Mechanical Instruction Book

on

BURROUGHS • STANDARD • TYPEWRITER

Book No. 50—1

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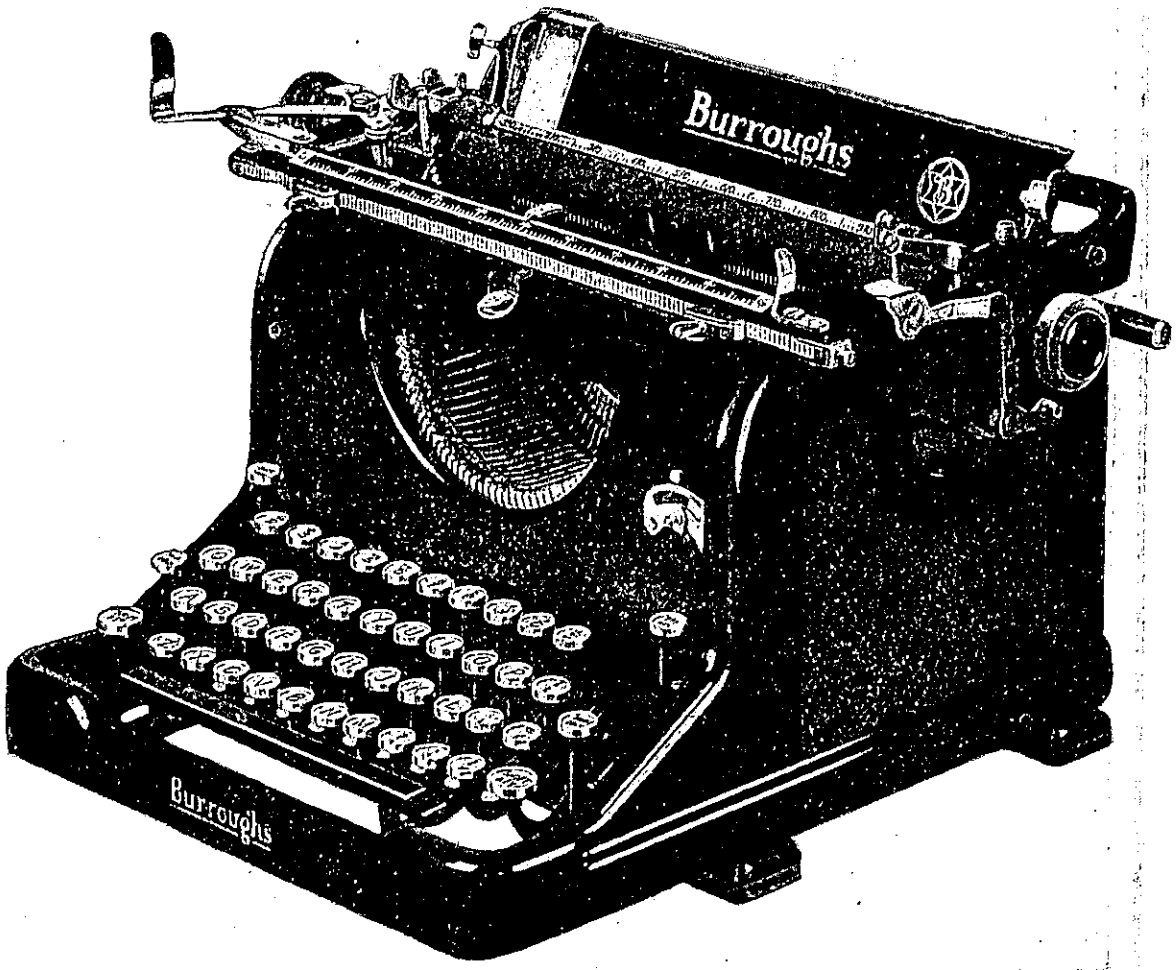
PROPERTY OF AND TO BE RETURNED TO
BURROUGHS ADDING MACHINE COMPANY
DETROIT, MICHIGAN

FOREWORD

The purpose of this book is to provide instructions which will enable inspectors to render practical service to Burroughs Typewriters.

This book explains the manner in which the different sections operate, including tests, adjustments and their application.

The subject of type aligning has been given special consideration in order to assist inspectors to acquire this essential practice.



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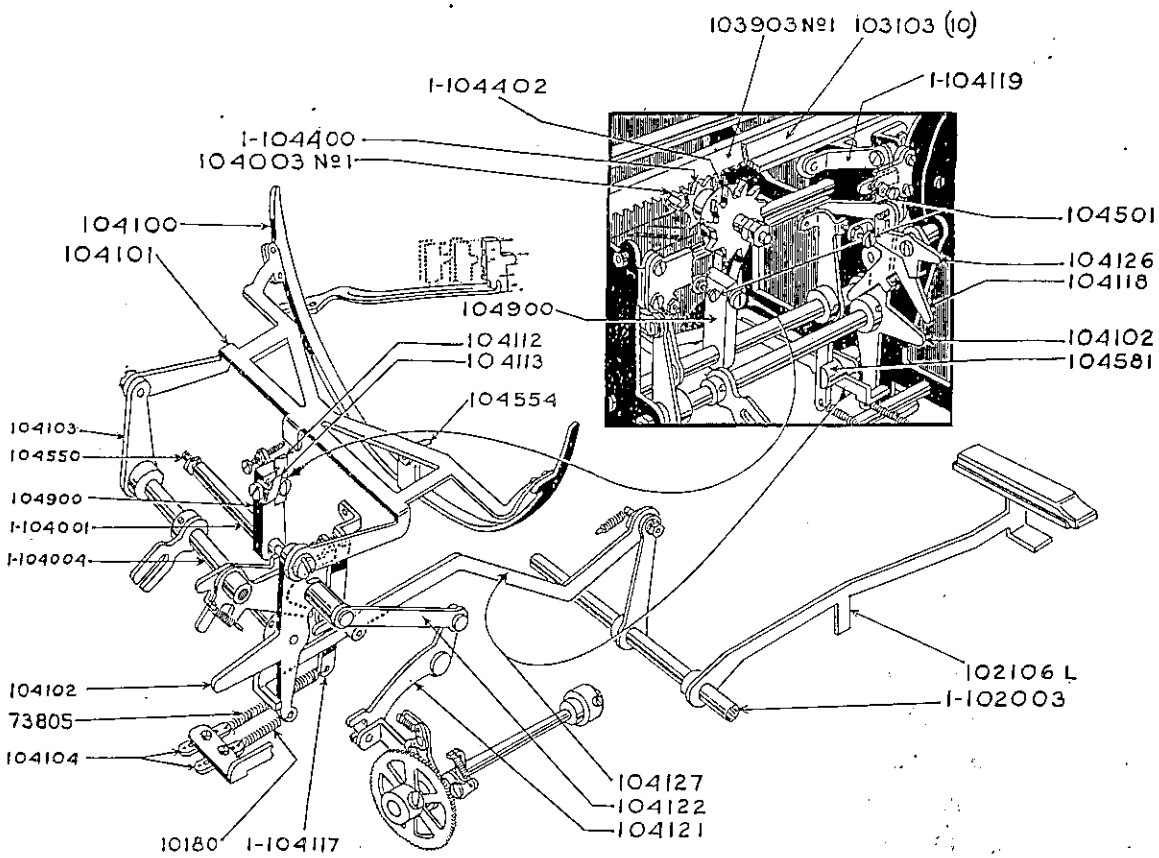
ESCAPEMENT MECHANISM



The Escapement Mechanism

The purpose of the escapement mechanism is to allow the clock spring to laterally move the carriage .100 part of an inch when one of the typewriter keys or the space bar is depressed.

The escapement movement is secured through escapement wheel 1-104402, which is controlled by stationary dog 104112 and loose dog 104113, the latter are carried by post 104900 of shaft assembly 1-104001. The escapement mechanism is operated by the typewriter keys and space bar through the universal bar assembly. The escapement movement is applied to the carriage through ratchet 104402 on escapement wheel 75229 and ratchet pawl assembly, the latter being pinned on pinion shaft 1-104003. Pinion 104003 is meshed with rack 103903.

Depression of the typewriter keys or the space bar rocks shaft assembly 102003, moves the loose dog out of the tooth space of the escapement wheel and moves the stationary dog to follow up into the tooth space vacated by the loose dog, this permits the clock spring to move the carriage .040 inch (drop) and align the loose dog with the next tooth space. As this 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 of an additional .060 inch.

Tests and Adjustments

The escapement wheel teeth should have parallel contact on the loose dog 104113. This condition is secured by moving the shaft assembly 1-104001 sidewise, which is accomplished by adjusting the pivot screws 104550, which support the shaft assembly. This shaft when it is correctly located should have minimum side play.

The hold of the loose dog on the teeth of the escapement wheel is determined by the minimum clearance between the rearward edge of the stationary dog 104112 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 post 104581, 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 post turned toward the rear. To increase the clearance the post 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.

When a key is depressed the loose dog should release the escapement wheel when the type is within $\frac{3}{32}$ to $\frac{3}{16}$ inch of the platen. This adjustment is made by turning the adjusting screw 104501 in arm of shaft assembly 1-104001, 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 turned toward the formed lip on the arm of shaft assembly 1-104001, to prevent an overthrow of the escapement dogs during a rapid typing operation.

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 the eccentric is turned which is in the vertical arm of the space bar pivot shaft.

The escapement shaft assembly is restored by spring 73805. This spring is hooked on slotted spring anchor 104104 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 103903 and escapement pinion 104003 is obtained through the resting of the rack on the roller of bell crank 104119. The lower arm of bell crank contacts on adjusting screw 104501, which raises or lowers the roller according to the direction that the screw is turned.

Rack 103903 should have full mesh with pinion 104003, however, the rack teeth should not bottom. This test should be applied to each end of the rack 103903.

The correct tension of the clock spring is secured by giving the drum two complete turns when the spring is in unwound position.

SELF-QUESTIONS

1—What is the purpose of the escapement mechanism?
2—How is the escapement movement accomplished?
3—From which sources is the escapement mechanism operated?
4—How is the escapement movement applied to the carriage?
5—Describe how the escapement mechanism is actuated.
6—What adjustment is made to cause the escapement wheel teeth to have parallel contact on loose dog 104113?
7—How is the hold of loose dog 104113 on the escapement wheel determined?
8—What adjustment is made to change the hold of loose dog 104113 on the escapement wheel?
9—How is the escapement wheel release tested?
10—What adjustment is made to prevent overthrow of the escapement dogs?
11—What is the purpose of slotted spring anchor 104104?
12—How is the mesh of escapement rack 103903 and pinion 104003 obtained?
13—What is the correct mesh of rack 103903 and pinion 104003 and how is this adjustment made?

Universal Bar

The universal bar assembly consists of universal bar 104100, which is fastened to the front arms of stamped part 104101. A formed lip on 104101 contacts on the escapement release mechanism. Two rear arms of 104101 pivot on the right and left arms on shaft assembly 1-104004. Universal bar 104100 is guided by pilot stud 104554, which rides in segment 106665.

Tests and Adjustments

Universal bar 104100 must contact evenly in the entire recess of segment 106665, to insure that the escapement release will be uniform on all keys.

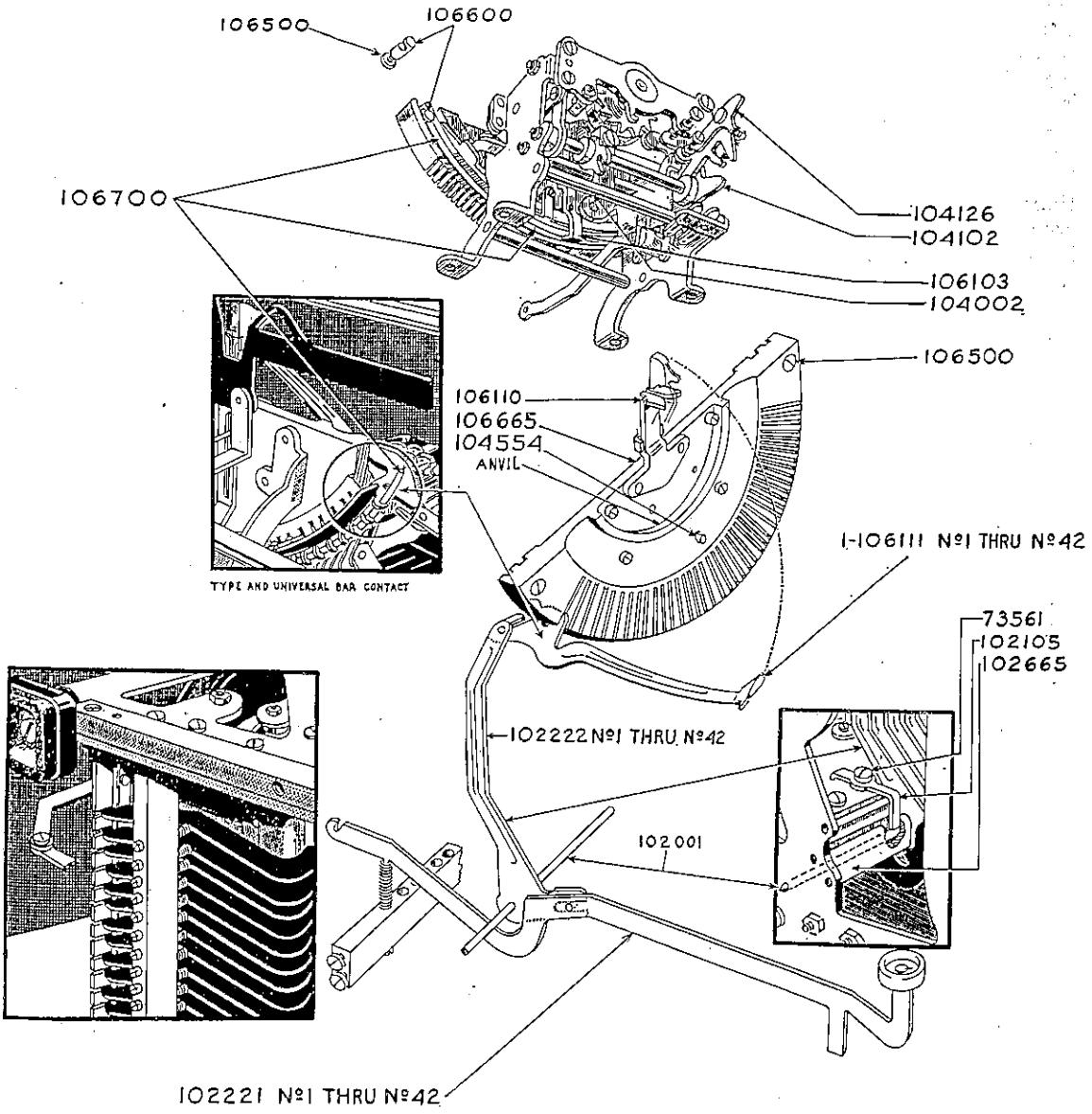
The universal bar is accurately made and carefully fitted at the Factory in order to practically eliminate the need of adjusting this part in the Field.

Shaft assembly 1-104004 can be moved right or left in order to align pilot stud 104554. The universal shaft must move freely with minimum end play of shaft assembly 1-104004. This adjustment is made with cone pointed screws 104550, which support the shaft assembly. Spring 10180 which restores this assembly is hooked to slotted spring anchor 104104, 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

14—Describe the construction of the universal bar assembly.
15—Which test is applied to the universal bar with respect to segment 106665?
16—How is pilot stud 104554 aligned for free movement?

TYPE BARS



Type Bars

Type bars 106111 are guided close to their pivoting point in long slots of segment 106665. Type bars 106111 are guided at the printing position by type guide 106110.

To secure accurate alignment, type bars 106111 should have minimum play in the slots of segment 106665 and not more than .002 play in type guide 106110.

The type bars pivot on curved rod 106700, which lies in the lower curved recess in segment 106665. Rod 106700 is locked in position by brace 106103. The lower lip of brace 106103 contacts on rod 106700, the upper lip contacting on segment 106665. Brace 106103 is fastened to segment 106665 in the center by screw 106501. The upper right and left ends of rod 106700 are anchored by part 106600 and screw 106500. To remove a type bar, the universal shaft assembly is latched back as follows: The rear arm of part 104102 is depressed and latch 104126 hooked over the stud in 104102. This permits the type bar to be disengaged from pivot rod 106700 and removed from the segment. The type bar is replaced in reverse order.

The type bars are connected to key levers 102221 (Nos. 1 to 42 inclusive), by bell cranks 102222 (Nos. 1 to 42 inclusive). Type bars, bell cranks and key levers are stamped with the same number.

The free action of the key assembly is essential; bell cranks 102222 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 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.

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 platen before the escapement takes place.

When any one of the type bars are held against the platen there should be .002 clearance between the type bar and the anvil.

Bell cranks 102222 pivot in guide slots of fulcrum casting 102665 on fulcrum shaft 102001, the latter is held by fingers 102105 and screws 73561.

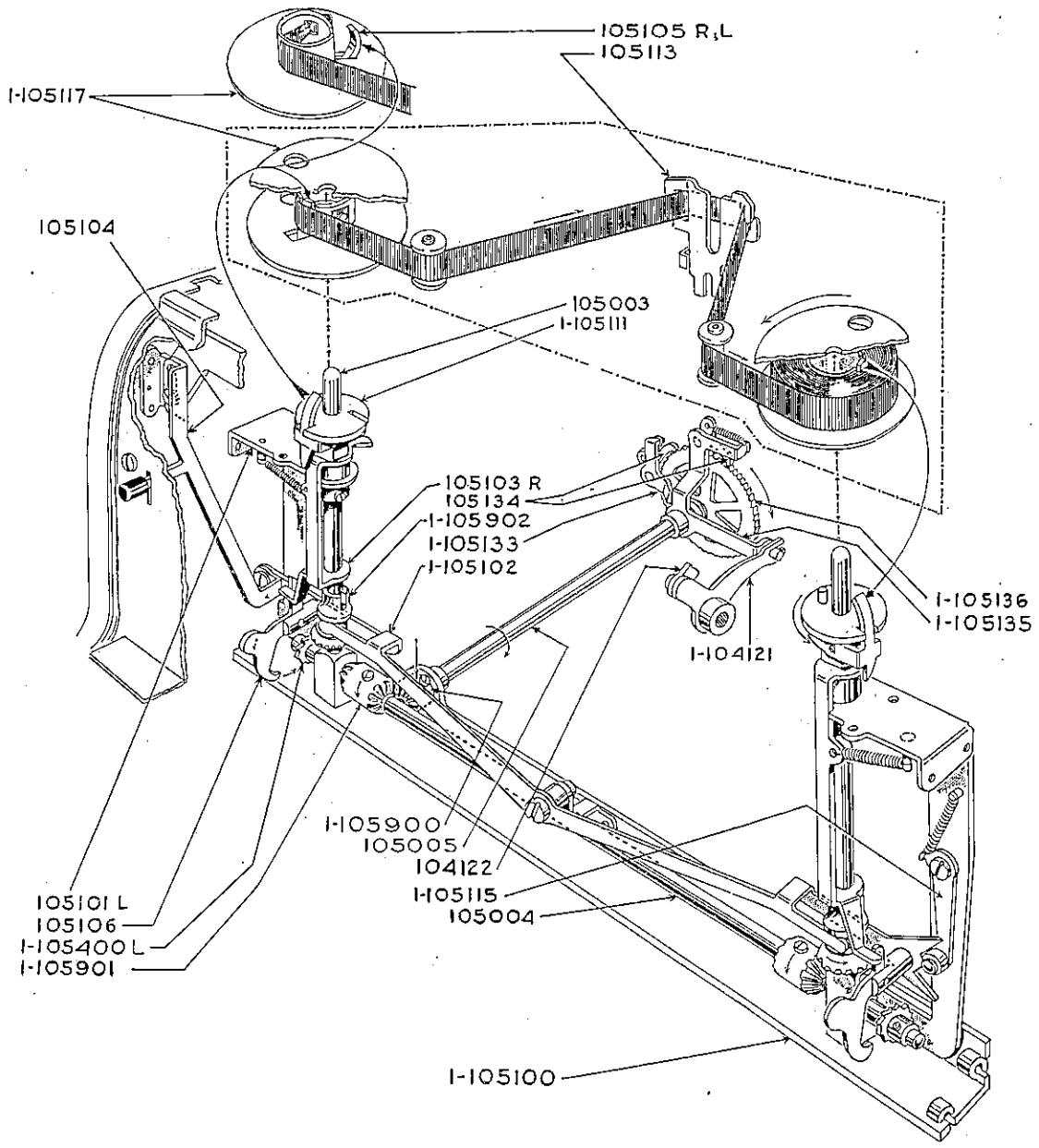
Type 106118 has a slot into which the type bar is seated.

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.

SELF-QUESTIONS

17—How are type bars guided and fitted at their printing and pivoting points?
18—How is curved pivot rod 106700 located and fastened in segment 106665?
19—How are type bars removed?
20—How are type bars connected with key levers?
21—How are bell cranks 102222 adjusted?
22—What is the purpose of the anvil on segment 106665?
23—How is the touch or spring tension of the key levers adjusted?
24—How is the spring tension of keys tested?
25—What is the purpose of the heel on the upper part of the type bar to the rear of the type?
26—How does the type depression actuate the universal bar?
27—What is the relative timing action of the type striking the platen and the escapement release?
28—How much clearance should there be between the type bar and the anvil when the bar is held against the platen?

RIBBON FEED MECHANISM



Ribbon Feed Mechanism

The ribbon feed mechanism is actuated by universal bar shaft assembly 1-104004, link 104122 and bell crank 1-104121. The fork of bell crank 1-104121 meshes with a stud in pivot arm 1-105135.

When one of the keys or the space bar is depressed, the universal shaft assembly rocks pivot arm 1-105135, pawl 105134 then turns ratchet wheel 1-105136, check pawl 105134 idles in the teeth of ratchet wheel 1-105136 and prevents the drag of pawl 105134 moving the ratchet wheel backward as the pawl is restoring to normal position.

Ribbon Reverse Mechanism

The ribbon reverse is secured through the movement of the unwinding ribbon spool. The ribbon spool seats on disk assembly 1-105111; a pin in the disk holding the spool to turn with disk assembly 1-105111. When the unwinding of the ribbon is nearing completion, pawl 105105R or L drops into the path of the arm on vertical bail 105103R or L, the continued unwinding of the ribbon causes pawl 105105R or L to contact and swing bail 105103R or L, which allows reverse hook 105106 to engage reverse ratchet 105400R or L on ribbon feed shaft 105004. The movement of ribbon feed shaft 105004 through reverse hooks 105106 pulls the arm of reverse rocker lever 1,105102 downward, meshing the gears and unmeshing the gears on the opposite side, thereby reversing the ribbon feed. Rocker lever 1-105102 is held in either position by detent 1-105115 resting in the upper or lower triangular space of the right arm of rocker lever 1-105102.

Ribbon Reverse Lever

The ribbon mechanism can be reversed at will by raising or lowering ribbon reverse lever 105104, which is directly connected to rocker lever 1-105102.

Tests and Adjustments

The reverse gears must be meshed without binding or excessive play. The mesh is adjusted by loosening the screw in gears 1-105901 and 1-105900, moving the gears and then tightening the setscrews in the gears.

All parts must move extremely free, no other adjustments should be necessary.

Shafts 105003 should be free with minimum up and down play, which can be increased or decreased by loosening the screw in the collar under bracket 105101R and L.

Detent 1-105115 should seat fully in the triangular space when the gears are meshed. If necessary to adjust, rocker lever 1-105102 is bent. This test is applied to both positions and the rocker lever bent to equalize the available movement.

Installing New Ribbon

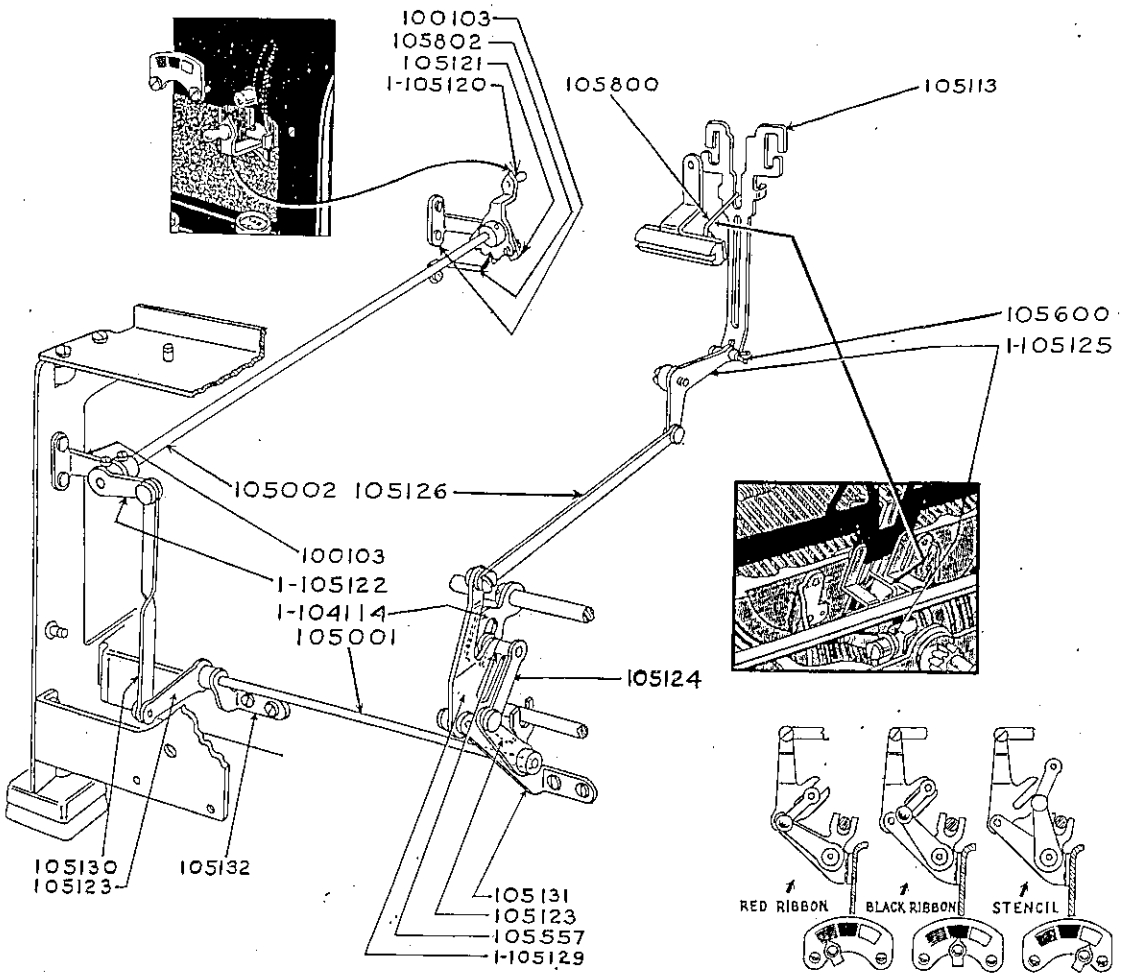
Place carriage in central position (pointer at 50). Wind ribbon on one spool, placing finger tip in one of the holes in the top of the ribbon spool.

Remove the spools, unhook the ribbon from the empty spool. Attach new ribbon to empty spool, passing ribbon end through center of empty spool, holding short end on hook and pulling long ribbon to catch on hook. Place ribbon spools on posts, the reverse pawl to enter slot between bottom ribbon winding and ribbon post. Place ribbon through guide between the latter and the card guide.

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 1-105102 and which adjustments may be required?

RIBBON COLOR SHIFT LEVER



Ribbon Color Shift Lever

The purpose of the ribbon color shift lever is to control the upward movement of ribbon guide in order to secure red printing, black printing, or no printing for stencil cutting. Ribbon guide 105113 is actuated by arm 1-104114 on universal bar shaft assembly 1-104004 through intermediate arm 105124, which has stud 105557 constantly in mesh with the fork of arm 1-104114 or shaft assembly 1-104004.

Ribbon Guide

The purpose of guide 105113 is to make visible the last writing line. When all keys are normal the ribbon is below the writing line. As a key is being depressed, ribbon guide 105113 raises the ribbon in front of the type before the type reaches the platen.

Red Printing

Lever 1-105120 moves intermediate arm 105124 almost entirely into the slot of bell crank 1-105129, when lever 1-105120 is placed in its left position, which gives the most possible amount of movement to bell crank 1-105129 when a key is depressed. Bell crank 105125 actuates ribbon guide 105113 through link 105126 and bell crank 1-105129.

Black Printing

When lever 1-105120 is placed in center position, the stud in intermediate arm 105124 is located toward the front at a greater distance from the center of bell crank, which results in less movement when a key is depressed.

Stencil Cutting

When lever 1-105120 is placed in extreme right position, the stud in intermediate arm 105124 is entirely removed from the slot in bell crank 1-105129. Now, when a key is depressed ribbon guide 105113 remains inactive.

Tests and Adjustments

When the keyboard is normal, there should be $\frac{1}{32}$ inch clearance between ribbon guide 105113 and type segment 106665.

Adjustment: Arm 105124 is bent forward for more clearance.

Note: No clearance between ribbon guide 105113 and type segment 106665 causes a metallic sound.

The purpose of limit wire 105800 is to prevent overthrow when the ribbon guide raises the ribbon to print in red.

Adjustment: When a key is depressed, ribbon color shift lever in left notch, there should be no clearance between limit wire 105800 and ribbon guide 105113.

When the shift key is locked down, the ribbon should raise sufficiently to insure full black print with shift lever in center position, $\frac{1}{4}$ key held depressed.

Adjustment: To raise or lower ribbon guide the screw in arm 1-105122 is loosened and arm 1-105122 located and the screw tightened.

When shift key is locked, with ribbon color shift lever in left position, the red portion of the ribbon should rise sufficiently to insure full print using $\frac{1}{4}$ type.

Adjustment: The screw is loosened and segment 105121 shifted. When this adjustment is made limit wire 105800 must be tested for no clearance between it and ribbon guide 105113.

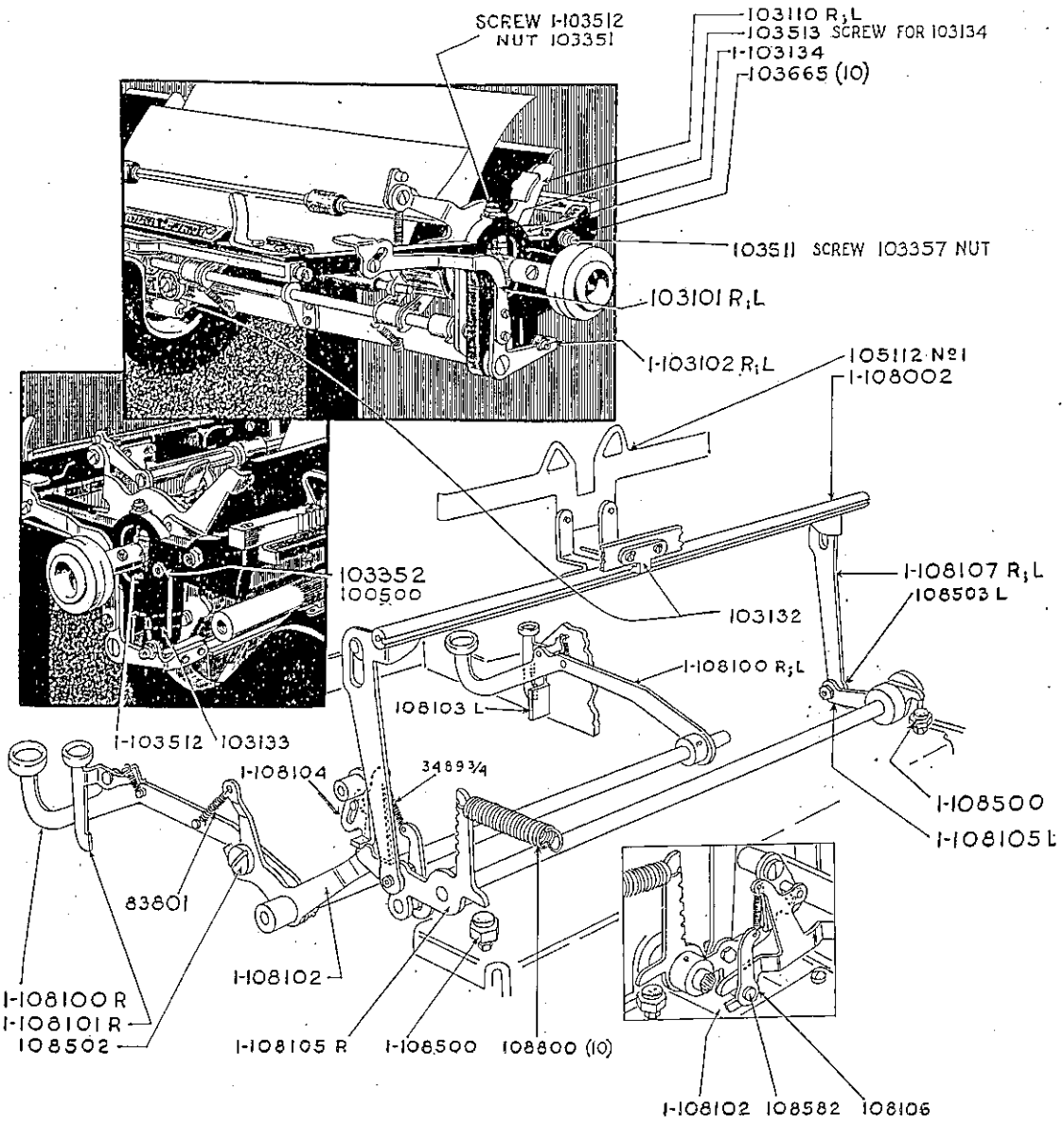
Stencil Lock Button

The purpose of stencil lock button 100553 is to make the manipulation of ribbon color shift lever 1-105120 positive. Button 100553 is carried by part 100800 having a lip which blocks lever 1-105120 from being shifted to the right. When button 100553 is pressed in, lever 1-105120 can be moved to the right.

SELF-QUESTIONS

36—What is the purpose of ribbon guide 105113?
37—Describe the operation of ribbon guide 105113.
38—What is the purpose of ribbon color shift lever 1-105120?
39—How is the ribbon guide actuated?
40—What takes place when lever 1-105120 is placed in left position?
41—What takes place when lever 1-105120 is placed in center position?
42—What happens when lever 1-105120 is placed in right position?
43—How is the center position of lever 1-105120 adjusted?
44—How is the left position of lever 1-105120 adjusted?
45—How much clearance should there be between ribbon guide 105113 and segment 106665 when the machine is normal?
46—What is the purpose of limit wire 105800?
47—What test is applied to limit wire 105800?
48—What test is applied to insure full black print when the shift lever is locked down, ribbon color shift lever in center position?
49—What adjustment may be required when the shift key is locked down, to insure full black print?
50—What test is applied to insure full red print when the shift key is locked?
51—What adjustment may be required to insure full red print when the shift key is locked?
52—What is the purpose of stencil lock button?

SHIFT KEY MECHANSIM



Shift Key Mechanism

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 the shift key is depressed, part 1-108102 is rocked, which first swings carriage normal arm 1-108104 to clear the step on part 1-108105R to allow the platen assembly to be raised. The fork of part 1-108102 picks up lower shaft assembly 11-108001 by contacting on arm of part 1-108105R. Lift shaft assembly 1-108002 is connected to the lower shaft assembly 11-108001 by arms 1-108107R and L. Lift shaft assembly 1-108002 carries aligning scale 105112 No. 1 or 2, ribbon guide 105113 and bell crank 1-105125, which actuates ribbon guide 105113 through link 105126 and bell crank 105129. The shift key and part 1-108102 when restored are held normal by spring 3489¾, which is hooked from the vertical arm of 1-108102 to spring anchor 108106, the latter pivots on stud 108582.

Lift shaft 1-108002 has a slot throughout its length. Hanger 103132 (of the platen assembly) has a bent lip, which seats in the slot of lift shaft 1-108002. When the carriage is spaced or tabulated, the lip of hanger rides in the slot of lift shaft 1-108002, to prevent overthrow of inner carriage on a rapid operation of the shift key.

Tests and Adjustments

The correct depressed position of the shift key causes the upper case type to print on a straight line with the lower case type. Upper limit screws 1-103512 are turned to secure the upper platen position. When the correct platen position is obtained, limit post screws 108500 are adjusted for no clearance between the screws and the rear arm of part 1-108105R.

Shift keys 1-108100R and L are adjusted to be on level with the letter keys by turning eccentric 108502 in part 1-108102. Shift key 1-108100R is spring-connected to part 1-108102, this permits the shift key lock 1-108101R and L to be readily unlatched.

When shift key lock is depressed and latched, spring 83801 should be slightly expanded.

Adjustment: Screws 73612, which hold parts 108103R and L, are loosened and part 108103R and L located to slightly expand spring 83801.

Before the shift height is adjusted, the platen is tested and located parallel to segment 106665, to insure equal type impression at the right and left platen ends. This adjustment is made with a type bar gauge, which is put in place of the letter H type bar.

The platen is located so that the curvature of the gauge will align with the platen surface in front and on top. Eccentric screws 103511 are turned when making this adjustment.

When the front of the platen aligns with the gauge and there is clearance between the gauge and the top of the platen, lower screws 103512 are sufficiently raised to align the platen with the gauge. When this adjustment is completed eccentric screws 103511 should be securely locked with nuts 103357 and should not be disturbed.

The upper and lower limit screws 103512 are approximately set to print the upper and lower case letter N in a straight line and then the limit screws are locked with lock nuts.

Lock arm 1-108104 should be tested for not weaving when the carriage is moved from left to right and vice versa. When a weave is present it can be removed by turning the eccentric screw 108503L which connects arm 1-108107L and lift shaft assembly 1-108002.

Compensating Spring

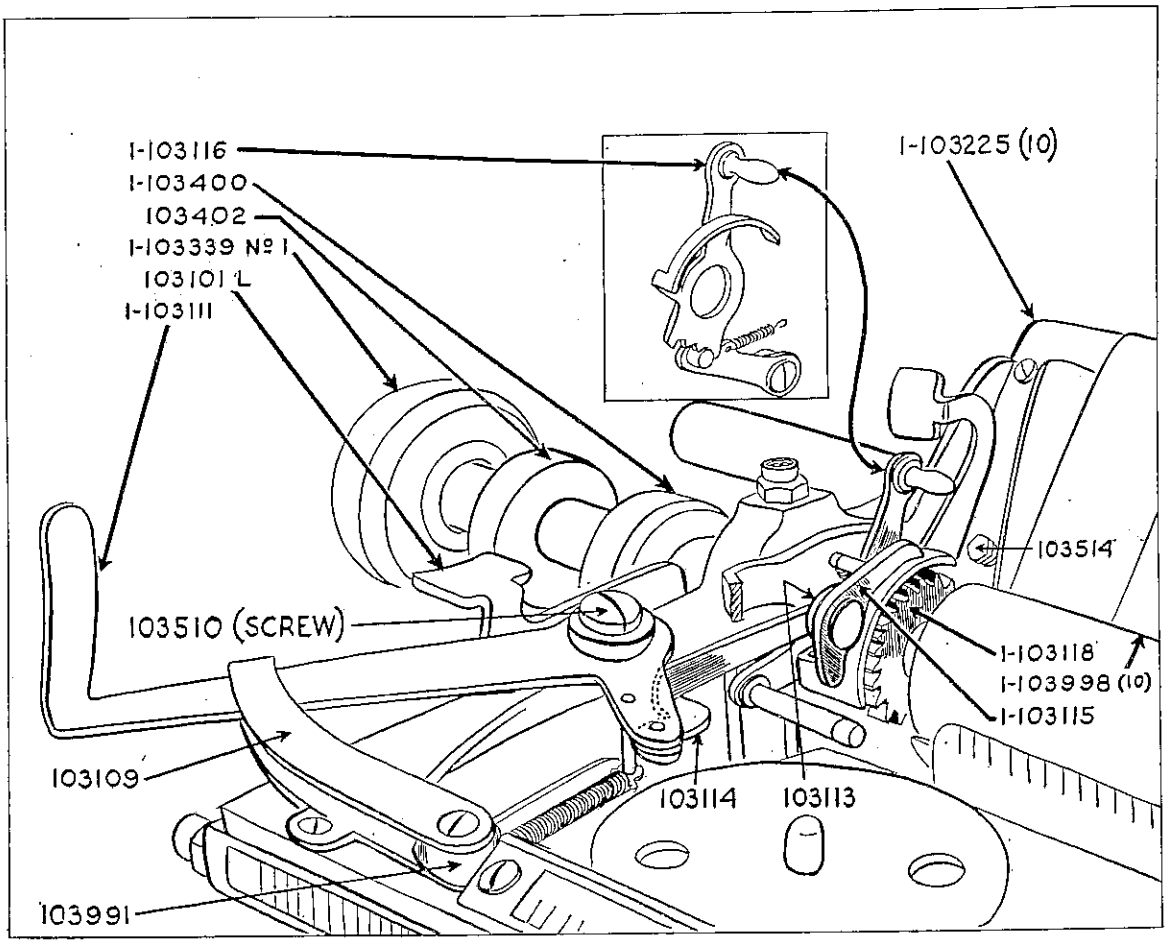
The purpose of compensating spring is to lighten the depression of the shift keys.

Compensating spring 108800 is hooked from a stud in side frame 100110R to one of 6 notches in the vertical arm of part 1-108105R.

SELF-QUESTIONS

53—What is the purpose of the shift keys?
54—How is the platen locked in printing position?
55—Describe in sequence the operation of the shift mechanism.
56—What is the purpose of spring 3489¾ (hooked from 1-108102 to spring anchor 108106)?
57—How is the carriage connected to the shift mechanism?
58—What adjustment is made to cause the upper and lower case type to print in a straight line?
59—What adjustment is made to secure the relative key level of the shift lever?
60—What adjustment is made to permit the unlatching of the shift keys and what test governs this adjustment?
61—What is the purpose of limit post screws 1-108500?
62—What adjustment is made to give platen lock arm 1-108104 equal hold on right and left sides?
63—What holds the platen assembly when it is lifted by the shift keys?
64—What test is applied to stabilizing shaft assembly 1-103001 and what adjustment may be required?
65—How much end play can the platen assembly have and what adjustment governs the amount of end play?
66—How are the upper and lower platen positions secured?
67—How are the correct positions of the platen determined?

CARRIAGE DETAILS (LEFT)



Complete Carriage 2-103665

The carriage position is accurately maintained by moving on rod assembly 1-103901, the latter is fastened to plate 1-100106. The carriage is held on rod 1-103901 by guide bearings 1-103911R and L, which are fastened to frame 1-103665. Free movement of the carriage is secured through two roller bearings 1-103999, which contact on the upper surface of rod 1-103901 and two roller bearings 1-103999, which contact on the front of rod 1-103901. The upward movement of the front of the carriage is limited by two hooks 103106R and L fastened to frame 103665 and contacting on the upper edge of the groove in rail 103900. One bearing 1-103999 contacts on rail 103900.

Tests and Adjustments

Hook 103132 should be adjusted to have minimum clearance between it and the upper edge of lift shaft 108002.

Adjustment: The screws holding hook 103132 are loosened and the latter shifted upward or downward and the screws tightened. Hooks 103106 should have a little more play than hook 103132, the adjustment being made in the same manner.

To Remove the Complete Carriage

Remove pointer 103107.

Detach drawband and hook it on stud in plate 1-100106.

Remove four nuts from screws holding guide bearings 103138R and L.

The complete carriage can now be lifted from machine.

To Remove Platen Assembly

Remove knob assembly 1-103339 No. 1.

Remove sliding member 103402.

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.

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 103665. The inner carriage assembly swings on stabilizing arms 1-103134 (of shaft assembly 1-103001) and stabilizing links 103133. Stabilizing arms 1-103134 are pinned to shaft 1-103001, the lower ends of the arms pivot on side plates 103110R and L on screws 103513. The rear ends of lower links 103133 also pivot on side plates. The front ends of lower links pivot on frame 103665.

Stabilizing shaft assembly 1-103001 floats on adjustable shoulder screws 103511 in frame 103665. These screws are adjusted to secure equal clearance between side plates 103110R and L and about .015 end play. Screws 103511 are locked with nuts 103357.

The complete inner carriage assembly should have minimum end play, which is secured with adjusting screws 100500 (in frame 103665), which contact on side plates 103110R and L; screws 100500 are locked with nut 103352.

SELF-QUESTIONS

68—What test is applied to hook 103132?

69—What test is applied to hooks 103106?

70—How are roller bearings 1-103999 adjusted which are located on the front of rod 103901?

71—How are roller bearings 1-103999 adjusted which are located on the top of rod 103901?

72—How is the complete carriage removed?

73—How is the platen assembly removed?

To Remove Inner Carriage Assembly

Remove platen assembly (instructions under own heading).

Remove variable line space clutch cup 1-103400.

Disconnect line space lever 103111 from ratchet assembly 1-103118.

Remove ratchet assembly 1-103118.

Remove carriage back plate 1-103225.

Remove pivot screw of left carriage release lever.

Back down left lower platen limit screw; this is necessary to permit removing screws holding link 103133.

The right link 103133 can be removed without disturbing the lower platen limit screw, which will maintain the lower platen limit position.

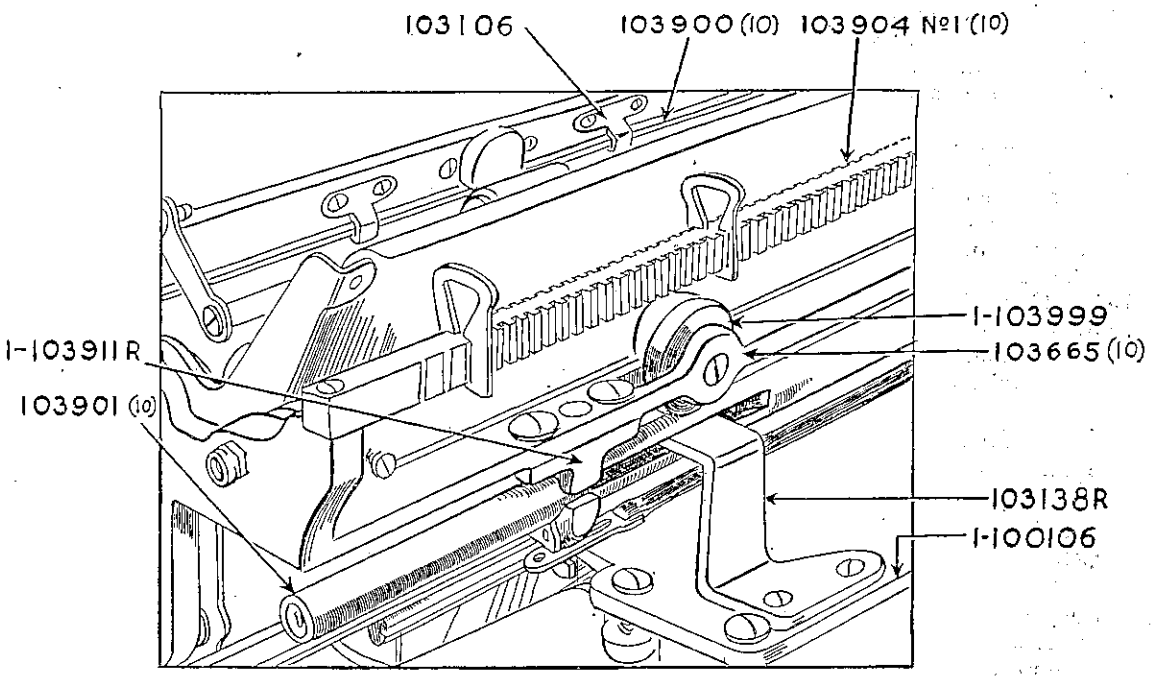
When reassembling, the left limit screw is raised and tested with a paper feeler.

Remove pivot screws in stabilizing arms 1-103134.

The inner carriage assembly can now be removed.

Reassemble in reverse order.

ROLLER AND GUIDE BEARINGS



Roller Bearings

Roller bearings 1-103999, which contact on front of rod 103901, 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 103901.

Adjustment: Screw 2851⅞ is loosened and eccentric stud 103554 is turned.

Note: Brass pin 103582 is between eccentric 103554 and screw 2851⅞.

Roller bearings 1-103999, which contact on the upper surface of rod 103901, should be adjusted to slightly clear rod 103901 when the carriage is raised.

Carriage normal arm 1-108104 should have equal hold on the step of part 1-108105 in right and left carriage positions.

Test: When the carriage is moved from left to right and vice versa, there should be no weave of part 1-108105. To equalize, eccentric in 1-108107L is turned.

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 103101R and L are fastened to rack assembly 1-103903. When either levers 103101R or L is depressed, the rack assembly is rocked to clear escapement gear 104003.

Test and Adjustment

When levers 103101R and L are in normal position, there should be clearance between the bottom of the slot and screw 103530.

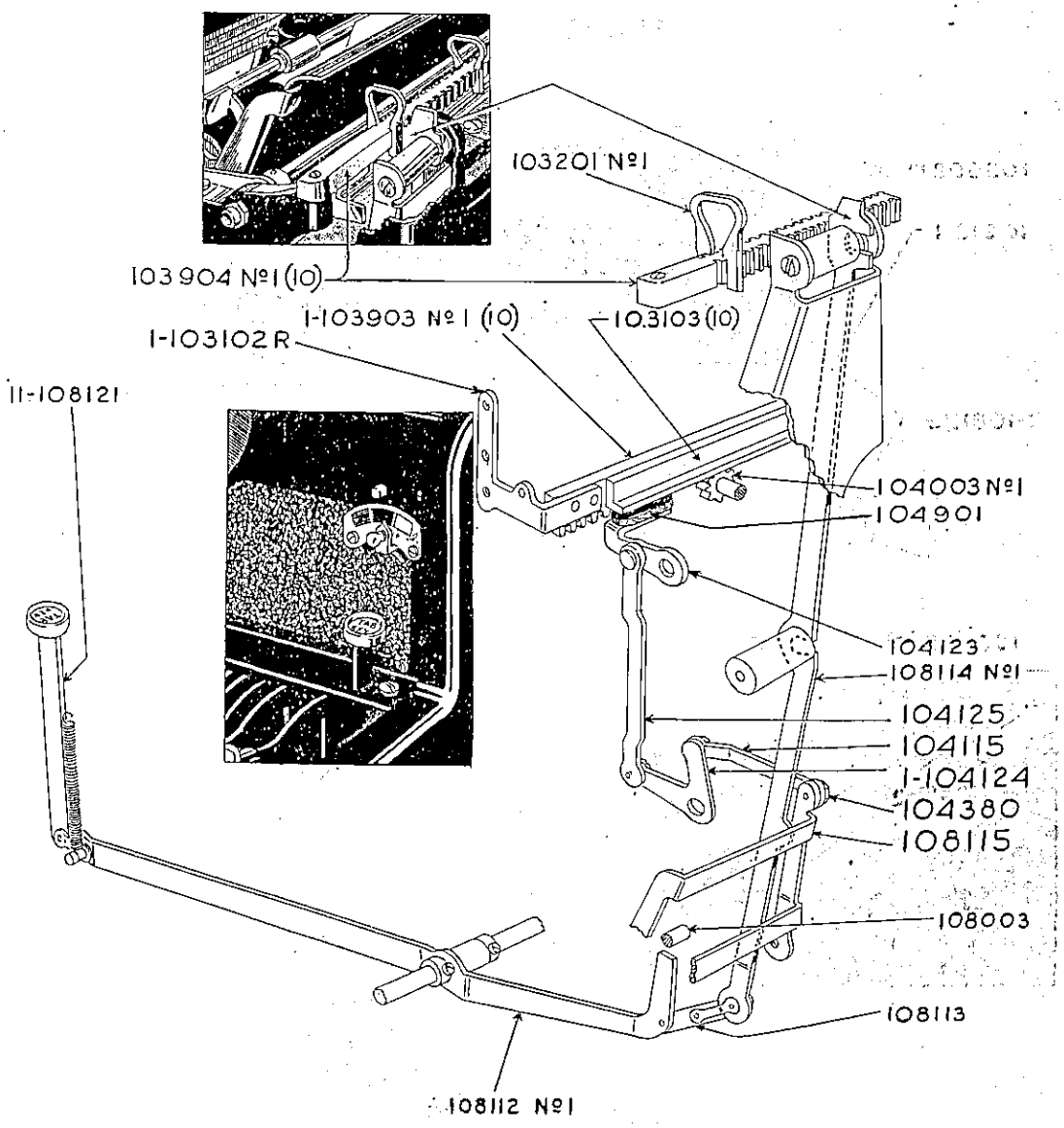
When the tabulator key is depressed, there should be clearance between the top of the slot and screw 103530.

Limit screws 103509 should be set to contact as closely as possible without binding.

Tabulator Key Mechanism

When tabulator key 11-108121 is depressed, lever 108112 No. 1 is rocked, which moves the upper end of vertical lever 108114 No. 1 (through link 108113) into the path of tabulator stops 103201. Lever 1-108112 when fully depressed is limited by its lower projection contacting on shaft 108003 (in frame 108116).

TABULATOR KEY MECHANISM



Rack assembly 1-103903 is disconnected from escapement gear 104003 by arm 104123, which is raised by the movement of the lower arm of vertical lever 108114 No. 1.

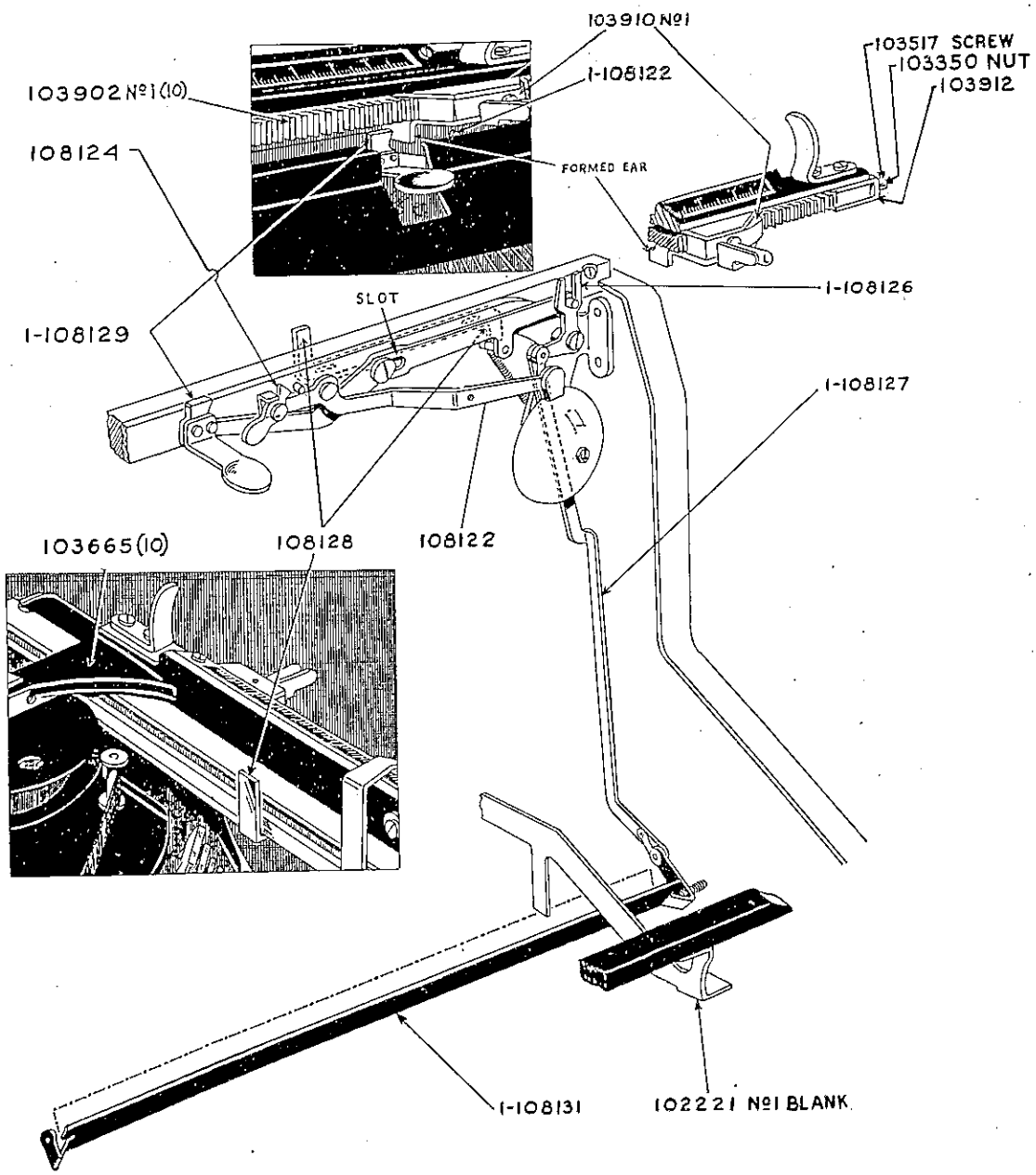
Arm 104123 is connected to 108114 by link 104125, bell crank 104124, link 104115 and bail 108115. Arm 104123 has leather facing, which contacts on ledge 103103 when rack assembly 1-103903 is raised through the depression of the tabulator key.

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 1-103903 and pinion 104003. To increase or decrease the clearance between 103903 and 104003, eccentric 104380 is turned.

MARGIN BLOCKS



Margin Blocks

Margin block 1-103105L insures that all written lines will start evenly from the left edge of the sheet blocking the carriage movement.

Margin block 1-103105R warns the operator that a new line should be started by ringing the bell and blocking the universal bar and the keys after six additional spaces. Margin blocks 1-103105R and L are carried on margin rack 103902; pawl 103910 (of 1-103105R and L) seats in one of the tooth spaces of rack 103902. As the carriage is being spaced, a formed ear on the lower edge of margin blocks 1-103105R and L passes over the pass-by pawl of bell clapper 1-108122. The clapper end is raised and released to strike the bell when the margin block rides from the pass-by pawl. When the carriage is moving from the fifth to the sixth additional space, the formed ear on the lower edge of the margin block contacts on vertical projection of margin release key 1-108129, moving the latter the length of its slot, rocking bell crank 1-108126; the latter raises link 1-108127 to move shutter 108131 to block the space bar and keys.

Margin Release Key

When it is necessary to write more than is permitted by the margin block, margin release lever 1-108129 is depressed, the latter moves out of the path of the margin block, which permits the carriage to be spaced until the carriage frame 103665 contacts on auxiliary stop 108128, the foot of the latter contacts on a stud in margin release key 108129, moving the latter to block the space bar and keys as explained in the previous subject.

Tests and Adjustments

The carriage is limited on the right and also on the left by tabulator frame 108116. The left carriage limit is adjusted to secure minimum clearance between it and the tabulator frame. The right carriage limit is adjusted to allow the carriage to travel to the 100th space and in this position the escapement wheel should hold loose dog 104113 against post 104900. (Illustration on page 4.) The right and left limits are adjusted by bending the projection of 103104.

Margin rack 103902 is in U blocks 103912, which are fastened to the platen frame. The relative position of margin rack 103902 and the left margin block is secured by adjusting nuts 103350, and screws 103517.

Test: Carriage set at 20, now, when the left margin block is moved against the margin release lever, pawl 103910 of margin block 1-103105R should enter the tooth space of margin rack 103902.

When the right margin block is limiting on the vertical projection of the margin release lever, the escapement wheel should also hold the escapement dog 104113 against post 104900. To adjust, stock is removed from the margin release lever where the right margin block contacts.

When the right margin block is limiting on the margin release lever, shutter 1-108131 should be blocking the space bar and keys. Adjustment: The lower end of link 1-108127 is bent. When the carriage is limiting on auxiliary stop 108128, shutter 1-108131 also should block the space bar and keys when the pointer is at 100. Adjustment: The vertical prong of 108128 is bent.

SELF-QUESTIONS

74—What is the purpose of margin blocks 1-103105R & L?

75—What effect does margin block 1-103105R produce?

76—Describe in sequence the operation of margin block 1-103105R.

77—What is the purpose of margin release key 1-108129.

78—What is the purpose of auxiliary stop 108128?

79—What limits the carriage to the right and to the left?

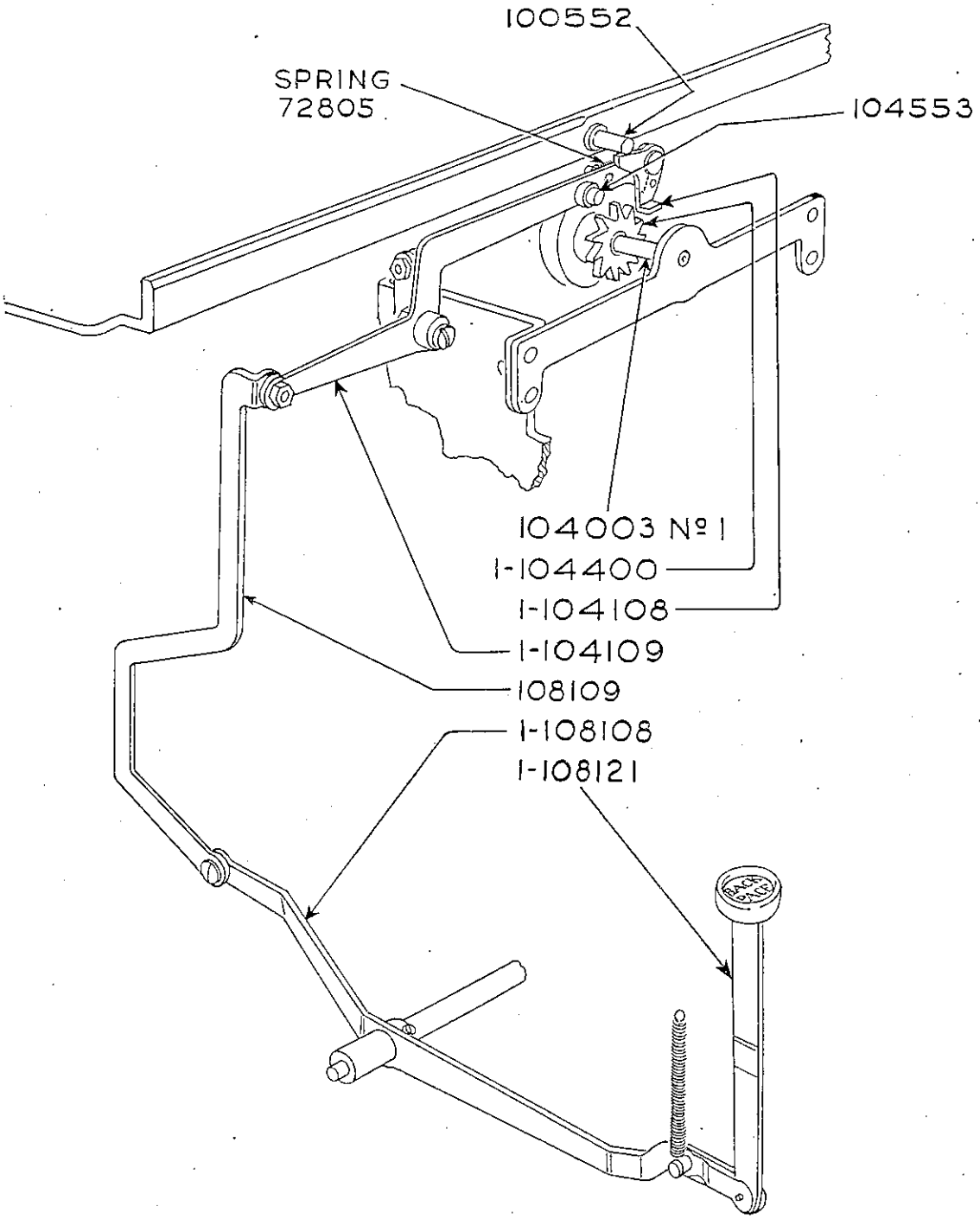
80—What adjustment governs the left carriage limit?

81—What adjustment governs the right carriage limit?

82—What test is applied to the margin release lever in connection with the escapement mechanism?

83—What adjustment governs the condition referred to in question number 82?

BACK SPACE KEY



Line Space and Carriage Return Lever

The purpose of line space and carriage return lever 103111 is to vertically space the platen as the carriage is being pulled toward the right.

Lever 103111 is a bell crank lever, which pivots on screw 103510 in frame 103665. Lever 103111 is connected to pawl arm 103113 with link 103114. When lever 103111 is swung toward the right, its short arm moves pawl arm 103113 and pawl 103115 rearward, which turns the platen.

Line Space Control Lever

Line space control lever 1-103116 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 1-103116 pivots on the shoulder of pawl arm 103113. Lever 1-103116 has a curved arm which limits the engagement of pawl 103115 and teeth of ratchet 1-103118. When lever 1-103116 is moved from position 3 to position 2, the curved arm moves sufficiently into the path of pawl 103115 to cause it to engage one tooth less. When lever 1-103116 is moved to position 1, the curved arm blocks another tooth, which causes pawl 103115 to engage only one tooth.

Line space and carriage return lever 103111 moves in guide 103109, stopping against leather bumper 103991. The movement of 103111 is limited by pawl 103115 contacting on hexagon screw 103514; the latter is adjusted to allow no play of 103111 when the latter is held to the right.

SELF-QUESTIONS

84—What is the purpose of the line space and carriage return lever?

85—What takes place when lever 103111 is operated?

86—What is the purpose of line space control lever 103116?

87—What test is applied to lever 103111 and what adjustment might be required?

Back Space Key

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

When back space key 1-108121 is depressed, pawl lever assembly 1-104109 is rocked through link 108109 and lever 1-108108.

Pawl 1-104108 engages ratchet 1-104400 on pinion shaft 104003. Stud 104553 (of pawl lever 1-104109) limits the movement of lever 1-104109 and insures correct spacing; check pawl 104111 holds the escapement wheel from turning.

Tests and Adjustments

When the back space key is depressed, there should be no clearance between stud 104553 and ratchet wheel 1-104400.

Adjustment: The eccentric in link 108109 is turned.

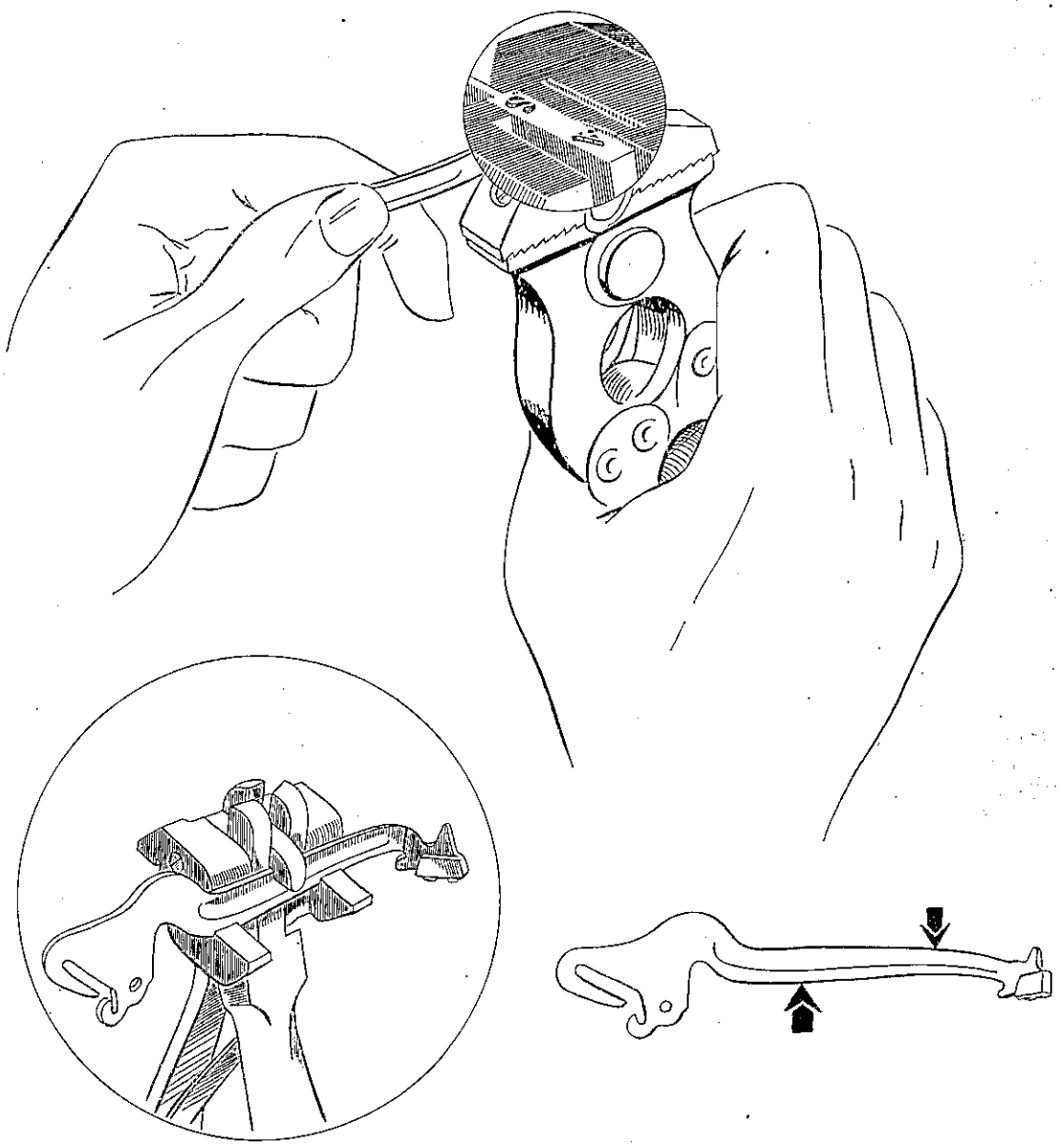
SELF-QUESTIONS

88—What is the purpose of the back space key?

89—Describe in sequence the operation of the back space key.

90—What test is applied to the back space key and what adjustment might be necessary?

TYPE ALIGNING TOOLS



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 page 15.

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 relation of the type bar with the anvil and the platen. When the type bar contacts on the platen there should be .002 clearance between the type bar and the anvil.

When there is no clearance between the type bar and anvil or when there is clearance between the type and platen, the center prong is applied at a point on the type bar as indicated by the arrow toward the right on the illustration.

When the clearance between the type bar and the anvil is more than .002, the center prong of the nine prong is applied on the opposite side.

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 the nine prongs have been used to raise or lower type, it is necessary to test for .002 clearance of type bar and anvil.

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 page 15. Check shift and platen position covered on page 13.

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

91—To which test is typewriter type aligned?
92—Which tool and how is it used to move the type sidewise in order to have equal space between all letters and other type?
93—What other type adjustment is usually necessary when type is moved sidewise?
94—Which tool and how is it used to place type on their feet when both characters print light on either side?
95—Which tool and how is it used to straighten type when its print is not parallel to other type?
96—Which tool and how is it used to center type with itself?
97—Which tool and how is it used to place type on its feet when the tops or bottoms of characters print light?
98—Which tool and how is it used to place type on its feet when the top of one character only prints light?
99—Which tool and how is it used to place type on its feet when the bottom of one character prints light?
100—Why is it advisable not to use the mauler until its exact need has been determined?
101—Which tool and how is it used to secure the right relation of the type bar on the anvil and platen?
102—How much clearance should there be between the anvil and type bar when the type is limiting on the platen?
103—Which tool and how is it used to raise the type when both characters are slightly low?
104—Which test should be applied when type are raised?
105—What should be done when both characters are excessively high?
106—Which tool and how is it used when the characters on a type are slightly in opposite directions?