pawl on rocker arm AA should latch over the shaft with slight lead. The turnbuckle on wire AM is adjusted. The turnbuckle has a

REGISTER SUBTRACT MECHANISM, CLASSES 76 AND 77 (Plate 39)



(Plate 39) Continued

slot which allows the key to restore to open the keyboard ball lock to permit a motor bar depression.

Rocker arm W should move shaft assembly AF to the left slightly more than it is moved by toggle plate on the crossfooter subtract operation. Wire AE is adjusted as required. In this adjustment, the square stud in W is advanced to the square stud in shaft AF. The normal position of the shaft should not be disturbed.

With a crossfooter add block active, manually latch pawl K on stud L. The twin cams should align to the register add position. Eccentric stud L is adjusted.

Wire T is adjusted to latch pawl K on the eccentric stud L with minimum lead.

With pawl K latched, the turnbuckle on

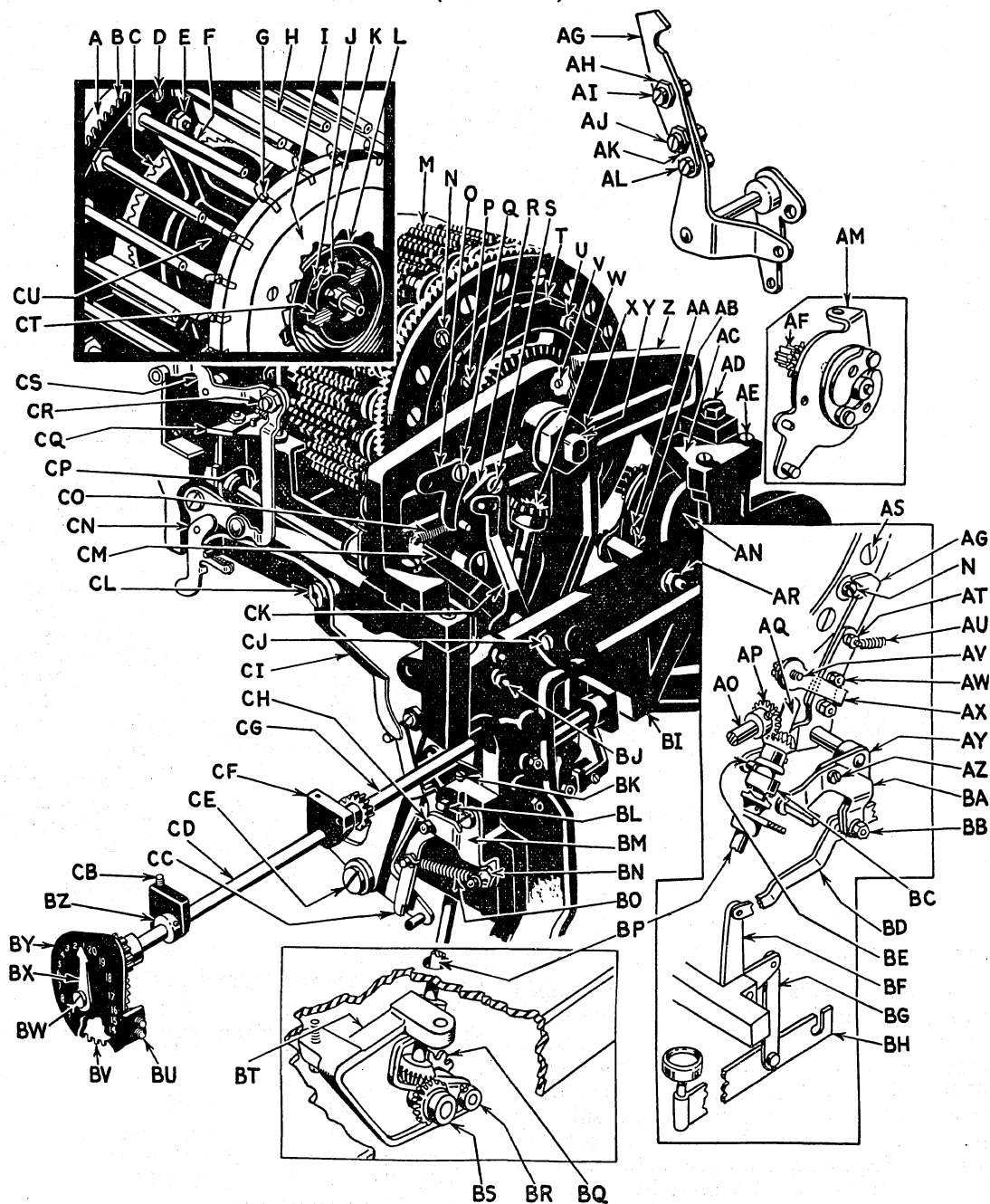
wire AQ is adjusted to raise lever AY to clear the stud in the twin cam assembly.

With pawl K latched on stud L, link H should be raised just enough to disengage the couplers. The adjustment is made by bending the ear of the bell-crank resting under the stud near the bottom of link H.

Due to the load applied against rocker arm W, shaft assembly AF has a tendency to recede slightly. Therefore, the clearance of the auxiliary arm AO with square stud in the toggle shaft AH should always be checked while pawl K is in the latched position.

Bell-crank B should raise carry link BC with slight clearance, out of the comb from the high point of passby slide X, to trip the automatic one. In the normal position, the bell-crank should have slight clearance under the carry link BC to insure its complete re-setting.

ROTARY MAGAZINE AND REGISTER PINION ASSEMBLY (Plate 40)



Rotary Magazine and Register Pinion Assembly (Plate 40)

General Information

Register cob assemblies are carried in a rotary magazine having a capacity of twenty registers. The register cob is supported on a horizontal pin and the adding pinions are held in cross alignment by a guide blade.

The normal position of the registers is in the rotary magazine, to permit the selection of any one register. Depressing the motor bar shuttles the register cob into the register section frame and after the amount is added, the register cob is automatically returned to the rotary magazine.

The registers are tabulated from one to twenty by means of a clock spring mounted

(Plate 40) Continued

in the rotary magazine. They are returned by power transferred from the drive when the register return key is depressed.

Register Selection

Registers are selected by trip blocks on the carriage during tabulation. Each trip block causes the escapement mechanism to operate and the rotary magazine to turn to the next consecutive register position. Registers can also be selected by a depression of the register trip key. If the key is held down, the rotary magazine will continue to turn until last register position is reached, and if quick depressions are made, the rotary magazine can be tabulated one register position at a time.

Holding the register return key depressed, causes the rotary magazine to revolve in the opposite direction to the tabulating motion, and return to the number one register position. If the key is allowed to restore, the rotary magazine stops, thus, selection of registers on the return is possible but not absolutely accurate.

Register Indication

Early machines have an indicator plate with numerals stamped on it for each register, mounted on the right front writer leg. This mechanism has been replaced by a horizontal indicator suspended between the front writer legs as shown on Plate 46.

The purpose of both mechanisms is to indicate the active register by means of a pointer and number.

Rotary Magazine Construction

The rotary magazine assembly CU is a flanged casting mounted on shaft Y. The latter is supported on the left by a bracket fastened to the carry section side plate. The right end of the shaft is held in casting Z by nut X. The rotary magazine rotates on ball bearings J on each side of the casting. Raceways for the ball bearings are pressed into the casting.

Register supporting pins F carry the cob assemblies and they are fastened to rim A of the casting CU. Gear B also fastened to the rim of the casting, rotates governor assembly AM to control the rotating speed of the rotary magazine. Register limit gear T is fastened to the side of the casting by three screws, one of which carries eccentric U for aligning the register supporting pins with the pilot shaft in the register frame.

Clock spring L is located in a recess of the

rotary casting. The inner end of the spring is hooked over a stud in a split connecting collar, the slot of which fits over a stud in shaft Y. The outer end of the spring is hooked over a stud in the casting. Cover plate I encloses the clock spring in the casting recess.

Each register cob has a guide blade H which is located in slots of the rotary casting to align with the adding pinion teeth and retain the added amounts.

Register Return Mechanism

Depressing the register return key BH rocks bell-crank BF, moving link BD rearward to swing the bail assembly AY downward. Stud BE in the bail assembly meshes upper clutch BC with the clutch member on the drive shaft BP, connecting shafts BP and AQ, by means of a keyway tongue and slot on the upper clutch member assembly. The upper end of shaft AQ has a bevel gear W which is meshed with bevel gear C fastened to the rotary casting which is the means of revolving the rotary casting when the clutch members are meshed.

When the rotary register magazine has been returned to the first register position, the head of screw N contacts lever AG which is connected to bail assembly AY, disengaging the register return clutch by the rocking movement of lever AG.

Tests and Adjustments

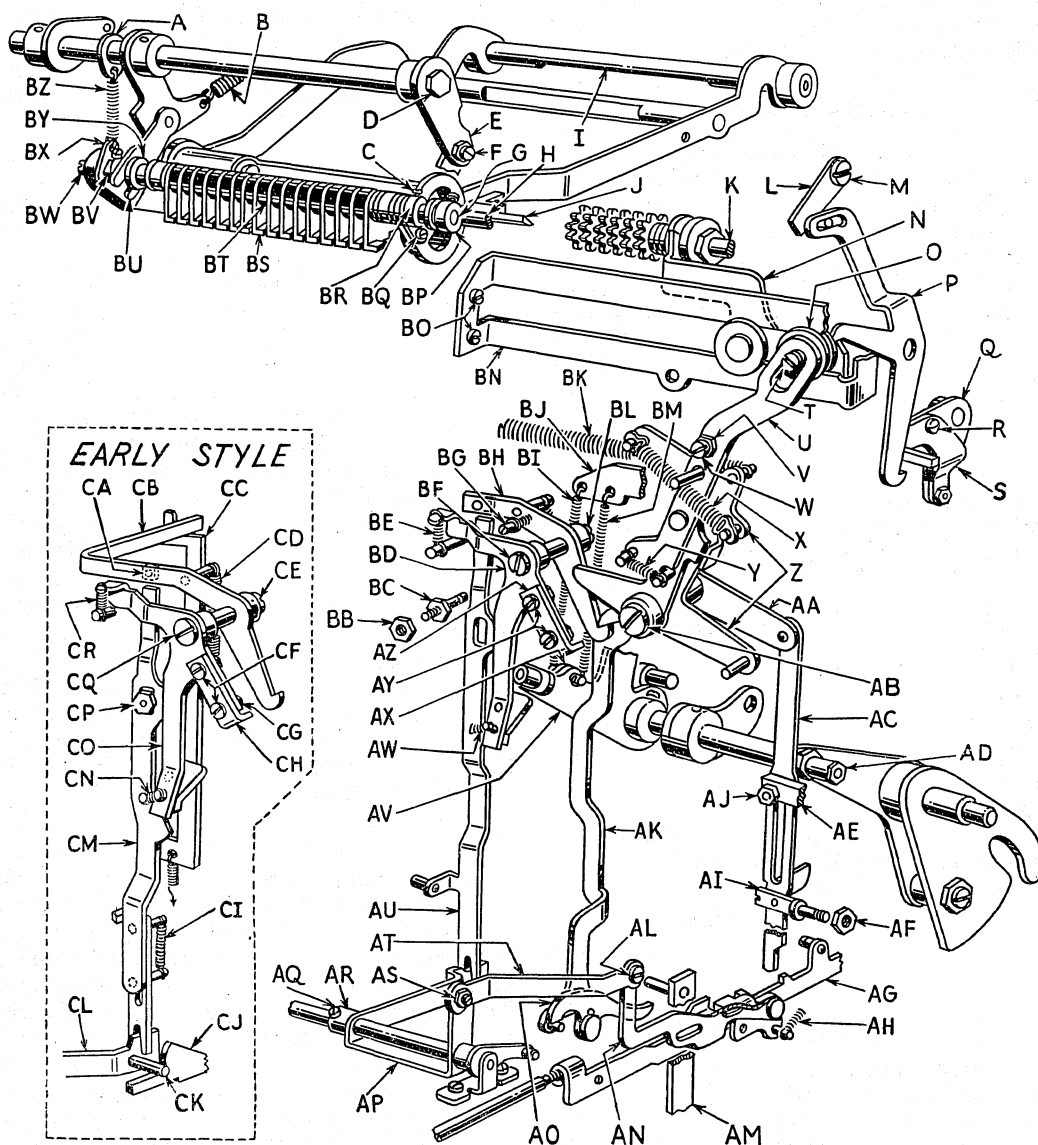
Register supporting pins F must align with the pilot shaft in the register frame to insure a free shuttle action in and out of the register cob assembly. Eccentric U is adjusted to raise or lower the register supporting pins. To move the register supporting pins forward or backward, casting Z is shifted slightly in the screw holes. Each register cob assembly should be tested for free shuttling movement.

In register twenty or the last register position, screw head N limits on top of lever AG. This position should correspond with the tooth on the register limit gear T. The length of lever AG is adjusted from the lower eccentric AJ.

To insure a complete return, the register return clutch should disengage after the rotary register magazine has reached the first position. This adjustment is made from the upper eccentric AH in lever AG.

Limit arm AX has an eccentric to adjust it to limit lever AG, and allow slight play of upper clutch member BC. This play insures that the tension of spring AU does not hold stud BE against the upper edge of the clutch member groove while the rotary magazine tabulates.

REGISTER SHUTTLING-IN MECHANISM (Plate 41)



Register Shuttling-In Mechanism
(Plate 41)

Register Frame Construction

The register frame has a pilot shaft to receive the cob assembly when it leaves the rotary magazine. The upper and lower part of the chamber has been removed to align the adding pinions with the rack bars and the carry racks.

The register cob limits against the hub of the pilot shaft assembly and from this limit, carry pawls BS are adjusted for equal side clearance between the adding pinion teeth. The carry pawls have a slotted guide shaft which limits them in the rearward position.

Intermediate pinion guide J fastened to the side of the register frame, prevents the adding pinion turning from the time it leaves the guide blade in the rotary magazine until it reaches the carry rack. The end of the intermediate pinion guide has just passing clearance with the guide blade in the rotary magazine.

Tests and Adjustments

With a register cob in the chamber, the adding pinions are aligned with the rack bars by moving the register frame in the pivotal centers. Remove all side play in the register frame. With spring unhooked, it should fall of its own weight.

(Plate 41) Continued

Carry pawls BS are aligned centrally between the adding pinion teeth with adjusting nut BV. Have the screw in the set collar BP loose, to permit the shaft to move sideways. Swing shaft G in the register section frame until the slotted guide shaft aligns the carry pawls about central in the tooth space to permit free sliding movement of the register cob assembly.

The adding pinions should have minimum play in the carry racks to insure free shuttling movement, and prevent the teeth catching on the carry pawls. This adjustment is made from the upper limits on the carry section.

The eccentrics in toggle links BU are adjusted to obtain about $1/64''$ play of the adding pinion in the rack bar.

Register Shuttling-In Mechanism

The register cob is shuttled into the register frame by spring tension on the depression of the motor bar. The drive clutch is tripped on the register shuttle-in movement. The shuttle arm assembly pivots on a stud and screw AB of the center front casting of the adding machine.

When the motor bar is depressed, slide AN and link AT are drawn forward, rocking bail AP which raises vertical link AU to release latch pawl BH, allowing the injector spring BK to pull the shuttle arm assembly AA and the cob assembly into the register frame. Shuttle-in arm U is driven by a formed lip on assembly AA, passing over a screw in slide N. This slide fits into a groove of the register cob assembly.

The register cob assembly is latched in the chamber of the register frame to add the amount, by passby pawl BD, trapping the shuttle-in arm.

As the shuttle arm swings inward, a stud in it drives link AK downward, rocking pawl AO to raise drive stem AM and trip the drive clutch.

On the forward stroke, roller AD contacts an ear on the reset arm AC, driving it downward, which swings shuttle arm AA outward until it is latched by pawl BH. The outward movement of the shuttle arm sets the tension of injector spring BK.

In the early machines, the register is shuttled in by the depression of the adding, result, and subtract keys. When an adding key is depressed, part CC raises latch CB which releases lever AA to allow spring BK

to drive parts Z and U to shuttle the register into the frame. When one of the result keys is depressed, assembly CL raises vertical link CM which trips latch CB to shuttle in the register as when the adding keys are depressed.

When the register subtract key is depressed, cam CJ raises vertical link CM which causes the register to shuttle in the same way as when result keys are depressed.

Tests and Adjustments

Pawl BH should release the shuttle arm after the motor bar is latched down, to insure a keyboard lock prior to the machine operation. The adjustment is made from the eccentric in link AT.

The formed ear on slide N should align with the groove of the register cob to permit free rotation of the rotary magazine. Eccentric V in the shuttle arm is adjusted.

With the register cob shuttle into the chamber, the nose of the shuttle arm U should have minimum clearance to move under the formed ear on limit arm AZ. The adjustment is made by moving the limit arm up or down in its slots. This adjustment is very important since it is the means of retaining the alignment of the adding pinion with the rack bars and the carry pawls in the addition of the amount during which time the ejector spring tension is set to shuttle out the register cob. Shuttle arm has a spring joint Y to permit making a very close adjustment.

The nose of arm AA should have about $1/32''$ reset clearance with pawl BH when the reset arm is in the lower position. The adjustment is made by bending the ear on the reset arm AC.

The drive clutch should trip about the same time the shuttle arm U is latched. To delay the drive clutch trip, stock is removed from the shoulder on link AK where stud in shuttle arm assembly contacts.

On the forward stroke when slide AN has its partial release, there should be sufficient receding of pawl BH to permit the shuttle arm assembly latching.

In early machines when adding, result, or subtract keys are depressed, latch CB should have $1/32''$ excess movement.

Adjustment: To adjust for the adding keys, the horizontal arm of CB is bent near its pivotal point.

If all keys are not affected, part CC should be checked. To adjust for result keys, weave bail CL. To adjust for the subtract key, the bottom of bail CL is twisted.

REGISTER SHUTTLING-OUT MECHANISM (Plate 42)

Register Shuttling-Out Mechanism (Plate 42)

After an amount has been added, the register cob assembly is shuttled out of the register frame and returned to the rotary magazine. A register release and a timer arm are required for this operation which takes place near the end of the return stroke. This construction is used on machines having ten banks adding capacity in the register.

The register release and timer arms AK and AD pivot on the main camshaft. They are driven downward to the latched position by stud Z in the main camshaft on the forward stroke. The tension of the springs on these arms is set on the downward motion as both arms are latched by pawl AI.

On the return stroke, when carriage tabulation takes place, the roller in camshaft BC contacts passby cam BB which raises the tabulator drive arm AT, allowing pawl AR to move under the square stud AQ. When the passby cam is released by roller BC, tabulator drive arm drops to normal, rocking lever AM through the square stud, to raise pawl AI and permit spring Y to pull timer arm AD upward and register release arm to latch on auxiliary pawl AJ. When timer arm AD reaches its upper position, it rocks bell-crank X to trip the auxiliary pawl and allow register release arm to move upward under tension of spring AG.

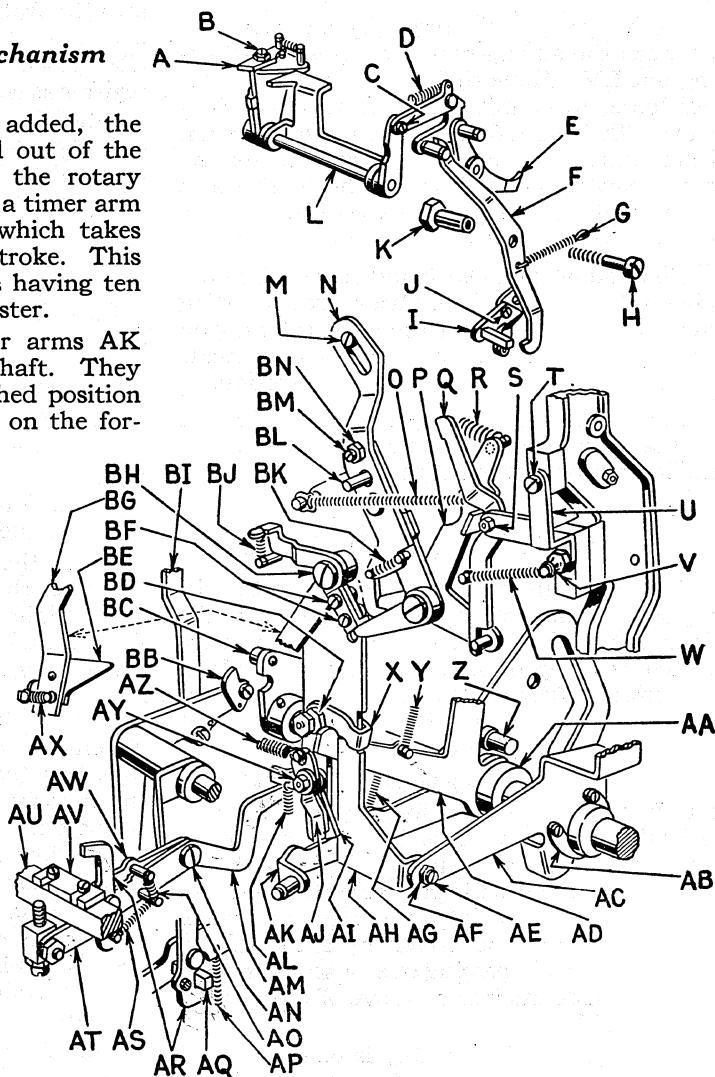
The roller in the register release arm contacts passby pawl BE, swinging the arm of bell-crank BG, to clear the nose on shuttle arm N and permit the ejector spring O to return the register cob to the rotary magazine.

Pawl AR is disengaged from square stud AQ by the upper ear contacting on plate AV, camming it rearward.

In returning the register cob to the rotary magazine, the amount of time required for timer arm AD to trip the register release arm AR, represents the timing element of the mechanism.

Auxiliary Pawl Q

Auxiliary pawl Q prevents the shuttle-in operation taking place prior to completing shuttle-out movement of the register cob. Since the shuttle arm assembly contains an



injector and an ejector spring which pull in opposite directions, damage would result on the formed lip of arm P if the tension of both springs is released at the same time allowing the scissors joint of the shuttle arms to close with a jar.

Auxiliary pawl Q moves over a stud in arm P when the register cob shuttles into the chamber, if the motor bar is not depressed prior to the register cob returning to the rotary magazine, the auxiliary pawl is idle. However, if the motor bar is depressed to shuttle in the register cob, the stud in arm P limits on the auxiliary pawl until the shuttle arm stud BL contacts and swings it off the stud in arm P.

Register Return Interlock F

Interlock F blocks the register return key

(Plate 42) Continued

when the register trip block is resting against pawl A. The register trip block cams pawl A rearward, rocking shaft assembly L, a stud of which contacts the upper end of the interlock swinging the hook under square stud in I.

Tests and Adjustments

When the roller in register release arm AK is on the point of passby pawl BE, the nose of shuttle arm N should clear the limit plate on BG by about $1/32''$ to insure releasing the shuttle arm. To adjust, stock is removed from the nose of the shuttle arm.

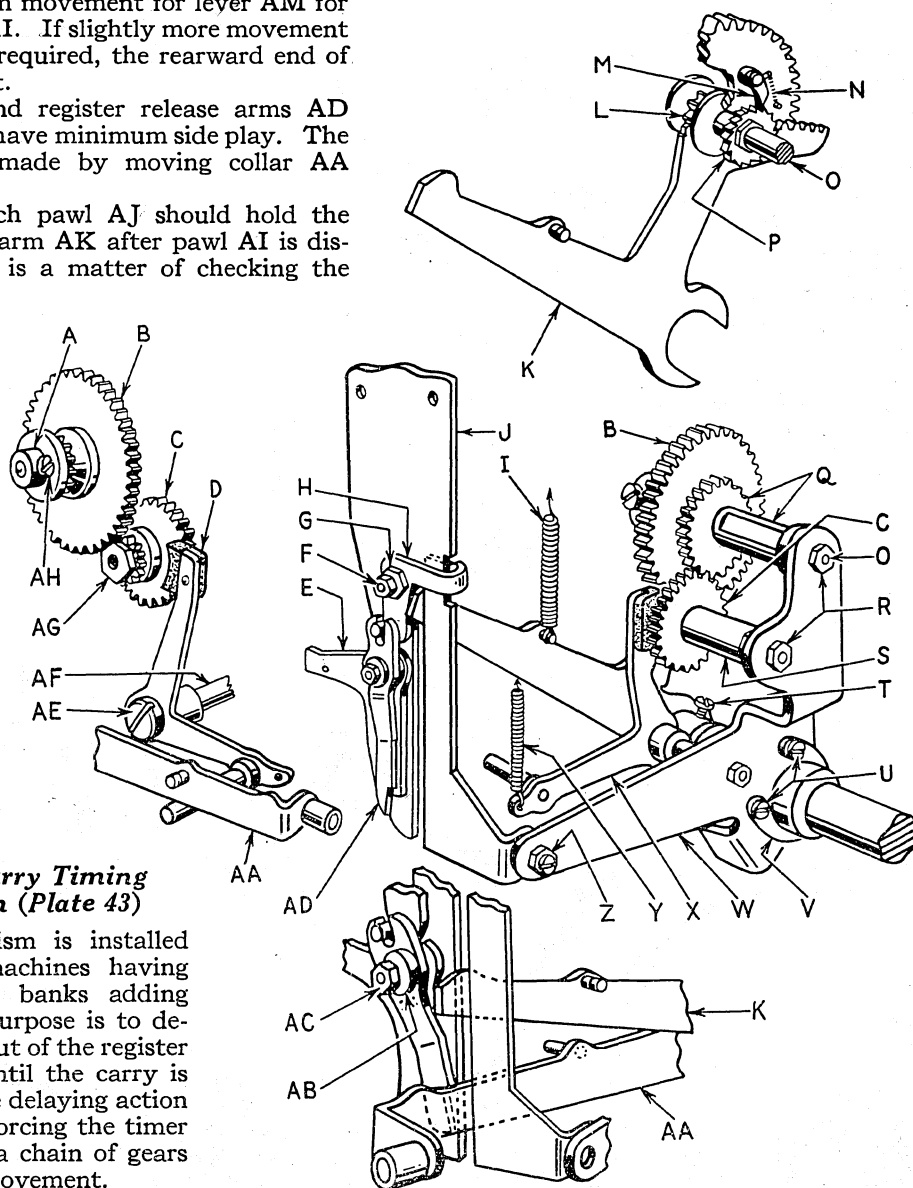
Plate AV should be located in its slots to disengage pawl AR as late as possible to obtain maximum movement for lever AM for releasing pawl AI. If slightly more movement of lever AM is required, the rearward end of the lever is bent.

The timer and register release arms AD and AK should have minimum side play. The adjustment is made by moving collar AA sideways.

Auxiliary latch pawl AJ should hold the register release arm AK after pawl AI is disengaged. This is a matter of checking the

contact surface between the two parts. To test whether the auxiliary latch pawl is effective, prevent the timer arm AD from contacting pawl X. In this position, the auxiliary latch pawl should be holding the register release arm down.

Auxiliary pawl Q should be released when the shuttle arm has moved to about $1/16''$ clearance on the formed ear on arm P. This reduces the shock in closing the scissors joint of the shuttle arm assembly.

REGISTER CARRY TIMING MECHANISM (Plate 43)**Register Carry Timing Mechanism (Plate 43)**

This mechanism is installed on Class 77 machines having more than ten banks adding capacity. Its purpose is to delay the shuttle out of the register cob assembly until the carry is completed. The delaying action is obtained by forcing the timer arm to revolve a chain of gears on its upward movement.

(Plate 43) Continued

Timer arm K has a geared sector which is in constant mesh with the pinion L. Drive gear B is revolved by ratchet gear P and drive pawl M pivoting on the drive gear. Due to the ratchet effect from pawl M, the drive gear revolves only on the upward stroke of the timer arm.

Gear Q is meshed with gear C and both gears are revolved from the drive gear which is meshed with the pinion of gear assembly C.

Brake bell-crank X contacts on the hub of gear assembly C to stop further turning of the

gears due to momentum after the register release arm reaches its upper position.

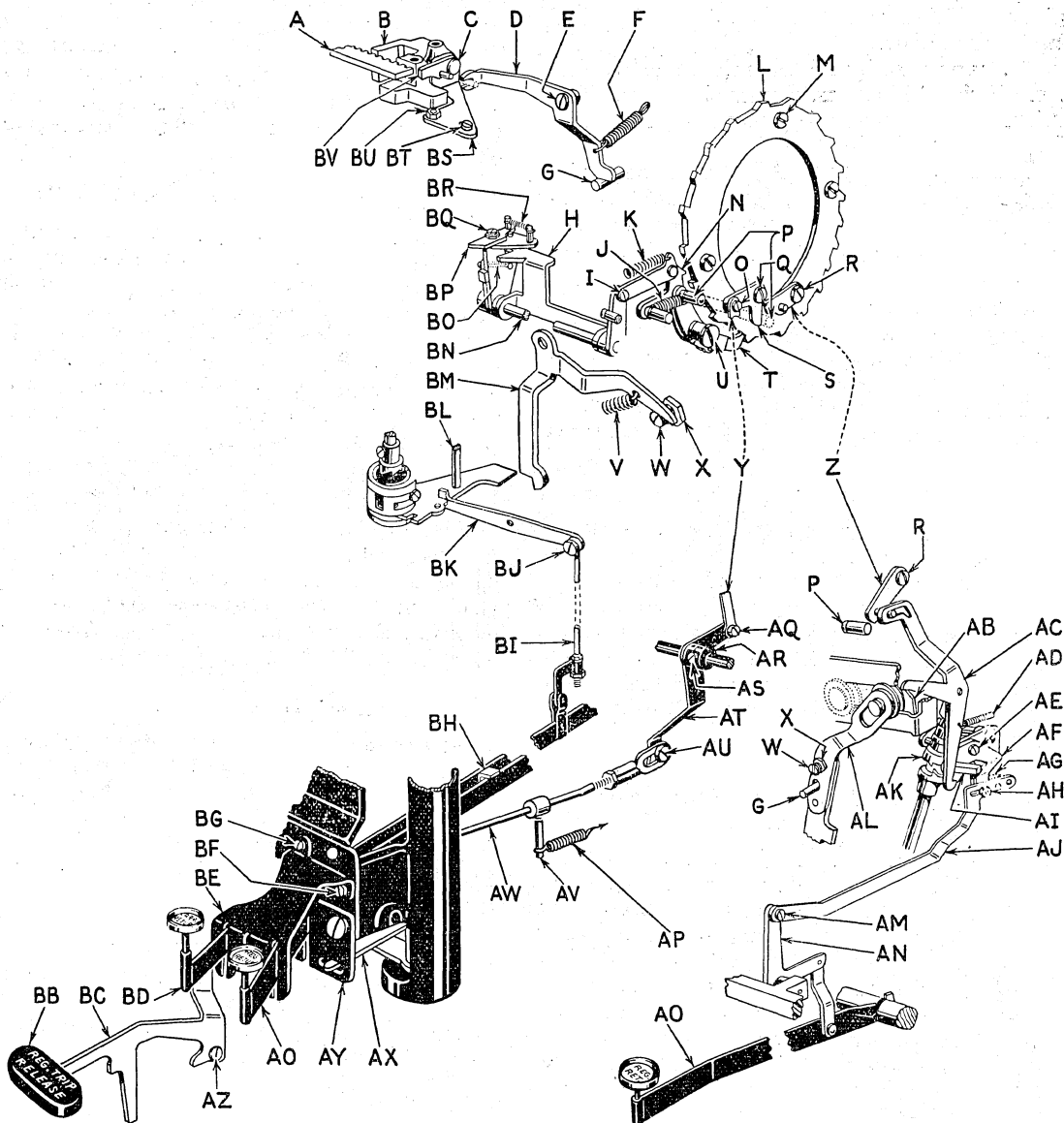
The contact of the brake is controlled by register release arm AA as it follows this arm upward through the tension of spring Y.

Tests and Adjustments

Eccentric Z is adjusted to obtain full mesh of pinion L with geared sector K.

Timer arm K and register release arm AA with this feature have the same purpose as on machines not having the geared carry timer mechanism covered in Plate 42.

REGISTER SELECTION, CARRIAGE CONTROLLED, AND INTERLOCKS (Plate 44)



Register Selection, Carriage Controlled, and Interlocks (Plate 44)

When the register trip block cams passby pawl BP rearward, it rocks shaft assembly BN, swinging upper pawl N into the path of the teeth of register limit gear L. As pawl BP moves rearward, limit pawl T swings clear of the limit gear teeth, allowing the rotary magazine to turn and limit on pawl N. As the register trip block moves past the passby pawl, spring K rocks the shaft assembly, placing limit pawl T in the path of the register limit gear, allowing the complete tabulation of the rotary magazine to the next register position.

Tests and Adjustments

When the register trip block is resting on the peak of passby pawl BP, limit pawl T should clear the tooth in the register limit gear to insure rotary magazine rotation. Eccentric in passby pawl BP is adjusted as required.

Register Trip Key

When the register trip key is depressed, wire AW rocks bell-crank AT, and through vertical link Y, bell-crank S swings limit pawl T out of the register limit gear L. The rotary magazine will continue to rotate as long as the key is held depressed. To tabulate the rotary magazine one register position at a time, a quick, snappy key depression is made.

Register trip key bell-crank BC enters the ball lock and the result key lock, blocking the entire keyboard while the key is depressed.

Tests and Adjustments

When the register trip key is held depressed, limit pawl T should have just passing clearance with the teeth of register limit gear L. The adjustment is made from the turnbuckle on wire AW. In this adjustment, keep in mind that the register trip key wire should always be adjusted as long as possible to insure a full key depression, thus obtaining a firm keyboard lock.

Register Trip and Return Key Interlock AC

Interlock AC blocks the depression of the register trip and return keys when the register cob is shuttled into the chamber to prevent rotating the rotary magazine out of position.

When the shuttle arm moves slide AB inward, interlock AC, which is resting on it, falls through tension spring AD. The cam slot in the top of the interlock arm swings

pawl Z into the path of the stud in limit pawl T to block the register trip key. The bottom hook on the interlock arm moves under square stud AI blocking the register return key.

Tests and Adjustments

The hook on interlock AC should move under the square stud AI to block the register return key as soon as the register cob starts its shuttle-in movement. The center arm of the interlock is bent sideways to adjust. Further, the register return key should remain blocked until the end of the register cob clears the circular guard on the shuttle-out movement to prevent bending the register supporting pin.

Interlock Z which is controlled by interlock AC should firmly block the register trip key when the register cob starts its shuttle-in movement. There is no adjustment to obtain this result except to observe the condition of the contact point between the interlock Z and the stud in the register limit pawl. This is to insure that the rotary magazine is not rotated while the register cob is in the register frame.

Carriage Tabulation Interlock BV

Carriage tabulation is blocked by interlock BV when the register cob is shuttled into the chamber to prevent the rotary magazine tabulation from a register trip block.

As the shuttle arm moves inward, stud G in this arm moves away from bell-crank D, the latter is rocked by spring F which swings the interlock BV into the tooth of the carriage pinion rack A.

Tests and Adjustments

Interlock bracket BS is shifted in its slots to align interlock pawl BV with the tooth space in the carriage pinion rack. In this adjustment, test interlock pawl BV for entering the carriage rack tooth space near each end of the carriage.

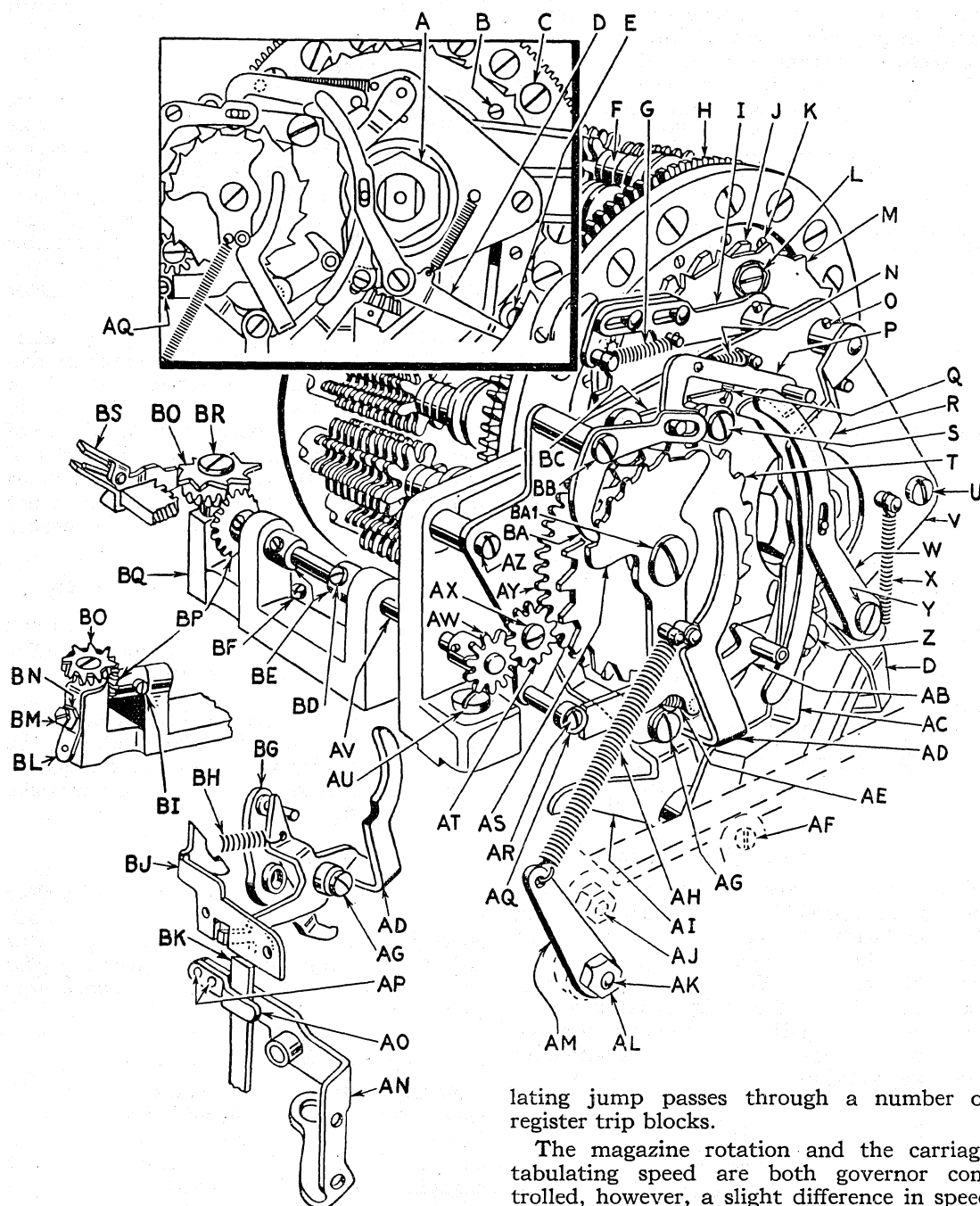
Carriage Return Interlock BM

As the shuttle arm moves inward, screw W leaves the interlock BM, and through spring V, moves over the plate of the carriage return clutch shaft BL. This is done to prevent engaging the carriage return clutch while interlock pawl BV is lodged in the carriage rack.

Tests and Adjustments

Interlock BM should have passing clearance over the plate of shaft assembly BL. To adjust, bend the plate, taking care not to loosen it on the shaft.

REGISTER AND CARRIAGE SYNCHRONIZING MECHANISM (Plate 45)



**Register and Carriage Synchronizing
Mechanism (Plate 45)**

This mechanism is used only on the skip tabulating machines. It insures the register selection from a tripping block remaining in step with carriage tabulation when the tabu-

lating jump passes through a number of register trip blocks.

The magazine rotation and the carriage tabulating speed are both governor controlled, however, a slight difference in speed between the two members remains because of their respective functions and distance of travel. Tabulating the registers through the synchronizing mechanism is accomplished with a chain of gears.

Register trip block BS moving through register trip star wheel BO, turns shaft assembly AV, and through intermediate gear

(Plate 45) Continued

AT, gear assembly AY and T are rotated. Escapement pawl AB is meshed with escapement gear T, and as the gear rotates, it carries up the escapement pawl, swinging ratchet segment AS. A roller in ratchet segment swings rocker arm AD, the upper ear of which swings register limit pawl BG out of the register limit gear J to permit the magazine to rotate.

Detent BC has a roller which rides in the teeth of escapement gear T to locate it at a definite position.

Escapement pawl AB ratchets back to normal when the tooth of disk M rocks arm assembly I and R, which in turn contacts the roller in the escapement pawl creating an escapement movement to allow the escapement pawl to ratchet. Rocker arm assembly I has passby slide to prevent arms R and W operating when the rotary magazine is returned.

When the top of rocker arm AD is swung rearward, a forward projection enters a slot in the shuttle slide BJ to prevent the register shuttle operation until the rotary magazine stops against the limit pawl BG.

Should the register trip blocks be set close together, it is possible to tabulate through several of them while the rotary magazine is rotating through one register trip operation. In this case the escapement pawl may be indexed up to as many as five positions on the ratchet segment AS by detent BA, as each tooth on the ratchet segment represents one register trip operation. When this condition takes place, disk M will ratchet the escapement pawl back to normal, one tooth or register position at a time.

Arm W is stud connected to arm assembly R, and its purpose is to continue the curved line of arm R over five register positions of the ratchet segment AS.

Ratchet arm AC has a notched edge which imparts the ratchet escapement movement to the escapement pawl AB when several register trip operations have been indexed in the ratchet segment AS.

When the rotary magazine is in the last register position, the head of screw E contacting on arm D moves ratchet arm AC forward, contacting the roller in escapement pawl AB, disabling it and detent BA. If the carriage tabulated through a number of register trip blocks, the escapement pawl is raised by each trip block, but due to the forward position of ratchet arm AC, an oscillating movement is imparted to the escapement pawl.

Tests and Adjustments

Detent BC is the basic locator of the escapement gear T and from this point the adjustments to follow are made. It is not permissible to adjust or bend the detent arm as this would change its length and the relative position of the synchronizing mechanism.

Register trip star wheel BO should be located with the active tooth forward in order that register trip block will contact only one tooth. The mesh of the star wheel with gear BP is changed, and remeshed to adjust. If this method fails to give the results required, remesh gears AW and AT and repeat the adjustment.

Register trip star wheel is moved back and forth by means of the eccentric in bracket BL, to obtain sufficient rotation of escapement gear T for detent roller BC to seat in the tooth spaces. Make the test by repeatedly tabulating and returning the carriage over its entire length.

Intermediate gear AT should have minimum play between gears AW and AY to insure full rotating action of the gears from the register trip star wheel. Intermediate gear is adjustable up and down in the slot of the synchronizing plate.

The nose of escapement pawl AB should have slight lead over the tooth of escapement gear T when ratchet segment AS is resting against the eccentric collar AQ. This is necessary to transfer the full rotating motion of the escapement gear to the escapement pawl. Eccentric collar AQ is turned for adjustment. To test the amount of lead of the escapement pawl, hold it manually in the normal position and rotate escapement gear toward it.

Ratchet segment teeth AS should have slight lead over detent BA to index the register trip operations if the carriage tabulating speed is faster than the rotary magazine motion. To adjust, remove stock from the nose of the detent.

In the register trip operation, limit pawl BG should have just a slight lead clear of the register limit gear teeth J. Keep in mind that the shorter the movement of the limit pawl, the lighter the load on carriage tabulation through the register trip block. Positive tripping of the registers is essential. To adjust, remove stock from the vertical projection of rocker arm where it contacts the stud in the limit pawl.

The forward projection of rocker arm AD should have minimum side clearance with the outside edge of the slot in the shuttle slide BJ.

(Plate 45) Continued

This is necessary to insure that the shuttle slide does not move inward with a register cob while the magazine is rotating. The adjustment is made by bending the forward projection of rocker arm AD.

The forward projection of rocker arm AD has a foot which blocks the motor bar depression when the register trip star wheel has been partially rotated by a register trip block. This condition must be considered when the forward projection on rocker arm AD is bent.

In the last register position, arm D should move escapement arm AC forward to disengage escapement pawl AB, when a register trip block rotates the register trip star wheel. This imparts an oscillating movement to ratchet segment AS. Arm D is bent for more or less throw from screw head E.

Detent BA should clear the teeth in ratchet segment AS in the last register position. The adjustment is made by weaving arm P to

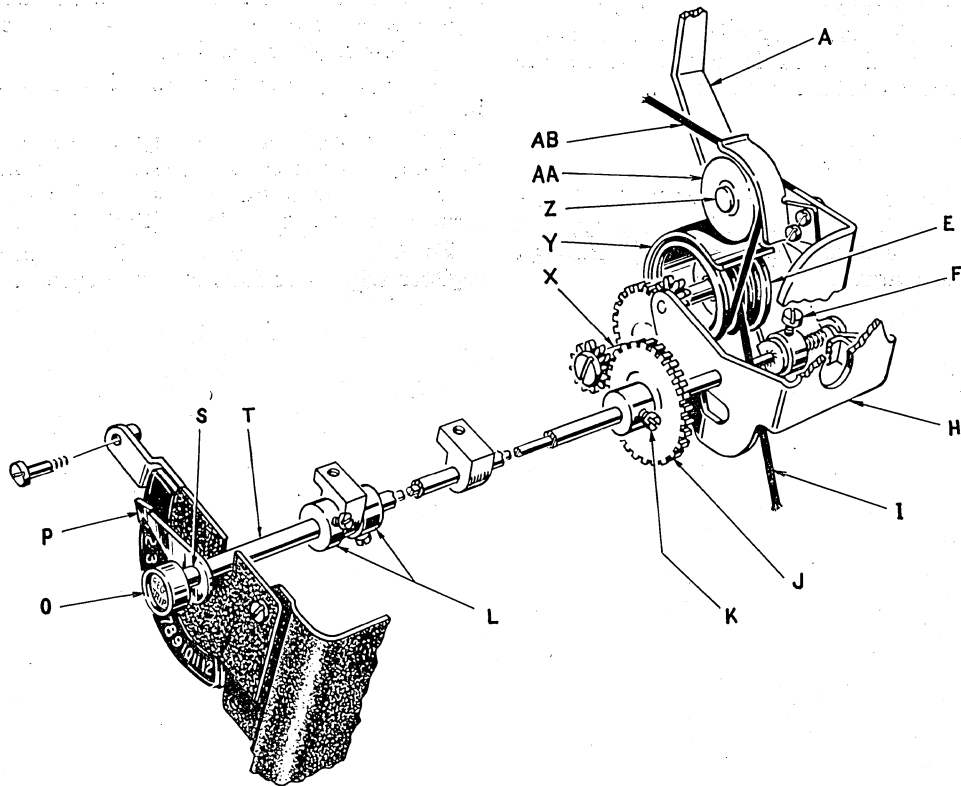
increase or decrease the movement from the stud.

Note: Ratchet segment AS has five teeth or positions to index register trip operations to compensate for the difference in carriage tabulating speed through a number of register trip blocks and the rotary magazine motion. In adjusting the governor speed of the carriage and the rotary magazine, it is unwise to use the full index capacity of the ratchet segment AS.

The ideal synchronized carriage tabulating speed and rotary magazine motion is to index no more than three register positions on the ratchet segment AS. The two remaining register positions on the ratchet segment should be retained as a margin of safety to insure accurate register selection.

To test the above, tabulate the carriage its entire length and observe how high the escapement pawl AB travels. Repeat the operation several times to obtain the true condition.

REGISTER POSITION INDICATOR MECHANISM—GEAR CONTROLLED—FOR 60 AND 100 PINION CONSTRUCTION REGISTER SECTION—SERIES M 200 AND M 800 MACHINES (Plate 46-1)



Register Position Indicator Mechanism—Gear Controlled—for 60 and 100 Pinion Construction Register Section—Series M 200 and M 800 Machines (Plate 46-1)

Purpose

To indicate the number of registers and show which is in active position.

Construction

This mechanism is used in all machines containing the one hundred pinion register section; and in order to standardize construction, it is also used in machines containing the sixty pinion register section beginning with serial number M2518D for Series M 200 machines and serial number M2613D for Series M 800 machines. Because of the wider register section in one hundred pinion machines, the arm (L, Plate 18) is not used as its movement is too limited. Gear J, which is fastened to indicator shaft assembly T, is used in place of the arm (L, Plate 18). It is actuated by

the geared portion of register return drum E through intermediate gear assembly X. Drum E is made with flanges higher than originally designed to better retain cords AB and I when wound on the drum; and contains one centrally located slot that prevents entangling of the cords. Guide plate Y is designed to accommodate the higher flanges of drum E. Roller AA is free to move laterally on shaft Z in order to follow cord AB as it is being wound or unwound on drum E. Collar S is provided as a limit for the depression of register trip key O; this prevents the incorrect positioning of the last active register, in those machines in which the full number of registers are not utilized, due to an overthrow of escapement pawl (T, Plate 17-1 Accumulation Symbol List) past register limit arm (D, Plate 17-1).

Operation

Register tabulation, through return cord AB, rotates cord drum E; which, through its geared portion, rotates gear assembly X. The

(Plate 46-1) Continued

latter, being meshed with gear J, rotates indicator shaft assembly T to position indicator P to the number of the active register.

Indicator P returns to figure one, when the register pinion assembly returns to normal, through cord I which is connected to the register return clutch cord drum.

Adjustment

1. Indicator shaft assembly T should be free to rotate, have minimum end play, and extend rearward approximately $\frac{1}{4}$ " through the forward arm of bracket H.

To adjust, position collars L.

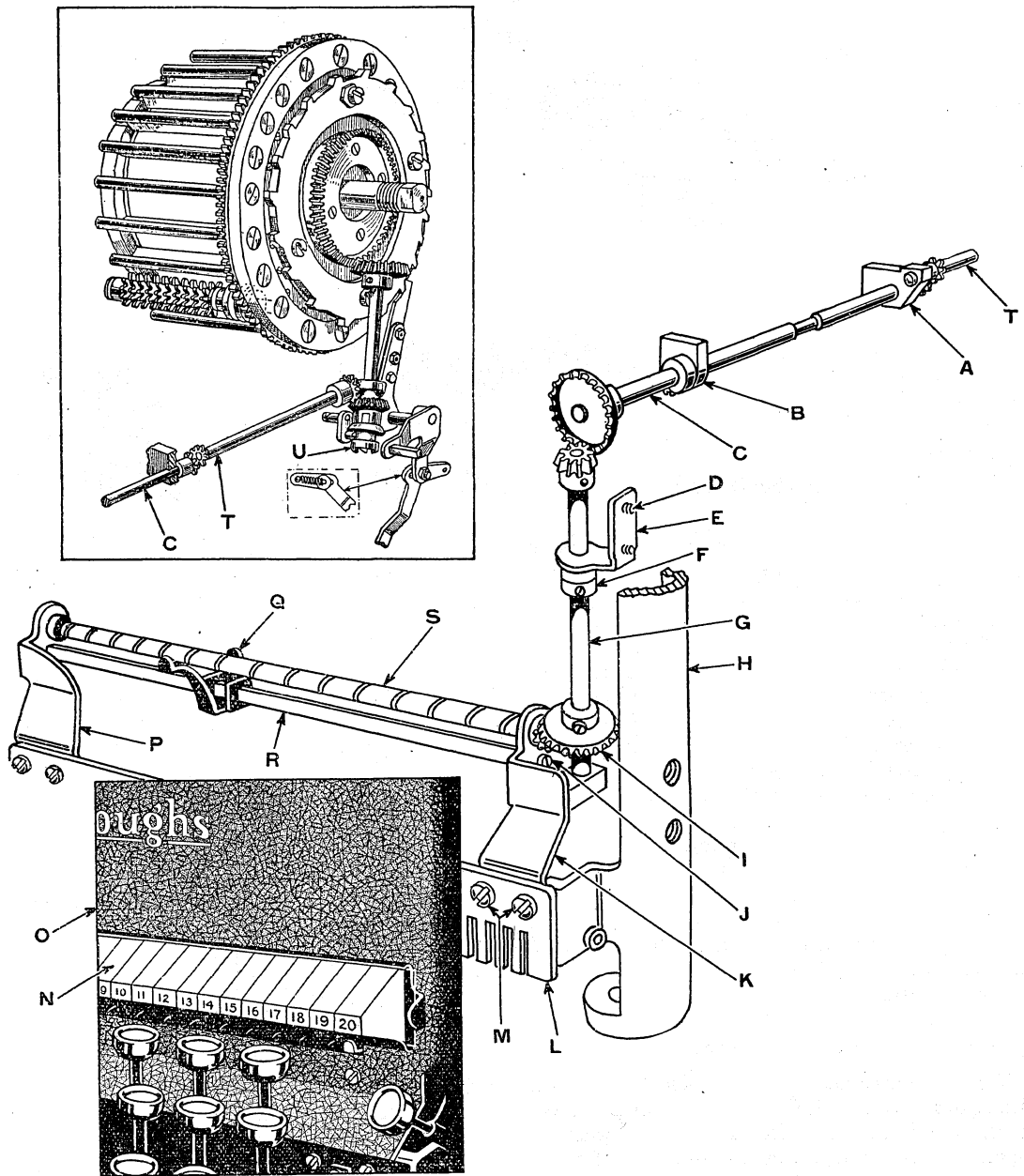
2. Indicator P should align with figure one when the register pinion assembly is in register No. 1 position, and with the last figure when the register pinion assembly is in the last register position.

To adjust, loosen screw K and position indicator P.

3. With register trip key depressed and limiting against collar S, escapement pawl T (Plate 17-1 Accumulation Symbol List) should clear escapement blade E (Plate 17-1).

To adjust, loosen screw F and position register trip shaft forward or rearward.

REGISTER INDICATOR, HORIZONTAL (Plate 46)



Register Indicator, Horizontal
(Plate 46)

This mechanism indicates the number of registers in the rotary magazine and shows which is in active position.

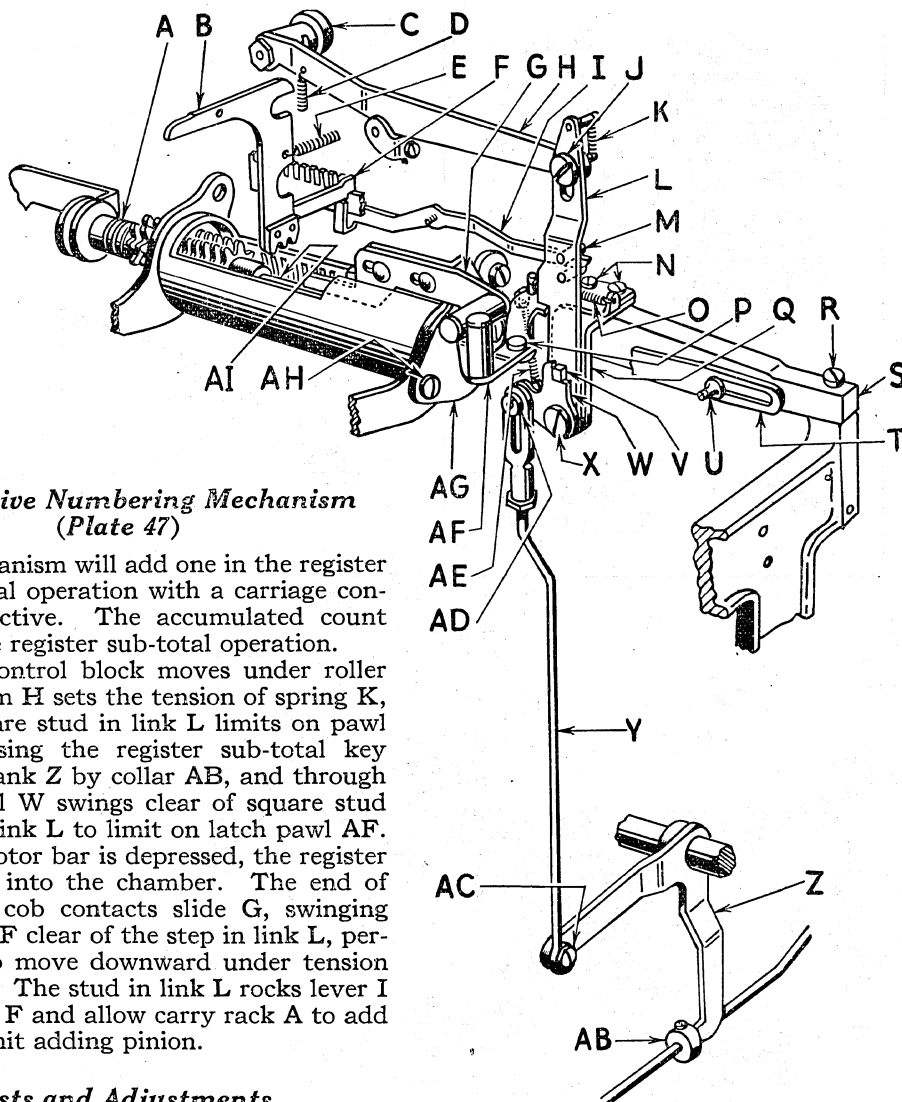
Register indicator Q fits over square bar R and has a stud which seats in the spiral groove of shaft S, giving the indicator horizontal movement in either direction from the rotation of the rotary magazine.

Shaft assemblies T, C, and G are the means of connecting spiral shaft S to the rotary magazine.

To set the indicator, return the rotary magazine to register one, loosen gear I, rotate shaft S to locate the indicator in register one, and tighten the gear.

The gears on shafts C and G should have full mesh and the shaft minimum end play, adjusted from the set collars on the shafts.

CONSECUTIVE NUMBERING MECHANISM, CLASSES 75 AND 77 (Plate 47)



*Consecutive Numbering Mechanism
(Plate 47)*

This mechanism will add one in the register on a sub-total operation with a carriage control block active. The accumulated count prints on the register sub-total operation.

When a control block moves under roller C, rocker arm H sets the tension of spring K, and the square stud in link L limits on pawl W. Depressing the register sub-total key rocks bell-crank Z by collar AB, and through wire Y, pawl W swings clear of square stud V, allowing link L to limit on latch pawl AF. When the motor bar is depressed, the register cob shuttles into the chamber. The end of the register cob contacts slide G, swinging latch pawl AF clear of the step in link L, permitting it to move downward under tension of spring K. The stud in link L rocks lever I to carry link F and allow carry rack A to add one in the unit adding pinion.

Tests and Adjustments

With a carriage control block active and the square stud in link L resting on pawl W, latch pawl AF should have just passing clearance under the step on link L. This is done to insure that the latch pawl has clearance to reset if a motor bar operation is made without the register sub-total key. The adjustment is made by removing stock from step on link L.

Latch pawl AF should have about half hold under the step of link L when the register cob is in the chamber. The speed of the register cob entering the chamber and contacting slide G is sufficient to overthrow latch pawl AF to release it. This is done to insure that latch pawl AF will always be in position to set the tension of spring K in

order to add the count in the correct column. The adjustment is made by swinging the stud in latch pawl AF or G.

The length of wire Y should be adjusted from its turnbuckle to hold the lower arm of bell-crank Z in a vertical position.

With the register sub-total key depressed, pawl W should clear the square stud in link L. Locate set collar AB on the register sub-total wire as required.

Lever I should raise carry link F with slight clearance over comb to insure releasing the carry rack. To adjust, bend lever I.

Note: A tabulation off the carriage control block must be made after the consecutive count operation to permit link L to reset for the next count operation.

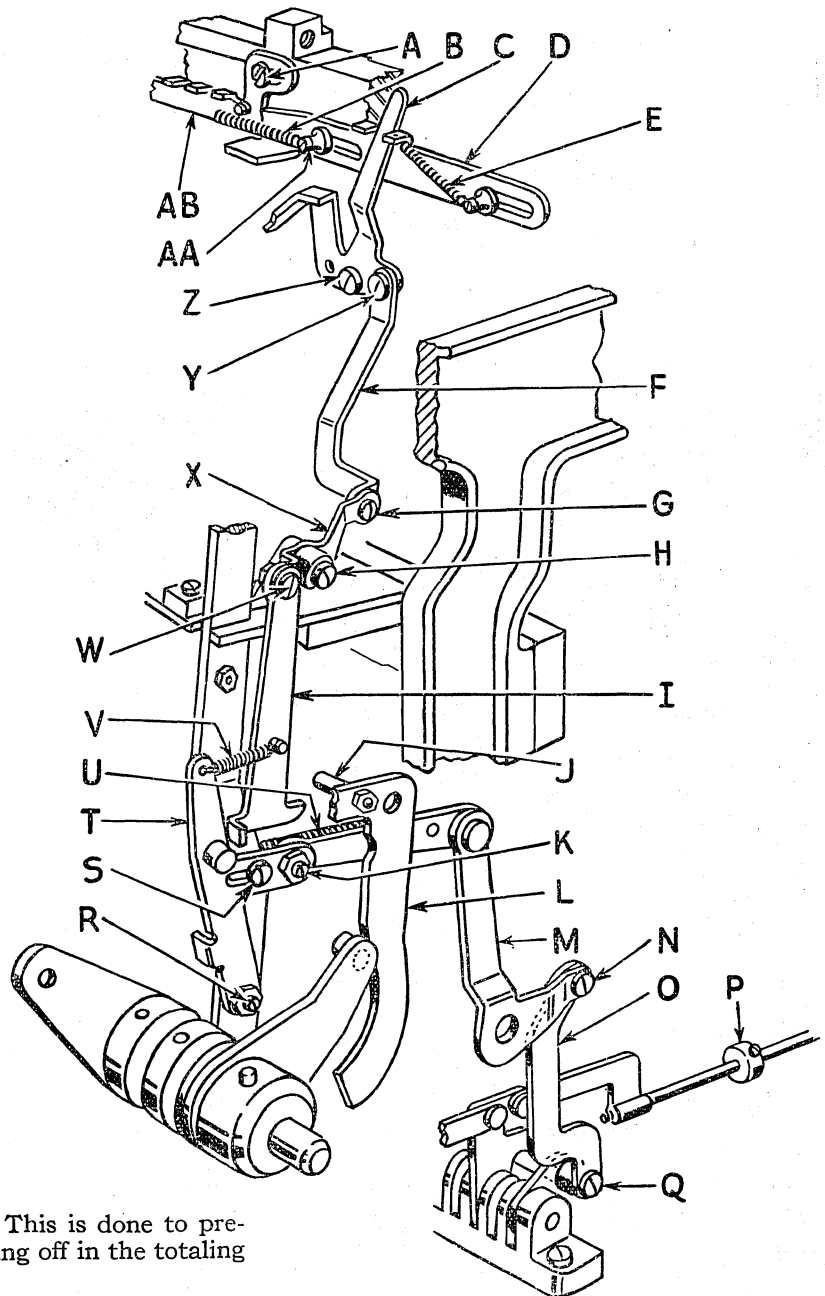
CONSECUTIVE NUMBERING, WITH MECHANISM FOR BLOCKING TRIP PAWLS, CLASSES 75 AND 77 (Plate 48)

Consecutive Numbering, With Mechanism for Blocking Trip Pawls (Plate 48)

Depressing the register sub-total key will index this mechanism to block the carry links by comb D on the machine operation. On machines without the consecutive count feature, comb D is moved to the blocking position on the key depression. This is done to prevent the carry links jarring off in the totaling operation.

When the register sub-total key is depressed, link O is moved downward, rocking bell-crank M which pulls arm T forward, placing its roller under meshing bell-crank L. As arm T moves forward, it contacts an ear on link I, moving the hook under stud J in the meshing bell-crank.

During the forward stroke of the machine operation, the main camshaft rocks meshing bell-crank L, lowering link I, which swings

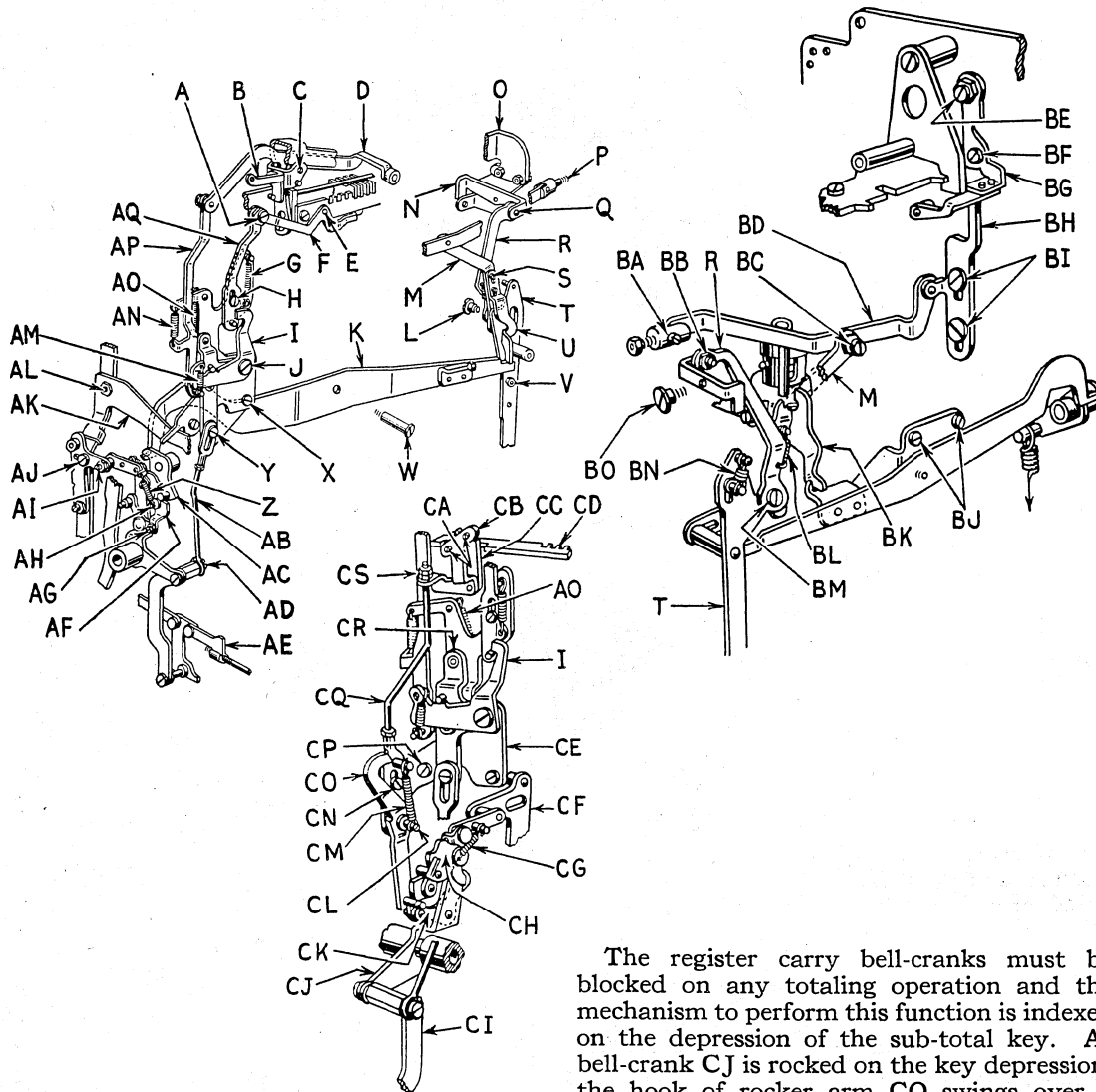


rocker arm X. Through link F and bell-crank C, blocking comb D is moved inward to block the trip of the carry links.

Tests and Adjustments

Stud J in the meshing bell-crank is eccentric to obtain full movement of blocking comb D in its slots without a bind.

CONSECUTIVE NUMBERING MECHANISM, CLASS 72 (Plate 49)



Consecutive Numbering Mechanism Class 7200 Machines (Plate 49)

This mechanism will add one in the unit column of the register by tripping the carry rack when the sub-total key is depressed on a carriage control block.

When a control block moves under the control arm D, it rocks hook pawl I over a stud in slide AQ through link AP. This connects the rocker arm F for tripping the carry link to the key linkage.

When the register sub-total key is depressed, linkage AE is latched, wire AB moves downward, drawing hook pawl I with it to trip carry link F through link AQ, to add one.

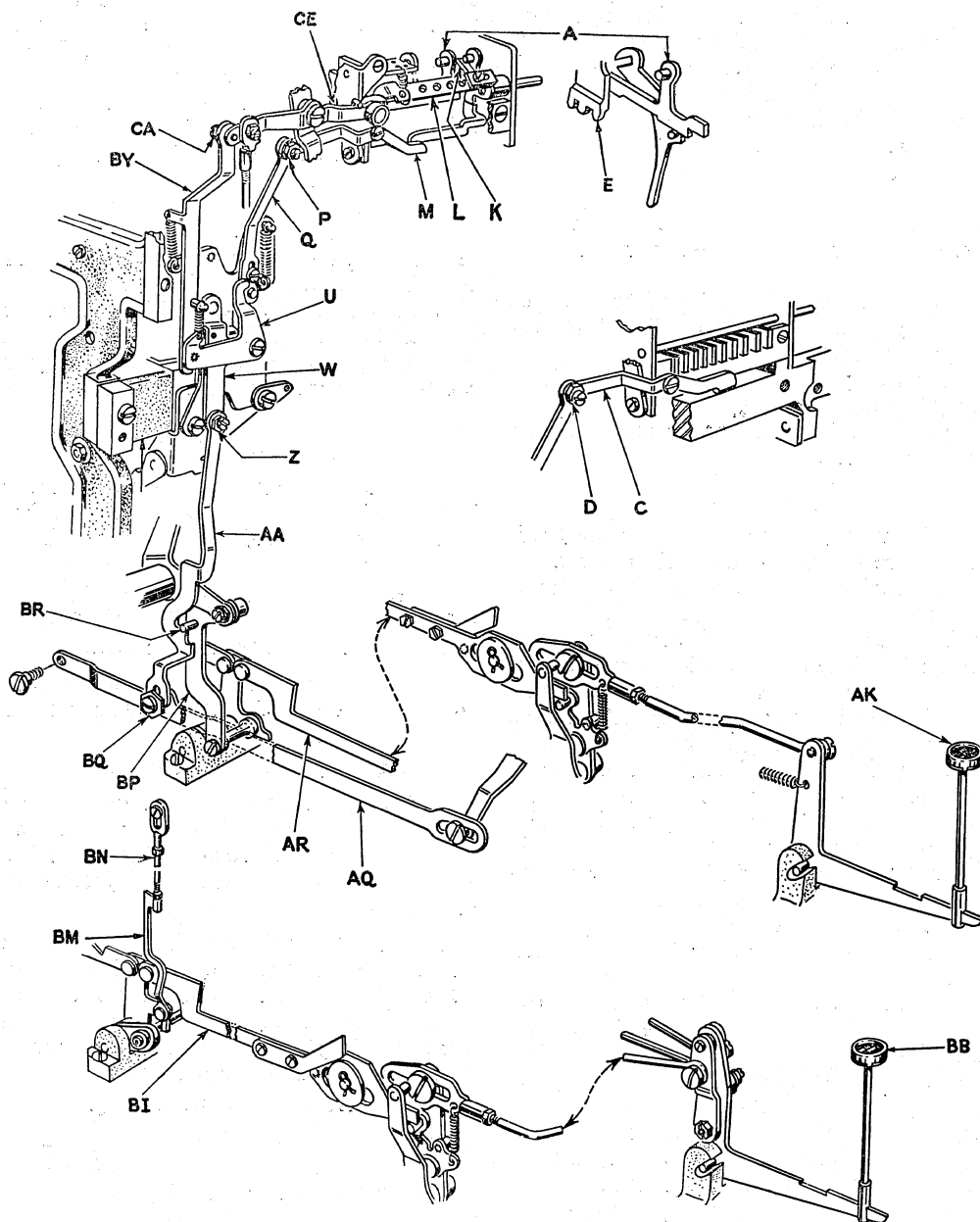
The register carry bell-cranks must be blocked on any totaling operation and the mechanism to perform this function is indexed on the depression of the sub-total key. As bell-crank CJ is rocked on the key depression, the hook of rocker arm CO swings over a spring stud in the turnbuckle of wire assembly CQ.

On the forward machine stroke, the register meshing bell-crank pulling arm AK downward, also carries down rocker arm CO and wire CQ, which moves rack CD to the left, blocking the carry bell-cranks.

Register Interlock

The sub-total key depression operates the register interlock mechanism to insure that the key cannot be depressed while the register pinion shaft is tabulating to prevent adding the count in the wrong column. Depressing the key rocks bell-crank CJ, pawl AC and rocker arm K. The latter, through links U and M, raises interlock BH into the slot of the register limit rack.

CONSECUTIVE NUMBERING MECHANISM TO COUNT IN A SPECIFIED COLUMN, CARRIAGE CONTROLLED—CLASS 72 AND SERIES M 200 MACHINES (Plate 49-1)



Consecutive Numbering Mechanism to Count in a Specified Column, Carriage Controlled—Class 72 and Series M 200 Machines (Plate 49-1)

Purpose

To provide for the addition of one in a specified column during a register sub-total operation.

Construction

This mechanism was introduced in Class 72 machines containing easy depression power result keys beginning with Serial No. B12678. These machines contain an individual register sub-total key and the sub-total key linkage is connected directly to the Consecutive Numbering Mechanism.

(Plate 49-1) Continued

In Series M 200 machines, beginning with Serial No. B197641, sub-totaling of any totaling operation is accomplished through the sub-total index key. Consequently, this mechanism was redesigned so that depression of the sub-total index key indexed the Consecutive Numbering Mechanism—when under carriage control—which then functions when the register total linkage moves forward.

Carry latches A are designed to permit tripping carry rack E in any desired column from one common function—rocking of bail L.

Changing the addition of one to another column may be readily accomplished by relocating finger K.

In machines prior to Serial B12678, it is necessary to change rocker arm C in order to change the column in which the addition of one takes place.

Operation

Initial indexing occurs when a control rail in line 2C moves over the roll on control lever CE which through link BY rocks hook pawl U over a stud in link Q.

Complete indexing occurs when the sub-total index key is depressed prior to depression of register total key AK. When the sub-total index key is depressed, link AQ moves forward placing the high step of link AA under BR in link BP. During a subsequent register sub-total operation, register total linkage AR, moving forward pulls link BP downward. The latter, through stud BR pulls link AA, slide W and link Q downward to rock rocker arm M. Rocker arm M through bail L and finger K trips carry latch A to permit the addition of one in the specified column.

In machines with easy depression power result keys prior to Serial No. B197641 the mechanism is completely indexed when a control rail rocks lever CE to rock hook pawl U over the stud in link Q. Then when register sub-total linkage BI moves forward, link Q is pulled downward through link BM, wire BN, slide W, and hook pawl U.

An extra idle machine operation—tab motor bar, add register—is required, just prior to the carriage entering the position in which the Consecutive Numbering Mechanism is active, to assure resetting the carry racks. This extra machine operation also assures that the register will be properly

positioned before the carry rack is released—in the following machines: all machines when using carriage controlled totals and sub-totals and tabulating through two registers; all machines except those containing the Carriage Controlled Total Machine Operation Delaying Mechanism (Plate 6H, Keyboard Instruction Book) when using carriage controlled totals and sub-totals and returning through two or more registers to the position in which the Consecutive Numbering Mechanism is active.

In machines that do not contain the sub-total index key, the add—CF key sometimes replaces register sub-total key BB in Position No. 72. In these machines the Consecutive Numbering Mechanism will advance, when in a carriage controlled position, from carriage controlled register sub-totals, no key being provided for manual indexing.

Adjustment

1. With a control rail active, hook pawl U should have at least a half hold on the stud in link Q; and with no control rail active, hook pawl U should cam off the stud when the register total linkage (or register sub-total linkage) pulls slide W downward.

To adjust, turn eccentric CA.

2. Rocker arm M, when normal, should have approximately .010" clearance below the arm of bail L.

To adjust, turn eccentric P.

Note: In machines that do not contain bail L, rocker arm C, when normal, should have the same amount of clearance below the carry rack latch. Make the adjustment from eccentric D.

3. With the sub-total index key depressed and latched, the high step of link AA should have a full hold on stud BR; and with the sub-total index key normal, stud BR should clear the high step of link AA when the result linkage moves forward.

To adjust, turn eccentric BQ.

4. With a control rail active, finger K should trip carry latch A with a slight lead as the register total linkage is latched forward on the result linkage lock during a register sub-total operation.

To adjust, turn eccentric Z.

Note: In machines that do not contain the sub-total index key, make the adjustment by shortening or lengthening wire BN.

*(Plate 49) Continued****Register Trip Key Interlock***

The rocking motion of rocker arm K raises arm R to place an ear of interlock N in the path of the register trip rod, thus blocking the depression of the register trip key.

Carriage Return Clutch Interlock

The rocking motion of rocker arm K swings the nose of interlock BK over the plate of clutch shaft assembly to block the engagement of the carriage return clutch members.

Tests and Adjustments

Hook pawl I should have a full hold on stud in slide AQ to insure connecting the carry link trip arm with the sub-total key mechanism. The adjustment is made from the eccentric in control arm D.

The sub-total key linkage must latch with slight lead when the key is depressed. The adjustment is made from wire in AE.

The turnbuckle of wire AB is adjusted to obtain the full movement of slide CR in the slots of its anchor blank.

Lever F should trip the carry link with slight lead to insure adding the count. The adjustment is made with the eccentric in lever F.

Rocker arm hook CO should have full hold on the stud in the turnbuckle of wire CQ when the sub-total key is depressed to insure rack CD blocking the carry bell-cranks. The adjustment is made by weaving the stud in rocker arm to or from AF.

Rack CD should move its full distance to block the carry bell-cranks. The nuts on wire CQ are adjusted as required.

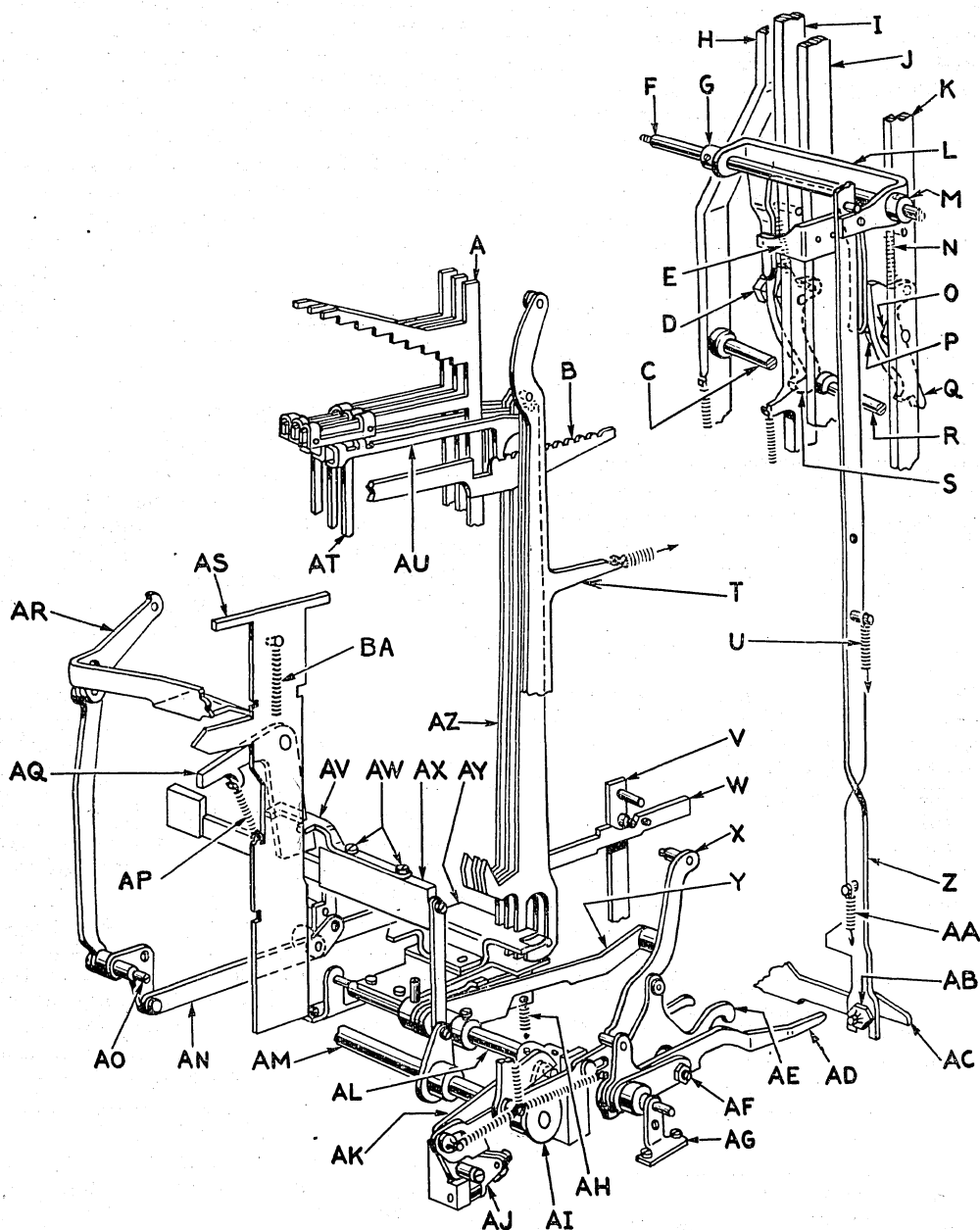
Register interlock BH should have passing clearance on the under side of the register limit rack between register positions. This is necessary to block the motor bar depression in this position. The adjustment is made with eccentric BC.

Register interlock BH is also raised on the depression of the register sub-total key. Link U is adjusted in its slots to block the key depression between register positions.

Interlock N should block the register trip key when the sub-total key is depressed to prevent tabulating the register on this operation. The eccentric in N is adjusted.

EXTEND MECHANISM, FORWARD STROKE, CLASS 78 (Plate 51)

(Plate 50 in Symbol Book Only)



Extend Mechanism, Forward Stroke, Class 78 (Plate 51)

Subtraction

General Information

The extend key is omitted on Class 7800 machines and the mechanism to perform this operation is indexed by a carriage control subtract block or by the depression of the crossfooter subtract key. From either operation, the machine will make two complete

machine strokes; the first being the extend, and the second the subtract operation.

The keyboard operation would be to add the larger amount in the crossfooter, list the smaller amount on the keyboard with the crossfooter subtract control active, depress the motor bar, take a balance to print the result. If a crossfooter subtract key is depressed, the result will be the same as from a crossfooter subtract control block.

On a credit balance problem, the smaller

(Plate 51) Continued

amount is added in the crossfooter. The larger amount is listed with a crossfooter subtract block active and the motor bar depressed. After the subtraction, the balance key is blocked, but the credit balance key can be depressed. Depression of the credit balance key causes the machine to operate three times, automatically printing the credit balance. The first operation extends the negative balance, the second is the subtract operation, while the third prints the credit balance.

Indexing the rack bars in the subtractor section and the complement layout of a subtract and overdraft problem is the same as covered in Plates 33 and 36 on the Class 77 machine.

The motor bar trips the drive clutch for the extend operation; the extend mechanism trips the subtract plate and the drive clutch for the subtract operation. It also disables simultaneous addition and intermediate keyboard, sets the writer key lock and indexes the ribbon and symbol mechanism.

Extend Mechanism Forward Stroke

When the control block moves under the subtract control arm, the limit for pawl AQ swings clear of the end of the pawl and lever X is rocked, placing the vertical part of the L shaped slot around the shoulder of the screw in driving arm AK.

As the raise bail shaft AM turns, the stud in hub assembly AI swings driving arm AK upward drawing lever X rearward to raise and couple arm AZ to the stud in the rack bar actuating arm T, to extend the amount in the subtractor. Driving arm AK is latched upward to retain the keyboard lock. It also disables the extend mechanism on the following subtract operation by the twin cams rocking lever X to the horizontal part of the L shaped slot after the extend operation is completed.

The rocking motion of lever X near the end of the forward stroke drops arm AK, allowing the detent arm AU to locate in the teeth of rack B.

Simultaneous addition couplers are disengaged by arm AD raising vertical arm Z which permits bail L to swing and the couplers Q and S to disengage from their respective studs.

Limit Arm AV

Limit arm AV for pawl AG is fastened to

raise bail AX, and it prevents the pawl on the cycle plate moving over the raise bail until the machine forward stroke has started. It also permits tabulating through the subtract control block without tripping the subtract mechanism as it provides clearance for the subtract bail to restore to normal.

Pawl AQ has a drop off step with a cam angle and as the raise bail moves upward, the limit arm AY clears the step allowing the pawl to move over the raise bail to pick up the cycle plate on the extend operation. The slight angle on drop off step is required to permit the limit arm to cam the pawl rearward and reset on the down stroke of the cycle plate.

Drive Trip for Subtract Operation

The drive clutch is tripped by the motor bar for the extend operation, and the upward movement of cycle plate AS trips the drive clutch for the subtract operation. The pointer on the cycle plate swings bail AR and through link assembly AN, drives slide W forward, camming drive trip link V upward to release the drive clutch.

Tests and Adjustments

Bail AR should have minimum clearance over the pointer of cycle plate AS when the latter is in the upper position, to insure tripping the drive clutch for the subtract stroke from slide W in the forward position. The adjustment is made by bending the shelf of the bail up or down.

When driving arm AK has completely raised shaft assembly AL, the slot in the top of arm AZ should have a full hold on the stud in rack bar actuating arm T. This is done to couple the index detents AU with the rack bar actuating arms to extend the amount. The adjustment is made from eccentric AF.

Arm AD should have slight play under arm AC when shaft assembly AL is completely raised. This arm should disengage the simultaneous addition couplers, but it should not create a bind on arm AC, the movement of which is limited by the twin cams being in the slot of the guide shaft on the side frame. To adjust, bend the arm AD up or down.

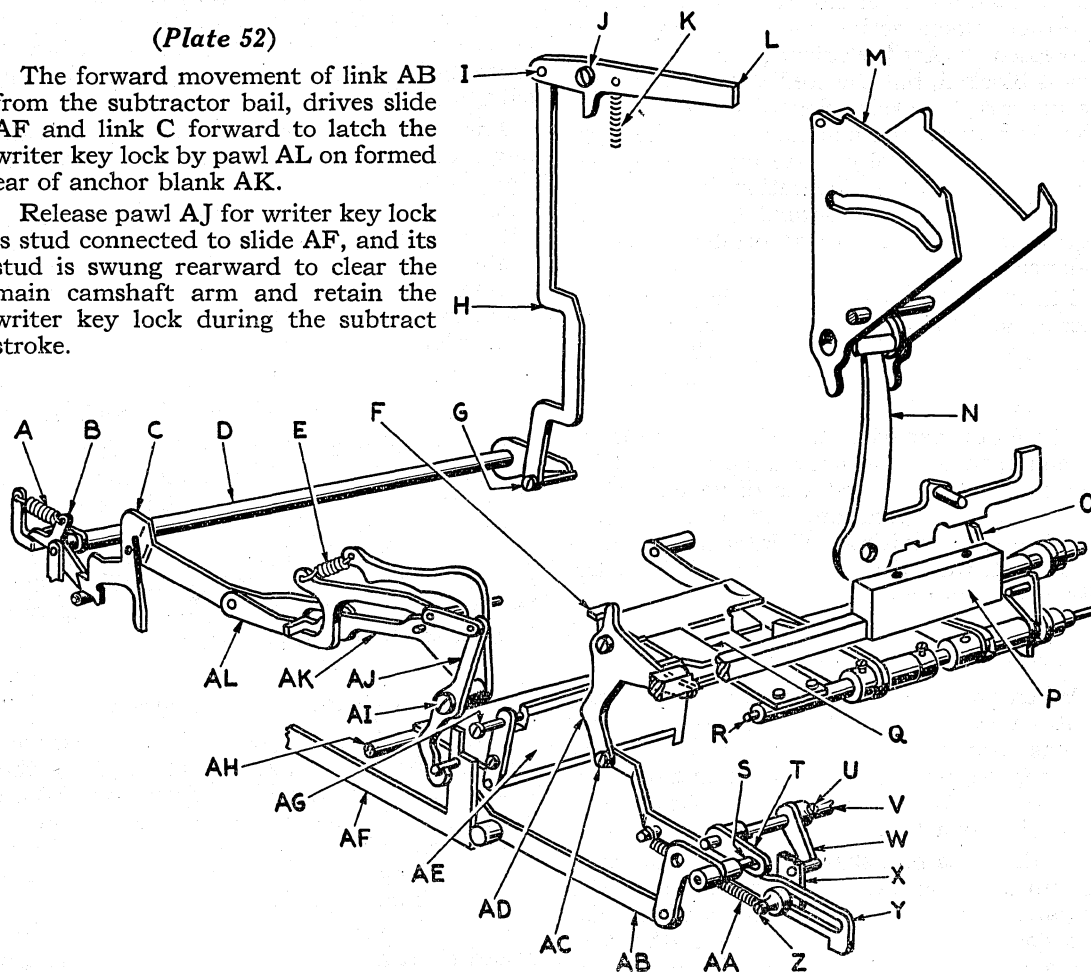
Limit arm AV should align flush with the drop off step on pawl AQ. To adjust, bend the limit arm up or down. This condition is very important as it provides the limited available time pawl AQ has to move over the raise bail while the latter is already on its upward stroke.

EXTEND MECHANISM, RETURN STROKE, CLASS 78 (Plate 52)

(Plate 52)

The forward movement of link AB from the subtractor bail, drives slide AF and link C forward to latch the writer key lock by pawl AL on formed ear of anchor blank AK.

Release pawl AJ for writer key lock is stud connected to slide AF, and its stud is swung rearward to clear the main camshaft arm and retain the writer key lock during the subtract stroke.



Intermediate Keyboard Section

The forward movement of link C rocks shaft assembly D which raises lever L through vertical link H to disable the intermediate keyboard section on the subtract stroke.

Twin Cam Shift Index

As the subtractor bail rocks assembly AB, it swings shaft assembly V which moves cam W forward, allowing the twin cam shift pawl AD to rock into the path of the raise bail P through link Y.

Extend Return Stroke

When raise bail P moves downward, it contacts the nose of the twin cam shift pawl AD, driving the toggle plate AE forward to rock the toggle shaft and move the twin cams to the crossfooter position through arm O swinging lever N.

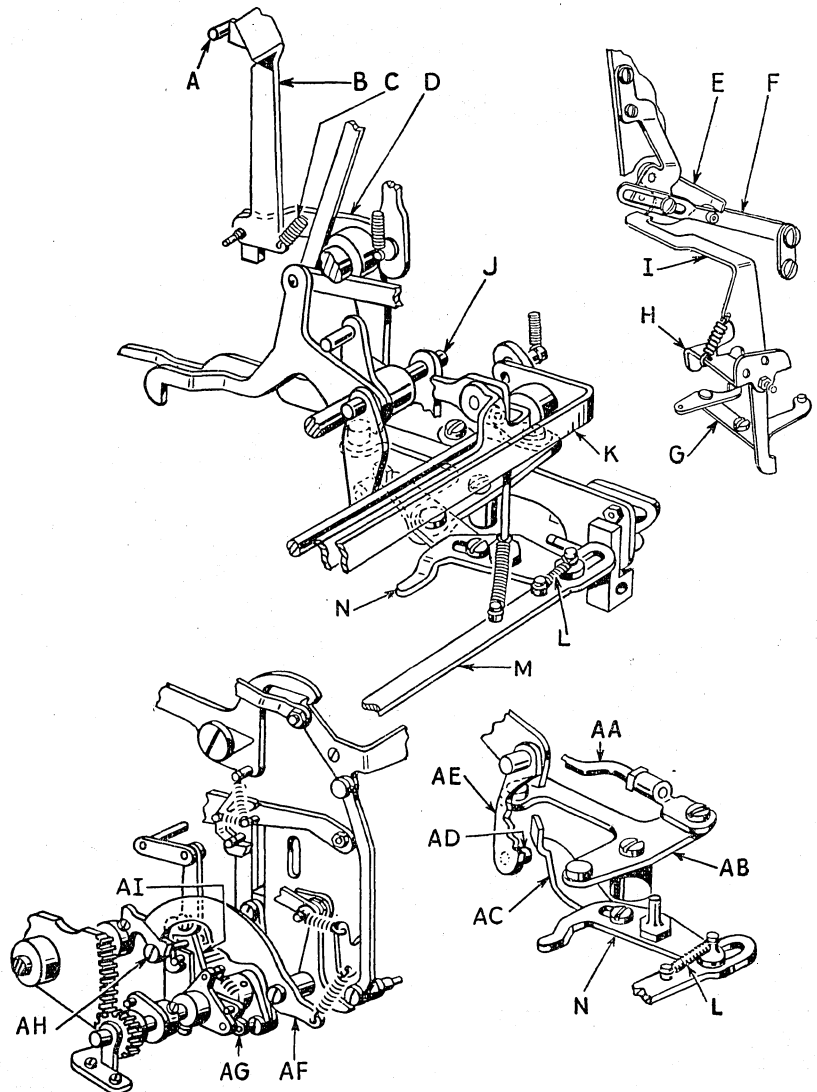
Tests and Adjustments

The ear of twin cam shifter pawl AD should rest against limit arm F in the normal position to insure clearance of the raise bail and prevent a cam shift on a regular motor bar operation. The adjustment is made by locating the hub assembly cam W on the shaft.

When the hub assembly cam W is in the forward position, the nose of the cam shifter pawl should have sufficient contact under the raise bail to shift the twin cams to the crossfooter position. This condition must be considered when locating hub assembly cam W for the above adjustment.

To obtain sufficient throw of the twin cams M to move to the crossfooter position from the cam shifter pawl, arm O is bent up or down as required.

REGISTER SUBTRACT CLEARING MECHANISM, CROSSFOOTER AND REGISTER SUBTRACT RELEASE MECHANISM, TOGGLE LATCH MECHANISM, CLASS 78 (Plate 53)



Register Subtract Clearing Mechanism (Plate 53)

On the depression of the register subtract key, the extend clearing mechanism is indexed by the side movement of link M, which swings bell-crank assembly N and AC. The formed ear on AC limits against stud AD.

Hub assembly AE is fastened to the raise bail shaft. As the shaft is turned on the forward stroke, the hub assembly swings rearward, allowing spring L to move bell-crank AC into the direct path of stud AD.

Near the end of the return stroke, stud AD contacts the formed ear of AC, driving it forward, which swings bell-crank AB to move shaft assembly J sideways into the extend clearing position. Wire AA connected to bell-crank AB, rocks bell-crank D, lowering latch B and latching it on stud A to hold the mechanism in the clearing position for the following subtract stroke.

Latch B is released on the forward stroke of the subtract operation to allow the clearing mechanism to restore to normal.

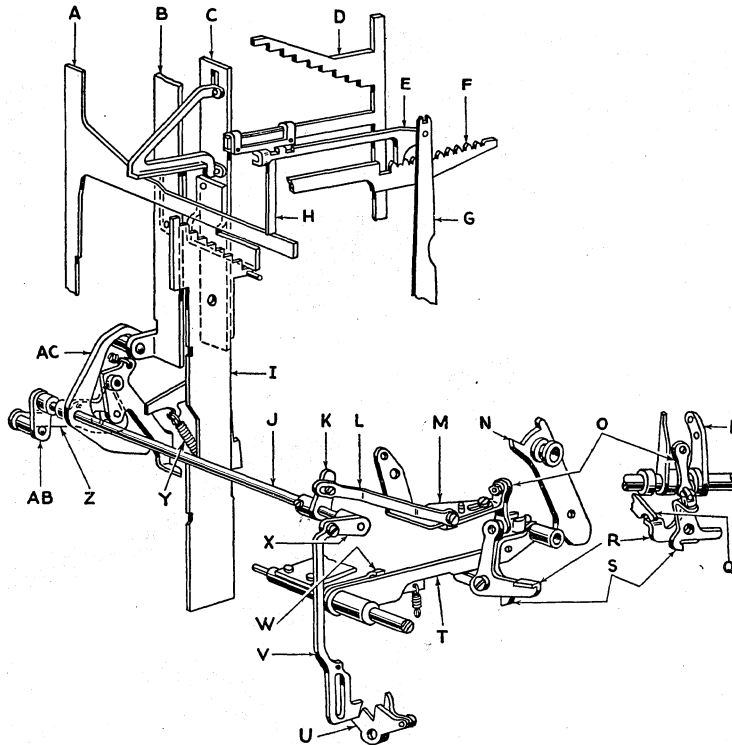
Crossfooter and Register Subtract Release Mechanism

When the crossfooter-and-register-subtract key is depressed, it is latched by latch E, which was formerly released at the beginning of the subtract stroke, but now is released near the end of the extend stroke by assembly G contacting part I. Part I swings on bracket H which is fastened to the side frame.

Toggle Latch Mechanism

When toggle plate AI moves forward, latch AF locates in back of screw AH to hold the toggle until released by passby pawl AG.

CROSSFOOTER SUBTRACT MECHANISM, FORWARD STROKE, CLASS 78 (Plate 54)



Crossfooter Subtract Mechanism Forward Stroke, Class 78 (Plate 54)

Subtract plate I raises lift arms A, which in turn raise index arms H and index limit plate D for the rack bars to index to the subtract complement. This function is covered in detail in Plate 33.

Subtractor Clearing Mechanism

As the subtract plate moves upward, it carries with it vertical link B. A stud in this vertical link contacts bell-crank AC, rocking shaft assembly J and drawing link L rearward. As slide M is drawn rearward by link L, coupling link O is moved into the slot of clearing hub assembly P.

Near the end of the forward stroke, cam N drives link T downward, rocking bell-crank S which swings hub assembly P to the clearing position and at the same time bell-crank R

contacts link Q to raise the index detents E out of the rack F.

Tests and Adjustments

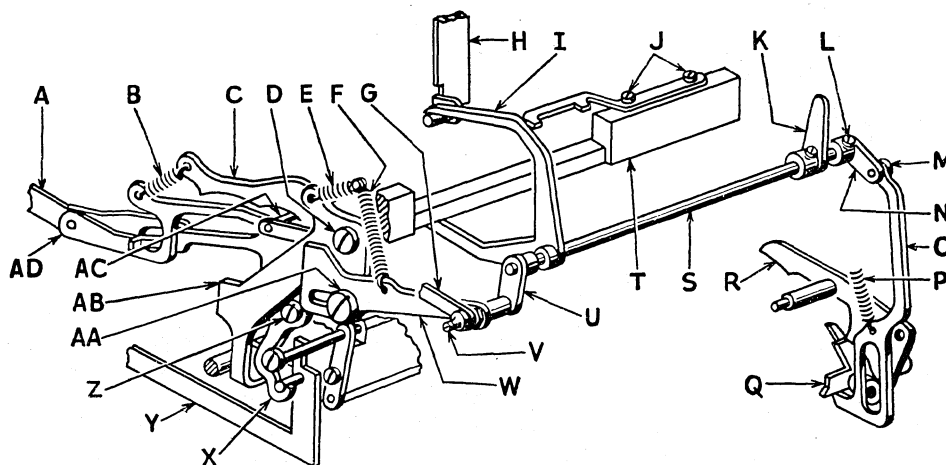
Coupling link O should seat fully in the slot of hub assembly P when the subtract plate is in the upper position. This is done to insure that the hub assembly will shift to the clearing position to clear out the extension. To adjust, the hub assembly K is located on the shaft as required.

Hub assembly P is located on its pivot shaft to align the slot with the coupling link O, by moving its set collar limit as required. This is done to permit the coupling link to move into the slot of hub assembly P.

On the 7800 machine, the extend clearing mechanism is normally inactive because cam N operates link T on each machine operation. Therefore, it is necessary to couple this mechanism on the subtract operation to obtain the clearing operation.

The clearing adjustment for index detent E is covered under Plate 51.

CROSSFOOTER SUBTRACT MECHANISM, RETURN STROKE, CLASS 78 (Plate 55)



Crossfooter Subtract Mechanism Return Stroke, Class 78 (Plate 55)

Toggle Restoring

Restoring link W moves forward as shaft S is rocked by link H, seating the pocket of its slot over the shoulder of screw AA. When the raise bail moves downward, it contacts the lower arm of bell-crank I, driving the toggle restoring link rearward. The latter pulls bell-crank AB with it to restore slide Y and toggle plate shaft S. As the toggle restoring link moves rearward, it is cammed out of the pocket into the horizontal part of the slot to release it by screw D.

Writer Key Lock Release

Slide Y moving rearward, swings link X, which locates stud AC forward over the latch AD. As the main camshaft restores, the writer key lock is released when latch AD is moved downward.

Keyboard Lock Release

Link O is moved downward as shaft S is

rocked upward, placing the hook under keyboard lock pawl Q. When shaft S is restored by the raise bail, the upward movement of link O swings pawl Q, releasing the keyboard lock and the extend driving arm R.

Tests and Adjustments

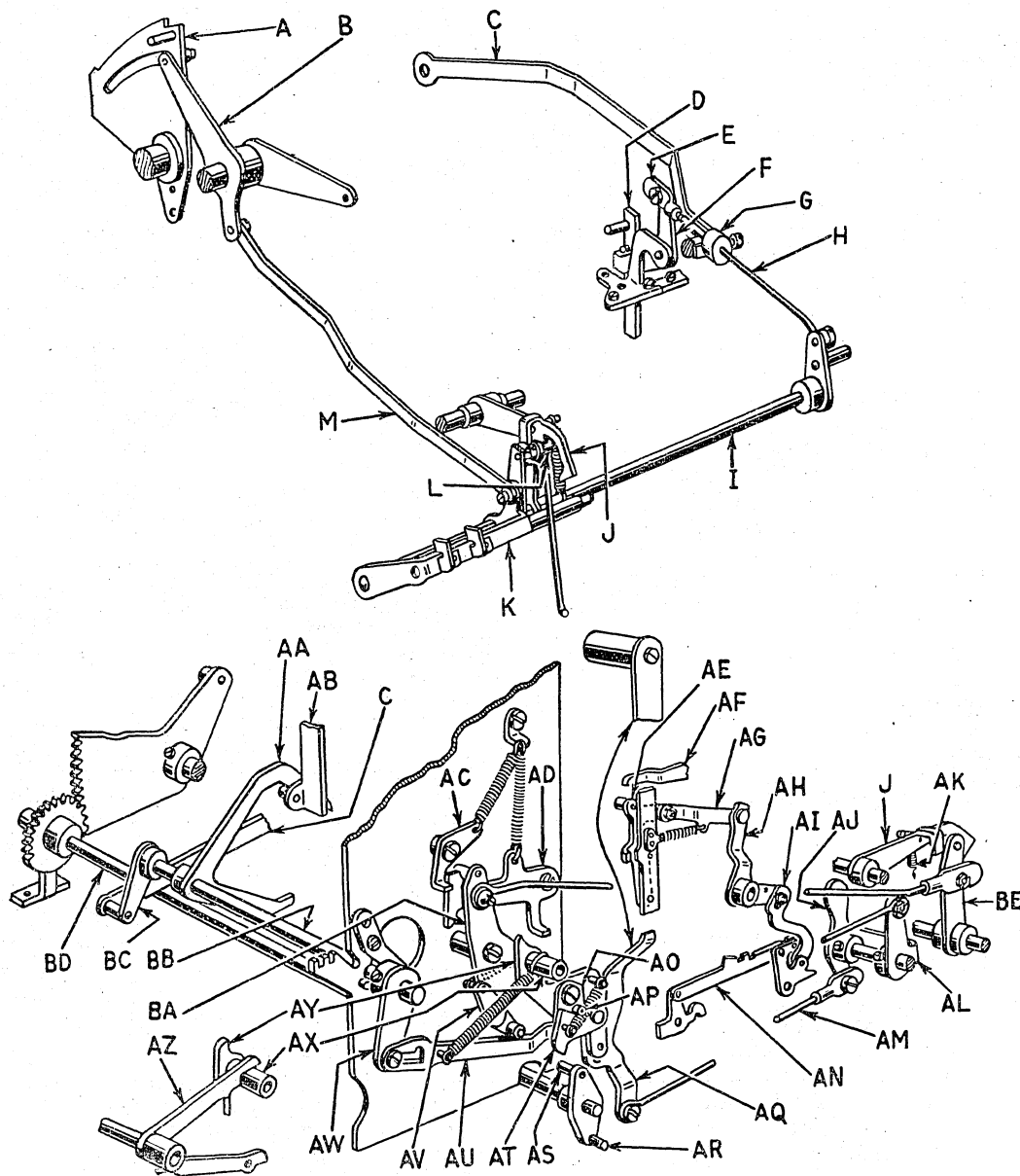
Hub assembly L should locate on shaft S to provide link O with sufficient movement to locate under pawl Q in the lower position. In the normal position, the hub assembly should not limit against the shaft immediately above it. The adjustment is made by locating hub assembly L as required on shaft S.

The slot in link O being wider than the shoulder of the screw holding it to pawl Q, provides a passby effect to permit it moving under pawl Q.

Toggle restoring link W should seat in the pocket of its slot in the forward position to insure driving bell-crank AB rearward. Eccentric V is adjusted as required.

Bell-crank AB should restore slide Y and the toggle plate before the toggle restoring link is cammed out of the pocket. The formed foot on the bell-crank is bent as required.

CREDIT BALANCE SUBTRACT OPERATION, FORWARD STROKE (Plate 56)



Credit Balance Subtract Operation, Forward Stroke (Plate 56)

The credit balance key depression trips the drive clutch for the first of a three operation cycle when the negative balance is extended, by rocking power shaft I forward. The second cycle is the subtract operation, and the drive clutch is tripped from the subtractor bail. The third cycle is the credit balance operation, and the drive clutch is

tripped from pawl J holding power shaft I forward.

When the subtract plate moves upward, link AB rocks shaft assembly BB through bell-crank AA, rocking AW forward to seat the shoulder of its screw in the pocket of the slot in link AU. Arm BC on shaft BB drives link C forward, contacting collar G, and through wire H, bell-crank F is rocked to raise the drive clutch stem D for the power to make the third or credit balance operation.

Power shaft I is rocked forward by wire H

(Plate 56) Continued

and held in this position by link C until pawl J moves downward over stud L to latch it forward. Pawl J can only fall after a depression of the credit balance key has latched pawl BA forward by latch AD. The wire extending from pawl BA to arm BE is the means of moving limit arm BE forward, and the screw in it from under the formed ear of pawl J.

Return Stroke, Latching Credit Balance Linkage

When the raise bail rocks shaft BB to normal, link AU is drawn rearward swinging the drive pawl AT downward into the path of stud AS. The raise bail shaft BD rotating, swings bell-crank carrying stud AS, which contacts against the front side of the drive pawl driving it and link AQ rearward. Link AQ has a vertical slot near the bottom to connect it to the drive pawl assembly and this slot permits the swinging motion of the drive pawl to draw the link rearward. Wire AM connecting link AQ and bail AL rocks the bail, drawing the credit balance linkage AN forward to latch it in the same manner as any result key linkage on a manual depression of a key.

At the same time the credit balance linkage AN is latched, the fork limit AZ latches the drive pawl assembly AX forward, and the nose of pawl AY swings the latch pawl AD downward, and it is held in this position by detent AC. Assembly BA cannot release at this time because pawl J is holding it forward.

Crossfooter Meshing

The forward movement of the credit balance linkage swings link AI downward, rocking bell-crank AH, which pulls link AG forward, placing roller in AE under the power meshing arm AF. The rocking motion of the power meshing arm AF draws the meshing link for the crossfooter downward to mesh the adding pinions with the rack bars.

When pawl BA is latched on the depression of the credit balance key, the auxiliary pawl assembly AV places tension against link AU to insure that it will seat in the pocket when hub assembly AW moves forward. The auxiliary pawl assembly has a spring joint which yields on the depression of the credit balance key.

Drive pawl AT is held in the path of stud AS by the link AU until the end of the forward stroke of the third cycle when stud AR contacts and raises forked limit arm AZ and pawl J.

The credit balance linkage moves the twin cams to the non-add position in the same manner as any other result key linkage; indexes the red ribbon, symbol, and the automatic date disabling mechanisms.

Tests and Adjustments

When the credit balance key is depressed, pawl BA should latch with slight lead on latch pawl AD. The adjustment is made from the wire connecting arm BE and the key. This is done to insure having pressure against link AU to seat in its pocket on the forward subtract stroke.

Wire connecting pawl assembly BA and arm BE should be adjusted to hold the screw head in BE with about 1/64" clearance on the formed ear of latch J with latch pawl AD holding pawl assembly BA. This is necessary to secure clearance for pawl J to fall behind the screw head in arm BE to retain drive clutch power to complete the third or credit balance operation.

The wire connecting vertical link AQ with bail AJ is adjusted to hold the shoulder of large head screw in the bail in about a vertical position. For detailed adjustment, refer to Plate 40 of the Keyboard Instruction Book.

Wire J should hold the shoulder of screw K on the step of the slot in link Q. This is necessary to prevent link Q moving forward when the credit balance linkage is latched by bail N. Bail N moves link Q only on the sub-total of a credit balance.

Credit balance linkage AN is latched with slight lead just as any result key on a manual depression. The adjustment is made from the short wire of the credit balance linkage. Make the test at the end of the subtract operation of a credit balance, when stud AS is contacting drive pawl AT.

Link C should hold power shaft I forward with slight clearance on the step of latch J, to insure the latch will hold the shaft forward for the power to complete the credit balance stroke. To adjust, move collar G as required.

With the credit balance linkage latched, the roller in arm AG should be under meshing bell-crank AF. This adjustment should be the same as when the balance key is depressed. It should provide a full mesh of the cross-footer adding pinions in the rack bars. The adjustment is made from the eccentric in link AG.

The shoulder of the screw in hub assembly AW should be in the pocket of link AU when the subtract plate is in the upper position. To adjust, locate hub assembly AW as re-

(Plate 56) Continued

quired on shaft BB. This adjustment insures drive pawl AT being lowered into the path of stud AS to latch the credit balance.

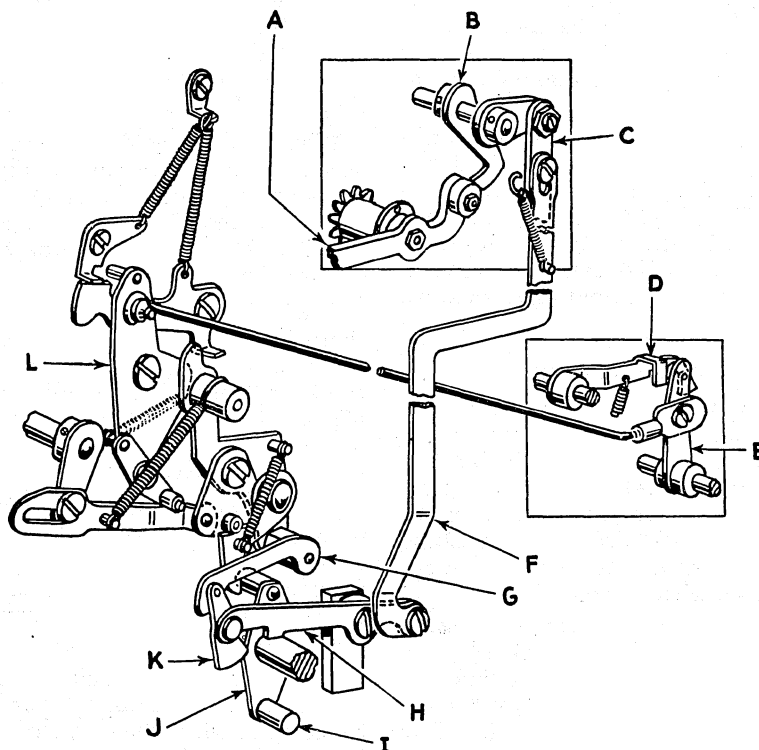
When pawl assembly AY is latched forward by AZ, latch pawl AD should be lowered to allow the ear on auxiliary detent AC passing clearance over it. The adjustment is made by swinging the lower foot of latch pawl AD. Detent AC holds the latch pawl down until it is released by assembly BA restoring when pawl J is raised.

Limit pawl AZ has two steps, the lower step is the normal limit for the drive pawl assembly AY. The forward step acts as a limit for this same assembly to prevent it receding due to

the latching lead required for the credit balance linkage. The forward limit is most important when taking a credit balance on a carriage control subtract block to insure normalizing the crossfooter subtract mechanism. Limit pawl AZ is released by stud AR on the forward stroke of the credit balance operation.

For this adjustment, refer to Plate 37, Keyboard Book, for all letters except AX, which is shown on Plate 56. Link AL is connected to stud AX by means of an eccentric which is adjusted to fully restore bail AN if a credit balance is taken from a subtract control block. This is necessary to normalize the crossfooter subtract mechanism on the third or credit balance operation.

【CREDIT BALANCE MECHANISM, CROSSFOOTER CONTROLS, CLASS 78 (Plate 57)



**Credit Balance Mechanism,
Crossfooter Controls
(Plate 57)**

Forward Stroke

In late machines, the crossfooter power meshing mechanism is indexed when the credit balance linkage is pulled in on the latter part of the subtract return stroke. At the beginning of the forward stroke of the third operation, the crossfooter is meshed as explained under the subject "Balance, Product, and Register Power Meshing Mechanism," Plate 29 in the Keyboard Instruction Book.

In early machines, the adding wheels are meshed with the rack bars as follows: Arm J,

through stud I contacting cam K, rocks lever H, which, through links F and C, swings meshing cam B to lower the crossfooter.

Link F is slotted to allow normal operation of link C to mesh the crossfooter during subtract operations.

Note: Late machines do not have link F and parts H, K and G.

Tests and Adjustments

When cam K is completely raised, arm B should be over the center of the roller on side plate A.

Adjustment: Angle of link F is bent.

CONSECUTIVE NUMBERING MECHANISM, CLASS 78 (Plate 58)

**Consecutive Numbering Mechanism,
Class 78 (Plate 58)**

This mechanism counts one and prints the accumulated count on the depression of the register sub-total key and the motor bar. In order to sub-total an amount, the sub-total index mechanism must be indexed by the depression of the sub-total key.

Depressing the sub-total key indexes the regular total linkage through wire L. Wire K fastened to this same key rocks bell-crank P, and through wire I and link E, rocker arm C raises the carry link B out of its comb to add one to the unit adding pinion.

The sub-total index linkage is latched forward by the rocking motion of bell-crank P contacting set collar N on wire J, the front end of which is connected to the sub-total index key.

It should be noted that the regular register total key and sub-total index key operations can be made without actuating the consecutive count mechanism because of the slotted turnbuckle on each key.

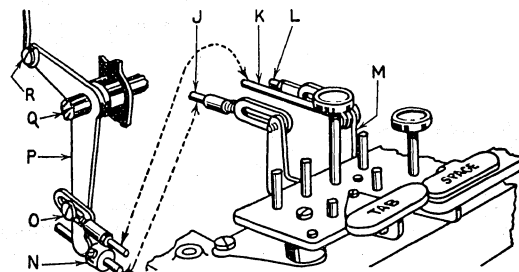
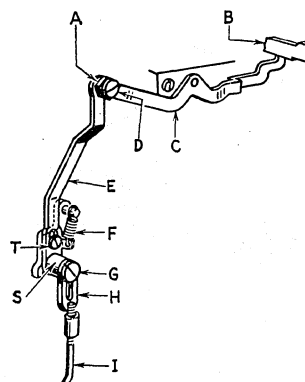
Tests and Adjustments

The turnbuckle on wire L should be adjusted to latch the total linkage with slight lead when the sub-total key is depressed.

Wire J is adjusted from the turnbuckle to latch the sub-total index key with slight lead.

Wire I is adjusted from the turnbuckle to hold the lower arm of bell-crank P in a vertical position.

Wire K is adjusted from the turnbuckle to



move link E the full length of its slot when the sub-total key is depressed.

Eccentric A is adjusted to trip carry link B out of its comb with slight lead when the sub-total key is depressed. In the normal position, rocker arm C should have slight clearance under carry link B.

Set collar N should be located on wire J to latch the sub-total index linkage when the sub-total key is depressed.

COUNTER DIALS TO ADVANCE FROM MOTOR CARRIAGE RETURN (Plate 59)

Counter Dial to Advance from Motor Carriage Return (Plate 59)

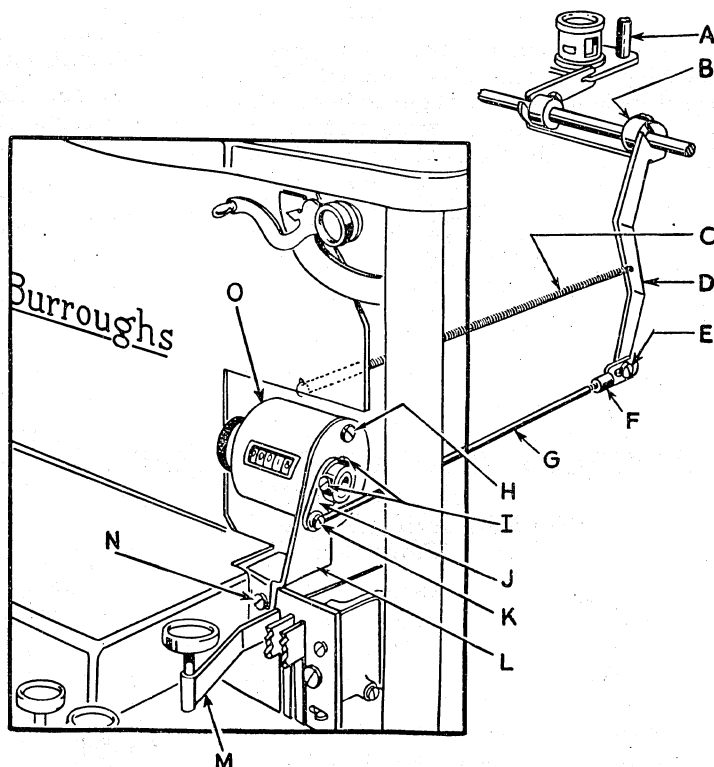
The counter dial is advanced one position through the engagement of the carriage return clutch to count the motor carriage return operations.

Depressing the carriage return key engages the carriage return clutch and the upward movement of shaft A rocks bail D, drawing wire G rearward to swing counter crank J to advance the dial one position.

Tests and Adjustments

Wire G is adjusted from the turnbuckle to advance the dial one position with slight lead.

Bail D pivots on the ribbon feed shaft and the two set collars B are located on this shaft to allow slight play in the bail.



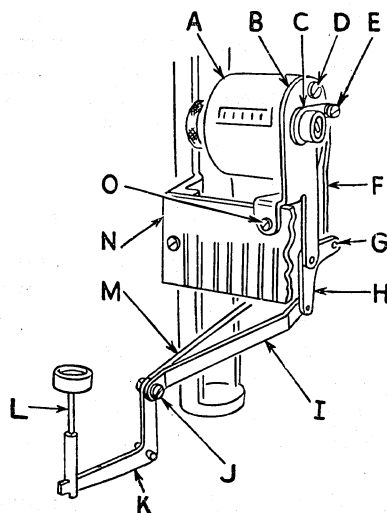
COUNTER DIALS TO ADVANCE FROM DEPRESSION OF RESULT KEYS (Plate 60)

Counter Dial to Advance from Depression of Result Keys (Plate 60)

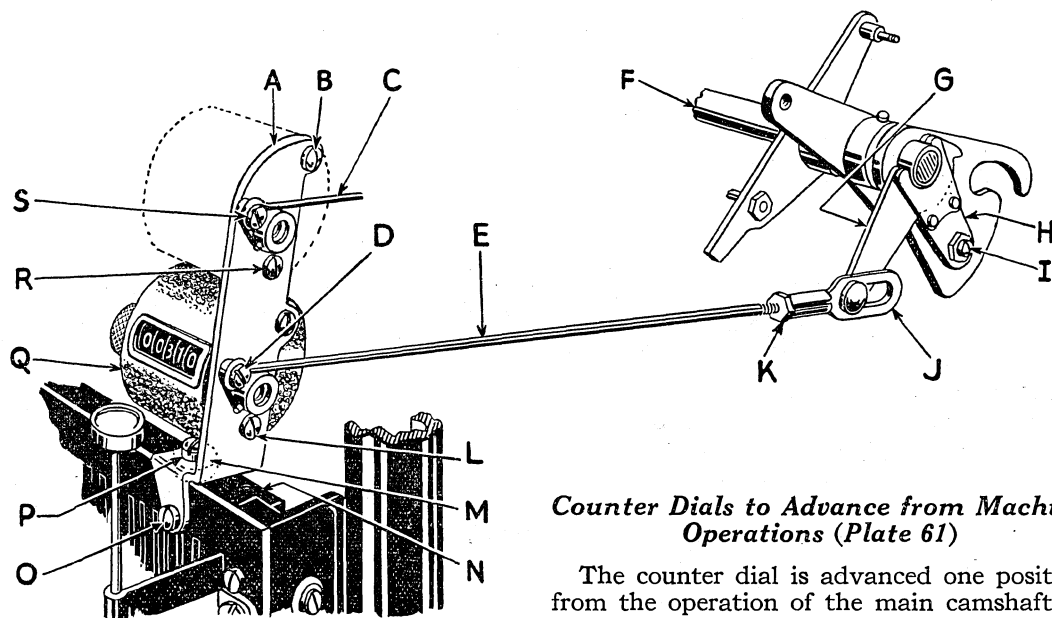
The counter dial is advanced one position on the depression of the result key to which it is connected.

Depression of the result key moves link I forward, rocking crank C through wire F to advance the dial one position.

Adjustment: Crank C should advance the dial with slight lead when the result key is depressed. Wire F is adjusted as required.



COUNTER DIALS TO ADVANCE FROM MACHINE OPERATIONS (Plate 61)



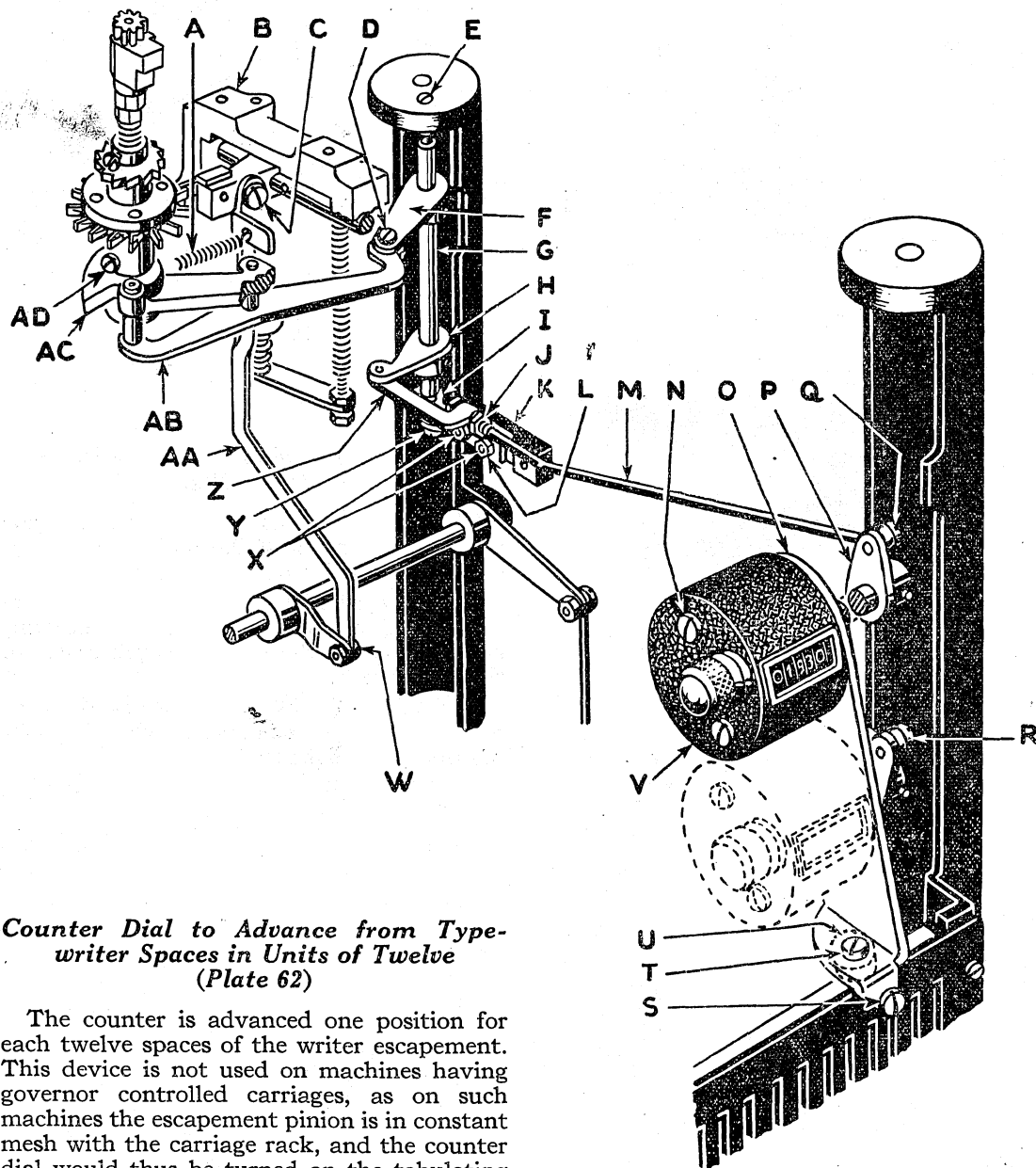
Counter Dials to Advance from Machine Operations (Plate 61)

The counter dial is advanced one position from the operation of the main camshaft to count the machine operations.

The forward movement of the main camshaft swings arm G through part H contacting its ear to draw the counter crank rearward through wire E.

Adjustment: Wire E is adjusted to the required length to advance the dial one position with slight lead.

COUNTER DIALS TO ADVANCE FROM TYPEWRITER SPACES IN UNITS OF TWELVE (Plate 62)



*Counter Dial to Advance from Typewriter Spaces in Units of Twelve
(Plate 62)*

The counter is advanced one position for each twelve spaces of the writer escapement. This device is not used on machines having governor controlled carriages, as on such machines the escapement pinion is in constant mesh with the carriage rack, and the counter dial would thus be turned on the tabulating operation, without writer key or space bar operations.

Rotary cam AC, which is carried by the escapement wheel assembly, makes a complete turn when twelve spacings are made. Rotary cam rocks lever AB by contacting its roller. Lever AB in turn rocks shaft assembly G which, through wire M to crank P, actuates the counter dial. Arm P restores when the roller on lever AB drops off the high point of the rotary cam.

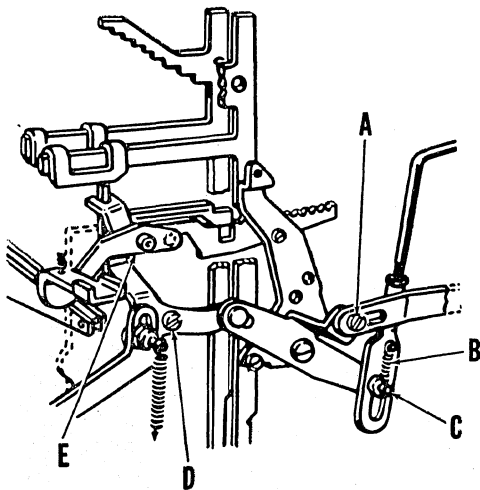
Tests and Adjustments

Rotary cam AC is located on the escapement shaft to permit roller in lever AB to seat in the rotary cam pocket.

Shaft assembly G should have minimum end play between its centers E.

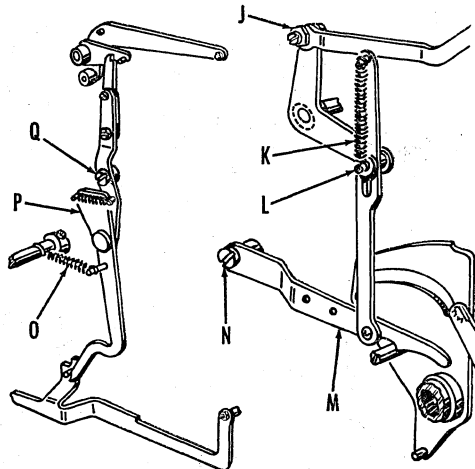
Wire M is adjusted for length to advance dial one position when the roller in lever AB is on the peak of the rotary cam.

MULTIPLIER-SUBTRACTOR REMOVAL AND INSTALLATION, SERIES M 200 MACHINES (Plate A)



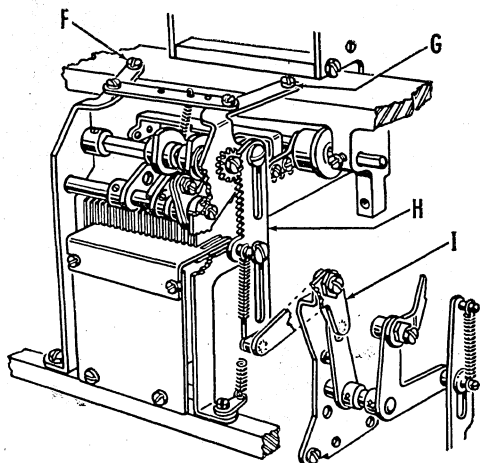
A. Remove the following parts if the Multiplier Factor To Print Mechanism is contained:

1. Screw C (with Spring B unhooked).
2. Screw A.
3. Screw D.
4. Adjustable Limit Arm E.



C. Remove the following parts if the Four Position Printing Mechanism is contained:

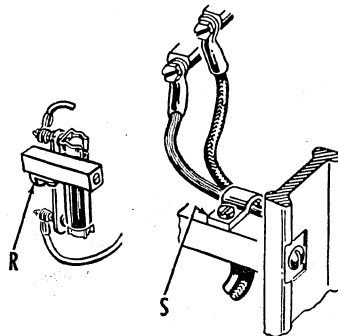
6. Screw and Eccentric J.
7. Spring K and Screw L.
8. Screw N and Lever M.
9. Screw Q and Normalizing Arm P (with Spring O unhooked).



B. Remove the following parts if the Four Position Add and Non-add Mechanism is contained:

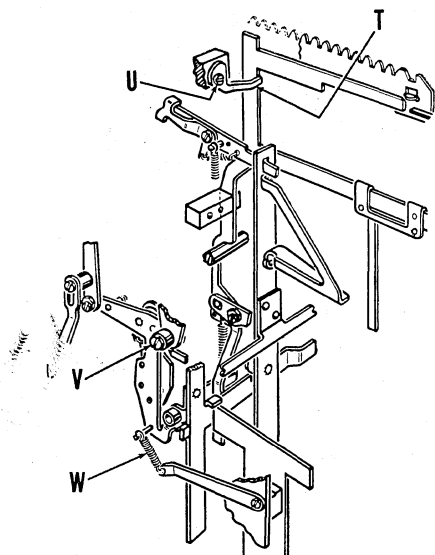
5. Screws F and G.

Note: Remove Bell Crank I in machines with a slot in the lower extremity of Rack H into which fits the roll of Bell Crank I.



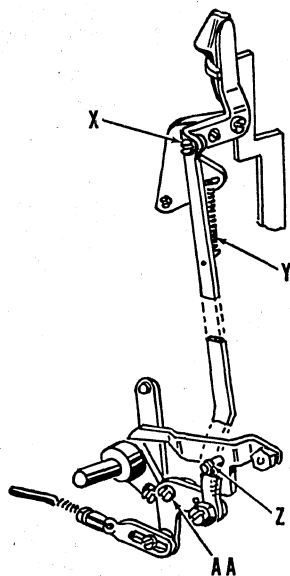
D. Remove the following part if the Minus Balance Signal Light is contained:

10. Bracket S if the electrical specifications are 125 volts or less; or Bracket R if the electrical specifications are more than 125 volts.

(Plate A)—Continued

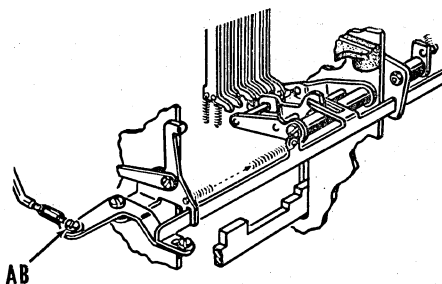
E. Remove the following parts if the Full Cent Bar to Point Off No. One, Two, or Three Places Mechanism is contained:

11. Screw U and Limit T, if contained.
12. Screw V (with Spring W unhooked).



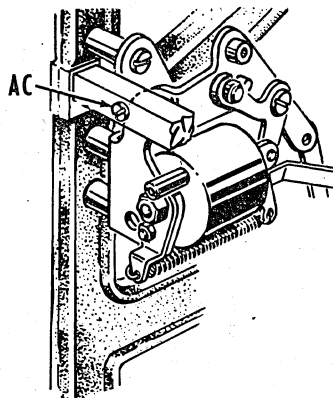
F. Remove the following parts if the Multiplier to Crossfooter Sub-Transfer Bar Mechanism is contained:

13. Screw X (with Spring Y unhooked).
14. Screw AA (with Spring Z unhooked).



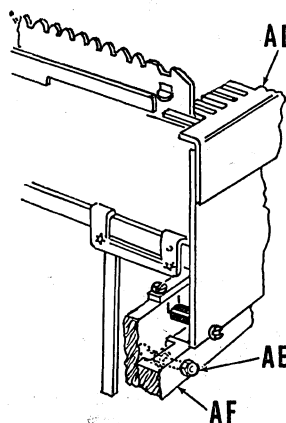
G. Remove the following part if the Extend Column (for Multiplier Factor to Print Mechanism) Selected from Front Panel Mechanism is contained:

15. Screw AB.



H. Remove the following parts which are common to Series M machines and most Class 72 machines:

16. Screw and Nut AC.

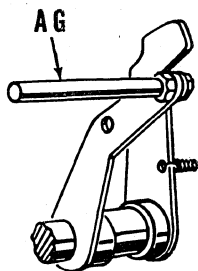


(Plate A)—Continued

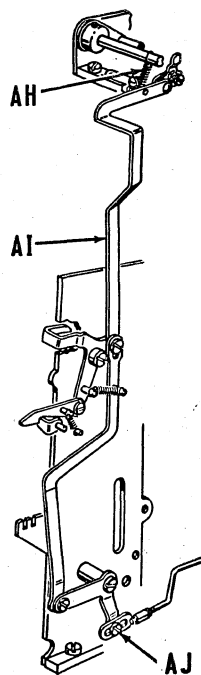
- 17. External Nut AE.
- 18. Two Screws holding Square Bar AF to the Side Frames.
- 19. Square Bar AF.

Note: The Four Position Add and Non-Add Unit, if contained, will come off with the Square Bar.

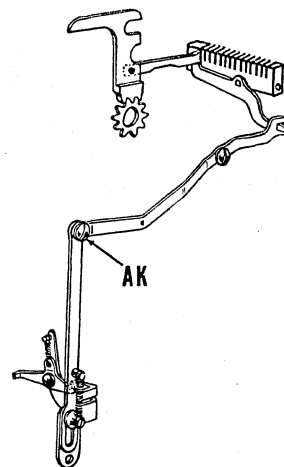
- 20. Guide Comb AD.



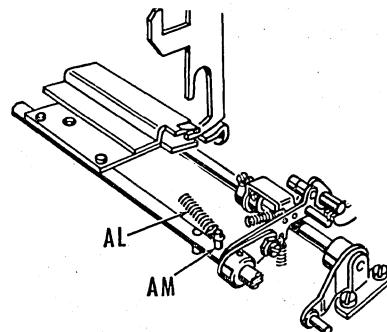
- 21. Eccentric Shaft AG, if contained.



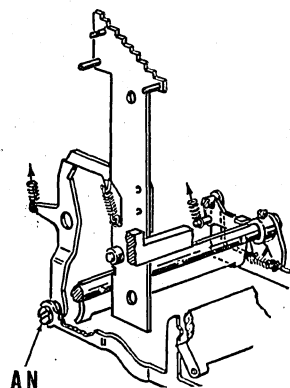
- 22. Link AI (with Spring AH unhooked).
- 23. Screw AJ.



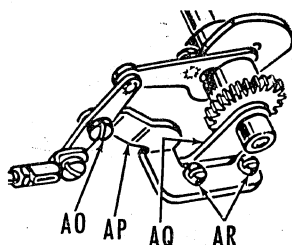
- 24. Screw and Nut AK.



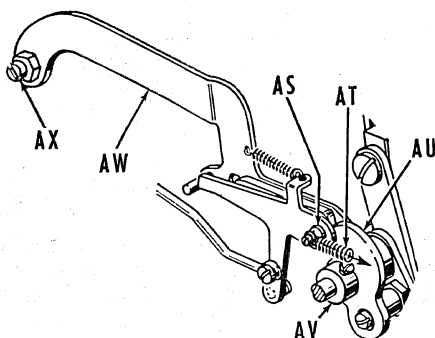
- 25. Spring AL from Stud AM.



- 26. Screw AN.

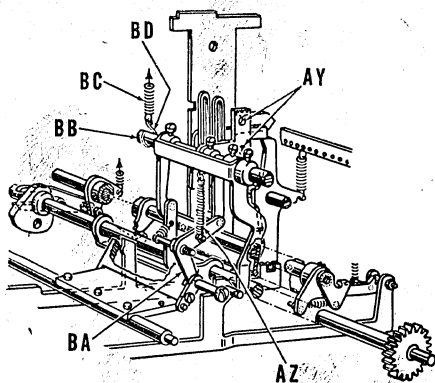
(Plate A)—Continued

- 27. Screw AO.
- 28. Screws AR.
- 29. Brackets AP and AQ.



- 30. Spring AT from Stud AS.

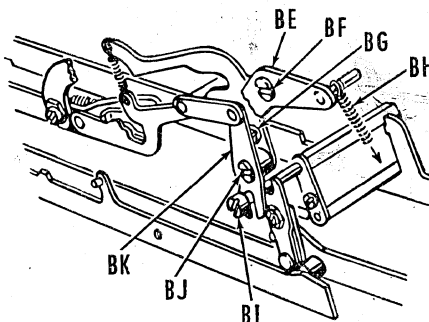
Note: Loosen Collar AV holding Cam AU and loosen Screw AX sufficiently to swing Slide AW outward.



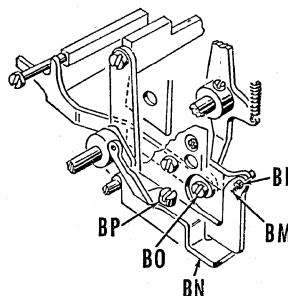
- 31. Spring AZ from the Stud in Lever BA.
- 32. Spring BC and Anchor BD from Shaft BB.

Note: Unhook the lower end of Spring BC from its Anchor in machines containing the Four Position Printing Mechanism.

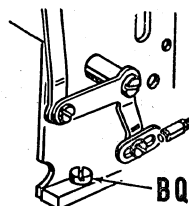
- 33. Two Screws AY fastening the Support Bracket for Shaft Assembly BB to the Multiplier Side Plate.



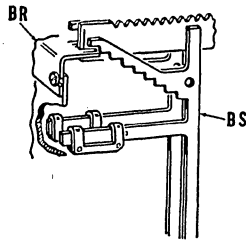
- 34. Screw BF and Lever BE after unhooking Spring BH.
- 35. Screw BJ and Lever BK.
- 36. Screw BG.
- 37. Toggle Screw BI.



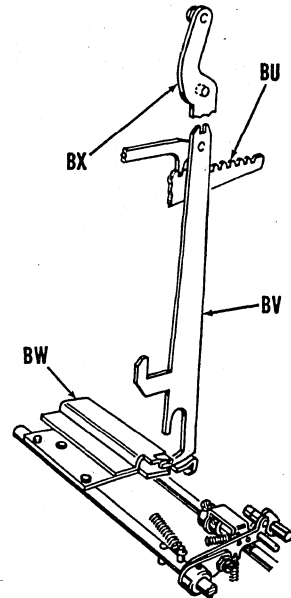
- 38. Screw BO.
- 39. Screw BM and Nut BL.
- 40. Screw BP and Anchor BN.



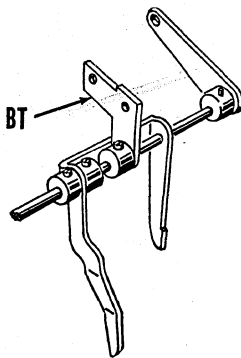
- 41. Screw BQ.

(Plate A)—Continued

- I. Remove the Multiplier by lifting it upward and swinging the lower portion rearward and upward in order that Limit Arms BS may clear the lugs on the Adding Racks.



INSTALLING THE MULTIPLIER



- J. Place Support Bracket BT in position as illustrated.

- K. Replace the Multiplier, using Guide Comb BR with its teeth in mesh with Vertical Extend Arms BV as an aid in aligning the Vertical Extend Arms with the spaces between Adding Rack Actuating Arms BX.

- L. After replacing the Multiplier Section in the machine, check the following:

42. Location of the lower portions of Vertical Extend Arms BV in Channel Bail BW.
43. Position of Vertical Extend Arms BV between Adding Rack Actuating Arms BX.
44. Location of Retaining Racks BU between Vertical Extend Arms BV and Adding Rack Actuating Arms BX.
45. Position of Limit Arms BS between the Adding Racks.

- M. Connect the Multiplier to the machine by reversing the procedure beginning with Item 41 through Item 1.

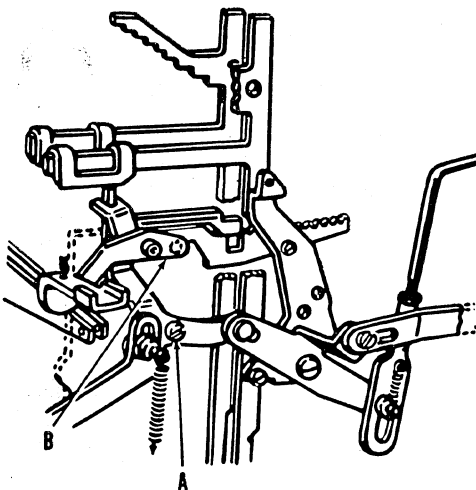
- N. Check Adjustments.

ADDING RACK REMOVAL AND INSTALLATION, SERIES M 200 AND M 800 (Plate B)

A. Remove the following parts:

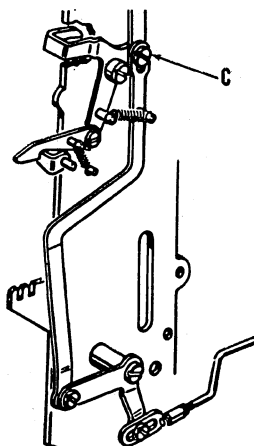
1. Carriage. (See Carriage Removal, Plate A, Carriage Instruction Book).
2. Dust Shield over Typewriter Basket.
3. Typewriter Front Panel.

B. Depress the Motor Bar, release all the Adding Racks and manually operate the machine for the forward stroke while holding the Twin Cams in Non-Add position.



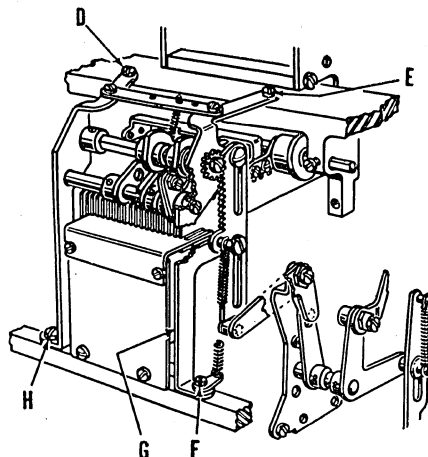
C. In Series M 200 machines, remove the following parts if the Multiplier Factor to Print Mechanism is contained:

4. Screw A.
5. Adjustable Limit B.



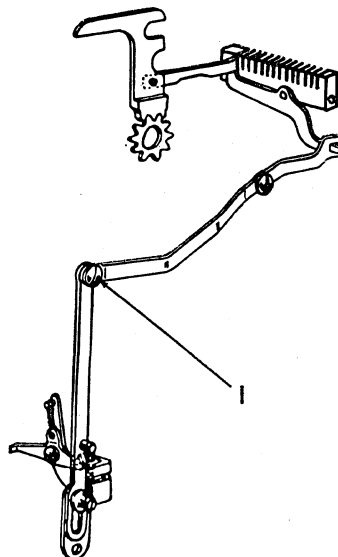
D. In Series M 200 machines, remove the following part if contained:

6. Screw C.



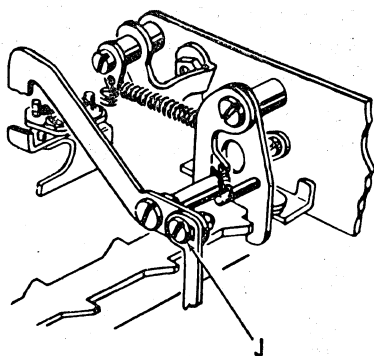
E. In Series M 200 machines, remove the following parts if the Four Position Add and Non-Add Mechanism is contained:

7. Screws D and E.
8. Screws F and H.
9. Assembly G.

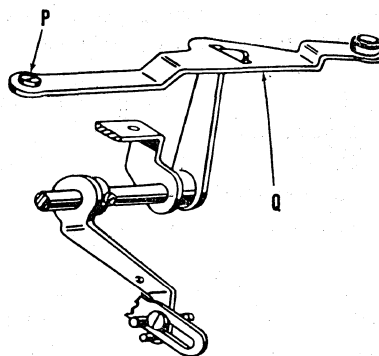


F. Remove the following parts common to Series M 200 and M 800 machines:

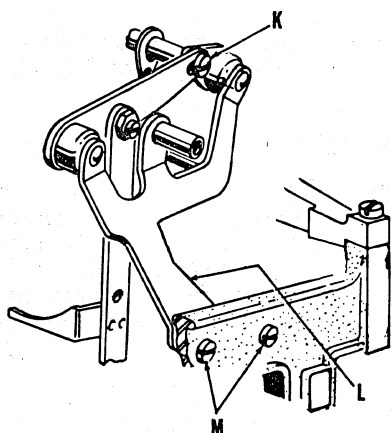
10. Screw and Nut I.

(Plate B)—Continued

11. Screw and Nut J.

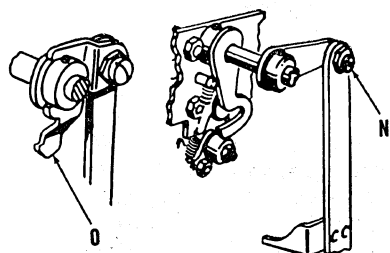


14. Screw P and Inner Carriage Shift Lever Q.

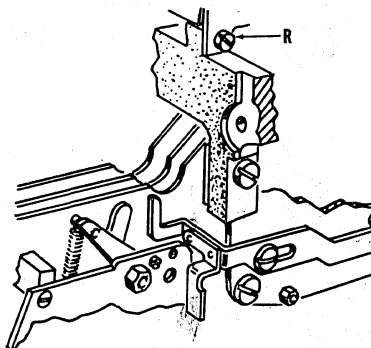


G. Loosen screws M, move Support Bracket L off the ends of the Shafts, and remove the following parts:

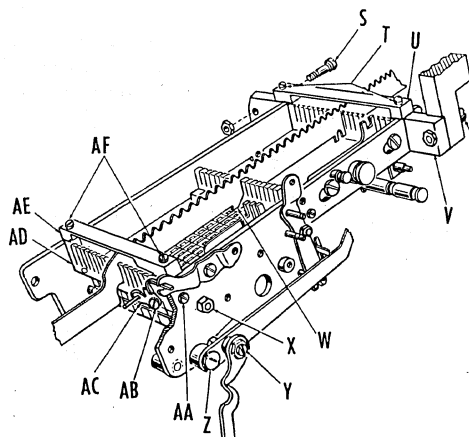
12. Screw K.



13. Screw and Eccentric N; and in Series M 800 machines Cam O if contained.



15. Loosen right and left Screws R.



H. In Series M 200 machines containing fractions, remove the following parts:

16. Screw AB and Bell Crank AC.

(Plate B)—Continued

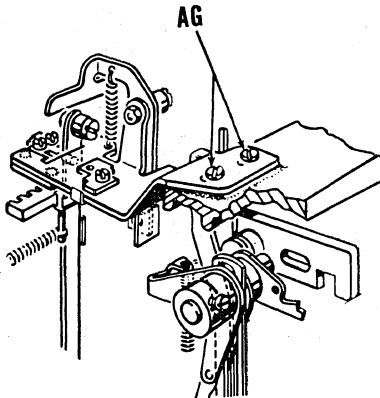
- I. Remove the following parts common to Series M machines, if contained:

17. Screws AF and front Strap AE.
18. Screw and Eccentric Y.
19. Screw Z.
20. Loosen Nuts X.
21. Right and left Screws AA.

- J. Lower Guide Comb AD sufficiently to clear projection W on the Adding Rack.

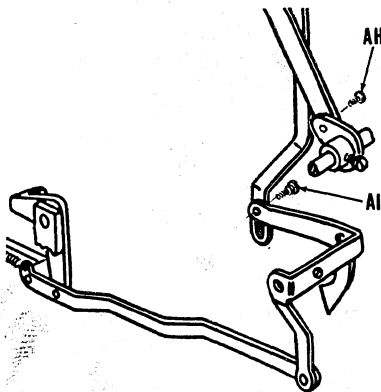
Note: Screw and Eccentric Y and Screw Z were removed to facilitate loosening lower Nut X. Nuts X were loosened to facilitate lowering of Front Guide Comb AD.

22. Screws T and rear Strap U.
23. Screws and Nuts S, and lower rear Guide Comb V.



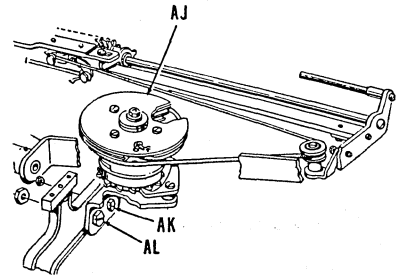
- K. In Series M 200 machines containing the Decimal Discount Key to Point Off One, Two or Three Places Mechanism, remove the following parts:

24. Screws AG.



- L. In Series M 800 machines containing the Crossfooter Non-clear Lock Mechanism remove the following parts:

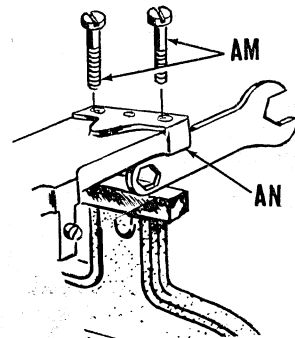
25. Screw AH.
26. Screw AI, if contained.



- M. In machines containing Spring Barrel Assembly AJ, remove the following parts:

27. Screw and Nut AK.
28. Screw and Nut AL, and Assembly AJ.

Note: For proper spring tension when replacing Spring Barrel Assembly AJ, place register No. 1 in active position, wind assembly to capacity and unwind ratchet five full turns. Check the assembly for clearance of other parts.

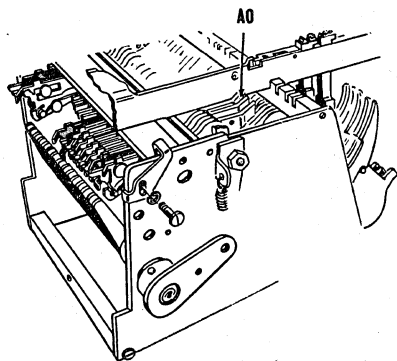


- N. Remove four Screws AM holding rear Head Casting AN to the right and left Side Frames. Raise Head Casting AN sufficiently to permit inserting an M.R.C. Unit Wrench (Kit 22 $\frac{1}{2}$) as illustrated.

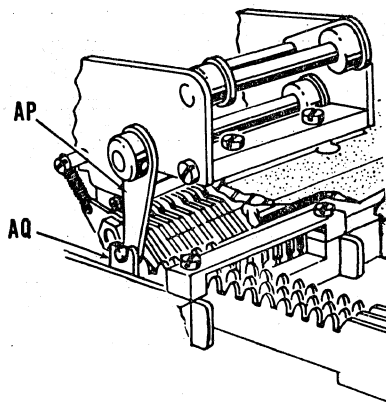
- O. Tilt the forward end of the Adding Rack downward and remove it through the Typewriter Type Levers and Wires.

*(Plate B)—Continued***INSTALLING ADDING RACK**

P. Install the new Adding Rack.



Note: Hold the front end of Hammer Driver Latch AO depressed to insure its not interfering with the Adding Rack when being installed.



Note: When lowering the Head Casting, check the stud in Arm AP for seating properly in Slide AQ.

R. Check Adjustments.

Q. Remove the M.R.C. Unit Wrench, and replace the removed parts in reverse order.

S. Check all Adding Racks for being free and non-binding on front Comb AD or Strap AE.

TYPE 70 MACHINES POWER

Instruction Book

April, 1945

Issued _____

To _____

Of _____

Property of and to be returned to
**BURROUGHS ADDING
MACHINE COMPANY**
DETROIT, MICHIGAN

POWER

FOREWORD

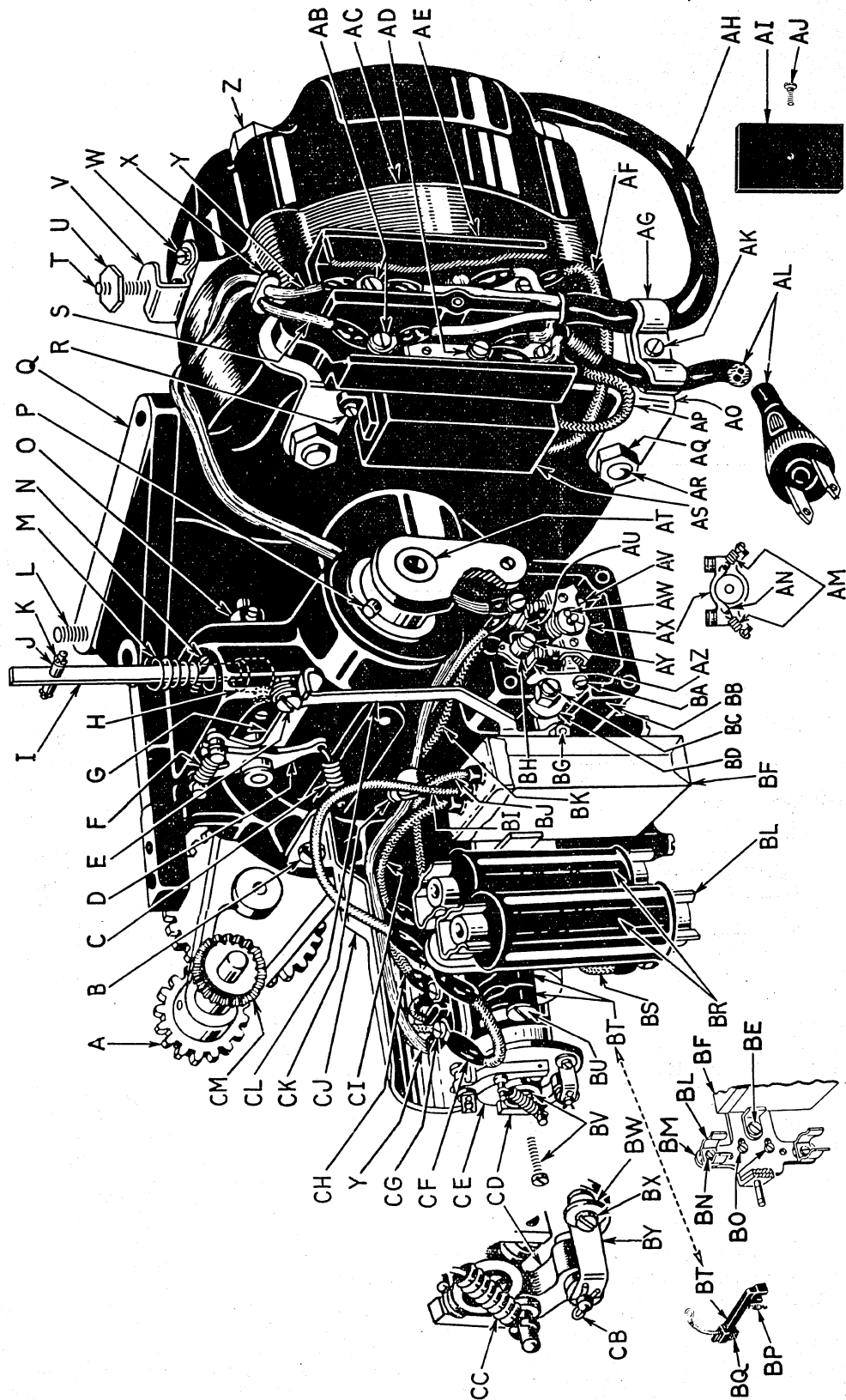
This book describes the electrical operation, mechanical function, tests and adjustments of the motors and drives on Type 70 machines.

Type 6 motor condensers, radio filters, the care of motors, and the motor register return mechanism.

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Description	Plate No.	Description	Plate No.
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Motor Bar Mechanism and Drive Trip	12	Governor	1
Motor—Constant Running	10	Radio Filter	1
Motor—Constant Running with Drive	11	Resistance Coils	1
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TYPE 6 MOTOR AND DRIVE (Plate 1)



Type 6 Motor and Drive (Plate 1)

Type 70 machines are equipped with Type 6 motors which operate on either alternating or direct currents. These motors are adaptable to variations in voltage of direct current and to variations in voltages and cycles of alternating currents. With this motor, one drive gear ratio, 13.5 is required. It has double resistance coils BR, radio filter AS, and condenser BF. It is constructed with split fields, one portion of which is electrically placed on each side of the brushes, governor, commutator, and switch.

The drive and motor are connected together as a single unit. The drive is fastened to the underside of the base with bolts L, and the motor by means of strain bolt assembly T, U, and V.

Terminal block AE for the motor cords AL and AH, formerly on the underside of the base, is fastened directly to the motor assembly. This eliminates the need of breaking the motor connections when the motor and drive assembly is removed.

Adjustment

Strain bolt T supports the motor to the base.

Adjustment: Turn strain bolt in base until bolt head contacts bracket V, and turn lock nut U down against top side of the bracket.

Governor

Governor CE controls the speed of the motor. This is accomplished by the centrifugal force exerted by two contact arms CD against the tension of control spring CC. These contacts parallel each other and are normally closed. When the motor picks up speed, the centrifugal force of the contact arms becomes greater than the tension of the control spring, causing the contact points to separate and the motor to slow down. The lower motor speed reduces the centrifugal force of the contact arms, permitting the control spring to close the contact points. This operation takes place approximately 100 times per second.

The control spring on the governor, which is fastened to the front end of the worm shaft, permits 130 to 135 machine cycles per minute when the motor and drive are warm. To determine the machine operating speed, count the number of continuous machine cycles for one minute. If the control spring is weak, the machine speed will be too slow, and too strong a tension would make the machine speed too fast.

Governor brushes BT have a shunt wire

which serves as a direct connection from the terminal to the brush.

Adjustment

If the tension of control spring CC is too weak, the machine operating speed will be too slow, because governor contact points separate too easily. Too strong a control spring tension would cause the machine to operate too fast.

Adjustment: Replace the control spring for either of the above conditions.

Resistance Coils

Resistance coils BR perform two functions. They prolong the life of the governor and switch contact points, and they reduce radio interference set up by the motor. These two functions are accomplished in conjunction with the condenser. The resistance coil consists of several turns of a special alloy wire wound on a porcelain spool. The size of the wire and the number of turns are determined by the ohmic value of the resistance coil required. The wire on the spool is insulated with glass so that it will withstand high heat values.

The single resistance coil has been discontinued in favor of the double coil construction, as the two coils provide a larger area to dissipate heat.

Resistance Coil Value

If a resistance coil of too high a value is used, it would result in excessive arcing at the governor contact points, and it likely would increase radio interference. If the value of the resistance coil is too low, the motor speed would increase, as too much current is passing through the coil and bypassing the governor.

Radio Filter

Radio filter AS to a degree, short circuits the interference voltage set up by the motor and dissipates it into the motor frame. This is accomplished by making the filter a specific way in conjunction with the electric circuit required. The radio filter may be composed of several interwound condensers, depending upon the capacity required.

Condenser

Condenser BF prolongs the life of the governor and contact points. It reduces the pitting and burning of the contact points by absorbing the spark or arcing when the points separate. The condenser is composed of strips of tin foil, separated by tissue, wound together in a flat coil and impregnated with

(Plate 1) Continued

wax. It is sealed in a container and it has the ability to store up electric energy, thereby reducing the extent of the arcing.

As the contact points of the governor start to separate, the arc that is set up is of extremely high heat, sufficient, if allowed to continue, to melt the contact points and weld them together. Any welding action across the contacts prevents them from separating and results in excessive motor speed. The condenser's ability to absorb this arc almost as soon as it occurs, by storing up this electrical energy, prevents burning the contact points.

Protecting the contacts from overheating, is made possible through the resistance coil. While the governor contact points are open, part of the energy is absorbed and stored in the condenser and part of it is dissipated in the form of heat through the resistance coil. The condenser would be completely discharged through the resistance coil if the governor contact points were left open long enough. The discharging of the condenser also takes place when the contact points are closed. A certain amount of current flows through the resistance coils, even when the governor contact points are separated.

Condenser Test

A defective condenser is apt to cause continuous running of the motor, excessive arcing at the governor contact points, possible shock from being grounded or excessive radio interference.

To test the condenser, observe the extent of the arcing at the governor contact points while the machine is operating, then remove one condenser lead wire from the contact points and again note the extent of the arcing. If the arcing becomes more pronounced after removal of the condenser lead wire, the condenser is effective. However, if the extent of the arcing remains the same before and after the removal of the lead wire, the condenser is defective.

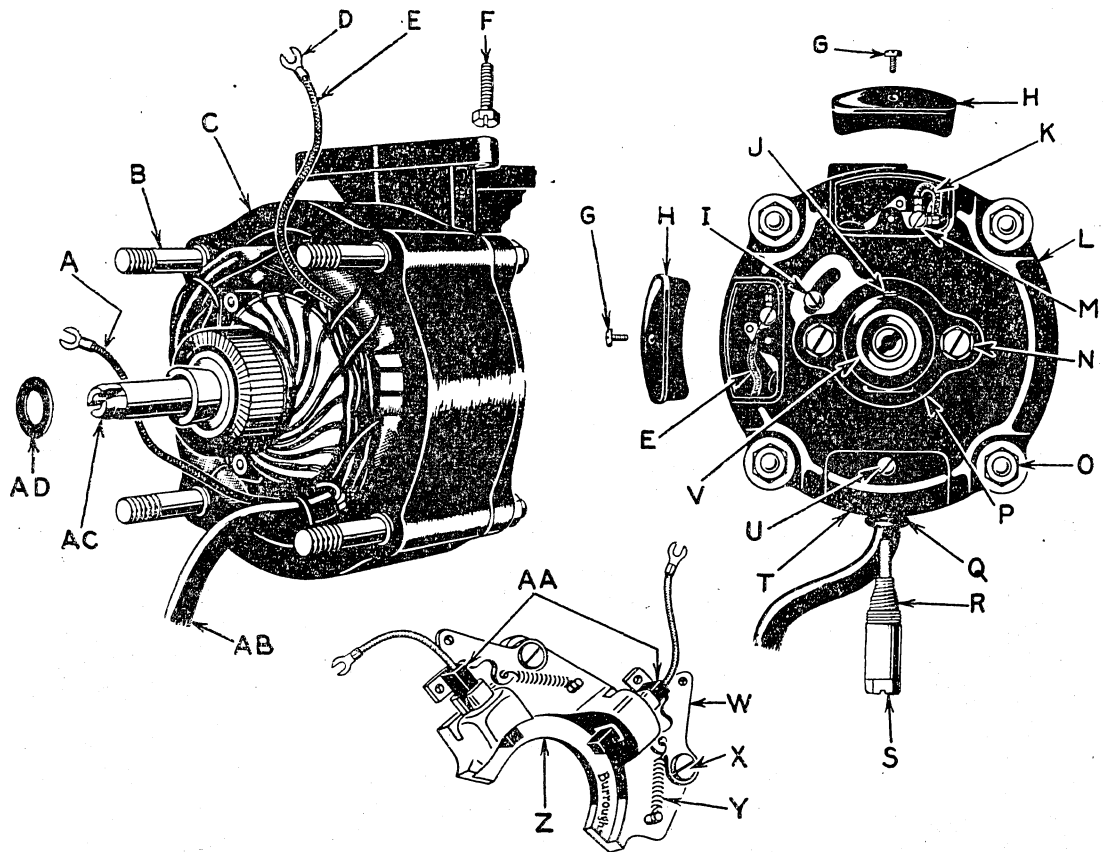
An occasional heavy flash at the contact points does not prove that the condenser is defective, as this may be the result of dirty contact points or the normal discharge of accumulated voltage.

Split Field Construction Motor

The motor circuit is arranged to electrically place two field coils on each side of the brushes and switch contact points to obtain the split field motor construction. By placing the brushes and switch contact points between field coils in this manner, the field coils serve as choke coils in retarding radio interference voltage as set up by the motor. The current passes successively through two field coils, brushes, armature, switch contact points, governor contact points, the remaining two field coils, and back through the line.

In motors without the split field coils, the circuit changes. The current passes successively through governor contact points, switch points, four field coils, brushes, armature, and back through the line.

MOTOR AND BRUSH ASSEMBLY, TYPE 6 (Plate 2)

**Motor and Brush Assembly, Type 6
(Plate 2)**

The slot in armature shaft AC and the pin in the worm shaft of the drive are the driving connections between these two units. The worm shaft pin seats in the slot of the armature shaft.

Brush holder Z is fastened in the motor back plate slot with screw I. The brushes are advanced in this slot to obtain a fast pick up motor speed to insure a uniform machine stroke. The motor action can be observed by making single machine operations, allowing the motor to stop turning between these operations. If the start of the machine stroke is slow, it indicates the motor pick up speed is too slow.

The brushes are advanced by moving the brush holder in the opposite direction of the revolving motion of the armature. An advanced brush holder increases the current

passing through the contact points and it may decrease the life of the governor. With a retarded brush holder, less current passes through the governor contact points. In either case the maximum motor speed is not affected because of the governor control.

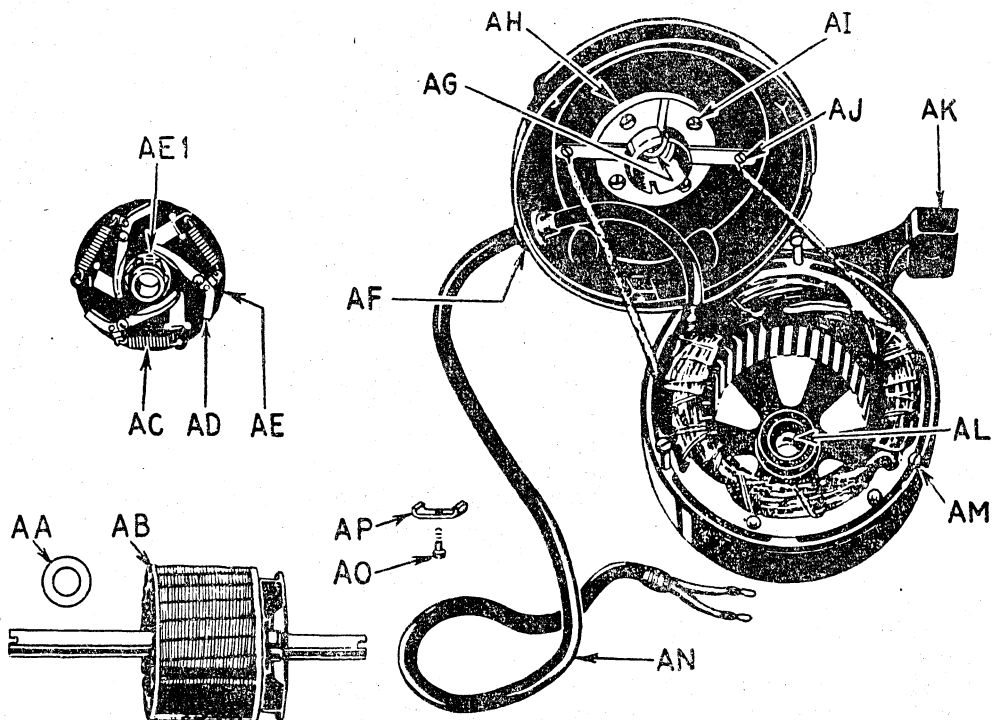
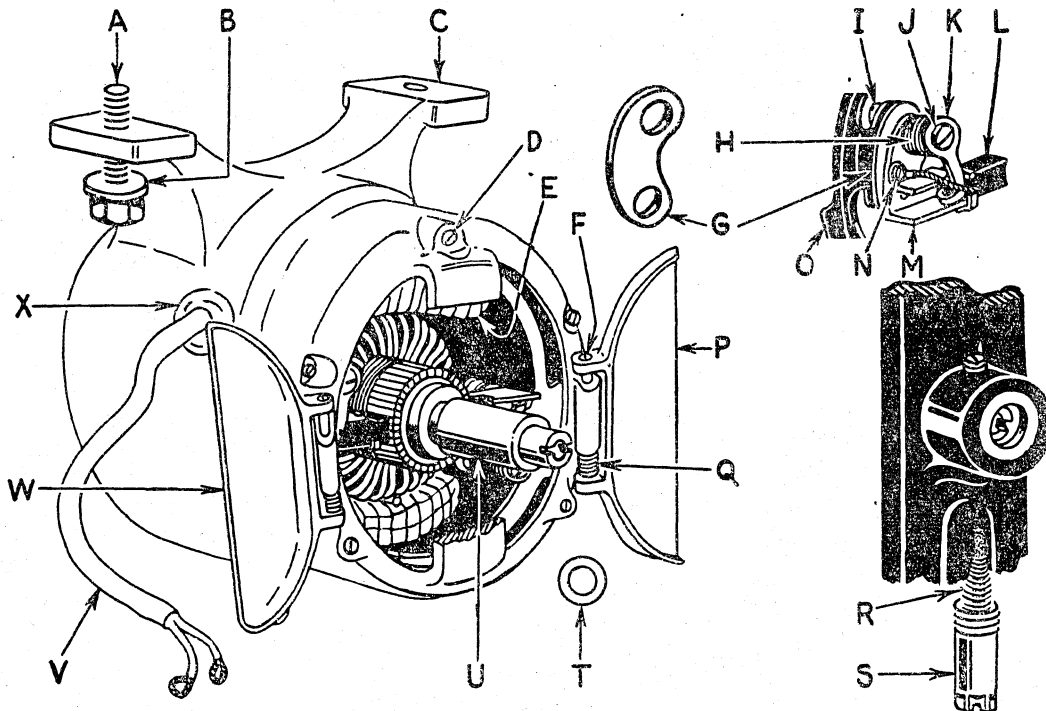
There is no fixed position for the brush holder in the slot to suit all machines. The desirable condition is to work toward a retarded position rather than an advanced position of the brushes.

Motor brush AA has the shunt wire which serves as a direct connection from the terminal to the brush. This prevents the burning and sticking of the brush in the holder, due to the current jumping between the brush and the holder.

Spring Y has sufficient tension to insure a firm contact with the commutator. This should reduce the arcing and resultant burning at this point and prolong the life of both.

CONSTANT RUNNING MOTORS (Plate 10)

(Plates 3-4-5-6-7-8-9 in Symbol Book only)



Constant Running Motors (Plate 10)

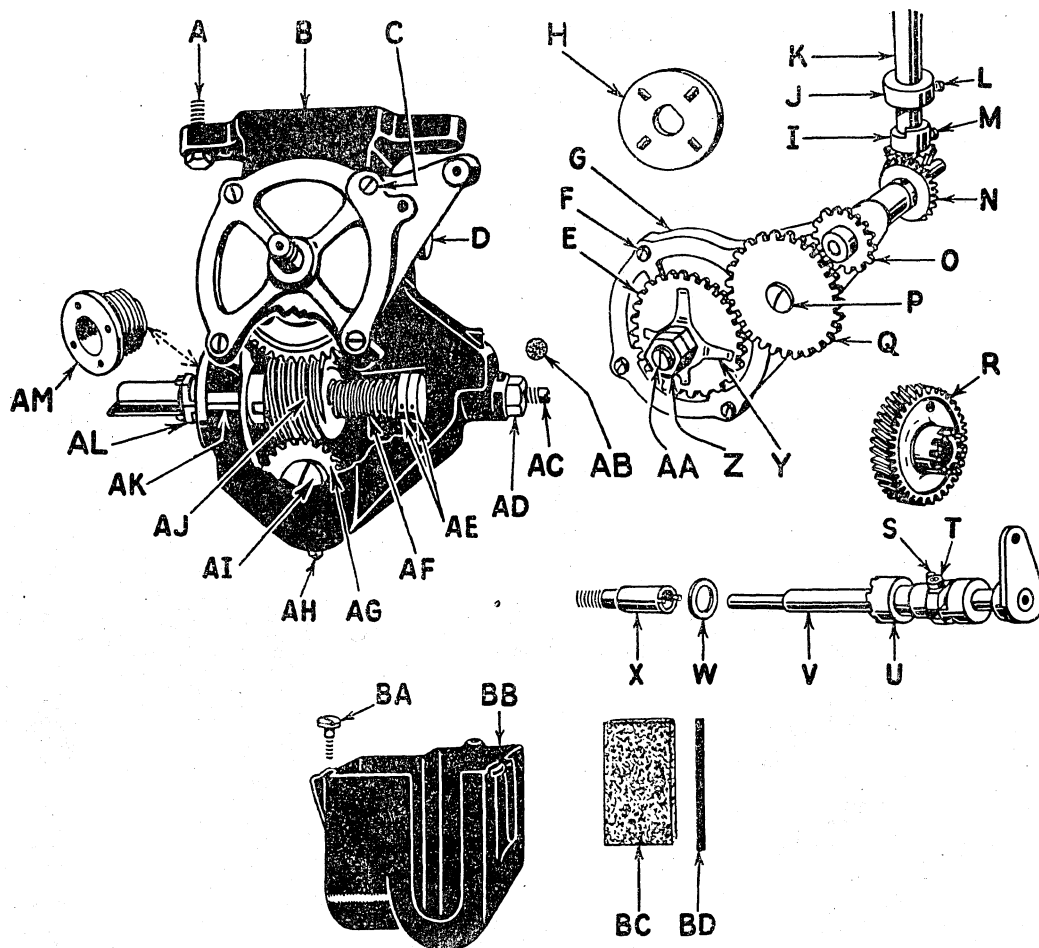
Machines equipped with a constant running direct or alternating current motor have a manual control switch mounted on the base. Each motor is a separate complete unit independent of the drive.

The direct current motor is adjusted to run at the required speed by shifting brushes L to the right or left. Brush ring O is held by

screws I. The alternating current motor has no adjustment to alter the speed. With either style motor, the machine speed remains the same as on the Type 6 motor, 130 to 135 cycles per minute.

Alternating current motors operate on various cycles which change the R.P.M. of the motor, therefore, a different gear ratio in the drive is required to maintain the standard machine operating speed.

DRIVE MECHANISM FOR CONSTANT RUNNING MOTORS (Plate 11)



Drive Mechanism for Constant Running Motors (Plate 11)

Thrust Screw AC

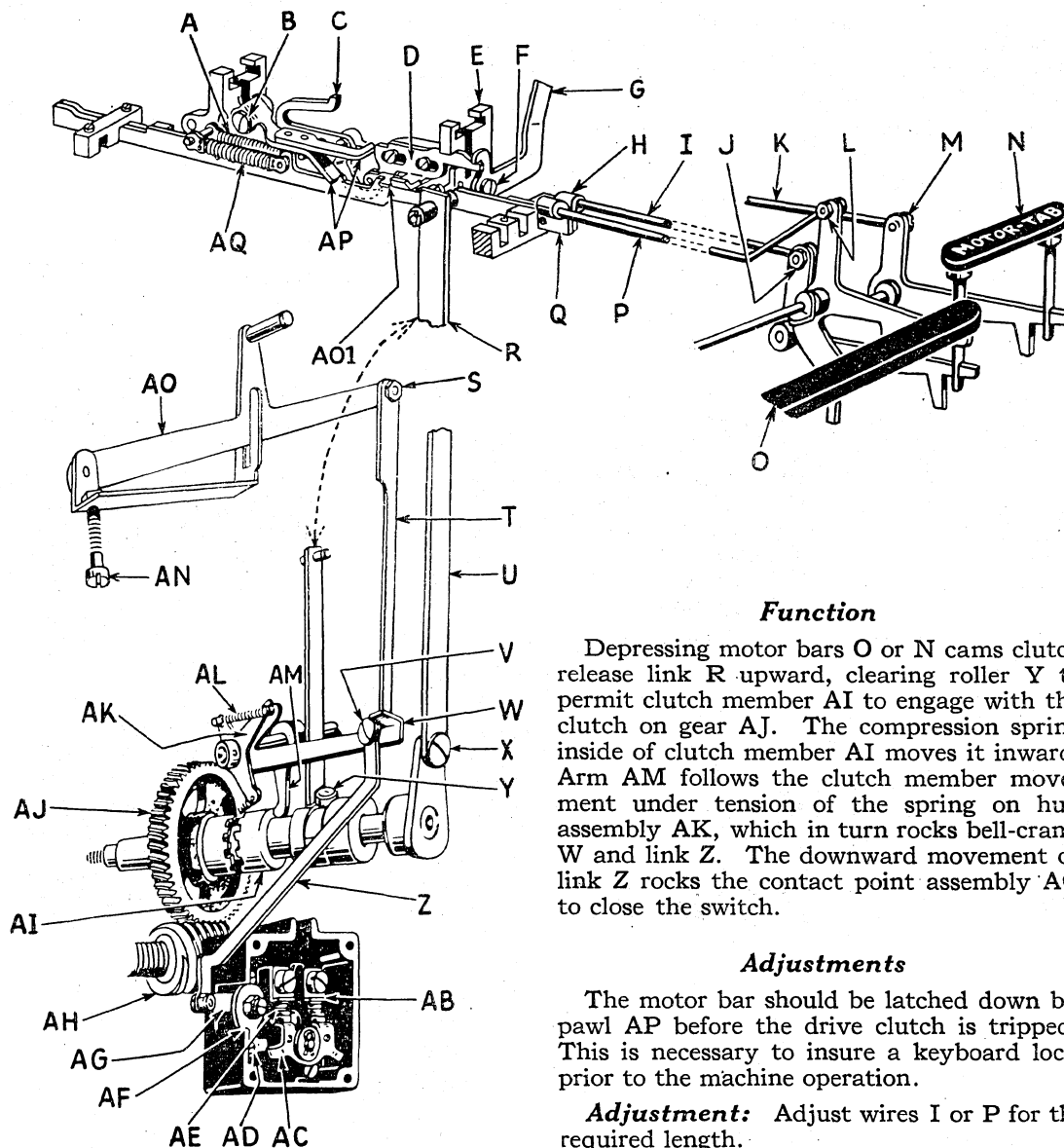
In the constant running motor drives, the amount of play of the worm shaft, which should be a minimum, is adjusted with thrust screw AC. Fiber washer AB is located between the worm shaft and screw AC, and should be kept lubricated to prevent noise. If noise is present, remove screw AC, put in

regular drive oil, and replace screw AC which must be correctly adjusted by threading it completely in, backing it out a half turn and locking it with lock nut AD.

Coupler AL

Constant running motors are connected to the drive with coupler AL which has two right angled projections that seat in slots of the armature and the worm shaft.

MOTOR BAR MECHANISM AND DRIVE TRIP (Plate 12)



Motor Bar Mechanism and Drive Trip (Plate 12)

When the motor bar is depressed, the drive clutch is tripped. The meshing movement of the clutch member allows the switch to be closed and the motor to run.

Arm W is connected to hub assembly AK by spring AL, which permits closing the contact points while the drive clutch is disengaged on the carriage or register return key depression.

Function

Depressing motor bars O or N cams clutch release link R upward, clearing roller Y to permit clutch member AI to engage with the clutch on gear AJ. The compression spring inside of clutch member AI moves it inward. Arm AM follows the clutch member movement under tension of the spring on hub assembly AK, which in turn rocks bell-crank W and link Z. The downward movement of link Z rocks the contact point assembly AC to close the switch.

Adjustments

The motor bar should be latched down by pawl AP before the drive clutch is tripped. This is necessary to insure a keyboard lock prior to the machine operation.

Adjustment: Adjust wires I or P for the required length.

With the motor bar latched down, slide D should have about $1/64''$ clearance with the end of horizontal arm of pawl assembly AP. This permits the pawl on slide D to drop back sufficiently to rest on top of the riser of slide Q and insure the release of the motor bar. The drop back also insures holding the register interlock arm G upward to retain the register lock during the machine operation.

Adjustment: Bend the angle arm of AP which latches down the motor bar.

If the motor bar is manually held depressed during the machine operation, slide D will drop back further since the angle arm of pawl

(Plate 12) Continued

AP is not limiting the motor bar. When holding the motor bar fully depressed, be sure slide D is not cramped tight in its slots. This results in a hard release of the pawl on the slide and it is caused by having the motor bar wire adjusted too short.

When the horizontal arm of pawl AP is resting on top of slide D, the angle arm of AP should have passing clearance on the riser of slide Q. This clearance is necessary to insure the motor bar restoring if the bar is held depressed during the machine operation.

Adjustment: Bend the horizontal arm of pawl AP.

On the return stroke of the machine operation, the main camshaft arm should raise the horizontal arm of pawl AP with about $1/64''$ lead.

Adjustment: Carefully bend the curved pawl C.

When the drive clutch is tripped, the contact points of the switch should have a full, firm contact. When the switch is open, the

contact points should have about $1/32''$ clearance.

Adjustment: Swing lower contact point assembly in the slot for screw AD.

With the carriage or register return key depressed, the contact points should also have a firm contact without a bind.

Adjustment: If the contact points are too tight, causing a bind, bend the limit arm of assembly AK to obtain more play between the bottom of the key lever and the roller in AO.

Caution: Whenever the limit arm of AK is bent, it is necessary to reset the contact point assembly for the drive clutch.

Rollers Y are of two sizes, the smaller one is used in the clutch of a constant speed motor and the larger one in the clutch of a Type 6 motor. The interchanging of the rollers will affect the switch point clearances. If a large size roller is used in a constant speed clutch, a bind is set up in the disengaging of the clutch which results in the loosening up of the retaining screw for roller Y.

DRIVE MECHANISM (Plate 15)

(Plates 13 and 14 in Symbol Book only)

Drive Mechanism (Plate 15)

The power of the motor is applied to the drive through worm X and worm wheel L, and controlled by the clutch which becomes active when the motor bar is depressed. Drives now have roller bearings for the worm shaft.

When the motor bar depression raises trip link G, clutch member J engages clutch member K which revolves shaft assembly M, and through link AC, rocks main shaft assembly E. Cam F swings geared sector arm H to turn gear I to operate the multiplier section.

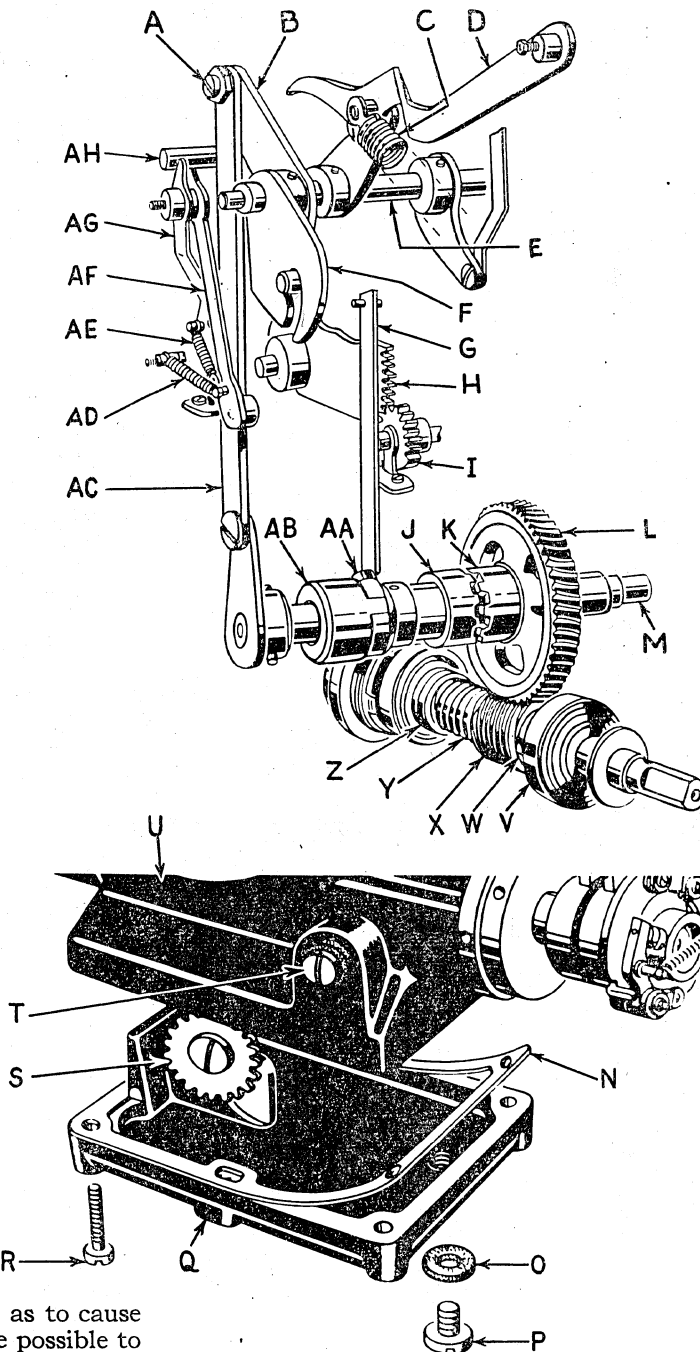
The cam shaped projections on the end of worm X seat in the slot of drive sleeve W, which is pinned to the worm shaft. The tension of spring Y is sufficient to hold worm X in the slot of drive sleeve W under normal operating conditions. In the event that the machine locks, the thrust of the worm would cause it to overcome the tension of spring Y and move out of the slot in drive sleeve W, allowing the motor to rotate without operating the machine.

In order to avoid oil leakage through the worm shaft bearings, the oil reservoir is below the worm shaft. The oil is carried upward to the drive bearings by splash gear S, which is meshed with worm X. The correct amount of oil is determined when the oil is level with the filling hole T. The oil is drained from the drive by removing screw P.

Adjustments

When the motor bar has been depressed with the register manually meshed and held meshed so as to cause the machine to lock, it should be possible to manually turn the armature shaft which indicates that worm X is disengaged from worm wheel L. Excessive tension of spring Y will prevent the manual turning of the armature shaft.

When 1's are extended, subtract key and motor bar depressed, the worm should not disengage when the machine is manually



operated. This is the heaviest machine load for the worm spring to carry.

Adjustment: To decrease or increase the tension of spring Y, threaded collars Z are adjusted as required by turning one collar Z against or away from spring Y; the other collar Z acting as a lock nut.

(Plate 15) Continued
Main Camshaft Mechanism

Main camshaft restoring arm D, to which the restoring spring C is connected, permits the tension of this spring to be applied prior to disengaging the drive clutch near end of the return stroke. This indirect hook up of the restoring spring eliminates the short or uncontrolled return stroke of the machine in the event that the drive clutch members prematurely disengage.

The pull power of the restoring spring is effective only in the pocket of arm D. After the roller has moved out of the pocket in arm D and into the dwell of this arm, the tension of the restoring spring is toward the pivot center of the main camshaft.

Excessive expansion of the restoring spring is eliminated, which reduced the operating load against the motor, drive and machine mechanism.

Booster arm AF insures that the drive shaft will assume a definite normal position at the end of each operation. Spring AD swings booster arm AF to contact link AC causing the latter to assume a vertical position.

Limit arm AG prevents an overthrow of link AC when the machine operation is completed.

Adjustments

When link AC is normal, booster arm AF limits on shaft AH. The roller on arm AF should clear link AC by $1/64''$ when the machine is normal.

Adjustment: Bend arm AF.

When link AC is normal, limit arm AG likewise limits on shaft AH. The roller on arm AG should have slight clearance on link AC when the machine is normal.

Adjustment: Bend arm AG.

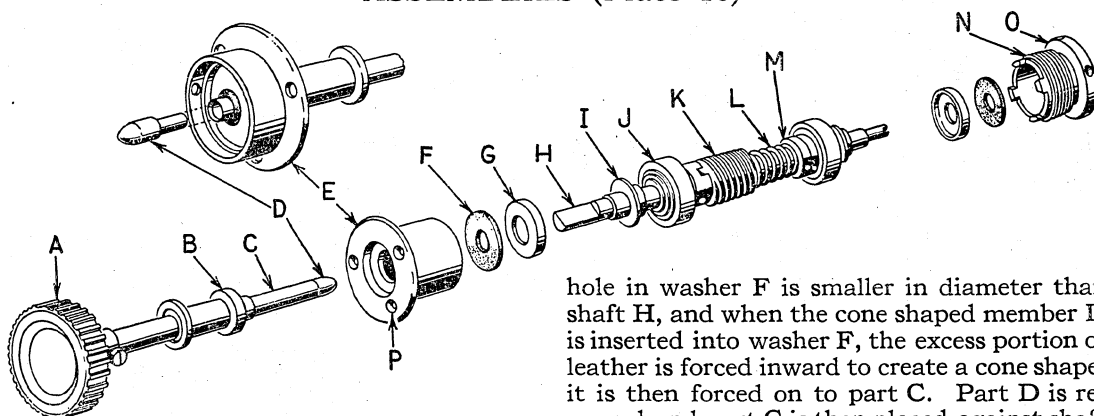
Link AC is adjusted to pull the accumulator meshing cams V (Plate 9, Accumulation Book) to working position to seat on their flat surfaces. The camshaft should also restore to complete normal position.

Adjustment: The eccentric in link AC is turned as required. Both conditions should be checked when adjusting the eccentric.

Spring AE should have sufficient tension to prevent an overthrow of link AC. A weak spring may result in additional machine operations.

Spring AD should have just sufficient tension to insure link AC assuming a vertical position. Excessive tension places a heavier duty on spring AE.

WORM SHAFT ASSEMBLY AND KIT FOR REPLACING OIL SEAL ASSEMBLIES (Plate 16)



Whenever it becomes necessary to remove drive shaft H, the following procedure must be adhered to because of oil seal washers F. Oil is prevented from leaking out around shaft H by leather washers F, held in place in retainers E and N by cups G.

To remove worm shaft H from the drive casting, the oil splash gear and the governor are removed. Remove the screws holding part E to the drive, and lock nut assembly N. The worm shaft is tapped lightly to remove.

When reassembling worm shaft, oil seal retainers E and N are placed on the shaft by means of Kit 71 $\frac{3}{4}$ No. 2 which consists of parts A, B, C, D. This is essential since the

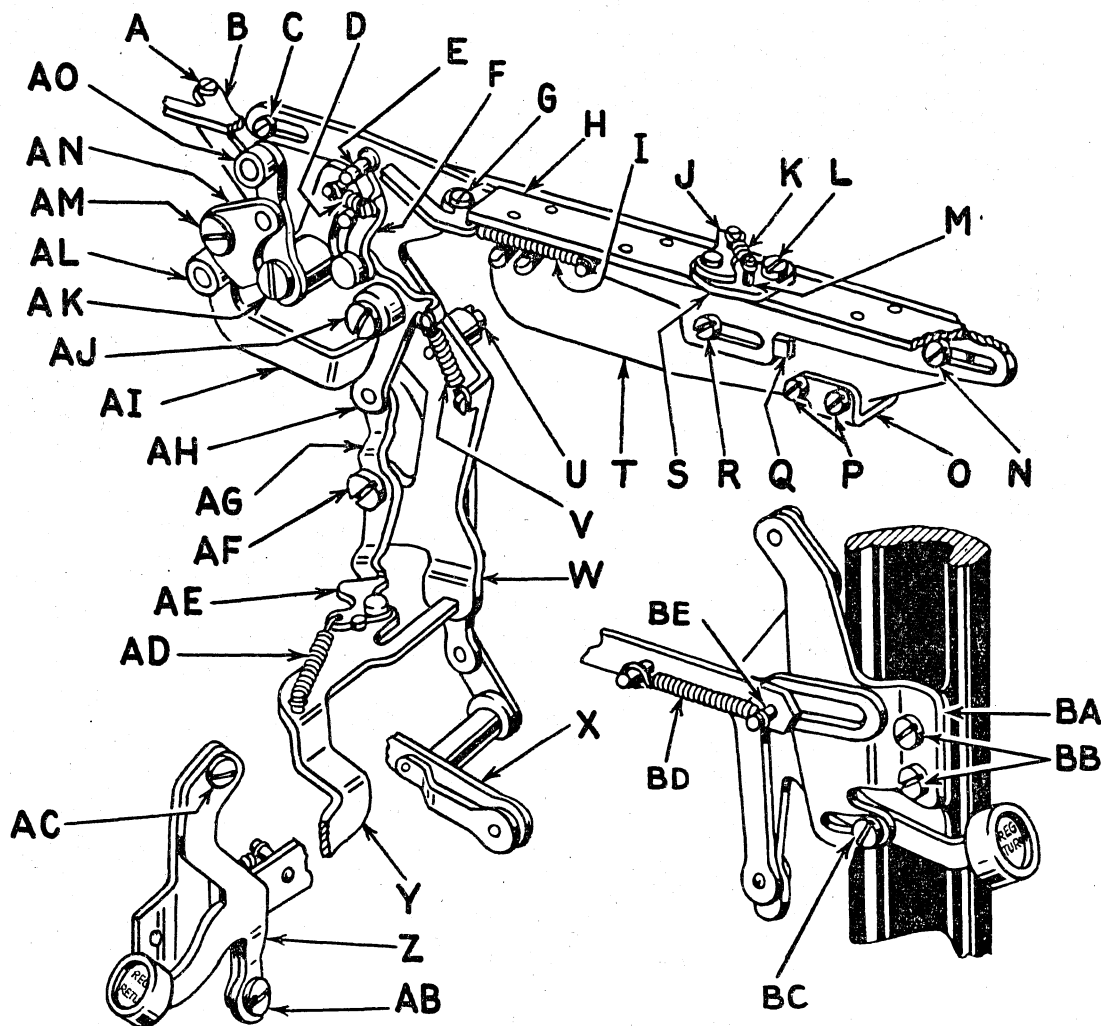
hole in washer F is smaller in diameter than shaft H, and when the cone shaped member D is inserted into washer F, the excess portion of leather is forced inward to create a cone shape, it is then forced on to part C. Part D is removed and part C is then placed against shaft H. Assembly E is moved into position on the shaft and into the drive casting by using part B.

Leather washers F must be oil soaked before placing them in position. The flange of assembly E is shellacked before assembling to the drive housing to prevent oil leaks. Assembly N is placed in position in the same manner.

The correct amount of play of worm shaft is secured by first taking up all of the end play with assembly N and then backing it up $\frac{1}{4}$ of a turn, it is then locked in position by lock nut.

The failure to use Kit 71 $\frac{3}{4}$ No. 2 will result in the cone shape of washers F pointing outward, away from the drive instead of inward, and consequently leak oil.

MOTOR RETURN REGISTER MECHANISM KEY CONTROL (Plate 17)



Motor Return Register Mechanism Key Control (Plate 17)

The depression of the register return key will return the registers to the first position.

Function

When the register return key is depressed, the clutch members are meshed through passby pawl AE engaging and rocking AG and AH. The rocking motion of bell-crank AH allows spring I to pull control slide H to the left, meshing the return clutch. Bell-crank AH is latched down by pawl F to remove the tension of restoring spring V from the engagement of the clutch members. It also latches the switch contact points together to obtain power for the return operation.

The tests and adjustments as given for Plates 18 and 20 will apply for the key control of the mechanism.

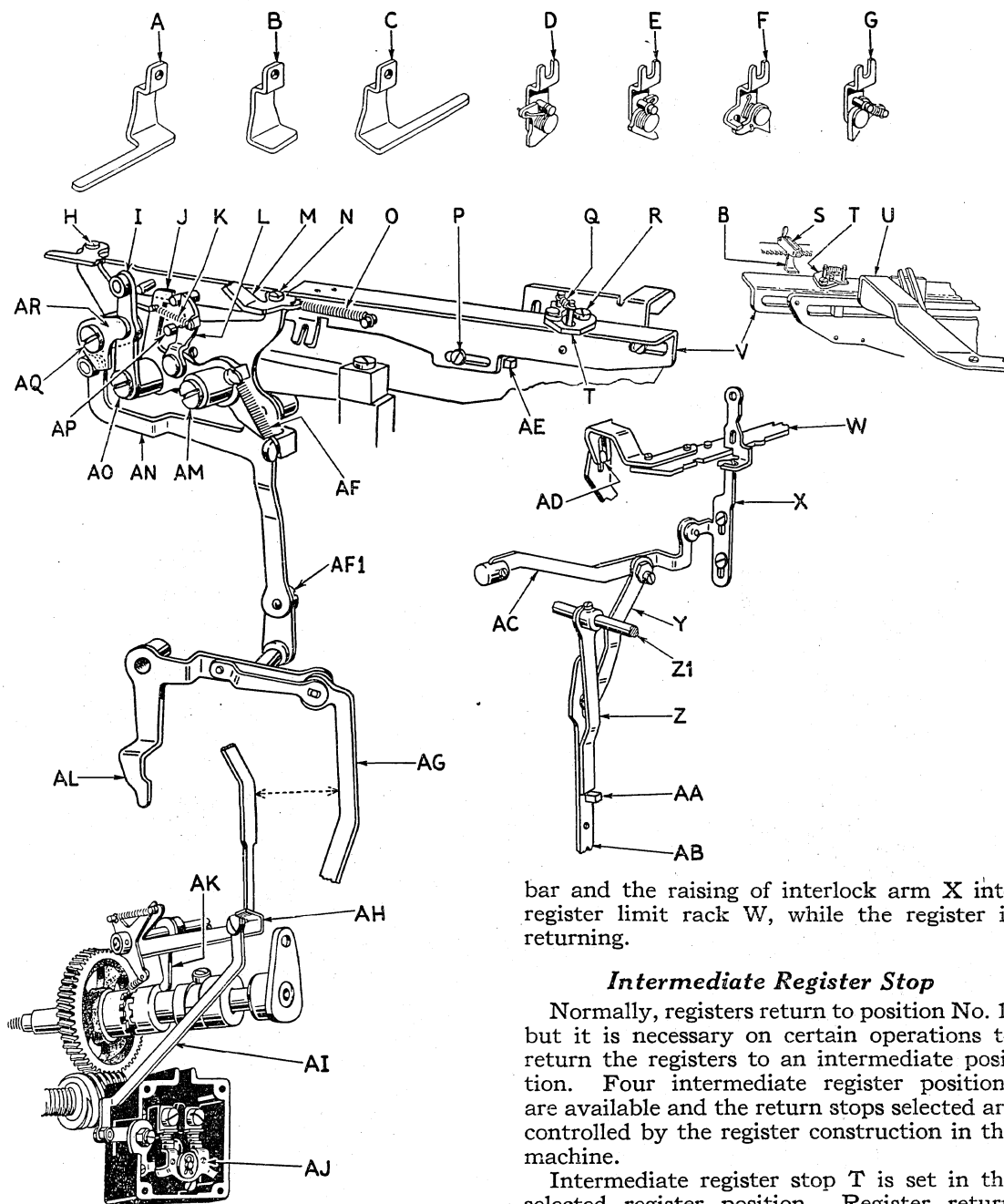
Motor Return Register Mechanism Carriage Control (Plate 18)

This mechanism permits the return of the registers on carriage tabulation, carriage return, and from the depression of the register return key.

Switch Control

The tabulation or return of the carriage causes register trip block E or D to pass over the roller in arm I, camming it downward. Pawl AR on arm I rocks bell-cranks AN and AL, lowering link AG to close the switch through link AI. The downward motion of arm I rocks hub assembly J, which permits pawl L to latch over stud AP and hold the switch contact points together to insure power for returning the registers.

MOTOR RETURN REGISTER MECHANISM CARRIAGE CONTROL (Plate 18)



(Plate 18) Continued
Register Interlock

When control slide V moves to the left, shaft Z1 is rocked which swings arm Z over stud AA to block the interlock arm AB. Arm Z remains in this position until the register return clutch is disengaged. The blocking of arm AB prevents the depression of the motor

bar and the raising of interlock arm X into register limit rack W, while the register is returning.

Intermediate Register Stop

Normally, registers return to position No. 1, but it is necessary on certain operations to return the registers to an intermediate position. Four intermediate register positions are available and the return stops selected are controlled by the register construction in the machine.

Intermediate register stop T is set in the selected register position. Register return trip block D and limit arm B is set to correspond to the selected register position. When the registers are being returned, the limit arm cams the intermediate register stop in the patch of travel of arm U, which moves slide V to disengage the return clutch.

Adjustments

Register return trip pawls D and E should

(Plate 18) Continued

lower arm I sufficiently to latch pawl L under stud AP.

Adjustment: Bend the trip pawls up or down to obtain the required movement. Be sure the spring on pawl L has sufficient tension to hold it latched under stud AP. A premature release of the pawl will result in a partial or short return of the register shaft.

With pawl L latched under stud AP, the switch contact points AJ should be firmly together without a bind. If the contact points are too tight, it creates a hard typing operation of the register trip block over the roller in arm I.

Adjustment: Made from eccentric AF1 in bell-crank AN.

The passby pawl on intermediate stop T

should have at least a flush hold on register restoring fork U.

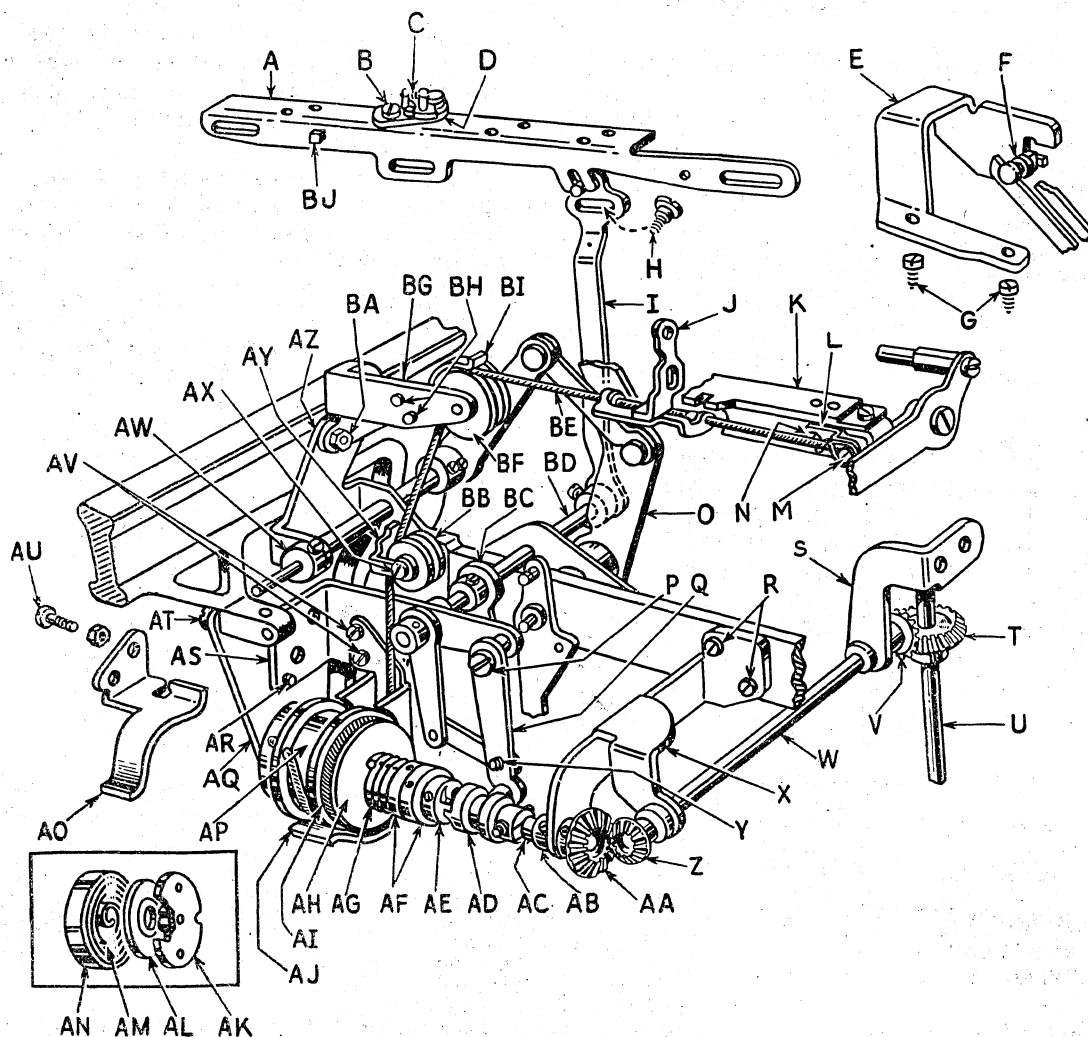
Adjustment: Bend the limit arm B as required.

Interlock Z should have a full hold on stud AA when the return clutch is meshed. This is necessary to prevent interlock arm X interfering with the return of the registers if the motor bar is depressed during the return operation.

Adjustment: Locate the interlock on shaft Z1 as required.

Interlock X in the normal position should have about 1/64" clearance under escapement rack W.

Adjustment: Eccentric in arm Y is adjusted as required. This adjustment must be checked when adjusting interlock Z.

MOTOR RETURN REGISTER MECHANISM (Plate 19)

Motor Return Register Mechanism (Plate 19)

Return Clutch Operation

The horizontal movement of control slide A swings arm I, and through shaft assembly BD and arm Q, the clutch members AD and AE are meshed. Clutch shaft AC is revolved by the drive through gear T, mounted on vertical carriage return shaft U and horizontal shaft assembly W. The power of the revolving clutch members is applied to drum AP through spring AG, friction clutch disc AH, and leather washer AI.

The revolving motion of the drum winds return cord BE around its outside diameter to return the registers. After the registers have been returned, the clutch is disengaged when coupler F contacts stud BJ, moving control slide A. The movement of the control slide swings arm I, which rocks shaft BD, and arm Q disengages clutch member AD.

Installing Register Return Cord

Thread one end of the return cord through guide holes in assembly J and fasten to screw M with a slip knot. Lead the other end of the return cord over the pulleys to the drum. Wind spring AM by turning the drum four times, hold the drum and thread the end of the return cord through the rim of the drum and tie a knot. To obtain sufficient slack in order to tie a knot, move registers from extreme left position, one or more positions to the right.

Return Cord Take-up Spring

The purpose of spring AM is to keep return cord BE taut on the tabulation of the registers. One end of spring AM is anchored to cover AN which is riveted to bracket AQ.

The other end of the spring has a formed ear which catches in a flange on the hub of disc assembly AK. Two studs passing into the holes in the disc AK, connect the take-up spring with drum AP.

Adjustments

Spring AG should have just sufficient tension to return the registers without friction clutch AH slipping.

Adjustment: Threaded adjusting collars AF are turned to obtain the required tension.

When making this adjustment, do not have excessive tension, as the friction clutch should slip if the register pinion cob is held up on its

return movement. An ideal test to make is to hold up the return of the pinion cob with just sufficient pressure to feel the pull of the friction clutch and then allow the pinion cob to slowly return to normal. After the limit tooth on the escapement rack K in register one has about 3/16" lead on the limit fork, the clutch knock-out should take place.

Another test that should be applied to the friction clutch; return the registers to position one, hold depressed, arm I, Plate 18, the return clutch should engage and disengage repeatedly if the friction is correctly adjusted.

Leather washer AI is oil soaked before assembly, as it evidently would be thoroughly oiled in a short time in the machine. It also provides a smooth knock-out clutch action and it retains the adjustment of the clutch over a longer period.

Clutch members AD and AE should have at least half hold in register one and a full mesh in all other register positions.

Adjustment: Arm I is located on shaft BD as required. Both conditions must be checked while making this adjustment, and the return assembly must be latched down by pawl L, Plate 18.

The half hold of the clutch member teeth in register one is necessary to insure a clutch knock-out if the return mechanism is tripped while in this position.

In adjusting clutch members AD and AE, keep in mind that the spring on control slide A is the means of holding the clutch together on the register return operation. To insure that the clutch members receive the full benefit from the control slide spring, the contact point assembly is latched by pawl L, Plate 18.

Shafts AC, W and U should have just sufficient end play to insure free action.

Adjustment: The set collars on these shafts are adjusted as required.

Bevel gears T, V, Z, and AA should have full mesh.

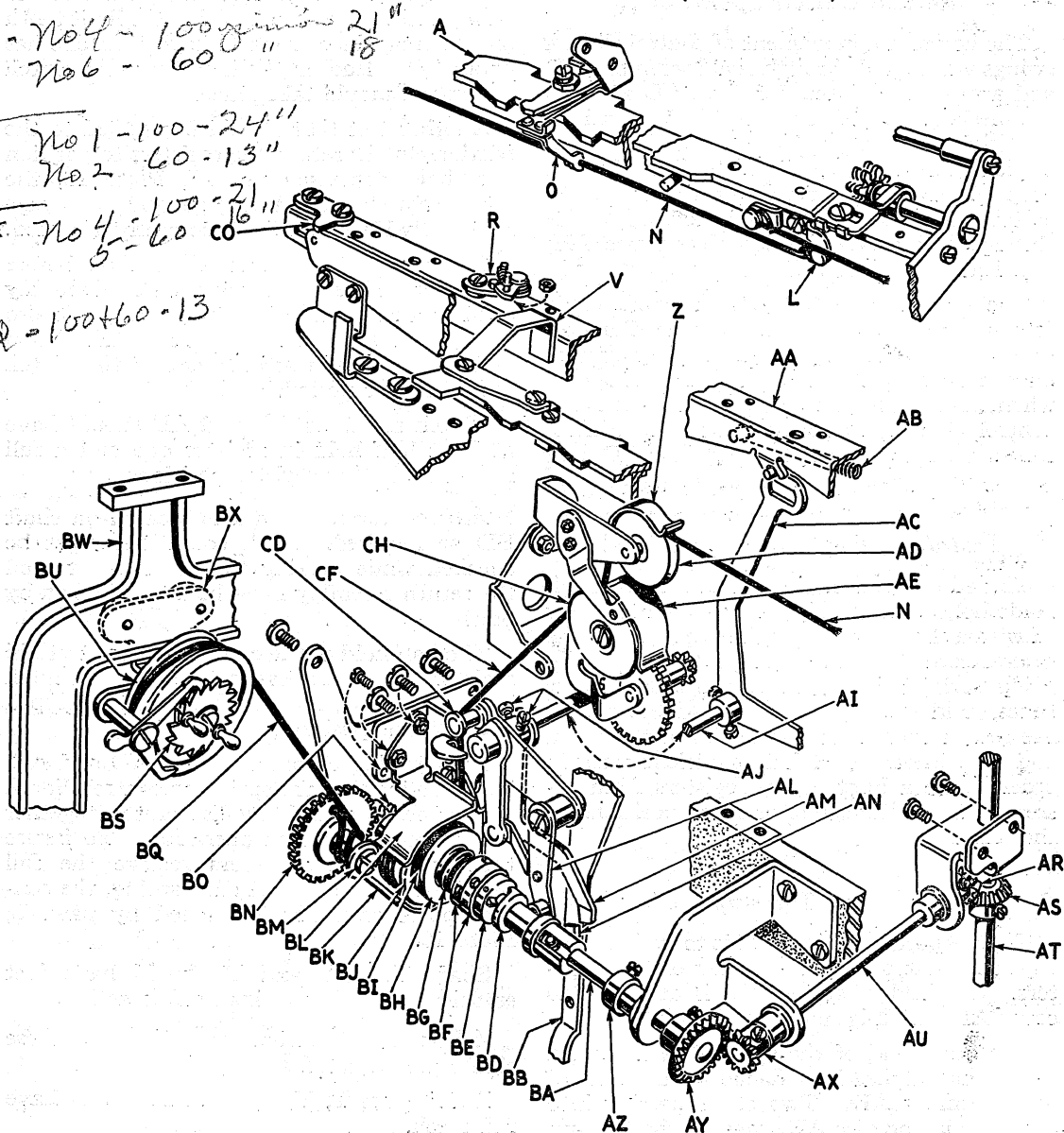
Adjustment: Set the hubs of the gears to obtain required gear mesh.

Full mesh and minimum shaft end play insure maximum thrust and a lasting adjustment.

The pulley guards AY and BI and drum guards AJ and AO should conform to the circumference of the pulley and drum, and be as close as possible to retain the return cord in position.

Adjustment: Bend the guards as required.

REGISTER RETURN MECHANISM, MOTOR DRIVEN—FOR 100 PINION CONSTRUCTION REGISTER SECTION—SERIES M 200 AND M 800 MACHINES (Plate 19-1)



Register Return Mechanism, Motor Driven—For 100 Pinion Construction Register Section—Series M 200 and M 800 Machines (Plate 19-1)

Purpose

To return the registers by motor power.

Construction

Various changes in the Register Return Mechanism (Plate 19) were necessitated by the greater lateral movement of the one

hundred pinion register assembly. The return cord take-up spring, contained in drum assembly BX on side frame BW, is longer and is connected to return cord drum BJ through cord BQ, gear BN, and gear BO.

Elimination of the arm (L, Plate 18, Accumulation Instruction Book) resulted in arranging the register return cord in two sections, N and CF, and also required redesigning the Register Position Indicator Mechanism (Plate 46-1, Accumulation Instruction Book).

(Plate 19-1)—Continued**Operation**

Indexing of the Register Return Mechanism, Motor Driven, either through key depression or carriage control, closes the motor switch points and moves control slide AA to the left. Turning of the motor revolves clutch shaft BA through carriage return shaft AT, gears AS and AR, shaft AU and gears AX and AY. Movement of control slide AA swings bell crank AC, which, through shaft assembly AI and arm AL, meshes clutch member BD with clutch member BE. The power of the revolving clutch members is applied to drum BJ through spring BG, friction clutch disk BH, and leather washer BI.

The revolving motion of drum BJ winds cord CF around its outside diameter to revolve intermediate drum CH. The revolving of drum CH then returns the register pinion assembly through cord N which is wound around drum CH and connected to the outside stud of escapement rack bracket L.

When the register pinion assembly is returned, arm V contacts bracket CO (when the registers return to No. 1 position) or pawl R (when the registers return to an intermediate position) moving control slide AA to the right to disengage clutch members BD and BE through bell crank AC, shaft assembly AI, and arm AL.

Return cords N and CF are kept taut during register tabulation by spring drum BU. Cord BQ is wound around drum BU and then connected to gear BN which is meshed with gear BO on clutch member shaft BA. Gear BO fits on two pins affixed to drum BJ, thus applying the tension of the spring in spring drum BU to drum BJ.

When control slide AA moves to the left, rocking shaft AI through bell crank AC, the lower end of arm AM swings over stud AN in interlock BB. Arm AM remains in this position until the register return clutch members disengage. The blocking of interlock BB, prevents depression of the motor bar while the registers are returning, to prevent meshing the pinions with the adding racks. When the motor bar is depressed, interlock BB is raised, positioning square stud AN in the path of arm AM to prevent engagement of the clutch members during a motor bar operation.

Machine operations indexed by the Cross-footer and Register Totals Indexing Mechanism—Carriage Controlled, are also blocked during register return (as explained in Plate 6H, Keyboard Instruction Book).

Adjustment

1. Shaft AT should have just sufficient end play to insure free action.

To adjust, position the collar on shaft underneath base with gear AS loosened.

2. Shaft AU should have just sufficient end play to insure free action.

To adjust, position either gear AR or AX on shaft AU.

3. Shaft BA should have just sufficient end play to insure free action.

To adjust, position collar AZ with gear AY loosened.

4. Gears AS and AR should have full mesh without bind.

To adjust, position gear AS.

5. Gears AX and AY should have full mesh without bind.

To adjust, position gear AY.

6. With the control arm (I, Plate 18) latched down, the teeth of clutch member BD should have a half hold (or slightly less) on the teeth of clutch member BE with the register pinion assembly in register No. 1 position, and a full hold with the register pinion assembly in any other register position.

To adjust, locate arm AC on shaft AI.

Note: The half hold (or slightly less) of the clutch member teeth, with the register pinion assembly in register No. 1 position, is necessary to insure clutch disengagement should the Register Return Mechanism be indexed while the registers are in this position.

When making this adjustment, it should be remembered that spring AB on control slide AA is the means of holding the clutch members together during a register return operation. To insure that the clutch members receive the full benefit from spring AB, control slide AA is latched to the left.

7. Spring BG should have just sufficient tension to return the registers without friction clutch disk BH slipping.

To adjust, turn spanner nuts BF to obtain the required tension, and lock the nuts.

Note: When making this adjustment, avoid placing excessive tension on spring BG as the friction clutch should slip if the register pinion assembly is blocked during its return movement. To test the amount of tension on spring BG, hold up the return of the pinion assembly with just sufficient pressure to feel the pull of the friction clutch, and then allow the pinion assembly to slowly return to the first register position. After the limit tooth on escapement rack A has about 3/16" lead past the register position limit (when in

(Plate 19-1)—Continued

register No. 1 position), the clutch should disengage.

Another test that should be applied to the friction clutch to determine if the friction is correctly adjusted is to return the registers to position No. 1 and hold the arm (I, Plate 18) depressed. The return clutch members should engage and disengage repeatedly. This test also serves to determine whether the clutch members have sufficient hold on each other in register No. 1 position.

Leather washer BI should be well oiled to provide a smooth disengaging clutch action and to retain the adjustment of the clutch over a longer period of time.

8. The return cords should have just sufficient tension to keep them taut during register travel.

To adjust, turn ratchet BS counterclockwise to increase tension.

Note: In this adjustment, keep in mind that the register tabulating spring must overcome return cord tension, and excessive cord tension tends to slow down register tabulation.

9. Pulley cord guard Z and drum cord guards AE, BK, and BL should be as close as possible to and conform to the circumference of the pulley or drum to retain the return cords in position.

To adjust, bend cord guards Z, AE, BK or BL.

10. Arm AM should have just sufficient clearance with the top of square stud AN to permit being positioned over the stud when the carriage return key is depressed and the motor bar is held down. This is to assure that the Register Return Mechanism may be indexed during carriage return.

To adjust, shorten or lengthen arm AM by bending it at its forms.

11. Arm AM should just clear the left side of square stud AN when the motor bar is depressed.

To adjust, swing arm AM and tighten set screws AJ.

Installation Notes

Whenever a cord is cut or trimmed during its installation, it should then be heated to fuse the frayed ends of the threads to prevent unraveling.

Guides Z, AE, BK, and BL may be removed to facilitate installing cords N and CF.

Register return cords N, CF, and BQ may

be installed by using the following procedures:

1. Register Return Cord N (21" long)—

a. Move the register pinion assembly to the last register position, and fasten cord N to the outside stud of bracket L with a slip knot.

b. Thread the loose end of the cord through guide O and lead it around pulley AD.

c. Tie a knot in the loose end of cord N.

d. With the register position indicator as near to the last register position as possible, turn drum CH so that the forward slot is up, and note the register position.

e. Move the register pinion assembly to the register position indicated; wind cord N around drum CH once, and place the knot into the slot.

f. Reposition the register position indicator for proper alignment, if necessary.

2. Register Return Cord CF (19" long)—

a. Tie a knot in one end of cord CF and thread the other end inward through the hole in the rim of drum BJ.

b. Tabulate the register pinion assembly from register No. 1 position until the rearward slot in drum CH is up.

c. Lead the loose end of cord CF over pulley CD, and tie a knot in the loose end.

d. Wind the cord once around drum CH; insert the knot into the rearward slot, and tabulate the register pinion assembly to wind the cord around drum CH.

e. Loosen screw BM sufficiently to unmesh gear BN from gear BO, and turn gear BN to wind more cord on its spindle. This operation takes up the slack left in cord CF and winds it around drum BJ, thus avoiding the necessity of removing guide BK.

f. Readjust the tension of cord BQ.

3. Register Return Cord BQ (13" long)—

a. Position the register pinion assembly in register No. 1 position.

b. Tie a knot in one end of the cord, and thread the other end inward through the hole in gear BN.

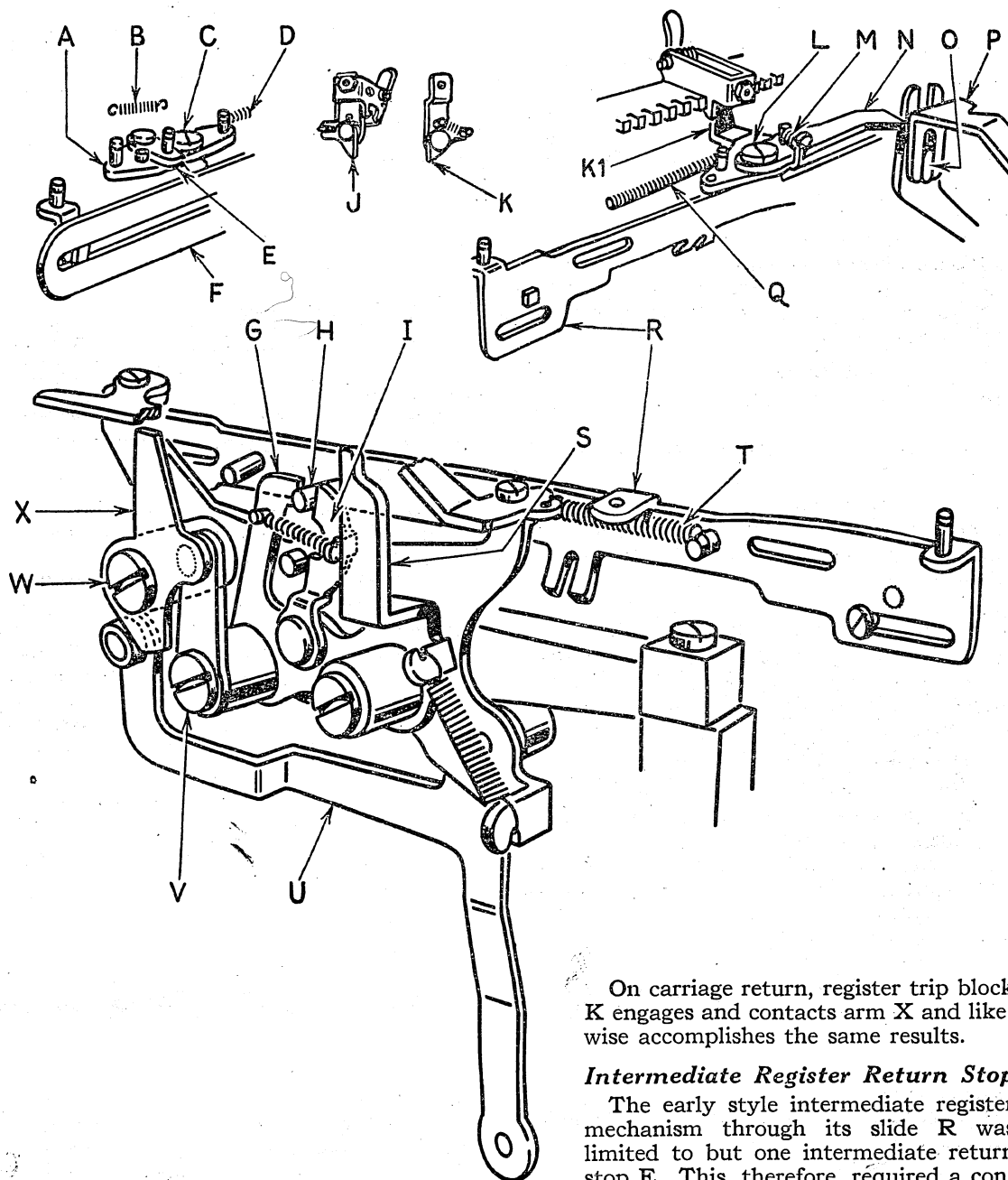
c. Lead the cord over the spindle of gear BN from the forward side of the machine, making one complete loop around the spindle, and tie a knot in the loose end.

d. Hold the loose end of the cord taut, and tabulate the register pinion assembly to the last register position.

e. Hold spring barrel BU with the slot up and to the rear; wind the spring by turning ratchet BS counterclockwise to draw the outer leaf of the spring away from the barrel, and insert the knot into the slot.

f. Adjust the tension of cord BQ.

MOTOR RETURN REGISTER MECHANISM CARRIAGE CONTROL (EARLY) (Plate 20)



Motor Return Register Mechanism Carriage Control (Early) (Plate 20)

The early style register return mechanism differs in that there are two separate arms, S and X, to engage the clutch members. On the carriage tabulation, register trip block J engages arm S to lower arm G to permit spring T to move slide R over, and accomplishes the results as previously described.

On carriage return, register trip block K engages and contacts arm X and likewise accomplishes the same results.

Intermediate Register Return Stop

The early style intermediate register mechanism through its slide R was limited to but one intermediate return stop E. This, therefore, required a considerable number of styles of slides R and intermediate stops E and N.

The carriage through part K1 locates passby pawl into the path of arm P. When the registers are being returned, arm P contacts pawl E to move slide R and disengage the clutch.

The tests and adjustments previously given, will apply to this mechanism.

BURROUGHS
SERIES M
BILLING-ACCOUNTING MACHINES

INSTRUCTION BOOK

CORRECTION INDEX

RELIABILITY IMPROVEMENT NOTICE

CONDITION: Breakage or stretching of Full Cent Wire CD (Plate 25-1, Keyboard Parts Catalog). Series M200 machines.

CAUSE: Wire material used not strong enough for Full Cent operation.

CORRECTION: The full cent wire is now made from 1/8" stock to prevent loss of wire adjustment and wire breakage.

INSTALLATION: The following parts are required to install the heavy wire based on serial number and construction.

Machines prior to Serial M12624D and M8195F with Full Cent - Non Tab construction.

72706A wire - replaces CD (Plate 25-1, Keyboard).

707505 screw for above.

Machines prior to Serial M8759D and M1088F with Full Cent to Tab.

72706A wire - replaces CD.

72500 #2 screw used in place of screw CC (Plate 25-1, Keyboard).

Machines after Serial M8759D and M1088F with Full Cent to Tab.

72706A wire - replaces BT (Plate 19-4A Carriage).

707505 screw for above.

1-702762B tab wire replaces BU (Plate 19-4A Carriage).

72124C No. 1 bellcrank replaces BQ.

72572 No. 1 screw for above.

Machines prior to Serial M8759D and M1088F with Full Cent to Tab and To Crossfooter key in position No. 111.

72706A wire - replaces CD (Plate 25-1, Keyboard).

707505 screw for above.

702303 1/2 collar used in place of collar AR (Plate 19-4A Carriage).

Machines after M8759D and M1088F with Full Cent to Tab and To Crossfooter key in position No. 111.

72706A wire.

707505 used for above.

Part No.	Unit List Price
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72124C No. 1	\$1.50
72500 No. 2	.19
72572 No. 1	.05
72706A	1.75
702303 1/2	1.35
1-702762B	1.50
707505	.11

PREVENTIVE MAINTENANCE GUIDE

(Plate 1-1)

Preventive Maintenance and Lubrication Procedure

Each Preventive Maintenance Attention is to include proper cleaning, lubrication, replacement of worn parts, installation of Correction Index parts and adjustment of the machine to insure correct function of all mechanisms and ease of operation.

It is very important that all Correction Index parts be installed at the time of the Preventive Maintenance Attention if a satisfactory program of Preventive Maintenance is to be maintained.

Preventive Maintenance Attentions must be rendered to all Series M Machines regularly, according to the Preventive Maintenance requirement.

Preventive Maintenance Attentions to all Series M Machines are to be performed as follows:

1. Inquire whether the machine has been performing satisfactorily and if the operator has observed any peculiarities in the operation that require correction.
2. Ask the operator to clear and print the total that is accumulated in each register and in the crossfooter. In the event an amount is extended in the multiplier-subtractor have the operator multiply by 1 and take a crossfooter total to show the amount that is extended. Have the operator demonstrate any particular complaint.
3. Make an operation test run of the machine, using all keys, motor bars, etc. Observe any peculiarities of operation with respect to speed, sound, carriage section, paper feed, printing, or operating results. The following approved lubricants and cleaning agents are to be used when performing the Preventive Maintenance Attention.
 - A. Machine Oil S131A
 - B. Machine Grease S167 1/4A
 - C. Drive Oil S165 1/2B
 - D. Case Cleaner and Polish S11

Parts requiring lubrication must first be cleansed of dust and old lubricants.

4. Check to assure the front and rear carriage control bars are tight on the carriage. Check to assure the carriage control rails are tight on the carriage control bars, and for proper alignment with the rolls on their respective control levers. Check each individual control rail to assure its being tight on its respective hanger.
 - A. Lubrication:
 1. Machine Oil S131A to be applied at the pivot points of all control levers of the carriage controlled features and to the internal bearing surfaces for the rolls on the carriage control levers.
5. Disconnect the wall plug and remove the machine case and the typewriter panels.
6. Check the carriage and install Correction Index parts applicable.
 - A. Check the condition of the platen, pressure rolls, feed rolls, twirlers, and paper guides.
 - B. Check spacing mechanism for proper operation.
 - C. Clean platen and pressure rolls with Platen Restorer.
 - D. Clean the carriage parts including raceways using sash brush (Kit 157) and a soft clean cloth.
 - E. Check the gears and clutches in the carriage return and carriage escape-ment mechanism for wear.
 - F. Check the carriage to move freely and to have minimum play in the raceways.
 - G. Check condition of carriage draw band.

H. Lubrication:

1. Machine Oil S131A is to be applied to:
 - a. Rolls on each end of the auxiliary aligning table.
 - b. Roll and pivot point of the auxiliary aligning table bracket.
 - c. Pivoting points of all pressure rolls (one drop).
 - d. All friction points of the carriage escapement assembly.
 - e. Carriage draw band pulley.
 - f. Front and rear carriage rails.
 - g. All friction and pivot points of the carriage governor.
 - h. All bearing and friction points on the carriage not specified above.
 2. A thin film of Machine Grease S167 1/4A is to be applied to:
 - a. Ball bearings in the roller assembly attached to the top of the machine case on machines containing a carriage high-back with ledger chute and roll paper holder.
 - b. Stud and lip on the vertical space actuating arm where it contacts the vertical spacing bail.
 - c. Small carriage return gear that is meshed with the carriage rack.
7. Check the keyboard section and install Correction Index parts applicable.
- A. Clean between the keystems using keyboard brush (Kit 156) and a soft clean cloth.
 - B. Check all keys for having free action, interlocks and limits to be in good condition and to operate properly.
 - C. Check for proper escapement of the intermediate keyboard. Assure all intermediate keyboard (T) stops are free.
 - D. Check to assure all adding rack limit (S) stops are free.
 - E. Check adjustment of adding rack limit stop restoring fork.
- F. Lubrication:
1. Machine Oil S131A to be applied to:
 - a. Keystems.
 - b. All pivot points of the keystem bell cranks.
 - c. Intermediate keyboard raceways.
8. Check the Printing section and install Correction Index parts applicable.
- A. Move the ribbon forward out of print position and clean all rack bar type using type cleaning brush (Kit 598). Manually operate the machine to position all type bars forward to nine position and clean sides of type magazines and face of type using Platen Restorer and a soft clean cloth.
 - B. Clean all typewriter type using type cleaning brush (Kit 598). Assure all typewriter key levers for being free.
 - C. Check all rack bar type to be free and type springs to be in good condition.
 - D. Clean the area of the machine in and around the printing section with a clean cloth and brush.
 - E. Check the condition of the ribbon with the operator, and install a new ribbon when required.
 - F. Check the ribbon mechanism for wear, feeding reversing and proper shifting.
- G. Lubrication:
1. Machine Oil S131A is to be applied to:
 - a. Typewriter keylevers at their pivot point, and where they enter their guide combs.
 - b. Pivot points where the typewriter type arms pivot on their hangers.
 - c. Ribbon feed and reverse mechanism.
 - d. All bearing points and movable parts of the typewriter.
 - e. All pivot and bearing points of the Hammer Section Assembly.

9. Check the accumulator sections and install all Correction Index parts applicable.
 - A. Check accumulator meshing controls for proper action.
 - B. Check for proper stepover of crossfooter section (Series M200) during multiplying operations.
 - C. Check for proper point off of crossfooter section (Series M200).
 - D. Check all adding racks for being free, and proper positioning.
 - E. Check alignment of pinions and carry pawls.
 - F. Check pinions to properly operate the carry mechanism.
 - G. Check lift arms in multiplier to limit adding racks properly.
 - H. Check for proper restoration of extension.
 - I. Check for proper timing of the tripping of the multiplying plates.
 - J. Lubrication:
 1. Machine Oil S131A is to be applied to:
 - a. All friction and pivot points of the subtractor section assembly.
 - b. Register pins that carry the register pinion assemblies in the R.M.R. section (Series M700).
 - c. Pilot shaft for the above register assemblies.
 - d. Shafts carrying the register pinion assemblies (M200, M800).
 - e. All adding pinions.
 - f. Carry pawls, carry racks and carry rack latch lift arms at their pivot points on their retaining shafts.
 - g. Carry rack latches at their respective latch combs.
 - h. All friction points, turning points, slides and component parts (not specified above) of the head section assembly.
 2. Machine grease S167 1/4A is to be applied to:
 - a. Gear and gear segment on the right end of the multiplier raise bail shaft.
 - b. Slots in right and left side plates of the subtractor assembly.
 - c. Right and left end of the crossfooter carry pawl shaft where contacted by the crossfooter meshing hooks.
 - d. Spiral shaft S and all gears illustrated on Plate 46, Accumulation Symbol Book.
10. Check the power section and install all Correction Index parts applicable.
 - A. Remove protective covers as required, and check condition of motor brushes, governor, governor brushes, electrical contact points, and remove all carbon dust.
 - B. Check motor cord and all wire terminals to be secure and in good condition.
 - C. Check oil in drive for proper level.
 - D. Check machine for proper operating speed.
 - E. Lubrication:
 1. Machine Oil S131A is to be applied to:
 - a. Wick of part R (Plate 2, Power Symbol Book) if contained.
 - b. Oil holes in right and left side frames for the main operating shaft.
 - c. All bearing points in brackets or side frames wherein a shaft pivots or rotates.
 - d. Bushings on the motor drive assembly for the carriage and register return gears.
 - e. All rollers.
 - f. Leather disc of the motor register return clutch.
 2. Thin film of Machine Grease S167 1/4A to be applied to:
 - a. Gear train of the motor drive unit.
 - b. Carriage and register return gears.
 - c. Bushing in base for the carriage and register return shaft.
 - d. Camming surfaces of the cams on the main operating shaft.

The Drive Unit should periodically be drained and thoroughly flushed to prevent an accumulation of foreign matter. The correct procedure for flushing the Drive Unit is as follows:

With the machine sitting level to facilitate draining, and all fluid oil drained off, pour in two ounces of solvent (S131 3/4), and operate the machine for approximately ten minutes to permit cleaning of the clutch members. Drain the dirty solvent and repeat this application until the solvent drains clear. Pour in two ounces of the approved mineral spirits being used in the Branch for cleaning machines, operate the machine for two minutes, and drain.

Refill the Drive Unit with two ounces of Drive Oil (S165 1/2B).

11. Operate the machine to be sure peculiarities pointed out by the operator or observed during the test run have been corrected.
12. Thoroughly clean and replace the case and typewriter panels.
13. Thoroughly clean all keytops and motor bars.
14. Clean the machine stand and apron, and suggest a new apron be installed if the old one is oil-soaked.
15. Satisfy yourself that the Preventive Maintenance Attention is complete and effective.
16. Have the operator test the machine while you are making out your reports.
17. Re-enter the totals and extension, previously cleared prior to starting the Attention, into their respective accumulators.

CORRECTION INDEX

I

CONDITION: Extend restoring bail assembly BJ (Plate 22-7, Fig. 2, Accumulation Symbol Book) or index arms C (Plate 22-7, Fig. 1, Accumulation Symbol Book) are bent.

Any one, or a combination of, the following conditions may contribute to, or be the full cause of, bending parts:

CAUSE: 1. Partial depression of the subtract key far enough to trip pawl AB (Plate 30, Keyboard Symbol Book) without tripping the drive, followed by full depression of a multiplying key, results in slide AH (Plate 25-1, Accumulation Symbol Book) being restored with the tens plate operation leaving the units plate indexed. When followed by a final product key or first product and clear multiplier key depression, the units plate is raised during the machine operation, resulting in a mechanical conflict.

CORRECTION: 1. Follow instructions in Correction Index 1006, Item VI for Series M200 Machines prior to M9163D and New Wide Base Class 72 Machines prior to Series M Machines.

CAUSE: 2. Partial depression of the subtract key far enough to trip pawl AB (Plate 30, Keyboard Symbol Book) without tripping the drive, followed by full depression of the clear multiplier key results in positioning lift arms CL (Plate 22-3, Accumulation Symbol Book) in the path of extend indexing fingers CP. Although the subtract operation shifts the twin cams CG (Plate 19-1, Keyboard Symbol Book) to add crossfooter position where stud CJ clears extend restoring arm CK, it is possible for the subtract mechanism releasing during the early part of the forward stroke since toggle AJ (Plate 22-3, Accumulation Symbol Book) is not positioned beyond center on a partial subtract key depression. If the subtract mechanism does restore, the twin cams could settle back to non-add or add register position and align stud CJ (Plate 19-1, Keyboard Symbol Book) and arm CK to cause a mechanical conflict.

CORRECTION: 2. Follow instructions in Correction Index 1006, Item IV.

CAUSE: 3. Failure of the Add Register-Clear Multiplier linkage to latch when indexed simultaneously with the First Product Key when the machine is under positive register control (add crossfooter cam on the control bar active). Failure of the add register-clear multiplier linkage to latch can be caused by the extra load placed on power shaft CG (Plate 6E, Keyboard Symbol Book) because of the two linkages being pulled forward at the same time and also because the add register-clear multiplier linkage is attempting to shift the twin cams to add register position while the first product linkage is blocking this movement, resulting in expansion of spring AY (Plate 12, Accumulation Symbol Book). These combined loads distorts the power shaft, thereby reducing latching lead. Failure of the add register-clear multiplier linkage to latch permits

CORRECTION INDEX

extend arms C (Plate 17, Keyboard Symbol Book) to engage the teeth in detaining racks D. If stud CJ (Plate 19-1, Keyboard Symbol Book) contacts extend restoring arm CK during the machine operation, a mechanical conflict will result.

CORRECTION: 3. By following the instructions in Correction Index 1008, Item VII, a stronger First Product linkage is provided and will provide more positive pulling action and, therefore, there will be less tendency to distort the power shaft.

CAUSE: 4. Failure of the Final Product or Add Register-Clear Multiplier linkages to latch following key depression, may result from a weak or broken latch spring or insufficient latching lead of the linkage over the latch, caused by incorrect adjustment of pawl S (Plate 8-4A, Keyboard Symbol Book) or worn bushing at AI (Plate 8-4). The linkage can recede as the machine operation starts, which may permit extend arms C (Plate 17, Keyboard Symbol Book) to engage the teeth in detaining racks D. If stud CJ (Plate 19-1, Keyboard Symbol Book) contacts extend restoring arm CK during the machine operation, a mechanical conflict will result.

CORRECTION: 4. Refine latching adjustments to provide the correct amount of "cushion" in the linkages and replace damaged or worn parts.

CAUSE: 5. Failure of units pawl C (Plate 22-1, Accumulation Symbol Book) to reset on latch D (excessive side play or poor alignment are common reasons) at the end of a multiplying cycle, followed by a Product or Clear Multiplier operation will result in mechanical conflict.

CORRECTION: 5. Refine resetting and alignment adjustments.

CAUSE: 6. Failure of lift arms CL (Plate 22-3, Accumulation Symbol Book) to restore fully home and causing interference with restoring of extend index fingers CP. The reasons for this failure may be: lift arms CL are not free; vertical link A (Plate 22-1, Accumulation Symbol Book) may be worn at the bottom end of the slot; the roll and stud in segment gear L (Plate 14, Power Symbol Book) may be worn or pin C (Correction Index 1008, Item XXIV) may be worn or the pin hole enlarged.

CORRECTION: 6. Assure free action of lift arms CL (Plate 22-3, Accumulation Symbol Book) and replace damaged or worn parts.

CAUSE: 7. Failure of Final Product or Clear Multiplier linkages to release at the end of a machine operation. When either linkage fails to release and the next machine operation is an extend operation opposing functions of extend clearing and extending attempt to take place. Failure of the linkages to release may be caused by; incomplete forward machine stroke through incorrect setting of eccentric AK (Plate 14, Power Symbol Book); worn bearings in link AJ (Plate 14, Power Symbol Book); pin C (Correction Index 1008, Item XXIV) may be worn or the pin hole enlarged;

CORRECTION INDEX

loose or worn roll AD (Plate 13, Power Symbol Book); the drive arm for shaft X (Plate 13, Power Symbol Book) may be loose or the adjustment of release collar AB (Plate 13, Power Symbol Book) may be incorrectly adjusted.

CORRECTION: 7. Follow instructions in Correction Index 1008, Item XXIV. Replace damaged or worn parts.

CAUSE: 8. Failure of keyboard interlocks to prevent depression of functional keys which have conflicting mechanical actions.

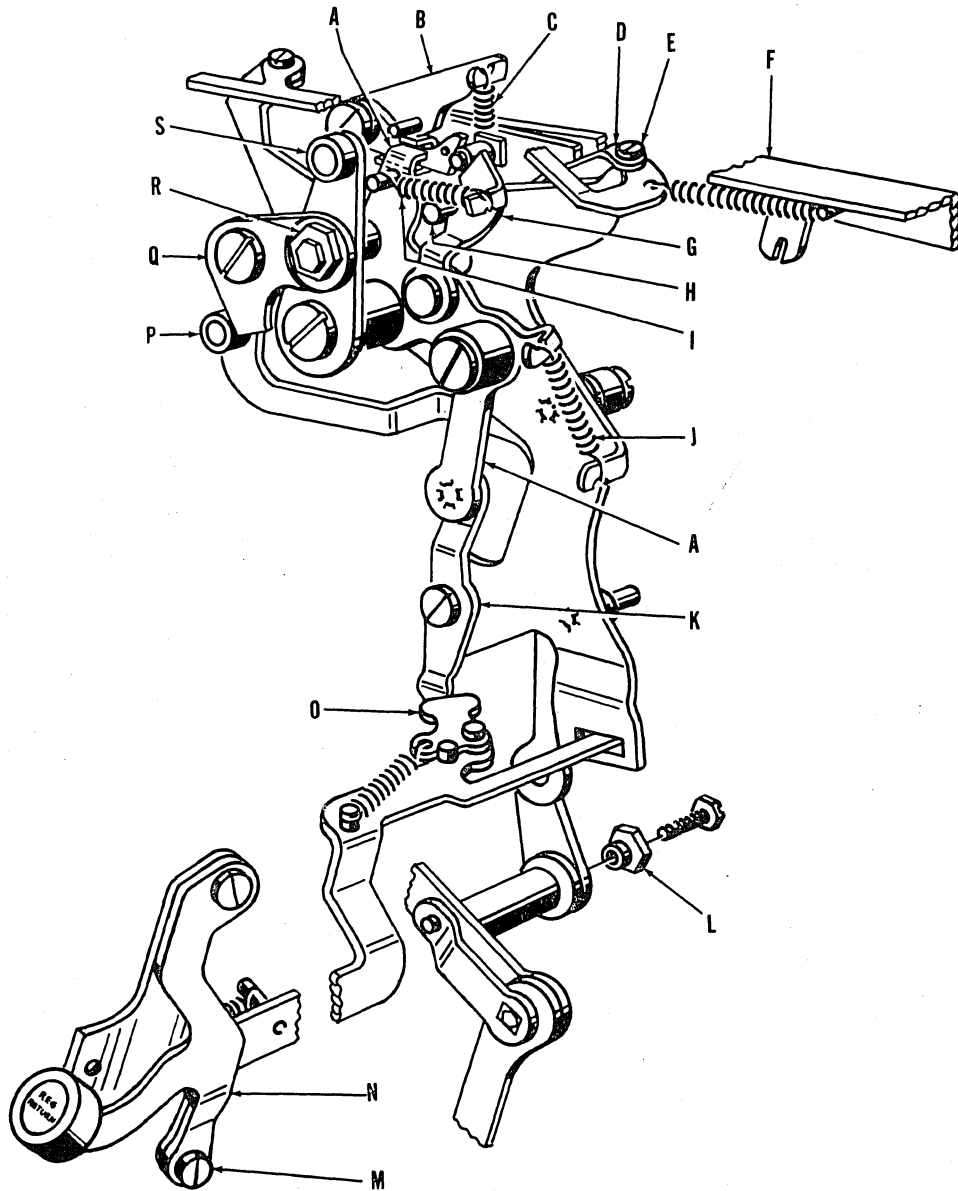
CORRECTION: 8. Refine adjustments and replace damaged or worn parts.

CAUSE: 9. Machines with non-extend of columns mechanism may have the additional condition: failure of block BC (Plate 18-2, Keyboard Symbol Book) to lock under latch BG with the "Non-Extend of Specified Columns" mechanism under carriage control (roll AF under cam AG), will permit channel bail BU to restore so that the slots in the bail align with extend arms BX in the factor side. Thus extend arms BX are not raised out of their detent arms for restoring to normal during the machine operation.

NOTE: Bending would only occur if an amount had been extended in the factor side.

CORRECTION: 9. Follow instructions in Correction Index 1002, Item I.

CORRECTION INDEX



I

CONDITION: Register fails to return under motor power.

CAUSE: Register return clutch control mechanism rebounds so that the clutch does not make full engagement.

CORRECTION: Install bellcrank assembly A which has latch G reinstalled to enforce clutch engagement until the register is fully returned. The following parts are required: Note: Order only for immediate need.

A 1-79268C No. 2

Register return clutch indexing bellcrank.

D 709261

Spring anchor for spring C.

CORRECTION INDEX

Item I (Cont'd)

E	74502	Screw for anchor D.
F	1A-709265A No. 9	Slide (100 pinion, 12 x 8).
	11A-709265A No. 9	Slide (100 pinion, 8 x 12).
	21A-709265A No. 9	Slide (100 pinion, 6 x 15).
	31A-709265A No. 9	Slide (100 pinion, 10 x 10).
	1A-709265D No. 1	Slide (60 pinion, 6 x 10).
	1A-709265D No. 2	Slide (60 pinion, 7 x 8).
	11A-709265D No. 2	Slide (60 pinion, 5 x 12).
	1A-709265D No. 3	Slide (60 pinion, 8 x 7).
	1A-709265D No. 4	Slide (60 pinion, 4 x 15).
I	8082A	Spring for latch G.
J	83806B	Spring for bellcrank A.

After installing the improved parts, the following tests and adjustments should be performed. NOTE: These tests and adjustments supersede those given in Plate 19-1, Power Instruction Book.

1. To assure free action and prevent any braking effect from driving shafts -

Shafts AT, AU and BA (Plate 19-1, Power Symbol Book) should have minimum end play and turn freely.

To adjust, position the set collars on the shafts.

2. To ensure quiet, free running gear mesh and minimize gear wear -

Gears AS and AR (Plate 19-1) and gears AX and AY should have full mesh with minimum backlash and turn freely.

To adjust, position gears AS and AY.

3. To ensure maximum imparted motion and full restoring of the register return key mechanism -

Passby pawl O (illustrated) should have equal clearance in front and rear of lever K when normal and when register return key N is fully depressed.

To adjust, turn eccentric screw M.

4. To ensure prompt and positive power shut-off after the register assembly return operation is completed -

Indexing pawls D and E (Plate 18, Power Symbol Book) should have equal clearance on either side of roll S (illustrated) when the carriage is limited by any tabulator stop.

To adjust, turn eccentric R. NOTE: Keep the high side of the eccentric turned upward, to ensure the dwell surface of cam Q reaching the center

CORRECTION INDEX

Item I (Cont'd)

of roll P when roll is latched depressed.

5. To ensure that the register return clutch remains meshed during the register return operation -
 - a. Control latch G (illustrated) should have .008" to .012" latching clearance under stud H as pawl O passes by lever K during a register return key depression.

To adjust, bend the lower extension of bellcrank A.

- b. Control latch G (illustrated) should have .008" to .012" latching clearance under stud H when the end of indexing pawl D and E (Plate 18, Power Symbol Book) is directly over roll S (illustrated).

To adjust, position the indexing pawls up or down in their retaining brackets.

6. To ensure that the registers will be fully restored to No. 1 position (when so indexed) prior to disengagement of the register return clutch -

With the register assembly held fully to the right, the limit step of escapement rack E (Plate 17-1, Accumulation Symbol Book) should have approximately 3/16" (.1875) lead over escapement pawl T (Plate 17-1).

To adjust 100 pinion construction, position limit plate CK (Plate 19-1, Power Symbol Book).

To adjust 60 pinion construction, bend the upper extension of limit plate J (Plate 8-1, Printing Symbol Book).

7. To ensure good contact of the limit plate with the register assembly when the latter is fully restored to position No. 1 -

Register limit plate CK (Plate 19-1, Power Symbol Book) should be as close to the adding pinion assembly shaft as possible, without interfering with vertical movement of the register assembly.

To adjust, turn eccentric C (Item IV, Correction Index No. 1009).

8. To ensure against the register having a false limit when restored and to ensure positive functioning of latch B (illustrated) if roll S is held depressed -

With the register pinion assembly held fully to the right, slide F should have .003" to .005" end play.

CORRECTION INDEX

Item I (Cont'd)

To adjust, position limit plate CO (Plate 19-1, Power Symbol Book).

9. To ensure a complete return of the register assembly from any position and clutch disengagement when register return operation is indexed with register No. 1 active -

With bellcrank A latched down, the teeth of clutch members BD (Plate 19-1, Power Symbol Book) and BE should have approximately one half hold of each other when register No. 1 is active, and have full hold when any other register is active.

To adjust, locate arm AC on shaft AI. NOTE: This adjustment should result in approximately .030" "cushion" of the return slide when the clutch members are fully engaged, and with register No. 1 active, latch B held inactive, roll S held depressed and the power on, the clutch should repeatedly engage and disengage. If necessary decrease the "cushion".

10. To prevent register control cords from losing position on their respective pulleys -

- a. Register return and control cords N, K, BA and CF (Plate 19-1, Power Symbol Book) should have sufficient tension to keep them taut at all times.

To adjust, turn ratchet BS (Plate 19-1, Power Symbol Book) clockwise to decrease tension and counter-clockwise to increase tension.

- b. Cord guards Z, AE, BK and BL (Plate 19-1, Power Symbol Book) should conform to the cord pulley outline and lie as close as possible to the rim of the pulleys without interference with cord travel.

To adjust, form the guards by bending.

11. To prevent a machine operation during carriage return from motor bar depression, resulting in trapping of registers -

- a. Engage carriage return clutch members T (Plate 18-1, Carriage Symbol Book) and Y (Plate 16, Carriage Symbol Book). Slide Q (Plate 20, Accumulation Symbol Book) should have at least .090" hold on the lip of lock plate H.

To adjust, turn eccentric V. NOTE: Eccentric 203495 and screw 79648 replace screw V.

- b. With the carriage return clutch engaged as in test 11.a., slide Q (Plate 20, Accumulation Symbol Book) should have minimum clearance under the lip of lock plate H.

To adjust, turn eccentric P (Plate 20, Accumulation Symbol Book). NOTE: Eccentric 203495 and screw 79505 replace screw P.

CORRECTION INDEX

Item I (Cont'd)

12. To ensure that the register return mechanism may be indexed during a carriage return operation -

With the carriage clutch engaged as in tests 11.a. and a motor bar held down against lock plate H (Plate 20, Accumulation Symbol Book), interlock arm AM (Plate 19-1, Power Symbol Book) should have minimum passing clearance over the top of stud AN in motor bar interlock BB.

To adjust, lengthen or shorten interlock AM in its offset.

13. To prevent indexing a register return operation during a machine operation -

With the motor bar depressed, there should be minimum passing clearance of square stud AN (Plate 19-1, Power Symbol Book) by the left side of interlock AM.

To adjust, position interlock AM on shaft AI.

14. To ensure that the motor is energized before the register return clutch is engaged -

With the power on, depress the register return key slowly. The motor should start before the register return clutch members engage. The power should shut off promptly when the register return clutch is disengaged.

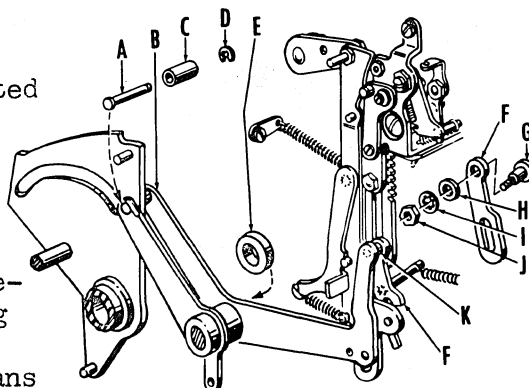
To adjust, turn eccentric L (illustrated).

II

CONDITION: Printing failure.

CAUSE: The roll in arm AR (Plate 6, Printing Symbol Book) which is operated by enclosed cam AQ is worn.

CORRECTION: Improved arm assembly B (illustrated) is now available. The added arm in the assembly provides support to both ends of roll C, thereby, guarding the roll against tilting during the driving operation. The arrangement also provides an easy means of replacing the roll when necessary. Pin A (71532 No. 3), roll C (71334 No. 3) and clip D (X133-105) are part of assembly B.



CORRECTION INDEX

Item II (Cont'd)

The following parts, which should be ordered only for immediate need, are required for installation in Field machines after Serial No. M8055D with or without four position printing.

B	11B-701143Z	Power arm assembly.
E	700103Z	Space collar to the right of B.

For machines with Four Position printing mechanism prior to Serial M8055D the following additional parts are required: (Reference - Plate 6-2, Printing Symbol Book)

AL	11-707122B	Link for machines with extra heavy hammer springs.
	1-707122B No. 2	Link for machines without extra heavy hammer springs.
L	707303	Bushing in link AL.
	707514	Screw post for link AL.
	X275-5	Lock washer for 707514, use nut 46.

For machines with Four Position printing mechanism prior to Serial B196123 (72), B135000 (77) and B196246 (78) the following parts are required in addition to the above consistencies:

1-707148B	(AF, Plate 6-2, Printing)	Printing bail.
1A-707146	(T, Plate 6-2, Printing)	Detent.
707511 No. 2	(AE, Plate 6-2, Printing)	Screw.
707519	(M, Plate 6-2, Printing)	Screw.
707803	(V, Plate 6-2, Printing)	Spring.
1-707148 1/4	(O, Plate 6-2, Printing)	Adjustable arm.
71361	(N, Plate 6-2, Printing)	Eccentric.
74533	(AK, Plate 6-2, Printing)	Screw.
1-707107 No. 2	(M, Plate 25, Printing)	Auto date disabling link.

Improved assembly B and collar E (illustrated) can also be installed in new wide base machines without four position printing mechanism prior to Serial No. M8055D by installing the following parts:

11-707122B	(AL, Plate 6-2, Printing)	Link for Machines with extra heavy hammer springs.
1-707122B No. 2	(AL, Plate 6-2, Printing)	Link for Machines without extra heavy hammer springs.
71545	(BK, Plate 6-2, Printing)	Screw for link AL, Plate 6-2.
701142 1/2	(AR, Plate 6-1, Printing)	Link.
709607	(AR, Plate 6-1, Printing)	Screw.
79632	(AS, Plate 6-1, Printing)	Eccentric.
72568	(AS, Plate 6-1, Printing)	Screw.
1-705148 1/2		Similar to AD, Plate 11, Carriage.
705356 1/2		Keyway collar for 1-705148 1/2.

CORRECTION INDEX

Item II (Cont'd)

79587 Screw for 705356 1/2.
71546 Screw to replace AJ, Plate 16-1, Printing. NOTE: Remove collar AI (Plate 16-1) and shift assemblies K and AK to the left so that link K is against the square stud in the spring beam. Machines which contain a square stud with a cleared hole, remove spacer AI and use original nut 705373.

Machines prior to Serial No. M7237D require the following parts for link AL (Plate 6-2, Printing Symbol Book):

707303	Bushing.
707514	Screw.
X275-5	Lock washer.
46	Nut.

When making any of the above changes remove stock from the upper rear corner of the stud in the spring beam for link AK (Plate 16-1, Printing) for clearance of assembly B (illustrated) when the latter is activated during the machine operation.

III

CONDITION: Printing failure.

CAUSE: Worn link I and stud K (illustrated in Item I).

CORRECTION: When it is not expedient to replace drive arm B, the assembly in the machine can be repaired by removing the worn stud and installing the following parts, as illustrated:

F	701142 1/2	Link (AR, Plate 6-1, Printing Symbol Book) or,
	1-701142 1/2 No. 2	Link (AS, Plate 6-2, Printing Symbol Book).
G	950 3/4Z	Screw. NOTE: After tightening nut J, remove excess length of the threaded end of the screw to provide clearance of latch I (Plate II, Carriage Symbol Book).
H	X10-206	Space collar.
I	X275-23	Lock washer.
J	46 3/4	Hexagon nut.

The shoulder of stud K and links F are now receiving revised hardening formula to prevent wear.

IV

CONDITION: Wrong multiplication and subtraction.

CORRECTION INDEX

Item IV (Cont'd)

CAUSE: Post in arm M (Plate 13, Power Symbol Book), for eccentric Q, loose.

CORRECTION: Install repair post 71318Z using lock washer X275-9 and nut 10762 Style 17 to retain the post. Hexagon screw X60-53 will replace screw R

Parts required:

71318Z	Repair post.
X275-9	Lock washer.
10762 Style 17	Hexagon nut.
X60-53	Hexagon headed screw.

V

CONDITION: Nines print in all columns from crossfooter total operation, wide base machines.

CAUSE: Stud in bellcrank AB (Plate 29, Keyboard Symbol Book), for the roll which actuates lever assembly C, is broken.

CORRECTION: Install improved bell crank 1-701187A which contains a larger stud for the roll. Machines starting with Serial No. M12422D contain the improved bellcrank.

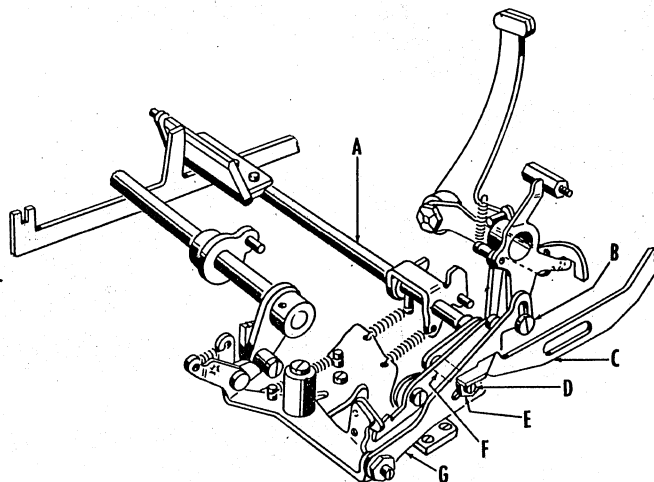
CORRECTION INDEX - MECANOGRAM

I

CONDITION: Incorrect totals,
Series M200 Machines.

CAUSE: Accidental shifting of the twin cams during other than multiplier, subtract or full cent operations. The need to adjust eccentric AC (Plate 25-1 Accumulation Symbol Book) to obtain correct timing between release of lift pawl S (in multiplier, subtract or full cent plates) and release of power slide AH, may disturb the clearance of link K (Plate 25) on shoulder screw L.

Insufficient clearance between link K and screw L during other than multiplier section operations may result in accidental shifting of the twin cams.



CORRECTION: Install improved toggle assembly A (illustrated) which has larger post F drilled to retain eccentric C with screw E. The eccentric permits adjustment of link G after eccentric AC (Plate 25-1) has been adjusted. When installing the improved toggle, stock must be removed from auto extend slide C (illustrated) for clearance of eccentric E and screw D, or an altered slide may be installed. Improved parts are installed in machines starting with Serial No. M10417D. Previous machines require the following parts:

A	21C-702011	Toggle assembly, without automatic extend.
	31A-702011	Toggle assembly, with automatic extend.
C	702197 1/2A No. 2	Auto extend slide.
D	2850 3/8	Screw.
E	79309	Eccentric.
G	72107 1/2A	Link.

Tests and Adjustments

1. To ensure positive tripping of lift pawl S (Plate 25-1) prior to the tripping of the drive -
 - a. Slow depression of a multiplying key should cause latch AE (Plate 25-1) to be tripped nearly simultaneously with tripping of the drive clutch, favoring earlier tripping of latch AE.
 - b. Manual operation of the machine should provide .020" resetting lead of eccentric screw AC over the step of latch AE.

To adjust, turn eccentric screw AC.

CORRECTION INDEX - MECANOGRAM

I (Cont'd.)

2. To prevent shifting of the twin cams by link G (illustrated) during any except multiplying, subtract or full cent operations -
With the machine normal, manually actuate link G forward. Link G should have approximately .005" passing clearance over shoulder screw B.

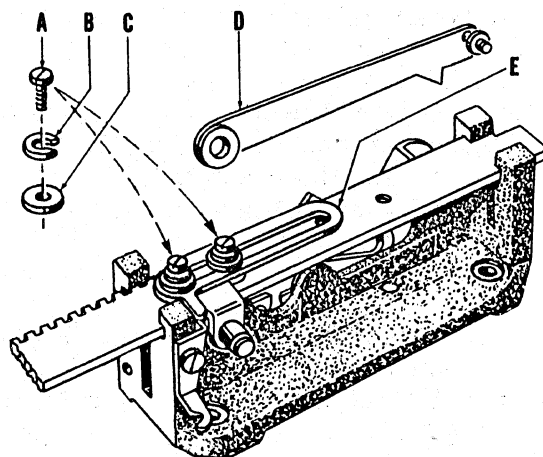
To adjust, turn eccentric D.

II

CONDITION: Product improvement.

CAUSE: To provide one common escapement pawl which will work in all wide base machines regardless of listing capacity.

CORRECTION: Escapement pawl D was first used in Serial No. M10555D. Machines constructed prior to this machine require the following parts for replacement:



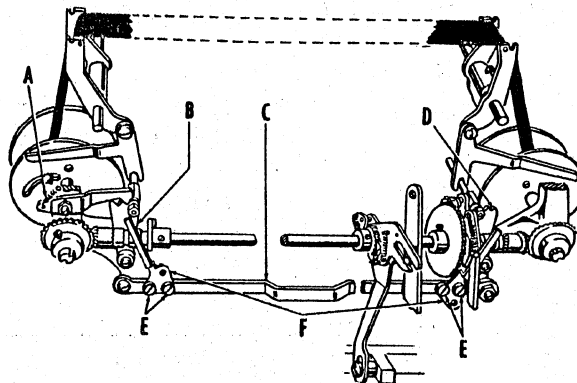
- | | |
|---|----------------------|
| A | 79624 No. 2 (2 req.) |
| B | X275-3 (2 req.) |
| C | 75210 (2 req.) |
| D | 1-706205B No. 2 |
| E | 702229 3/4 |

Screw.
Lock washer.
Space washer.
Escapement pawl.
Intermediate keyboard limit.

III

- CONDITION: 1. Ribbon torn from ribbon spool.
2. Hard writer key depression.

CAUSE: During ribbon reversing, inactive feed gear Z or AS (Plate 16-1, Printing Symbol Book) engages intermediate gear Y or AU before the active feed gear is disengaged, resulting in a locked mechanism.



CORRECTION: Install the following illustrated improved parts to provide reversing latitude and controlled feed gear movement:

CORRECTION INDEX - MECANOGRAM

III (Cont'd.)

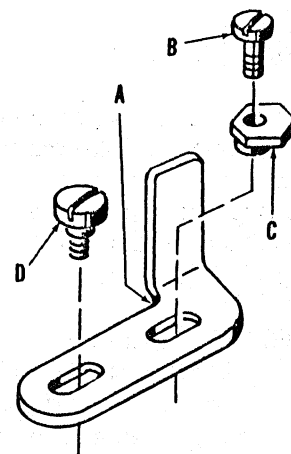
A	89800A	Spring to replace spring AZ (Plate 16-1).
B	1-75113BR	Reverse arm, contains a smaller diameter stud for the groove in the feed gear.
C	75209B	Link, four tapped holes added and spring stud at left end removed.
D	1-75113BL	Reverse arm, contains a smaller diameter stud for the groove in the feed gear.
E	2850 3/8	Screws to retain flat springs 75209B No. 2. Use 49 3/4 nut. (4 each required).
F	75209B No. 2	Flat spring (2 required). Install as illustrated. These springs stabilize feed gear movement when meshing or unmeshing with intermediate gears.

IV

CONDITION: Register assembly (100 pinion construction) fails to settle against the escapement pawl after a register return operation.

CAUSE: Register limit CK (Plate 19-1, Power Symbol Book) fractured between the right retaining screw hole and the edge of the form for the limit projection.

CORRECTION: Install improved limit A (illustrated). The elongated holes in limit A have been changed to eliminate the sharp corners, which in effect, has added stock at these points, thus strengthening the limit.



In addition, screw B and eccentric C replaces retaining screw CJ (Plate 19-1) in the right slot to permit locating the limit so that it will not interfere with the meshing movement of the register section. Screw D (illustrated) is used in the left slot. The improved limit is included in new machines beginning with Serial No. M12102D.

Parts required:

A	709118A No. 14	Register return limit.
B	73611	Screw for right slot of limit A.
C	203495	Eccentric for screw B.
D	74529	Screw for left slot of limit A.

CORRECTION INDEX - MECANOGRAM

V

CONDITION: Faulty printing (either no print, light print or printing in wrong column) in machines containing the four position printing mechanism.

CAUSE: Broken gear W (Plate 6-2, Printing Symbol Book) or screw AJ, caused by a false limit between a tooth of gear W and the surface of rack AI above the toothed area.

CORRECTION: Rack AI (no change in symbol number) has been redimensioned and copper plated for identification, to provide a limit against lower shoulder screw U. Installation of the improved rack started with machine M12265D. Field machines can be corrected by installing a copper plated rack (1-707145 No. 2) or by grinding an additional tooth space in the present rack above the upper tooth space, for the exposed tooth of gear W.

VI

CONDITION: Product improvement.

CAUSE: To provide a means of securing the required clearance - without bending - between the vertical projection of full cent slide CH (Plate 25-1, Keyboard Instruction Book) and toggle screw BM.

CORRECTION: Redesigned full cent slide A (illustrated) permits the use of screw B and eccentric C for acquiring the above clearance and has been installed in machines beginning with Serial No. M12080D.

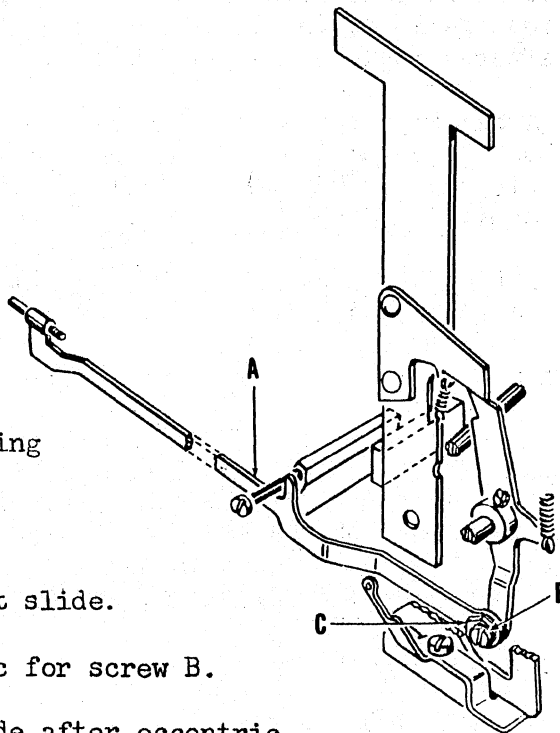
Parts required:

A	72102A No. 19	Full cent slide.
B	76559	Screw.
C	71361	Eccentric for screw B.

The following adjustment should be made after eccentric screw 702622 in power indexing slide BE (Plate 25-1) has been adjusted.

With trip lever AY limiting on shaft AW there should be .008" to .012" clearance between the upright projection on slide CH and screw BM.

To adjust, turn eccentric C (illustrated).



CORRECTION INDEX - MECANOGRAM

VI (Cont'd.)

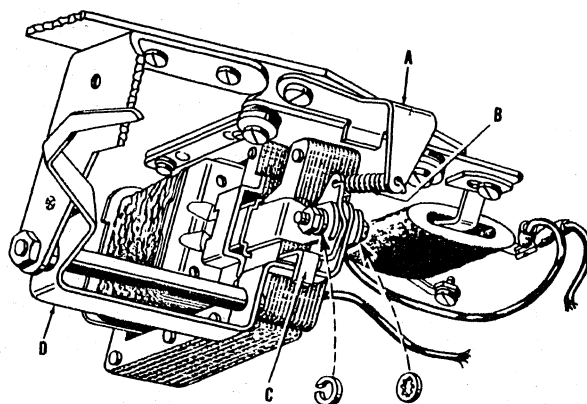
NOTE: Previous adjustment Nos. 1 and 3 given under item A (Plate 25-1, Keyboard Instruction Book) prevail.

VII

CONDITION: Repeated machine cycles from result keys.

CAUSE: The plunger of solenoid BY (Plate 8-4A, Keyboard Symbol Book) fails to restore, because bail W weaves when tension of plunger restoring spring CA is applied through bail W.

CORRECTION: Spring anchors A and C (illustrated) and spring B were incorporated in machines to provide with Serial No. M12065D, to provide direct restoring action to the solenoid plunger. Field machines may be corrected by installing the following parts as illustrated.



A	700143 3/4	Spring anchor. Under screw now in the machine.
B	74803	Plunger restoring spring.
C	700143 1/2	Spring anchor.

CORRECTION INDEX - MECANOGRAM

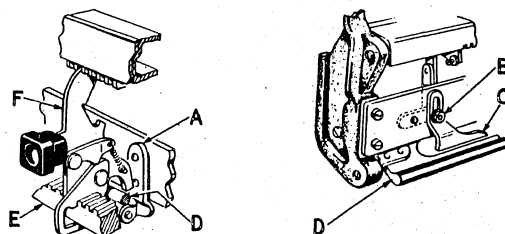
Correction Index - Mecanogram No. 1008 includes those Series M Mecanogram items which may be considered as having current value that were previously announced in Mecanograms through No. 597.

Items pertaining to the Series M machine announced in Mecanograms through No. 597 may be obsoleted or discarded.

I.

CONDITION: Selective column tabulation keys, all dashes 703291A No. 1 (AQ, Plate 8, Carriage Symbol Book - F, in illustration) altered to avoid interference with brackets A.

CAUSE: To permit placing the keys directly opposite brackets A when required by operational specifications.



CORRECTION: The above tabulation keys are now made narrower at the point of contact with bail D. Keys 1A-703291 No. 3 (square, gray, blank button) which permit tabulation at the extreme right end of the carriage also contain the above change.

Limit plate C (703297 1/4) is used to prevent the narrowed portion of the key leaving the bail during key depression. The key, if permitted to leave bail D, would be forced off bar E by the bail's rocking to normal.

The improved keys may be installed only in those Field machines that contain square bar E. They may also be used along with the earlier style keys.

Installation requires limit plate C (703297 1/4), screw B (10057 5/8), washer B (X275-23), and nut B (46 1/4).

Test: With key F depressed, bail D should have minimum movement.

To adjust, position limit plate C.

Note: Assure that limit plate C does not collide with roll U (Plate 20, Carriage Symbol Book) when tabulating to the extreme right end of the carriage.

II

CONDITION: Carriage failing to tabulate and/or failure to restore adding rack limit stops J (Plate 1, Accumulation Symbol Book) during a machine operation.

CORRECTION INDEX - MECANOGRAM

CAUSE: Loosening of the shoulder screw in pass-by pawl AE.

CORRECTION: Install longer-threaded screw 701626 and nut 46.

III

CONDITION: Carriage failing to index automatic operations.

CAUSE: Automatic operation indexing pawls on front control arms AL, V, W, X (Plate 6G, Keyboard Symbol Book) accidentally turned to an inactive position while changing a front control bar.

CORRECTION: Install limit 705195 $3/4$ on the rear side of bracket AJ to the two innermost holes. The two innermost screws AH are replaced by two screws 75621 and two nuts 49 $1/4$.

Limit 705195 $3/4$ was installed on Series M200 machines beginning with Serial No. M4594D and on Series M800 machines beginning with Serial No. M4685D. The limit should be installed in field machines equipped with crossfooter and register totals, carriage controlled, when frequent changing of the front control bars is required.

IV

CONDITION: Incorrect form spacing.

CAUSE: Loosening of screw S (Plate 1-1, Carriage Symbol Book).

CORRECTION: Platen A is held rigid to platen shaft C by rolled pin B in machines beginning with Serial No. M1271D. Rolled pins B may be installed in Field machines to overcome the above condition when necessary.

Installation requires drilling of the platen hub and platen shaft at right angle to screw S. Use drill Kit 260 No. 42 (.0935).

V

CONDITION: Electrical shock to an operator.

CAUSE: Inadvertent contact with one of the terminals of switch assembly CG (Plate 6F, Keyboard Symbol Book).

CORRECTION: Install protective shield 701901Z.

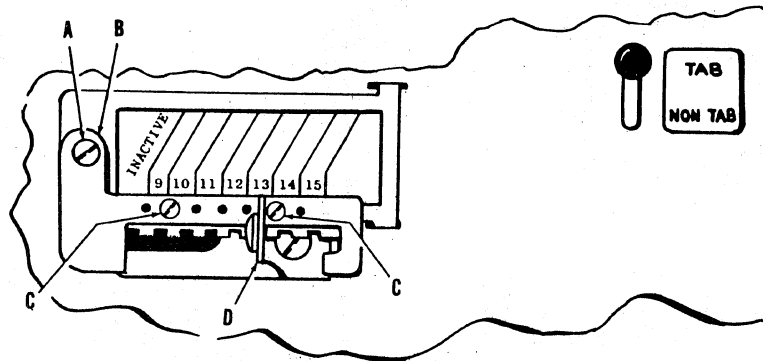
The shield is retained by screw E and abuts against dust shield AD (Plate 14, Power Symbol Book).

VI

CONDITION: Selection of different columns for the multiplying factor made easier.

CORRECTION INDEX - MECANOGRAM

CAUSE: To provide an easier and faster means of manually positioning the multiplying factor extend columns in those machines where frequent changing of the multiplier factor extend column is necessary to comply with the change in factor values.



CORRECTION: Install limit plate B (705155 1/4) using screw A (705503 1/2). When other than either extreme position of lever D is required, install limit screw C (709508) according to need.

Screws C are included with the accessories for each machine when shipped from the factory.

VII

CONDITION: Wrong totals, bending of shaft C (Plate 19-1, Keyboard Symbol Book) or bending of index arms BX, resulting from simultaneous use of the first product key and the add register/clear multiplier key with an add crossfooter block active on the control bar.

CAUSE: The extra load resulting from the functions set up by the two keys tends to temporarily stretch link K (Plate 6D, Keyboard Symbol Book) thereby reducing latching lead and causing premature restoring of the linkages. Adjustment of eccentric S (Plate 6F) for latching lead when the two linkages are indexed may result in overthrow of the twin cams by an individually indexed linkage.

CORRECTION: Improved linkage assembly 1B-702171 No. 14 with stronger front link K (Plate 6D) and thin retaining clip 21 No. 7 replacing clip BS (Plate 6E), has been installed in machines beginning with Serial No. M6848D and should be installed in prior machines to eliminate the above condition. Longer screws 702637 should also be installed in place of screws BQ (Plate 8-3).

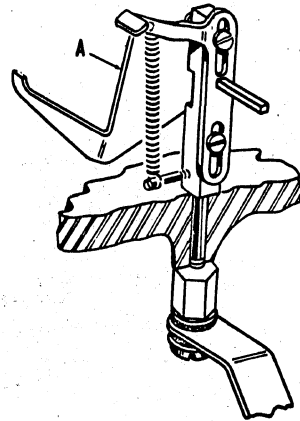
CORRECTION INDEX - MECANOGRAM

VIII

CONDITION: Wrong register and crossfooter totals, Series M800.

CAUSE: Failure of the error key to restore the sub-total indexing mechanism, should the sub-total index key be inadvertently depressed, prior to taking a machine operation.

CORRECTION: Redesigned rocker arm A (1-72293A No. 2) containing an added projection that extends under the forward horizontal portion of sub-total index key result linkage CK (Plate 40A, Keyboard Symbol Book) has been installed in Series M800 Machines beginning with Serial No. B740607. When the rocker arm is actuated by the error key, the added projection lifts the forward end of the result linkage permitting the stud in part AR to reposition under the result linkage.



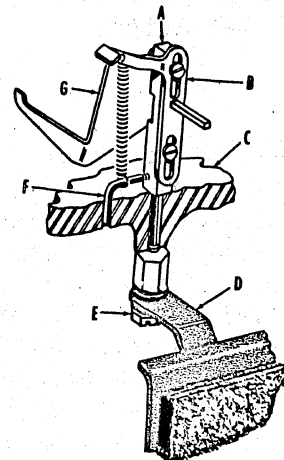
The sub-total index key release by the error key may be added to Series M800 machines in the Field, prior to the above machine number, by installing redesigned rocker arm A (illustr.).

IX

CONDITION: Failure to sub-total or non-subtract, Series M800 machines, or to non-clear subtractor, Series M700 machines.

CAUSE: Bind in rocker arm G and slide B caused by accidental turning of post A when loosening or tightening front drive housing cover screw E.

CORRECTION: Post assembly A (11B-702511) Series M800, or (1A-702511) Series M700 is now prevented from turning by replacing the spring anchor in the post with spring anchor F (702511 1/4) which extends into a hole through machine base C.



Spring anchor F has been installed in Series M800 and Series M700 machines beginning with Serial No. M7639D and M7956D respectively. The new spring anchor should be installed in Field machines the first time the typewriter is removed. The hole in the machine base for spring anchor F is located by using the spring anchor installed in the post as a template. Use drill Kit 260 No. 38.

NOTE: Rocker arm G (1-72293A No. 2) should also be installed at the same time on Series M800 machines between Serial No. B197900 and Serial No. B740607.

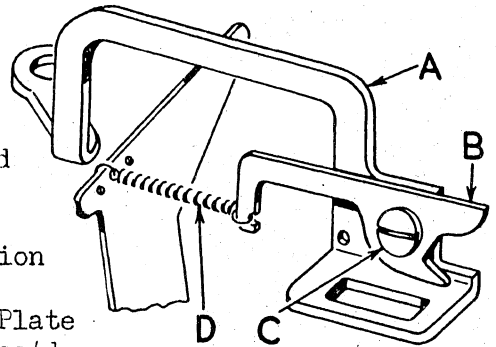
CORRECTION INDEX - MECANOGRAM

X

CONDITION: Failure to index the second operation of an automatic subtract in conjunction with a carriage controlled total, Series M800.

CAUSE: Palm tabulator lever held depressed by the operator during the machine cycle.

The drive is tripped for the first operation of the cycle from the carriage controlled total. However, when tabulator lever D (Plate 14-1, Keyboard Symbol Book) is held depressed, it prevents movement of the typewriter keylock mechanism. This results in bending of bail T (Plate 20, Keyboard Symbol Book) by the extend plate and failure to trip the drive for the second operation.



CORRECTION: Machines beginning with Serial No. M6340D contain interlock slide A (illust.) with yielding pawl B which prevents depression of the tabulator lever during a machine operation but permits functioning of the typewriter keylock with the tabulator lever held depressed at the start of a machine operation. This mechanism may be installed in Field machines where needed.

Parts required:

A	702145 1/4 No. 2	Tabulator interlock slide
B	702147	Yielding pawl for 702145 1/4 No. 2
C	1361 1/2	Screw for 702147 - Use 46 1/4 nut
D	72830	Spring for 702147

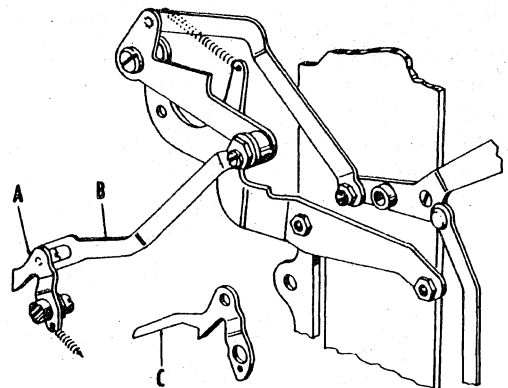
XI

CONDITION: Repeat of Items mechanism failing to function properly, Class 7800 and Series M800 machines.

CAUSE: Breakage of the forward projection of latch release arm C.

CORRECTION: Latch release arm A replaces release arm C in Series M800 machines beginning with Serial No. M9568D.

Installation of latch release arm A in Class 7800 and Series M800 prior to the above serial number also requires the use of new link B.



CORRECTION INDEX - MECANOGRAM

Parts required:

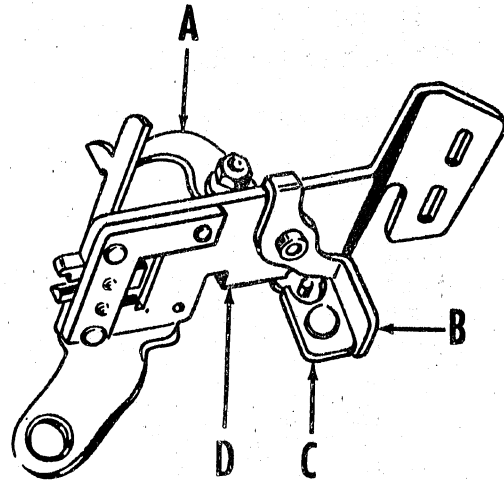
A	118 Fte. 141 No. 3	Latch release arm
B	123 A Fte. 141 No. 2	Link

XII

CONDITION: Machine lock or wrong multiplication, Series M200.

CAUSE: Check pawl E (Plate 24-1, Keyboard Symbol Book) lodging under the step at the lower end of bell crank AA when the crossfooter is meshed with the adding racks. This possibility may be aggravated when grinding the step of the bell crank to obtain equal throw of the check pawl and feed pawl F for the point off action.

CORRECTION: Bell crank A (1-709103A), illustrated, includes equalizing plate C which presents a straight surface to the pawls to assure their uniform release during point off, without impeding the crossfooter restoring from the adding racks to the carry racks.



Control plate assembly D (1-709100A) includes limit plate B to permit adjustment of the normal position of the bell crank. The improved parts were installed in machines beginning with Serial No. M7585D and M1732C and should be installed in prior machines if the above condition is encountered.

Test - With both feed and check pawls fully engaged in the teeth of the feed rack, there should be slight clearance of equalizing plate C with the pawls.

To adjust, move limit plate B.

XIII

CONDITION: Adding racks marked for identification purposes.

CAUSE: To permit easy identification of the adding racks while the racks are in the machine.

CORRECTION: Adding racks AN (Plate 3, Printing Symbol Book) for all numbers are marked with their identification number on the rear end of the bar.

CORRECTION INDEX - MECANOGRAM

XIV

CONDITION: Printing of the wrong symbol on minus balance totals, Series M800.

CAUSE: Failure of latch AD (Plate 55, Accumulation Symbol Book) to release from the formed lip of bracket C, thus retaining symbol type A (Plate 31, Printing Symbol Book) in subtract position during the last cycle of a minus balance operation.

CORRECTION: The following improved parts were installed in Series M800 machines to overcome the above condition beginning with Serial No. M8383D and M1745C.

- Intermediate arm X (Plate 55, Accumulation Symbol Book) contains a larger diameter stud AC to insure release of latch AD by the camming action of the arm on the twin cam shaft assembly.
- Drive trip slide Y has a stud for spring 480B to retain the slide in normal position until it is indexed through machine operation.
- Spring anchor 20 No. 104 is placed under the forward screw AE (Plate 7-1) for the other end of the spring.
- Latch AD (Plate 55) has stock removed from its underside to compensate for larger diameter stud AC and to prevent cramping the latch against the adding rack index arm shaft located immediately under the latch.
- Bell crank AB is no longer milled at the form thus insuring full hold on slide Y and providing early forward movement of stud AC under the arm in the twin cam shaft assembly.

Parts required:

1A-702221 No. 3	Keylock slide
1-702102A No. 5	Drive trip slide
1A-72220 No. 2	Intermediate arm
20 No. 104	Spring anchor
480B	Spring between 20 No. 104 and
	1-702102A No. 5
1-704124 No. 2	Bell crank

XV

CONDITION: Faulty printing - none, light, wrong columns, etc.

CAUSE: Worn bushings in printing section side plates I and V (Plate 6-1, Printing Symbol Book).

CORRECTION: Side plates are available with longer bushings that provide more bearing surface for shaft assembly W (Plate 2) and thereby reduce wear. The shaft of assembly W is made longer so that it bears fully on the longer bushing in the right side plate; and the hub of arm G is made narrower to provide room for the longer bushing in the left side plate.

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The improved side plates and the longer shaft assembly were installed in machines beginning with Serial No. B740607 approximately, and should be used for all replacements.

Replacement parts for machines most likely to require them are as follows:

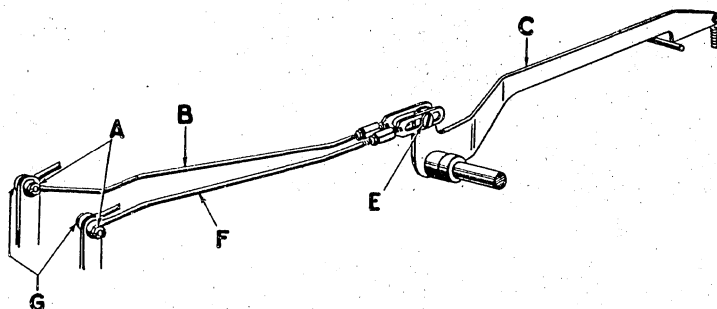
MACHINE DESCRIPTION	SIDE PLATES	SHAFT ASSEMBLY
Series M200 and Class 7200 New Wide Base		
1/10 fractions with four position printing	11-707110R No. 3 1-707110L No. 3	1-707000A No. 10
1/10 fractions without four position printing	11A-707110R No. 1 11-77110AL	1-707000A No. 10
1/8 fractions with four position printing	11-707110R No. 3 1-707110L No. 3	1-707000A No. 11
1/8 fractions without four position printing	11A-707110R No. 1 11-77110AL	1-707000A No. 11
whole numbers with four position printing	1-707110R No. 3 1-707110L No. 3	1-707000A No. 9
Series M700 and Class 7700		
with four position printing (Domestic)	1-707110R No. 3 1-707110L No. 3	1-707000 No. 2
with four position printing (Sterling)	1-707110R No. 3 1-707110L No. 3	1-707000 No. 8
Series M800 and Class 7800 New Wide Base		
with four position printing (Domestic)	1-707110R No. 3 1-707110L No. 3	1-707000A No. 1
without four position printing (Domestic)	1A-77110R No. 2 11-77110AL	1-707000A No. 1
with four position printing (Sterling)	1-707110R No. 3 1-707110L No. 3	1-707000A No. 7
without four position printing (Sterling)	1A-77110R No. 2 11-77110AL	1-707000A No. 7

NOTE: Machines not having the above specifications require parts ordered

CORRECTION INDEX - MECANOGRAM

from the Adding Machine Service Department. Include the machine style and serial number with all orders.

XVI



CONDITION: Minus balance symbol printing from a balance or sub-balance operation on machines containing symbol bail latch N (Plate 33, Printing Symbol Book), Series M700.

CAUSE: Inadvertent depression of the minus balance key and failing to use the error key prior to depressing the balance or sub-balance key. If the above takes place, symbol bail V will be latched in an indexed position by latch N causing the minus balance to print.

CORRECTION: Symbol bail latch C (illust.) which is inactivated when a balance or sub-balance key is depressed thus eliminating the above condition has been installed in machines beginning with Serial No. M4490D.

Installation on machines prior to the above serial number will require the following parts:

A	72324 (2 req.)	Nuts
B	1-702791	Balance key wire
C	1-702159 1/4A	Symbol bail latch
E	79511	Screw
	71366	Nut (For assembling wire B to latch C)
F	1-702792	Sub-balance wire
G	75631 (2 req.)	Screws

XVII

CONDITION: Loss of movement of subtractor power shaft assembly T (Plate 26, Accumulation Symbol Book).

CAUSE: Worn or broken stud supporting roll (749) of segment gear L.

CORRECTION: Install shoulder screw 950 3/4 Z, nut 46 3/4 and washer X275-23 in place of the stud that supports the roll of segment gear L.

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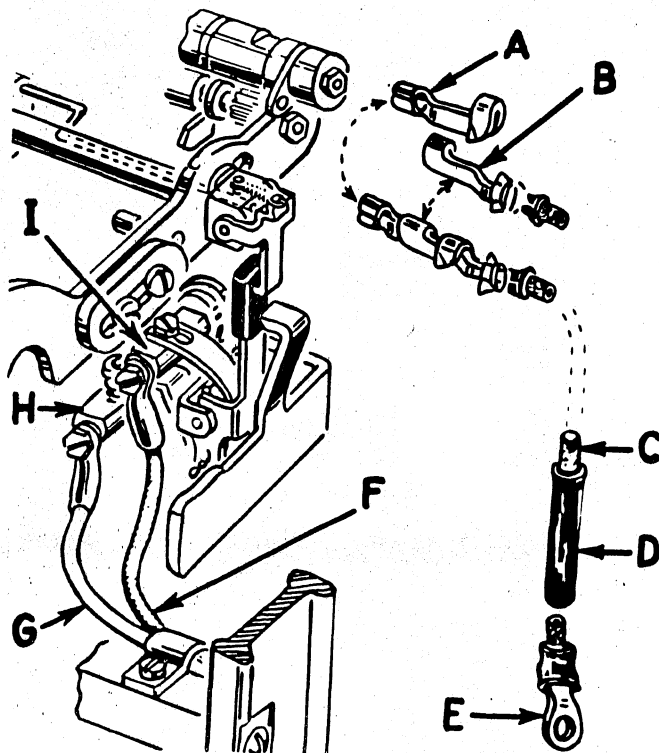
XVIII

CONDITION: Minus balance signal light failing to operate.

CAUSE: Wires F or G broken near terminals I or H.

CORRECTION: Wires broken near their terminals may be repaired by using repair assembly C (1-797062) which includes parts A, B, C, D and E, thus eliminating replacement of the complete assembly AG (Plate 38, Accumulation Symbol Book).

To install, clean the broken end of wire F or G and insert it in the tubular end of knife connector A, flatten the tubular end until the wire is held firmly. Then position plastic tube D over the joint formed by knife connectors A and B and connect terminal E to terminal H or I.



XIX

CONDITION: Electric shock and arcing between terminals of resistor G and bracket DD (Plate 8-4A, Keyboard Symbol Book), and between resistors when more than one is required.

CAUSE: Insufficient spacing between resistors and between the resistor and the bracket.

CORRECTION: The above condition will be eliminated by using the following spacers and screws to increase the gap:

16340 (2 req.)
73612 (2 req.)
200416 (2 req.)
74531 (2 req.)

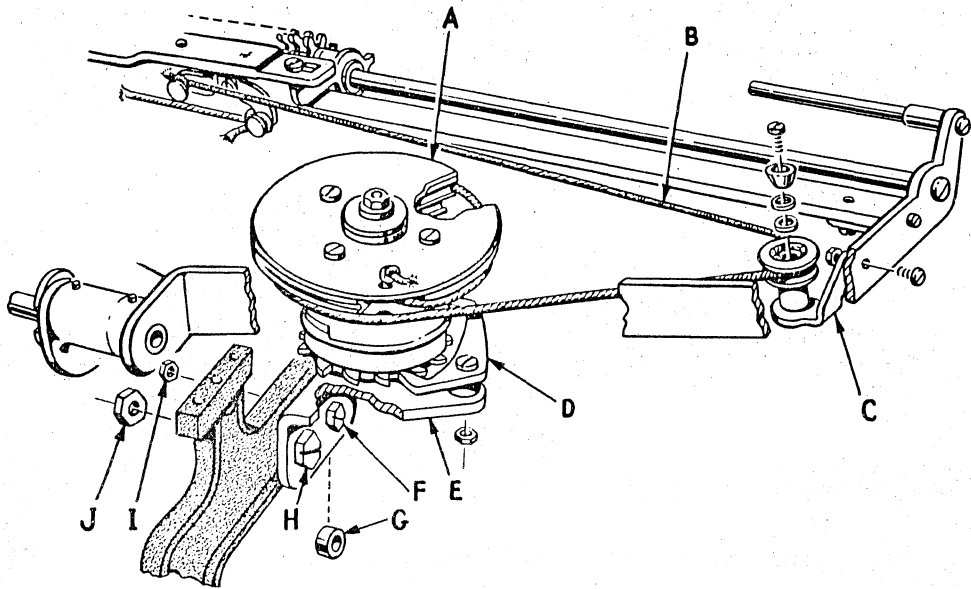
Spacer between resistor G and bracket DD.
Screw to hold one resistor to the bracket.
Spacer for each additional resistor.
Screw to replace 73612 screws when two resistors are used.
Screw to replace 73612 screws when three resistors are used.
Screw to replace 73612 screws when four resistors are used.

200537 1/2 (2 req.)
203559 1/2 (2 req.)

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The increased spacing between resistors started with Serial No. M7440D, approximately. Machines prior to the above number should be changed when need is indicated.

XX



CONDITION: Wrong register selection, incorrect addition, or locks in the register section - 100 pinion construction.

CAUSE: Sluggish escapement of the register pinion assembly and vibrations of shafts AN and W and blade V (Plate 8A, Accumulation Symbol Book).

CORRECTION: Spring barrel assembly A provides uniform spring tension on the register pinion assembly in all positions, and reduces vibration because weight has been shifted from the register assembly to the machine side frame. It may be installed in older machines prior to Serial No. M6906D as follows:

Remove:

- Power spring assembly BE (Plate 8A).
- Draw cord pulley BC.
- Counterbalance springs P from brackets B and N.
- Stock from the machine case, sufficient for clearance of spring barrel assembly A (illust.).

Use the support bracket E of assembly A as a template (located with screw H through the existing hole in the side frame) to drill a new hole in the machine side frame for screw F. Use drill, Kit 260 No. 11.

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Install:

- Spring barrel A using screws F and H, collar G, and nuts I and J.
- Pulley assembly C using screws BB and AZ (Plate 8A).
- Lighter springs 8084A from bracket N and 83838 from bracket B to the register assembly.

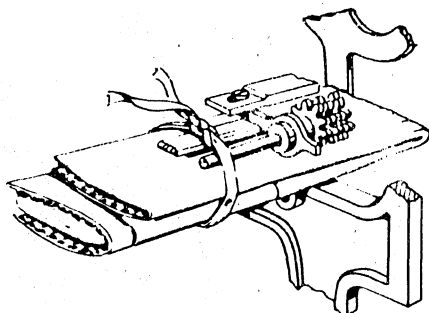
Adjust spring tension by placing register No. 1 in active position, wind assembly to capacity and unwind ratchet five full turns.

Parts required:

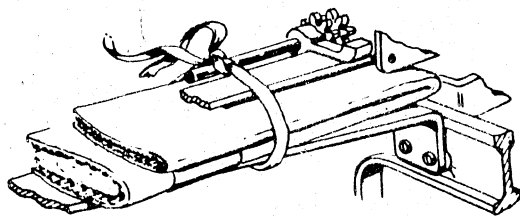
A	2-709041	Spring barrel assembly (includes D and E)
B	709902 No. 1	Draw cord, 100 pinion
C	1-709190	Pulley assembly for B
F	3660 3/4	Screw for bracket E
G	89312 A Sty. 10	Space collar, .115" long)
	73333	Space collar, .122" long)
	9044	Space collar, .125" long)
	38 Fte. 69	Space collar, .138" long)
H	70500	Screw for bracket E
I	45 3/4	Nut for screw F
J	393	Nut for screw H
P (Plate 8A)	8084A	Spring for bracket N
P (Plate 8A)	83838	Spring for bracket B

Select one

XXI



LEFT SIDE-FRONT VIEW



RIGHT SIDE-REAR VIEW

CONDITION: 100 pinion register section damaged in transit.

CAUSE: Machine not properly prepared for transporting.

CORRECTION: Protection of the 100 pinion register section while being transported, either boxed or unboxed, requires the use of two coroflex pads (30031) as illustrated.

CORRECTION INDEX - MECANOGRAM

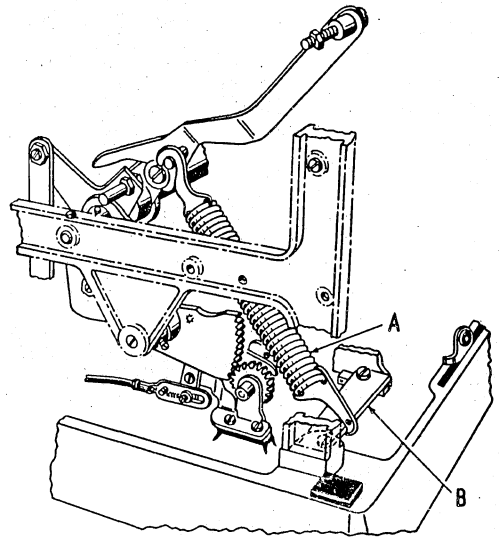
One coroflex pad A is inserted between the left side frame and the register section pinion cob. A second coroflex pad B is inserted between the right side frame and the register section pinion cob.

XXII

CONDITION: Machine failing to restore to its normal (home) position during subtract and minus balance operations, Series M800.

CAUSE: Additional load placed upon restoring spring F (Plate 11, Power Symbol Book) while clearing extended amounts from the subtractor.

CORRECTION: An improved machine restoring spring hookup was installed in machines beginning with Serial No. M7970D to derive maximum benefit from restoring spring A (illust.) when restoring the machine to its home position.



The improved machine restoring spring hookup may be installed in Series M800 and Class 7800 wide base machines prior to the above serial number when required.

Parts required:

A	1-701812 No. 2	Restoring spring for machine of 10 capacity or less.
	11-701812 No. 2	Restoring spring for machines of more than 10 capacity (identified by its red spring anchor).
B	20 No. 158	Spring anchor plate.

XXIII

CONDITION: Difficulty of removing the armature of type 3, 6 and 6A motors from the worm shaft of the drive assembly.

CAUSE: Corrosion in the sleeve coupling of the shafts.

CORRECTION: Anti-seize compound S753 should be applied to all worm shafts before assembly of the armature to prevent this corrosive action.

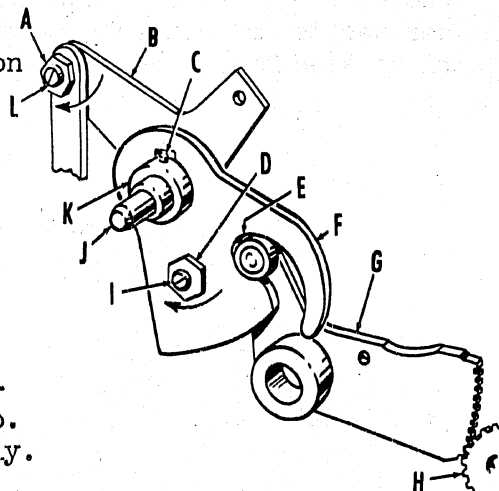
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XXIV

CONDITION: Malfunctioning of the accumulation and/or printing sections.

CAUSE: Insufficient driving motion of power operating shaft assembly J (illust.) resulting from worn pin C and enlargement of the pin hole in the shaft.

CORRECTION: Hub K is now held more rigidly to shaft J by the use of two pins instead of one. The double pin construction was installed in machines beginning with Serial No. M5721D (M200) and M6340D (M800) approximately.



The above condition may be remedied in machines prior to the above machine numbers by resizing the pin hole with a Kit 261 drill and Kit 370 reamer for larger taper pin C (308538).

The following tests and adjustments should be applied after repinning:

Test 1. Complete the forward stroke of an add register operation. Twim cam U (Plate 9, Accumulation Instruction Book) should position the flat of cam V under roll S with .045" to .050" clearance between the upper stud of cam V and meshing arm Z.

To adjust, turn eccentric A.

Test 2. With the machine normal there should be minimum play, between the teeth of segment G and gear H in Series M800, and from .010" to .015" play in Series M200 machines.

To adjust, turn eccentric D.

It is important to set eccentrics A and D with the wide side to the right of center so the power applied to the eccentrics during the machine operation will not have a loosening effect on screws L and I. The force in a clockwise direction, indicated by the bent arrows, applied to the right of center will tend to tighten the screws.

Setting eccentric A with the wide side to the right of center (toward the power shaft) will shorten the distance to the fulcrum of driving arm B and thereby provide maximum movement of the power shaft.

After adjusting the eccentrics there should be clearance at E between the roll in segment G and the end of the slot in driving cam F with the machine fully restored to normal. If clearance is lacking, stock should be removed from the end of the slot by grinding. This will prevent loosening of the threaded hub to which eccentric D is attached.

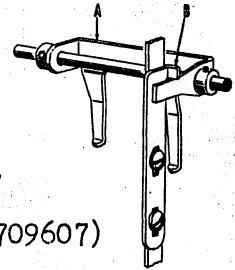
CORRECTION INDEX - MECANOGRAM

XXV

CONDITION: Wrong crossfooter totals.

CAUSE: Non-adding of amounts in the crossfooter when adding simultaneously due to wear of adjustable limit B (72186 1/2) changing the adjustment of finger bail A.

CORRECTION: Install hardened limit B. Loosen screws (709607) and position limit B up or down for adjustment.

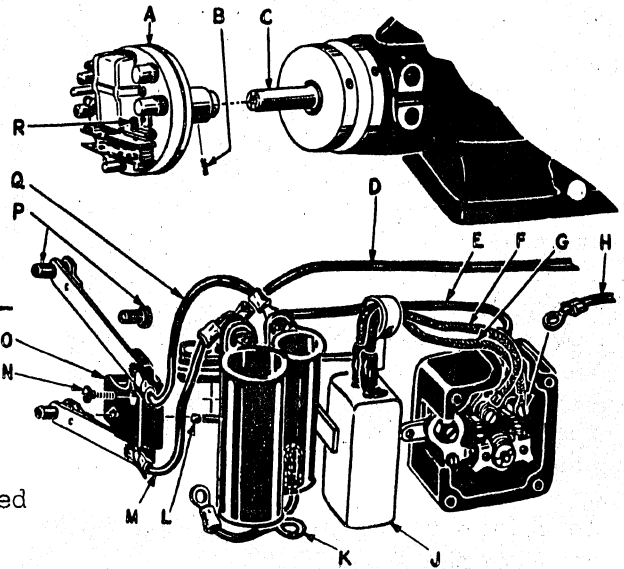


XXVI

CONDITION: Motor failure or erratic motor speed.

CAUSE: Binding centrifugal arm, burned contact point or a burned brush surface of the governor assembly.

CORRECTION: Double contact centrifugal governor AI (Plate 1-2, Power Symbol Book) has been replaced by single contact centrifugal governor A (illustration) in machines beginning with Serial No. M6406D. The single contact governor has a self-contained condenser and speed control adjusting screw and may be installed in Field machines as follows:



Remove:

- Front end of wire Y (Plate 1, Power Symbol Book) from binding screw CG.
- Parts B, BT, BU, BV, CE, CF, CG and CJ.
- The black wire CI from condenser BF.

Assemble:

- Brush assembly O (illustration) over spring stud L and retain with screw N in the hole from which screw BU (Plate 1) was removed.

NOTE: Brush arms on brush assembly O contain a 5° (five degree) angle when assembled. To assure that both brush arms have retained their 5° angle, so as to impart equal pressure of the brushes on the governor, make the following adjustment prior to installing brush assembly O. This gives an approximate setting of 5° angle.

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Remove brushes and place a 1/8" open end wrench Kit No. 19, 19 1/2, or 19 3/4, flat against the front of the brush assembly. Align the brush end of the brush arm flush with the front side of the wrench by bending the brush arms at the form.

- Brush wires Q and M (illust.) - one to each upper resistor coil terminal post.
- The bracket for the resistors and the brush arms.

NOTE: The brush arms should impart 2 1/2 oz. pressure of the brushes on the governor. An approximate setting for attaining this pressure may best be accomplished by proceeding as follows:

With wrench Kit No. 19, 19 1/2, or 19 3/4 placed flat against the front of brush assembly O, position the bracket for the resistors and the brush arms forward or rearward so that the front side of the wrench is flush with the end of shaft C.

- The two remaining wires BI (red) and BJ (green) (Plate 1) - one to each switch point.
- Governor A on shaft C. The assembly is retained by two set-screws B - one with a cup end (X60-6) and one with a cone end (X60-190). With the governor placed to the limit shoulder on shaft C, tighten one screw to mark the shaft. Using a Kit 270 No. 31 drill, bore a cone-shaped hole at the mark to the depth of the cutting surface of the drill. Tighten the cone-ended screw in the hole and lock the assembly with the cup-shaped screw.

An alternate method is to mark shaft C as above and file a small flat area on the shaft. When this method is used, two cup-ended screws (X60-6) are required.

- Front end of wire D (Y, Plate 1) to the upper front resistor terminal post.

Motor speed may be regulated to provide 125-135 machine strokes per minute by turning self-locking adjusting screw R.

Parts required:

A	1A-71181A	Governor
B	X60-6	Bristol Screw, cup end
	X60-190	Bristol Screw, cone end
	79505	Screw to retain brush holder assembly O (use 46 nut).
O	1-71908C	Brush holder assembly
P	81990	Carbon brush (part of O. Required for replacement only.)

Frontier Alkali

Breakage of Reset linkage 702991 1/4A No. 3

The submitted part was checked and found to be within specifications which indicates that a malfunction occurred and caused the breakage. Since the machine involved was built prior to the incorporation of solenoid controlled results, we feel the malfunction that caused the breakage was due to power shaft 42A-702030A No. 1 (CG, Plate 6E) Keyboard Symbol List) being rocked twice during the machine operation.

In this machine, since the switch bail controlled the position of drive pawl AE, (Plate 6F), the pawl would be held in its active position until the bail was released during the forward machine stroke. This enabled the oscillating slide AC (Plate 6F) to contact the pawl twice and rock the power shaft a second time. The power shaft would then be forward at the time the result linkage restoring shaft CA (Plate 6E) raised the result linkage. Washers BR (Plate 6E) would then obstruct the full movement of the restoring shaft CA (Plate 6E) which could cause the latter to bend or break link 702991 1/4A No.3.

To alleviate this condition, the only suggestion we can make is to review adjustments 8 and 10 (Plate 6A, Keyboard Instruction Book) and when adjusting arm CF (Plate 6E, Keyboard Symbol List), reduce the latching hold of latch U (Plate 6E) on the square stud in bail CJ (Plate 6F) to a $\frac{1}{2}$ hold to speed the release of the bail on the machine operation, thus reducing the possibility of the drive pawl being picked up a second time. Drive pawl AS (Plate 6F) should also be adjusted for only $\frac{1}{2}$ hold of the square stud in slide AC (Plate 6F) to speed the disengaging action.

Another possibility is that washers BR (Plate 6E) are not chamfered which could be the cause of limiting the reset action of the result linkage and thus either bending the reset shaft or breaking link 702991 1/4A No. 3.

CORRECTION INDEX - MECANOGRAM

I

CONDITION: Additional and/or continuous machine operations.

CAUSE: 1. Clutch trip slide I cammed upward by drive clutch roll L at the end of a machine operation.

CORRECTION: 1. Install clutch trip slide latch C.

Latch C was installed in all Series M machines beginning with Serial No. M8492D. Installation of the latch requires a $\frac{3}{16}$ " notch cut in the drive housing to provide clearance for the spring anchor portion of latch plate P.

After installing latch C in machines prior to Serial No. M8492D, make the following tests and adjustments:

Test 1. Raise clutch trip slide I and operate the motor manually until the clutch trip slide resets to normal. In this position latch C should have .010" passing clearance over the projection of latch plate P.

To adjust, turn eccentric screw D.

Test 2. With clutch trip slide I in the same position as in Test No. 1, latch C should have $\frac{3}{4}$ " hold on latch plate P.

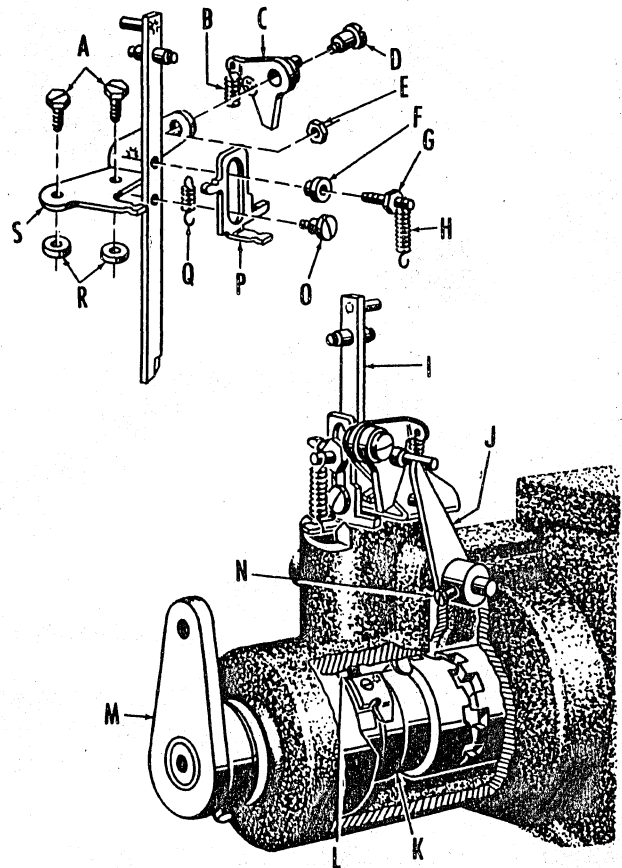
To adjust, position arm J and tighten screw N.

Parts required:

A 76567 (2 req.)

B 283A

Screw to retain bracket S on the drive housing. Use drill template Kit 532, drill Kit 260 No. 37, and tap Kit 270 No. 4 (See plate 1A, Power Symbol Book).
Spring for latch C



(Fig. 1)

CORRECTION INDEX - MECANOGRAM

C	1-71241	Latch to detain clutch trip slide I
D	71627	Eccentric screw to retain latch C
E	46 1/4	Nut for eccentric screw D
F	8436	Spacer for spring-jointed latch plate P
G	83639	Spring anchor screw for latch plate P
H	83832	Spring from screw G to latch plate P
I	1-71903B No. 2	Clutch trip slide for Classes 7200 and 7800 and Series M200 and M800 machines.
	1-701903B	Clutch trip slide for Class 7700 and Series M700 machines.
J	1A-71242	Arm to control latch C
M	1C-71007	Assembled drive clutch shaft
N	72581	Screw for latch control arm J
O	3259 1/8A	Shoulder screw for latch plate P
P	71240A	Spring-jointed latch plate
Q	7282 1/4	Spring to restore clutch trip slide I
R	76120 (2 req.)	Space washer between drive housing and bracket S.
S	1-71239	Bracket for latch C
	701629	Locking pin. Install in place of plug F (Plate 1-2, Power Symbol Book).
	Kit 532	Drill template. One furnished to each Service station.

For machines prior to Serial No. M8492D that contain solenoid controlled results, remove switch bracket AU (Plate 8-4A, Keyboard Symbol Book) and install parts A through H as illustrated in item II, Fig. 2, of this mecanogram.

CAUSE: 2. Drive clutch roll L (Fig. 1) falling off clutch member K.

CORRECTION: 2. Roll L (71309A) is held more secure to clutch member K by a cupped screw 71506C in machines beginning with Serial No. M12117D.

Remove clutch member K and install roll L using 71506C screw in machines prior to the above machine number. Tighten and flare the cupped screw.

CAUSE: 3. Chipped drive clutch roll L (Fig. 1).

CORRECTION: 3. The inside hole diameter of clutch member K has been slightly increased in machines beginning with Serial No. M12117D. The added clearance will permit the clutch member to bear more on the tongues of the clutch coupling instead of on the drive shaft, providing a smoother disengaging movement and thereby reduce the contact force of the roll on the drive clutch trip slide. The tongues of the clutch coupling also receive a finishing operation to further the smoother disengaging action of the clutch member.

To overcome the condition of chipped drive clutch rolls in machines after Serial No. 8492D install parts F, G, H, I, M, O, P, Q and 701629 locking pin as

CORRECTION INDEX - MECANOGRAM

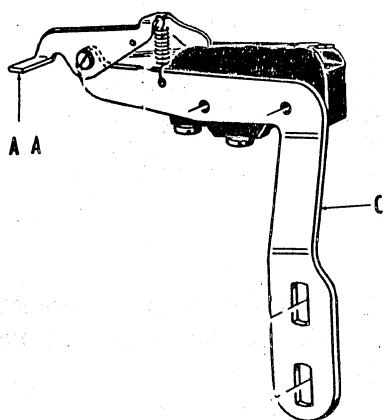
listed under Correction 1, Fig. 1, of this item. Space washers D (item II, Fig. 2) are also required between brackets AT (Plate 8-4A, Keyboard Symbol Book) and AU. Use screws E (item II, Fig. 2).

To overcome chipped rolls on machines prior to Serial No. M8492D that do not contain the drive clutch slide latch mechanism illustrated on Plate 1A, Power Symbol Book, install assembled drive clutch shaft M (Fig. 1) and 701629 locking pin only.

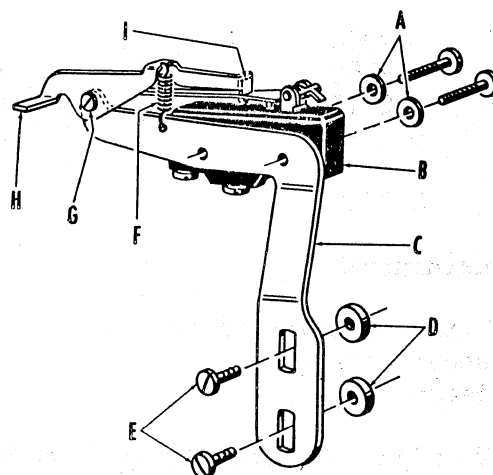
II

CONDITION: 1. (a) Solenoid BY (Plate 8-4A, Keyboard Symbol Book) failing to operate; (b) carriage and/or registers failing to return.

2. Excessive burning out of carriage and register return switch AI.



(Fig. 1)



(Fig. 2)

CAUSE: Insufficient movement of the switch contact arm in switch assembly AI to close or open the switch points due to weaving of switch bracket AU.

CORRECTION: Stronger switch bracket C (illustrated) along with temporary switch activating arm AA (Fig. 1) was installed in machines beginning with Serial No. M12143D.

Activating arm AA was redesigned, stud removed and spring hole added for 79819 spring, to work in conjunction with stronger bracket C and the X83-9 switch (AI, Plate 8-4A, Keyboard Symbol Book) and was installed only in machines between Serial No. M12143D and M12248D.

A new improved switch B (Fig. 2) and switch activating arm H have been installed in machines beginning with Serial No. M12248D to further improve the switch actuating movement.

CORRECTION INDEX - MECANOGRAM

Replacement of X83-9 switch (AI, Plate 8-4A, Keyboard Symbol Book) which is no longer available, or installation of stronger switch bracket C, in machines prior to Serial No. M12143D requires installation of all of the following parts as illustrated in Fig. 2. When replacing switch X83-9 in machines between Serial No. M12143D and M12248D, only switch B, spring F and lever H are required.

Parts required:

A	3826 1/2	Metal washers. Use original screws AJ (Plate 8-4A, Keyboard Symbol Book).
B	X83-54	Carriage and register return switch.
C ^{701272B}	701272A	Switch bracket.
D	79336 (2 req.)	Spacers between bracket C (illust.) and bracket AT (Plate 8-4A, Keyboard Symbol Book).
E	79505 (2 req.)	Screws for bracket C (illust.).
F ^{3 2844}	4487	Spring for lever H to bracket C.
G	201562	Screw retaining lever F to bracket C. Use 46 nut. Same as AF (Plate 8-4A, Keyboard Symbol Book).
H	✓ 1-701274A	Activating lever.

Adjustments:

1. With the power on depress the carriage return key slowly. The motor should start before the carriage return clutch members engage; release the key and the power should shut off.

To adjust, with power on, loosen screws E and raise switch B the full length of the slots in bracket C, and then lower the switch until the power shuts off.

NOTE: After making the above test, assure that activating lever H does not bind against the well on the machine base when the carriage return key is depressed. Should a bind occur, remove stock at point I.

III

CONDITION: Interference of spring-jointed latch plate G (Mecanogram 1006, item 1) with the switch contact arm of the register and carriage return switch when modifying machines prior to Serial No. M12117D per Correction Index - Mecanogram 1006, item 1.

CORRECTION: Install two spacers (79336) between bracket AT (Plate 8-4A, Keyboard Symbol Book) and switch bracket AU. Use longer screws (79505) in place of screws AV.

CORRECTION INDEX - MECANOGRAM

An alternate means of overcoming the above condition is to remove approximately 1/2" stock from the end of the switch contact arm.

NOTE: Add symbol numbers 79336 (2 req.) and 79505 (2 req.) to the list of parts required under item I of Correction Index - Mecanogram 1006.

IV

CONDITION: Breaking of hexagon posts A during shipment.

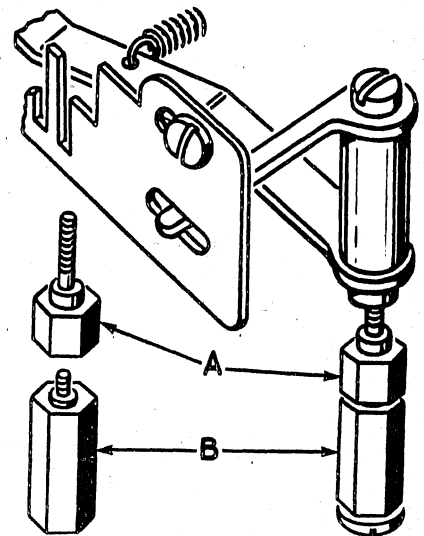
CAUSE: 1. (Fig. 3) Failure to remove hexagon post B when preparing the machine for shipment allows the weight of the machine to rest on the hexagon post instead of on the machine base. Thus, shifting of the machine during shipment snaps the threaded portion of hexagon posts A.

With hexagon posts B removed and the machine properly positioned in the shipping box, the weight of the machine rests on the machine base and the machine is prevented from shifting forward during shipment through the front base legs limiting against the blocking braces.

CORRECTION: 1. Remove hexagon posts B. Re-assemble posts B at machine destination to permit assembly of dust shield AD (Plate 14, Power Symbol Book).

Use hexagon post A (70527 No. 1) and B (70527 No. 2) as service replacement for hexagon post 70527 in older machines.

Correction Index - Mecanogram No. 1001, dated 11-5-56 is hereby cancelled. Please remove from book.



(Fig. 1)

CORRECTION INDEX - MECANOGRAM

I

CONDITION: A. Continuous machine operation (runaway) during multiplying operations, Class 7200, Series M200.

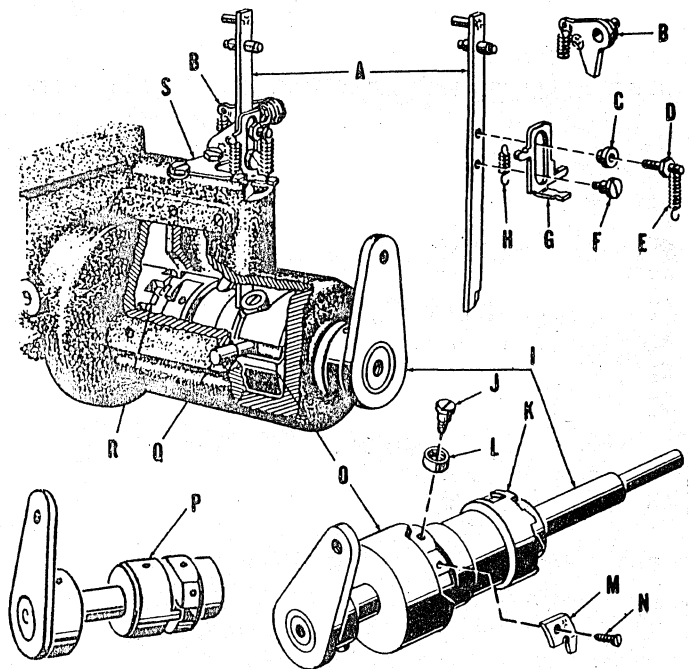
B. Keyboard locked due to the loss of the first machine cycle of a two cycle operation, Class 7800 Series M800.

CAUSE: Short stroking - teeth of clutch member K failing to engage fully with the teeth of gear R during the initial rotation of the gear, and to maintain its engagement during the forward machine cycle.

CORRECTION: Some of the components on drive clutch shaft assembly I, and drive clutch trip slide A have been redesigned in machines beginning with Serial No. M12117D.

Sufficient stock was removed from the end of coupling P to accomodate cam sleeve O between the coupling and the drive housing.

The sleeve provides a bearing surface for roll L of approximately three-fourths of the distance around its circumference, and is locked in a permanent position in relation to roll L by pin Q which is inserted in the drive housing in place of plug F (Plate 1-2, Power Symbol Book). In the event clutch member K (illust.) does not fully engage gear R during the initial rotation, roll L will contact the cam surface of the sleeve and forcibly engage the two members.



The inside hole diameter of clutch member K has been increased slightly to permit the clutch member to bear more on the tongues of coupling P instead of on the shaft. The added clearance will provide a smoother disengaging movement of the clutch member thereby reducing the contact force of roll L on drive trip slide A.

Dwell plate M contains a stud and has a cam surface added to its rearward edge. The stud contacts the angle of clutch member K to prevent the plate from turning. The cam surface was added in order for the dwell plate to raise trip slide A, instead of the trip slide locking on the dwell plate, in the event the drive clutch shaft is rotated in reverse.

CORRECTION INDEX - MECANOGRAM

Spring-jointed latch plate G replaces stationary latch plate X (Plate 1A, Power Symbol Book) on trip slide A (illust.). The spring-jointed latch plate permits the dwell plate to raise the trip slide without harmful effect, when latch B is positioned over latch plate G. Installation of trip slide A with spring-jointed latch plate G requires a 3/16" notch being cut in the drive housing to provide clearance for the spring anchor portion of the plate.

Screws J and N holding clutch roll L and dwell plate M on clutch member K are cupped, and when tightened and flared will hold the roll and plate more securely to the clutch member.

The redesigned drive clutch shaft and clutch trip slide may be installed in Field machines when the above conditions result from machine short stroking.

Parts required for machines containing the drive clutch trip latch mechanism illustrated in Plate 1A, Power Symbol Book are indicated with #.

#A	1-71903B No. 2 (M200, M800) 1-701903B (M700)	Clutch trip slide
#C	8436	Spacer for latch plate G
#D	83639	Spring anchor screw for plate G
#E	83832	Spring from screw D to plate G
#F	3259 1/8A	Shoulder screw for plate G
#G	71240A	Spring-jointed latch plate
#H	7282 1/4	Spring for plate G to bracket S
#I	1C-71007	Assembled drive clutch shaft, includes J, K, L, M, N, and O.
J	71506C	Cupped screw
K	1-71304C	Clutch member, includes J, L, M, and N.
L	71309A	Drive clutch roll
M	1-71243A	Dwell plate
N	71631	Cupped screw
	71301 1/2	Cam sleeve
#Q	701629	Locking pin for cam sleeve O

Parts required for machines prior to Serial No. M8492D that do not contain the drive trip latch mechanism illustrated in Plate 1A, Power Symbol Book.

I	1C-71007	Assembled drive clutch shaft
Q	701629	Locking pin for cam sleeve O

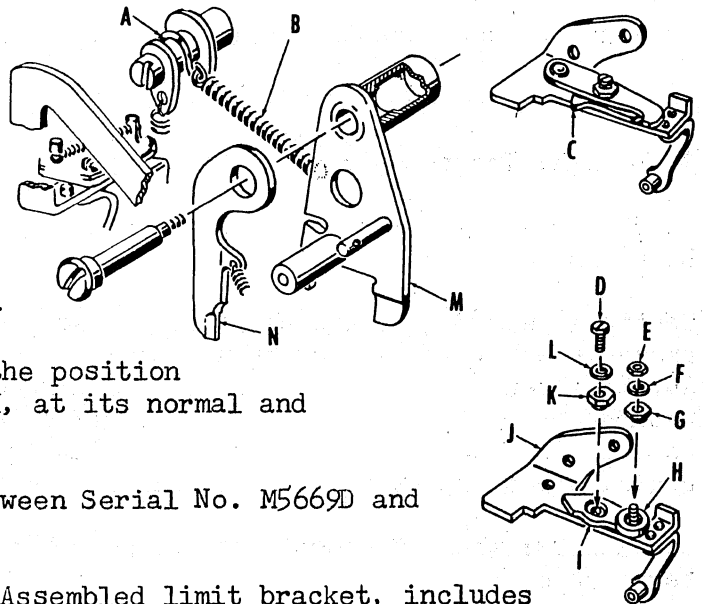
Note: Previous construction no longer available. Install necessary parts as listed above for replacement.

CORRECTION INDEX - MECANOGRAM

II

CONDITION: Wrong register totals resulting from incorrect register selection - registers failing to trip, or skipping.

CAUSE: Failure of limit C to hold register escapement limit M in position, when the escapement mechanism is indexed, to permit the rear leg of limit M to position in front of the step of escapement rack E (Plate 17-1, Accumulation Symbol Book) when returning to normal.



CORRECTION: Install redesigned limit bracket J (illust.) containing individual adjustable limits H and I for adjusting the position of register escapement limit M, at its normal and indexed position.

Parts required for machine between Serial No. M5669D and M11938D are indicated by #.

#J	1-79200B No. 2	Assembled limit bracket, includes D, E, F, G, H, I, K, and L.
D	75615 No. 2	Screw
E	46 1/4	Nut
F	X275-5	Lock washer
G	200472	Eccentric
H	79380	Roller limit
I	79247A No. 1	Limit
K	62341	Eccentric
L	X275-5	Lock washer

Machines prior to Serial No. M5669D that contain the register escapement mechanism shown on Plate 17-1 Accumulation Symbol Book, require the following additional parts:

A	20 No. 154	Spring Anchor
B	3284 1/2	Spring
M	1-709104A No. 2	Register escapement limit
N	709108 3/4	Intermediate escapement limit

After installing make the following tests and adjustments:

Test 1. With the rear step of escapement rack E (Plate 17-1, Accumulation Symbol Book) limiting on escapement limit M, (illust.), the register pinions should be aligned centrally with the adding racks.

CORRECTION INDEX - MECANOGRAM

To adjust, turn eccentric G.

Test 2. With the register section in any register position except the last register, depress the register trip key. Release the key slowly and check escapement limit M to position in front of the rear step of escapement rack E (Plate 17-1, Accumulation Symbol Book) with .008" to .012" clearance.

To adjust, turn eccentric K (illust.).

III

CONDITION: Incorrect carriage tabulation.

CAUSE: Breaking or loosening of screws AU (Plate 2, Carriage Symbol Book) in carriage tab stop bar AY.

Continued weaving of the carriage tab stop bar each time the inner carriage assembly is raised, resulting in breaking or loosening of screws AU, has been reduced in machines beginning with Serial No. M11986D by counterboring the tab stop bar to receive longer space collars K which assures full seating of the space collars to hold the tab stop bar more rigidly to rear outer carriage rail Q.

CORRECTION: Where frequent loosening or breaking of screws AU is encountered on machines prior to Serial No. M11986D the following applicable parts should be installed:

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
73011A 12"	Tab stop bar, 12 inch	1
73011A 18"	Tab stop bar, 18 inch	1
703011A No. 2 22"	Tab stop bar, 22 inch	1
703011A No. 1 30"	Tab stop bar, 30 inch	1
703374	Space collar on 72614 screw	1

Proper alignment of the counterbored holes in bar AY with the heads of screws AU will be provided by installing but not tightening screws AU with screws AG loose.

Then tighten screws AG and finally tighten screws AU.

This cancels item 5 of Mecanogram No. 553.

IV

CONDITION: Electric shock, motor noisy, smoking, running slow, or failing to run.

CORRECTION INDEX - MECANOGRAM

CAUSE: Arcing and burning out of the insulation between the brush arm pivot stud and plate AI (Plate 1-1, Power Symbol Book).

A new insulating material having greater dielectric strength is now being used on Series M motors (also on Series H Motors) to prevent arcing at this point.

There is no change in the part numbers for brush holder assembly G or its component parts. However, assemblies containing the new insulating material may be readily identified since the insulating material is gray in color.

CORRECTION: Install plate AI (1-4610A) or complete brush holder assembly G (2-4610A) containing the new insulating material.

Note: Shielded motors require installation of complete brush holder assembly (22-4610A).

V

CONDITION: Wrong multiplying or subtract totals due to improperly extended amounts, Series M200.

CAUSE: Add register/clear multiplier key operation indexed with the subtract key mechanism partially indexed; that is, subtract plate lift pawl AB (Plate 30, Keyboard Symbol Book) positioned over raise bar B.

The above cause may result in one or more of the following, which in turn will result in subsequent wrong totals:

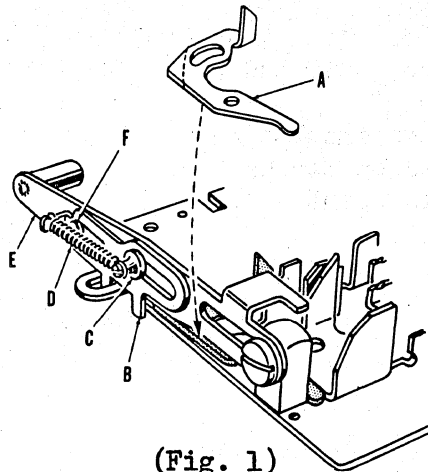
1. Bent or twisted extend restoring assembly B (Plate 19-1, Keyboard Symbol Book).
2. Hub on right end of shaft D sheared.
3. Bent or fractured extend arms BX.
4. Bent extend fingers AY (Plate 17, Keyboard Symbol Book).
5. Stud CJ (Plate 19-1, Keyboard Symbol Book) failing to contact extend clearing cams CK thereby leaving amounts extended and the extend lock mechanism indexed.

Any of the above may occur during an extend clearing operation when using the add register/clear multiplier key if prior to indexing the add register/clear multiplier key the operator, either mistakenly or through riding the subtract key, depresses the subtract key sufficiently to release the subtract plate lift pawl without indexing the power.

During the machine operation, causes 1 through 4 will occur if the twin cams do not shift to the add crossfooter position. Cause 5 will occur when the twin cams shift to the add crossfooter position.

CORRECTION INDEX - MECANOGRAM

CORRECTION: Interlock slide E (illust.) has been redesigned to accomodate spring connected slide B. Bell crank A, which is located on the keyboard bottom plate and actuated upon depression of the add register/clear multiplier key has also been redesigned (stock added) and when used in conjunction with slide E will effect an interlock between the subtract key and the add register/clear multiplier key.



(Fig. 1)

Note: This interlock arrangement prevents depression of the add register/clear multiplier key when the subtract key is indexed, but does not prevent depression of the subtract key with the add register/clear multiplier key indexed.

Spring D will yield and permit ball raceway lock P or AV (Plate 13-1, Keyboard Symbol Book) to enter the ball raceway as the result key power shaft BH is actuated should the add register/clear multiplier key be held depressed throughout the operation.

Interlock slide E (Illust.) and bellcrank A have been installed in new machines beginning with Serial No. M12045D.

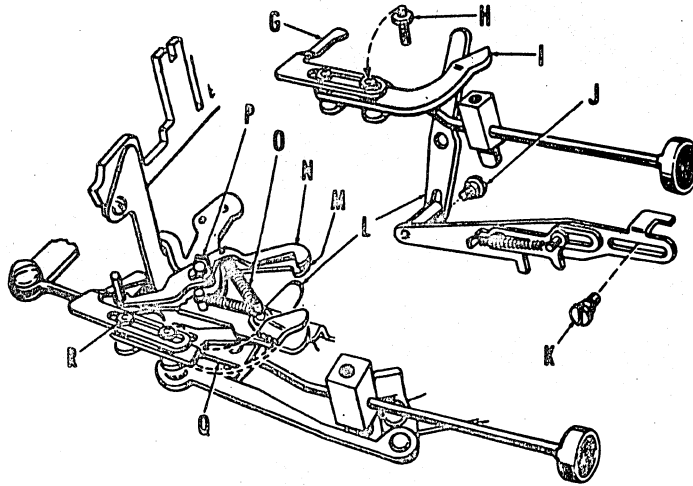
Parts required for machines starting with Serial No. M9163D and for prior machines between Serial No. B197641 and Serial No. M8176D are indicated with #.

#A	1102C Fte. 133	Bell crank for actuating keyboard interlock slide.
#E	1-72144B	Interlock slide, includes B, C, D, F
B	72144 1/2	Auxiliary slide
C	72531	Spring anchor screw for slide B
D	203819 No. 2	Spring
F	79503	Screw for slide B

Machines manufactured between Serial No. M8176D and M9163D that contain locking plate assembly AI (Plate 30-1, Keyboard Symbol Book) and interlock slide AA require all of the following additional parts (Fig. 2) after which the following tests and adjustments should be applied.

G	702199 1/2	Latch release arm
H	702520 1/2 (2 req.)	Screws for arms G and I
J	72599	Screw for locking slide E
K	79511	Screw for locking slide E
N	1-702246 3/4	Auxiliary latch
O	53804	Spring for auxiliary latch M

CORRECTION INDEX - MECANOGRAM



(Fig. 2)

P	21 No. 7	Clip to retain auxiliary latch M
Q	1C-702246 1/2	Locking plate assembly used with carriage controlled totals.
	11B-702246 1/2	Locking plate assembly used without carriage controlled totals.
R	46 1/4 (4 req.)	Nuts for screws H

Test 1. With the power off depress the subtract key slowly. Latch N should latch on lever L just prior to the release of subtract plate lift pawl AB (Plate 30, Keyboard Symbol Book).

To adjust, position clamp I (illust.).

Test 2. With the subtract key normal there should be 3/32" clearance between auxiliary latch N and lever L to assure release of the lever when the subtract key restores following a subtract operation.

To adjust, position latch release arm G.

VI

CONDITION: Keyboard locked, Series M200.

CAUSE: Stud AN (Plate 6-3, Keyboard Symbol Book) failing to release auxiliary latch N (item V) from lever L during a slow release of the subtract key.

CORRECTION: Position collar AO (Plate 6-3, Keyboard Symbol Book) rearward to an inactive position and install latch release arm G (item V, Fig. 2).

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Latch release arm G replaces collar AO (Plate 6-3, Keyboard Symbol Book) and stud AN in machines beginning with Serial No. M10871D. Arm G (item V, Fig. 2) assures the release of auxiliary latch N during a slow release of the subtract key.

Parts required for machines between Serial No. M9163D and M10871D.

G	702199 1/2	Latch release arm
H	702520 1/2 (2 req.)	Screws for arms G and I
R	46 1/4 (4 req.)	Nuts for screws H

VII

CONDITION: A. Ineffective locking of the keyboard from a partially depressed subtract key.

B. Hard depression of the subtract key when fully depressing the key to index the power.

CAUSE: A. Under adjustment of clamp I (item V, Fig. 2) so as not to cause a subsequent hard key depression when fully depressing the subtract key to index the power mechanism.

B. Over adjustment of clamp I to retain interlock slide AD (Plate 31, Keyboard Symbol Book) in an active position with the subtract key mechanism partially indexed.

CORRECTION: A new auxiliary latch N (item V, Fig. 2) is used in machines beginning with Serial No. M9163D.

The new latch retains lever L in position to lock the entire lower keyboard (including Clear Multiplier Key when used in conjunction with interlock slide E (item V, Fig. 1) and bellcrank A) from the time subtract plate lift pawl AB (Plate 30, Keyboard Instruction Book) is released until latch M (item V, Fig. 2) is positioned during the machine operation.

The auxiliary latch may be installed to facilitate adjustment of machines subsequent to Serial No. B197641 by installing parts A, E, and G through R listed in Item V of this mecanogram. Tests and adjustments under Item V prevail.

CORRECTION INDEX - MECANOGRAM

I

CONDITION: Additional and/or continuous machine operations during multiplier operations.

The measures necessary to maintain the multiplier plates in their correct positions in relation to the raise bar during a multiplying operation have been applied to machines of current construction beginning with Serial No. M 11701D.

Corrections Nos. 1, 2 and 3 should all be applied to machines between Serial No. M8495D and Serial No. M11701D when runaway occurs from any one of Causes 1, 2 or 3.

Corrections Nos. 1 and 3 should be applied to machines prior to Serial No. M8495D that contain multiplier latch pawl AN (Plate 22-1, Accumulation Instruction Book) after first making the adjustment given in Plate 22-1.

CAUSE: 1. (Fig. 1) Accidental resetting of indexed tens multiplier plate O caused by bouncing of the tens plate when tens plate lift pawl Q is contacted by raise bar H. As a result of the bouncing, the tens plate lift pawl resets prior to the indexing of units plate lift pawl P during the forward machine stroke.

CORRECTION: 1. Remove .015" stock from stud W in arm B and install the following parts:

- A. 12046 3/16 Hexagon shoulder nut
 - U. 20 No. 90 Spring anchor
 - V. 71809 Spring
- In machines with Four Position Printing, hook spring V to anchor OO (Plate 25-1, Keyboard Symbol Book)

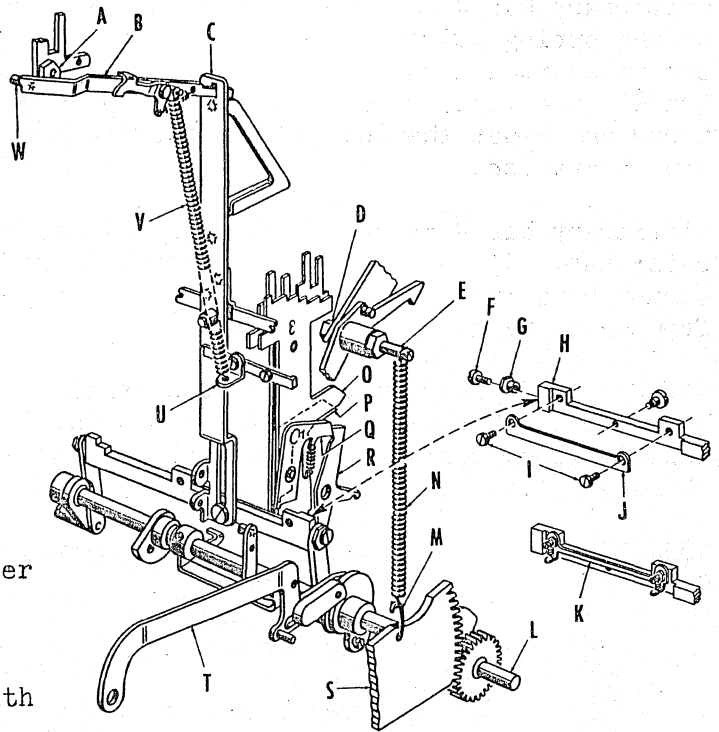


Fig. 1

Use of stronger spring V insures multiplier plate pawl Q remaining in closer contact with the raise bar, thus minimizing the tendency of the plate to bounce and permit the pawl to leave the raise bar.

CORRECTION INDEX - MECANOGRAM

Stud W has been shortened .015" to eliminate the possibility of its catching on the stop section side plate and bending arm B. Bending of the arm reduces the spring restoring movement of slide C, providing additional clearance between the pawl and the raise bar during a bounce and permitting the pawl to leave the raise bar more readily. Hexagon shoulder nut A acts as a guide for the arm to prevent the stud in the arm from contacting the side plate.

CAUSE: 2. (Fig. 1) Units plate pawl P, indexed on the forward stroke of the first (tens) operation, accidentally reset on the return stroke of the same operation by spring-jointed auxiliary raise bar K.

CORRECTION: 2. Remove spring-jointed bar K and install the following parts.

- I. 74533 (2 req.) Screws for auxiliary raise bar
- J. 704241A Stationary auxiliary raise bar

Stationary bar J replaces spring-jointed bar K to reduce the possibility of the spring-jointed bar becoming sprung or bowed outward due to the strain exerted upon the bar as pawl Q is disengaged from the bar by latch arm R. The tendency of a sprung or bowed spring-jointed bar is to over-throw and reset the indexed units plate pawl on the return stroke of the tens operation.

Stationary bar J extends only slightly above the contact surface of the raise bar. It is also thinner, which, together with the fact that it cannot be sprung from the raise bar, will prevent the units plate pawl from being reset between cycles.

CAUSE: 3. (Fig. 1) Multiplier power shaft L failing to position raise bar H low enough between cycles to permit indexed units plate pawl P to position over spring-jointed bar K, due to excessive pressure applied on the key by the operator when multiplying.

CORRECTION: 3. Install the following parts:

- D. 46 Nut for screw E
- E. 531 Fte. 146 Spring anchor screw
- M. 20 No. 74 Spring anchor
- N. 71809 Spring
- T 1-72111 1/2B Intermediate keyboard disabling slide

ADJUSTMENTS:

1. Adjust segment gear S for slight play.

When making this adjustment, press downward on the driving cam so that all allowances in the cam and eccentric are used up thus preventing loss of play in the segment gear when power is applied to the parts during machine operation.

CORRECTION INDEX - MECANOGRAM

Insufficient play in the segment gear results in a rebound of the multiplier shaft and accelerates the upward movement of the raise bar to overthrow the tens multiplier plates.

Excessive play in the gear will not assure sufficient restoring movement of the raise bar between cycles to permit the units plate pawl being positioned over the raise bar.

To assist in full restoration of shaft L and consequent restoration of the raise bar between cycles, spring N has been installed and the slots in intermediate keyboard disabling slide T have been elongated sufficiently to permit the idling block on the slide to contact the cam on shaft L longer. This, plus the fact that stationary auxiliary bar J extends only slightly above the raise bar, provides sufficient clearance between the indexed units plate pawl and the raise bar between cycles for the units plate pawl to position over the raise bar should the operator ride the key.

Spring N also tends to reduce the backlash in the segment gear mesh and to stabilize the movement of the raise bar when it is being raised.

2. Loosen screw F (704592) and adjust eccentric G (704300 1/2 #2) in both ends of raise bar H to position the step of adding rack limit plates BA (Plate 17, Keyboard Instruction Book) so that the lug of the adding rack favors the upper portion of the step.

CAUSE: 4. (Fig. 2) Failure of lift pawl A to be released before power indexing slide C is released. In machines prior to Serial No. M9029D containing the auxiliary raise bar, inability to adjust for the proper timing relationship between the releasing of these two parts, may be caused by the horizontal arm of the lift pawl being too long.

CORRECTION: 4. Beginning with Machine Serial No. M9029D, the arm of lift pawl A on cipher multiplier plate and full cent plate 1A-74107 No. 1 and on tens multiplier plates 1A-74107 Nos. 2, 4, 6, 8, 10, 12, 14, 16, 18 and subtract plate 1A-16 1/2A Fte. 134 has been shortened .015" so that eccentric screw B may be adjusted for releasing slide C after the lift pawl has been released.

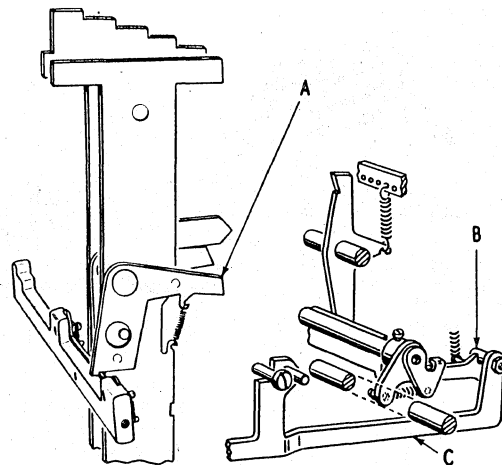


Fig. 2

Beginning with Machine Serial No. M9296D, the arm of the lift pawl on second cycle (unit) multiplier plates 1A-74107 Nos. 3, 5, 7, 9, 11, 13, 15, and 17 has also been shortened to the same dimension as the above numbered plates.

CORRECTION INDEX - MECANOGRAM

Machines prior to Serial No. M9029D containing pawls A that are difficult to adjust for proper timing of release should have the multiplier plates replaced with plates containing the shorter lift pawls. Plates with the shorter lift pawl were temporarily identified with red paint in or near the stamped plate numbers. Use of the identifying red paint marking on the multiplier plates is being discontinued in machines beginning with Serial No. M11119D, and plates installed in machines after this number, or plates ordered from the factory for service replacement after April 1957, may or may not contain the above identifying mark.

This item cancels Causes 1, 2, and 3 of Item 1, Mecanogram 1001. However, the information contained in Cause 3 of Item 1, Mecanogram 1001 is not changed but is transferred to Cause 4 of this Mecanogram.

II

CONDITION: Additional and/or continuous machine operations from result keys, Series M200 and M800 machines.

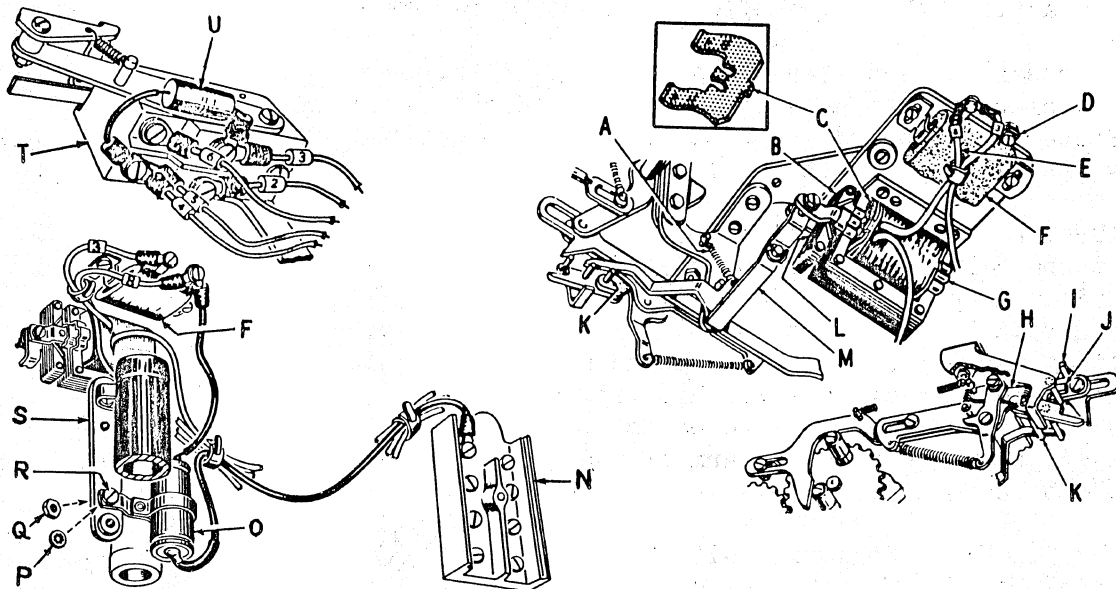


Fig. 1

CAUSE: 1. (Fig. 1) Solenoid plunger B failing to restore to normal due to the following conditions:

1. Residual magnetism within the solenoid.
2. Center prong of plunger spring C broken and remaining within the solenoid.
3. Solenoid plunger broken at point L.
4. Solenoid bail M worn in slot where plunger B connects.

CORRECTION INDEX - MECANOGRAM

CORRECTION: 1. 1. Resistor U or capacitor O is installed into the solenoid circuit to reduce residual magnetism within the solenoid in machines beginning with Serial No. M11602D.

Resistor U is used in machines using alternating current. It is installed by placing one of its connectors under the screw on the carriage and register return switch holding the two wires labeled 4 and 5, and the other connector under the screw holding the wire labeled 3.

Capacitor O is used in machines with direct current of any voltage. It is assembled to resistor bracket S with screw R, lock washer P, and nut Q. The connector on the shorter of the two wires of the capacitor is placed under the screw holding the solenoid wire labeled 8 to the lower terminal of resistor F. The connector on the longer wire is placed under the upper left screw of terminal block N.

Parts required:

A. 3283	Spring replacing spring A (3284 1/2) on machines prior to Serial No. M10352D. Spring 3283 is used on all machines beginning with Serial No. M10352D.
U. 1-702215 1/2 No. 1	Resistor for A.C. motors, 150 volts or less.
1-702215 1/2 No. 2	Resistor for A.C. motors, 151 to 250 volts.
O. 1-701276	Capacitor for all D.C. voltages.
R. 7062	Screw for attaching capacitor to bracket S.
P. X275-23	Lock washer between capacitor strap and bracket S.
Q. 46 1/4	Nut for screw R.

2. Remove broken center prong of spring C and install parts listed in Correction 1, Part 1.

The center prong of spring C is not required as a means of helping separate the plunger from the solenoid in machines containing spring 3283 and resistor U or capacitor O.

The protrusion on the solenoid plunger that contacted the center prong of the spring has been removed from all current solenoids.

The center prong of the spring was temporarily removed on new machines beginning with Serial No. M11430D until such time as the solenoids with the protrusion removed from the plunger became available. However, the spring is required for use as a clip to hold the solenoid assembly together and is retained in stock for this reason only. When used as a clip for solenoids whose plungers contain the protrusion, the center prong of the spring should be removed.

3. A new stronger solenoid (illustrated) should overcome breaking of the plunger. It is available and is used in machines beginning with Serial No. M8941D. The new solenoid, for 50 and 60 cycles, carries the same part number (X73-1), and may be identified since the plunger is not readily removable.

CORRECTION INDEX - MECANOGRAM

4. Install improved solenoid bail M (700143). Improved bail has been installed in machines beginning with Serial No. M11074D (M200), M11028D (M800). No change in part number.

CAUSE: 2. (Fig. 1) Solenoid bail M failing to restore drive pawl J downward to its inactive position due to the bail being out of adjustment.

CORRECTION: 2. Apply adjustments Nos. 4 and 5 (Plate 8-4A, Keyboard Instruction Book).

CAUSE: 3. (Fig. 1) Resistor F wired wrong for machines using direct current. The resistor is required for protection and control of the solenoid when direct current of any voltage or alternating current of 125 volts or more is used.

Unless otherwise specified, all machines are manufactured for alternating current of 115 to 125 volts, and solenoid resistor F is by-passed by attaching both wires, labeled 3 and 8, to the same (upper) terminal post as shown in the upper right illustration, Fig. 1. Also, beginning with Serial No. M11602D, all machines where the type of current is not specified will contain resistor U assembled to carriage and register return switch T.

CORRECTION: 3. To prepare a machine manufactured for alternating current for use on direct current, proceed as follows:

1. Connect wire E (labeled 8) to the lower terminal of resistor F as shown in the lower left illustration, Fig. 1.
2. Remove resistor U, if contained, from switch T.
3. Install capacitor O. (See Cause 1, Correction 1, Part 1)

Refer to Plate 1-6, Power Symbol Book for symbol numbers of resistors.

CAUSE: 4. (Fig. 2) Insufficient upward movement of switch actuating arm A to permit switch B to open sufficiently - in Series M200 machines. Insufficient upward movement of actuating arm A may also result in pitting or fusing of the switch contact points.

CORRECTION: 4. Install improved switch actuating arm A (1-700146), containing an open slot at the bottom that permits the arm of switch B to travel farther and assure sufficient opening of the switch. The improved switch actuating arm is used in machines beginning with Serial No. M9040D.

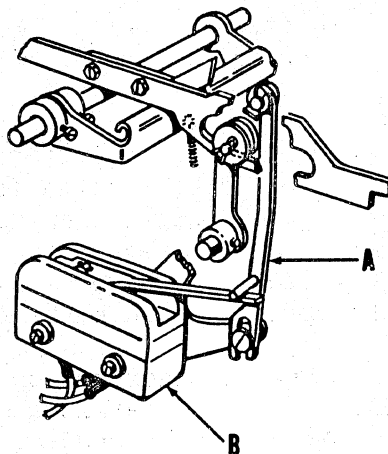


Fig. 2

This item cancels Items 1, 2, and 3 of Mecanogram 1001.

CORRECTION INDEX - MECANOGRAM

III

CONDITION: Hard motor bar depression and/or machine failing to operate.

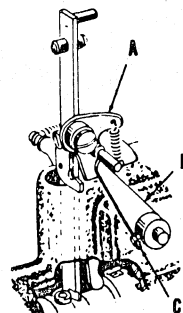
CAUSE: Latch arm B failing to normalize latch A.

CORRECTION: The hub of latch arm B has been enlarged to provide more threads for screw C to permit tightening of the screw securely without stripping the threads in the hub.

Install the following parts:

B. 1A-71242 Latch arm

C. 72581 Screw for latch arm



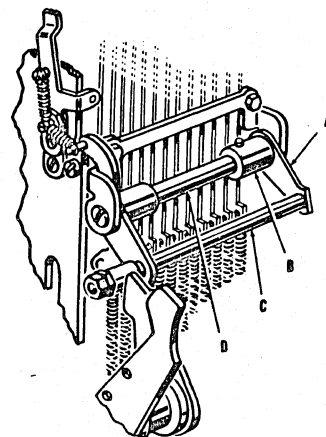
IV

CONDITION: Wrong multiplication or subtraction.

CAUSE: Restoring shaft C failing to restore the extend arms to normal during an extend clearing operation due to support arm A shearing from hub B.

CORRECTION: Install shaft assembly D (1-704001A). Support arm A is now brazed to shaft assembly D to eliminate the possibility of the arm breaking loose from normal usage.

Order for immediate need only.



V

CONDITION: Potential electric shock from aligning light J (Plate 37, Carriage Symbol Book).

CAUSE: Spring clip H, for cover F, contacting the metal portion of aligning light bulb G.

CORRECTION: A new arrangement for fastening cover F to reflector I is used in machines beginning with Serial No. M11927D and should be installed in Field machines where necessary.

Parts required:

705A Fte. 133

705194 1/4

Spring clip on reflector I

Insulator for aligning light bulb G

This cancels Item 3, Mecanogram 1002.

CORRECTION INDEX - MECANOGRAM

I

CONDITION: Excessive machine noise.

CAUSE: Machine case and motor cover not insulated from the machine base.

CORRECTION: Install case with improved sound abatement construction.

Improved case construction for sound abatement is standard on Series M200 and M800 machines of current manufacture. A similar arrangement for Field installation is available for consignment machines or as a "repair" attention to customers' machines.

Rubber pads 700903Z No.3 that fit under the case and around the feet of the side frames are used for Field installation in place of the rubber plugs used in factory construction.

Parts required for Field installation and the procedure used are as follows:

Part Number	Description	Quantity
700903Z No.3	Rubber pad	4
1-700113AY No.2	Case bracket	1
700554	Case bracket pin	1
700505 No. 3	Case screw	2
700904	Rubber washer for screw 700505 No.3	2
701343	Metal flanged collar for drive cover	3
88903	Rubber grommets used with 701343	3
701580 No.2	Drive cover screws	3
3820 1/2	Washer for drive cover screws	3
700569	Shoulder screw for case to bracket	
	1-700113AY No. 2	1
700908	Rubber flanged bushing for screw 700569	1
707302 No.1	Metal washer for screw 700569	1

1. Remove case lock G (Plate 14, Power Symbol Book) by driving pin 700554 from the underside of the base.
2. Install new case bracket 1-700113AY No.2.
3. Remove the two dowel pins for the case from the rear corners of the machine base.
4. Install four rubber pads 700903Z No.3 - one on each foot of side frame M.
5. Remove the bosses at the case screw holes on the inside of the case to provide clearance between the case and the side frames. A hack-saw may be used.
6. Enlarge the case screw holes in the case to compensate for the raised position given the case by the rubber pads. Use a 5/16" drill. It is not necessary to counterbore the hole.

CORRECTION INDEX - MECANOGRAM

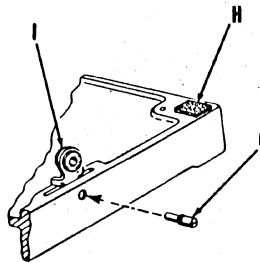
7. Remove the locking stud from the case and enlarge the hole, using a 5/16" drill. It is not necessary to counterbore the hole.
8. Assemble two sets of metal flanged collars 701343, rubber grommets 88903, washers 3820 1/2 and screws 701580 No.2 on the under side of the base for the retaining slots in the drive cover. Use the third set for retaining the front end of the drive cover with the grommet forced into the hole in the support bracket of the cover before the bushing is placed in position.
9. Install the machine case and retain with two screws 700505 No.3 with a rubber washer 700904 between each screw head and the case. Tighten the screws to apply sufficient pressure on the rubber washer to prevent loosening of the screws but not enough to draw in the case.
10. Attach case to bracket 1-700113AY no.2 using screw 700569, metal washer 707302 No.1, and rubber flanged bushing 700908. Should there be interference between the case and the hub on the bracket, the case should be filed for relief.

This item cancels Mecanogram No.526 (dated 11-19-54).

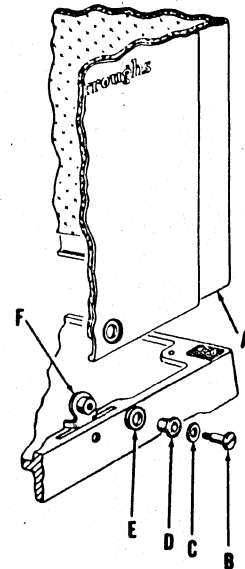
II

CONDITION: Product improvement.

CAUSE: To eliminate the possibility of dislodging the rubber insulator from bracket I when installing the case; and to assist in stabilizing the case on the machine base to reduce a possibility of side frame breakage and bent case screws.



CORRECTION: An improved method of fastening the case to the machine base is used in machines beginning with Serial No.M11379D (60 Pinion Const.) and M11557D (100 Pinion Const.).



The case has been altered and contains a counterbored hole in place of the locking stud and is fastened securely to redesigned bracket F by means of screw B, metal washer C, rubber flanged bushing D, and metal washer E.

Cases and locking parts used for new machines are as follows:

A. 1-700667D No.2	Case (60 Pinion)
1-700667D No.3	Case (100 Pinion)
1-700667B No.1	Case (Rotary magazine register)
B. 700569	Shoulder screw for case to bracket

CORRECTION INDEX - MECANOGRAM

II (Cont'd)

- C. 707302 No. 1 .025" metal washer used under head of screw B.
D. 700908 Rubber flanged bushing on screw B.
E. 510 1/2 .040" metal washer under flange of rubber bushing
D and bracket F.
F. 1-700113AY No.2 Bracket in slot of base.
G. 700554 Pin to secure bracket F to base.
H. 700903 No.3 Rubber plug between base and case

Cases ordered for service replacement on machines between Serial No. M5855D and Serial No. M11379D (60 Pinion) and M11557D (100 Pinion) require parts B, C, D, E, F and G.

Cases ordered for service replacement on machines prior to Serial No. M5855D, in addition to parts B, C, D, E, F, and G, require the following parts:

Part Number	Description	Quantity
7009032 No.3	Rubber pad between case and base	4
700505A No.3	Case screws (sides)	2
700904A	Rubber washer or case screws (sides)	2
9825	Metal washer on case screw (sides)	2

Cases containing the locking stud used on machines after Serial No. M5855D may be modified for use with bracket F by removing the locking stud from the case and enlarging the hole, using a 5/16" drill, and installing screw B, .025" metal washer C, rubber flanged bushing D, bracket F, and locking pin G.

The hole in the case should not be counterbored as in the new cases.

III

CONDITION: Erratic motor speed. (Motor hesitating to start - running slow - running fast).

CAUSE: Brush holder arms on brush holder assembly R (Plate 1-3A, Power Symbol Book) loose and making improper contact on governor AE.

CORRECTION: Install new brush holder assembly 1-71908C.

CORRECTION INDEX

I

CONDITION: Carriage return failure.

CAUSE: Worn teeth in carriage return gears S and N (Plate 3, Power Symbol Book) because of insufficient hardening and incorrect meshing.

CORRECTION: Install improved gears S (71901A No. 1) and N (71902A) which are hardened by a changed process. Gear S also has a reduced inside diameter to prevent tilting of the gear when the set screw is tightened. The reduced diameter gear is identified by copper plating. Both gears require set screw 69558. The improved gears should be meshed only with gears having an identifying groove in the gear hub.

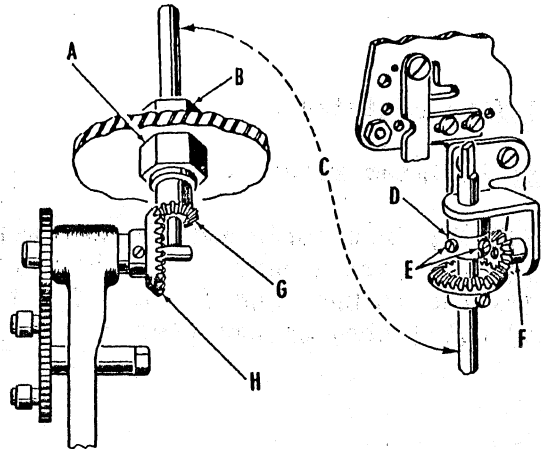
Correct mesh of the gears is provided by having the outside diameter of the gears flush with each other. If the mesh is too tight, face the right end of the bushing for shaft assembly M enough to permit flush alignment. If the mesh is too loose, use one or more steel washers 701378 on shaft assembly M to provide gear alignment.

II

* CONDITION: Carriage return failure.

CAUSE: Insufficient support in the machine base, for shaft assembly O (Plate 3, Power Symbol Book), permitting gears S and N to separate and wear.

CORRECTION: Install improved bearing, illustrated, which provides added support to shaft C. The milled flat in shaft C is repositioned, lowering gear G, to provide full mesh between gears G and H. Collar P (Plate 3) is moved to the upper end of shaft C (illustrated) to make room for the new bearing. Screws Q (Plate 3) are replaced by screws E (illustrated) to avoid interference between the screws and the teeth of gear F. Collar D should be positioned to provide .005" end play of shaft C.



Parts required:

A	1-700314	Bearing assembly
B	700315	Hexagon nut
C	701010 No. 2	Shaft (lower section)
E	75618	Screw for collar D (2 required)

Parts are promised by July 1, 1960.

* Changed since last issue.

Printed in U.S. America Revised 5-25-60 (1)

For Form 3763

CORRECTION INDEX

III

CONDITION: Carriage return failure.

CAUSE: Worn teeth in clutch members AC and AD (Plate 22, Carriage Symbol Book).

CORRECTION: Install improved clutch member 1-705260A and 1-705353. The teeth of clutch member AC are repositioned to provide full contact with the teeth in clutch member AD, thus distributing the load more evenly.

IV

CONDITION: Erratic form spacing.

CAUSE: Loosening of screw I (Plate 1-1, Carriage Symbol List) in variable space twirler H.

CORRECTION: Install screw B (8850 1/8) which has more threaded length to provide tightening of the screw against the platen shaft instead of against the hub of the twirler.

V

CONDITION: Register return failure.

CAUSE: Register return draw cords stiff.

CORRECTION: Draw cords may be made more flexible before installing by placing the cord around the machine stand leg, or other similar object, and drawing it back and forth. The two ends, where held, should then be worked until they become flexible.

VI

CONDITION: Product Improvement.

CAUSE: Need for bender for adjusting cross alignment of adding rack type and for adjusting and re-forming control wire (except 1/8" wires) that are difficult to reach.

CORRECTION: Bender, Kit 52 now available. It is made from 1/4" diameter stock 11 1/4" long, with 1/8" slot.

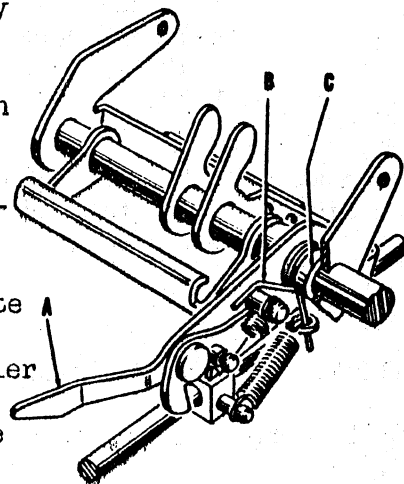
CORRECTION INDEX

I

CONDITION: Bending of extend restoring assembly B (Plate 19-1, Keyboard Symbol Book), extend fingers BX or extend arms BX (Plate 18-2, Keyboard Symbol Book) in Series M200 machines when clearing a previously extended amount from the multiplier factor side--with the non-extend of specified columns mechanism under carriage control.

CAUSE: 1. Failure of normalizing latch BG (Plate 18-2) to latch square block BC on a snap depression of the final product or clear multiplier keys.

2. Normalizing latch BG releasing square block BC prior to the restoring of extend arms BX during the forward machine stroke.



* CORRECTION: Install redesigned normalizing cam BI (Plate 18-2) which has the formed arm for rod AY moved rearward to impart a downward and forward movement, thereby reducing the tendency to flip latch W upward at the time of latching block BC.

Install redesigned latch A (illustrated) and torsion spring B. Rightmost collar X (Plate 18-2) is not required when using torsion spring B.

The pawl on latch A (illustrated) has been extended farther below the latch. This, and the fact that torsion spring B actuates the latch downward faster and smoother, provides a more positive positioning of the latch. Also, the opening formed by the latching portion of the latch and the pawl has been reduced to insure that the pawl will prevent relatching of the latch when the final product or clear multiplier key is held depressed.

To delay release of the latch during the forward machine stroke, the latch has been further altered so the resetting finger of the latch is in a higher position in relation to reset shaft S (Plate 18-2).

Machines between Series M200 Serial Nos. M7591D and M12347D require the following illustrated parts:

A	1-702235 1/2B	Latch
B	702810	Spring for latch A
C	702393A	Space collar

Machines Style 720722 starting with Serial No. B46251 and Series M200, between Serial No. B197641 and M7591D require the following additional parts (reference Plate 18-2):

* Changed since last issue.

CORRECTION INDEX

I (Cont'd.)

BI	1-702219A	Caming arm
AX	1A-702119 3/4A	Intermediate arm
AZ	702613	Shoulder screw
AY	1-702760B	Link rod
BJ	705566	Shoulder screw

Starting with Serial No. 12532D, the front end of latch A (illustration) is annealed to facilitate adjustment. Reference: Adjustment 6, Page 16F, Keyboard Instruction Book.

II

CONDITION: Printing failure.

CAUSE: 1. Worn roll or loose retaining stud AJ (Plate 3, Printing Symbol Book).

CORRECTION: Install roll 71334 No. 2 and retaining stud 71532 No. 2.

Repair stud 71532Z No. 2 is now available for replacement of stud 71532 No. 2 in arm Z, when the hole in the arm has become enlarged. The repair stud is approximately .010" larger at the rivet end, and .007" longer to provide additional riveting stock. Use Kit 260 No. 29 drill to clear the hole prior to installing the repair stud.

III

Cancelled - See Correction Index 1005, Item V.

IV

CONDITION: Breaking of register assembly end bracket W (Plate S-8-1A, Accumulation Symbol Book) in Sterling Machines.

CAUSE: Flexing of the end bracket by tension of spring BK when the pinion assembly limits against the register escapement stop during register tabulation.

CORRECTION: Install reinforced end bracket 1-79140DR using spring anchor screw 79596B in the leftmost location and screw F (709636) and 49 1/4 nut in the rightmost location. Shorten spring BK approximately 1/2".

Lovejoy

CORRECTION INDEX

I

CONDITION: Faulty carriage tabulation and return.

CAUSE: Bottom half of the lower ball race is worn, permitting loss of one or more ball bearings from the assembly.

CORRECTION: Install assembly 1C-705009 (M, Plate 21, Power Symbol Book) which has a bearing surface with improved hardening. The improved race block, located immediately above the race adjusting and lock nuts, is grooved in its outer surface for identification. Order for immediate need only.

II

CONDITION: Indexing incorrect amounts in wide base and new wide base machines.

CAUSE: Broken intermediate keyboard escapement rack D (Plate 5, Keyboard Symbol Book).

CORRECTION: Install strengthened rack 706907 #2. Modify to meet requirements of machine construction as follows:

Class 72 and M200 ($1/10$ fractions), Class 78, M800 and Class 77 (without register designation), remove one tooth from the left end.

Class 72 and M200 ($1/4$ fractions), remove two teeth from the left end.

Class 72 and M200 ($1/8$ fractions), Class 77 and M700 (with two bar designation), remove three teeth from the left end.

Style 720722, modification not required.