

Reference Book

on

BURROUGHS TYPES 50 AND 60 MACHINES



Construction, Functions,
Adjustments and Symbols

Book No. 2

PROPERTY OF AND TO BE RETURNED TO
BURROUGHS ADDING MACHINE COMPANY
DETROIT, MICHIGAN

Foreword

REFERENCE BOOK

ON

BURROUGHS TYPES 50 AND 60 MACHINES

The purpose of this book is to provide complete information on the mechanisms, construction, adjustments and symbols of Types 50 and 60 machines.

Parts in the illustrations are designated alphabetically for two reasons:

First: To permit concentration on the subject which is difficult when large symbols must be kept in mind at the same time.

Second: To provide larger and plainer illustrations through the additional space made available by the use of letters instead of numbers.

Symbol numbers of parts designated by letters are shown following each illustration, irrespective of sectional classification.

The Types 50 and 60 parts are symbolized in the 100,000 series; the fourth digit from the right indicates the section in which the part is located and the first, second and third digits indicate the kind of part.

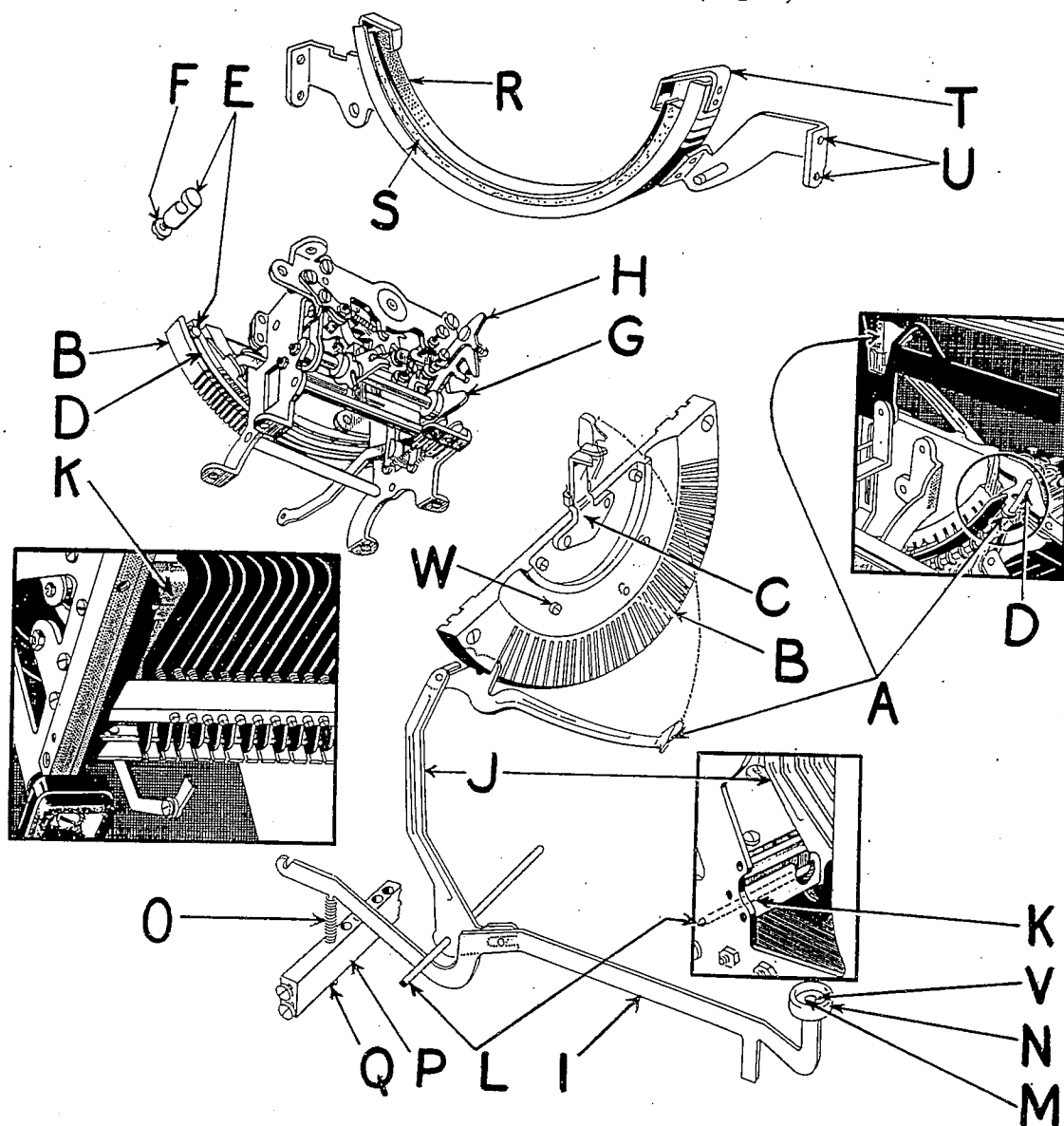
SECTIONS	PARTS
100000	Panels..... 0 to 9 inclusive, shafts
101000	Motor and Drive.....10 to 29 inclusive, punched pieces
102000	Keyboard.....30 to 49 inclusive, bushings, hubs, collars, etc.
103000	Carriage.....50 to 64 inclusive, screws, studs and pins
104000	Escapement.....65 to 69 inclusive, castings
105000	Ribbon.....70 to 79 inclusive, wires and connections
106000	Type.....80 to 89 inclusive, springs
108000	Shift and Tabulation....90 to 99 inclusive, miscellaneous

The star following a symbol indicates the part is not supplied separately; order such parts in the dash assembly.

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TYPE BAR MECHANISM (Fig. 1)

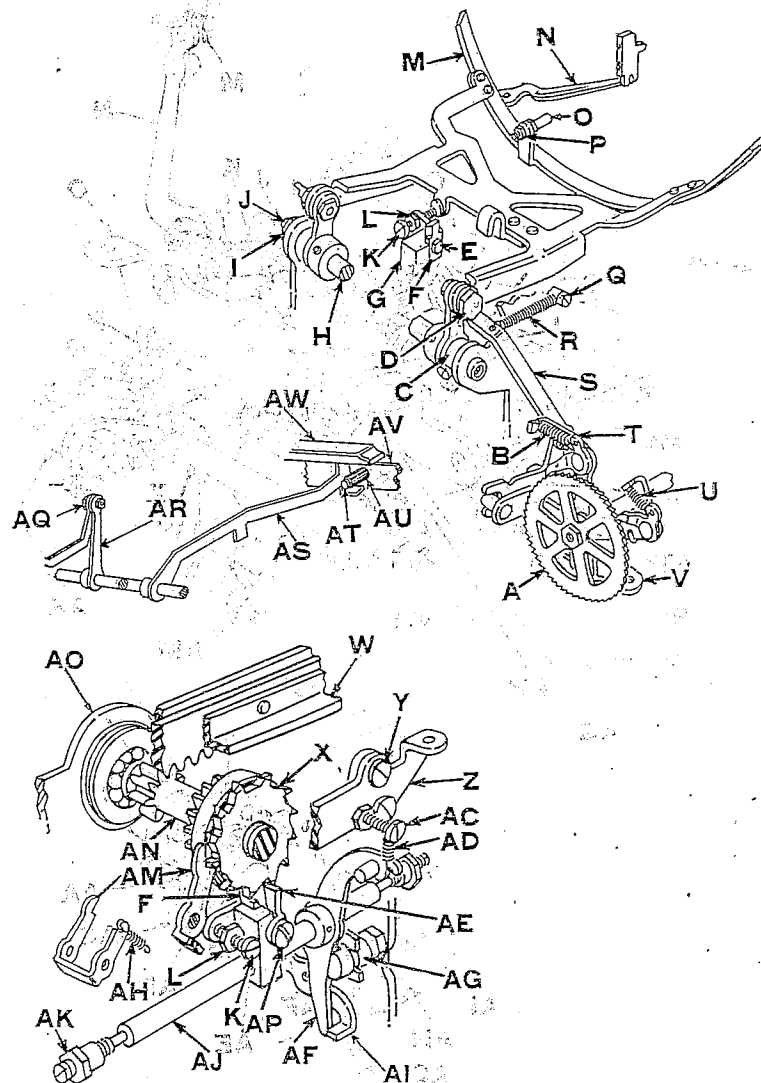


SYMBOLS (Fig. 1)

A	1- 106111 No. 1 thru No. 42 Specify No.	M	102991A No.1(key paper)specify character
B	106665A* No. 1	N	72200 No. 1 (ring)
C	106110	O	102800 (42 req.)
D	106700	P	1A-102002
E	106600	Q	102504
F	106500	R	106901*
G	1- 104102*	S	106900*
H	104126	T	1A-106100
I	1- 102221 No. 1 thru No. 42	U	73612
J	1- 102222 No. 1 thru No. 42	V	72992 No. 1 (glass)
K	102665*	W	(4) 106501 (screw)
L	102001		

ESCAPEMENT MECHANISM, LATER

Common to Types 50 and 60 (Fig. 2-1)



SYMBOLS (Plate 2-1)

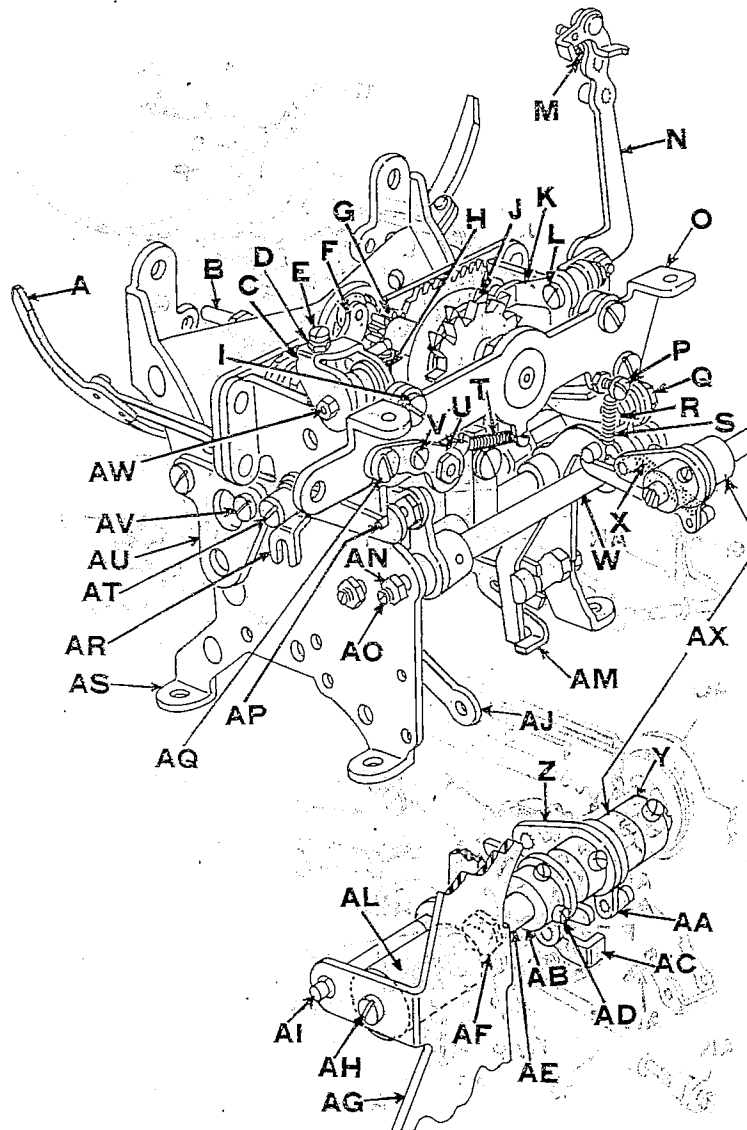
A 11-105136
 44808
 75621 (set screw for screw 104550 No. 2)
 104500B No. 1
 104509
 104112 No. 3 (use for 8, 9, 10 or 12 pitch)
 104112 No. 3 Pitch 14
 104900 Style E* (part of AJ)
 1A-104004 Style E
 473/4
 104550
 104501
 49 1/4
 M 1-104100 Style E
 N 1-106111 (specify No. as stamped) and style of type

O 104554
 P 49 1/4 Nut 1097 1/2 Washer
 Q 3464 1/2
 R 9281 1/2
 S 1-104121A
 T 105134
 U 44808
 V 1-105133 No. 1
 W 1-103903 P. 8-9-12-14 (specify length)
 X 1A-103903A P. 10 (specify length)
 Y 1-104003A (use for 8, 9, 10 or 12 pitch)
 Z 11-104003A (14 pitch)
 7357 1/2
 1A-104106A
 AC 104501 Screw, 49 1/4 nut
 AD 10180
 AE 104113 No. 2 (use for all pitches)

AF 1-104117 Style E*
 AG 104581
 AH 77801
 AI 104127A Style E
 AJ 1-104001 Style E
 AK 47 3/4 Nut, 104550 screw
 AM 104111A
 AN 1-104404 (specify pitch)
 AO 104105A*
 AP 75634
 AQ 104505
 AR 1-102107*
 AS 1-102106BL
 AT 100800A*
 AU 100900A
 AV 1-100101A
 AW 1-102103

ESCAPEMENT UNIT, LATERAL

Common to Types 50 and 60 (Fig. 2-2)



SYMBOLS (Plate 2-2)

A 1-104100 Style E
 B 104554 Stud, 49 $\frac{1}{4}$ nut, 1097 $\frac{3}{4}$ washer
 C 1-104148 (use for p. 9-10-12-14)—
 1-104148 P8
 D 49 $\frac{1}{4}$
 E 104501
 F Part of C
 G 1-104404 (all pitches)
 H 12083 $\frac{1}{2}$ (for 11", 13" and 15" carriage)
 I 200811 (for 18" and 22" carriages)
 J 7357 $\frac{1}{2}$
 K 1-104003A (use for 8-9-10-12 pitch)—
 11-104003A (1 $\frac{1}{2}$ pitch)
 L 1-104119 (use for 9-10-12-14 pitch)—
 11-104119 (for pitch 8)
 M 104504
 N 104803
 O 1A-104109A No. 1 (use for 8-9-10-12
 pitch)

P 1-104109B No. 2 (for 14 pitch)
 Q 1A-104106A
 R 104501 Screw, 49 $\frac{1}{4}$ nut
 S 104500B No. 1
 T 46 $\frac{3}{4}$
 U 10180
 V 77801
 W 1-104143C
 X 100563 $\frac{1}{2}$
 Y 1A-104004 Style E
 Z Same as Z
 AA 1-71403 $\frac{1}{2}$
 AB 1-104120
 AC Part of AX
 AD 1A-105143
 AE 105126A
 AF 550 $\frac{3}{4}$ (included in AB)
 AG 101002A Style E (for type 60)
 AH 101002A (for type 50)

AI 393
 AJ 1B-108116
 AK 73612
 AL 108004 Shaft, 470 clip
 AM 108007 No. 1
 AN 104127A Style E
 AO 47 $\frac{1}{2}$
 AP 104550
 AQ 104500B No. 2
 AR 83556
 AS 1-108142 Style E
 AT 1-104110BR
 AU 108513
 AV 104152
 AW 73612
 AX 104515
 AY 1-104118A Style E

Type Bars

Type bars A (Fig. 1) are guided close to their pivoting point in long slots of segment B. Type bars A are guided at the printing position by type guide C.

To secure accurate alignment, type bars A should have minimum play in the slots of segment B and not more than .002 play in type guide C.

The type bars pivot on curved rod D, which lies in the lower curved recess in segment B. The upper right and left ends of rod D are anchored by part E and screw F. To remove a type bar, the universal shaft assembly is latched back as follows: The rear arm of part G is depressed and latch H hooked over the stud in G. This permits the type bar to be disengaged from pivot rod D and removed from the segment. The type bar is replaced in reverse order.

The type bars are connected to key levers I, by bell cranks J. Type bars, bell cranks and key levers are stamped with the same number.

The free action of the key assembly is essential; bell cranks J are adjusted by bending to align the stud with the type bar slot. When this adjustment is made, the universal bar should be locked rearward, which allows the hook of the type bar a free contact on the curved pivot rod.

The purpose of the heel on the back of the type is to prevent damage to the face of a second type, in the event that two type are driven against the platen at the same time. In the condition referred to, the heel of the first type contacts between the upper and lower type faces of the second type.

The purpose of the anvil on the segment is to prevent cutting through the sheets when keys are subjected to heavy depression. This is especially true when cutting stencils.

The spring tension of the key levers is individually adjusted and uniform. The spring tension is secured by the adjusting screws Q in the spring beam. The spring tension is tested by a 2½ ounce weight to the key which should raise the lower projection of the type even with the top of the other type

which are in normal position. The spring tension of the space bar is tested with a two ounce weight.

When a key is depressed the cam face above the slots in the type bar contacts on the universal bar to actuate the escapement mechanism. The type strikes the platen before the escapement takes place.

Bell cranks J pivot in guide slots of fulcrum casting K on fulcrum shaft L.

The type has a slot into which the type bar is seated.

The type is soldered to the type bar while it is held in a special fixture. The soldering fixture insures the accurate locating of the type. The type is located in the fixture by the center line between the upper and lower character. The type bar is located in the fixture at the place where the type bar pivots in the segment.

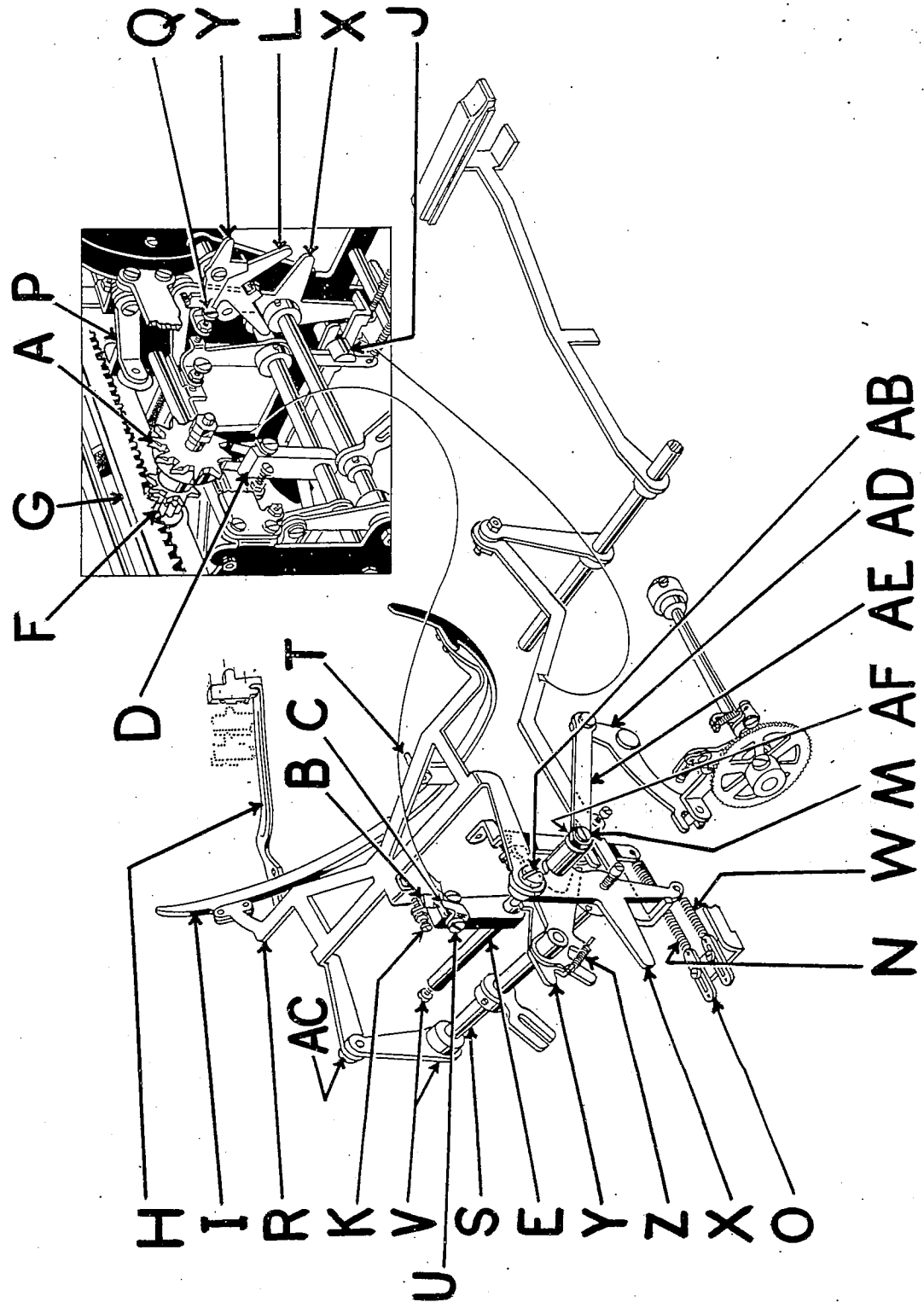
When the type bars are at rest, they limit on leather R and felt S cushion in basket T, which is fastened to the right and left side plates with screws U.

When a key is depressed, the contact of the type on the platen and the type bar on the anvil should be equal. Test: A .002 feeler is used.

SELF-QUESTIONS

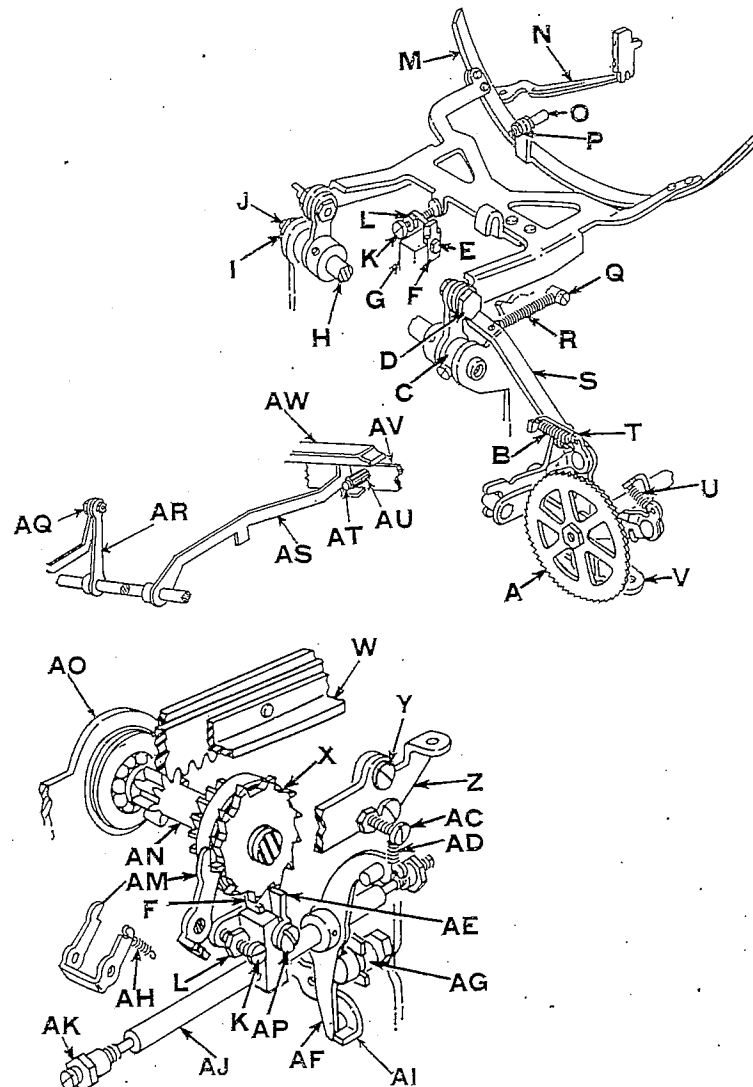
- 1—How are type bars guided and fitted at their printing and pivoting points?
- 2—How is curved pivot rod D located and fastened in segment B?
- 3—How are type bars removed?
- 4—How are type bars connected with key levers?
- 5—How are bell cranks J adjusted?
- 6—What is the purpose of the anvil on segment B?
- 7—How is the touch or spring tension of the key levers adjusted?
- 8—How is the spring tension of keys tested?
- 9—What is the purpose of the heel on the upper part of the type bar to the rear of the type?
- 10—How does the type depression actuate the universal bar?
- 11—What is the relative timing action of the type striking the platen and the escapement release?
- 12—How much contact should there be between the type bar and the anvil when the bar is held against the platen?

ESCAPEMENT MECHANISM—TYPE 50 (Fig. 2)



ESCAPEMENT MECHANISM, LATER

Types 50 and 60 (Fig. 2-1)



This mechanism is now common to both Types 50 and 60. The tests and adjustments on page 7, and continued on page 8, covering the escapement mechanism (Fig. 2) are not applicable to the present style mechanism.

Sequence

When space bar AW (Type 60) is depressed, lever AR pulls link AI forward, the latter swings lever AF which rocks shaft assembly AJ moving loose dog AE out of escapement wheel X. The hold of link AI on lever AF gradually decreases, resulting in lever AF disengaging from link AI which allows lever AF to restore to normal and the completion of the platen spacing.

When the space bar in Type 50 machines is depressed, the platen spaces partially on the downstroke and is completed on the upstroke.

Tests and Adjustments

When space bar AW is depressed to within

1/32 inch of rubber limit AU, loose dog AE should release escapement wheel X.
Adjustment: Eccentric AQ is turned.

When space bar AW is restoring and lip of AS is within 1/8 inch of rubber limit AU, AI should restore to rear of AF.

Adjustment: The lower projection of link AI is lowered for earlier release and raised for later release.

When space bar AW is restoring and lip of AS is within 1/8 inch of rubber limit AU, AI should restore to rear of AF.

Adjustment: Post AG is turned.

The preceding tests and adjustments are applied to Types 50 and 60; however, for Type 50 machines the following adjustment is added and is made when the adjustments common to both types are completed:

The lip of link AI is bent upward to delay completion of spacing until upstroke.

SYMBOLS (Fig. 2)

A	1- 104003A	P	1- 104119
B	104112 No. 3	Q	104501
C	104113 No. 2	R	104101*
D	104900*	S	1A-104004
E	1- 104001 (Specify Style E for Electric)	1-	104004 (Style E for Electric)
F	1- 104404 Specify Pitch	T	104554
G	1A-103903A P. 10 Specify Length	U	75634
	1- 103903 (P. 8-12-14) Specify Length	V	104550
H	1- 106111 No 1 thru 42 Specify No.	W	10180
I	1- 104100 (Specify Style E for Electric)	X	1- 104102
J	104581	Y	104126
	104506 (Screw for 104581)	Z	9283 1/4
K	104501	AB	104500 No. 1 (Specify Style E for Electric)
L	1- 104118	AC	104500A No. 2
M	76559 (Screw for 104380)	AD	1- 104121 (Specify Style E for Electric)
N	73805	AE	104122*
O	104104	AF	104380 (Eccentric)
	74502 (Screws for 104104)		

Escapement Mechanism

The purpose of the escapement mechanism is to allow the clock spring to laterally move the carriage one-tenth part of an inch when one of the typewriter keys or the space bar is depressed.

The escapement is secured through escapement wheel assembly A, (Fig. 2) the latter consists of the escapement wheel and ratchet mounted on the shaft.

Assembly A is controlled by stationary dog B and loose dog C. Stationary dog B is fastened to post D. Loose dog C pivots on post D of shaft assembly E. The escapement mechanism is operated by the writing keys and the space bar through the universal bar assembly. The escapement movement is applied to the carriage through the ratchet of assembly A and the pawl and pinion assembly F, the latter consists of the pawl drum, the back space ratchet and the pinion.

Pawl and pinion assembly F rotates on the shaft of escapement wheel assembly A, the pinion of the latter is meshed with rack G.

When writing keys are depressed, type bar H moves universal bar I rearward which rocks shaft assembly E. Loose dog C is moved out of the tooth space of the escapement wheel and stationary dog B follows up into the tooth space vacated by loose dog C which permits the clock spring to move the carriage .040 (drop) and align the loose dog with the next tooth space. As the escapement mechanism restores, the stationary dog moves out of the tooth space followed by the entry of the loose dog into the next tooth space which permits the clock spring to complete the escapement movement by an additional .060.

When a key is depressed the loose dog should release the escapement wheel when the type is within $\frac{3}{16}$ " to $\frac{3}{32}$ " of the platen. This adjustment is made by turning the adjusting screw K in arm of shaft assembly E, advancing to or retarding from the formed lip of the universal bar assembly.

When the escapement wheel release has been properly adjusted, a key should be held down and the adjusting screw in arm L turned toward the formed lip on the arm of shaft assembly E, to prevent an overthrow of the escapement dogs during a rapid typing operation.

Tests and Adjustments

The hold of the loose dog C on the teeth of the escapement wheel is determined by the minimum clearance between the rearward edge of the stationary dog B and the forward edge of each tooth of the escapement wheel. The amount of clearance can be noticed as follows: The carriage is held with the left hand, and the escapement mechanism tripped to release the loose dog by rocking the rear arm on the universal bar shaft. The escapement wheel can now be moved to pass the stationary dog. In this position the stationary dog is normal, limited by stud J, the latter has a flat surface. To decrease the clearance between the stationary dog and the escapement wheel, the screw in the side plate is loosened and the stud turned toward the rear. To increase the clearance the stud is turned forward. The hold of the loose dog is increased as the clearance between the stationary dog and the escapement wheel is increased. Note: Increasing the hold of the loose dog loads up the key depression which may not be desirable.

The space bar should trip the escapement mechanism when the space bar is within $\frac{1}{32}$ inch of the felt pads. To secure more or less clearance at this point, eccentric AF is turned which is in the vertical arm of the space bar pivot shaft. In Type 60 machines, the overthrow of the escapement dogs is prevented by arm F (on shaft G) blocking the stud in part H (Fig. 3).

The escapement shaft assembly is restored by spring N. This spring is hooked on slotted spring anchor O which provides adjustable tension. This spring should be sufficiently strong to insure that the type bar during restoring will quickly vacate the type bar guide.

The mesh of escapement rack G and pinion F is obtained through the resting of the rack assembly on the roller of bell crank P. The lower arm of bell crank contacts on adjusting screw Q, which raises or lowers the roller according to the direction that the screw is turned.

Rack G should have full mesh with pinion F, however, the rack teeth should not bottom. This test should be applied to each end of rack G. Test for rack mesh: The carriage is moved to the left. The escapement wheel is blocked with a screw driver in the right hand. With the carriage grasped by the left hand, the amount of play can be felt.

The correct tension of the clock spring is secured by giving the drum $2\frac{1}{2}$ complete turns when the spring is in unwound position.

SELF-QUESTIONS

- 13—What is the purpose of the escapement mechanism?
- 14—How is the escapement movement accomplished?
- 15—From which sources is the escapement mechanism operated?
- 16—How is the escapement movement applied to the carriage?
- 17—Describe how the escapement mechanism is actuated.
- 18—What adjustment is made to cause the escapement wheel teeth to have parallel contact on loose dog C?
- 19—How is the hold of loose dog C on the escapement wheel determined?
- 20—What adjustment is made to change the hold of loose dog C on the escapement wheel?
- 21—How is the escapement wheel release tested?
- 22—What adjustment is made to prevent overthrow of the escapement dogs?

- 23—What is the purpose of slotted spring anchor O?
- 24—How is the mesh of escapement rack G and pinion F obtained?
- 25—What is the correct mesh of rack G and pinion F and how is this adjustment made?

Universal Bar Assembly

Universal bar I is fastened to the front arms of stamped part R. A formed lip on R contacts on adjusting screw K of the escapement release mechanism. Two rear arms of R pivot on the right and left arms of shaft assembly S. Universal bar I is guided by pilot stud T, which rides in type bar segment.

Tests and Adjustments

Universal bar I must contact evenly in the entire recess of type bar segment, to insure that the escapement release will be uniform on all keys.

The universal bar is accurately made and carefully fitted at the Factory in order to practically eliminate the need of adjusting this part in the Field.

Shaft assembly S can be moved right or left in order to align pilot stud T. The universal shaft must move freely with minimum end play of shaft assembly S. This adjustment is made with cone pointed screws V, which support the shaft assembly. Spring W which restores this assembly is hooked to slotted spring anchor O, which provides adjustable tension. This assembly must completely restore to insure that the pawl and ratchet of the ribbon feed mechanism will positively engage.

SELF-QUESTIONS

- 26—Describe the construction of the universal bar assembly.
- 27—Which test is applied to the universal bar with respect to the type bar segment?
- 28—How is pilot stud T aligned for free movement?

Removing Escapement Wheel Assembly

Remove carriage and plate Q (Fig. 3).

Place a little vaseline in front ball bearings A to retain them.

Tip the machine upward.

Remove screws B and C from end plate D.

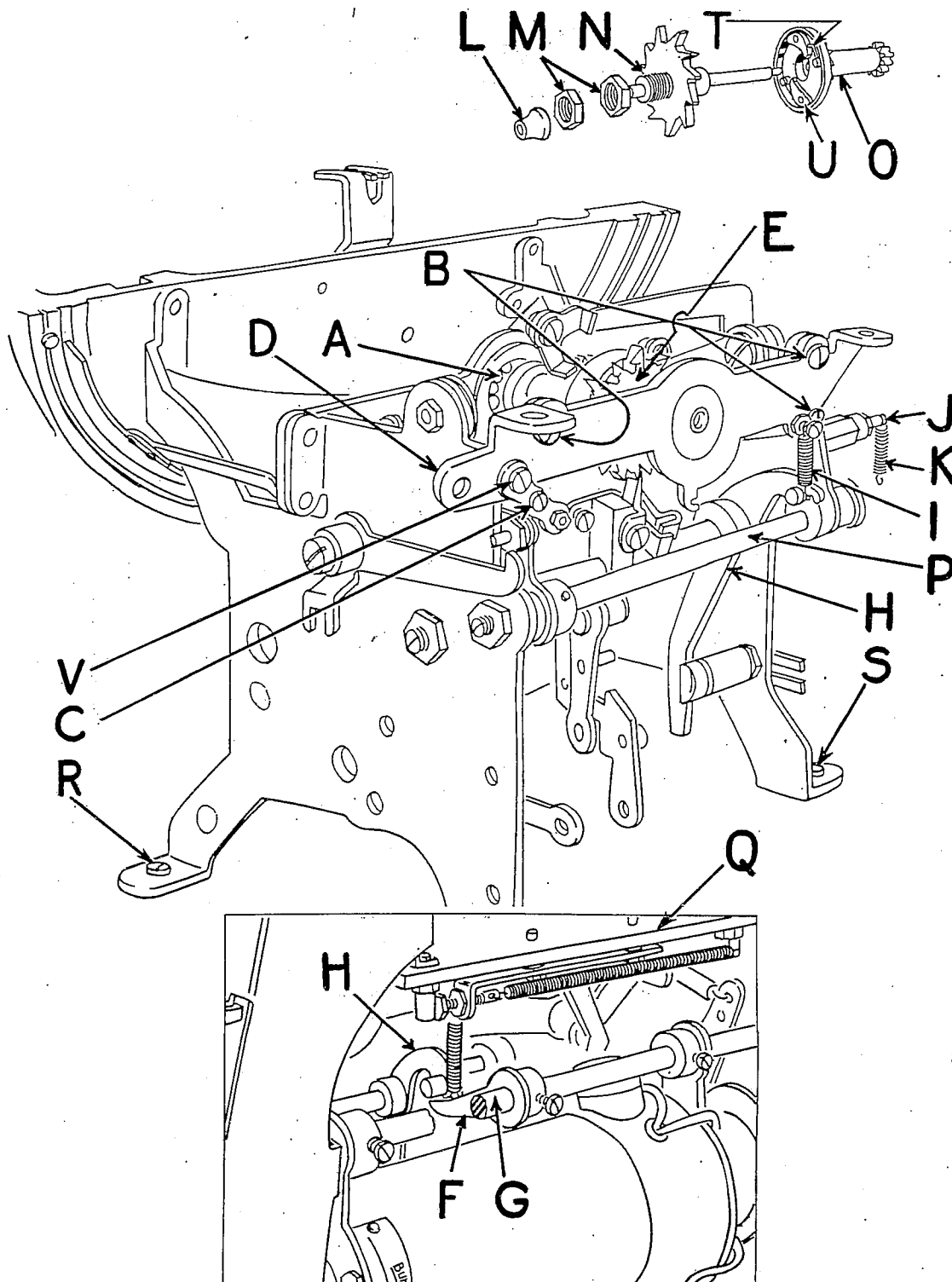
Remove end plate D together with complete escapement wheel assembly E.

SYMBOLS (Fig. 3)

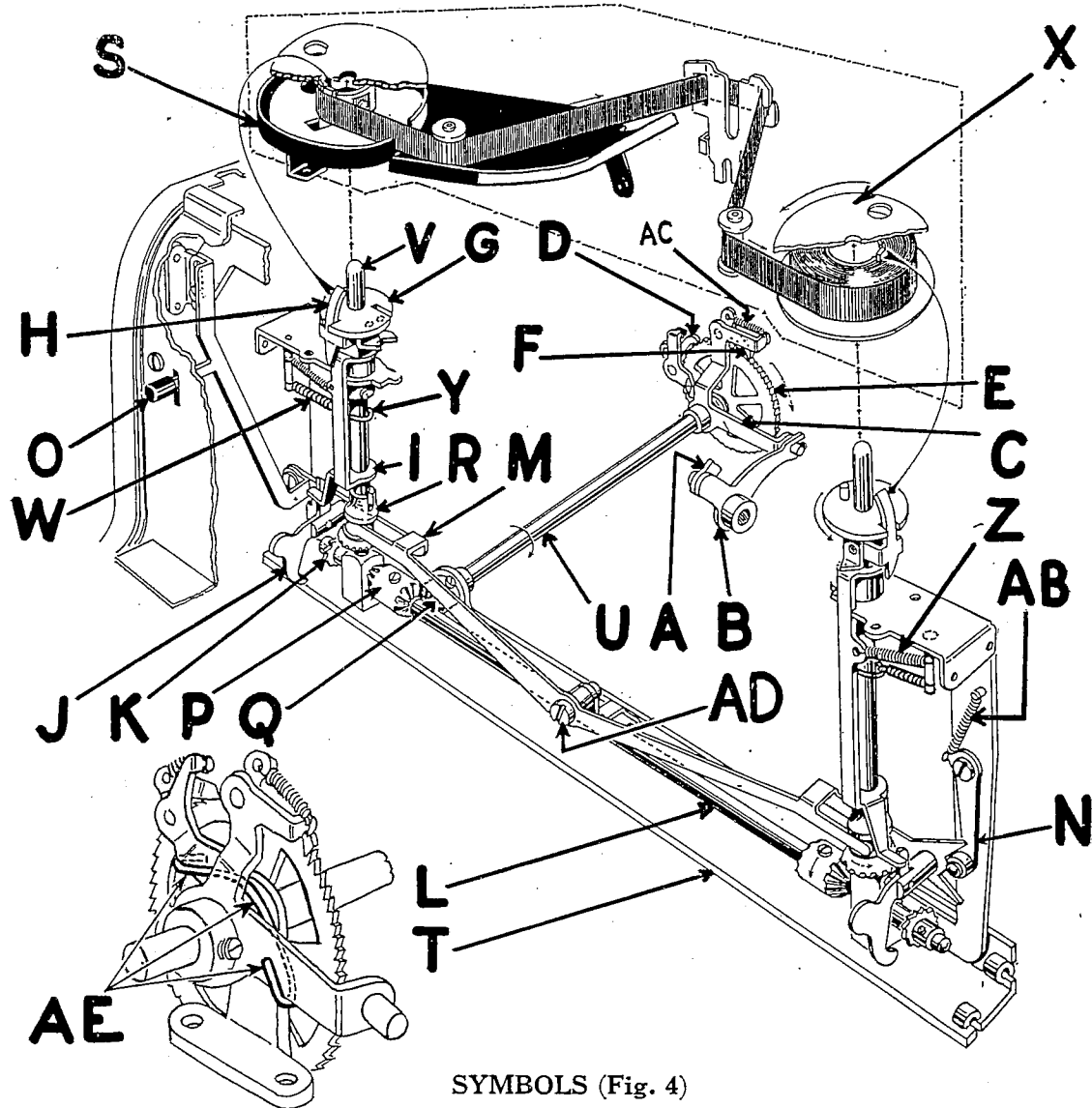
A	4499 (10)	I	10085
B	7357 $\frac{1}{2}$	J	104510
C	73611	K	82813
D	1-104106A	L	104401A
E	1-104003A	M	104350
F	1-104118 Style E	N	1-104003A
G	101002	O	1-104404 Specify Pitch
H	1-104117 Style E*	P	1-104004 Style E

Q	1-100106A (11) (18)
	1-100106 Style E (11) (18) for Electric
R	102501 (front)
S	104503 (rear)
T	104800
U	75230
V	83556

ESCAPEMENT MECHANISM—TYPE 60 (Fig. 3)



RIBBON FEED MECHANISM (Fig. 4)



SYMBOLS (Fig. 4)

A	104122*	Q	1-105903
B	1-104121	R	1-105902
C	1-105135 (Specify Style E for Electric)	S	1-105109R&L
D	105134*	T	1-105100
E	1-105136	U	105005
F	105134	V	1-105003R&L
G	1-105111		1-105101R&L set collar for 1-105003 R&L
H	105105R&L*	W	3981
I	105103R*	X	1-105990 No. (1) (2) (3) (4) (5) Single Color Ribbon. Specify Color.
J	105106*		1-105991 No. (1) (2) (3) (4) (5) Multiple Color Ribbon (Specify Color Comb.)
K	1-105400L	Y	105700
L	105004	Z	10780½
M	1-105102	AB	3284½
N	1-105115	AC	44808
	105503 (Screw for 1-105115)	AD	1362½
O	105104	AE	105803 (Specify Style E for Electric)
	200900 (Red Button on 105104)		
P	1-105901		

Ribbon Feed Mechanism

The ribbon feed mechanism is actuated by the universal bar shaft assembly, link A (Fig. 4) and bell crank B. The fork of bell crank B meshes with a stud in pivot arm C.

When one of the keys or the space bar is depressed, the universal shaft assembly rocks pivot arm C, pawl F then turns ratchet wheel E, check pawl D idles in the teeth of ratchet wheel E and prevents the drag of pawl F moving the ratchet wheel backward as the pawl is restoring to normal position.

The purpose of spring W is to prevent undue slack of the ribbon as it is winding. Spring AE insures that pivot arm C will restore more positively.

Ribbon Reverse Mechanism

The ribbon reverse is secured through the movement of the unwinding ribbon spool. The ribbon spool seats on disk assembly G; a pin in the disk holding the spool to turn with the disk assembly G. When the unwinding of the ribbon is nearing completion, pawl H drops into the path of the arm on vertical bail I, the continued unwinding of the ribbon causes pawl H to contact and swing bail I, which allows reverse hook J to engage reverse ratchet K on ribbon feed shaft L. The movement of ribbon feed shaft L through reverse hooks J pulls the arm of reverse rocker lever M downward, meshing the gears and unmeshing the gears on the opposite side, thereby reversing the ribbon feed. Rocker lever M is held in either position by detent N resting in the upper or lower triangular space of the right arm of rocker lever M.

Ribbon Reverse Lever

The ribbon mechanism can be reversed at

will by raising or lowering ribbon reverse lever O, which is directly connected to rocker lever M.

Tests and Adjustments

The reverse gears must be meshed without binding or excessive play. The mesh is adjusted by loosening the screw in gears P and Q, moving the gears and then tightening the set screws in the gears.

All parts must move extremely free, on other adjustments should be necessary.

Shafts V should be free with minimum up and down play, which can be increased or decreased by loosening the screw in the collar under bracket.

Detent N should seat fully in the triangular space when the gears are meshed. If necessary to adjust, rocker lever M is bent. This test is applied to both positions and the rocker lever bent to equalize the available movement.

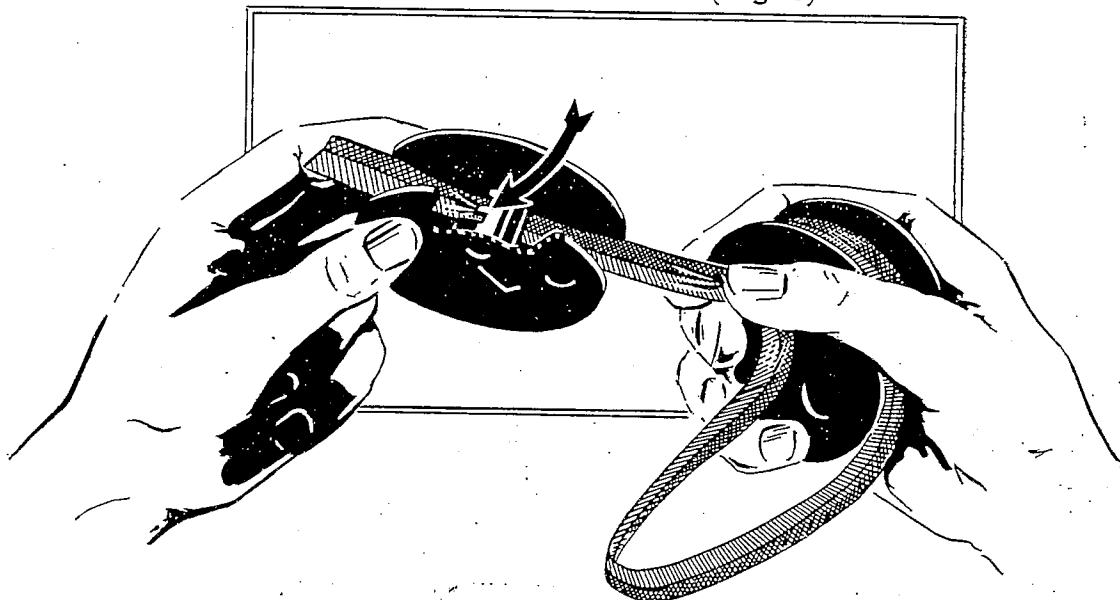
Installing New Ribbon (Fig 5)

Place carriage in central position (pointer at 50). Wind ribbon on one spool, placing finger tip in one of the holes in the top of the ribbon spool.

Remove spools, unhook old ribbon from the empty spool. Attach the new ribbon to the empty spool, passing the end of the ribbon through the opening under the hook. Fold about an inch of the ribbon over the hook, pull short end of the ribbon over hook to cause the ribbon to catch on the hook.

Place ribbon spools on posts, the reverse pawls to enter slot between bottom winding and ribbon post. Place ribbon through ribbon guide, between the latter and card guide.

INSTALLING RIBBON (Fig. 5)



Ribbon Color Shift Lever—Type 50

The purpose of the ribbon color shift lever is to control the upward movement of the ribbon guide in order to secure red printing, black printing or no printing for stencil cutting.

Ribbon guide A (Fig. 6) is actuated from the universal bar as follows:

When a writing key is depressed, universal bar B rocks shaft assembly C. Slotted arm E rocks bell crank F through stud G and link H.

Bell crank F actuates ribbon guide A through link I and bell crank J.

Ribbon Guide

The purpose of ribbon guide A is to make the last writing line visible when no key is being depressed. When all keys are normal, the ribbon is below the writing line. As a key is being depressed, ribbon guide A raises the ribbon in front of the type before the type reaches the platen.

Red Printing

When ribbon color shift lever K is moved to its extreme left position, shaft assembly L rocks shaft assembly M through link N. Shaft assembly M through link H moves stud G toward the bottom of the slot in bell crank F and toward the upper end of the slot in arm E. This position of stud G provides the maximum movement for the ribbon guide when keys are depressed which places the red portion of the ribbon in printing position.

Black Printing

When ribbon color shift lever K is moved to central position, stud G is moved toward the front of the fork of bell crank F and toward the bottom of the fork of arm E. This position of stud provides less movement of the ribbon guide which locates the black portion of the ribbon when keys are depressed.

Stencil Cutting

When ribbon color shift lever K is moved to extreme right position, stud G is moved entirely out of the slot in the fork of bell crank F. When keys are depressed, the ribbon guide remains inactive with the ribbon below the printing line.

Ribbon Guide Limits

When lever K is in left or red position overthrow of ribbon guide A is prevented by the lip on bell crank F contacting on the upper prong of part P, the latter is located by link R.

When lever K is moved to central position, link R locates the lower prong of P in line with the step of bell crank F.

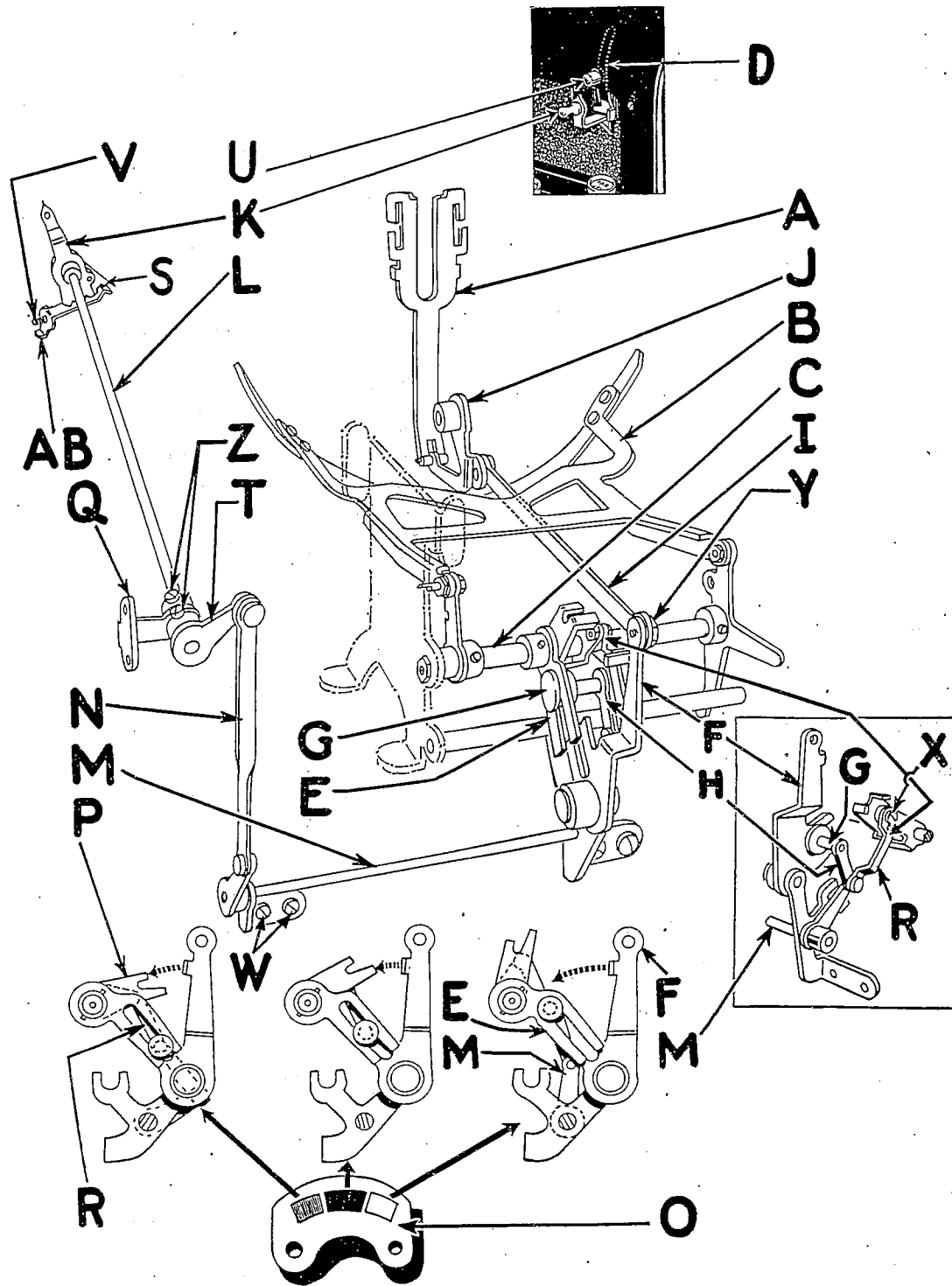
SELF-QUESTIONS

- 29—How is the ribbon feed mechanism actuated?
- 30—How is the ribbon reverse secured?
- 31—Describe the ribbon reverse as it takes place.
- 32—What is the purpose of the ribbon reverse lever?
- 33—Which tests are applied to the ribbon reverse mechanism?
- 34—How is a new ribbon installed?
- 35—Which tests are applied to rocker lever M and which adjustments may be required?
- 36—What is the purpose of spring W?
- 37—What is the purpose of spring AE?

SYMBOLS (Fig. 6)

A	105113 No. 1, 2 and 3 (No. 2 for logotype with offset right) (No. 3 for logotype with offset left)	N	105130*
B	1- 104100	O	105128
C	1A-104004	P	105144*
D	100800	Q	100103*
E	1- 104114*	R	105145*
F	1- 105129A	S	105121 73563 (Screw for 105121)
G	105557	T	1-105122
H	105124*	U	100553
I	105126*	V	952 $\frac{3}{4}$
J	105125A* (1- 105125A)	W	73611
K	1- 105120*	X	76528
L	1- 105002	Y	79503
M	1A-105001	Z	76570
		AB	105802

RIBBON COLOR SHIFT MECHANISM—TYPE 50 (Fig. 6)



Stencil Lock Button

The purpose of stencil lock button U (Fig. 6) is to make the manipulation of ribbon color shift lever K positive. Button U is carried by part D having a lip which blocks lever K from being shifted to the right. When button U is pressed in, lever K can be moved to the right.

Tests and Adjustments

With lever K in black position, the prong of the fork of bell crank F should be slightly over the center of stud G.

Adjustment: Screw in arm T of shaft assembly L is loosened; bell crank F located.

Test by placing lever K at stencil position, stud G not to bind in order to prevent lever K vibrating when keys are depressed.

Ear of bell crank F to have flush hold on the upper and lower prongs of part P.

Adjustment: The offset in link R is decreased or increased.

Link R to be parallel to part P in all positions of lever K, this is to insure free movement of link R which is essential. Adjust link R by twisting it.

When the shift key is depressed, ribbon guide A should immediately move upward.

Adjustment: Bell crank F is slightly and carefully bent forward.

Test: Lock down shift key and depress key, ribbon should raise slightly above type. When ribbon raises too high, bell crank F is bent back. Test for possible cushion effect when keys are depressed.

Adjustment: Prongs of part P should limit only and not cushion.

With lever K at red position; rapid depression of keys not to raise ribbon above bottom of type, if so, upper prong of part P is bent rearward to reduce excessive play. This adjustment is to prevent black printing with red.

SELF-QUESTIONS

- 38—What is the purpose of ribbon guide A?
- 39—Describe the operation of ribbon guide.
- 40—What is the purpose of ribbon color shift lever K?
- 41—How is the ribbon guide actuated?
- 42—What takes place when lever K is placed in left position?
- 43—What takes place when lever K is placed in center position?
- 44—What happens when lever K is placed in right position?
- 45—How is the center position of lever K adjusted?
- 46—How is the left position of lever K adjusted?
- 47—What is the purpose of part P?
- 48—Which test and adjustment are applicable to part P?
- 49—What test is applied to insure full black print when the shift lever is locked down, ribbon color shift lever in center position?
- 50—What adjustment may be required when the shift key is locked down, to insure full black print?
- 51—What test is applied to insure full red print when the shift key is locked?
- 52—What adjustment may be required to insure full red print when the shift key is locked?
- 53—What is the purpose of stencil lock button?

RIBBON COLOR SHIFT MECHANISM NO. 2

Types 50 and 60 (Fig. 6-1)

This mechanism which is used for both Types 50 and 60, supersedes the mechanism formerly used in Type 50 and the mechanism used in Type 60.

Sequence

When shift lever Y is moved to extreme left position, shaft assembly T through link Q and bail M lowers link L locating stud K in the end of slot of driver I.

When writing keys are depressed, the maximum movement of driver I is applied to part J which through part D raises ribbon guide A to locate the red portion of the ribbon in printing position.

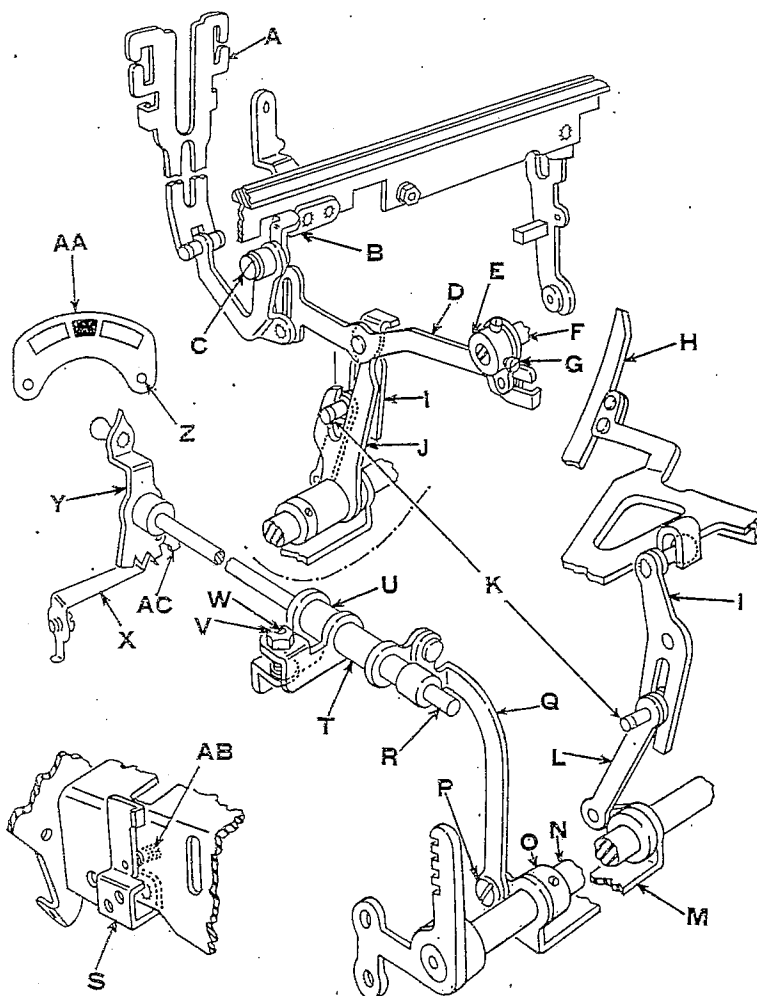
When shift lever Y is moved to center position, stud K is located higher in the slot of driver I. When writing keys are depressed, ribbon guide A is raised just high enough to locate the black portion of the ribbon in printing position.

When shift lever Y is moved to extreme right position, stud K is located in the highest position in the slot of driver I, also stud K is raised out of the slot of part J which eliminates all movement of ribbon guide A, retaining the ribbon out of printing position for stencil work.

Tests and Adjustments

Depress and lock shift key in upper case position; when moving lever Y from black to red and vice versa, there should be no movement of ribbon guide A. When movement of ribbon guide A is present, the upper part of driver I is twisted until movement of A is eliminated. Ribbon guide A to rest on type segment and pick up immediately when shift key is depressed.

Produced by Burroughs, Detroit, Michigan 2-1-38



Adjustment: Bend bracket B up or down.

Black: When a writing key is depressed and type is held against platen, there should be full black print. In the preceding test the top of upper case type should be even with the ribbon.

Adjustment: Loosen nut V and turn screw W.

Stud K should limit on the lip of S. To adjust for limit, remove type bar (push in pilot pin to remove type bar). Screw AB can now be turned to limit K on lip of S.

Red: Test for full red print by holding D forward.

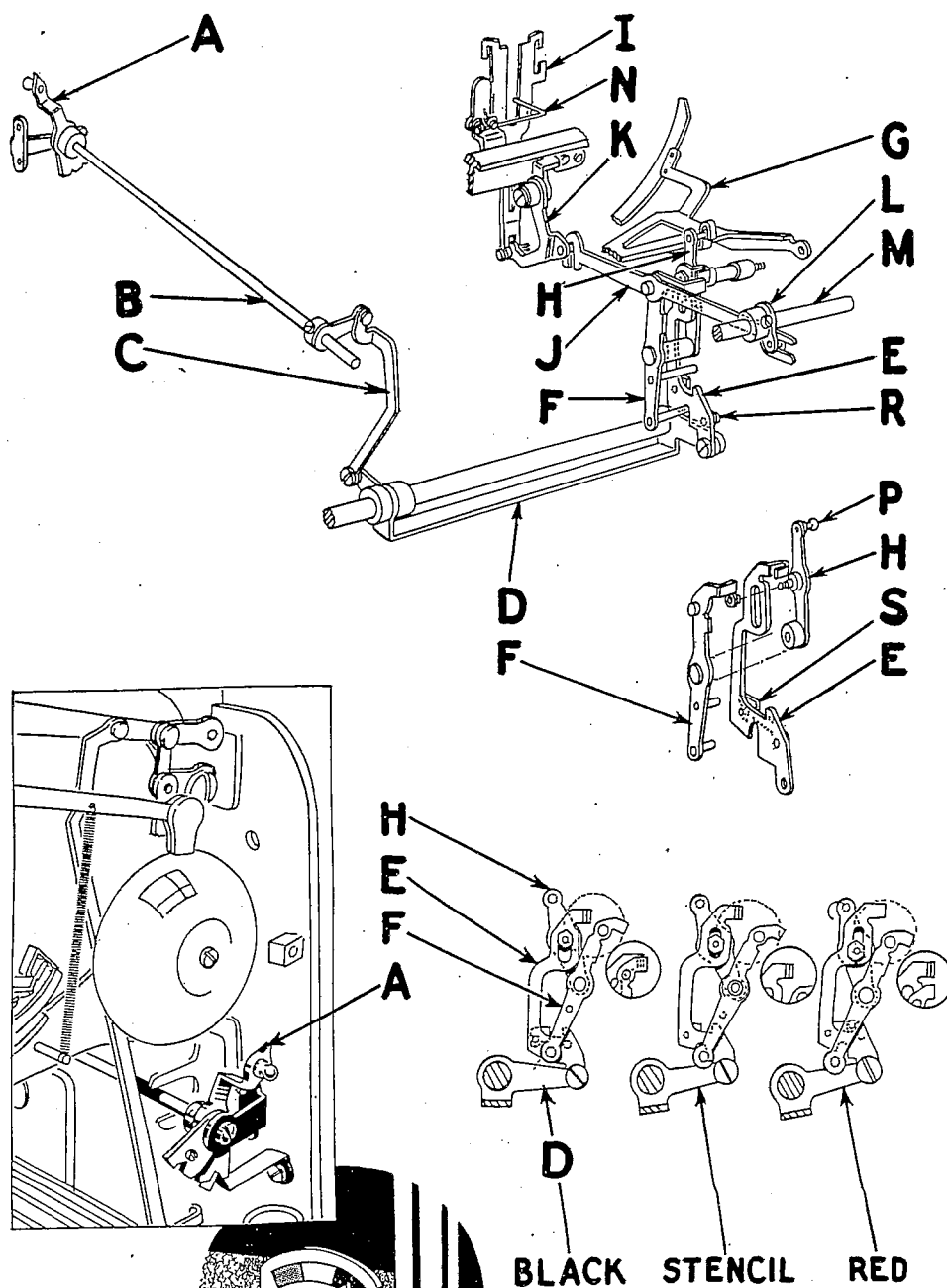
Adjustment: Screws in E are loosened and E located as required.

Clip AC can be adjusted for individual touch. Operators who make heavy impressions require clip AC to be set further to the left for more positive movement. For the average operator, clip AC is set so that the slot in Y is just visible.

(For Form 3724)

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RIBBON COLOR SHIFT MECHANISM—TYPE 60 (Fig. 7)



SYMBOLS (Fig. 7)

A	1-105120*	F	1-105137	L	1-105143
B	1-105002 Style E	G	1-104100 Style E	M	101002
C	105130 Style E	H	1-105140	N	105300B
D	105138*	I	105113 No. 1*	P	105583
E	1-105139	J	105126 Style E	R	76570
		K	1-105125A Style E	S	105142

Ribbon Color Shift Mechanism—Type 60

When ribbon color shift lever A of shaft assembly B (Fig. 7) is moved to the extreme left position, link C swings bail D, raising coupler E in line with the upper stud in lever F, thus indexing the red ribbon position.

When the depression of a writing key actuates the escapement mechanism universal bar G rocks lever assembly H and also coupler E. The upper stud in lever F acts as a fulcrum for coupler E, resulting in maximum movement of the ribbon guide I raising the red portion of the ribbon to printing position.

The movement of lever F is applied to ribbon guide I through link J and bell crank K. Link J pivots on the uppermost stud in lever F and is guided and retained by arm L on shaft M.

When lever A is moved from left to center position, coupler E is lowered sufficiently to clear the upper and also the lower stud in lever F which indexes the stencil position.

When a writing key is depressed arm F floats on lever assembly H without raising ribbon guide I and thereby holding the ribbon out of printing position.

When lever A is moved from center to right position, coupler E is lowered to locate its lower pocket in line with the lower stud in lever F, thus indexing the black ribbon position.

When a writing key is depressed, only sufficient movement is secured from lever F to raise ribbon guide I to locate the black portion of the ribbon in printing position.

The purpose of spring N is to arrest possible overthrow of ribbon guide I when the keys are depressed with undue force.

Tests and Adjustments

The black ribbon position is the basic adjustment, for that reason it must be made first.

Lever A in right position:

When a type bar (use full type $\frac{1}{4}, \frac{1}{2}$) is held against the platen with the hand, the ribbon should raise sufficiently to cover the type surface.

Adjustment: The upper arm of lever H is

twisted to cause part P to contact sooner or later in the U bend of universal bar G.

Red Ribbon Position

Lever A in left position:

Type bar ($\frac{1}{4}, \frac{1}{2}$) held against platen with the hand, the ribbon should be raised to cover half of the type.

Adjustment: Screw R is loosened and link S placed to locate the ribbon to cover half of the type.

With a key depressed and held, limit wire N should have least possible clearance with ribbon guide I so as not to actually contact on the latter.

When keys are depressed to print red there must be a definite amount of clearance between the ear on lever F and coupler E.

Excessive clearance between F and E can result in the ribbon moving upward partially above the type.

Insufficient clearance can prevent the ribbon raising, resulting in black print.

Adjustment: The ear on lever F is bent.

Lever A in right (black) position:

When keys are depressed and held, the ear of lever F should contact on the bend of coupler E without binding.

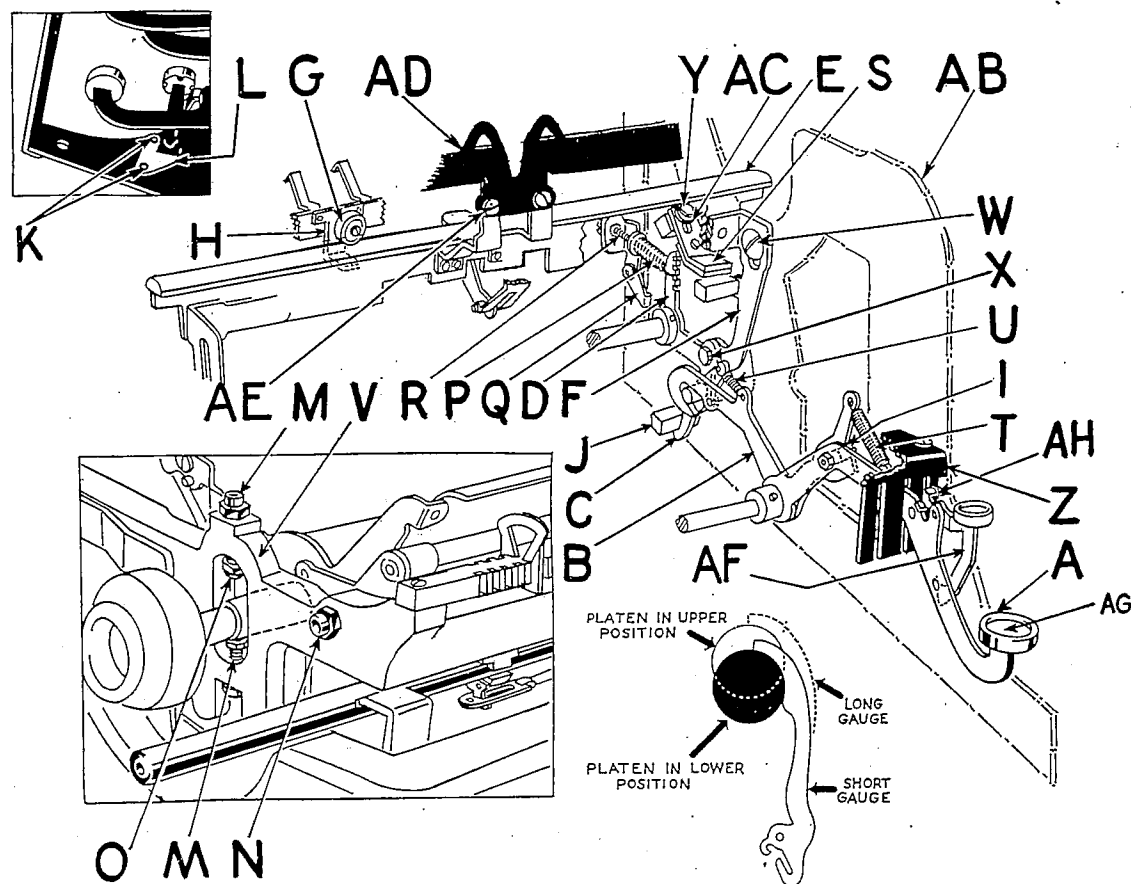
Adjustment: The bend on coupler E is opened or closed.

Arm L should be located to contact in the end of the slot of lever J without binding.

SELF-QUESTIONS

- 54—How does the movement of the universal bar actuate the ribbon guide mechanism?
- 55—How is the movement of part E caused to raise the ribbon guide full height for red, or partial height for black?
- 56—How is the movement of lever F applied to the ribbon guide?
- 57—How is the ribbon caused to remain inactive when pointer A is placed in stencil position?
- 58—What is the purpose of spring N?
- 59—What test is used to prevent overthrow of the ribbon?
- 60—What test is applied to spring N?
- 61—What can result when there is excessive clearance between the upper stud in F and E?
- 62—What can result when there is insufficient clearance between upper stud in F and E?
- 63—How should arm L be located?

SHIFT KEY MECHANISM—TYPE 50 (Fig. 8)



SYMBOLS (Fig. 8)

A	1-108100R*	S	1-108137
B	1-108102* (11)	T	83801
	1-108102 (13) (for 13", 15", 18", 22")*	U	3688
C	108138	V	103665A (11) Specify Pitch
D	11-108001*		1A-103665B (13) (15) (18) (22) Specify Pitch
E	1-108002A (11) (13) (15) (18) (22)	W	3455 $\frac{1}{4}$ (for roller AI)
F	1-108107AR* No. 1	X	108503AR&AL
G	103905C (11) (13) (15) (18) (22)	Y	203597 (Screw)
H	103132B	Z	1- 102102 No. 1
I	108502	AB	1- 100110R No. 1
J	108583A	AC	3612 $\frac{1}{2}$ (Washer)
K	73612	AD	105112 No. 1 (Specify Pitch)
L	108103R&L (13)	AE	105502
M	103512A and nuts 103351 upper 103359 lower	AF	108101R*
N	103511 and nut 103357	AG	102992 (Specify Char.)
O	1-103358	AH	4483
P	108800A	AI	108381 (for Screw W)
Q	1-108143R		1- 103999A (Roller Bearing on 103905)
R	108520		103535A (Screw for Bearing on 103905)

Shift Key Mechanism—Type 50

The purpose of the shift key mechanism is to raise the platen in line with the upper case type. The shift mechanism also locks the platen in printing position when the shift lever is in normal position.

When shift key A (Fig. 8) is depressed, bell crank B is rocked which disengages platen latch C and rocks shaft assembly D to raise lift rail E through arms F.

Lift rail E raises the inner carriage by contacting on the roller bearing located in the center of bar G. Bar G carries hooks H which are located on the under portion of lift rail E. The purpose of hooks H is to prevent overthrow of the carriage on rapid operation of the shift key. When the carriage is spaced or tabulated, the lips of hooks H ride along the under part of lift rail E to retain the platen in printing position.

Lift rail E which is used in machines having 18" or 22" carriages, has center, left and right braces (Fig. 16).

Right and left arms F are riveted to rail E. Arm F right and left are connected to shaft assembly D with shoulder screws X. Shoulder screw X in arm F right, is eccentric for the purpose of securing the same amount of clearance between latch C and square stud J in right and left carriage positions.

Tests and Adjustments

Before the platen positions for the upper and lower case type are adjusted, the clearance between latch C and square stud J should be examined for being equal in right and left platen positions. When the clearance between latch C and stud J is not equal in right and left carriage positions, eccentric screw X in right arm F is turned.

Platen lock: There should be minimum clearance between latch C and square stud J. The screw hole in square stud J is off center to permit locating stud J forward or rearward. The hole in side plate AB is elongated to permit raising and lowering stud J.

When the shift key is depressed, there should be .010" clearance between latch C and the front face of stud J. This clearance is secured by turning stud J. When the shift keys are normal, there should be .003" clearance between latch C and the under face of stud J. This clearance is secured by moving stud J upward or downward.

The shift keys are adjusted to be even with the writing keys when the latter and the shift keys are depressed at the same time.

Adjustment: Eccentric screw I is turned.

When the shift keys are depressed and latched, spring T should be slightly expanded.

Adjustment: Screws K which fasten part L are loosened and part L located.

The platen should have about .002" end play. Carriage bearing should have about .002" play on lift rail E with wiper spring off adjusting platen position.

Before the type is aligned, the shift mechanism must be adjusted in order to locate the platen parallel with the segment. The shift adjustment also secures the correct contact of the type bars on the platen and on the anvil.

The correct platen positions are determined by two type bar gauges which are put in place of type bar H. The platen is located so that the surface of the platen aligns with the curvature of the gauges. These gauges also determine the correct contact of the type on the platen and on the anvil.

The lower case platen position and the contact of the type on the platen and anvil are secured first by using the shorter gauge. Lower bumper screws M are slightly turned upward or downward. Also eccentrics N are turned.

Note: The turning of eccentrics N moves the platen forward or rearward from the type and also raises or lowers the platen.

The contact of the platen on fibre bumpers O is tested with a .003" paper feeler. It is essential that the degree of contact of the platen on O be equal at both ends of the platen. The contact of the type on the platen and the type bar on the anvil is tested with a .002" paper feeler. The feeler is applied between the type and platen and also between the type bar and anvil. The test is made with the right, center and left type bars. The contact of the type on the platen and type bar on the anvil should be equal.

The upper case platen position is secured next by using the longer gauge. The upper bumper screws are slightly turned and the platen contact tested with a .003" paper feeler.

When the upper platen position adjustment is completed, limit S is moved to just contact on square stud in arm F. The contact of limit S on square stud in arm F should be even on the right and left sides which is determined with .003" feeler.

Compensating Spring 108800A

The purpose of compensating spring P is to lighten the depression of the shift keys in non-electric typewriters. Spring P is connected from the notched arm of assembly D to bracket Q. Screw R passes through bracket Q and threads into a bushing in spring P.

SELF-QUESTIONS

- 64—What is the purpose of the shift keys?
- 65—How is the platen locked in printing position?
- 66—What holds the platen assembly when it is lifted by the shift mechanism?
- 67—What adjustment is made to secure equal clearance between stud J and latch C in right and left carriage positions?
- 68—How is the clearance between latch C and stud J increased or decreased?
- 69—How is clearance secured between latch C and the front face of stud J with the shift key depressed?
- 70—What is the purpose of spring T?
- 71—How much end play should the platen have?
- 72—How much play should bar G have on lift rail E?
- 73—For which purpose is the shift adjustment made?
- 74—Which platen position should be made first and for what purpose?
- 75—How are the platen positions determined?
- 76—What adjustment is made to obtain the lower platen position?
- 77—How is the contact between fibre bumpers O and the platen shaft tested?
- 78—How is the upper platen position adjusted and tested?
- 79—What is the purpose of limit S and how is it adjusted?
- 80—What is the purpose of compensating spring P?
- 81—How is spring P adjusted?

Platen Shift Mechanism—Type 60

Arms A (Fig. 9) in Type 60 machines are longer and have guide rollers B which roll in slots of side frames C when the platen is raised or lowered by the shift mechanism. Shift rail D is raised through arms A by arms E, the latter are slotted and connected to arms A by shoulder screws F.

Shoulder screw F on the right side is eccentric, its purpose being to permit leveling shift rail D when the shift mechanism is adjusted.

Shaft assembly G to which arms E are pinned, pivots on trunions AE which are locked by nuts AF.

The platen lock in Type 60 machines consists of detent J contacting on spear cam of arm E by the tension of spring L.

Tests and Adjustments

Before adjusting the shift mechanism, the following conditions should be observed:

Inner carriage should have .015" end play.

Bumper screws M (Fig. 8) should clear platen shaft.

Hooks H (Fig. 8) should have ample clearance from shift rail.

Square studs M on the right should have the same degree of contact on limits N as

square studs M have on the left side. When the contact of studs M on limits N is not the same on both sides, it is indicated by movement of one square stud M from the limit N when detent L is swung off spear cam of arm E, the other square stud will not move.

This test is made by looking from the front (platen in center position) at studs M and moving detent J intermittently from spear cam of arm E.

Adjustment: That limit N which is under the square stud which moves is raised.

Uneven contact of studs M on limits N can also be observed by unhooking spring L, holding downward on one side of shift rail D and trying the other side for spring, this test is applied to each side. Of the two tests, the former is the most accurate.

With the lower case or short gauge placed in position, the platen position and the type contact on the platen and anvil are tested.

Adjustment: Eccentric N (Fig. 8) is turned.

The curvature of the platen should align with the gauge. The type contact on platen and anvil is tested with .002" feeler.

The upper case or long gauge is now placed in position. If the platen height is higher on one side than on the other, shift rail D is raised or lowered by turning eccentric shoulder screw F in right side. If this adjustment is made, it is necessary to start at the beginning and re-adjust the lower case position.

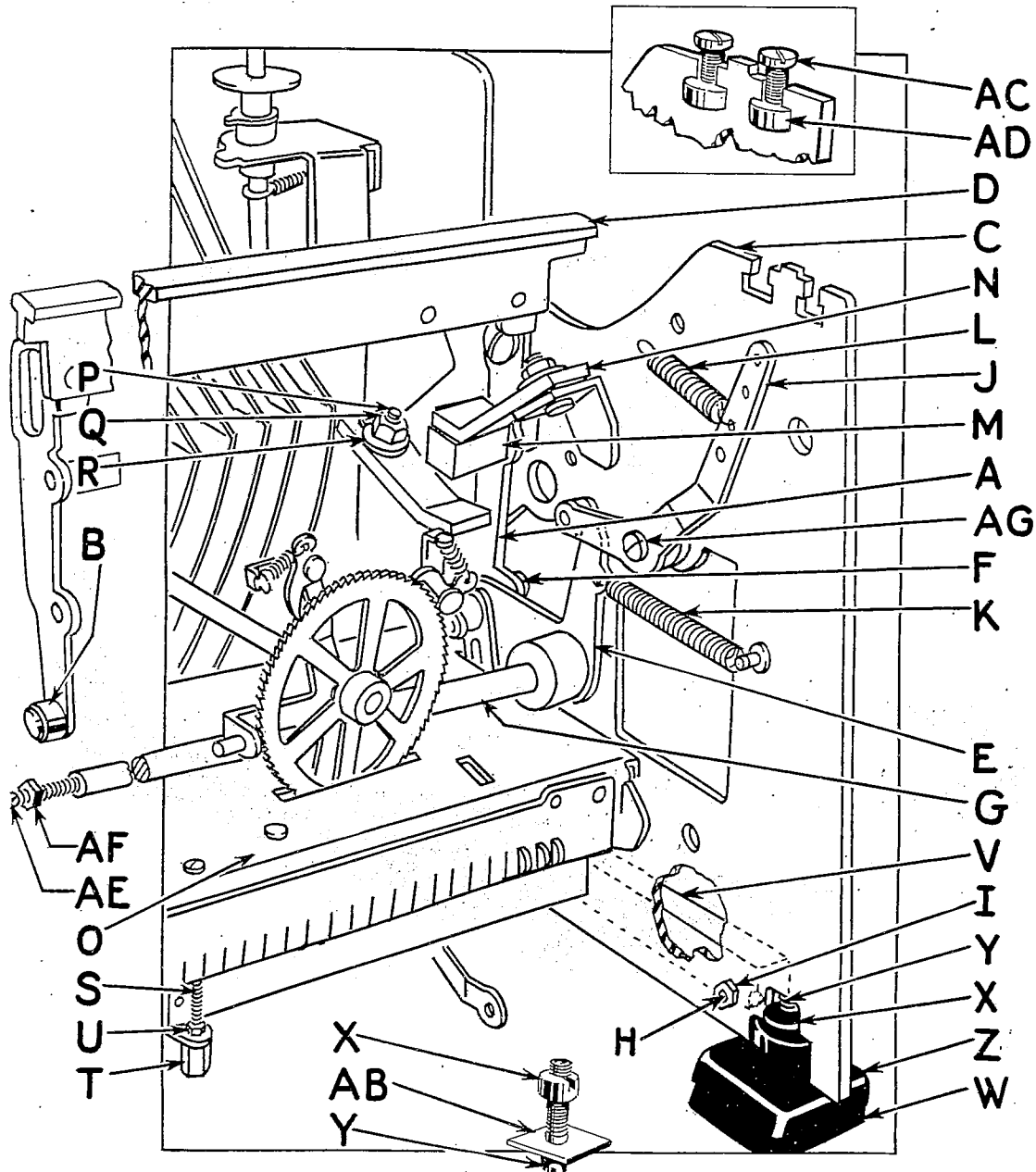
The same test is applied to the upper limits when the lower limits have been adjusted.

When the upper and lower limits have been thoroughly adjusted, the upper and lower bumper screws (M Fig. 8) are set against the platen shaft using a .003" feeler.

SELF-QUESTIONS

- 82—What is the difference of arms A in Types 50 and 60 machines?
- 83—What is the purpose of eccentric shoulder screw F?
- 84—How is the platen held in upper position in Type 60 machines?
- 85—Which preparations should be made before adjusting the shift mechanism?
- 86—What test is made with respect to square stud M and limits N and how is this applied?
- 87—How is the lower case position secured?
- 88—How is type contact on platen and anvil tested?
- 89—In the event that the platen height is higher on the right side than on the left side, what adjustment is made?
- 90—How is the lower case platen position affected when shift rail D is leveled?
- 91—When and how are the lower bumper screws (M Fig. 8) adjusted?

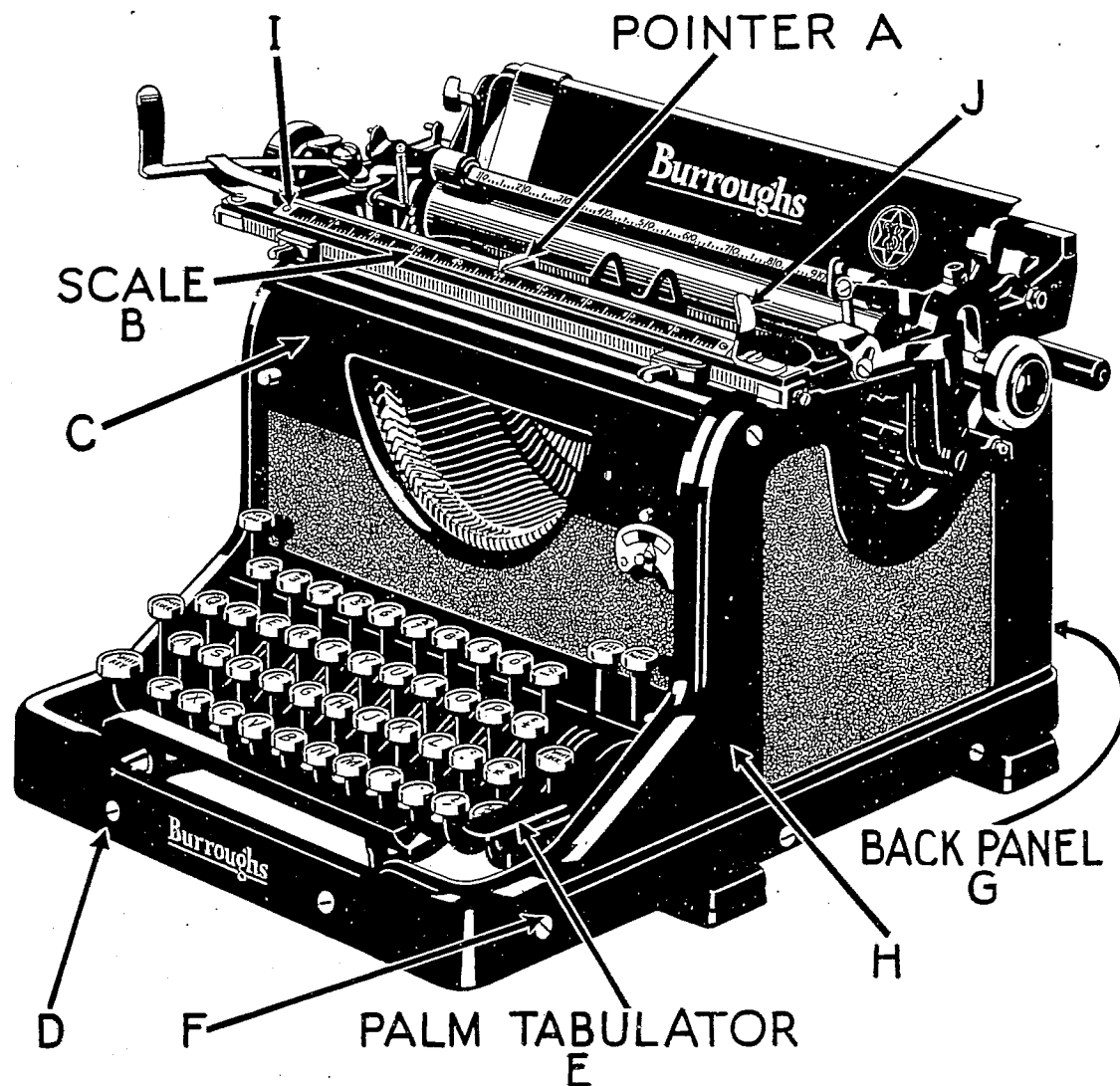
SHIFT MECHANISM—TYPE 60 (Fig. 9)



SYMBOLS (Fig. 9)

A	1- 108107BR&BL No. 1*	J	1- 108174
B	75300A Roller 60532 Stud	K	108800 Style E (11) (13) (15) (18) (22)
C	1- 100110AL&R No. 1 Style E	L	99807
D	1A-108002A (Specify Length)	M	108584*
E	1- 108105AR&AL Style E	N	108137
F	108503R&L*	O	1- 102100 Style E
G	11A-108001 Style E	P	108514
H	1055 $\frac{1}{8}$	Q	45
I	45 $\frac{1}{8}$	R	3612 $\frac{1}{2}$
		S	102502
		T	100352
		U	46
		V	100901
		W	100902
		X	100351
		Y	100502
		Z	100107
		AB	100108
		AC	1055 $\frac{1}{8}$
		AD	100350
		AE	100500
		AF	45
		AG	957 $\frac{1}{2}$

STANDARD TYPEWRITER—GENERAL VIEW (Fig. 10)



SYMBOLS (Fig. 10)

- | | | | |
|---|---|---|--|
| A | 103107 (uses Screws 75615) | H | 1-100167L (11) Side Panel (Specify Style E for Electric) |
| B | 103221 (Specify Length and Pitch) | | 1-100167R (11) Side Panel (Specify Style E for Electric) |
| C | 1-100169A Front Panel | | 1-100167L (18) Side Panel (Specify Style E for Electric) |
| | 1-100169A No. 2, Front Panel (for Stroke Counter) | | 1-100167R (18) Side Panel (Specify Style E for Electric) |
| | 1-100169A Style E, Front Panel (for Electric) | | |
| | 1-100169A Style E, No. 2, Front Panel (for Stroke Counter) (Electric) | I | 103525 (used for 103221, 105128) |
| D | 1-100170A | J | 103100 No. 1 (for 11") |
| E | 1-72125 No. 2 | | 1-103100 No. 2 (for 13", 15", 18", 22") |
| F | 100501 | | |
| G | 1-100168 (Specify Style E for Electric) | | |

Carriage Details

The carriage position is accurately maintained by moving on rod assembly A, (Fig. 11) the latter is fastened to plate B. The carriage is held on rod A by guide bearings C, which are fastened to frame D. Free movement of the carriage is secured through two roller bearings B (Fig. 14), which contact on the upper surface of rod A and two roller bearings, which contact on the front of rod A. The upward movement of the front of the carriage is limited by hooks P (Fig. 13) fastened to carriage frame and contacting on the upper edge of the groove in front carriage rail. One bearing B (Fig. 14) contacts on front rail A (Fig. 16).

Tests and Adjustments

Hooks V (Fig. 14) should be adjusted to have minimum clearance between it and lift rail E (Fig. 8).

Adjustment: The screws holding hooks V (Fig. 14) are loosened and the latter shifted upward or downward and the screws tightened. Hooks P (Fig. 13) should have a little more play than hooks V (Fig. 14), the adjustment being made in the same manner.

To Remove Complete Carriage—Type 50

Remove pointer A (Fig. 10). Detach drawband and hook it on stud in plate B (Fig. 11). Remove screws T holding carriage to bearings C (Fig. 11). The complete carriage can now be lifted from machine.

Type 60

Depress carriage return key to trip the clutch which holds the tapes when the carriage is removed.

Remove screws T (Fig. 11) and lift carriage off machine.

To Remove Platen Assembly

Remove knob assembly A (Fig. 13).

Remove sliding member B (Fig. 13).

Loosen screw holding platen to shaft and withdraw platen shaft.

Platen can now be lifted out of the carriage.

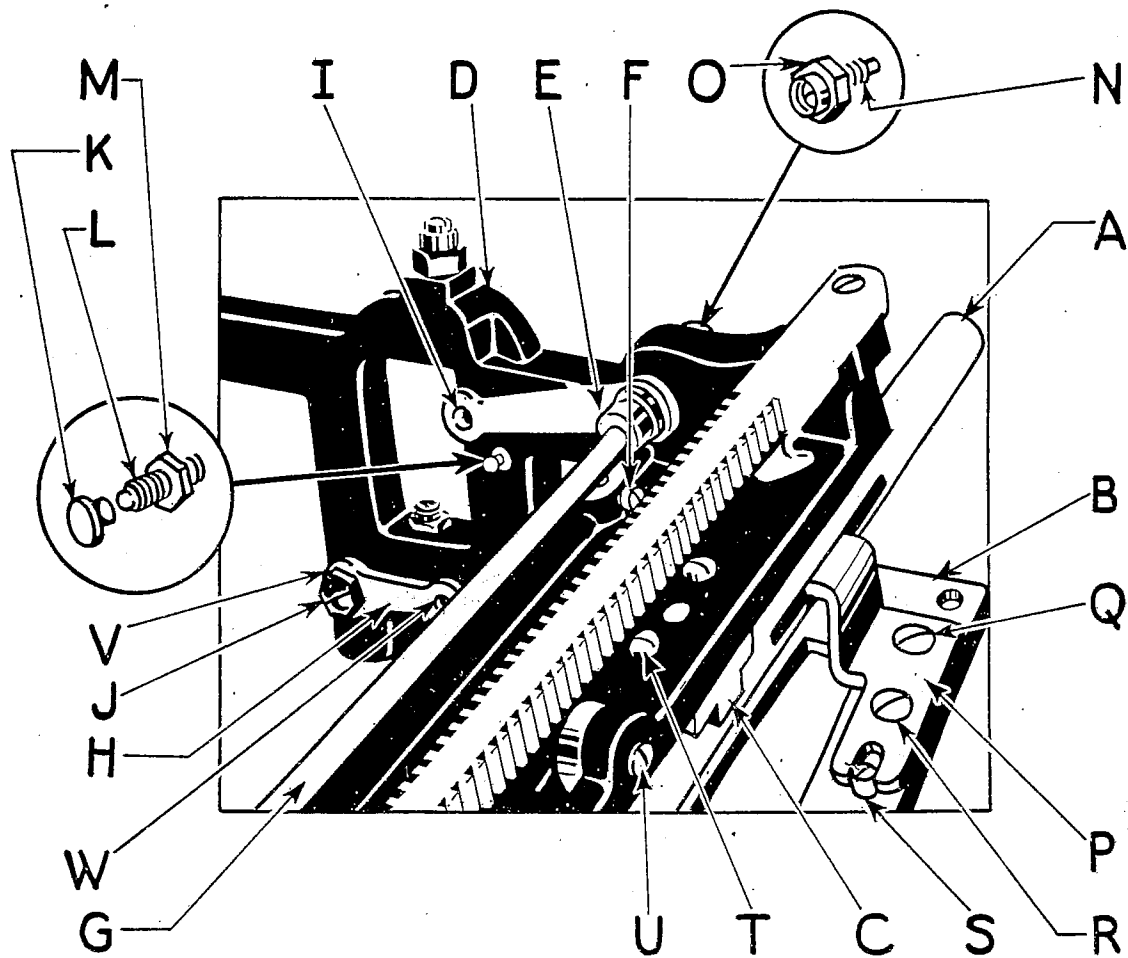
When replacing platen, there should be .002 clearance between right platen end and side plate.

Eccentric Screw S

Carriages are now constructed with an eccentric adjustment for aligning rod assembly A (Fig. 11) with the type segment. Brackets P have a slot for eccentric screw S, the latter's slot is at right angles to the elongated holes of screws R & Q. This adjustment is made at the Factory and should not be disturbed.

Caution: When removing carriages, if screws R & Q should be removed, eccentric screw S should be left undisturbed. As a safeguard, a chisel mark is made across the screw and bracket P when the aligning adjustment is completed.

CARRIAGE DETAILS (Fig. 11)



SYMBOLS (Fig. 11)

A	1A-103901 (11) (13) (18) 1A-103901A (15) (22)	J	103522A
B	1- 100106A (11) used for (11) (13) (15) Specify Style E for Electric	K	103391
	1- 100106A (18) used for (18) (22) Specify Style E for Electric	L	103526A
C	1- 103911R 103911L	M	103352
D	103665A 11" (Specify Style E for Electric) 103665C 13" (Specify Style E for Electric)	N	103511
	1- 103665B 15", 18", 22" (Specify Style E for Electric)	O	103357
E	1- 103134AR&AL*	P	103138AR&AL*
F	2851 $\frac{1}{8}$	Q	103504
G	1- 103001C (11) (13) (15) (18) (22)	R	103504 (Specify Style E for Electric)
H	103133	S	103547 Eccentric Screw
I	103513	T	103500 for (11) and (13) 103533 No. 1 for (15) and (18) 103533 No. 2 for (22)
		U	103503
		V	103360 Eccentric Bushing
		W	12059 $\frac{1}{2}$

Inner Carriage Assembly

The inner carriage assembly is the inside unit of the complete carriage. Vertical spacing and platen shift are directly applied to the platen.

The platen is located in elliptical openings in the left and right sides of frame D (Fig. 11).

The inner carriage assembly swings on stabilizing arms E (of shaft assembly G) and stabilizing links H. Stabilizing arms E are pinned to shaft G, the lower ends of the arms pivot on side plates on screws I. The rear ends of lower links H also pivot on side plates. The front ends of lower links pivot on frame D.

Stabilizing shaft assembly G floats on adjustable shoulder screws N in frame D. These screws are adjusted to secure equal clearance between side plates and about .015 end play. Screws N are locked with nuts O.

The complete inner carriage assembly should have minimum side play which is accomplished by part K and adjusting screw L.

The disk surface of part K contacts on the side plates, screw L which is threaded in frame D seats in part K.

To Remove Inner Carriage Assembly

Remove platen assembly (instructions under own heading).

Remove variable line space clutch cup C (Fig. 13).

Remove ratchet assembly.

Back down left lower platen limit screw; this is necessary to permit removing screws holding link H (Fig. 11).

The right link H can be removed without disturbing the lower platen limit screw, which

will maintain the lower platen limit position.

When re-assembling, the left limit screw is raised and tested with a paper feeler.

Remove pivot screws in stabilizing arms E.

Re-assemble in reverse order.

Roller Bearings

Roller bearings B (Fig. 14), which contact on front of rod A (Fig. 11), should turn when rearward pressure is applied to carriage and the latter moved. When the carriage is held forward, there should be minimum clearance between the roller bearing and rod A.

Adjustment: Screw AJ (Fig. 14) is loosened and eccentric stud C (Fig. 14) is turned.

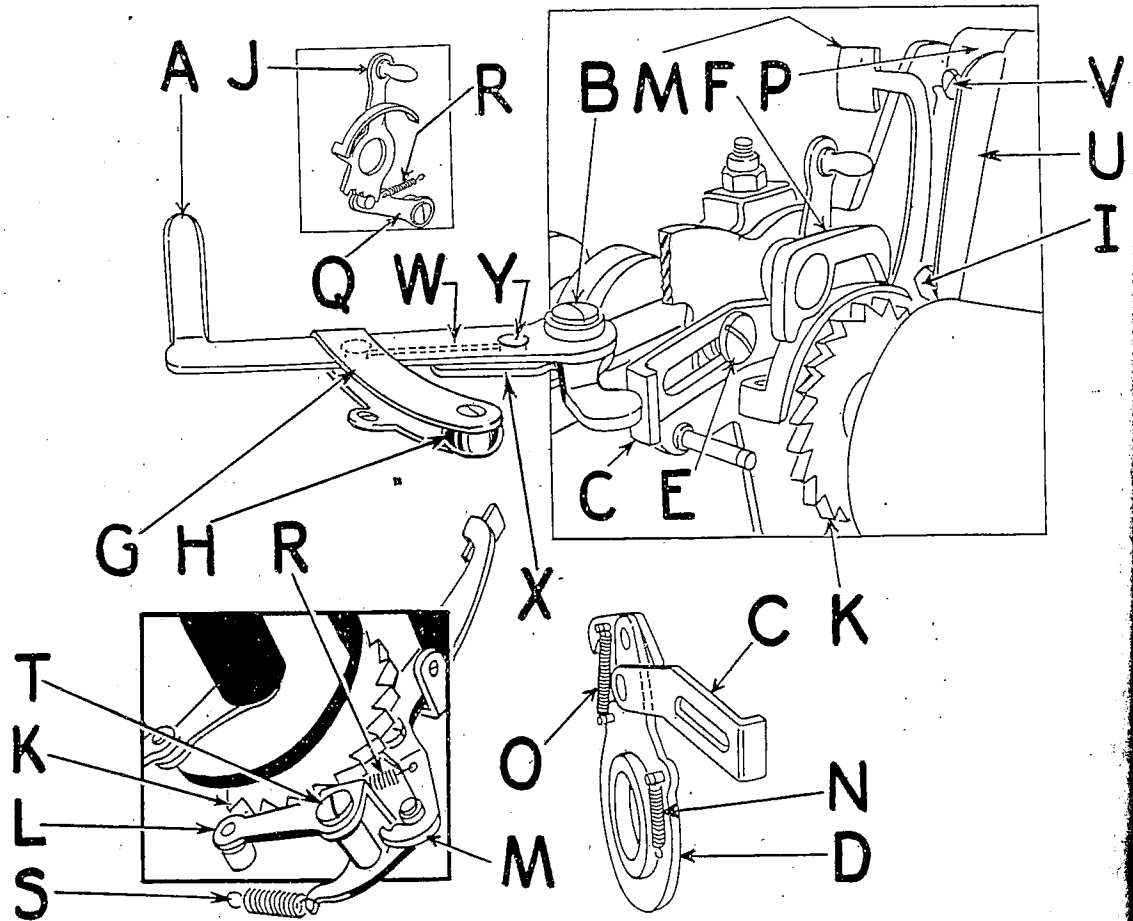
Note: Brass pin AI is between eccentric C and screw AJ.

Roller bearings B (Fig. 14), which contact on the upper surface of rod A (Fig. 11), should be adjusted to slightly clear rod A when the carriage is raised.

SELF-QUESTIONS

- 92—How are hooks V (Fig. 14) adjusted?
- 93—How are hooks P (Fig. 13) adjusted?
- 94—How are roller bearings B (Fig. 14) adjusted for front contact on rod A (Fig. 11)?
- 95—How are roller bearings B (Fig. 14) adjusted for top contact on rod A (Fig. 11)?
- 96—How is the complete Type 50 carriage removed?
- 97—How is the complete Type 60 carriage removed?
- 98—How is the platen assembly removed?
- 99—How is the inner carriage held in frame D (Fig. 11)?
- 100—What adjustment is made to secure the correct play of the inner carriage in frame D (Fig. 11)?
- 101—How is the inner carriage removed?

LINE SPACE AND CARRIAGE RETURN LEVER (Fig. 12)



SYMBOLS (Fig. 12)

A	1-	103111C	M	103120L
B		103510A	N	103810
C		103114A*	O	7282¼
D	1-	103113A	P	1- 103226
		1A-103113 Style E (for Electric)	Q	1- 103119
E		103506A	R	3281½
F	1-	103115*	S	103803 No. 2
G		103109A	T	103515
H		103991	U	1- 103225C No. 1 (11) (13) (15) (18) (22)
I		103514 No. 2	V	103518 No. 1 (11) (13) (15) (18) (22)
J	1-	103116 (Specify Style E for Electric)	W	103813 No. 1 (Spring)
K	1-	103118	X	103159 (Link)
L	1-	103117 (Specify Style E for Electric)	Y	103599 (Stud)

Line Space and Carriage Return Lever

The purpose of line space and carriage return lever A is to vertically space the platen as the carriage is being pulled toward the right.

Lever A (Fig. 12) pivots on shoulder screw B. The short arm of lever A contacts on link C, the latter pivots on pawl arm D. Link C is supported and guided by shoulder screw E. Pawl lever D carries spacing pawl F.

Line space and carriage return lever A moves in guide G, stopping against leather bumper H. The movement of lever A is limited by spacing pawl F contacting on hexagon screw I; the latter is adjusted to allow no play of lever A when it is held to the right.

Even spacing is secured by detent L seating in the tooth spaces of ratchet K. Detent release lever M permits the disengagement of detent L when lever M is pulled forward.

Carriages on Type 60 machines do not have release lever M. Detent L is always active.

Line Space Control Lever

Line space control lever J has three positions which determine the number of spaces that the platen is turned when the line space and carriage return lever is operated.

Lever J pivots on the shoulder of ratchet wheel K. Lever J has a curved arm which limits the engagement of pawl F and teeth of ratchet K. When lever J is moved from position 3 to position 2, the curved arm moves sufficiently into the path of pawl F to cause it to engage one tooth less. When lever J is moved to position 1, the curved arm blocks another tooth, which causes pawl F to engage only one tooth.

SELF-QUESTIONS

- 102—What is the purpose of the line space and carriage return lever?
- 103—What takes place when lever A is operated?
- 104—What is the purpose of line space control lever J?
- 105—What test is applied to lever A and what adjustment might be required?

SYMBOLS (Fig. 13)

A	1- 103339 No. 1	V	103524A
B	103402	W	103509
C	1- 103400	X	103351
D	102505	Y	1- 103102AL Specify Pitch
E	103101BL	Z	1- 103903A P. 10 (11)
F	103543		1- 103903 P. 8-9-12-14 (11)
G	1- 103111B	AB	103133
H	103109	AC	1- 103110AL
I	1- 103809	AD	103501
J	1- 103993	AE	1- 103802A (11)
K	Bail unit complete, 1-103005 (11) specify pitch	AF	103004 No. 2 (11)
L	1- 103105L (11) Specify Pitch	AG	1- 103994 No. 1
M	103108 (Wiper Cover)	AH	103123*
N	103154	AI	1- 103127R&L
O	103902 (11) Specify Pitch	AJ	Feed Roll Unit Complete
P	103106		1A-103002 (11)
Q	1- 103112R	AK	1- 103128B (11)
R	103101AR	AL	103803 No. 2
S	1- 103110R No. 1	AM	103125
T	1- 103998 No. 1 (11)	AN	74502
U	103528	AO	103905 (11)*
		AP	103355 (Bushings)*

Carriage Release Levers

The purpose of the carriage release levers is to permit the carriage to be moved into any desired column.

Carriage release levers E and R (Fig. 13) are fastened to rack assembly Y (Fig. 13). When either lever is depressed, the rack assembly is rocked to clear escapement gear A (Fig. 2).

Tests and Adjustments

When levers E and R are in normal position, there should be clearance between the

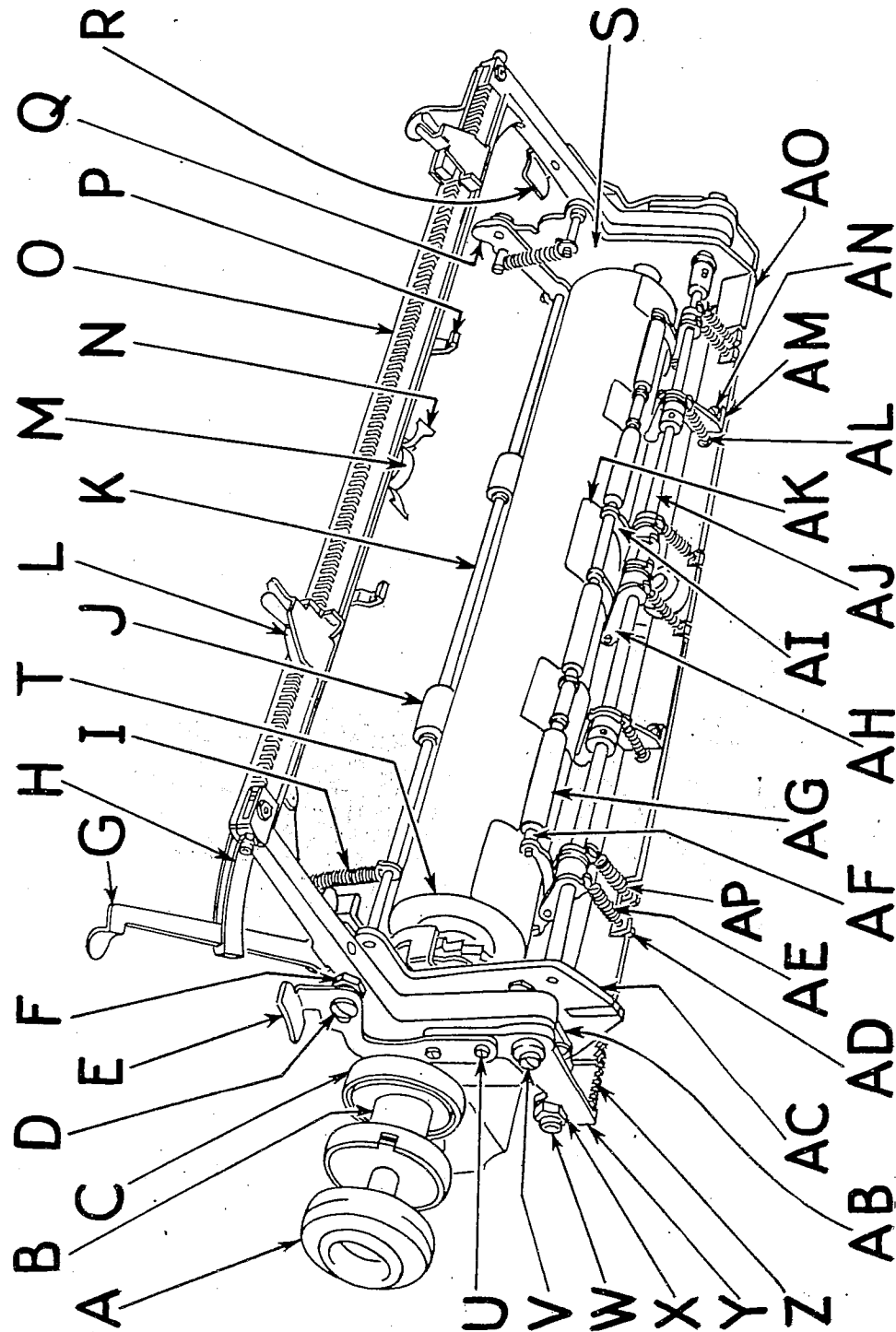
bottom of the slot and screw D (Fig. 13).

When the tabulator key is depressed, there should be clearance between the top of the slot and screw D.

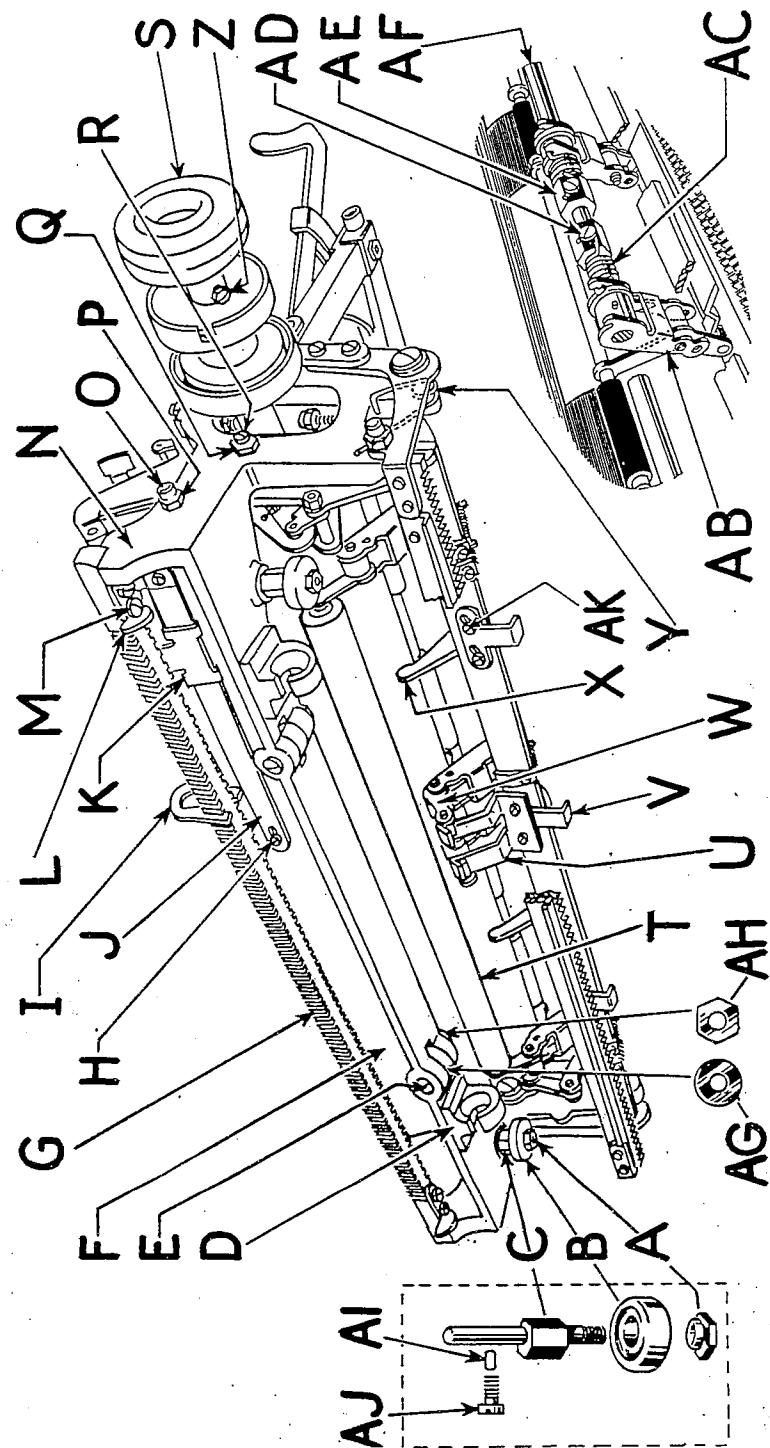
Wiper Spring 103154

The purpose of wiper spring N (Fig. 13) is to insure free movement of the carriage. Wiper spring N is a flexible band, its ends contacting lightly on front rail A (Fig. 16) removing dust during the carriage movement. Wiper spring N which is held by shield M (Fig. 13) over the roller bearing, can be readily removed or installed by removing shield M.

CARRIAGE ASSEMBLY FRONT—EARLY STYLE (Fig. 13)



CARRIAGE ASSEMBLY REAR—EARLY STYLE (Fig 14)



SYMBOLS (Fig. 14)

A	103359	S	1- 103339 No. 1
B	1- 103999A	T	1- 103994 No. 3
C	103554 (11)	1- 103994 No. 2 (18) (for 18" and 22")	
	103554 (15) (for 13", 15", 18", 22")	1- 103994 No. 3 (Rear, Long) (for 11", 13" and 15")	
D	1- 103911R	U	103141A (11)
E	103503 Eccentric		103141 (15) (for 13" and 15")
F	1A-103225 (11)	V	103132A
	1- 103225B (13) (15) (18) (22)	W	1- 103127R&L
G	103904 (11) Specify Pitch	X	1- 103126
H	103557	Y	103804AR or AL
I	103201A No. 2 (for Pitch 12 and 14)	Z	103545
	103201A No. 1 (for Pitch 8, 9 and 10)	AB	103123 No. 1*
J	103224 (11)	AC	103807R&L
K	1- 103226	AD	952 $\frac{3}{4}$
L	103104	AE	103388*
M	3361 $\frac{1}{4}$ A	AF	103002 (11) (13) (18) (22)
N	103665A (11) (Specify Style E for Electric)		103002A (15)
	1- 103665B (13) (15) (18) (22) (Specify Style E for Electric)	AG	103137 (Washer)
O	103511	AH	49 $\frac{1}{2}$ (Nut)
P	103357	AI	103582 (Brass Pin)
Q	103352	AJ	2851 $\frac{7}{8}$ (Screw)
R	103526A	AK	74502

Brace U (Fig. 14)

The purpose of this brace is to apply tension in the center of the feed roll shaft so as to secure equal tension for the entire feed roll assembly.

Feed Roll Tension

The tension of feed roll springs AE (Fig. 13) can be increased or decreased by turning screws AD (Fig. 13) into or out of bushings AP (Fig. 13).

Feed Roll Springs

AE (Fig. 13) (11) six required.

AE (Fig. 13) (13) (also used for 15") two required.

AE (Fig. 13) (18) (also used for 22") six required.

Carriages 13" and 15" have torque springs AC (Fig. 14) the tension of the latter can be adjusted by turning hexagon collars AE (Fig. 14).

The purpose of springs AC (Fig. 14) is to apply tension to the center of the platen so as to insure uniform tension to the feed roll assembly.

Front Feed Rolls

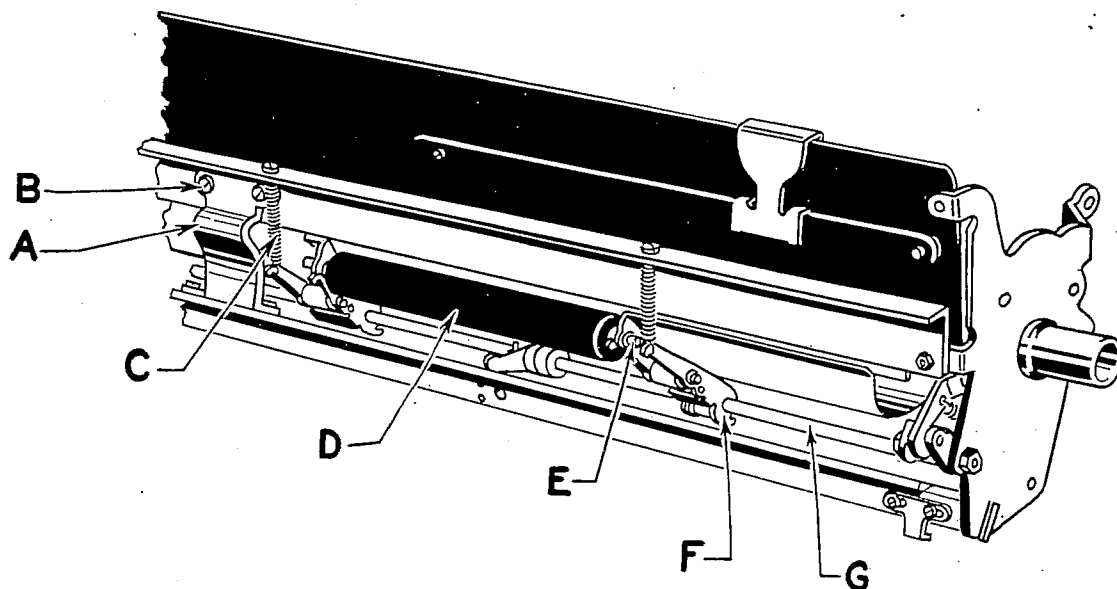
AG (Fig. 13) four required for 11", 13", 15"; six for 18" and 22".

Rear Feed Rolls

T (Fig. 14) one required, used for 11", 13" and 15".

D (Fig. 15) three required, used for 18" and 22".

FEED ROLL UNIT FOR 18" AND 22" CARRIAGES (Fig. 15)



SYMBOLS (Fig. 15)

A	103145A	F	1- 103125 No. 2 R or L
B	73612	G	Complete Feed Roll Unit
C	1- 103302 (18) (use for 22)		1A-103002 (18) (22)
D	1- 103994 No. 2 (18)		1- 103002A (18) (22) (for Electric)
E	103004 No. 1 (18) (use for 22)		

Front Rail Support B (Fig. 16)

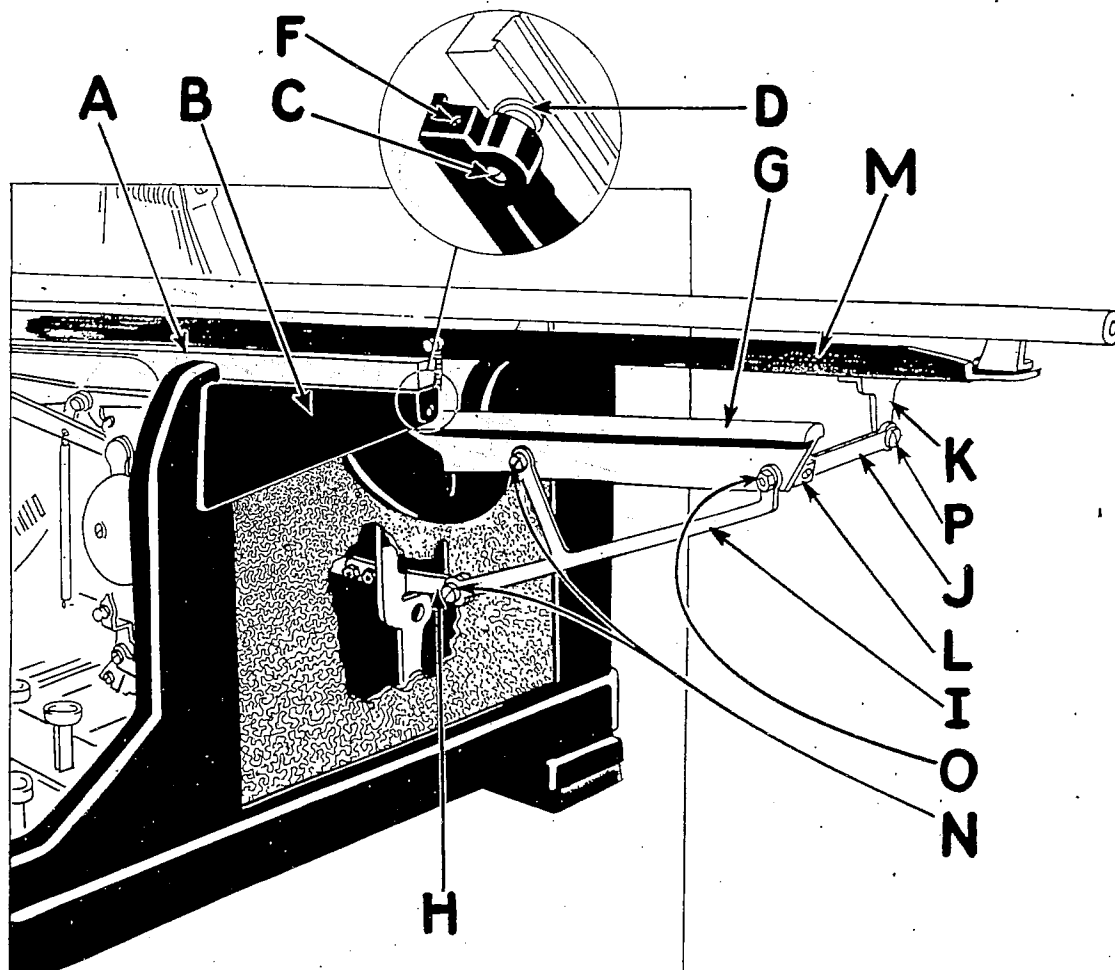
Machines with 18" and 22" carriages are equipped with braces for front rail A, these braces are integral with side panels which are symbolized as B. Screws C are threaded through bushings D and into front rail A. Bushings D are turned to raise or lower front rail A in order to secure the correct clearance between hooks U (Fig. 14) and front rail A. Bushings D are locked with screws F so as to permit removal and replacement of side

panels B without disturbing the adjustment of front rail A.

Lift Rail G (Fig. 16)

Machines with 18" and 22" carriages are equipped with lift rail G which is re-enforced by brace H in the center and brace I on the right and left side. Side sway of lift rail G is prevented by link J which pivots on hanger K and part L (in lift rail G).

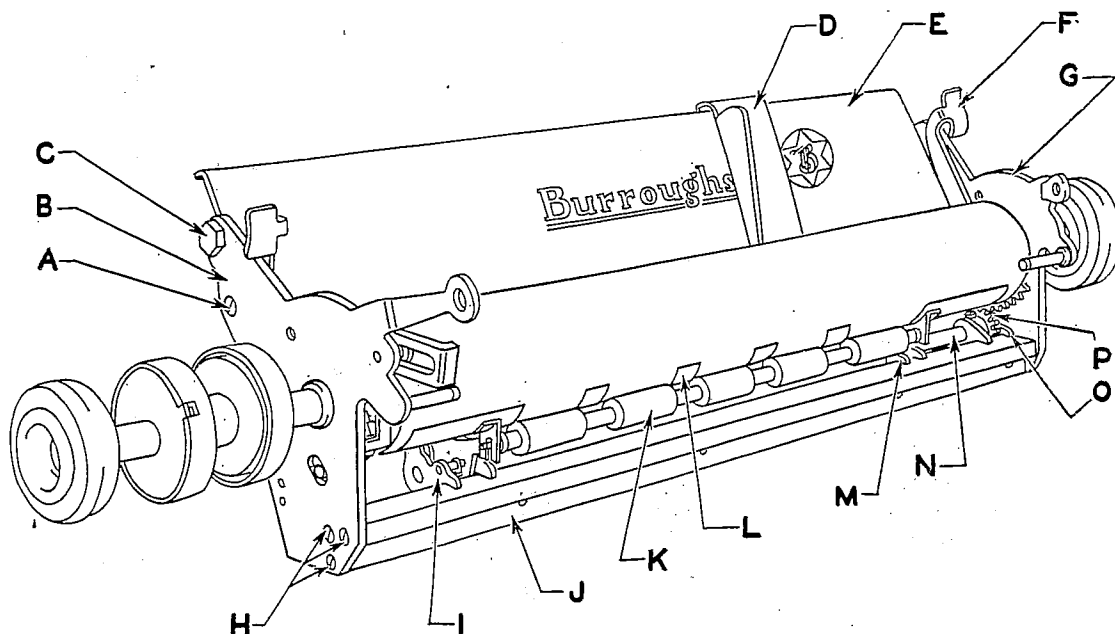
FRONT RAIL SUPPORT (Fig. 16)



SYMBOLS (Fig. 16)

A	103900 Specify Length	I	108150 (18) use for (22)
B	1- 100167R&L (18) use for (22) (Specify Style E for Electric)	J	108153 (18) use for (22)
C	100585A	K	1- 108154 (18) use for (22)
D	100586	L	108588
F	100584	M	1- 100106A (18) (use for 22)
G	1A-108002A (18) (22)	N	8357 Screw and 46 Nut
H	108152A (18) use for (22)	O	108587 Screw and 46 Nut
		P	108509 and 103354 Nut

INNER CARRIAGE ASSEMBLY (LATE) (Fig. 17)



SYMBOLS (Fig. 17)

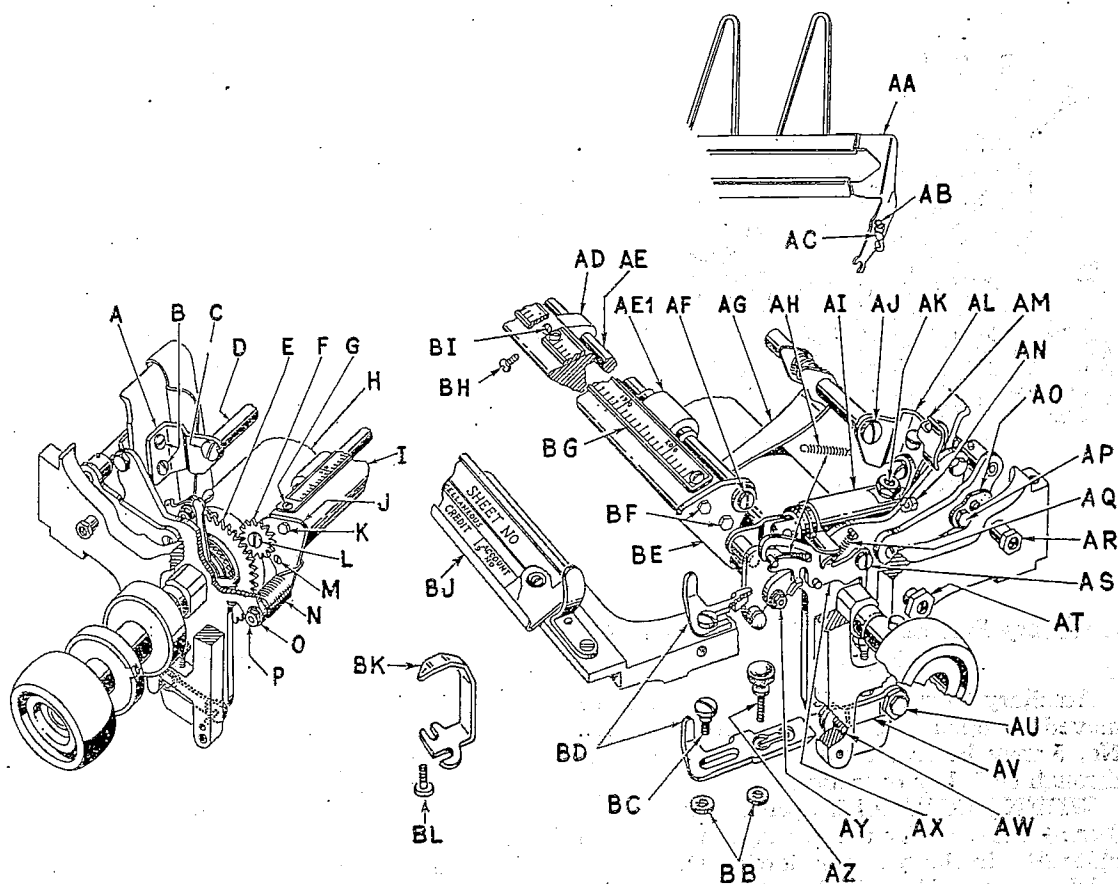
- A 3261B
 B 1-103110BL No. 1
 C 103518A No. 1
 D 1-103226AL No. 1
 E 1-103225C No. 1 (Specify Length)
 F 1-103120A
 G 1-103110BR No. 1
 H 79547
 I 1-103125 No. 2 L
 J 103905C (Specify Length)
 K 1-103004B (11) (1 required for 11")
 (2 required for 18" and 22")
 1-103004B (13) (2 required for 13" and 15")
 L 1-103128D (11) (13) (15) (18) (1 required)
 (For 22", 2 style 11" are used)

- M 1-103125 No. 2 R
 N 103008 (Specify Length)
 O 103125 No. 1
 P 1-103158

The later carriage shown in Figures 17 and 18 is included in Style 11 machines manufactured beginning November 8, 1933, and in the wider sizes, February 1, 1934, approximately.

Only the later parts are shown in Figures 17 and 18; parts common to both early and later constructions are found in Figures 13 and 14.

GEARED AUXILIARY PRESSURE ROLL BAIL, JOURNAL RACK NO. 1, AND FORM HEADING HOLDER—TYPE 60 (Fig. 17-1)



Geared Auxiliary Pressure Roll Bail (Nos. 4 and 6)

Auxiliary Pressure Roll Bails Nos. 4 and 6 (AE) are re-enforced for greater rigidity; and are geared to the platen to provide a more positive means of spacing bills or similar forms which are inserted into the form chute.

Bail No. 4 may be moved to open position manually and bail No. 6 may be so moved either manually or through shift key operation (see Fig. 17-2).

Journal Rack No. 1

Journal Rack No. 1 (AA) facilitates the simultaneous handling of a ledger and journal.

By holding the journal in upright position, the journal rack permits the easy insertion, behind the journal, of ledgers or other forms.

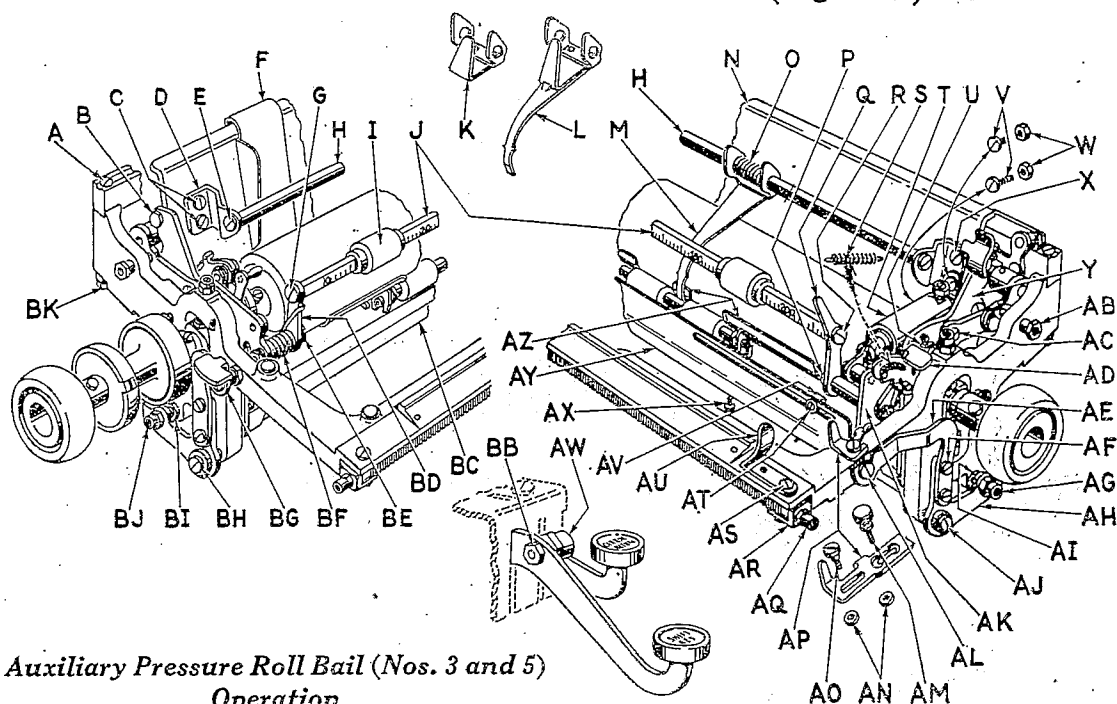
The journal rack is attached to the carriage at AR and AT, and latches AC (which fasten over shoulder nuts AR) permit its ready removal when not required.

Journal Bands (AG) which hold the journal around the platen, are ordinarily used with the journal rack to hold the journal while other forms are being inserted.

Form Heading Holder

A Form Heading Holder (BJ) may be used in place of the front scale to facilitate the operator's selection of printing columns.

AUXILIARY PRESSURE ROLL BAIL, FORM CHUTE, AND JOURNAL BANDS—TYPE 60 (Fig. 17-2)



Auxiliary Pressure Roll Bail (Nos. 3 and 5)

Operation

Auxiliary Pressure Roll Bail No. 3 may be moved to open position manually, and bail No. 5 may be so moved either manually or through shift key operation.

WHEN MANUALLY opened, bail J (Nos. 3 or 5) is latched by the seating of the stud in latch AD.

Movement of bail J (Nos. 3 or 5) to closed position, after having been opened manually, is accomplished by depressing the finger piece of latch AD; the pocket of latch AD will thus be moved out of contact with the stud in plate AK, and the bail will restore to closed position through the tension of springs BF and S.

The closing movement of the bail is controlled by the air resistance of dashpot T.

WHEN THE SHIFT KEY is depressed, on machines equipped with bail No. 5 and with slide AP located in rearward position, the upward movement of the platen will cause the roller of plate AK to limit against the lower lip of slide AP, and will rock plate AK forward to open the bail.

Since latch AD is held inactive when slide AP is located in its rearward position, release of the shift key and the consequent lowering of the platen will allow springs BF and S to return the bail to closed position.

ECCENTRIC AW, when used on machines equipped with bails Nos. 5 or 6 (see Fig. 17-1 for information on bail No. 6), provides for the return of the carriage from the depression

of the shift key.

Adjustments

1. Dashpot T should be adjusted to prevent an imprint caused by the striking of the rolls against the carbon paper.

To adjust, loosen the locknut at the top of the dashpot, turn the screw, and retighten the locknut.

2. Eccentric AW, on machines providing for carriage return from shift key operation, should be adjusted to actuate the carriage return key when the shift key lock is depressed.

Form Chute

Form Chute AY permits easy front insertion of bills (or similar forms) to a fixed printing line, where they are held by the Auxiliary Pressure Roll Bail.

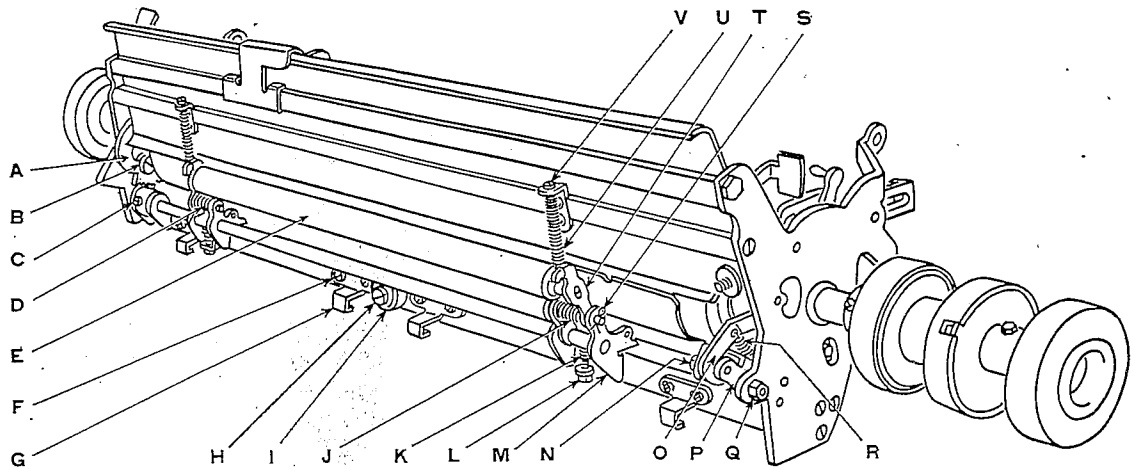
The form chute is connected to the inner carriage and is adjusted to the forms at the factory.

Journal Bands

Journal Bands M are used to hold the journal against the platen while the pressure rolls are opened for removal and insertion of other forms. They are also used in conjunction with the bill magazine to guide the journal in back of the magazine.

The journal bands, which are assembled on shaft H, may be adjusted to varying journal widths; however, the lower extremities of the bands should always be positioned over the projections of paper pan AY.

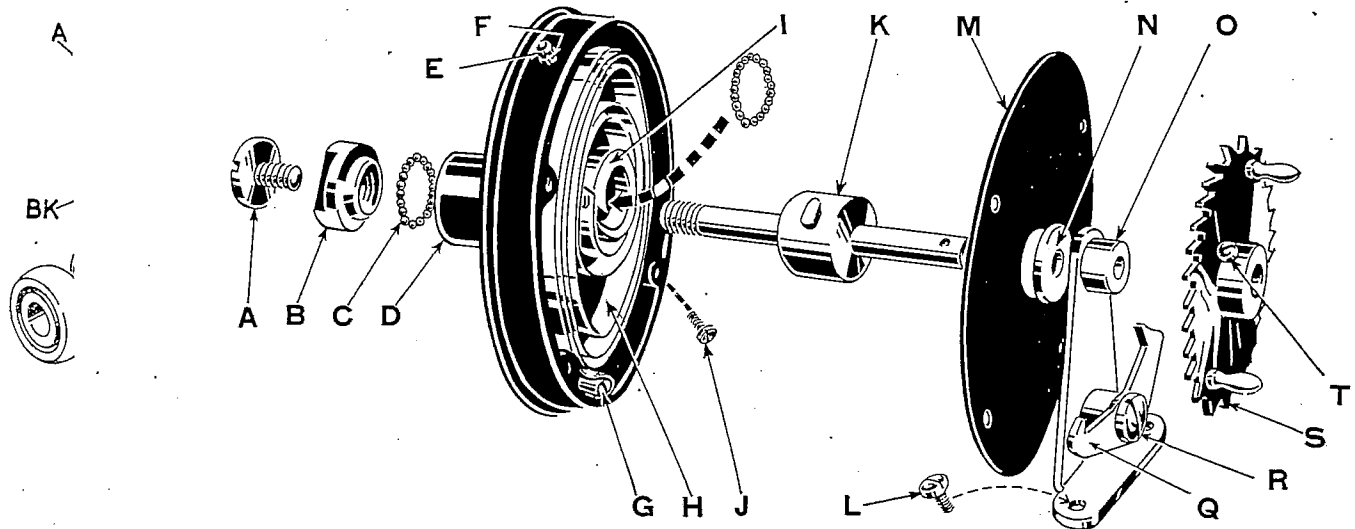
INNER CARRIAGE ASSEMBLY (LATE) (Fig. 18)



SYMBOLS (Fig. 18)

A	1-103120A	L	103501
B	103542A	M	1-103125 No. 2
C	1-103158	N	103515
D	103811R	O	103120L
E	1-103995 No. 1 (11) (13) (for 18 and 22 use two 11)	P	1-103117
F	75621	Q	103354
G	103132B	R	3281½
H	103535A	S	103812 (Pin)
I	1-103999A	T	1-103123AL
J	103811L	U	1-103802 (13)
K	1-103802 (11)	V	103501

SPRING BARREL ASSEMBLY—TYPE 50 (Fig. 19)



Auxili

Auxi moved No. 5 through WHI 3 or 5) plate A. Move position is accor of latch be mov plate A position and S.

The c trolled t WHE on mach with slic the upwa the rolle lower lip forward

Since AP is loc of the sh of the pl return th

ECCE equipped for infor the return

SYMBOLS (Fig. 19)

(Complete Unit) 2-108006 (11) used for 11, 13 and 15

(Complete Unit) 2-108006 (18) used for 18 and 22

A 71517 Screw in 108006 locking 75309

B 75309 No. 1 Cone

C 75999 Ball bearings

D 1-75330 Spring barrel

E 75656 Drawband stud

F 49 1/4 Nut

G 75605 Anchor screw for 108803

H 108803 Clock spring (11) for 13, 15 (18) for 22

I 1-75305 Split ring

J 74502 Screws holding 75194

K 1-108006 Shaft 75003, anchor collar 75509

L 3361 1/4 A Screws holding 1-108132 to side plates

M 75194 Disk cover for 1-75330

N 10021 3/4 Washer on shaft 108166

O 1-108132 Bracket for 1-108006

Q 108133 Escapement pawl

R 10056 Screw for 108133

S 1-108134 Escapement wheel

T 75606 Pilot screw holding 1-108134 to shaft of 1-108006

Margin Blocks—Types 50 and 60

Margin block A (Fig. 20) warns the operator that a new line should be started by ringing the bell, blocking the universal bar and the writing keys after six additional spaces.

The right and left margin blocks are carried by margin rack B, pawl C of the margin blocks seating in the tooth spaces of rack B.

As the carriage is being spaced, a formed ear on the lower edge of margin block A passes over passby pawl D of bell clapper E. The clapper end is raised and released to strike bell W when the margin block rides over pawl D.

When the carriage is moving from the fifth to the sixth additional space, the formed ear on margin block contacts on the vertical projection of limit lever F, moving the latter the length of its slot.

Bail G is rocked through links H, I and J. Bail G locks all writing keys and the space bar. When bail G is blocked by a key, spring V expands.

Link J also rocks bell crank L which through link M swings arm N, the latter swings arm P to block stud Q.

The purpose of arm P blocking stud Q, which is carried by the escapement shaft

assembly, is to prevent a partial release of the escapement mechanism when the carriage is limiting on lever F.

Type 60 machines block stud Q through bell crank R, lever S and link T; the latter is similar to link M in Type 50 machines.

Note: A partial release of the escapement mechanism with the carriage limiting on lever F can result in one space being lost when the carriage is pulled back.

The left margin block provides a definite limit for the carriage when it is being returned which insures that written lines will start evenly from the left edge.

Margin Release Key

The margin release key X is located in line with and to the right of the tabulator key.

When it is necessary to write more than is permitted by the margin block, the margin release key is depressed, which swings limit lever F below the margin block through lever Y and link Z to permit the carriage to be spaced until the carriage frame contacts on auxiliary stop AB, a lower projection of the latter contacts on a stud in limit lever F. The space bar and escapement mechanism are blocked through the movement of limit lever F as explained in the previous subject.

SYMBOLS (Fig. 20)

A	1-103105R (Specify Pitch) (Style E for Electric)	T	1-108140 Style E
B	1-103902 (Specify Width and Pitch)	U	89801
C	103910* (Specify Pitch)	V	108802
D	108124*	W	108125
E	1-108122	X	21-108121
F	1-108129B	Y	1-108136
G	1-108131	Z	108135*
H	108196*	AB	108128 No. 1 (11) 108128 (15) for 13", 15", 18", 22"
I	1-108126A	AC	71806
J	1-108127A	AD	74544
K	108504	AE	108513
L	1-108139*	AF	10056
M	1-108140A	AG	108513
N	1-108141*	AH	103517A
O	108504 (Specify Style E for Electric)	AI	103350A
P	1-108142	AJ	103912 No. 1
Q	104500A No. 2*	AK	103100 No. 1 use for (11) 1-103100 No. 2 use for (13) (15) (18) (22)
R	1-108142 Style E	AL	384A
S	1-108141 Style E		

Tests and Adjustments

Left margin block set at 1, carriage held to extreme right, carriage stop should contact on tabulator frame. When the carriage is drawn to the right, it should limit on the left margin block and pawl C should seat in rack B.

When keys are locked by bail G and bail G is swung forward, if keys are depressed the escapement mechanism should be blocked by arm P.

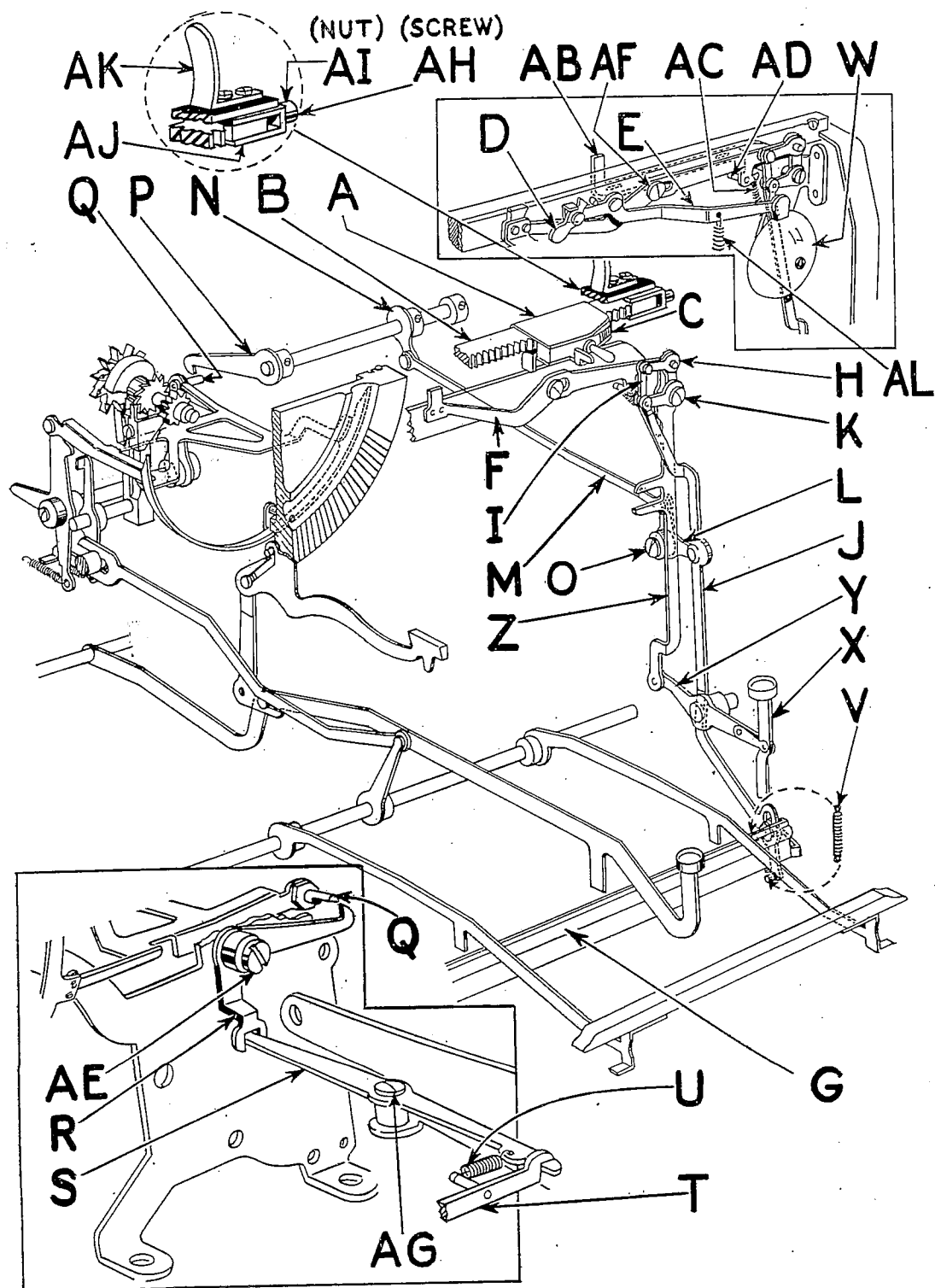
Adjustment: Type 50 machines; screw in arm P is loosened and its hook is located for hold on stud Q.

Type 60 machines; the offset in link T is adjusted.

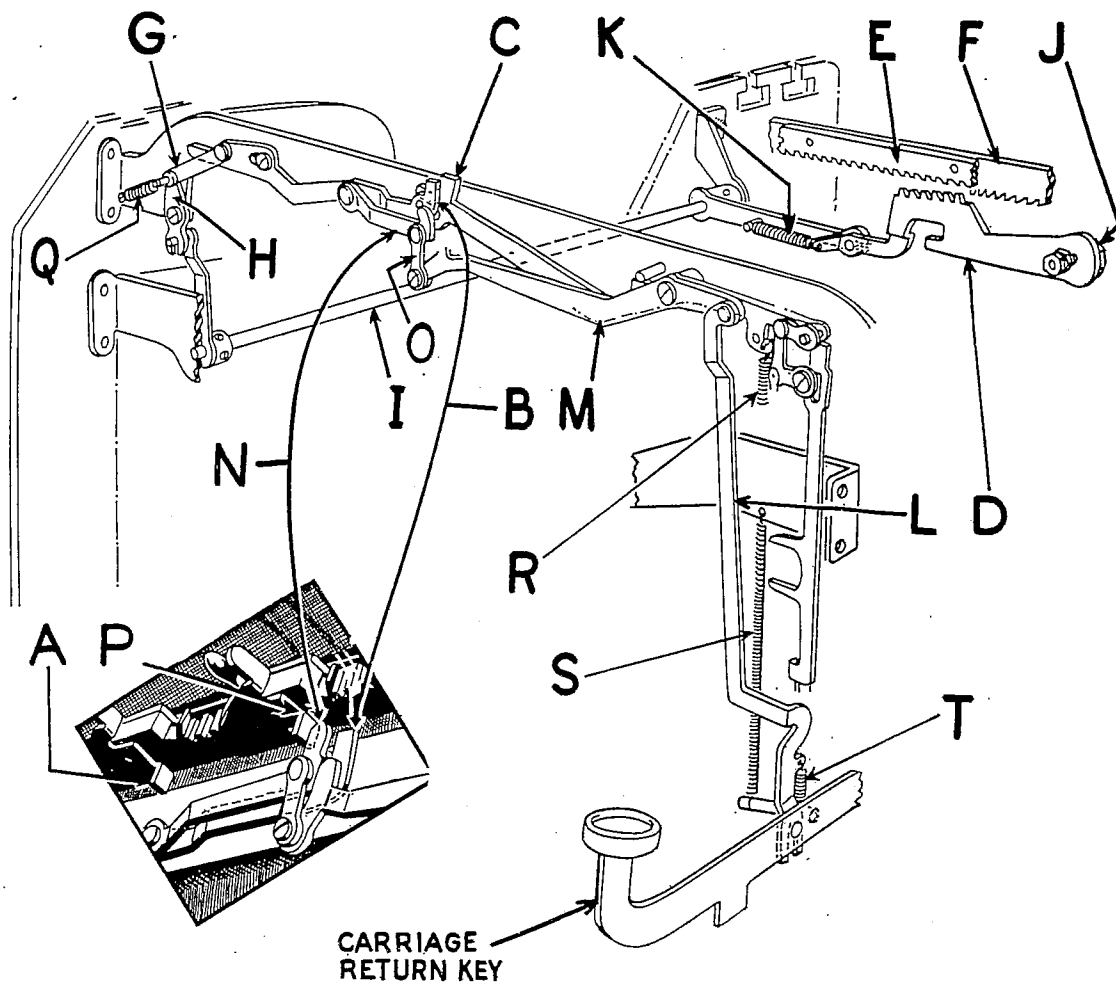
SELF-QUESTIONS

- 106—What is the purpose of margin blocks?
- 107—What effect does margin block produce?
- 108—Describe in sequence the operation of margin block.
- 109—How is a partial release of the escapement mechanism prevented?
- 110—What is the effect of a partial release of the escapement mechanism?
- 111—What is the purpose of margin release key?
- 112—What is the purpose of stop AB?
- 113—What limits the carriage to the right and to the left?
- 114—What adjustment governs the left carriage limit?
- 115—What adjustment governs the right carriage limit?
- 116—What test is applied to the margin release lever in connection with the escapement mechanism?
- 117—What adjustment governs the condition referred to in question number 116?

MARGIN BLOCK MECHANISM (Fig. 20)



AUXILIARY MARGIN BLOCK MECHANISM (Fig. 21)



SYMBOLS (Fig. 21)

A	1-103105L Specify Pitch (Style E for Electric)	J	104508
B	1A-108144	K	16880
	11-108144 (use for Electric only)	L	108190*
C	1-108129B	M	1-108189A
D	1-104129A Specify Pitch	N	108193*
E	103906*	O	108194*
F	1A-103903A P. 10 Specify Length	P	1-103105L No. 2 Style E (Specify Pitch)
	1-103903 P. 8-12-14 Specify Length	Q	87801A
G	108148*	R	71806
H	108149A*	S	780 No. 2
I	1-108009	T	108806

Auxiliary Margin Limit Mechanism Types 50 and 60

The purpose of this mechanism is to prevent possible overthrow of the carriage when the latter is returned with undue force. This mechanism locks the escapement rack assembly as the carriage limits on the margin blocks.

Type 50 machines have single control which is effective only when the carriage is returned to its right limit.

Type 60 machines have double control which is effective not only when the carriage is returned to the extreme right, but also when the carriage is returned to an intermediate position.

Type 50

When the carriage is returned toward the right, margin block A (Fig. 21) contacts on and moves part B as it limits on margin release lever C. The movement of part B raises part D engaging its teeth with rack E which is fastened to escapement rack F. Part B raises part D through link G, lever H, and shaft assembly I.

Part D which swings on shoulder screw J has an elongated slot in order to allow its teeth to readily enter the tooth spaces of rack E.

Part D is held to the left by spring K.

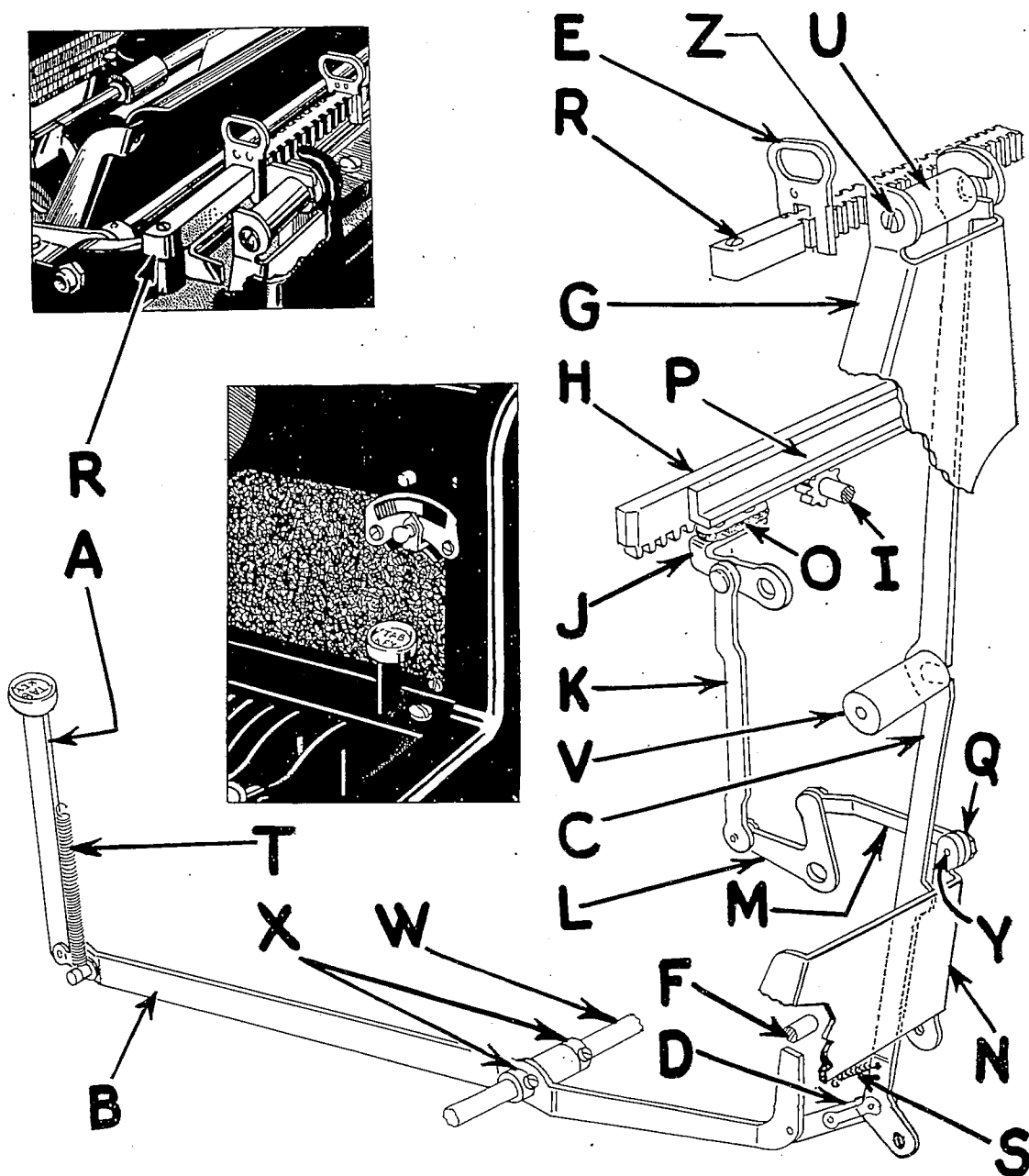
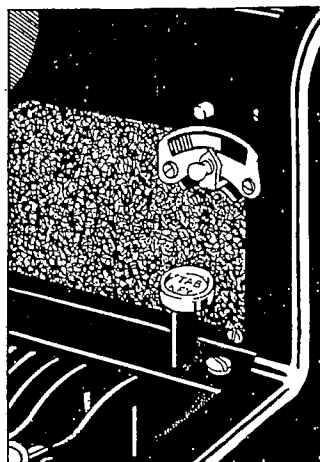
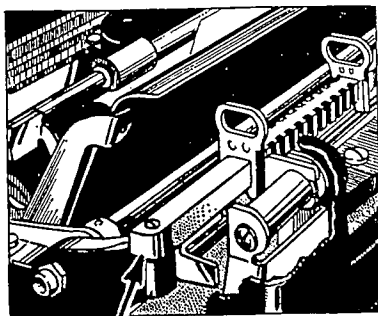
Type 60

When the carriage return key is depressed, link L rocks lever M which raises part N through link O. When the carriage return key is held depressed, the intermediate margin block P will contact on N resulting in part D entering and locking rack E. When the carriage return key is depressed and not held, part N will drop and allow the carriage to return and contact on margin block A and rack E as explained under heading "Type 50."

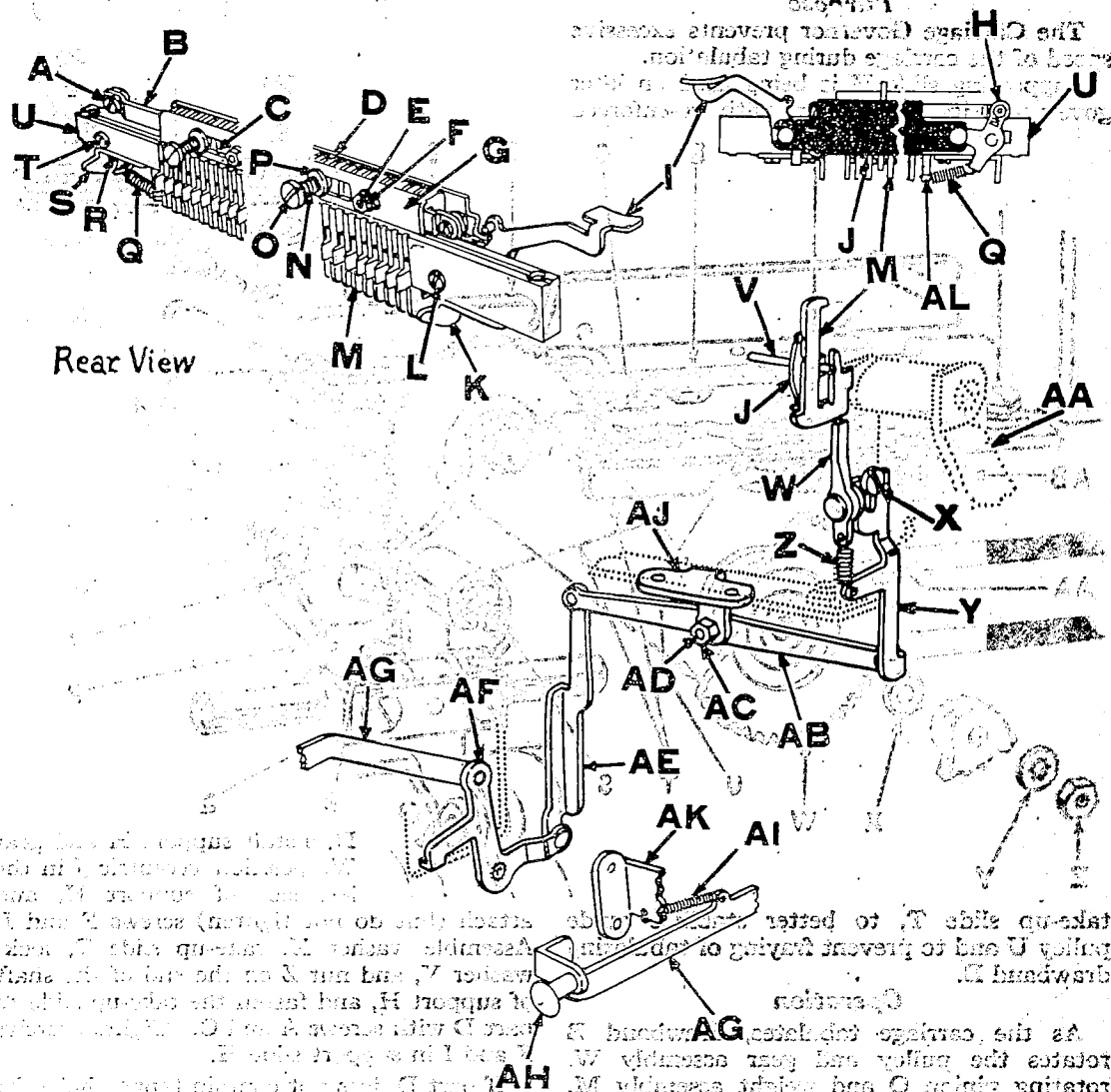
SELF-QUESTIONS

- 118—What is the purpose of the auxiliary margin limit mechanism?
- 119—How does the auxiliary margin limit mechanism used in Type 50 machines differ from that used in Type 60 machines?
- 120—How does the auxiliary margin limit mechanism in Type 50 machines function?

TABULATING MECHANISM (Fig. 22)



(S-38) KEY SET TABULATING MECHANISM (Fig. 22-1)



The purpose of this mechanism is to permit indexing tabulator stops M by the depression of key button AH instead of manually shifting the tabulator stops. (The carriage governor on reverse page is standard construction for this feature.)

Sequence

When key button AH is depressed with the platen in selected carriage position, part AG and bell-crank AF rock lever AB through link AE. Part Y carries pawl W upward, raising tabulator stop M. Tabulator stop M is latched in upper position by part G.

To restore the tabulator stops to normal position, lever I is depressed, which causes part G to clear stops M and also restores tabulator stops M through bar D. Part G is rocked to clear stops by cam C contacting

on the stud in B. Bar D is carried downward by lever I. Bar D is supported on the opposite side by lever H. **Tests and Adjustments**

Pawl W should align with tab stops M. Adjustment: Arm of Y, which serves as spring anchor is bent.

When in normal position pawl W should clear tab stops M. Adjustment: Arm of bell-crank (AF) is bent.

When lever I is started, cam C should engage stud in B. When lever I is in normal position cam C should clear stud in B.

Adjustment: Screw E and nut H are loosened and cam C (is slotted) is located as required.

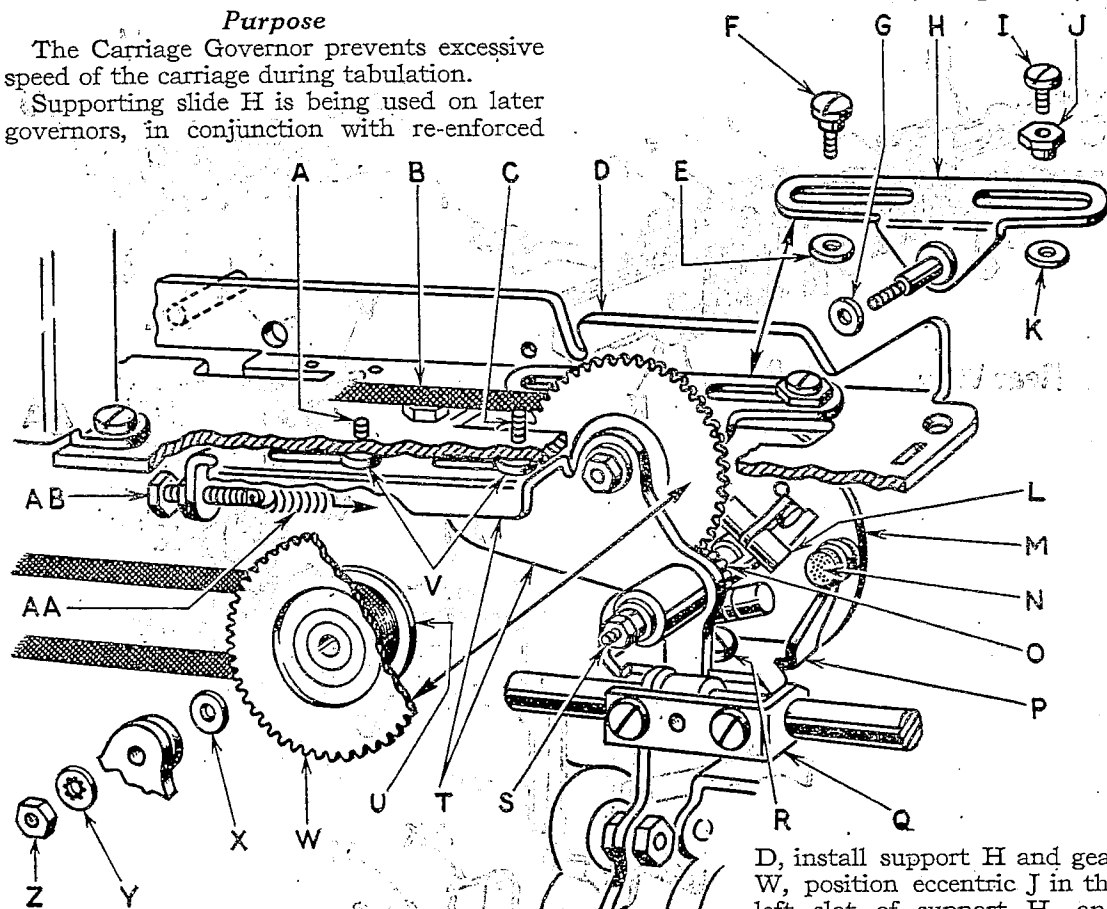
Place washers H and I over the hole in

CARRIAGE GOVERNOR WITH GOVERNOR SUPPORT (Fig. 22-2)

Purpose

The Carriage Governor prevents excessive speed of the carriage during tabulation.

Supporting slide H is being used on later governors, in conjunction with re-enforced



take-up slide T, to better stabilize guide pulley U and to prevent fraying of tabulating drawband B.

Operation

As the carriage tabulates, drawband B rotates the pulley and gear assembly W, rotating pinion O and weight assembly M. The turning speed of assembly M causes weights L to swing outward, the forward extremities of the weight arms contacting on the fulcrum cone (at forward end of shaft S), causing disk M to be forced rearward against felts N which are mounted in floating part P and supported by yoke Q.

At the inception of a carriage return, drawband B is slackened, enabling spring AA to shift the governor assembly to the left, so that felt assembly P clears the stationary yoke Q and, being no longer supported by the yoke, loses its breaking effect on disk M.

Installation

To install the governor, remove the motor and dismantle support H and gear W from the assembled governor parts, so that they may be installed separately on the machine. Place washers E and K over the holes in part

D, install support H and gear W, position eccentric J in the left slot of support H, and attach (but do not tighten) screws F and I. Assemble washer X, take-up slide T, lockwasher Y, and nut Z on the end of the shaft of support H, and fasten the take-up slide to part D with screws A and C. Tighten screws F and I in support slide H.

If part D does not contain tapped holes for screws F and I, a template (Kit 400 No. 2), whose pilot studs are inserted into the screw holes of A and C, is required. A No. 37 drill and a $\frac{1}{8} \times 44$ tap are also required. It may be necessary, in order to drill and tap the holes, to loosen screws Q and R (Fig. 11), and to shift the rear carriage rail (being careful not to disturb eccentric S on the same plate).

Adjustments

1. Yoke Q, whose forward extremities are normally aligned with the projections of part P, can be adjusted to increase or decrease the breaking effect of felts N on disk M. When the back of the yoke is rocked downward, the breaking effect is increased.

2. Tape B should be adjusted as explained on page 50.

3. Eccentric J can be adjusted to provide free sliding movement of slides H and T.

SYMBOLS (Fig. 22)

A	11-108121	O	104901
B	1-108112B No. 1	P	103103*
C	108114B No. 1	Q	104380 Eccentric
D	1-108113 No. 2	R	103904 (Specify Length and Pitch)
E	103201A No. 1	S	74803
F	108003 No. 1*	T	75817
G	108116	U	108007 No. 1
H	1A-103903A (Specify Width and Pitch)	V	108007 No. 1
I	104003 No. 1*	W	108005A
J	104123 No. 1*	X	1-7140 $\frac{1}{4}$
K	104125A*	Y	74502
L	1-104124	Z	73612
M	104115*		
N	108115A		

For Decimal Tabulator, symbol is 108007 No. 2 (specify pitch).

Tabulating Mechanism

When tabulator key A (Fig. 22) is depressed, lever B is rocked, which moves the upper end of vertical lever C (through link D) into the path of tabulator stops E. Lever B when fully depressed is limited by its lower projection contacting on shaft F (in frame G).

Rack assembly H is disconnected from escapement gear I by arm J, which is raised by the movement of the lower arm of vertical lever C.

Arm J is connected to lever C by link K, bell crank L, link M and bail N. Arm J has leather facing O, which contacts on ledge P when rack assembly H is raised through the depression of the tabulator key.

As the rack slides on the arm, the leather

creates sufficient friction to control the speed of the carriage.

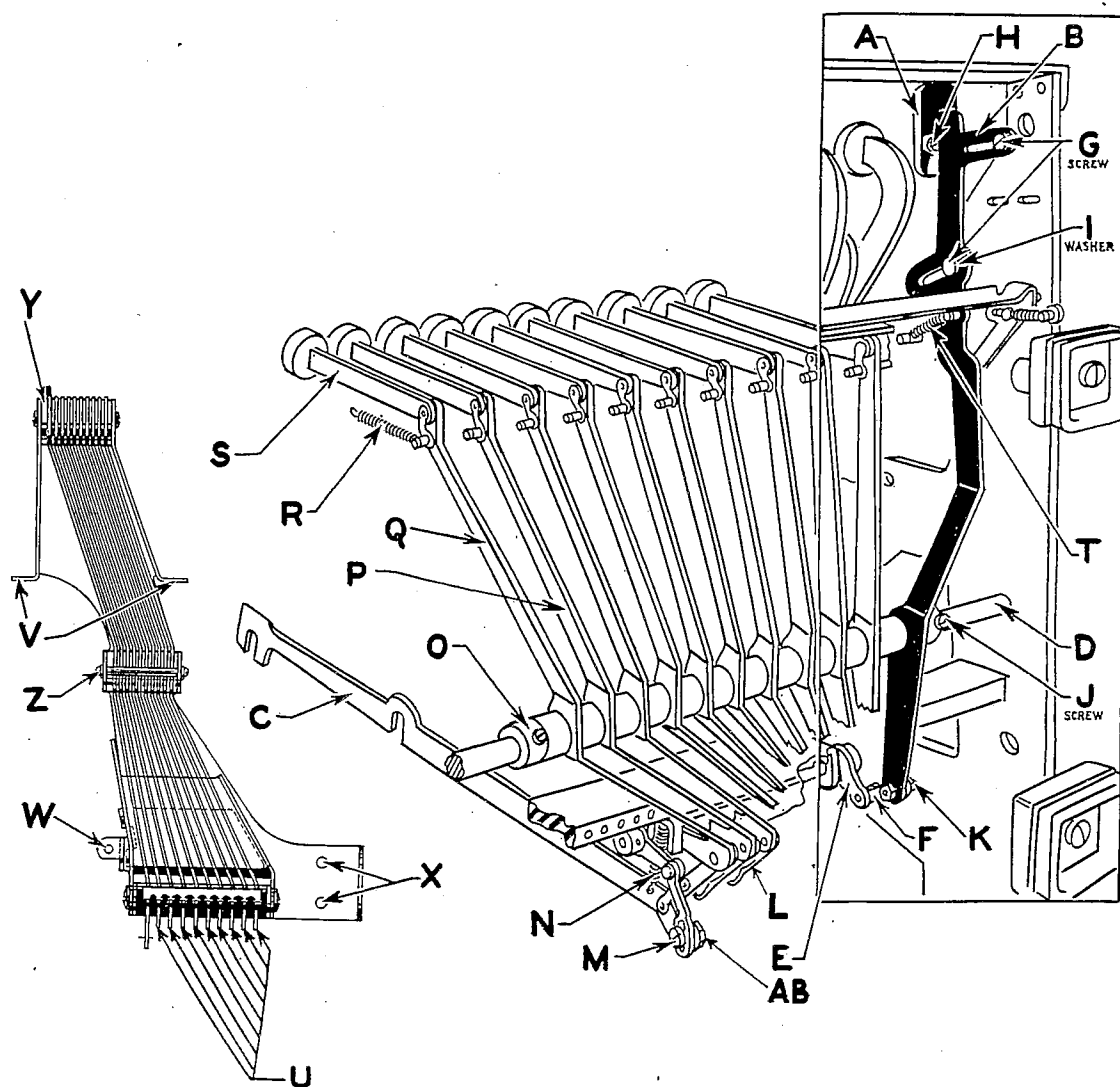
Tests and Adjustments

When the tabulator key is depressed, there should be $\frac{1}{32}$ -inch clearance between rack H and pinion I. To increase or decrease the clearance, eccentric Q is turned.

When the tabulator key is depressed, a drop of the carriage movement equal to half space should take place, i. e., pointer A (Fig. 10) should be between the graduations of scale B (Fig. 10). When the tabulator key is released, the pointer should be on one of the graduations.

Adjustment: Limit screws AH (Fig. 20) are turned.

DECIMAL TABULATING KEYS (Fig. 23)



SYMBOLS (Fig. 23)

A	1-72125 No. 2	H	73563	Q	1-108112B No. 1
B	1-108120A	I	3826½	R	75817
C	108114B No. 1	J	75618	S	31-108121 Specify Character
D	108005A	K	9259⅞	T	69808
E	1A-108003 No. 2	L	1-108113 No. 2	U	108114A No. 2 thru No. 10 (Specify Pitch)
F	108195	M	79511	V	84504 Screws (2 for Hand, 1 for Electric) 100501 (for Electric in place of 84504)
G	203527	N	74803	W	73611 (for Hand) 651¼ (for Electric)
		O	1-108302	X	2858¼A
P	1-108112A No. 2 thru No. 11 for 10 Dec. 1-108112A No. 12 thru No. 17 for 6 Decimal 11B-108116 (for 10 Tab. Pica) complete unit 21B-108116 (for 6 Tab. Pica) complete unit 31B-108116 (for 10 Tab. Elite) complete unit 41B-108116 (for 6 Tab. Elite) complete unit 103504 (Screws for 108116 to side Frame)			Y	108007 No. 2 (Specify Pitch)
				Z	108004 (Retaining Shaft) 470 (Clip)
				AB	49½

Decimal Tabulating Keys

The purpose of this mechanism is to permit listing amounts in vertical order for financial statements. This mechanism is controlled from 2 to 10 tab keys. When any key between 2 and 10 inclusive is depressed, the carriage is stopped to the left of the tab key No. 1 as many spaces as are indicated by the number of that key which is depressed.

In the decimal tabulating mechanism, shafts Y (Fig. 23) have ten grooves for the ten or less vertical levers C required and these grooves space the vertical levers exactly to conform to the escapement pitch of the carriage.

Palm Tabulator

The palm tabulator key which operates

the standard tabulator mechanism provides quicker and easier operation than the standard tabulator key.

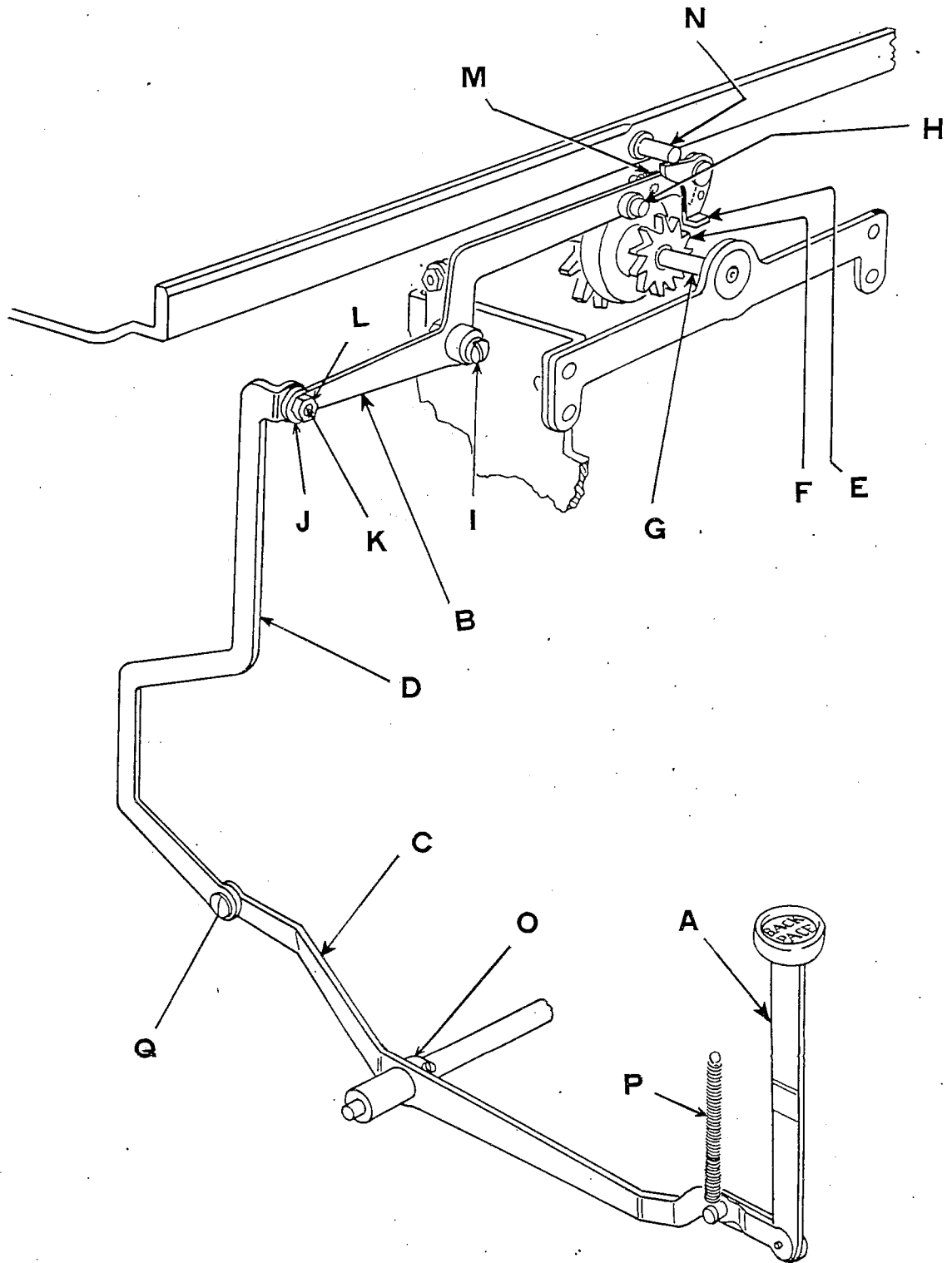
When bar A (Fig. 23) is depressed, lever B swings tip arm C in the path of the stop E (Fig. 22). It also disconnects the rack as explained under the previous heading "Tabulator Mechanism."

Lever B pivots on shaft D rocking shaft assembly E through link F. Shaft assembly E is connected to the lower end of tip arm C.

SELF-QUESTIONS

- 121—What causes the carriage to tabulate when the tab key is depressed?
- 122—How much clearance should there be between H and I when the tab key is depressed?
- 123—Which test and adjustment relative to the rack and pointer is used?
- 124—What is the purpose of the decimal tabulator?

BACK SPACE KEY (Fig 24)



SYMBOLS (Fig. 24)

A	1-108121	H	104553A
B	1-104109A No. 1 (use for Pitch 9, 10 and 12)	I	104504
	1-104109A No. 2 (use for Pitch 14)	J	79333 No. 1
	11-104109A No. 1 (use for Pitch 8)	K	79547
C	1-108108A	L	46
	1-108108 Style E (for Electric)	M	72805
D	108109 (Specify Style E for Electric)	N	100552
E	1-104108 No. 1*	O	1-108300A
F	1-104400	P	2887 $\frac{1}{4}$ A
G	104003 No. 1	Q	259 $\frac{1}{2}$

Back Space Key

The purpose of the back space key is to permit manually returning the carriage one space.

When back space key A (Fig. 24) is depressed, pawl lever assembly B is rocked through link D and lever C.

Pawl E engages ratchet F on pinion shaft G. Stud H (of pawl lever B) limits the movement of lever B and insures correct spacing; check pawl T (Fig. 32) holds the escapement wheel from turning.

Tests and Adjustments

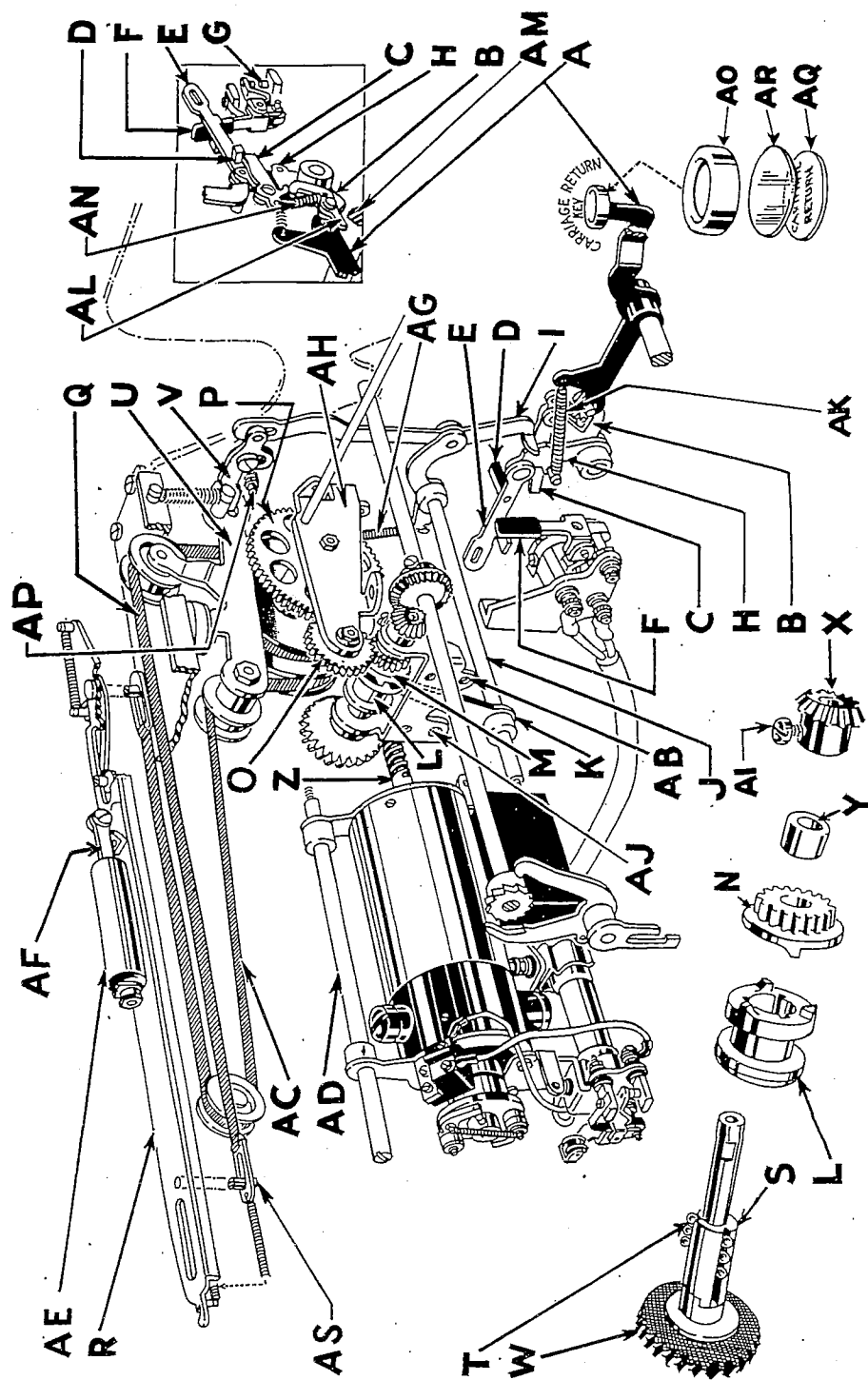
When the back space key is depressed, there should be no clearance between stud H and ratchet wheel F.

Adjustment: The eccentric in link D is turned.

SELF-QUESTIONS

- 125—What is the purpose of the back space key?
- 126—Describe in sequence the operation of the back space key.
- 127—What test is applied to the back space key and what adjustment might be necessary?

CARRIAGE RETURN KEY MECHANISM—TYPE 60 (Fig 25)



SYMBOLS (Fig. 25)

A	1-108111	W	1-101901
B	1A-108183	X	1-101903
C	108184*	Y	101304 No. 1
D	108591*	Z	101900
E	1-108186*	AB	1-101108
F	1A-4524A	AC	1-103990 No. 2 (11) (13) (18) (22) Style E (13 used for 15" Cge.)
G	3893 $\frac{1}{4}$ *	AD	101002 (For motor detail see Fig. 31)
H	1-108185	AE	1-103447A
I	108181*	AF	1A-103448*
J	1A-108012	AG	108805
K	1-108179*	AH	108169*
L	1-101303 No. 1	AI	71519
M	101303 No. 2*	AJ	75615
N	1-101902	AK	99807
O	108402	AL	108197*
P	108168*	AM	108005A*
Q	1-103990 No. 1 Style E (Specify Length)	AN	9283 $\frac{1}{4}$
R	1-103147A (11) (13) (18) 1-103147A (15) 1-103147A (22)	AO	72200 No. 2 (Ring)
S	101003*	AP	108517 Eccentric
T	4499 (9 required)	AQ	72991 No. 2 (Cge. Return Keypaper)
U	1-108188	AR	72992 No. 2 (Glass)
V	1-108182A	AS	103564A

Carriage Return Key Mechanism Type 60

When carriage return key is partially depressed, the switch points are allowed to come together first, to cause the motor to operate. Lever A (Fig. 25) rocks bell crank B causing pawl C to contact on the square stud D in link E, moving the latter rearward which allows switch lever F to follow and points G to come together causing the motor to operate. Link E pivots on bell crank H.

When the carriage return key is completely depressed, bell crank H moves out of the path of link I which moving downward rocks shaft assembly J, arm K moving clutch member L into clutch member M thus engaging clutch.

Clutch member M carries integrally gear N which is meshed with and revolves gears O and P. The latter being fastened to the spring barrel revolves it, winding tape Q which is anchored to return slide R.

Return slide R moves in its slot sufficiently to space the platen before moving the carriage.

Clutch member L moves laterally on worm wheel shaft S and slides on balls T in recesses of the shaft.

Tests and Adjustments

The motor should be running while bell

crank H has half to full hold on the ear of vertical link I.

Adjustment: Switch lever F is advanced or retarded from link E.

When the carriage return key is normal, there should be not more than .010" clearance between clutch members L and M.

Adjustment: The bent ear on vertical link I is bent.

Return key depressed and clutch completely engaged, there should be $\frac{1}{32}$ -inch clearance between top of slot in link I and its guide stud.

Adjustment: Eccentric pivot screw AP of lever V is turned, or rubber bumper for disengaging arm U is raised or lowered.

Test for restoring of bell crank H.

Return key depressed to almost release link I, then return key allowed to restore, then bell crank H should restore and stop motor.

Latch (AL)

When link I is moving downward, pawl C moves under square stud D. The cam surface of pawl C riding under stud D permits latch AL to hook pawl C holding it in this position until the carriage return key becomes normal. Latch AL releases pawl C when the latch contacts on shaft AM. The purpose of latch AL is to prevent repeat engagements of the clutch.

Clutch Disengagement

The carriage return movement is limited by the carriage contacting on the margin block which causes the tension of the return tape Q to lower disengaging arm U, the latter rocks lever V which raises and resets link I. At the beginning, lever V pivots on the upper surface of the slot in link I, later it contacts on the shoulder of eccentric screw AP which accelerates the lift of link I due to the longer leverage of the different pivot point of lever V.

The mesh of gears O and P is fixed, however, the mesh of gears O and M is adjustable. Bracket AH has vertical slot which permits gear O being moved upward and downward. (See Fig. 28).

- To remove complete clutch unit AB:
- Remove tabulator unit.
- Remove spring barrel.
- Remove four screws AJ.

Tests and Adjustments

Latch AL should release when it contacts on shaft AM.

Adjustment: Arm A is bent, however, arm A must not be bent to the extent that the engagement of the clutch will be impaired.

Test for Position of Eccentric AP

Return key depressed with slight finger pressure applied to top of link I, the clutch should not engage.

Adjustment: Eccentric AP is turned.

Selective Motor Return

The carriage can be returned to two positions, viz.: When the return key is depressed and held, the carriage will stop on the first margin block P (Fig. 21) and limit on auxiliary stop N (Fig. 21). However, when the return key is depressed and immediately released, the carriage will pass the first margin block and stop with the second on margin stop A (Fig. 21).

SELF-QUESTIONS

- 128—How and when is the motor caused to run through the return key?
- 129—How are the clutch members engaged through the return key mechanism?
- 130—How is the platen spaced?
- 131—How are the clutch members disengaged?
- 132—Which test is made and what adjustment might be required to cause the motor to run at the correct time period?
- 133—What is the correct amount of clearance between the clutch members when the machine is normal?
- 134—Which test is applied when return key is completely depressed?
- 135—Which test governs the restoring of bell crank HP?

136—What is the purpose of the double pivot of lever V?

137—How is the clutch unit removed?

138—What is the purpose of latch AL?

Return Tape—Type 60

One end of return tape Q (Fig. 25) is hooked in the pocket of the spring barrel. The other end of return tape is hooked on stud AS (Fig. 25) in return slide R (Fig. 25). Return tape Q passes over the guide pulley on disengaging arm U (Fig. 25).

Tabulating Tape I (Fig. 26)

On account of the spring barrel being located on the right side, the tabulating tape draws the carriage toward the left by passing around pulley C (Fig. 26) which acts as a fulcrum. Pulley C is carried by slide D (Fig. 26).

One end of the tabulating tape is hooked on stud E (Fig. 26) in the right end of return slide R (Fig. 25). The other end of the tabulating tape is hooked in the spring barrel. The tabulating tape also rides over guide pulley F (Fig. 27) before it winds on the spring barrel.

When the carriage limits on the return operation, the tabulating tape is completely unwound. When the return key is depressed with the carriage in extreme right position, spring G (Fig. 26) pulls slide D (Fig. 26) and pulley C (Fig. 26) toward the left and thereby takes up the slack of the tabulating tape (Fig. 25).

Tests and Adjustments

The correct length of the tapes is essential which is secured in both cases by adjusting the length of the tabulating tape. To test the length of the tapes, the shift key should be locked down with the power on. With the carriage in extreme right position, the tabulating tape should have a little play. To increase or decrease play of the tabulating tape limit screw H is turned (Fig. 26).

Play of the return tape is also necessary which is noted by placing the carriage in extreme left position. Play of the return tape in this position is also secured by turning limit screw H.

To Remove Return Tape

Place carriage in extreme left position, this unwinds the tape and locates the pocket in the spring barrel I (Fig. 27) to permit unhooking the tape end.

With a screw driver, the tabulating tape is pushed off guide pulley F (Fig. 27) in order to provide sufficient slack for the return tape

to be readily unhooked. The return tape is now withdrawn through the opening in the side plate. The return tape is installed in the reverse order.

To Remove Tabulating Tape

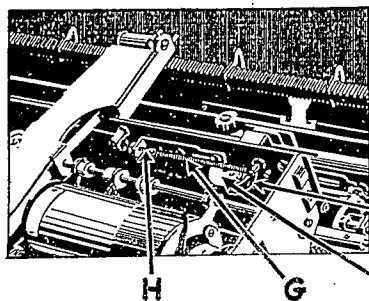
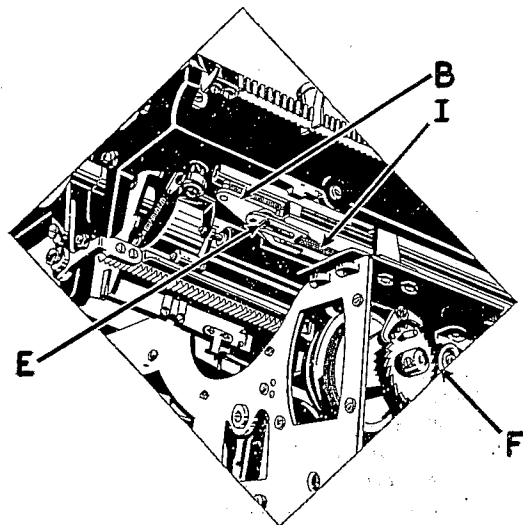
To avoid damaging or tangling the tape, the following precautions should be observed:

There are two conditions under which the tape can be safely unhooked.

First: To let out the tension, this however, will destroy the previous tension adjustment.

Second: Locking the clutch by depressing the carriage return key.

RETURN AND TABULATING TAPES (Fig. 26)



SYMBOLS (Fig. 26)

- B 1-103147A (specify length)
- C 11-103999
- D 1-108187
- E 103566
- F 11-103999
- G 108807
- H 108568
- I 1-103990 No. 2 Style E (specify length)

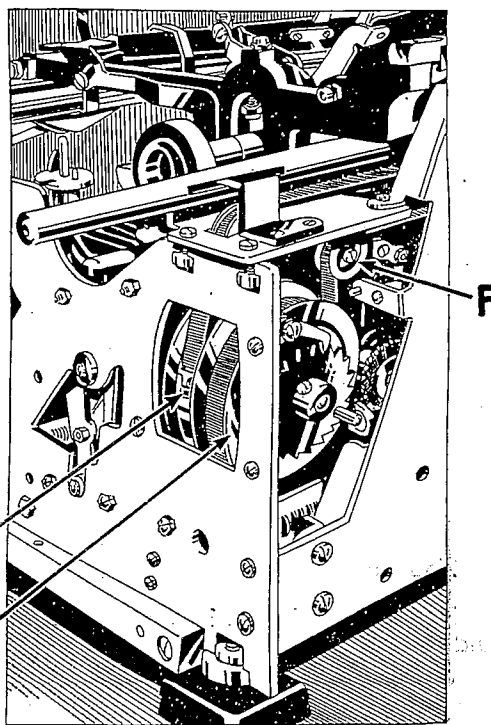
The carriage is first moved to locate the pocket of the spring barrel J (Fig. 27) in the center, then the carriage return key is depressed which locks the spring barrel and holds the tension of the barrel spring.

The tabulating tape is now slipped over pulleys C (Fig. 26) and F (Fig. 27), which permits the removal of the tape. The tabulating tape is installed in opposite order.

SELF-QUESTIONS

- 139—How is the return tape hooked up?
- 140—How is the tabulating tape hooked up?
- 141—How is the slack of the tabulating tape taken up, when the return key is depressed?
- 142—How is the correct length of the tapes secured?
- 143—What test is made to determine the correct length of the tapes?
- 144—How is the return tape removed?
- 145—How is the tabulating tape removed?

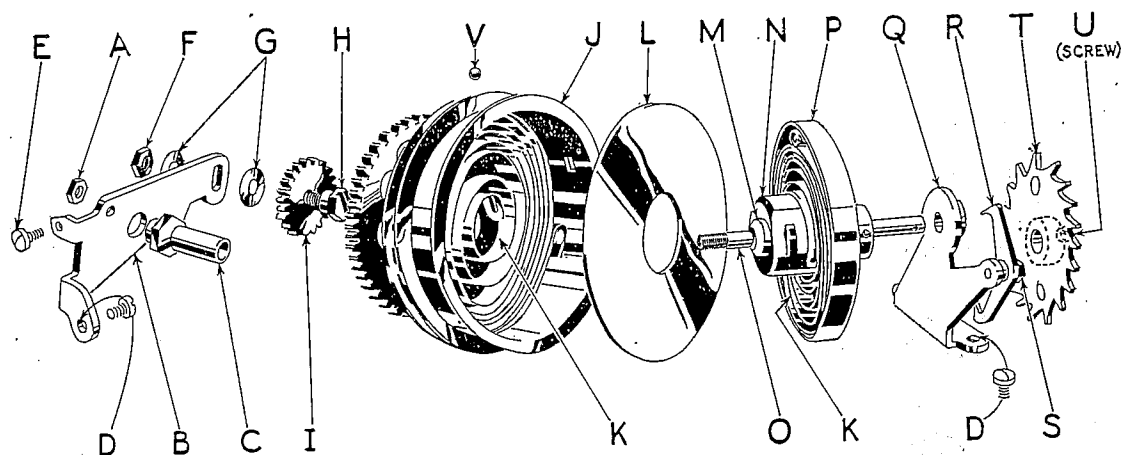
RETURN AND TABULATING TAPE MECHANISM (Fig. 27)



SYMBOLS (Fig. 27)

- F 11-103999
- I 1-103990 No. 1 Style E (specify length)
- J 1-108006

SPRING BARREL ASSEMBLY—TYPE 60 (Fig. 28)



SYMBOLS (Fig. 28)

(Complete Unit) (2-108006 Style E) (11) (used for 11", 13" and 15")	K	108800 (11) Style E (11) (13) (15) (18) (22)
(Complete Unit) (2-108006 Style E) (18) (used for 18" and 22")	L	108165 Separating disk
A	M	3236 $\frac{3}{8}$ Small cone
B	N	3333 $\frac{1}{4}$ A Spring anchor
C	O	108006* Style E Shaft
D	P	1-108006 Style E Stationary drum and shaft
E	Q	1-108132 Style E Bracket for 1-108006 Style E
F	R	108133 Pawl on bracket
G	S	10056 Screw for pawl
H	T	1-108134 Ratchet wheel
I	U	75606 Screw for ratchet
J	V	3298 Ball bearings (20 required)

To Remove Spring Barrel Assembly

Remove tension of barrel spring, unhook and remove tapes.

Unhook spring AG (Fig. 25) from shaft assembly J (Fig. 25).

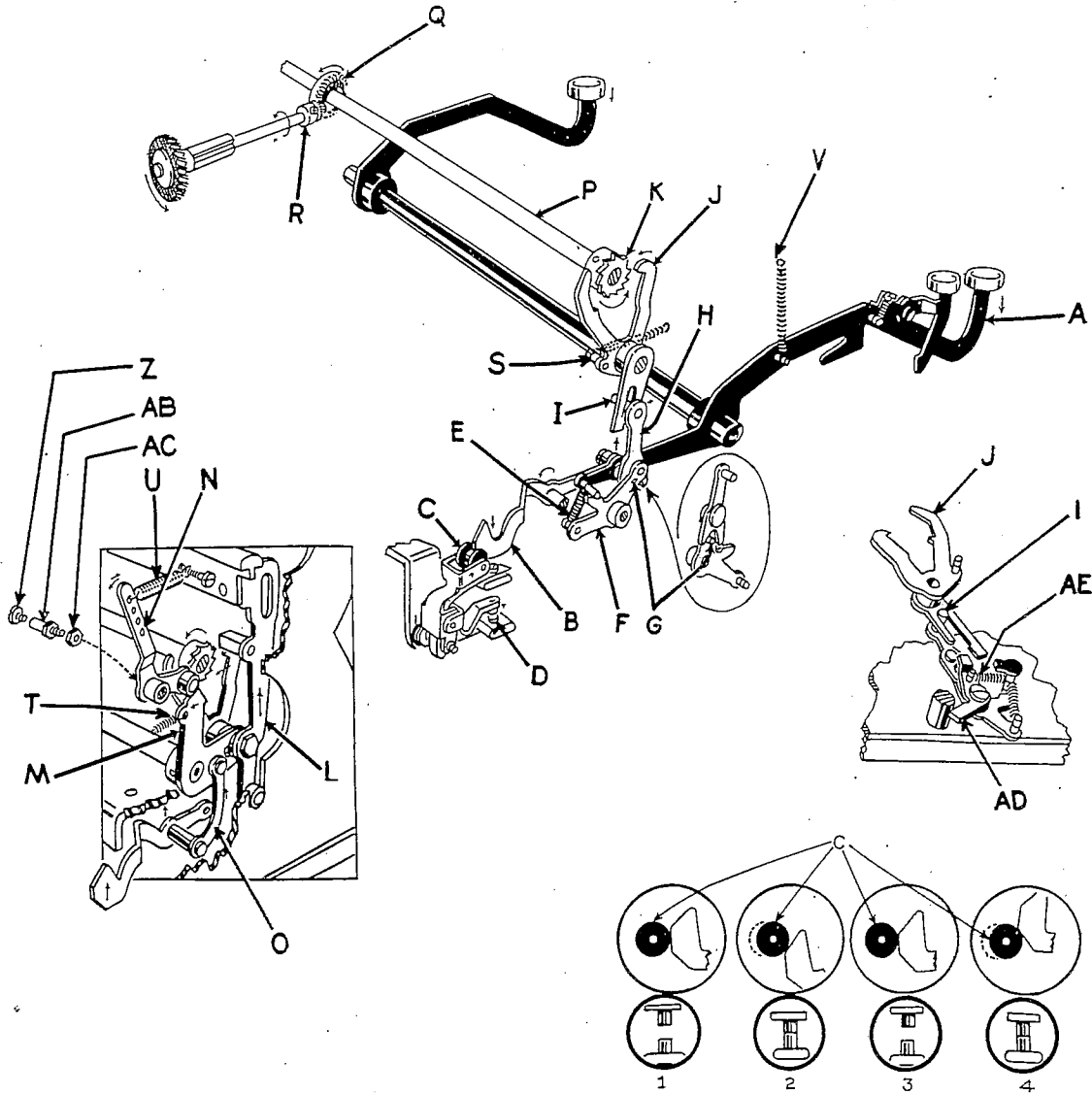
Remove one screw E (Fig. 28) and three screws D (Fig. 28).

Spring barrel can now be removed from the rear of the machine.

Caution: Nut A (Fig. 28) on the outside of bracket B (Fig. 28) must not be loosened or turned without holding cone C (Fig. 28) with a flat wrench. If nut A is turned without holding cone C, it will bind or loosen the ball bearing adjustment.

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TYPE 60 SHIFT KEY MECHANISM (Fig. 29)



SYMBOLS (Fig. 29)

A 1-108100L Style E*
 B 1-108175
 C 1-101102
 D 1A-4523A*
 E 9680
 F 1-108170
 G 73554*
 H 1-108171*
 I 9253 1/4*
 J 1-108172
 K 1-108403
 L 1-108107BR&BL No. 1
 M 1-108105AL&AR Style E
 N 1-108174
 O 108178*

P 108011*
 Q 1-101904
 R 1-101903
 S 74809
 T 108800 Style E (11) (13) (15) (18) (22)
 U 99807
 V 10280 1/2
 W 102991 No. 2 (shift key paper)
 X 72992 No. 2 (glass)
 Y 72200 No. 2 (ring)
 Z 957 1/2 screw
 AB 108590 eccentric
 AC 47 1/2
 AD 1-108198
 AE 82809

Platen Shift Key Mechanism—Type 60

When the shift key A (Fig. 29) is depressed, lever B is rocked which lowers spear point of B to allow roller C to follow and points D to come together to operate the motor. (Shown in Circle 2.)

Spring E swings timing arm F, stud G moves from the front to the rear fork of part H, stud I swings the front pawl of fork J to engage rotating ratchet gear K, which raises arm L and the shift assembly upward.

Cam point of bell crank M rocks rearward and detent N seats over its forward surface. Link O raises spear point of lever B which separates points D to stop the motor. (Shown in Circle 3.)

When shift key A is released, lever B is rocked raising its spear point which allows points D to come together and operate the motor. (Shown in Circle 4.)

Timing arm F swings back, stud G moving over to and contacting on the front fork of part H which rocks the rear pawl of fork J to engage rotating ratchet gear K which pulls downward arm L, rocking bell-crank M to normal, detent N seating on the rear surface. Link O lowers lever B which allows roller C to restore and points D to separate which stops the motor (Shown in Circle 1).

Ratchet gear K is carried by shaft P which is rotated by beveled gears Q and R from the clutch shaft. This is shown on the Return Key Mechanism print.

Lock Arm AD

The purpose of lock arm AD is to hold the platen in upper position when the carriage return key is depressed with the shift key latched down.

Operation

When pawl J has moved completely upward, lock arm AD swings under J blocking it. When the shift key is released, as pawl J moves forward it clears K.

Tests and Adjustments

The motor must be running before pawl J engages ratchet K. When the shift key is sufficiently depressed to locate stud G in the center of bell crank H, the motor should be operating.

Adjustment: The arm which carries roller C is bent.

When the shift key is slowly released and held and when stud G is in the center of bell crank H, the motor should be running.

Adjustment: The spear end of lever B is raised or lowered.

Note: The adjustments covering the switch point engagement when the shift key is depressed or released must be equalized.

The step of the front prong of pawl J should seat in the teeth of ratchet K when the shift key is depressed (power off). Also the step on the rear prong of pawl J should seat in the teeth of ratchet K when the platen is raised (power off). The correct seating of pawl J in ratchet K is indicated by clearance between stud G in arm F and fork of bell crank H. Clearance at pawl J and ratchet K can be observed by spring E being expanded.

Adjustment: The stud in lever A is tilted by bending rear arm of lever A.

Purpose of spring S is to hold the pawls of J from ratchet gear K. When the machine is normal, spring S pulls pawl J toward the front. When the shift key is held depressed, spring S pulls pawl J toward the rear.

Adjustment: The direction of the tension of spring S is adjusted by tilting its spring anchor up or down.

Test to insure complete platen lift.

With motor cord disconnected, shift key held depressed, motor is twirled manually.

Platen should be completely raised when detent N passes over the spear point of bell crank M. This same test is applied when the shift key is allowed to return, then the platen should also be completely lowered when detent N passes over the point of bell crank M.

Adjustment: The position of detent N can be equalized for both positions by turning eccentric AB.

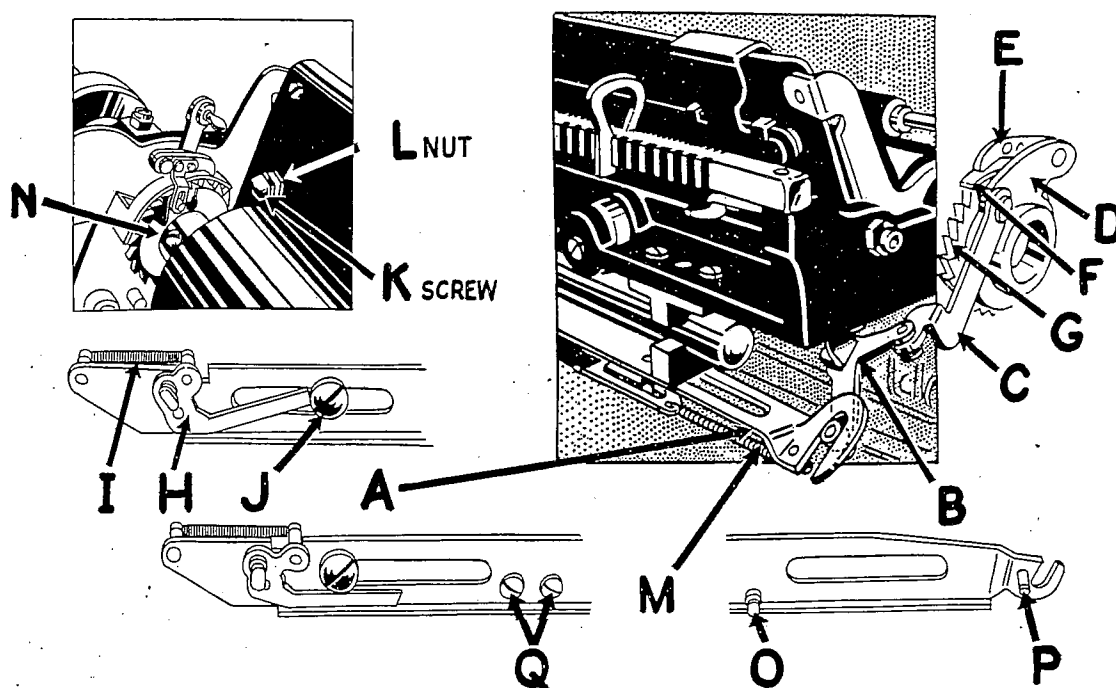
When the shift key is held down the hold of AD under J should equal the clearance between AD and J when the shift key is depressed and sufficiently released to allow J to contact on K.

Adjustment: The horizontal arm of AD is bent.

SELF-QUESTIONS

- 146—How is the motor caused to run when the shift key is depressed?
- 147—How is the shift assembly raised when the shift key is depressed?
- 148—How is the motor stopped when the shift assembly is raised?
- 149—How is the motor caused to run when the shift key is released?
- 150—How is the shift assembly lowered when the shift key is released?
- 151—Which test and what adjustment might be required to cause the motor to run at the correct time period?
- 152—What test and adjustment is applicable to pawl J and ratchet K?
- 153—What is the purpose of spring S?
- 154—What adjustment is applicable to spring S?
- 155—How is the platen lift tested?
- 156—How is the platen lift adjusted?

PLATEN SPACING MECHANISM—TYPE 60 (Fig. 30)



SYMBOLS (Fig. 30)

A 1-103147A (11) (13) (18)
 1-103147A (15)
 1-103147A (22)
 B 1-103148A*
 C 103114 Style E*
 D 1A-103113 Style E
 E 1-103115 Style E*
 F 1-103116 Style E
 G 1-103118
 H 1-103155 (11) (13) (18)
 11-103155 (15) (22)

I 77880 No. 3
 J 103537
 K 103514 No. 1
 L 103353
 M 9282 1/4
 N 103153
 O 103564A
 P 1353 1/4
 Q 73514

Platen Spacing Mechanism—Type 60

Return slide A (Fig. 30) rocks bell crank B which through link C rocks space arm D. Pawl E glides over part F engaging ratchet G to turn the platen one or more spaces.

The spacing movement of return slide A is controlled to prevent double spacing by air dashpot (AE Fig. 25) and also by latch H.

The purpose of latch H is to prevent the carriage moving ahead of slide A which would cause the carriage to oscillate and double space. When slide A moves to the end of the slot, spring I swings latch H in line with stud J, holding slide until the clutch is released.

Tests and Adjustments

The movement of pawl E is limited by adjusting screw K and nut L.

Screw K should be adjusted to block further movement of pawl E when detent (L Fig. 12) seated in the tooth space of ratchet G.

Bell crank B must move freely when the shift key is normal or when it is held depressed.

Adjustment: Bell crank B is aligned with link C.

Latch H must not swing beyond the center of stud J which would lock slide A and prevent its return to normal. When latch H swings beyond center, slide A should be replaced.

Note: The platen in Type 60 machines is fastened to the platen shaft at both ends.

SYMBOLS (Fig. 31)

A	11-4567 No. 2 (110V) (150V) (220V) (complete unit)	V.	1-101703
B	550 $\frac{3}{4}$	W	1-101702
C	101900	X	101107*
D	101306	Y	2858 $\frac{1}{4}$
E	4499	Z	1-4599 $\frac{1}{8}$
F	101305	AB	1-101107 (Cge. return switch unit)
G	73563	AC	1-101100
H	1A-4595	AD	2850 $\frac{3}{16}$ (4 required)
I	1-4590 $\frac{1}{2}$ A (Brushes)	AE	101103
J	4581 No. 3 (use for 11") 4581 No. 4 (use for 13", 15", 18" and 22")	AF	101502
K	1-101701	AG	101906 (110V) (150V) (220V)
L	71181	AH	1A-4524A
M	4552 $\frac{1}{4}$ A	AI	2859 $\frac{3}{4}$ B
N	1A-4523A	AJ	2851 $\frac{1}{8}$
O	1-4556 $\frac{1}{2}$ C	AK	651 $\frac{1}{4}$ (not illustrated) (screws for AL)
P	461 $\frac{1}{4}$	AL	1-101110L
Q	2820 $\frac{1}{2}$	AM	4552B
R	3929A	AN	73611
S	3890 $\frac{3}{4}$	AO	101105 (clamp for cable)
T	100903	AP	101002
U	1-101997	AQ	277 (clip on AM)

Note: Late construction has R and S bakelite molded on AC and AD.

Motor Unit

The motor unit consists of motor, switches, condenser, fuse, etc. This assembly hangs on shaft AP (Fig. 31) which passes through the collars of side plates AL. The lower projections on side plates AL are fastened to assembly O (Fig. 9) with screws AK.

The complete motor assembly can be readily removed by loosening screws B in the collars of AL and removing shaft AP, also the screws which hold side plates AL to assembly O (Fig. 9).

The motor is protected by combination fuse and thermal cut-out AG, which prevents the motor burning out in the event that the return tape were to break which would wind the spring tight and stop the motor. The thermal fuse also protects the motor when the carriage is held. This thermal fuse will not break down in less than twenty to thirty seconds thereby allowing for a variation of the motor load.

An ordinary fuse should not be used.

Motor Speed

The motor speed is set to turn shaft P (Fig. 29) 185 to 195 R.P.M. for 11 inch carriages; 175 to 185 R.P.M. for 18 inch carriages.

Note: The speed of machines not having latch H (Fig. 30) should not exceed 178-180 R.P.M.

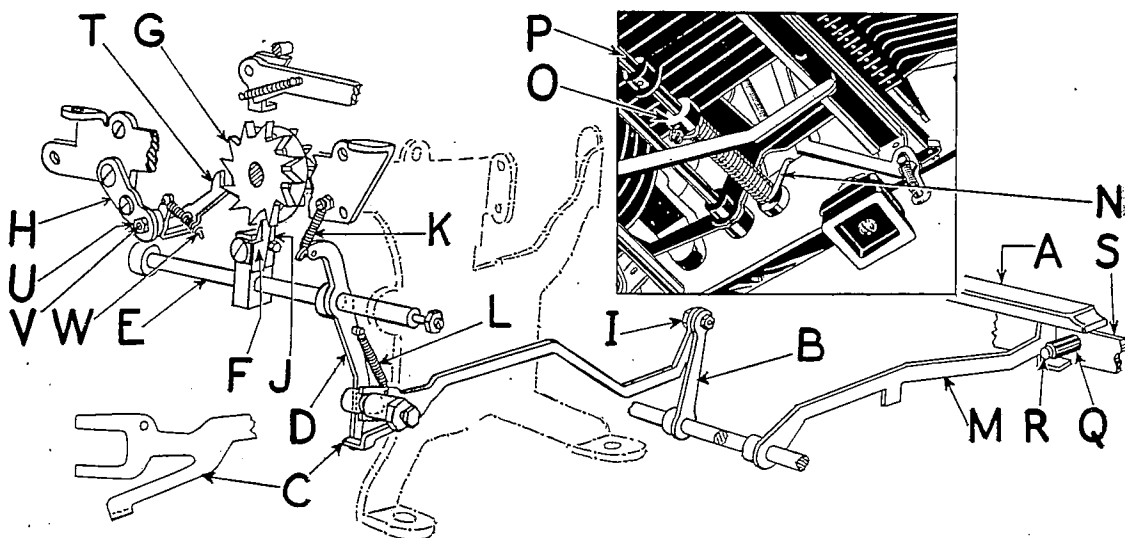
The speed of shaft P (Fig. 29) can be tested by depressing the shift key sufficiently to cause the motor to operate. A screw driver is held on gear K (Fig. 29) and the contacts of the screw in gear K are counted.

Note: Eccentric Q (Fig. 22) must be located so that its high point will clear worm C.

SELF-QUESTIONS

- 157—How is the motor unit removed?
- 158—What device is used to protect the motor and how does it function?
- 159—At what speed is the motor set for 11" carriages?
- 160—At what speed is the motor set for 18" carriages?
- 161—What is the speed for machines not having latch H?

SPACE BAR—TYPE 60 (Fig. 32)



(SYMBOLS Fig. 32)

A	1-102103	M	100103A*
B	1-102107*	N	102801
C	104127A Style E	O	1-7140 $\frac{3}{4}$
D	1-104117 Style E*	P	1A-102003
E	1-104001	Q	100900A
F	104113 No. 2	R	100300A*
G	1-104003A	S	1-100101A
H	1-104143B	T	104111
I	104505	U	49 $\frac{1}{4}$
J	104112 No. 3	V	104502
K	82813	W	10780 $\frac{1}{2}$
L	3981		

Space Bar—Type 60

When the space bar in Type 60 machines is depressed, the platen spaces completely on the down stroke.

While space bar A (Fig. 32) is being depressed, lever B pulls link C forward, the latter swings lever D which rocks shaft assembly E, moving loose dog F out of escapement wheel G. The hold of link C on lever D gradually decreases, resulting in lever D disengaging from link C which allows lever D to restore to normal and complete the spacing of the platen.

Tests and Adjustments

When space bar A is depressed to within $\frac{1}{32}$ inch of rubber limit Q, loose dog F should release escapement wheel G.

Adjustment: Eccentric I is turned.

When space bar A is depressed to rubber limit Q, lever D should release from link C.

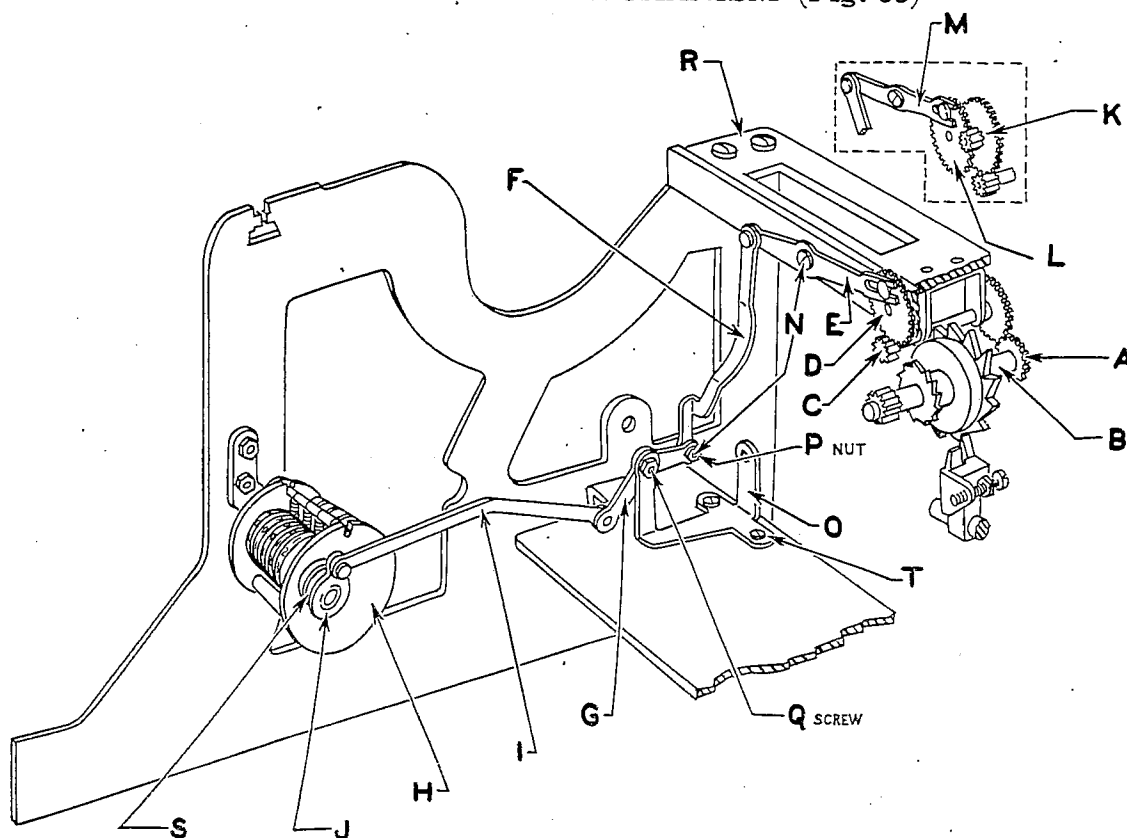
Adjustment: The lower projection of link C is lowered for earlier release and raised for later release.

The tension of spring N can be adjusted by releasing set collar O and turning it in either direction.

SELF-QUESTIONS

- 162—How does the space bar now used in Type 60 machines function compared to the space bar in Type 50 machines?
- 163—How is the depression of the space bar timed with the escapement mechanism?
- 164—How is the depression of the space bar timed to the release of lever D?

STROKE COUNTER MECHANISM (Fig. 33)



SYMBOLS (Fig. 33)

A	1- 104138	L	11- 104137 No. 2
B	1- 104003A	M	1- 108156 No. 2
C	1- 104006	N	72591
D	1- 104137 No. 2	O	1- 105133 No. 2 (Specify Style E for Electric)
E	1- 108156		1- 105133 No. 2 (18) Style E
F	108157*	P	49 1/4
G	108159*	Q	76528
H	51A-1618A	R	11- 100106A (11) (18) (for 240 to 1 ratio)
I	1- 108158		1- 100106A (11) (18)
J	1- 108160*	S	75618
K	11- 104137 No. 1	T	7356 1/2

Stroke Counter Mechanism Types 50 and 60

The purpose of this mechanism is to count in multiples, the key strokes.

One style counts 1 for 60 key strokes; the other style counts 1 for 240 key strokes.

Sequence and Construction 60-1

Gear A (Fig. 33) on shaft assembly B turns gear assembly C, and gear D which oscillates lever E. Link F rocks bell crank G to actuate stroke counter H through link I and arm J.

Gear A is mounted on standard escape-ment shaft, replacing one of the two lock nuts on that shaft assembly.

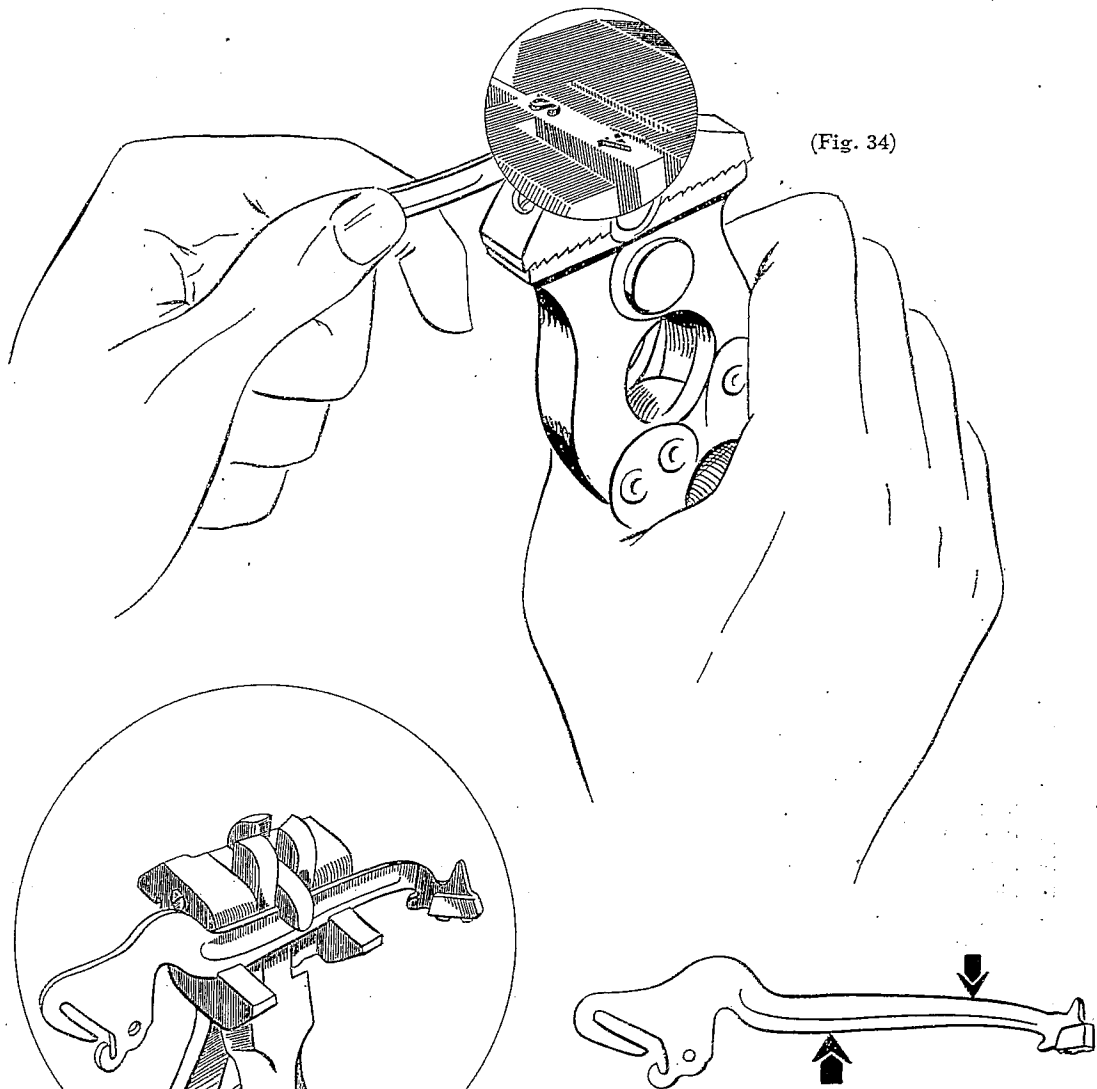
240-1

This construction is similar to the 60-1. The higher gear ratio is obtained by adding gear 11-104137 No. 1.

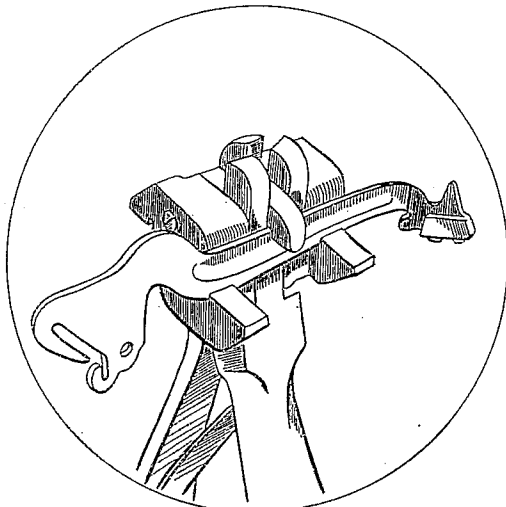
SELF-QUESTIONS

- 165—What is the purpose of the stroke counter mechanism?
 166—How is the stroke counter mechanism actuated?
 167—How many styles of stroke counter mechanism are there and what is different in their construction?

TYPE ALIGNING TOOLS



(Fig. 34)



(Fig. 35)

Type Aligning

Typewriter type is aligned to print as follows:

The letters should print exactly in a straight line.

The impression of the printed letters should be the same, top, bottom and sides.

The letters should print in center when printing lower case, upper case and lower case. Also when printing upper case, lower case, upper case of the same letter.

The letter should also print with equal space between all letters.

The tools which are required for aligning, their purpose and their use are explained in detail under their own heading.

To insure good and lasting alignment the carriage should be tested and adjusted as covered on Pages 23-25.

Offset Tool

Used to move the upper and lower character to the left or to the right. The type bar is removed for this adjustment.

To offset type to the right, the type is inserted with the type face upward, the type bar pulled to limit the type on the slot shoulder with the type face even with the stationary block (see illustration). Pressure is now applied.

To offset type to the left, the type is inserted face downward and even with the bottom face of the stationary block and the type held to limit as explained for right offset.

After this operation, it is usually necessary to straighten type with the flat benders, which are used as explained under their own heading.

Note: It is not possible to specify the amount of pressure to apply to this or any other tool used for aligning type. The correct amount of pressure or the correct amount of bending can only be acquired through experience; it is advisable to start easily and note the effect.

Aligning Benders, Straight and Offset

These benders have straight slots at one end to fit the type bar and tapered slots at the other end to fit the type. The benders are used for placing type on their feet when either side prints light. The benders are also used to bend type parallel with other type and to center type with itself when the lower character is printed, backspaced, and the higher

character is printed on the lower character.

The type bar, which is not removed, is held with the straight bender. To apply, the key is depressed to place the type bar into the type guide, the bender is held in the opening of the type guide, and the type allowed to move into the straight slot to hold the type bar and clear the type guide. The bending is done with the offset bender applied to the type using the tapered slot. To place type on its feet, the offset bender is held horizontally and the type twisted. To straighten type the offset bender is held vertically. Caution: Under no circumstances should type be bent when the type bar is in the type guide.

Peening Tool or Mauler

This tool is used to place type on their feet when the top or bottom of the upper or lower type prints light.

When the top of both upper and lower characters prints light, the mauler is applied on the type bar opposite to the type face and immediately above the number, which is stamped on the bar.

When the bottom of both upper and lower characters prints light, the mauler is applied on the opposite side.

When the top of the upper character only prints light, the mauler is applied to the upper portion of the type and as close to the face edge as safety will permit.

When the top of the lower character prints light, the mauler is applied on the type along the edge and close to the top of the character.

When the bottom of the upper character prints light, the mauler is applied on the type along the edge and close to the bottom of the lower character.

Caution: The necessity of applying the mauler to the type ought to be definitely and correctly decided before it is used, on account of the fact that the pressure of the mauler can loosen the solder.

Nine Prong

This tool is used to secure the correct contact of the type on the platen and the correct contact of the type bar on the anvil.

When the nine prong is applied to a type bar, the bend takes place in the direction of the center prong.

This tool is also used to lengthen or shorten the type bar when the type prints high or low.

When the type prints low, the center prong of the nine prong is applied, as indicated by

the arrow toward the left as shown on the illustration.

When the type prints high, the center prong of the tool is applied on the opposite side.

Note: The lengthening or shortening of the type bar is accomplished by increasing or decreasing the curvature of the type bar and is for that reason limited. When type print considerably high or low, the type bar must be changed.

Note: When nine prongs have been used to raise or lower type, it is necessary to test for equal contact on platen and anvil as explained on Page 19.

Nine prongs are also used to straighten type when the upper and lower characters are in opposite direction.

Making a Complete Type Change

Before aligning the type, check the carriage for conditions covered on Pages 23-25. Check shift and platen position covered on Page 19.

To Center the N Type

Print the small N, capital and again the small N, there should be equal vertical space between the letters. To adjust, bend the type bar above the guide to the right or left. Repeat the centering operation with the M type. To test, if the N type is straight, print as follows: nmNMn NMN, if the capital and small letters show the same relation to center the type are straight.

Another test to make in determining if the N type is straight is as follows: Print the small N lightly, back space and then print the capital N on top of the small letter. The left vertical line of each letter should be in line. This same test may be used during the centering operation of all type.

Center the characters on each type by printing small letter, capital and small letter. There should be equal space between the characters. During this operation all type which print light on either side should approximately be put on their feet. Type which print light on top or bottom requiring the use of the peening tool or mauler can be put on their feet later.

Print a sample of the upper and lower case

characters and align the letter N central with the majority of the other letters. Again check the upper and lower inner carriage limits with a paper feeler, adjust the two overthrow posts for the inner carriage and test the inner carriage lock for being parallel.

The upper and lower case letter N is now considered standard and all letters are aligned to it. Each character is aligned for equal space between the N, i.e., NAN, nan. All letters are aligned in an exact straight line with upper and lower case letter N. All letters are aligned to print parallel to letter N and all letters are placed on their feet. In order for the upper and lower case letters to have equal space between the upper and lower case N, the characters of each type must be central with itself, i.e., when upper case character is printed on lower case character.

SELF-QUESTIONS

- 168—To which test is typewriter type aligned?
- 169—Which tool and how is it used to move the type sidewise in order to have equal space between all letters and other type?
- 170—What other type adjustment is usually necessary when type is moved sidewise?
- 171—Which tool and how is it used to place type on their feet when both characters print light on either side?
- 172—Which tool and how is it used to straighten type when its print is not parallel to other type?
- 173—Which tool and how is it used to center type with itself?
- 174—Which tool and how is it used to place type on its feet when the tops or bottoms of characters print light?
- 175—Which tool and how is it used to place type on its feet when the top of one character only prints light?
- 176—Which tool and how is it used to place type on its feet when the bottom of one character prints light?
- 177—Why is it advisable not to use the mauler until its exact need has been determined?
- 178—Which tool and how is it used to secure the right relation of the type bar on the anvil and platen?
- 179—How much clearance should there be between the anvil and type bar when the type is limiting on the platen?
- 180—Which tool and how is it used to raise the type when both characters are slightly low?
- 181—Which test should be applied when type are raised?
- 182—What should be done when both characters are excessively high?
- 183—Which tool and how is it used when the characters on a type are slightly in opposite directions?

Type Aligning

Typewriter type is aligned to print as follows:

The letters should print exactly in a straight line.

The impression of the printed letters should be the same, top, bottom and sides.

The letters should print in center when printing lower case, upper case and lower case. Also when printing upper case, lower case, upper case of the same letter.

The letter should also print with equal space between all letters.

The tools which are required for aligning, their purpose and their use are explained in detail under their own heading.

To insure good and lasting alignment the carriage should be tested and adjusted as covered on Pages 23-25.

Offset Tool

Used to move the upper and lower character to the left or to the right. The type bar is removed for this adjustment.

To offset type to the right, the type is inserted with the type face upward, the type bar pulled to limit the type on the slot shoulder with the type face even with the stationary block (see illustration). Pressure is now applied.

To offset type to the left, the type is inserted face downward and even with the bottom face of the stationary block and the type held to limit as explained for right offset.

After this operation, it is usually necessary to straighten type with the flat benders, which are used as explained under their own heading.

Note: It is not possible to specify the amount of pressure to apply to this or any other tool used for aligning type. The correct amount of pressure or the correct amount of bending can only be acquired through experience; it is advisable to start easily and note the effect.

Aligning Benders, Straight and Offset

These benders have straight slots at one end to fit the type bar and tapered slots at the other end to fit the type. The benders are used for placing type on their feet when either side prints light. The benders are also used to bend type parallel with other type and to center type with itself when the lower character is printed, backspaced, and the higher

character is printed on the lower character.

The type bar, which is not removed, is held with the straight bender. To apply, the key is depressed to place the type bar into the type guide, the bender is held in the opening of the type guide, and the type allowed to move into the straight slot to hold the type bar and clear the type guide. The bending is done with the offset bender applied to the type using the tapered slot. To place type on its feet, the offset bender is held horizontally and the type twisted. To straighten type the offset bender is held vertically. Caution: Under no circumstances should type be bent when the type bar is in the type guide.

Peening Tool or Mauler

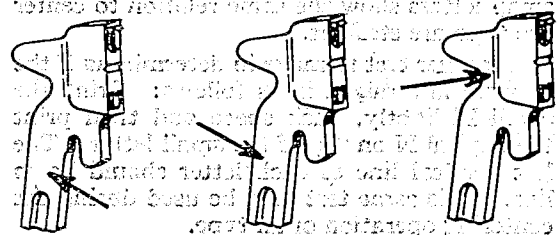


Fig. 36

Fig. 37

Fig. 38

This tool is used to raise and lower type and also to place type on their feet when the printing is partially light.

To raise type: The mauler is applied as indicated by the arrow on (Fig. 36).

To lower type: The mauler is applied at the point indicated by the arrow on (Fig. 37).

When the print of the top of the upper type is light, the mauler is applied as indicated by the arrow on (Fig. 38).

When the top of the lower character prints light, the mauler is applied on the type along the edge and close to the top of the character.

Caution: The necessity of applying the mauler to the type ought to be definitely and correctly decided before it is used, on account of the fact that the pressure of the mauler can loosen the solder.

Nine Prong

This tool is used to secure the correct contact of the type on the platen and the correct contact of the type bar on the anvil.

When the nine prong is applied to a type bar, the bend takes place in the direction of the center prong.

Nine prongs are also used to straighten type when the upper and lower characters are in opposite direction.

Making a Complete Type Change

Before aligning the type, check the carriage for conditions covered on Pages 23-25. Check shift and platen position covered on Page 19.

To Center the N Type

Print the small N, capital and again the small N, there should be equal vertical space between the letters. To adjust, bend the type bar above the guide to the right or left. Repeat the centering operation with the M type. To test, if the N type is straight, print as follows: nmnmN NMN, if the capital and small letters show the same relation to center the type are straight.

Another test to make in determining if the N type is straight is as follows: Print the small N lightly, back space and then print the capital N on top of the small letter. The left vertical line of each letter should be in line. This same test may be used during the centering operation of all type.

Center the characters on each type by printing small letter, capital and small letter. There should be equal space between the characters. During this operation all type which print light on either side should approximately be put on their feet.


Print a sample of the upper and lower case characters and align the letter N central with the majority of the other letters. Again check the upper and lower inner carriage limits with a paper feeler, adjust the two overthrow posts for the inner carriage and test the inner carriage lock for being parallel.

The upper and lower case letter N is now considered standard and all letters are aligned

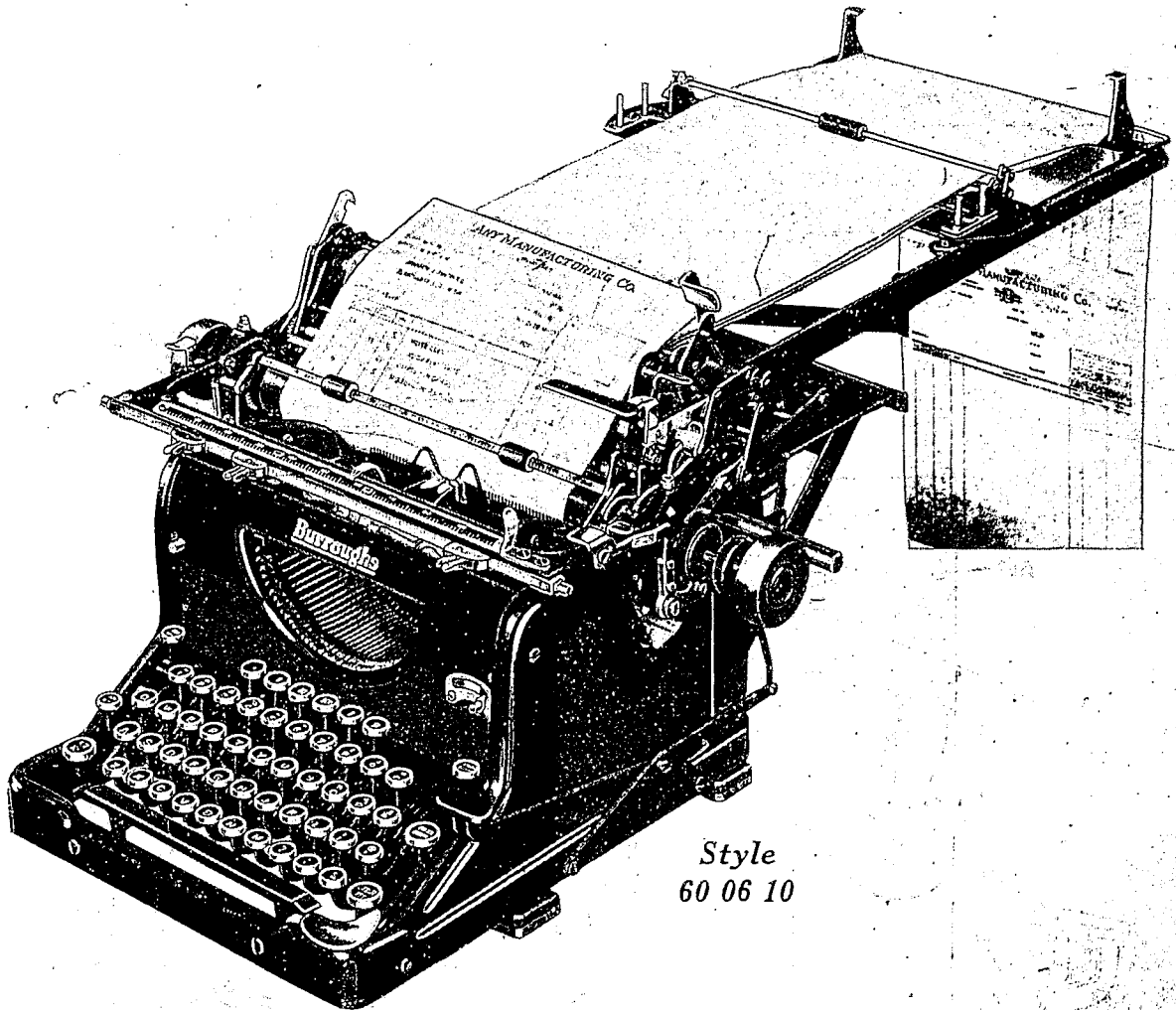
to it. Each character is aligned for equal space between the N, i. e., NAN, nan. All letters are aligned in an exact straight line with upper and lower case letter N. All letters are aligned to print parallel to letter N and all letters are placed on their feet. In order for the upper and lower case letters to have equal space between the upper and lower case N, the characters of each type must be central with itself, i. e., when upper case character is printed on lower case character.

SELF-QUESTIONS

- 168—To which test is typewriter type aligned?
- 169—Which tool and how is it used to move the type sideways in order to have equal space between all letters and other type?
- 170—What other type adjustment is usually necessary when type is moved sideways?
- 171—Which tool and how is it used to place type on their feet when both characters print light on either side?
- 172—Which tool and how is it used to straighten type when its print is not parallel to other type?
- 173—Which tool and how is it used to center type with itself?
- 174—Which tool and how is it used to place type on its feet when the tops or bottoms of characters print light?
- 175—Which tool and how is it used to place type on its feet when the top of the upper type prints light?
- 176—Why is it advisable not to use the mauler until its exact need has been determined?
- 177—Which tool and how is it used to secure the right relation of the type bar on the anvil and platen?
- 178—How much clearance should there be between the anvil and type bar when the type is limiting on the platen?
- 179—Which tool and how is it used to raise the type when both characters are slightly low?
- 180—Which test should be applied when type are raised?
- 181—What should be done when both characters are excessively high?
- 182—Which tool and how is it used when the characters on a type are slightly in opposite directions?

 This supplement cancels the last two pages, (63 and 64) of the Instruction Book dated 1-34.

FANFOLD BILLING MACHINE

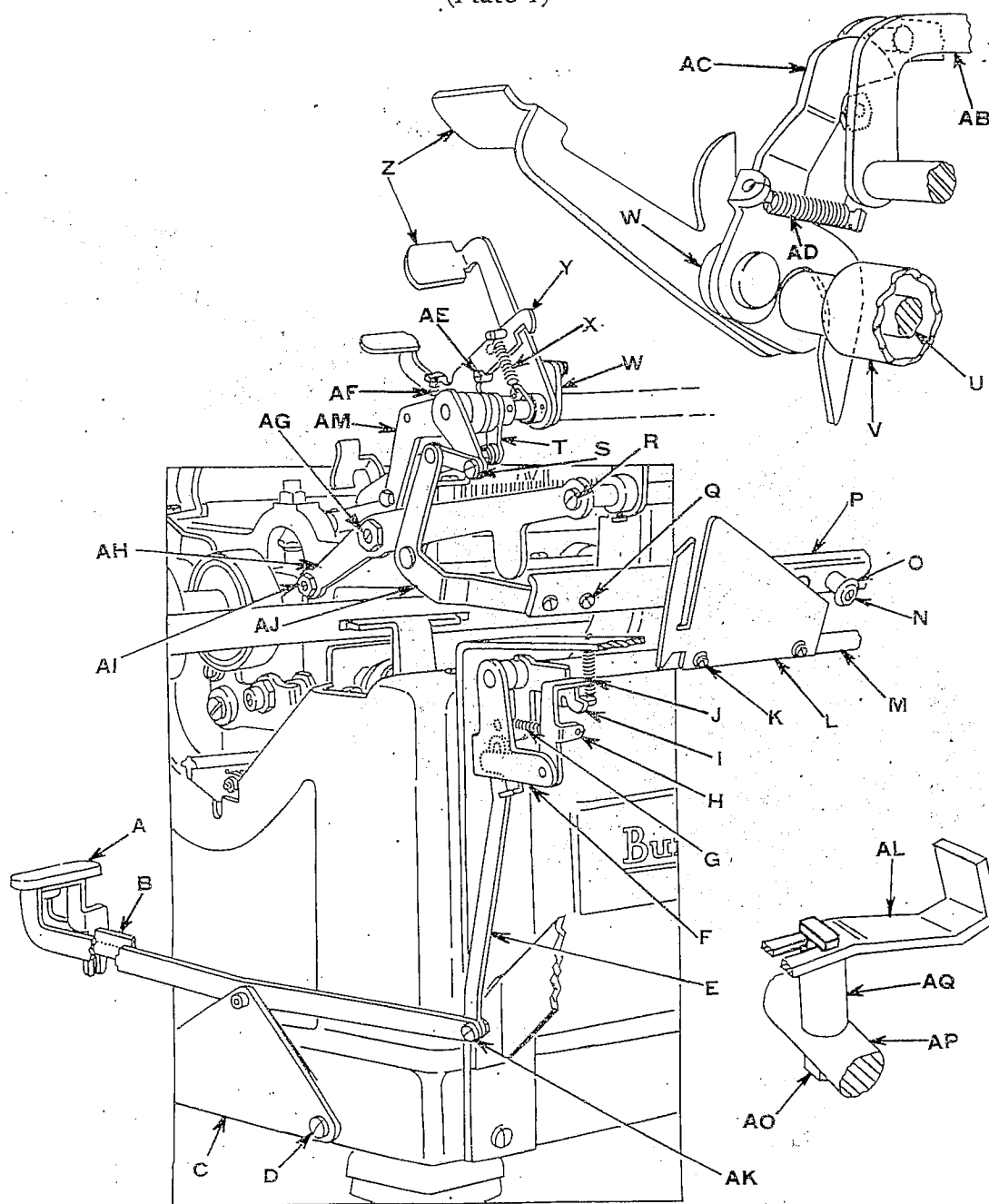


Style
60 06 10

FOREWORD

These instructions are supplementary to the Types 50 and 60 Instruction Book. The construction of and mechanisms special to Fanfold Billing operation, functions and adjustments are covered in detail in this supplement. The procedure of setting up the mechanism for billing operation, with which Inspectors should be familiar, is also included in this supplement.

CARRIAGE OPENING MECHANISM, REAR (Plate 1)



CARRIAGE OPENING MECHANISM

Style 600610 (Plate 1)

Depressing bar A rocks latch H through link E to clear arm I, allowing spring J to swing shaft M and locate cam L in the path of roller O. Bar A when depressed, also contacts on carriage return lever B.

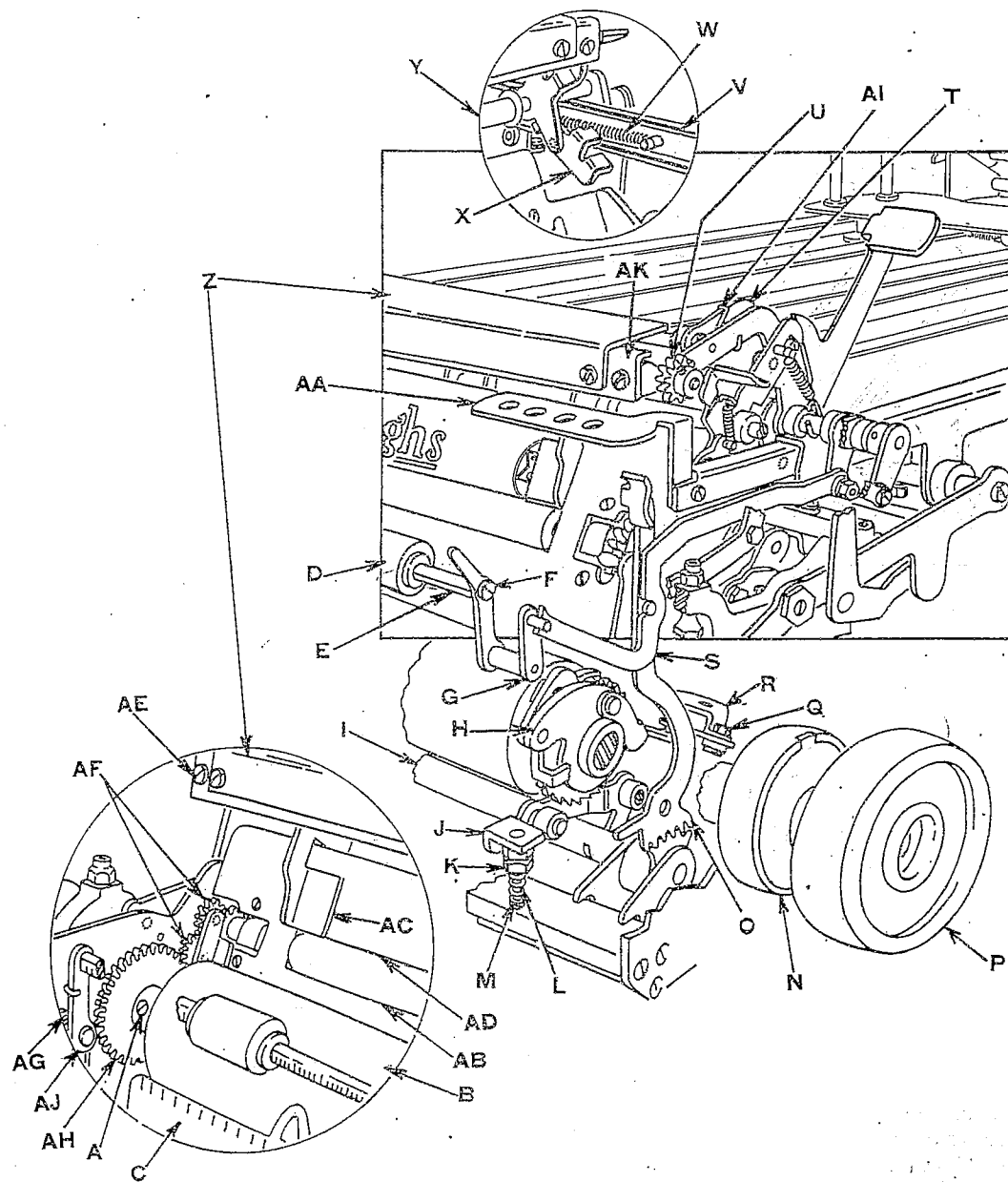
As the carriage is returning, bail P is

raised by roller O riding on cam L. The raising of bail P rocks shaft assembly U which releases feed rolls and platen detent as follows:

Arm T (Plate 1) pushes link S (Plate 2) forward, the pocket of the latter contacting on the stud in feed roll release lever O (Plate 2) swinging the latter to release feed rolls I and detent J. The lower arm of lever O (Plate 2) is geared to the arm on feed roller shaft I, the latter has a flat which lowers detent J.

CARRIAGE OPENING MECHANISM, FRONT

(Plate 2)



Link S (Plate 2) also swings auxiliary bail E forward contacting on the stud in arm G. The raising of bail P (Plate 1) raises paper clamp Z (Plate 2) through arm Z (Plate 1) contacting on the right arm W of hollow shaft V (Plate 1).

Paper tension bail AB (Plate 1) is raised by passby latch AC (Plate 1) the latter pivots on arm W of hollow shaft V.

When the carriage is completely opened, it is latched by right and left arms Y (Plate 1). The carriage can also be opened manually by swinging arm Z (Plate 1) rearwards and manually released by depressing latch arm Y

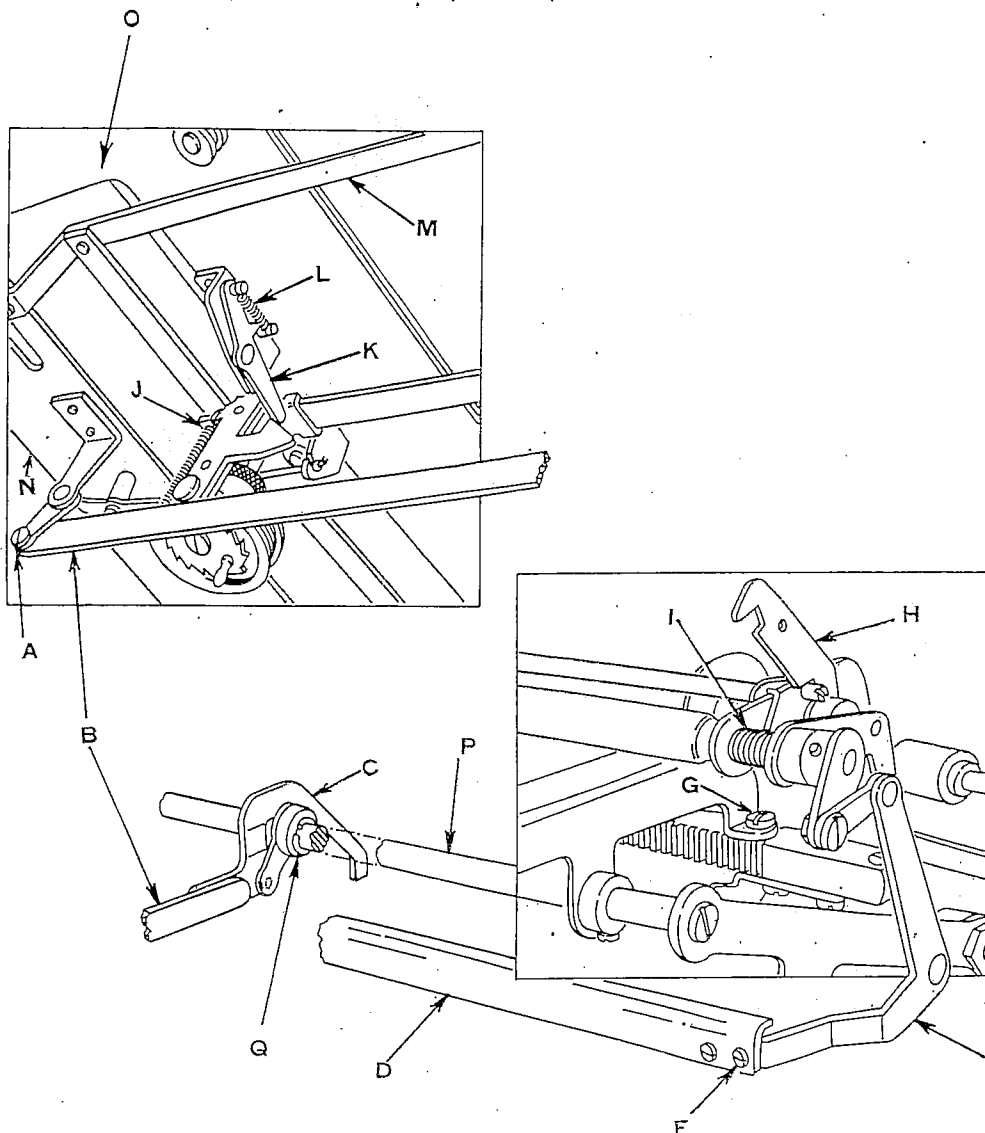
(Plate 1). When the carriage is closed, the feed rolls and detent can be released as usual through lever O (Plate 2). The carriage when in opened position is automatically closed when form limit stop AA (Plate 2) is released by the stud in slide V (Plate 2) on the step of passby latch X (Plate 2).

Limit Stop AA (Plate 2)

Limit stop AA when pulled forward, moves slide V, the latter is limited by adjustable stop T (Plate 4) which is fastened to slide R (Plate 4) by thumb screw S (Plate 4). Slide R (Plate

TRAILER LATCHING MECHANISM

(Plate 3)



4) moves on flanged spring screw Z (Plate 4) in the rear and on post AQ (Plate 1) in front. Slide R (Plate 4) is slotted and held in the front end of slot by spring K (Plate 4) to provide clearance space between latch AC (Plate 1) and the bent lip on slide AL (Plate 1) (shown as R on Plate 4).

A continued pulling of limit stop AA (Plate 2) after slide R (Plate 4) contacts on stop T, moves slide R (shown as AL on Plate 1) in its slot to swing latch AC (Plate 1) which releases paper tension bail AB (Plate 1).

When an invoice is completed, the carriage is returned and opened through the depression of bar A (Plate 1). The forms including the completed invoice and carbons are carried rearward by trailer O (Plate 3), the latter is

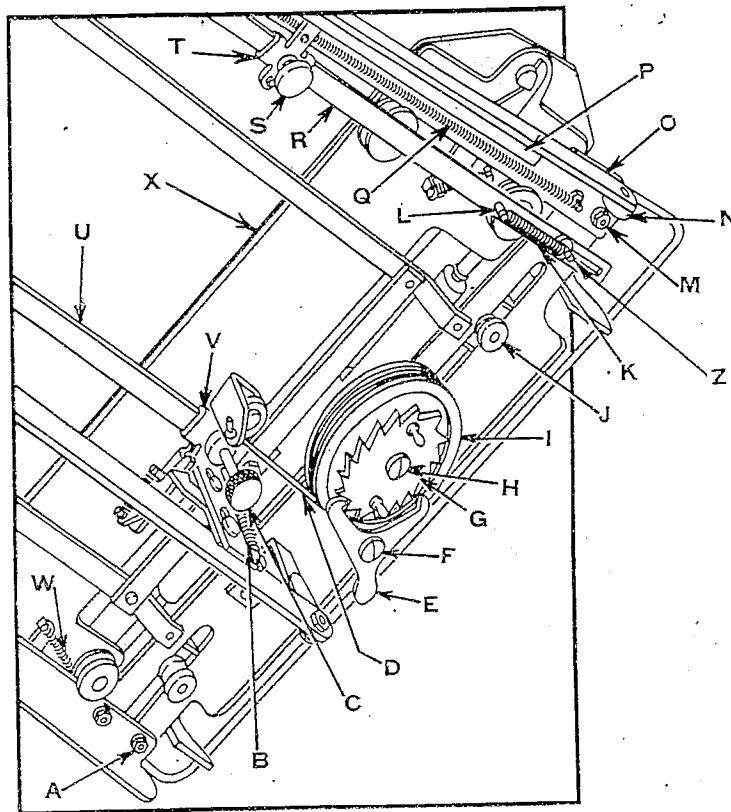
pulled back by spring barrel assembly I (Plate 4) through draw string D (Plate 4).

Trailer O (Plate 3) is locked in rear position while the carriage is open by latch K (Plate 3) catching on hook J (Plate 3). This locates and holds the carbons in position for the next invoice while the forms are pulled out with limit stop AA (Plate 2) which locates the bottom of the completed invoice on the tear-off line. The limit stop when released, closes the carriage through the stud in part V, contacting on passby X (Plate 2) on latch Y (Plate 1).

Hook J (Plate 3) slides on bracket V (Plate 4), the latter is the limit for trailer O (Plate 3). Bracket V (Plate 4) is adjustable on bar U (Plate 4), knurled finger screw C

LIMIT STOP CONTROL MECHANISM

(Plate 4)



(Plate 4) being loosened and the bracket located as required. This adjustment is made when carbons are made shorter.

Spring barrel assembly is fastened rigidly to part N (Plate 3).

TESTS AND ADJUSTMENTS

Platen (Plate 2)

Platen must spin freely when the carriage is open. With platen screws loose and right twirler removed, the left twirler is set against the shoulder on platen shaft, a .002 feeler placed between twirler hub and bushing.

Platen and platen ratchet are pushed to right position and platen screws locked. The feeler is now removed and right twirler placed so that outside flange of the disk on the twirler is flush with the sliding member.

In the event that the vertical spacing were changed by using a different diameter platen it would also be necessary to change the pressure rolls.

Eccentrics AE (Plate 1)

The purpose of eccentrics AE is to permit latching the paper clamp when more, thicker or thinner forms are used.

Eccentrics AE are used on both right and left sides. Eccentric AE must be located with the high point toward the rear, in order to allow the latch to ride off AE.

When eccentric AE is turned to its extreme height, the hold of latches Y (Plate 1) on AE is reduced, which results in the carriage not remaining closed.

Plate 3

When the carriage is open, which locks trailer O, the stud in hook J should not bind on link B, the latter should have slight play. Adjustment: Part N is bent.

Plate 5

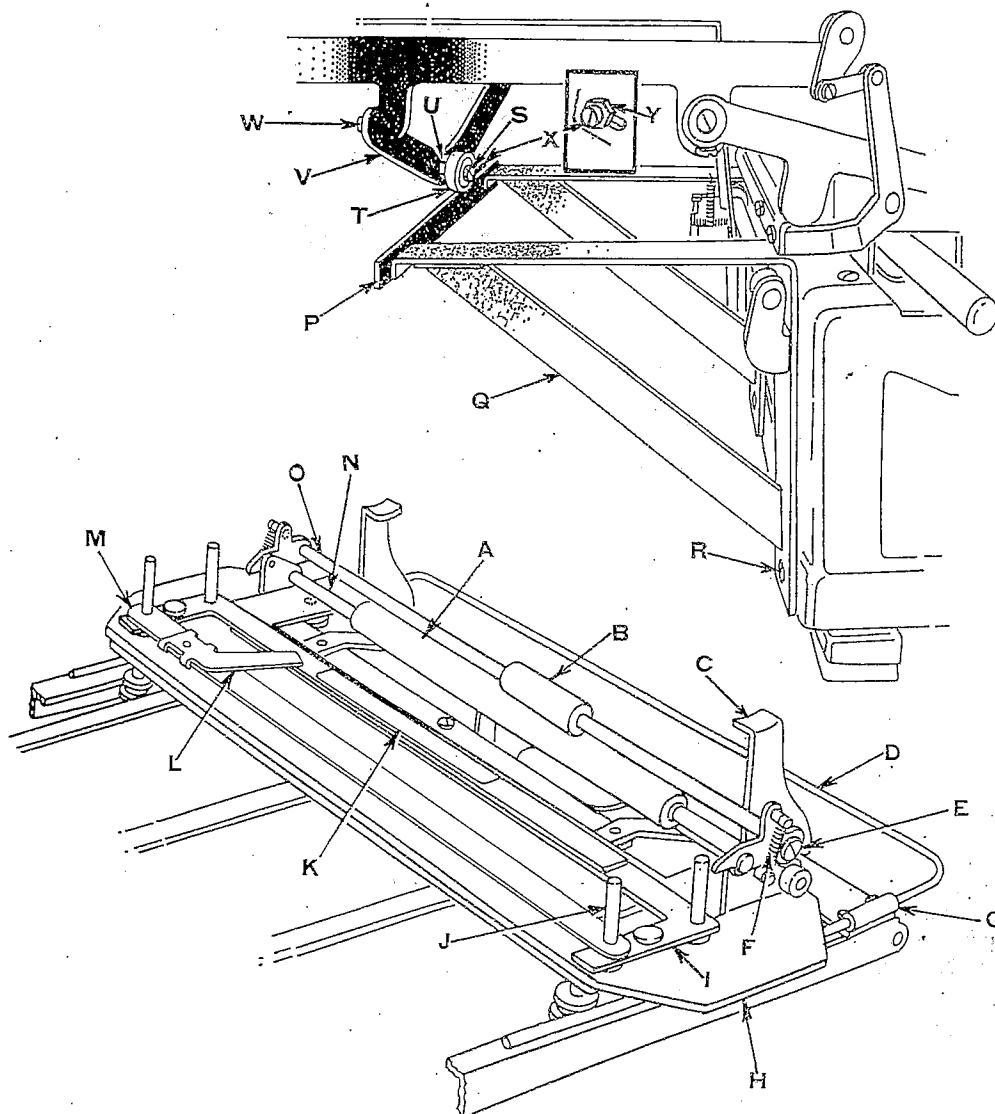
The form holding table is supported by roller bearing T contacting on bar P. With the carriage on the extreme left side, eccentric U is adjusted so that the front roller bearing on the outer carriage will contact the front rail.

With the carriage on the extreme right, eccentric Y is also adjusted so that the front roller bearing will contact the rail.

Platen Detent J (Plate 2)

Platen detent J is adjustable for weight of forms, nuts K are turned.

CARBON BLADE AND REAR END ASSEMBLY (Plate 5)



Line Finder C (Plate 2)

Line finder C is special, the left end being shorter, also stock has been removed to clear the ribbon guide which is moved forward to provide clearance for the forms.

The spring on disengaging arm U (Page 48, Types 50 and 60 Instruction Book) used in Fanfold Billing Machines, has been changed—new symbol 10804 No. 2.

Bail P (Plate 1) must be free moving with spring X (Plate 1) and accelerator spring I (Plate 3) unhooked.

To adjust for free movement of bail P, the right and left bearing plates AM (Plate 1) are bent, also the link which pivots on bail arm AJ (Plate 1) should be aligned to insure free movement of bail P.

ACCELERATING SPRING I (Plate 3)

When hooking up, spring I should have a complete turn after taking up all slack. Test carriage closing with limit stop AA (Plate 2).

HOW TO ATTACH THE FANFOLD ASSEMBLY TO THE BILLING MACHINE

Form limit stop AA (Plate 2) and screws R (Plate 1) are removed from the ends of the shaft of the fanfold assembly. Screws G (Plate 3) are also removed from the billing machine rack.

With the shift key depressed and locked down, the fanfold assembly is placed in position by passing the form limit bar V between the inner carriage side plate and the pressure roll release lever; the fanfold assembly is fastened to the billing machine rack as shown on Plate 3 and fastened with screws R on the right and left side as shown on Plate 1.

Form limit stop AA is fastened to bar V.

SETTING UP

Carriage closed, drag roller B (Plate 5) upward. Pass forms (face down) over wire between guides and drag rolls A and B (Plate 5) and pull forms over paper clamp Z (Plate 2) to front edge of limit stop AA (Plate 2), drop drag rolls.

Locate assembly T (Plate 4) loosen knurled screw S and set assembly T on bar R a distance from the rear end of bar R equal to the length of one form.

Center forms. Place two carbon blades I (Plate 5) alternately on pins J as shown on Plate 5. Adjust forms so that the outside edges are equidistant from the right angles of blades I. Locate guides C. Place and locate carbons in blades I (Plate 5) to have equal clearance on each side of form, test by placing carbon blades on pins J on forms, when central, slip clip K (Plate 5) on blade I (Plate 5). Note: For standard forms, carbon holders are placed as shown in the illustration. For some forms, the carbon holders are reversed which extends the carbon further.

The position of trailer O (Plate 3) should now be located. One of the carbons is placed on the top of the forms. Knurled screw C (Plate 4) is loosened, complete assembly V (Plate 4) moved to locate carbon end to line with the front edge of paper clamp and knurled screw C tightened. This location of the carbon provides finger room when the forms are pulled.

When customer's form requires writing close to top edge, finger room is obtained by cutting off a small portion of the carbon on the upper right corner.

The first carbon is placed on the bottom form, carbon face upward. The next carbon is placed from the opposite side and the balance of the carbons are staggered in the same manner.

Pass forms and carbons under paper ten-

sion bail AB (Plate 1) and between guides AC (Plate 2) locate the latter parallel with rear guides C (Plate 5).

Narrow forms, right side should have $\frac{3}{4}$ " hold on limit stop AA (Plate 2). Close carriage by depressing latch Y (Plate 1), turn platen to date line. Release auxiliary bail E (Plate 2) and make a completed bill.

To Locate Roller O (Plate 1)

When bill is completed, the carriage is placed in the position from which it returns and opens. Roller O is now located in hole of bail P (Plate 1) so that roller will be 1" ahead of cam L (Plate 1).

When bar A is depressed, the carriage is returned and opened. Cam L (Plate 1) opens the carriage. The forms aligned with the front edge of limit stop AA (Plate 2) are pulled out to a stop. Limit stop AA and the forms are let go, the carriage closing and the completed bill torn off.

To tear off, pull forward and slightly upward from left to right; do not pull against paper clamp Z (Plate 2) which can cause the carriage to open.

TO SHORTEN CARBON SHEETS

Complete bill.

Depress carriage opening bar.

Release knurled knob C (Plate 4) and bring assembly V (Plate 4) forward 2 or 3 inches or distance required and tighten knurled knob C.

Complete carbon shift by evening forms and limit stop pulling to stop and release.

Open carriage manually and pull forms from under paper clamp in rear, crease carbon back and forth and tear off form and carbon on top of paper clamp Z (Plate 2).

Grasp middle form and hold firmly in place even with the front edge of limit stop AA (Plate 2).

Release knurled knob C and move assembly V (Plate 4) back to again locate the carbon with the front edge of paper clamp Z (Plate 2) and tighten knob C (Plate 4).

Notice: When assembly V (Plate 4) is shifted forward, it may be advisable to reduce the tension of spring I (Plate 4) in order to eliminate unnecessary jar when trailer O (Plate 3) moves back.

Slitter L (Plate 5)

The purpose of slitter L is to slit forms lengthwise. Blade L which is adjustable on bar M, should point inward as shown on Plate 5 for slitting the left side of the forms. For right side slitting, bar M is turned end for end so as to locate blade L on the right side. Bar M is placed on front pins J as shown on Plate 5.

MECHANISM TO PREVENT CARRIAGE DROP
BACK FROM LEFT MARGIN
TYPE 50 MACHINES

1
T

Installation:

1. Remove left front and rear case panels and spring drum.
2. Loosen bracket K and part L and remove shaft assembly I (Fig. 21).
3. Remove screw I (Fig. 24) in arm E and place arm on top of rack E (Fig. 21).
4. Locate shaft assembly J in machine and replace parts K & L.
5. Part C locates between machine number plate and the escapement unit bracket which supports arm E. Pawl A aligns directly above the escapement star wheel teeth. Screw D and eccentric shoulder bushing F replace I (Fig. 24) and 46 nut.
Assemblies C and J are joined through link I with screw G.
6. Install new 104113 #2 escapement pawl, which now has increased stock thickness where the lower part of the pawl limits on the escapement block after escaping from the star wheel. Stock has been added at this point to retain the star wheel tooth to be contacted by pawl A, in a lower position to eliminate the possibility of a point to point lock when assembly C is actuated on carriage return.

Adjustment:

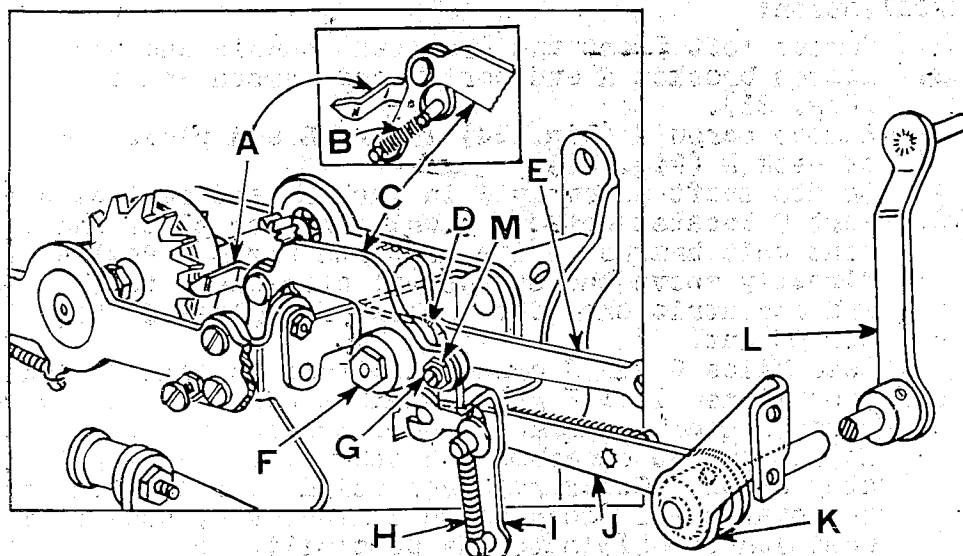
1. Test for correct adjustment of operating slide B (Fig. 21) through part L. Part D (Fig. 21) to engage fully with auxiliary rack E (Fig. 21).
2. Check for pawl A to align with star wheel teeth.
3. Eccentric bushing F is adjusted first, to provide minimum clearance between the point of pawl A and the star wheel teeth when the left margin block is operated to actuate pawl A.
4. Eccentric collar M is adjusted last to provide vertical location of pawl A to insure full downward throw when pawl A is actuated on carriage return. This eccentric has been added since the above mechanism was made standard construction. When installing in earlier machines equipped with this mechanism, replacement of assembly C is also required. The following tests cover adjustment of eccentric collar M:

With carriage not limiting against left margin block, depress and hold key down, hold up carriage travel and release key to bring loose escapement dog to the left of the star wheel tooth set up. Apply upward pressure to the second star wheel tooth to the left of the loose dog to contact star wheel with loose escapement dog. Hold star wheel in this position and return carriage slowly to left margin block limit.

Release star wheel slowly, pawl A should carry star wheel around for one space of pawls U (see Fig. 3). Test by noting the loose escapement pawl to be held tight against the escapement block and back space detent T (Fig. 32) to seat in tooth space of star wheel.

Mechanism to Prevent Drop Back From Left Margin Type 50

1
T



The purpose of this mechanism is to prevent carriage drop back from the left margin when the carriage return lever is started before writing keys or space bar is released causing the following result:

The loose escapement dog locates to the left of the star wheel tooth originally set up, and the detent cannot seat in the tooth spaces of the star wheel.

Pawl A is connected with and actuated by the auxiliary margin limit mechanism which is covered in detail on pages 40 and 41 of Type 50 & 60 Instruction Book.

When margin block A (Fig. 21, Type 50 & 60 Instruction Book) contacts on part B to raise part D, (Fig. 21), pawl A (print 1/T) enters the tooth space of the star wheel locating the latter to limit on the loose dog.

SYMBOLS

A	1-104151	G	76568
B	104806	H	108806
C	1-104150	I	1-108211
D	104504 No. 2	J	11-108009
E	1A-104109A No. 1	K	108145
F	104354 Ecc.	L	1-108146A
		M	72367 Ecc. collar

Note: This mechanism requires spring 3981 in place of Q, (Fig. 21). Spring Q remains standard on Type 60.

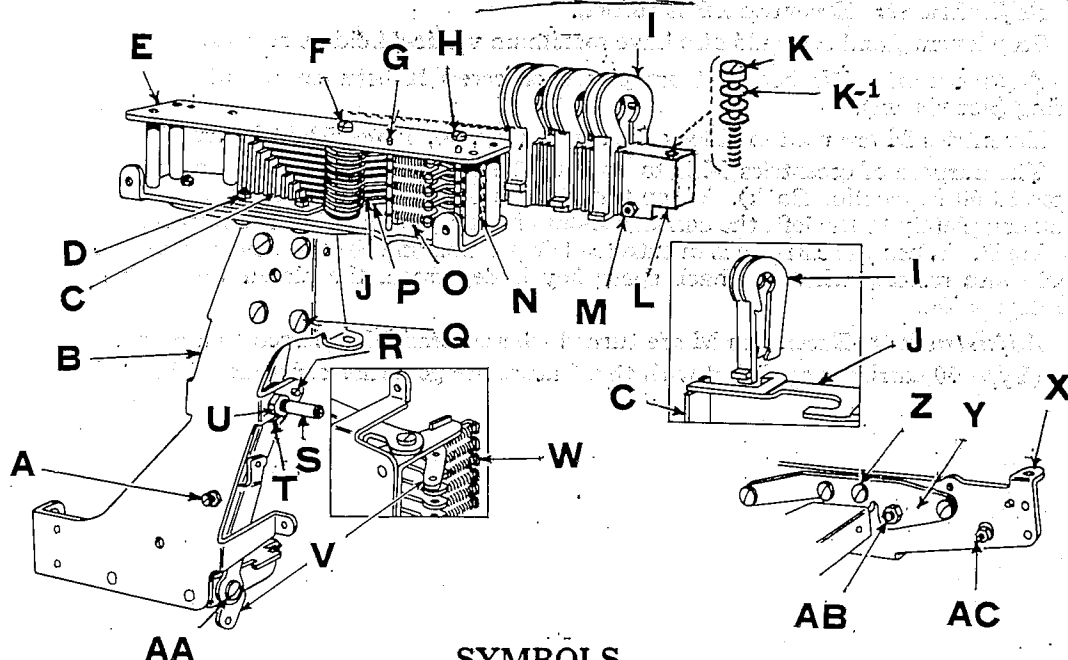
Produced by Burroughs, Detroit, Michigan

Issued 8-7-36

Selective Column Tabulation Feature

Types 50 & 60

2-1
T



SYMBOLS

A	75602 screw, 46 $\frac{3}{4}$ nut	N	84813
B	1-108116 No. 2	O	84813
C	108114 $\frac{1}{2}$ Nos. 2 thru 10 (as stamped)	P	108224 Nos. 2-4-6-8-10 (as stamped)
D	46 nut, 4456 $\frac{1}{2}$ screw	Q	2858 $\frac{1}{4}$ A screw (4 reqd.)
E	1-108222		1097 $\frac{1}{8}$ lock washers
F	108017	R	108004 (uses 470 wire clip)
G	108016	S	101002AE
H	108622	T	108007 P10 No. 2
I	1A-103201 $\frac{1}{2}$ A Nos. 1 thru 10 (specify pitch) (single lug)	U	393
	1A-103201 $\frac{1}{2}$ A Nos. 12 thru 20 (specify pitch) (double lug)	V	108114 $\frac{1}{2}$ No. 1
J	108224 Nos. 1-3-5-7-9 (as stamped)	W	74803
K	103520A No. 3	X	108222*
K-1	103166	Y	108223
L	103904 No. 3 (specify pitch and length)	Z	4456 $\frac{1}{2}$ (4 reqd.)
M	46 nut, 103646 screw	AA	74529
		AB	45 $\frac{3}{16}$
		AC	46 nut, 108234 washer

Not Shown

108233 (cover for E; uses 4 screws 108623)
1-100168 No. 2 Sty. E or Sty. H (back panel)

This mechanism permits selecting any one of ten columns for tabulating, with the carriage in extreme right position. When the carriage is not in right position, only columns to the right of present carriage position can be selected, unless the carriage is first returned to the right.

Decimal tabulating keys covered by Fig. 23, Types 50 and 60, actuate this mechanism.

When one of the tab keys is depressed, the corresponding lever C swings stop lever J or P to block the selected stop I. Lever C also rocks part V, which disconnects the rack as shown by (Fig. 22, Types 50 and 60 Instruction Book).

(OVER)

Produced by Burroughs, Detroit, Michigan

Issued 6-2-39

TESTS AND ADJUSTMENTS

Stop levers J and P should have maximum depth hold on the selected stop I, but clear the bodies of the inactive stops I.

Adjustment: Eccentric AB is turned.

Stop levers J and P should also have maximum vertical hold on stops I.

Adjustment: Washers K-1 are placed on screw K between L and the inner carriage casting (not shown).

Eccentrics M are used in place of limits L, (Fig. 14, Types 50-60 Instruction Book).

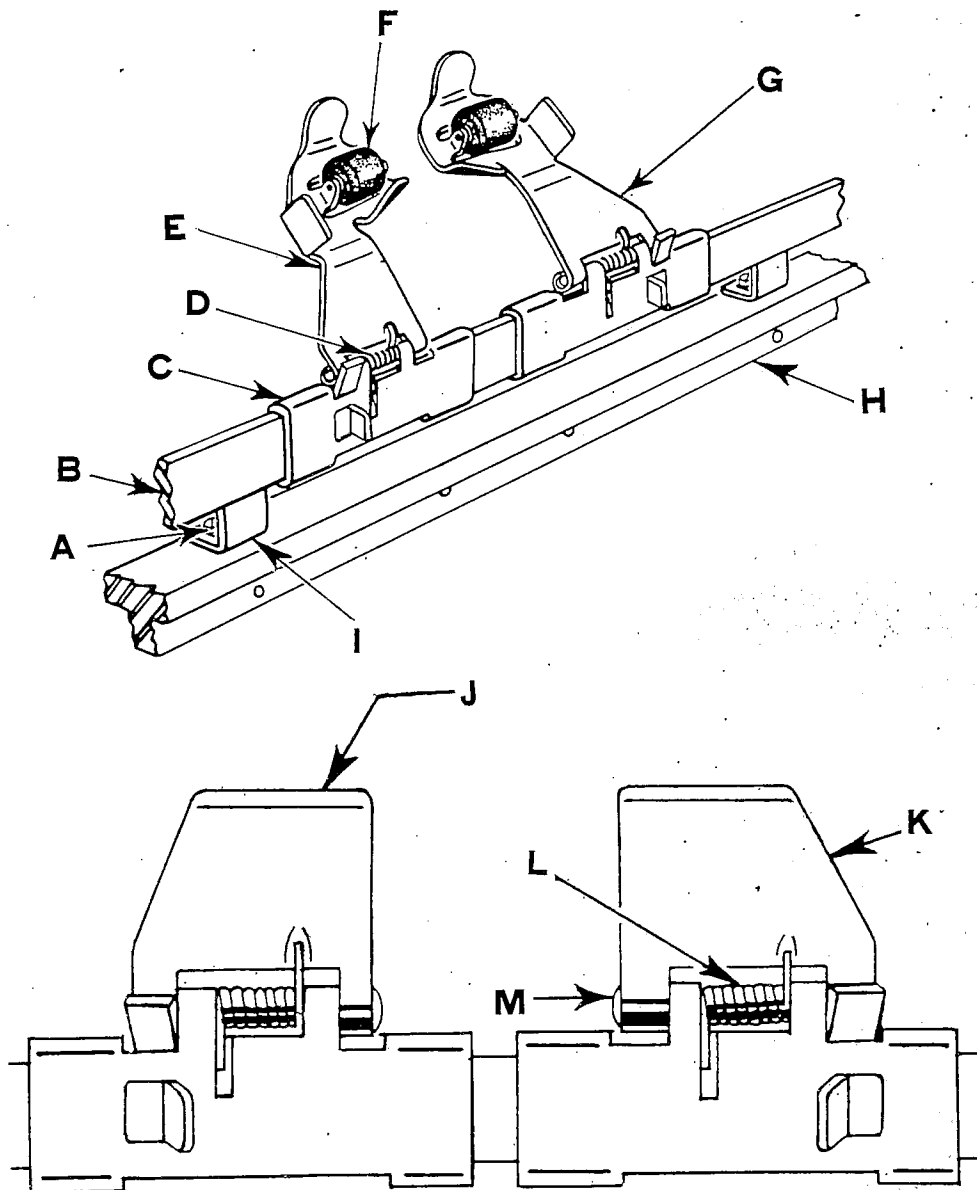
The purpose of eccentrics M is to prevent the inner carriage moving off rail A, (Fig. 11, Types 50-60 Instruction Book). When the carriage is in extreme right position with the margin block completely to the left, the carriage should have minimum play between eccentric M and housing B. When the carriage is in extreme left position and the tab key is depressed, the rack should also restore; when the back space key is depressed, the platen will back space with one depression.

Adjustment: Eccentrics M are turned whereas limits L referred to are bent.

(Type 60 carriages equipped with this feature are governor controlled, Fig. 22-2.)

Paper Fingers Types 50 and 60

3-1
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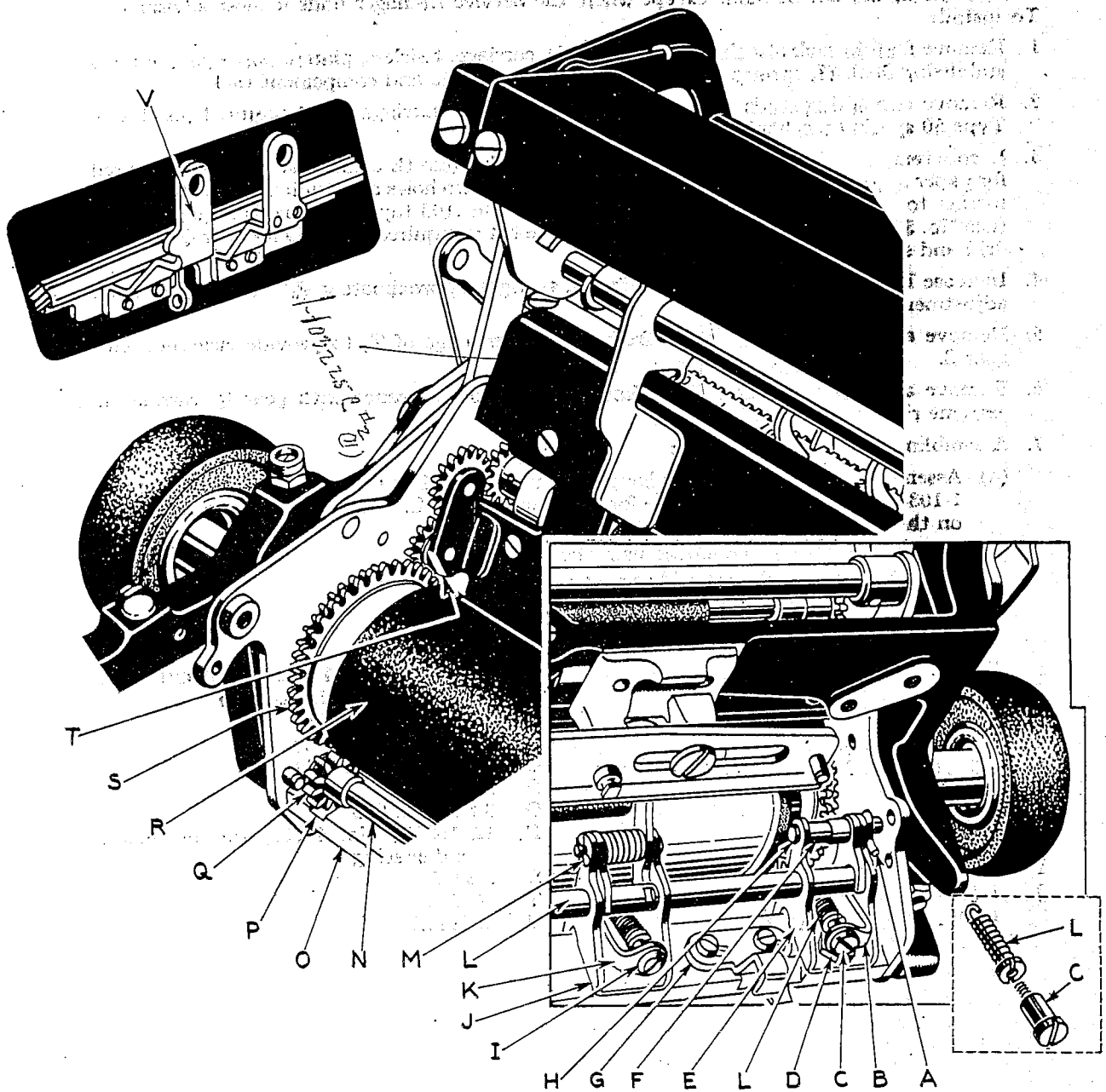


Paper fingers E are used for heavier forms. Paper fingers J and K are cut off to provide line indication. Either assembly is fastened to rail H by screws A passing through slotted lugs I. The previous style paper fingers used wide bar similar to B. Paper fingers and narrow bar can be used to replace the paper fingers and the wide bar.

SYMBOLS

A	950%	11A-103238AL (includes C, D and F)	H	103905C (all lengths)
B	1-103915A (all lengths)	(with cork roll)	I	*Part of B
C	103239BL (included in E)	F	J	1-103238AR No. 2
D	103814A (included in C)	1-103993 No. 3 (rubber)	K	1-103238AL No. 2
E	1A-103238AL (includes C, D and F)	1-103993 No. 4 (cork)	L	103814A No. 2
		G	M	103549A Pin

Geared Pressure Rolls (Front) $\frac{4-1}{T}$ (Type 60 Fanfold)



Produced by Burroughs, Detroit, Michigan

7-11-39

GEARED PRESSURE ROLLS (FRONT)

Type 60 Fanfold

The purpose of this mechanism is to prevent short spacing on Fanfold billing forms; Field installation should not be made except where the Service Manager finds it most advisable. To install:

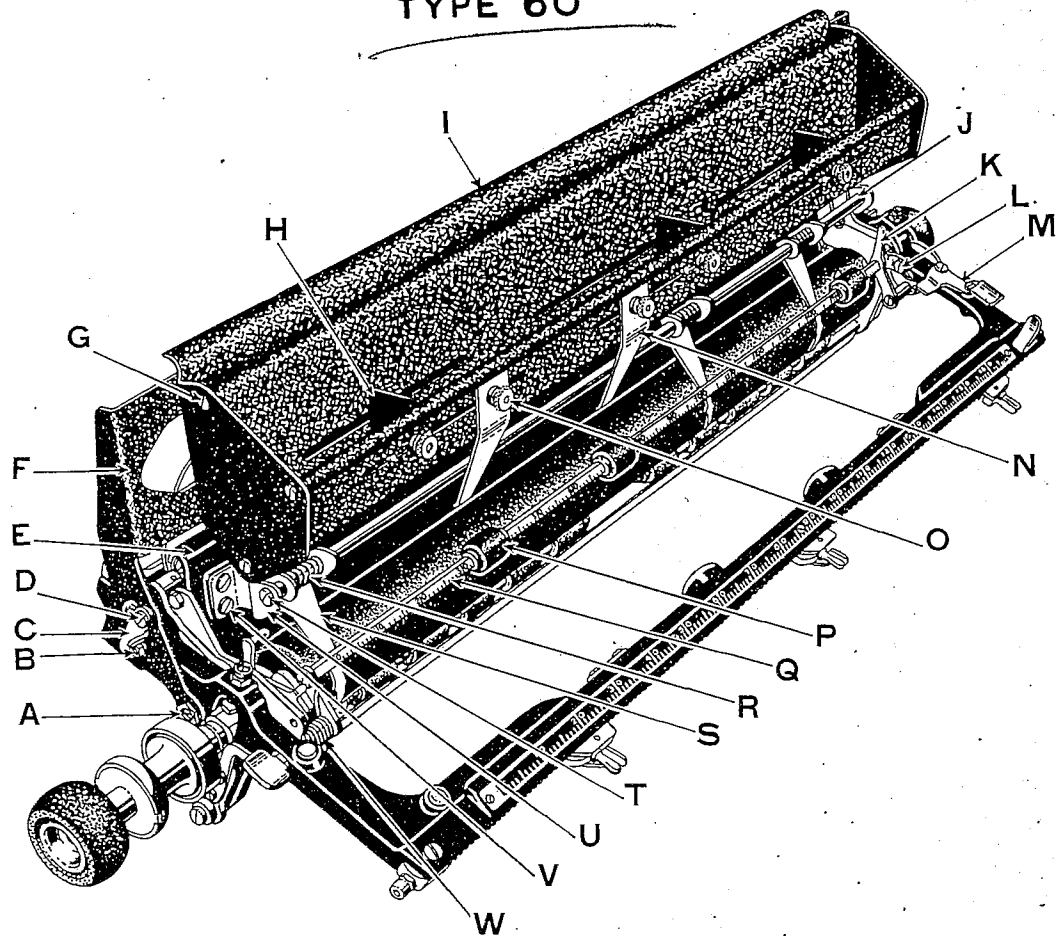
1. Remove fanfold rack attachment, case panels, carriage, twirlers, platen, paper pan, left end stabilizing hook H, springs L, hangers J, line space slide and escapement rack.
2. Remove two spring studs from left side plate of inner carriage. Not required (used with Type 50 spacing mechanism only).
3. Locate template C-51955 on extreme left end of rail O (use threaded hole already in O (used for paper fingers) and screw 79625 as pilot anchor. Two holes are required to locate hook H further to the right, to clear F (use No. 44 drill and .103 tap); one hole is required for D (use No. 37 drill and $\frac{1}{8}$ x 44 tap); one clearance cut is required in rail O for gear Q (use $\frac{1}{4}$ " drill and same template).
4. Increase length of mill cut in rail O for H, to right approximately $\frac{3}{16}$ " to allow for hook adjustment.
5. Remove approximately $\frac{1}{16}$ " stock from lower front edge of T, to provide clearance with gear S.
6. Remove stock from bracket V as shown, to provide clearance with gear Q, carriage in extreme right position.
7. Assembling pressure roll hangers:
 - (a) Assemble right pressure roller hanger on new shaft M as removed (use stronger spring 1-103802B No. 3 to compensate for additional spring L. This strong spring is required on this hanger only.
 - (b) Assemble hanger J as removed using new part K.
 - (c) Assemble additional hanger F as shown.

SYMBOLS

A	72 No. 2	L	1-103802B No. 1 (use 1-103802B No. 3 on extreme right hanger)
B	1-103127BL No. 2 (11)	M	103008A No. 2 (11)
C	53 Fte. 134	N	1-103004 No. 3 (11)
D	104557	O	103905C No. 2 (11)
E	1-103125 No. 2R	P	Mill cut
F	7332	Q	338A Fte. 213
G	103132L No. 2	R	1A-103998 No. 4 (11) specify density and spacing
H	103583A	S	103415
I	103501A	T	103263
J	1-103125 No. 2L	V	105114L
K	1-103127BL No. 3 (11)		

BILL MAGAZINE FEATURE AND JOURNAL BAND FEATURE TYPE 60

5-1
T



The bill magazine is designed to hold a convenient supply of unit forms such as checks, note notices, etc. It is located above the platen and can be readily removed by swinging latches C above studs B. Guides H are adjustable to suit different paper widths. Deflectors N guide the front feed forms.

SYMBOLS

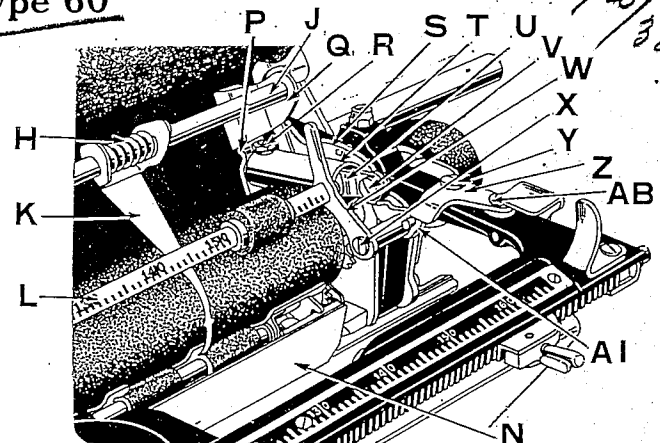
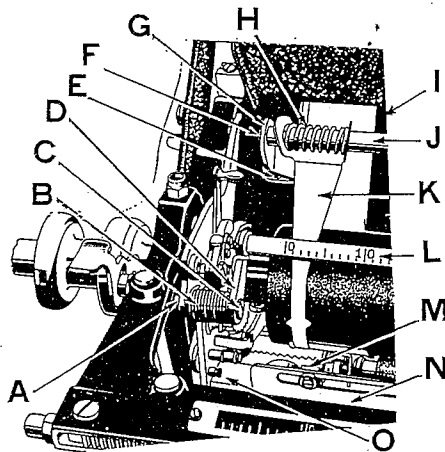
A	103352 No. 2	L	103608AR
B	302 Env. 1776 Nut	M	111 Env. 1777
C	73236L	N	1-109 Env. 1776
D	74529 Screw	O	103373 Knurled Nut, 1-110 Env. 1776
E	1-103225C No. 1 Env. 1776 (specify length)	P	1-103993
F	117L Env. 1776*	Q	103005 (specify pitch and length) Env. 1777
G	2850 $\frac{11}{16}$ Env. 1776	R	800 Env. 1776
H	1-118 Env. 1776	S	1-108 No. 1 Env. 1776
I	(Complete magazine) 1-901 Env. 1776 (specify length)	T	4456 $\frac{1}{2}$ Env. 1777
J	1 Env. 1776	U	119L Env. 1776
K	1-103259AR Env. 1777	V	2850 $\frac{11}{16}$ Env. 1776
		W	103817A Env. 1777

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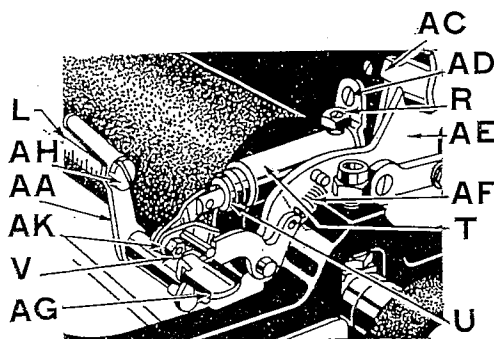
Issued 10-10-39

Auxiliary Pressure Roll Operating Device and Bill Chute

Type 60



AUX. PRESSURE ROLL BAIL—AIR CUSHION



SHIFT KEY CONTROL

Depression of the shift keys or the shift lock key causes bail L to swing forward, due to the stud in part AI contacting on part Z. Part AI pulls plunger U out of dashpot T. When the shift mechanism returns to normal position, the return movement of the bail is controlled by the air resistance of the dashpot.

This feature is used only with the single gothic keyboard arrangement (No. 7); it is not satisfactory for capital letters.

MANUAL CONTROL

When the auxiliary pressure roll assembly is pulled forward, it is latched by the long stud in part AK seating in the pocket of latch AG. Plunger U moves outward being connected to part AK.

This mechanism is released when the finger piece on latch AG is depressed, the return of the bail is controlled by air resistance when plunger U is pushed into dashpot T.

BILL CHUTE

Bill chute N permits easy front insertion of bills or similar forms to a fixed limit stop. The limit stops are not adjustable, being integral with the bill chute.

SYMBOLS

- A 49 1/4 nut, 1097 3/4 washer
- B 103817A Env. 1777
- C 103608AL
- D 1-103259AL
- E 2850 3/4 Env. 1776
- F 4456 1/4 Env. 1777
- G 119L Env. 1776
- H 800 Env. 1776
- I 1-103225C No. 1 (specify length) Env. 1776
- J 1 Env. 1776
- K 1-108 No. 1 Env. 1776
- L 103005 (specify pitch and length) Env. 1777
- M 101A Env. 1768 nut, 75210 Env. 1768 washer, 500 Env. 1768 screw
- N 1-100 Env. 1768 (specify length) (1 3/8" printing line)
- N 1-100 Env. 1768 (for printing line other than 1 3/8") (specify)
- N 1-100 No. 2 Env. 1768 (for 46 key)
- O For Bill Chute Machines:
 - 103905C Env. 1768 (specify length) (42 key machine)
 - 103905C No. 4 (11) (42 key fanfold)
 - 103905C No. 3 Env. 1768 (46 key machine)
 - 103905C No. 2 (11) Env. 1768 (46 key fanfold)
 - (Screws for bill chute not shown; use 500 Env. 1768 for 46 key and 73514 for 42 key)
 - Aligning Scale (not shown) for machines equipped with bill chute:

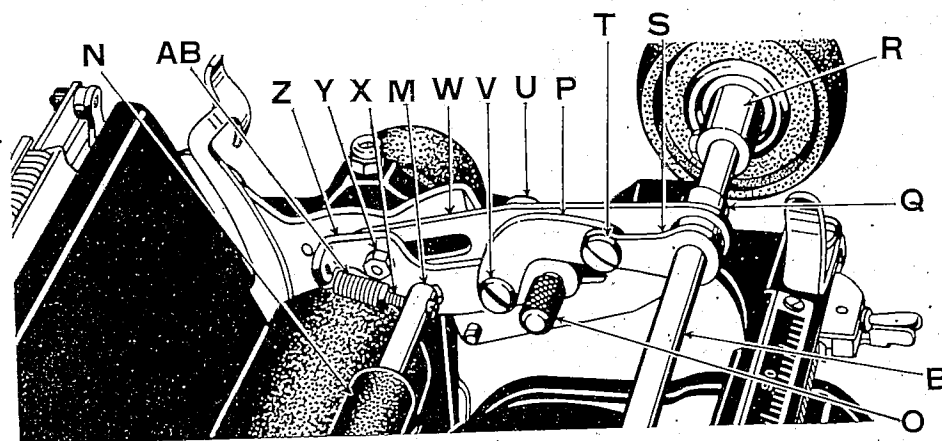
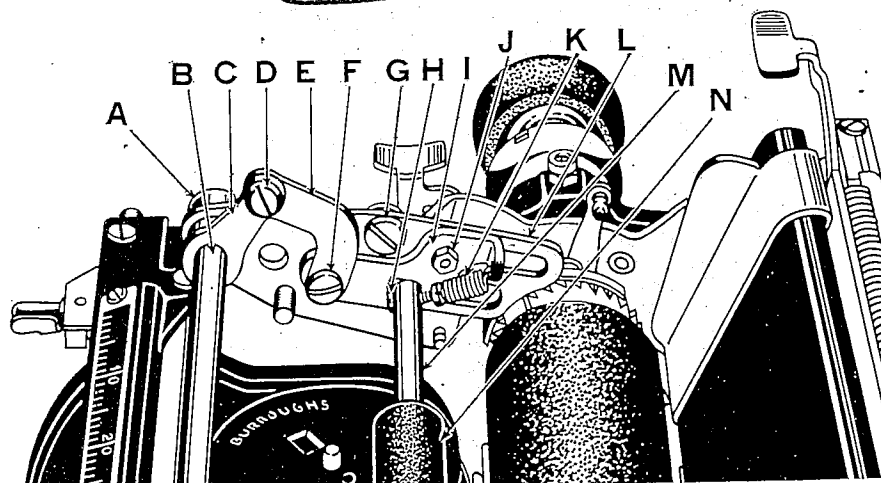
- 105112 No. 1 Env. 1768 (specify pitch)
 - 1-105112 No. 3 Env. 1768 (specify pitch) (for oversize twirler)
 - 1-105112 No. 11 Env. 1768 (specify pitch) (for fanfold)
 - P Bracket, included in T
 - Q 119R Env. 1776
 - R 103536 screw, 103359 nut
 - S 1-103110BR No. 3 Env. 1777
 - T 1-103447A Env. 1777 (includes P, R and U)
 - U 1-103448 Env. 1777
 - V 9053 3/4 Env. 1777 screw, 103354 nut
 - W 103259AR Env. 1777
 - X 103608R
 - Y 4456 1/4 Env. 1777
 - Z 111 Env. 1777
 - AA 1-103259AR No. 2 Env. 1777
 - AB 4456 1/4 Env. 1777
 - AC 1-103120A Env. 1777
 - AD 2850 3/4 Env. 1776, washer 76120 Env. 1777
 - AE 1-103110BR No. 3 Env. 1777
 - AF 2883 1/2
 - AG 103260 (uses screw 79503)
 - AH 103519
 - AI (included in W) (AK included in AA)
- NOTE: The stud (not shown) in right shift key arm that controls "Carriage Return from Shift Key" is symbol 501 Env. 1777: nut 103354

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Issued 10-10-39

CARD HOLDER...FEED ROLL BAIL TYPE 60

7-1
T



THE CARD HOLDER AND FEED ROLL BAIL IS USED IN CONNECTION WITH THE BILL CHUTE FOR PRE-STUFFED ENVELOPES, CARDS OR OTHER HEAVY PAPER STOCK.

THE FEED ROLLS WHEN OPENED ALLOW THE FORMS TO BE READILY INSERTED AND WHEN CLOSED THE FEED ROLLS ARE HELD SECURELY IN PLACE BY TOGGLE LINKS E AND P. THE OPENING AND CLOSING IS ACCOMPLISHED BY TURNING TWIRLER R.

THE OPENING IS ADJUSTABLE TO TWO POSITIONS. WHEN KNURLED PLUNGER O IS PUSHED IN, IT ENTERS INTO A CURVED SLOT IN PLATE W, WHICH PREVENTS THE COMPLETE OPENING MOVEMENT OF THE BAIL. THE TENSION APPLIED BY THE BAIL WHEN IN LOCKED POSITION IS ADJUSTED BY TURNING SCREW X.

SYMBOLS

A....73356 COLLAR, 103649 SET SCREW
B....2 ENV. 1322 (SPECIFY CARRIAGE LENGTH)
C....1-1322 1/2 L ENV. 1322
D....259 1/2 ENV. 1322 SCREW, 46 NUT
E....103 ENV. 1322
F....76120 ENV. 1322 WASHER, 500 ENV.
1322 SCREW, 501 ENV. 1322 NUT
G....15501 A ENV. 1322 SCREW, 103352
ENV. 1322 NUT
H....74534 ENV. 1322
I....102 L ENV. 1322
J....7354 3/4 ENV. 1322 SCREW, 46 ENV.
1322 NUT
K....1-103802 B No. 3
L....1-101 L ENV. 1322
M....1 ENV. 1322 (SPECIFY LENGTH)(USES
SCREW 8054 3/4 ENV. 1322)
N....1-103993 ENV. 1322

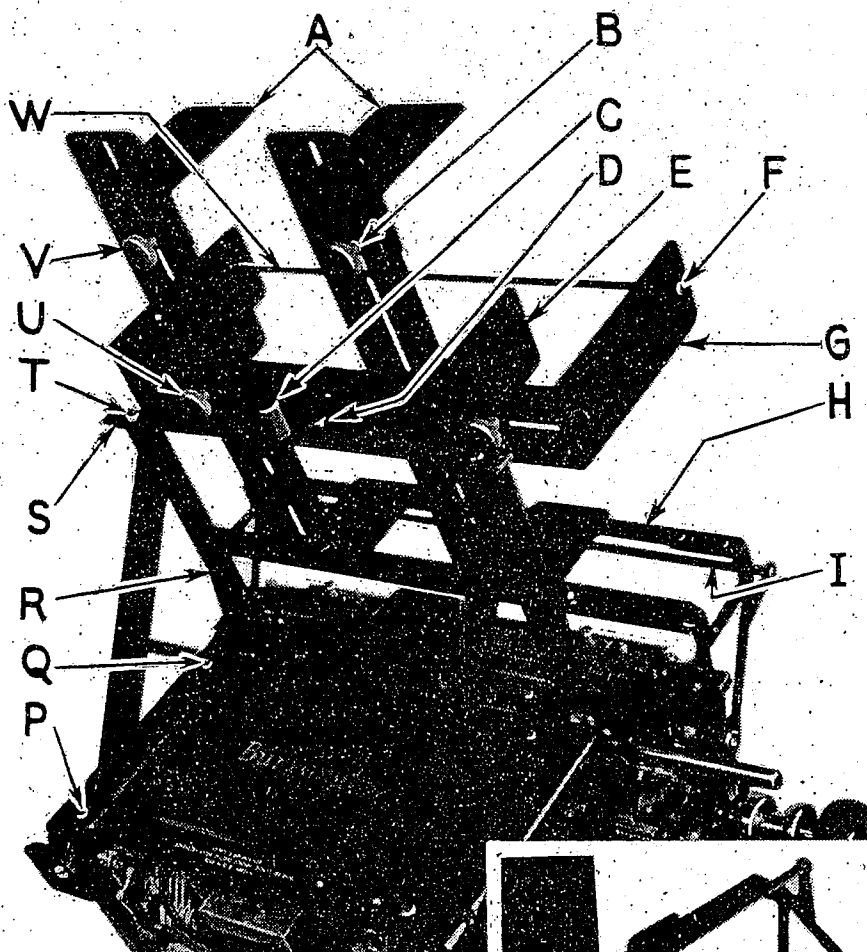
O....73327* (USES 73807 SPRING)
P....103 ENV. 1322
Q....73356 ENV. 1322 COLLAR, 103649 SET
SCREW
R....1-103339 R No. 3 (INCLUDES NUT
103545)
S....1-1322 1/2 R ENV. 1322
T....259 1/2 ENV. 1322 SCREW, 46 NUT
U....15501 A ENV. 1322 SCREW, 103352
ENV. 1322 NUT
V....500 ENV. 1322 SCREW, 501 ENV. 1322
NUT, 76120 ENV. 1322 WASHER
W....101 R ENV. 1322
X....74534 ENV. 1322
Y....7354 3/4 ENV. 1322
Z....1-102 R ENV. 1322
AB....1-103802 B No. 3

NOTE: MACHINES ORIGINALLY CONSTRUCTED FOR USE WITH PRE-STUFFED ENVELOPES ARE EQUIPPED WITH SPECIAL PLATEN, FEED RATCHET DETENT, REAR PRESSURE ROLL, PAPER PAN AND TYPE; SPECIFY MACHINE NUMBER WHEN ORDERING.

CONTINUOUS BILLING FORM FEATURE

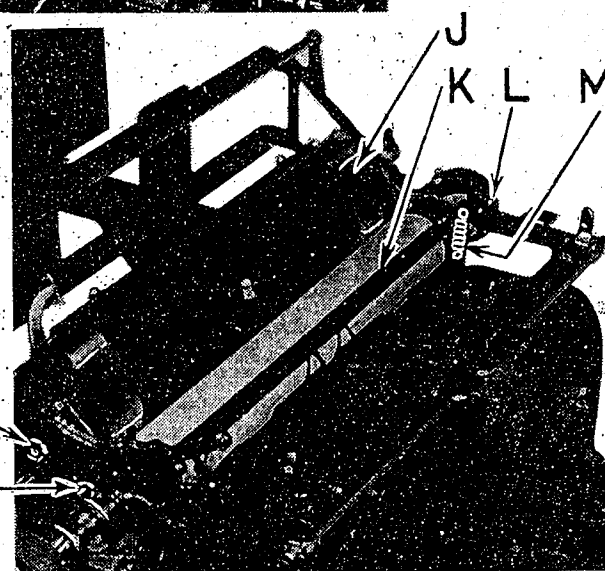
TYPE 50-60

8-1
T



SYMBOLS

- A....1-103234 A Used for forms up to and including 11" long
- 1-103234 A No.2 Used for forms from 11" to 12" long
- B....2820 1/2
- O....103347 Cover, 103826 wire retainer and 103642 plunger
- D....1-103999 A (Roller) Use 75615 screw
- E....1-103234 A
- T....73611
- G....1-103233 A
- H....1B-103229 (11")(13")(15")(18")
- I....103010 (11")(13")(15")(18")
- J....1-103226 AR & AL No. 2
- K....1-103112 No.2 (11")(13")(15")(18")
- L....103502
- M....1-103809 Spring
- N....103352 No.2 Nut, 103526 A screw
- O....103357 No.2 Nut, 103511 A screw
- P....100501
- Q....12053 1/4
- R....1-100175
- S....100904 A (11")(13")(15")(18")
- T....4453 3/4
- U....3361 1/4 A (Screw used on left)
- V....103322
- W....103007 A

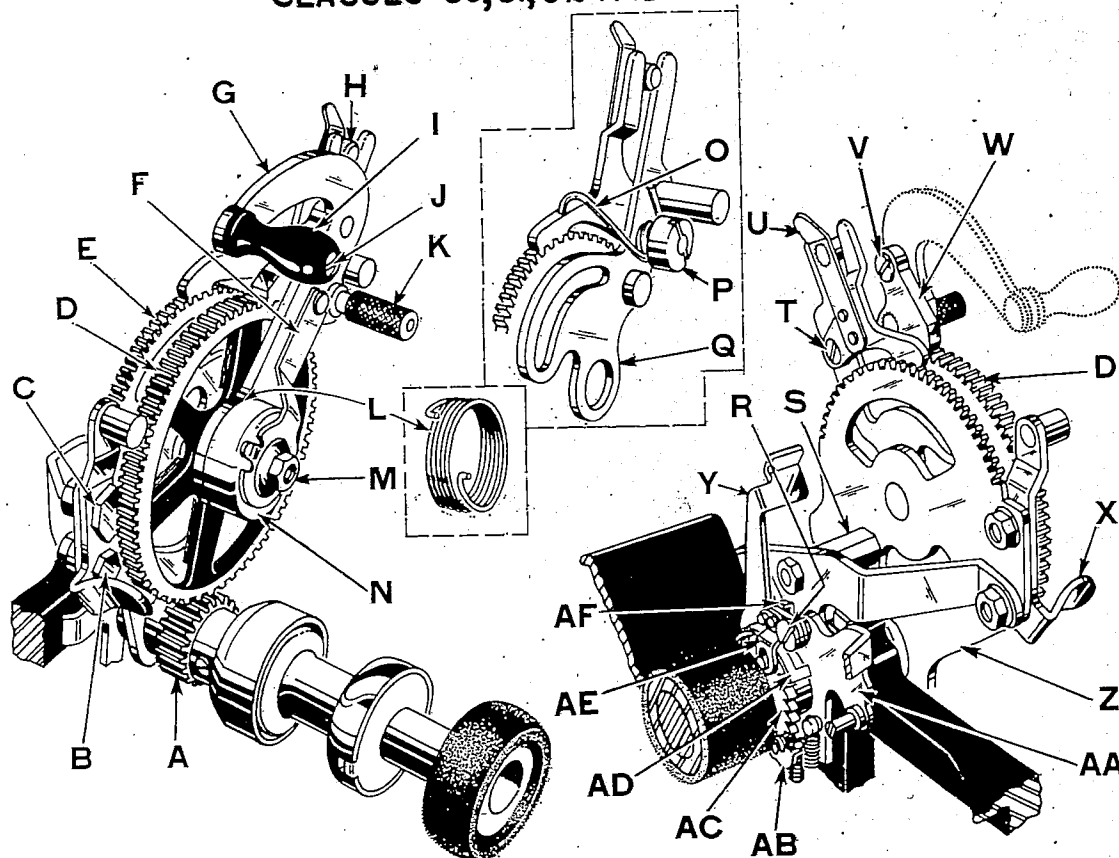


PRINTED IN U. S. AMERICA

ISSUED 4-21-42

INJECTOR AND EJECTOR, RIGHT HAND CLASSES 60, 61, 62 AND FANFOLD

9-1
T-1869



THERE ARE TWO STYLES OF I AND E (ENV. T 1869 FANFOLD) AND (ENV. TA 1869 FOR CLASSES 60, 61 AND 62).

No. 1. THE I AND E HANDLE WHEN PULLED FORWARD TO EJECT THE BILL, IS BROUGHT BACK TO NORMAL POSITION BY SPRING L (WOUND RIGHT). THIS STYLE IS GENERALLY USED IN FANFOLD MACHINES.

No. 2. THE I AND E HANDLE IS NORMALLY HELD FORWARD BY SPRING L (WOUND LEFT). HANDLE G IS MANUALLY PUSHED BACK AND IN THAT POSITION PAWL W ENGAGES GEARWHEEL D. THE I AND E HANDLE ADVANCES WITH THE PLATEN; WHEN TWO OR MORE LINES ARE WRITTEN THE I AND E IS PULLED FORWARD AND THEN PUSHED BACK MANUALLY. THE I AND E HANDLE BEING PULLED FROM THE LAST ITEM TO ITS FORWARD LIMIT CORRECTLY LOCATES THE PRINTING LINE FOR THE NEXT BILL.

THE I AND E FEATURE, WHEN NOT WANTED CAN BE DISABLED BY PUSHING KNURLED KNOB K INWARD WITH THE I AND E HANDLE IN REARWARD POSITION.

TESTS AND ADJUSTMENTS: WHEN I AND E HANDLE G IS PULLED FORWARD AND LIMITS ON STUD IN X, DETENT AB SHOULD SEAT IN THE RATCHET SPACE OF RATCHET AC. ADJUSTMENT: ECCENTRIC C IS TURNED. AS REQUIRED.

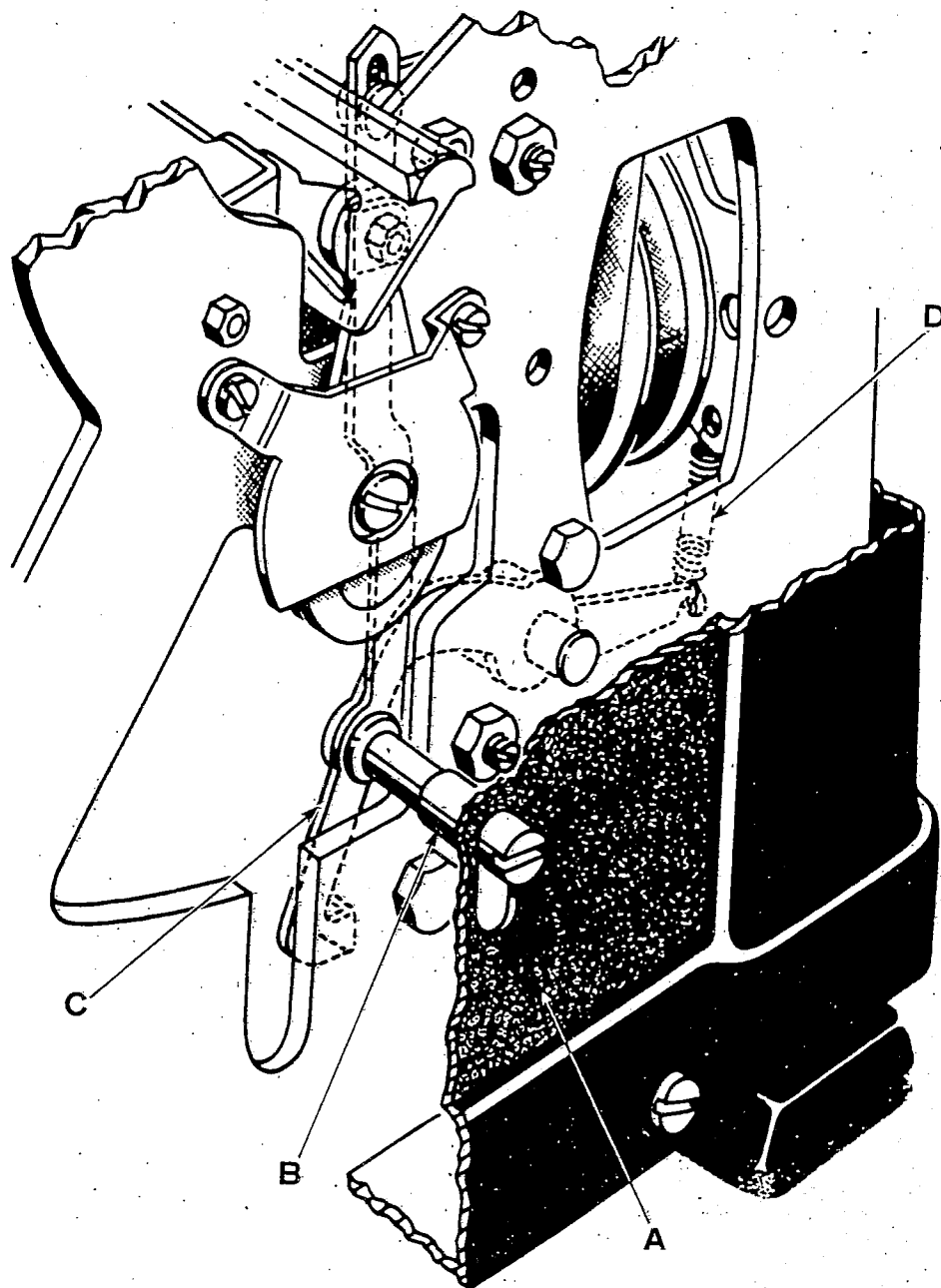
A....1-103400 No. 3, SCREW 103507
B....103559 1/2 SCREW, 103445 3/16 NUT, 1097 11/16
C....103560 1/2 ECCENTRIC SCREW, 103445 3/16 NUT
D....1-103993 1/4
E....1-103219 1/2 (COMPLETE ASSEMBLY 2-103219 1/2
No. 1 (FOR CONSTANT SPACING) (No. 2 FOR
VARIABLE SPACING) (INCLUDES C, D, E, F, G, H, L,
M, N, O, P, Q, T AND X)
F....103218
G....1-103211
H....1-103213
I....103991 1/2 (INCLUDED IN G)
J....73612
K....103327, 73807 SPRING (INCLUDED IN G)
L....4881 3/4 (WOUND RIGHT)
M....1-103445 1/2 NUT, 103552 1/8 POST
N....103210 1/2 DRUM
O....103882
P....103337

Q....1-103212
R....302523 SCREW, 1097 7/16 WASHER, 103353 NUT
S....103558 1/2 HEX, 4456 1/2 SCREW, 103447 1/2
T....103562 1/2
U....INCLUDED IN H
V....4856
W....1-103992 1/4 (INCLUDED IN G)
X....1-103211 1/2
Y....1-103120 A No. 3
Z....1-103214
AA....21-103110 BR No. 3 (FANFOLD)
21-103110 BR No. 1 (NOT FANFOLD)
AB....1-103117 AR No. 1 STYLE E
AC....11-103118 R No. 1
AD....1-103116 No. 1 STYLE E (SPACE CONTROL
GUARD)
AE....1-103115 R STYLE E (PAWL)
AF....21-103113 AR STYLE E (PLATEN SPACING
ASSEMBLY)

PRINTED IN U. S. AMERICA

Issue 5-26-41

CARRIAGE RETURN MANUAL DE-CLUTCHER 10-1 TYPE 60 FANFOLD MACHINES



THE PURPOSE OF THIS DEVICE IS TO PERMIT MOVING THE CARRIAGE BY RESTORING THE RETURN CLUTCH WHEN THE MOTOR IS INACTIVE FROM ANY CAUSE WITH THE RETURN KEY DEPRESSED. WHEN THE RETURN KEY IS IN DEPRESSED POSITION, PART B IS RAISED WHICH RESTORES THE CLUTCH ASSEMBLY.

SYMBOLS

A....11-100167 R (11") STYLE E
B....703545

C....11-108180
D....108805

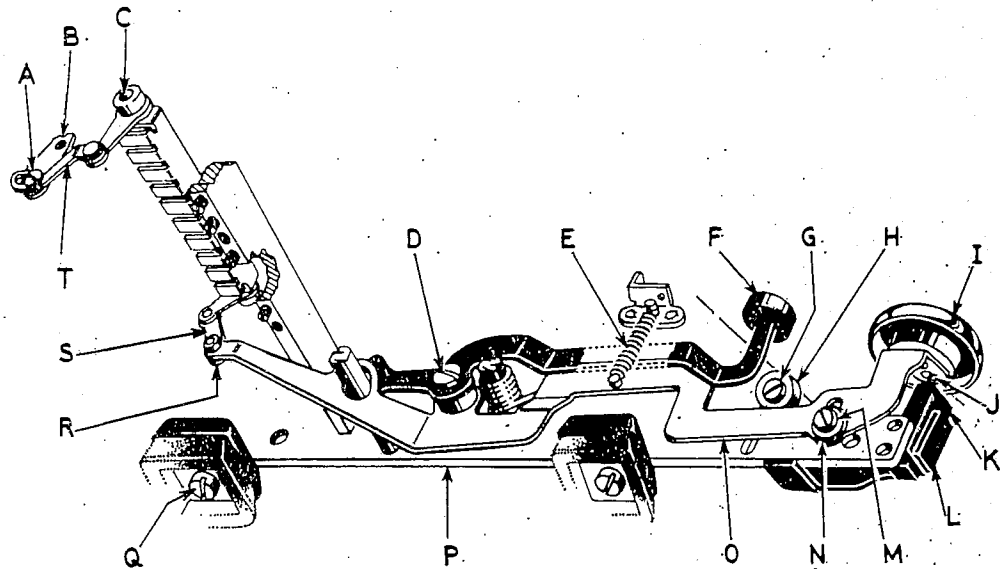
PRINTED IN U. S. AMERICA

ISSUED 5-26-41

PALM TABULATOR

TYPES 50-60

200-1
T



THE PURPOSE OF THIS NEW PALM TABULATOR MECHANISM IS TO PROVIDE A SOFTER TOUCH FOR THE OPERATOR AND TO PREVENT BREAKAGE THROUGH CUSHION LIMIT K. WHEN LEVER I IS DEPRESSED, LEVER O IS ROCKED, WHICH, THROUGH LINK S AND BAIL ASSEMBLY C, SWINGS TIP ARM B INTO THE PATH OF THE TAB STOP.

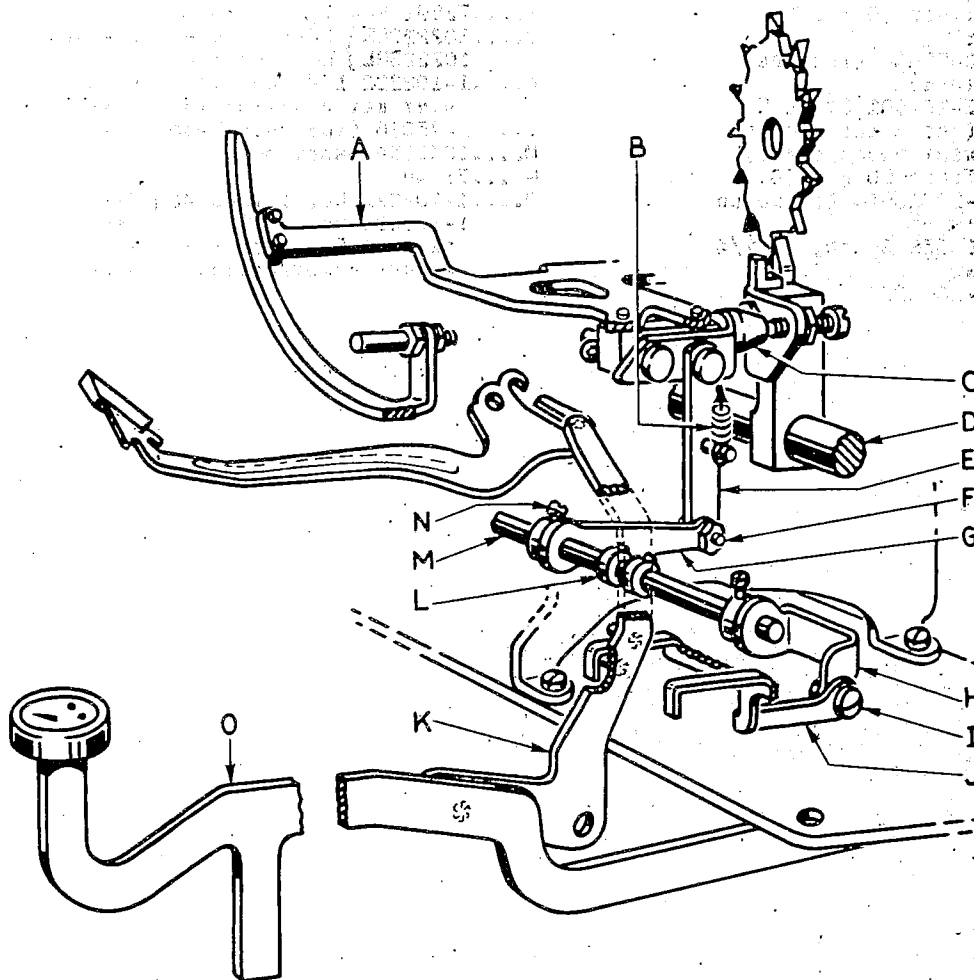
A....79511 (USE 49-1/4 NUT)
B....108114 B No. 1
C....1B-108003 No.2 (INCLUDES T,S)
D....108604
E....81806
F....1-108111
G....12059-9/16 (USE 46 NUT)
H....108931
I....108913
J....75618 OR 1653-1/2

K....108932
L....108250
M....72567 USE 46 NUT
N....613-1/2 WASHER
O....1-108120 C
P....1-100110 C.R. STY. E
Q....100502
R....108523 Ecc. (USE 49-1/4 NUT)
S....108195 A *
T....108113 No. 3 *

NON-ESCAPEMENT MECHANISM

TYPES 50 & 60

201
T



PURPOSE

THE PURPOSE OF THIS MECHANISM IS TO PERMIT THE TYPING OF ACCENT MARKS, SUCH AS ARE NECESSARY TO THE RECORDING OF CERTAIN FOREIGN LANGUAGES, WITHOUT USING THE "BACK SPACE" KEY.

CONSTRUCTION

NON-ESCAPEMENT KEYS WHICH RECORD ACCENT MARKS IN BOTH NORMAL AND SHIFTED POSITIONS, ARE STANDARD ON KEYBOARDS FOR FOREIGN LANGUAGES SUCH AS FRENCH, SPANISH, ETC. WHEN AN ACCENT KEY IS DEPRESSED, CARRIAGE ESCAPEMENT IS NOT EFFECTED, AND THE SUBSEQUENT RECORDING OF A LETTER DIRECTLY BENEATH THE ACCENT MARK MAY BE ACCOMPLISHED WITHOUT FIRST BACK-SPACING THE CARRIAGE.

NON-ESCAPEMENT ACCENT KEYS MAY NOT BE FURNISHED IN KEY POSITIONS 5 THROUGH 33 INCLUSIVE.

OPERATION

WHEN KEY O IS DEPRESSED, BELL CRANK K IS ROCKED FORWARD, PULLING BAIL J FORWARD AND TURNING SHAFT M THROUGH ASSEMBLY H. AS SHAFT M IS TURNED, ASSEMBLY E IS MOVED DOWNWARD AND CONTACT POINT C IS LOWERED TO INACTIVE POSITION. WITH CONTACT POINT C IN ITS LOWER POSITION THE UNIVERSAL BAR A MAY BE CAMMED REARWARD WITHOUT ACTUATING THE ESCAPEMENT MECHANISM.

ADJUSTMENT

WHEN KEY O IS DEPRESSED, CONTACT POINT C SHOULD BE IN NON-ESCAPEMENT POSITION. TO ADJUST LOOSEN THE SET SCREW IN ASSEMBLY H AND SHIFT ASSEMBLY H ON SHAFT M.

PRINTED IN U. S. AMERICA

(OVER)

ISSUED 7-17-45

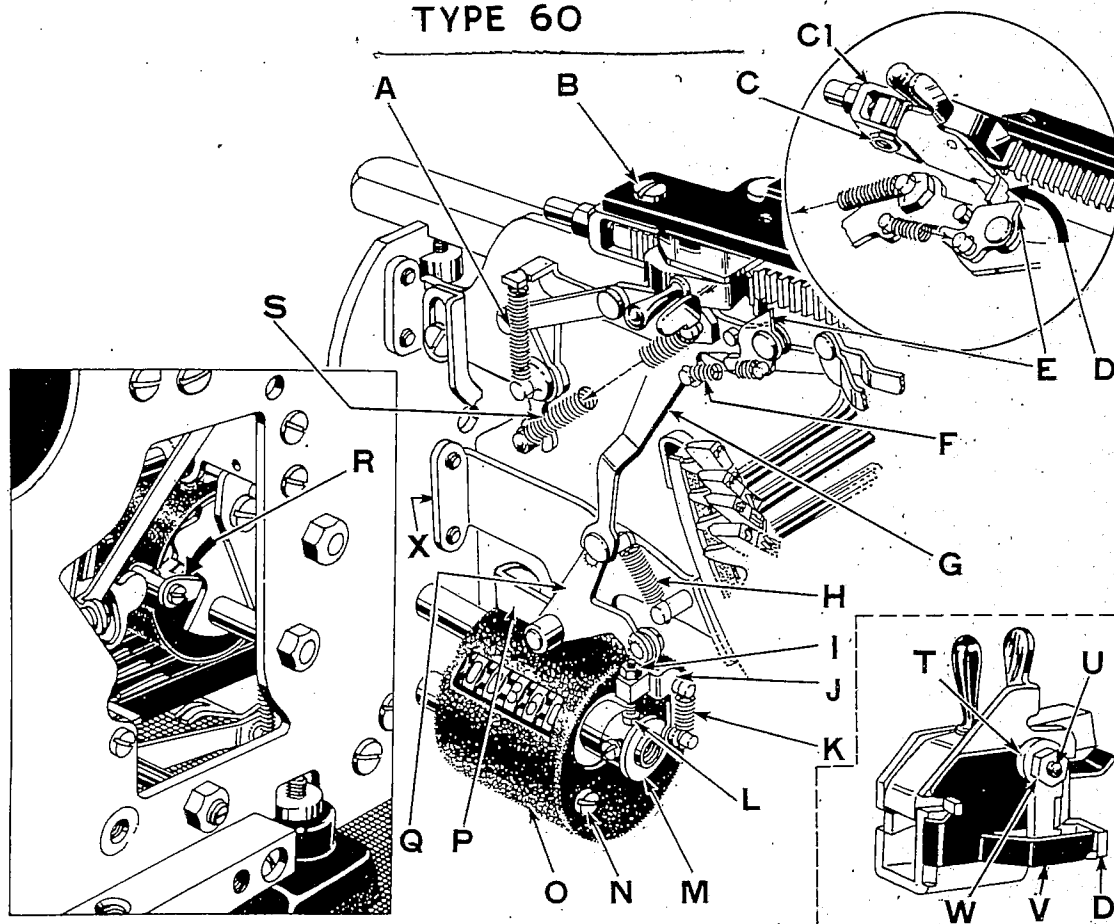
SYMBOLS

- A....11A-104100 STYLE E
(INCLUDES C,E)
TYPES 50 AND 60
- B....483
- C....104584A* (INCLUDED
IN E)
- D....1Z-104001 STYLE E
(ASSEMBLED ESCAPE-
MENT BLOCK SHAFT)
TYPES 50 AND 60
- E....1-104135A* (INCLUDED
IN A)
- F....104558 SCREW, 49 1/4
NUT
- G....1-104133A
- H....1-104134AR } USE 71519
1-104134AL } SCREW IN HUB
- I....72591 SCREW, 49 1/4 NUT
- J....102223BR } SPECIFY NON-ESCAPEMENT
102223BL } KEY POSITION
- K....1-102222 1/2B SPECIFY NON-ESCAPE-
MENT KEY POSITION AND STAMPING
- L....1-75336 (INCLUDES 79566 SCREW)
- M....104005A SHAFT ONLY
- N....73548
- O....1-102221 No. 1 THRU 42 } SPECIFY NON-
1-102221 No. 00 F } ESCAPEMENT KEY
THRU 44 F - USED WITH } POSITION AND
46 KEY CONSTRUCTION } STAMPING

DIAL COUNTER ADVANCED DURING CARRIAGE RETURN TO MARGINAL STOP

600-1
T1882

TYPE 60



WHEN THE CARRIAGE IS BEING RETURNED THE PROJECTION ON MARGINAL STOP D CONTACTS PASSBYPAWL E ROCKING LEVER G WHICH IN TURN ROCKS BELL CRANK Q; THE LATTER THROUGH PART J ROCKS ARM M WHICH INDEXES THE MECHANISM IN COUNTER O. WHEN LEVER G RETURNS TO NORMAL POSITION ARM M ACTUATES THE COUNTER. WHEN PASSBYPAWL E PASSES PROJECTION D, THE UPWARD MOVEMENT OF LEVER G IS DELAYED BY SPRING V THE PURPOSE OF THE LATTER BEING TO PREVENT OVERTHROW OF THE ACTIVE DIAL.

TESTS AND ADJUSTMENTS:

THE PURPOSE OF THE SPRING CONNECTION OF PART J AND ARM M IS TO COMPENSATE THE VARIATION OF HEIGHT OF THE CARRIAGE WITH RESPECT TO THE HEIGHT OF PASSBYPAWL E.

THE PROJECTION OF MARGINAL BLOCK D IS LOCATED ONE ESCAPEMENT BELOW THE HIGH POINT OF PASSBYPAWL E WITH THE CARRIAGE AT ITS HIGHEST POSITION. LOOSEN SCREW IN ARM M, HOLD PUSH PAWL ASSEMBLY R UPWARD AND TIGHTEN SCREW IN ARM M.

TO SET LIMIT SCREW L, INDEX THE DIAL MANUALLY BY SWINGING LEVER G TO THE LEFT AND ALLOWING IT TO RETURN SLOWLY, WHEN THE DIAL COMES TO A STOP, HOLD LEVER G AND SET SCREW L TO LIMIT ON M, TIGHTEN NUT I.

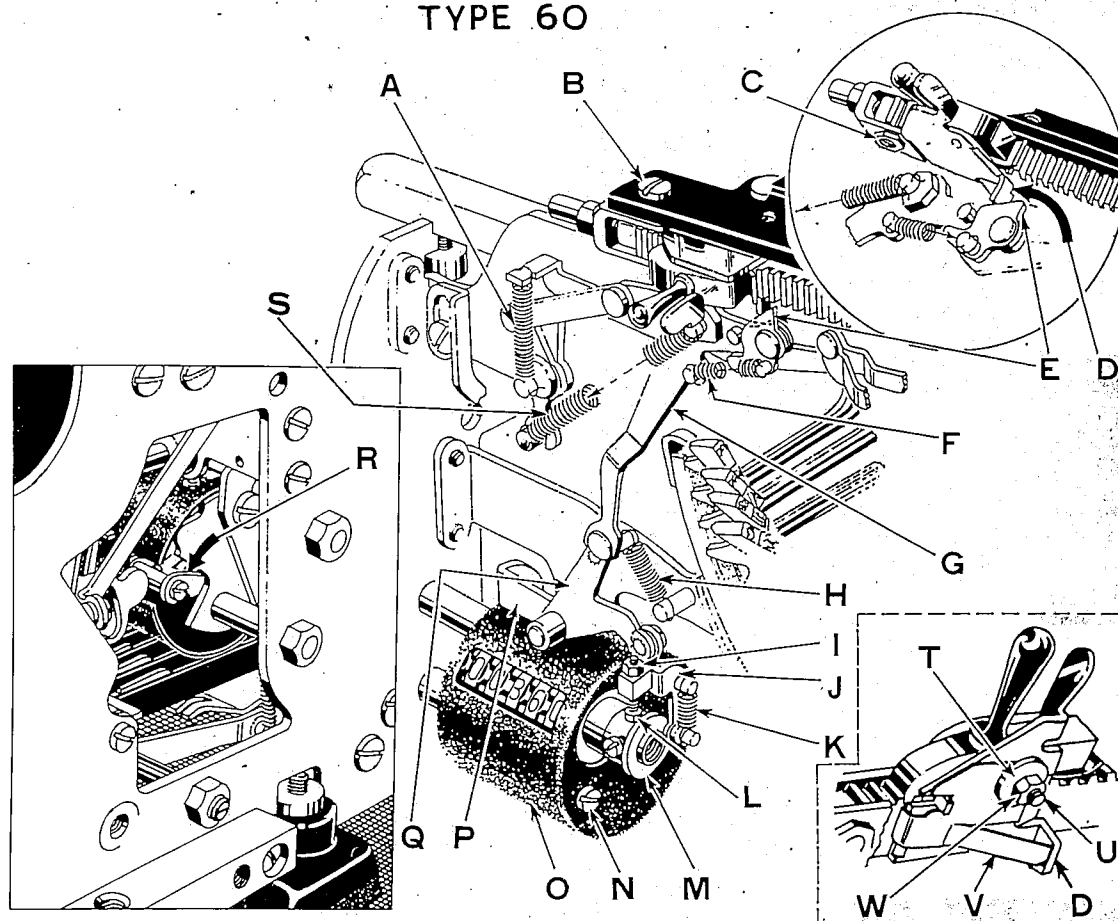
A....483 B FOR TYPE 60
480 B FOR TYPE 50
B....103505 ENV. 1882
C....300 ENV. 1882
D....103912 No. 1 ENV. 1882
E....103105 AL #3 STYLE E (COMPLETE MARGIN BLOCK 11-103105 AL STYLE E ENV. 1882 SPECIFY PITCH)(COMPLETE COMBINATION MARGIN BLOCK 1-103105 AL #3 STYLE E ENV. 1882 SPECIFY PITCH)

F....1-103 ENV. 1882*
F....79807
G....1-102 ENV. 1882, USE SPRING SCREW 72515 ENV. 1882 (INCLUDES E)
H....3882
I....49 3/8 NUT
J....101 ENV. 1882*
K....72833
L....500 ENV. 1882
M....1-108160 Use SCREW 75618
N....952 3/4

O....51A-1618 A COMPLETE ASSEMBLY
P....1-100 ENV. 1882 (INCLUDES I, J, K, L, M, Q)
Q....104 ENV. 1882
R....1620 A No. 1, USE SCREW 74502
S....71804 FOR TYPE 50
9280 1/4 FOR TYPE 60
T....103161 5/8 ENV. 1882
U....103553 No. 2
V....103161 1/2 ENV. 1882
W....49 3/4
X....1A-106100 ENV. 1882

DIAL COUNTER ADVANCED DURING CARRIAGE RETURN TO MARGINAL STOP TYPE 60

T 1882



WHEN THE CARRIAGE IS BEING RETURNED THE PROJECTION ON MARGINAL STOP D CONTACTS PASSBYPAWL E ROCKING LEVER G WHICH IN TURN ROCKS BELL CRANK Q; THE LATTER THROUGH PART J ROCKS ARM M WHICH INDEXES THE MECHANISM IN COUNTER O. WHEN LEVER G RETURNS TO NORMAL POSITION, ARM M ACTUATES THE COUNTER. WHEN PASSBYPAWL E PASSES PROJECTION D, THE UPWARD MOVEMENT OF LEVER G IS DELAYED BY SPRING V THE PURPOSE OF THE LATTER BEING TO PREVENT OVERTHROW OF THE ACTIVE DIAL.

TESTS AND ADJUSTMENTS:

THE PURPOSE OF THE SPRING CONNECTION OF PART J AND ARM M IS TO COMPENSATE THE VARIATION OF HEIGHT OF THE CARRIAGE WITH RESPECT TO THE HEIGHT OF PASSBYPAWL E.

THE PROJECTION OF MARGINAL BLOCK D IS LOCATED ONE ESCAPEMENT BELOW THE HIGH POINT OF PASSBYPAWL E WITH THE CARRIAGE AT ITS HIGHEST POSITION. LOOSEN SCREW IN ARM M, HOLD PUSH PAWL ASSEMBLY R UPWARD AND TIGHTEN SCREW IN ARM M.

TO SET LIMIT SCREW L, INDEX THE DIAL MANUALLY BY SWINGING LEVER G TO THE LEFT AND ALLOWING IT TO RETURN SLOWLY, WHEN THE DIAL COMES TO A STOP, HOLD LEVER G AND SET SCREW L TO LIMIT ON M, TIGHTEN NUT I.

A....483 B
B....103505 Env. 1882
C....300 Env. 1882
D....103105 AL No. 3 STYLE E (COMPLETE MARGIN BLOCK
1-103105 AL STYLE E ENV. 1882 SPECIFY PITCH)
(COMPLETE COMBINATION MARGIN BLOCK 1-103105 AL
No. 3 STYLE E ENV. 1882 SPECIFY PITCH)
E....1-103 Env. 1882*
F....79807
G....1-102 Env. 1882, Use SPRING SCREW 72515 Env. 1882
(INCLUDES E)
H....3882
I....49 3/8 NUT
J....101 Env. 1882*

K....72833
L....500 Env. 1882
M....1-108160
N....952 3/4
O....51A-1618 A COMPLETE ASSEMBLY
P....1-100 Env. 1882 (INCLUDES I, J, K, L, M, Q)
Q....104 Env. 1882
R....1620 A No. 1, Use SCREW 74502
S....71804
T....103162
U....103553 No. 2
V....103800
W....49 3/4

PRINTED IN U. S. AMERICA

Issued 7-22-40

60B-1

Writing Keys, Carriage Escapement, and Ribbon Mechanisms of the Typewriting Machine (Basic)

PRELIMINARY MECHANICAL WORK

A. Remove the following:

1. Case Panels (AN)
 - (a) Back Panel
 - (b) Right Panel
 - (c) Left Panel
 - (d) Front Panel
2. Ribbon (Q)
3. Dust Shields (P)
4. Line Finder (B)
5. Pointer (A)
6. Motor Shield (K)
7. Rubber Foot (AO)

B. Remove Complete Motor

1. Raise the carriage to its shifted position.
2. Remove Screws (C).
3. Remove Screws (D) and (J), and Washer (I).
4. Loosen all Collars on Shaft (H).
5. Loosen Nut (E) and remove Shaft (H).

C. Replace the following:

1. Shaft (H) and Collar (F)

Note: Connect Collar (F) to Link (G) and test for free.
2. Ribbon (Q)
3. Rubber Foot (AO)

TRACING

A. Writing Keys

Subject: Printing

Method: a. Locate the Ribbon Shift Lever in black position.
b. Depress the Q key Lever slowly.
c. Trace the actuation of parts:

1. Moving the Type Bar (L) toward the Platen.

Notes: (1) Note the construction of the Key Lever (N) and Type Bar (L).

(2) Note how the Key Lever is limited in both normal and depressed positions.

(3) Observe the pivot points of the Key Lever (N), Bellcrank (M), and Type Bars (L).

(4) Note how the Type Bars are restored to normal.

B. Escapement Mechanism

1. Subject: Carriage Escapement from Writing Keys

Method: a. Depress a Writing Key slowly, and trace the actuation of parts:

1. Moving the Universal Bar (AH) rearward, which in turn produces the following:

- (a) Rearward movement of the Loose and Stationary Dogs (AM) and (AL).
- (b) Initial escapement of the Carriage.

Note: Note how the Carriage is limited in the initial escapement position.

- b. Release the Writing Key slowly, and trace the actuation of parts:

2. Resetting the Loose and Stationary Dogs to normal position.
3. Permitting the completion of the Carriage escapement.

Note: Note how the Universal Bar (AH) is restored to normal.

2. Subject: Carriage Escapement from the Space Bar

Method: a. Depress the Space Bar slowly.

- b. Trace the actuation of parts:

1. Rocking the Escapement Assembly (AK).
2. Permitting the complete escapement of the Carriage.

Notes: (1) Note how the Link (AJ) is lowered to clear under Assembly (AK).

(2) Observe the normal and depressed limits of the Space Bar.

(3) Note how the Space Bar is restored.

C. Ribbon Mechanism

1. Subject: Ribbon Feed

Method: a. Depress a Writing Key slowly.

- b. Trace the actuation of parts:

1. Rocking the Bellcrank (T), which in turn produces the following:

- (a) Rotating of the Ratchet Gear (R).
- (b) Turning of the Vertical Shaft (S).
- (c) Winding of the Ribbon on Spool (O).

2. Restoring of the Bellcrank (T) as the Writing Key is released.

Note: Observe how a backlash of the Ratchet Gear (R) is prevented during the restoration of the Bellcrank (T).

2. Subject: Ribbon Reverse

Method: a. Wind the Ribbon on the left Ribbon Spool (O) until the opposite Spool is nearly unwound.

- b. Operate the Writing Keys slowly.

- c. Trace the actuation of parts:

1. Permitting Pawl (U) to locate in the path of Bail (Y).
2. Turning the Bail (Y).
3. Positioning the Hook (W) in the teeth of Ratchet Gear (V).
4. Rocking the Assembly (Z) to reverse the location of Gears (X).

Notes: (1) Note how the Assembly (Z) is retained in a reversed position.

(2) Note how the manual reverse of the Ribbon is accomplished by raising or lowering the Button (AF).

3. *Subject:* Indexing of the Ribbon Shift Mechanism

Method: a. Move the Ribbon Shift Lever slowly to the black position.

b. Trace the actuation of parts:

1. Rocking the Bail (AC).
2. Locating the Stud (AD) in the central portion of the slot in Lever (AE).

Note: Note the location of Stud (AD) when the Shift Lever is located in the Red and Stencil positions.

4. *Subject:* Actuation of the Ribbon Lift Mechanism

Method: a. Depress a Writing Key slowly.

b. Trace the actuation of parts:

1. Rocking the Lever (AE), which in turn produces the following:

- (a) Forward movement of Arm (AG).
- (b) Raising of the Ribbon Guide (AI).

Note: Note how an overthrow of the Ribbon Mechanism is prevented when located in the Red or Black printing positions.

SELF QUESTIONS

1. How are the type bars guided at their printing and pivoting positions?
2. How does the carriage escapement from a writing key take place?
3. How is the Escapement Mechanism restored to normal?
4. How is the feeding of the ribbon accomplished?
5. What prevents a back lash of the ratchet gear (R)?
6. How is the reverse of the ribbon accomplished?
7. How is the Ribbon Mechanism indexed to print black?
8. How is the ribbon raised to the black position?
9. What prevents an overthrow of the Ribbon Mechanism when printing in the black position?
10. How does the carriage escapement, resulting from a depression of a writing key, differ from that resulting from a depression of the space bar?
11. How is a manual reverse of the ribbon feed secured?
12. How does a type bar actuate the universal bar?

QUIZ: By Instructor

REFERENCES

Instruction Book, Type 50 and 60 Machines

Type Bars.....	Page 5
Escapement Mechanism.....	Pages 6A, 7
Ribbon Feed Mechanism.....	Page 11
Ribbon Reverse Mechanism.....	Page 11
Ribbon Color Shift Mechanism.....	Page 14A

MECHANICAL WORK

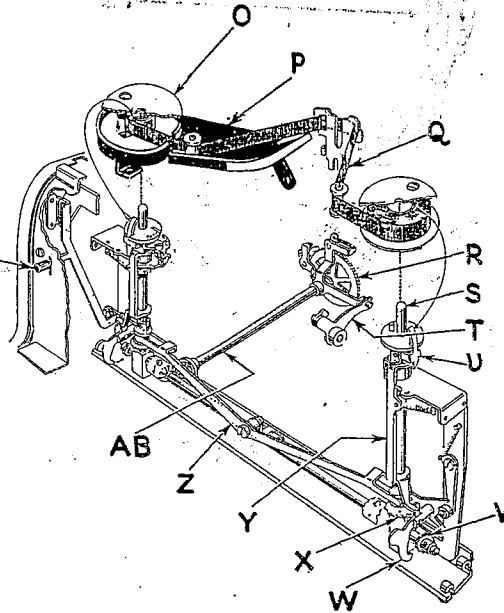
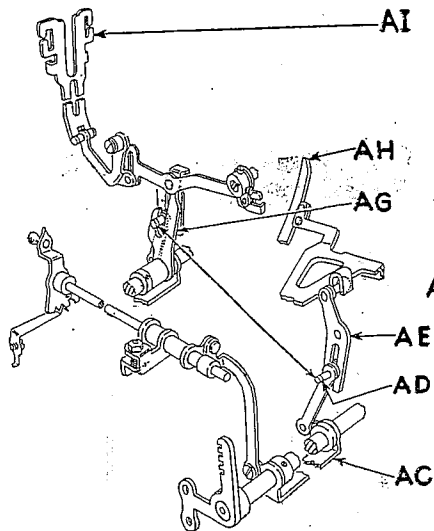
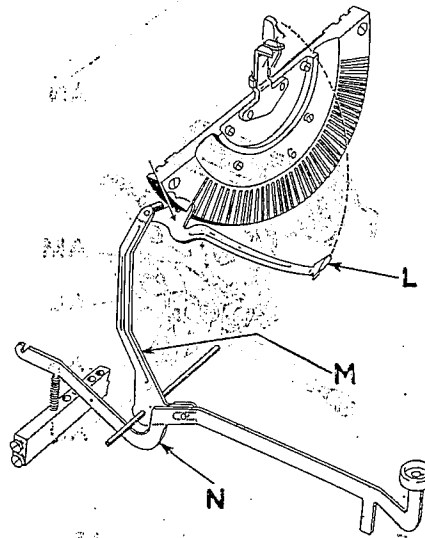
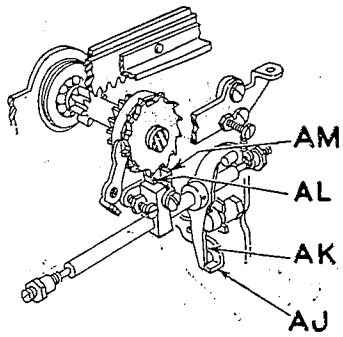
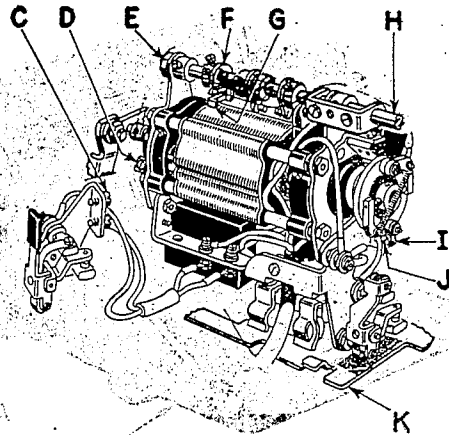
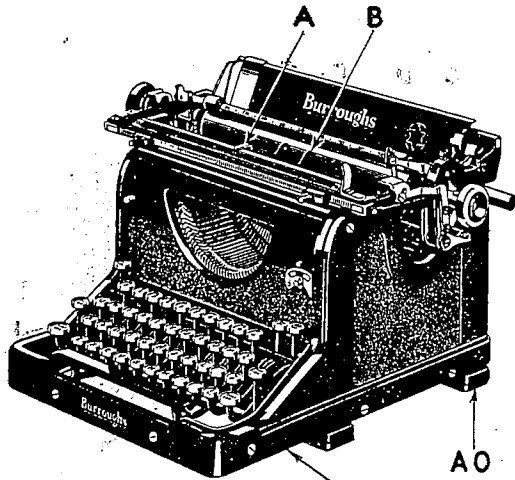
Remove and replace the following:

1. Ratchet Gear Shaft (AB)
2. Ribbon Guide (AI)

Replace the following:

3. Motor and Drive Assembly

TRAINING GUIDES FOR SERIES T MACHINES



3. Explain the following...
Method of...
of...
1. Explain the...
2. Explain the...
3. Explain the...
4. Explain the...
5. Explain the...
6. Explain the...
7. Explain the...
8. Explain the...
9. Explain the...
10. Explain the...

SELF QUESTION

1. How are the...
2. How are the...
3. How are the...
4. How are the...
5. How are the...
6. How are the...
7. How are the...
8. How are the...
9. How are the...
10. How are the...

QUESTIONS

QUESTIONS

1. Explain the...
2. Explain the...
3. Explain the...
4. Explain the...
5. Explain the...

QUESTIONS

1. Explain the...
2. Explain the...
3. Explain the...
4. Explain the...
5. Explain the...

Model 11 and 2 series T
260B-2

Carriage Construction, Back Space and Carriage Shift Mechanisms (Basic)

TRACING

A. Carriage Construction and Operation

1. Subject: Carriage Construction

- Method:**
- Note the construction of the Inner Carriage (B) and Outer Carriage (F).
 - Observe how the Carriage is guided for free and even movement from right to left and vice versa.
 - Note the construction of the Pressure Roll Release Mechanism (E).
 - Observe the Variable Line Finder Mechanism (A).

2. Subject: Carriage Operation

Method: a. Depress the Carriage Release Lever (G) slowly.

b. Trace the actuation of parts:

- Rocking the Carriage Rack Bar (H).
- Moving the Carriage to the left.

Notes: (1) Note how the Carriage is limited in a normal position.
(2) Observe the normal limit of the Rack Bar (H).

B. Carriage Tabulation

Subject: Tabulator Bar

Method: a. Depress the Tabulator Bar (J) slowly, and trace the actuation of parts:

- Rocking the Vertical Tab. Lever (I).
- Raising the Carriage Rack Bar (H).
- Moving the Carriage to the left.
- Limiting the Carriage travel.

Note: Note how the Carriage is limited as the Tabulator Bar is released.

C. Back Space Mechanism

Subject: Back Space Key

Method: a. Depress the Back Space Key slowly.

b. Trace the actuation of parts:

- Rocking the horizontal Lever (O).
- Rotating the Ratchet Gear (M).
- Moving the Carriage to the right.

Notes: (1) Note how the Escapement Gear (N) is prevented from turning as the Ratchet Gear (M) is rotated.

(2) Note how the Carriage is limited as the Back Space Key is released.

D. Platen Shift Mechanism

1. Subject: Raising of the Platen

Method: a. Depress the Shift Key slowly.

b. Trace the actuation of parts:

1. Closing the Shift Switch Points (K), which in turn produces the following:
 - (a) Revolving of the Clutch Member (S).
2. Raising the Control Slide (Q), which in turn produces the following:
 - (a) Engaging of the Clutch Pawl (R) with the Clutch Member (S).
 - (b) Rotating of the Shift Shaft Assembly (P).
 - (c) Raising of the Platen Assembly (C).
3. Disengaging of the Clutch Pawl (R) from the Clutch Member (S).
4. Opening of the Shift Switch Points (K).

Note: Note how the Platen Assembly (C) is retained in its shifted position by Detent Cam (T).

2. Subject: Lowering of the Platen

Method: a. Locate the Platen in a raised position.

b. Release the Shift Key slowly.

c. Trace the actuation of parts:

1. Closing the Shift Switch Points (K).
2. Revolving the Clutch Member (S).
3. Lowering the Control Slide (Q), which in turn produces the following:
 - (a) Engaging of the Clutch Pawl (R) with the Clutch Member (S).
 - (b) Rotating of the Shift Shaft Assembly (P).
 - (c) Lowering of the Platen (C).
4. Disengaging the Clutch Pawl (R) from the Clutch Member (S).
5. Opening of the Shift Switch Points.

SELF QUESTIONS

1. How are the inner and outer carriages connected?
2. How are the pressure rolls released from the platen?
3. What is the purpose of the variable line finder (A)?
4. How is the rack bar (H) raised upon depression of the tabulator bar (J)?
5. What is the purpose of the auxiliary pressure rolls (D)?
6. How is the inner carriage stabilized?
7. How are the shift switch points closed?
8. How is the platen raised when the shift key is depressed?
9. What is the purpose of detent cam (T)?
10. How are the shift switch points opened when the platen is raised?
11. How is the carriage back spaced?

QUIZ (By Instructor)

REFERENCES

Instruction Book, Types 50 and 60 Machines

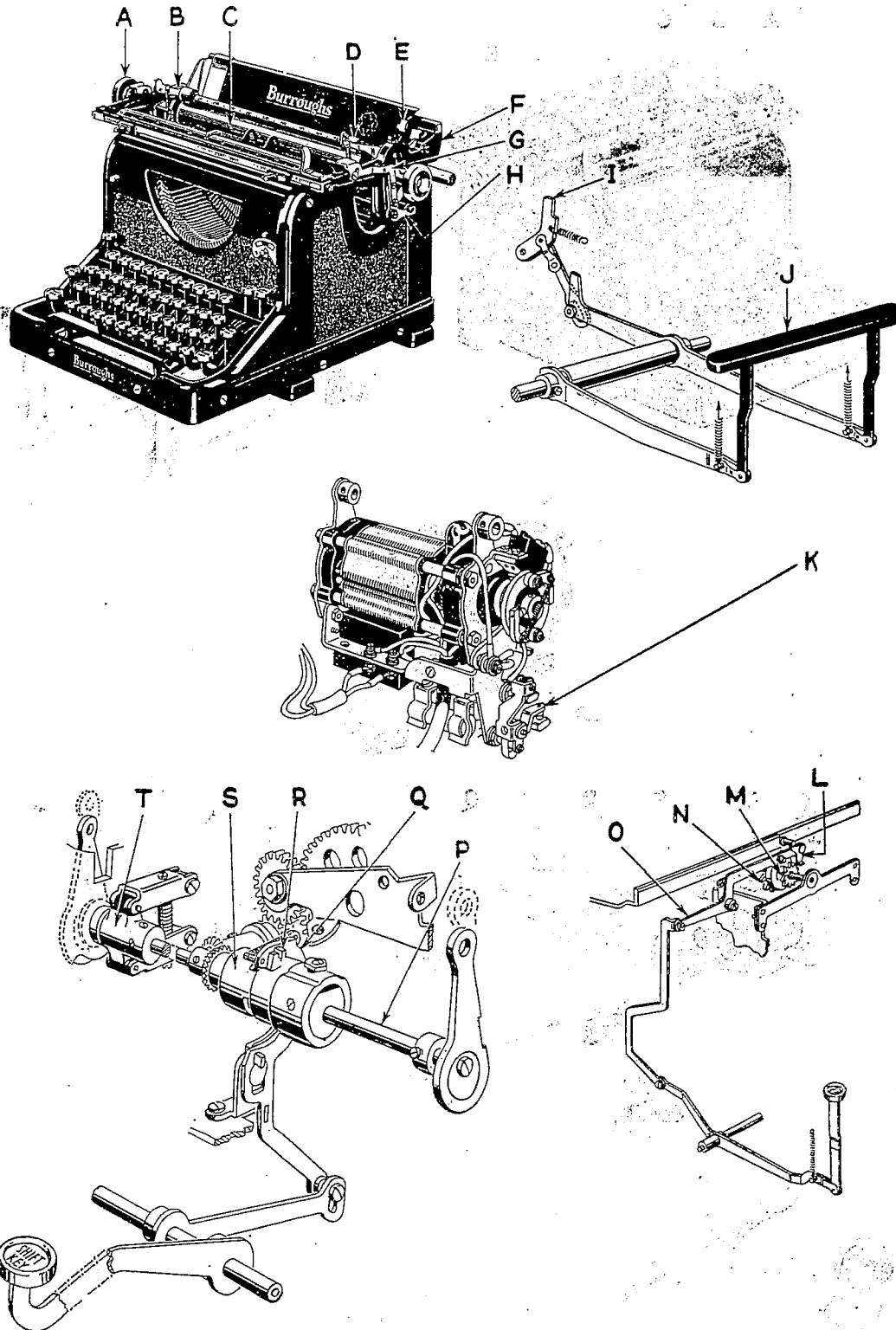
Carriage Details.....	Page 23
Inner Carriage Assembly.....	Page 25
Roller Bearings.....	Page 25
Tabulating Mechanism.....	Page 43
Back Space Key.....	Page 47
Quiet Platen Shift Mechanism (Type 60).....	Page 69
Clutch.....	Page 69
Switch.....	Page 69

MECHANICAL WORK

A. Remove and replace the following:

1. Outer Carriage (F).
2. Inner Carriage (B).
3. Escapement Wheel (M).

TRAINING GUIDES FOR SERIES T MACHINES



REFERENCES

1. Burroughs Service Training School, January 1948
2. Burroughs Service Training School, January 1948
3. Burroughs Service Training School, January 1948
4. Burroughs Service Training School, January 1948
5. Burroughs Service Training School, January 1948
6. Burroughs Service Training School, January 1948
7. Burroughs Service Training School, January 1948
8. Burroughs Service Training School, January 1948
9. Burroughs Service Training School, January 1948
10. Burroughs Service Training School, January 1948

MECHANICAL WORK

1. Burroughs Service Training School, January 1948
2. Burroughs Service Training School, January 1948
3. Burroughs Service Training School, January 1948
4. Burroughs Service Training School, January 1948
5. Burroughs Service Training School, January 1948
6. Burroughs Service Training School, January 1948
7. Burroughs Service Training School, January 1948
8. Burroughs Service Training School, January 1948
9. Burroughs Service Training School, January 1948
10. Burroughs Service Training School, January 1948

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60B-3

Carriage Return, Platen Spacing, Margin Stop, and Margin Release Mechanisms (Basic)

TRACING

A. Carriage Return Mechanism

1. Subject: Carriage Return Indexing

Method: a. Disconnect the Power Plug from the Power Supply.

b. Depress the Carriage Return Key slowly.

c. Trace the actuation of parts:

1. Moving the Control Slide (I) rearward, which in turn produces the following:

(a) Closing of the Return Switch Points.

(b) Lowering of the Vertical Link (J).

(c) Engaging of the Clutch Members (D and L).

Notes: (1) Note how the Return Switch Points are held closed.

(2) Observe how the slot of the Vertical Link (J) locates over Stud (H).

(3) Note how the Drive Pawl (K) is disabled by the Vertical Link (J).

2. Subject: Carriage Return Operation

Method: a. With the Carriage Return Key depressed, manually turn the Governor (A) slowly, and trace the actuation of parts:

1. Rotating the Spring Barrel (G).

2. Returning the Carriage to the right.

3. Limiting the return movement of the Carriage, which in turn produces the following:

(a) Rocking of the Pulley Assembly (F).

(b) Resetting of the Vertical Link (J).

(c) Disengaging of the Clutch Members (D and L).

(d) Opening of the Switch Points.

Notes: (1) Note how the Clutch Members are held disengaged.

(2) Observe the resetting of the Drive Pawl (K) as the Carriage Return Mechanism is released.

B. Platen Spacing Mechanism

1. Subject: Platen Spacing during Carriage Return

Method: a. With the Carriage Return Key depressed and the Carriage limited against the left Margin Stop, manually turn the Governor (A), and trace the actuation of parts:

1. Moving the Spacing Slide (C) to the right.

Note: Note how the Slide (B) is actuated to prevent slack in the Tabulating Tape.

2. Moving the Feed Pawl (N) rearward.

Note: Note how the Friction Spring (M) effects the engagement of the Feed Pawl (N) with the Ratchet Gear (O).

3. Spacing the Platen.

4. Limiting the rearward travel of the Feed Pawl (N).

Notes: (1) Note how the Platen is retained in a spaced position.

(2) Note how the Latch (E) safeguards the Platen spacing in the event the Carriage moves ahead of the Spacing Slide (C).

C. Margin Stop and Margin Release Mechanisms

1. Subject: Margin Stop and Release Key

Method: a. Locate the Margin Stops at 20, 40, 60 on the Stop Bar.

b. Depress the Writing Keys (continually), and trace the actuation of parts:

1. Limiting the travel of the Carriage.

Note: Note how the Writing Keys are blocked against depression.

c. Depress the Margin Release Key slowly, and trace the actuation of parts:

2. Permitting the Carriage to travel beyond the Right Margin Stop.

d. Connect the Power Plug to the Power Supply.

e. Hold the Carriage Return Key depressed, and trace the actuation of parts:

3. Limiting the Carriage travel to the right.

2. Subject: Auxiliary Margin Limit (Q)

Method: a. Depress the Carriage Return Key.

b. Trace the actuation of parts:

1. Limiting the Carriage travel.

2. Turning the Shaft (P) as the Carriage travel is limited.

3. Raising the Auxiliary Margin Limit (Q).

Note: Note how the Auxiliary Margin Limit (Q) prevents a weave of the rearward portion of the Carriage.

SELF QUESTIONS

1. How is the carriage return clutch tripped?
2. What holds the return switch closed during the return of the carriage?
3. How is the Carriage Return Mechanism reset to normal position?
4. What permits the Carriage Return Mechanism to reset when the carriage return key is held depressed?
5. How is the platen vertically spaced when the carriage returns?
6. What is the purpose of the friction spring (M)?
7. What is the purpose of Slide (B)?
8. How are the keylevers blocked by the right margin stop?
9. What is the purpose of the margin release key?
10. What is the purpose of the auxiliary margin stop (Q)?
11. How are the keylevers released by the margin release key?

QUIZ (By Instructor)

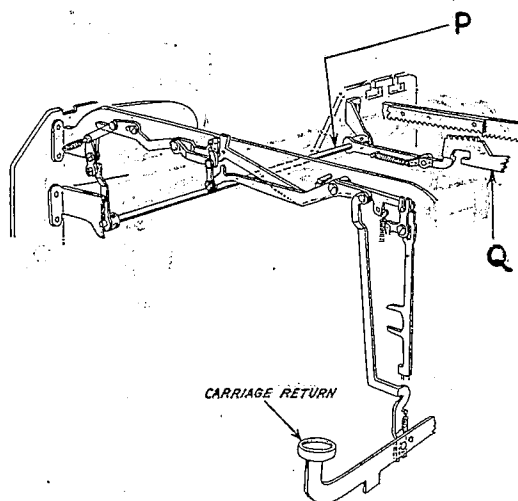
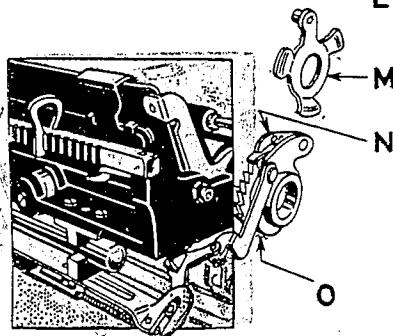
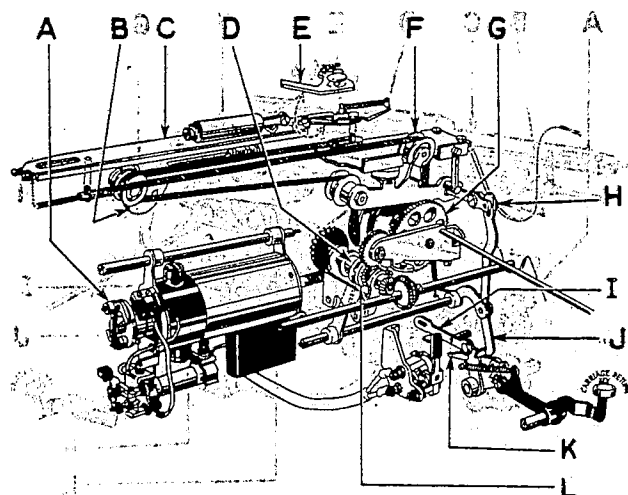
REFERENCES

Instruction Book, Types 50 and 60 Machines

Margin Block—Types 50 and 60.....	Page 37
Margin Release Key.....	Page 37
Auxiliary Margin Limit Mechanism—Type 60.....	Page 41
Carriage Return Key Mechanism—Type 60.....	Page 49
Latch.....	Page 49
Clutch Disengagement.....	Page 50
Selective Motor Return.....	Page 50
Return Tape—Type 60.....	Page 50
Tabulating Tape I (Fig. 26).....	Page 50
Platen Spacing Mechanism—Type 60.....	Page 57

ANALYSIS (Of Conditions Effected by Instructor)

TRAINING GUIDES FOR SERIES T MACHINES



IMPROVED SHIFT KEY MECHANISM CLASS 50 MACHINE

The purpose of this mechanism is to secure quiet shift key operation. In this new mechanism the upper and lower platen (alignment) positions are secured by rectangular studs 108584 (in arms 1-108107 AR & AL) limiting on the leather surfaces of parts 1-108137 upper and 11-108137 lower. Blocks 100582 (in side frames 1-100110 R & L) carry and hold parts 1-108137 and 11-108137, the latter have adjusting slots through which screws 203597 pass into blocks 100582. Washer 3612 1/2 is used between the head of screws 203597 and 1-108137 and 11-108137.

The former upper and lower limit screws 103512 have been replaced by cushion heads 1-103358 which are threaded on screws 103512A, the latter serves only to absorb possible overthrow of the platen when the shift key is snapped.

TESTS AND ADJUSTMENTS

When it is necessary to raise or lower the upper or lower platen position, screws 203597 are loosened and parts 1-108137 or 11-108137 are shifted forward or backward by applying light tapping to parts 1-108137 or 11-108137. The contact of rectangular studs 108584 on the right and left sides should be equal which is ascertained by placing a strip of paper between the stud 108584 and the leather surface of parts 1-108137 and 11-108137, and exerting a gentle pull on the paper. This test should be applied to the upper and to the lower platen positions.

When the correct upper and lower platen positions are secured, upper and lower screws 103512A are adjusted to have slight pressure between cushion heads 1-103358 and the platen shaft. This test is also determined by placing a strip of paper between the cushion head and platen shaft and pulling the paper.

Note: Limit post screws 1-108500 are not used in this mechanism.

PLATEN NORMAL LOCK

The platen normal lock is now secured by hook arm 108138 contacting under the square shoulder of screw 108583, the latter seats in a slot of the side frame. When the upper and lower platen positions have been located, screw 108583 is located to just allow hook arm 108138 to engage the square shoulder of screw 108583.

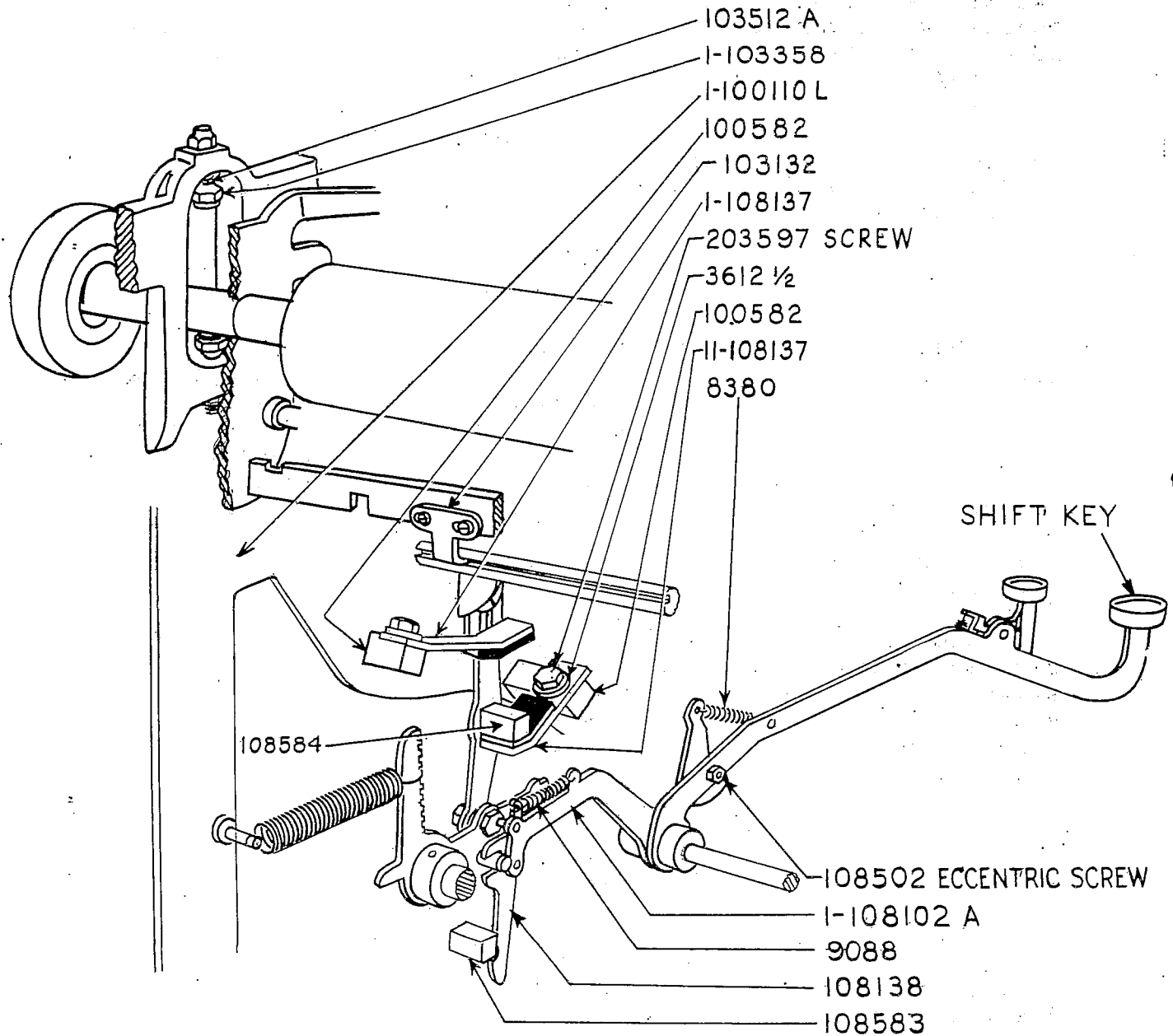
HANGERS 103132

Two additional hangers 103132 are used, one at each end to stabilize the carriage when it is placed in extreme right or left positions.

Improved Shift Key Mechanism

Class 50

No.294



IMPROVED MARGIN BLOCK MECHANISM CLASS 50 MACHINE

The purpose of this mechanism is to prevent a partial release of the escapement mechanism when the carriage is limiting on part 1-108129A, with the result that when the carriage is pulled back, one space is lost.

Bail 1-108131 is narrower in the new mechanism which increases the clearance between it and the keystems and permits the blocking of the keys sooner when the carriage is limiting on part 1-108129A. In the event that a key is slightly held down while other keys are operated, bail 1-108131 will move under and block all keys. However, when a key is held down considerably lower while other keys are operated, bail 1-108131 cannot move under the keystems, then the universal bar movement is blocked by hook arm 1-108142 moving over stud 104500A #2. In the earlier style mechanism when a key was held down more or less thereby preventing bail 1-108131 moving under the keystems and not having hook arm 1-108142, it was possible to partially release the escapement.

SEQUENCE AND CONSTRUCTION

When the carriage pulls part 1-108129A, bell-crank 108126 is rocked which moves bail 108131 through link 108127 and spring 108802. Link 108127 also rocks bell-crank 1-108139 which moves hook arm 1-108142 over stud 104500A #2. When bail 108131 cannot move under the keystems due to one or more keys being held down, spring 108802 expands which prevents the carriage pulling the bail against the keystems.

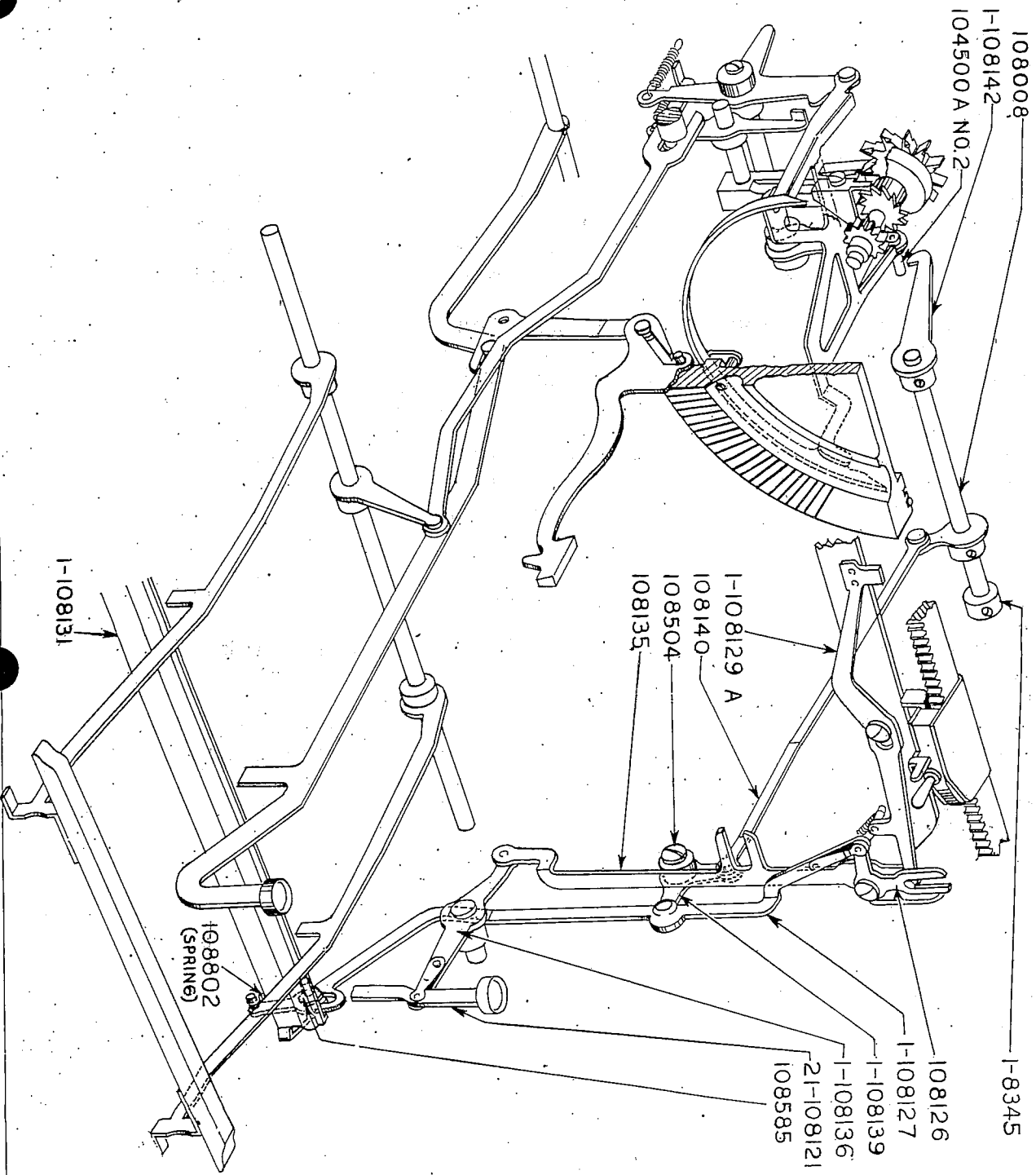
NEW MARGIN RELEASE KEY

The margin release key is now located to the right of the tabulator key. When the margin release key is depressed, part 1-108129A is rocked through lever 1-108136 and link 108135.

Service Research Dept.--R.C.S.--6-29-32

Produced by Burroughs, Detroit, Michigan

Improved Margin Lock Mechanism Class 50 No. 295



INSTRUCTIONS FOR PREPARING CLASS 50 MACHINE

Tie rear end of carriage release levers 103101 R&L securely to platen shaft so rack assembly 1-103903 does not engage escapement gear.

Tie carriage by looping cords around each end of casting 103365 immediately under the tabulating stop rail 103904 #1 and passing across back of machine inside the tabulator mechanism, fastening securely to symbols 103138 on opposite sides.

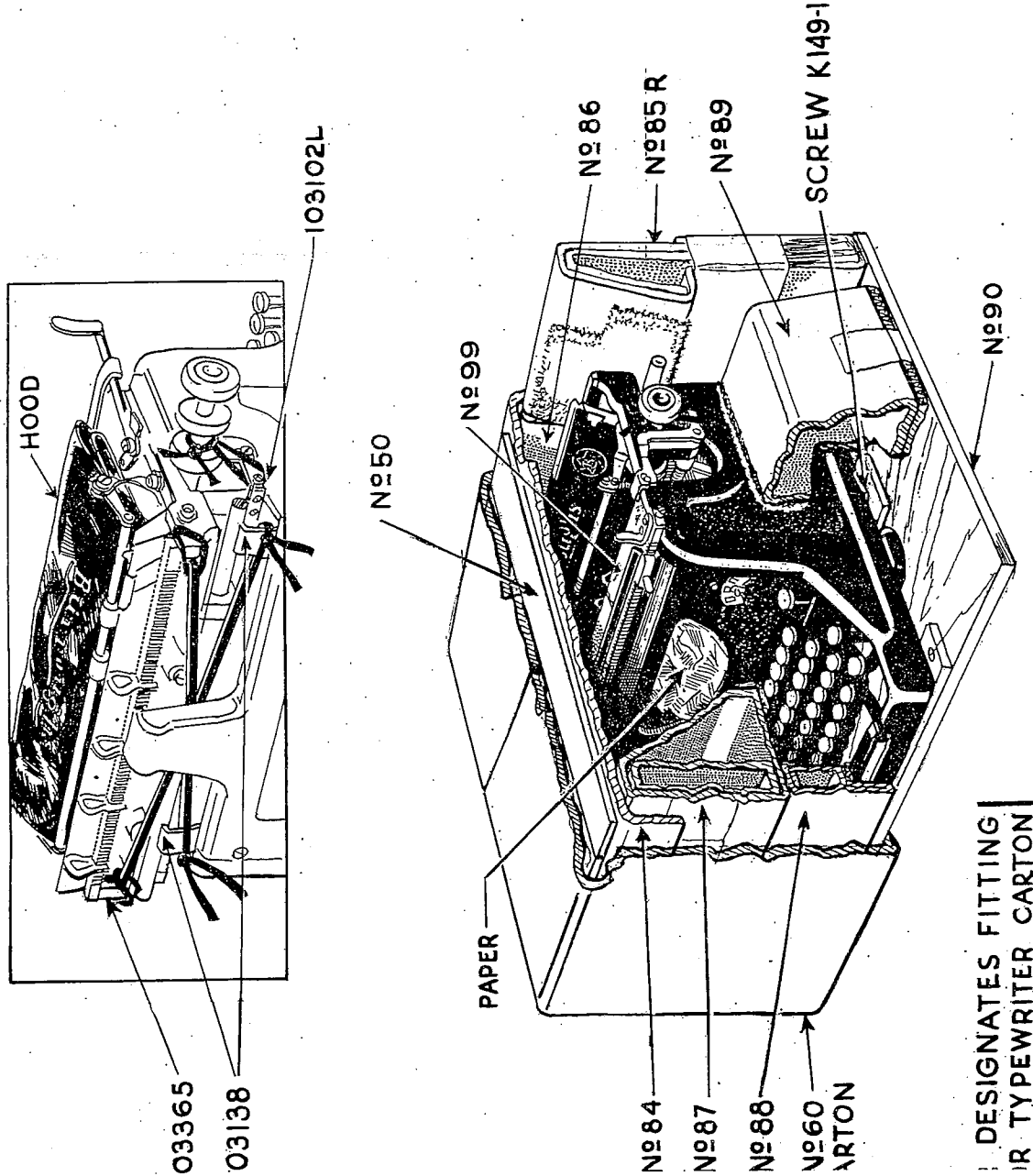
Fill type basket with loosely crumpled paper to prevent type bars from bouncing. Place symbol 9 over ribbon spools (or remove ribbon spools, enclose in envelope, and attach to machine). Fold hood, place on top of machine, and swing front pressure roll frame to position over the platen to retain hood in position.

INSTRUCTIONS FOR PACKING CLASS 50 MACHINES

Fasten typewriter to bottom board (symbol 90) with screws K 149-1. Set in carton (symbol 99 No. 60). Place in both rear side fittings (symbols 85 R&L with felt protection contacting typewriter. Place in rear center fitting (symbol 86) felt

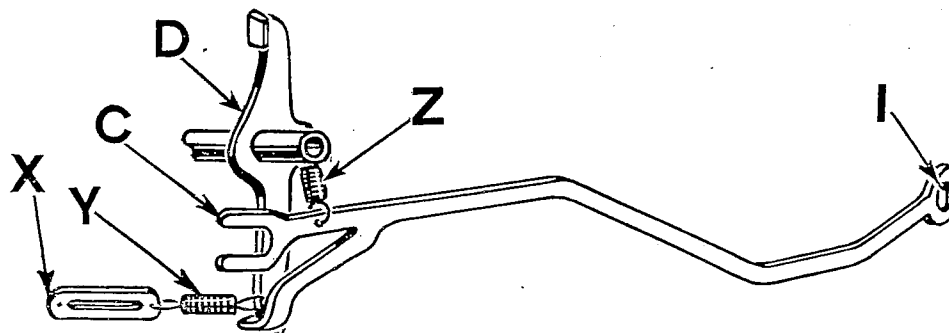
down. Place fittings (symbol 89) on each side of type writer with felt contacting machine. Place fitting (symbol 88) with felt contacting and resting on front bar of typewriter frame. Place fitting (symbol 87) with felt contacting typewriter at rear of keyboard. Place top fitting (symbol 84) so flanges fit between carton and front and rear fittings. Close inner lids of carton and place fitting (a strip of same material as carton) between ends of lids so an even surface will be provided when outer lids are closed. Seal in regular manner.

Produced by Burroughs, Detroit, Michigan
Service Research Dept.-8-1-32-Print #300



Adjustments Necessary to Secure Full Carriage Escape-
ment on the Down Stroke of the Space Bar on Type 50
Machines Already Equipped with Necessary Parts

TYPE 50 MACHINES



SYMBOLS

C	104127A	Y	74808	(for all pitches except 14)
D	1-104117A* (1A-104001)			
I	104505 eccentric		10180	(for 14 pitch only)
X	104104* (order dash)	Z	82813	(for all pitches)
X	11A-104104 (includes 74808)			
	1-104104 (includes 10180)			

Beginning with machine A90692, all Classes 50 to 54 include the necessary parts for optional adjustment of half or full carriage escapement on the down stroke of the space bar.

1. All machines leave the Factory adjusted for half escapement, however, adjustments are completed for full escapement on the down stroke as follows:

- Initial carriage escapement to take place when the space bar is depressed to within $\frac{1}{16}$ " to $\frac{1}{8}$ " of rubber limits Q (see Fig. 32 Type 50-60 Symbol List). Adjustment is made through eccentric I in link C.
- Final carriage escapement to take place just as the space bar contacts rubber limits Q. Adjustment is made by raising or lowering the lower arm of link C.
- Link C to reset on arm D when the space bar is within approximately $\frac{1}{8}$ " of its return limit on rubbers Q. Adjustment is made by repositioning escapement block limit J (Fig. 2).

2. Following the above adjustments the entire lower arm of link C is adjusted (in the Factory) upward sufficiently so that the lip on arm C does not release from part D on full depression of the space bar, thus providing standard Type 50 or half escapement.

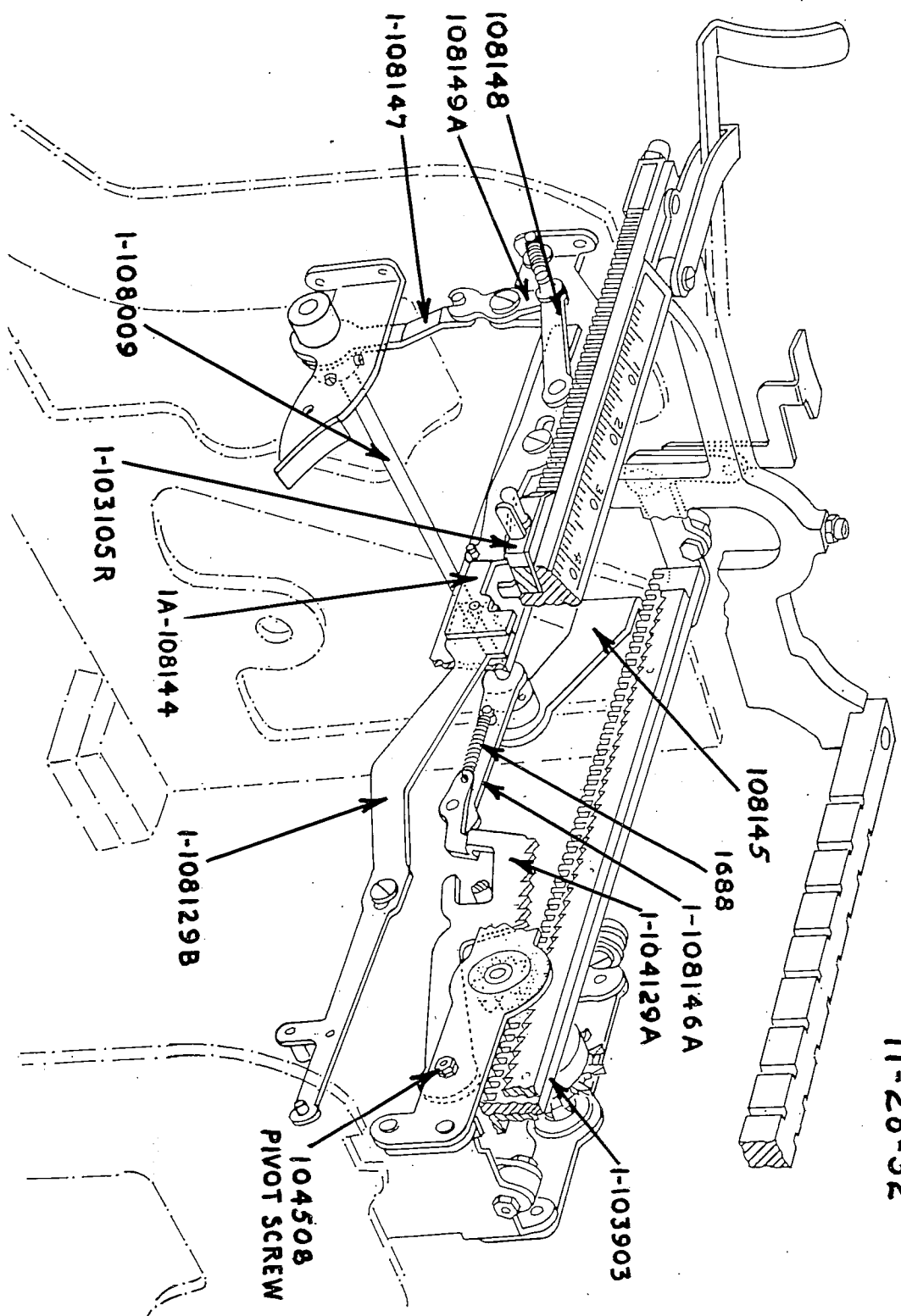
3. To provide full carriage escapement (in the Field) on the down stroke of the space bar, adjust the lower arm of link C downward and note all adjustments listed above under item (1).

4. To return to standard half escapement, adjust as in above item (2) and check for the escapement trip of the space bar to take place when the space bar is within $\frac{1}{32}$ " to $\frac{1}{16}$ " of the rubber limits.

AUXILIARY MARGIN LIMIT MECHANISM

TYPE 50

308
11-28-32

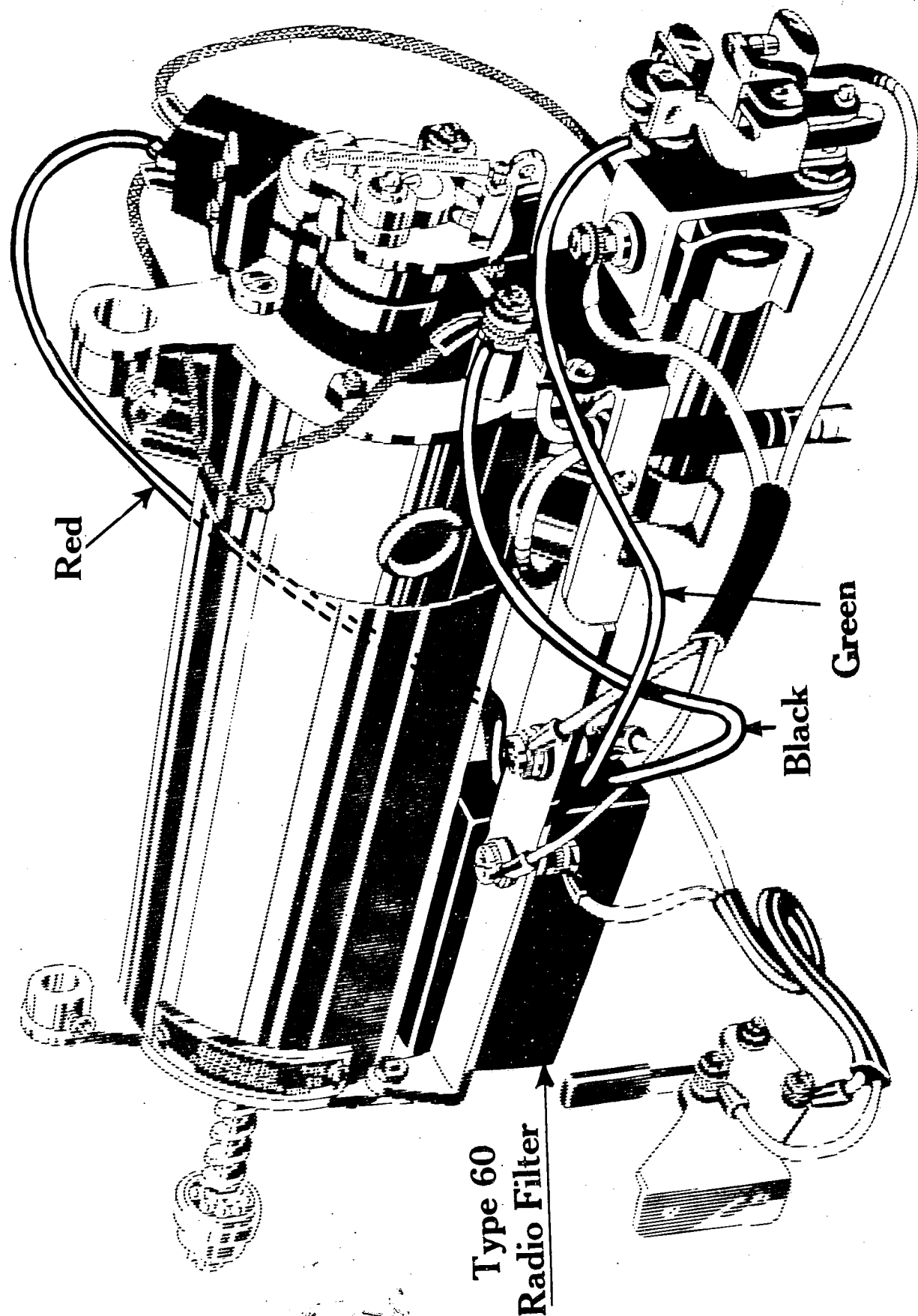


PRODUCED BY BURROUGHS, DETROIT, MICHIGAN

Radio Interference Eliminator

Type 60

353
12-27-33



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