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TELETYPE

PRINTING TELEGRAPH SYSTEMS

ADJUSTMENTS

SEQUENTIAL SELECTOR

(BS6)



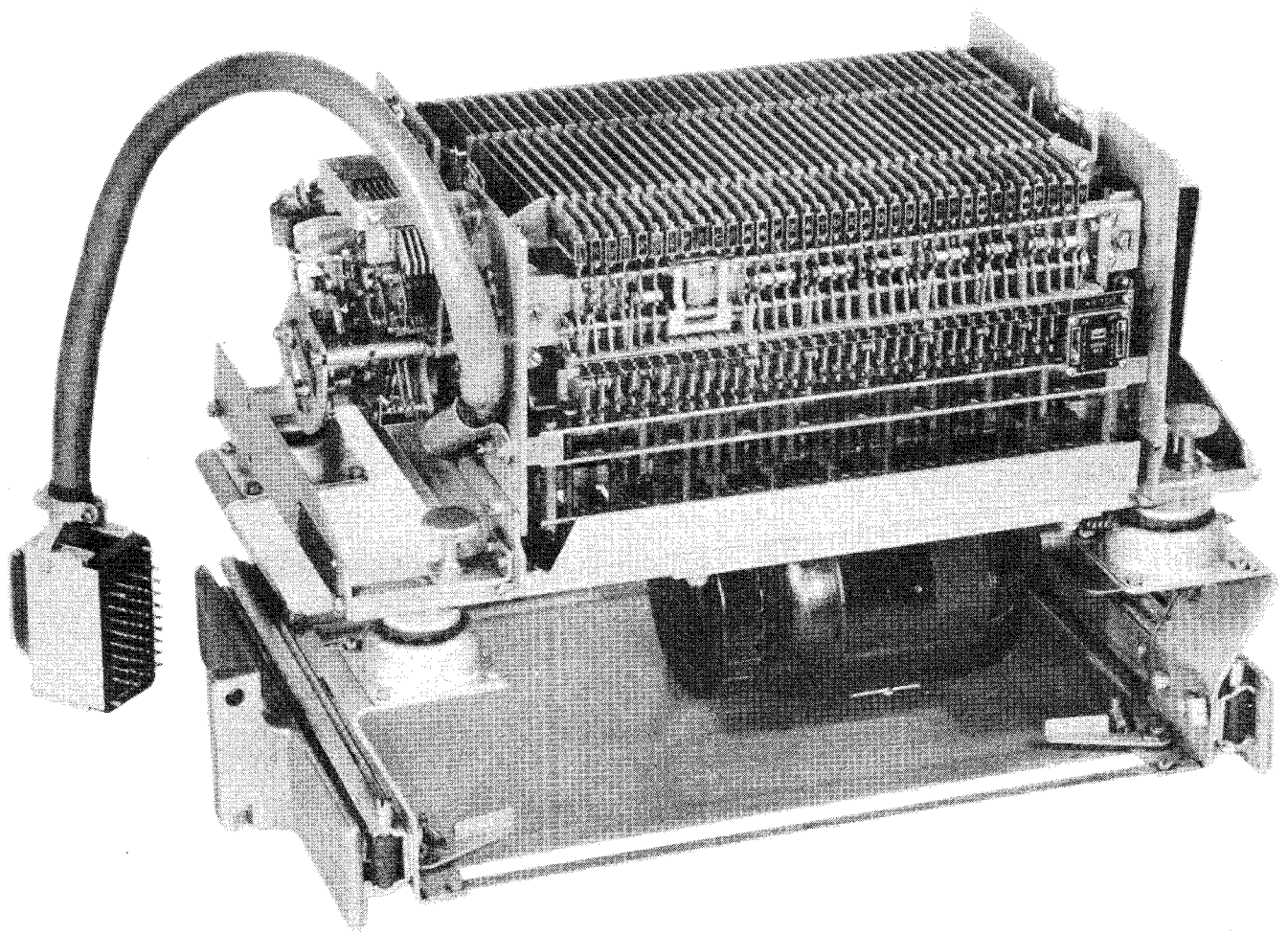


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SECTION I

GENERAL DESCRIPTION AND ADJUSTMENT PROCEDURES

1. GENERAL DESCRIPTION

a. The Teletype Sequential Selector is a motor-driven electro-mechanical receiving unit which automatically controls telegraph signal circuits in response to predetermined sequences of printing telegraph signals. These sequences may be composed of both character and functional signals which precede and follow regular Teletype messages. Facilities are available for equipping the unit with as many as 33 contacts. When changes are necessary, a contact may be placed under the control of a required sequence by manually substituting the necessary code levers.

b. The Sequential Selector unit is mounted by resilient fittings to a metal panel which may be secured to a relay rack, a cabinet shelf or a table. The panel also supports the motor and a countershaft which drives the main shaft of the selector unit. The panel incorporates sliding rails and latches which permit forward movement of the panel relative to its mounting brackets, which are positioned for standard relay rack spacing.

c. As an adjunct to the contact operating mechanism a mechanical timer is attached to the left, lower rear, side of the Sequential Selector. The timer is geared to the mainshaft through a friction clutch. When it is desirable to introduce a pause in the control sequence, the timer operates in response to a BLANK combination in a transmitter start pattern.

d. The Sequential Selector incorporates an answer back feature which generates an "H" character signal by means of a cam and contact assembly located near the lower, right, rear corner of the unit. When the Sequential Selector at an outlying station receives the transmitter-start pattern signal sequence directing it to start an associated transmitter distributor, the "H" answer back mechanism automatically starts. If there is tape in the transmitter distributor, it will also start and the "H"

answer back signal will be shunted out of the signal circuit. If the transmitter distributor is without tape, it will not start. However, the "H" answer back signal will be transmitted over the signal line connected to the transmitter distributor.

2. GENERAL ADJUSTMENT PROCEDURES

a. The following adjustments cover the B56 Sequential Selector.

b. Adjustments are arranged in a sequence that would be followed if a complete readjustment of a unit were undertaken. In following such a procedure, parts and assemblies which are removed to facilitate adjustments should not be replaced until other adjustments which would be facilitated by the removal of these parts are made. If one adjustment is changed, related adjustments should be checked.

c. The spring tension values given in this book are scale readings which should be obtained when Teletype scales are used as specified. Springs which do not meet the requirements specified and for which no adjusting procedure is given should be replaced by new springs. Ordering information may be obtained from the Teletype parts bulletin.

d. Before proceeding to adjust any part, read the applicable portion of the adjusting text carefully. After the adjustment is completed, be sure to tighten any screws or nuts which may have been loosened. If a part that is mounted on shims is to be removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

3. SELECTING A CODE LEVER

When the instructions for making an adjustment specify the selection of a certain code lever, the following method should be followed: (Refer to Teletype code chart Figure 89). Hold the armature against the magnet pole faces

and rotate the main shaft counterclockwise, as viewed from the drive gear end, until the operating cam sleeve and the selector cam sleeve are in their stop position. Then release the armature and continue to rotate the main shaft until the locking lever (see Figure 11) is about to drop off the long high part of the locking lever cam. Hold or release the selector armature to move the armature lever to the operated (MARKING) or unoperated (SPACING) side in accordance with the first selecting impulse of the code combination to be set up. Refer to the code chart (Figure 89). Hold the armature lever in this position and again rotate the main shaft until the outer (No. 1) selector sword has been positioned and the locking lever is on the peak of the locking lever cam. Position the armature lever in accordance with the second impulse of the code combination to be set up and repeat the procedure followed in positioning the outer (No. 1) selector sword. Position all of the selector swords by following the foregoing procedure. When all swords have been positioned and the pawl-and-ratchet clutch has been engaged, further rotation of the main shaft will cause the unit to select the code lever which corresponds to the code combination set up on the holding magnet selector.

4. SPEED SETTING

a. When a governed motor is used, a speed indicator is required for the purpose of checking the motor speed. The fork is equipped with shutters attached to the end of the tines. The governor is equipped with a target having black spots on a white background.

b. To check the speed, the target should be well illuminated. Tap the speed-indicator fork lightly to make it vibrate. Hold the fork so that the shutters are close to the eye and view the target through the openings in the shutters. If the motor is running at the correct speed, the target will appear to be stationary. If the motor is running too fast, the spots will appear

to be moving in the direction of motor rotation; if too slow, in the opposite direction. To increase the speed, operate the speed adjusting lever. To decrease the speed, operate the governor adjusting bracket.

NOTE

There is a possibility of setting the speed incorrectly; i.e., the speed could be half the desired speed, or some multiple thereof, even though the spots appear to be stationary when viewed through the shutters of the speed indicator. This should be kept in mind if trouble is experienced in the operation of the unit.

5. TO MEASURE RECEIVING RANGE

a. Mounted on the holding magnet selector mounting plate at the left end of the main shaft is the range finder assembly. This range finder assembly is used for the purpose of orienting the selector to the incoming signals. Transmit the letters RY alternately to the unit continuously while the receiving range is being determined. The range may be determined as follows:

b. Set the RY test indicator so that its white portion appears. While RY is being received, loosen the index-arm thumb screw (Figure 19) and shift the index arm of the range finder toward 0 until an error (RED) appears on the RY test indicator. Reset the indicator. Then move the index arm back slowly until errors no longer appear. This position indicates one limit of the orientation range. Note the position of the index arm on the scale. Determine the opposite end of the receiving range by repeating the foregoing procedure with the index arm near the opposite end of the range scale. After the two limits of the receiving range have been found, set the index arm of the range scale midway between these two points.

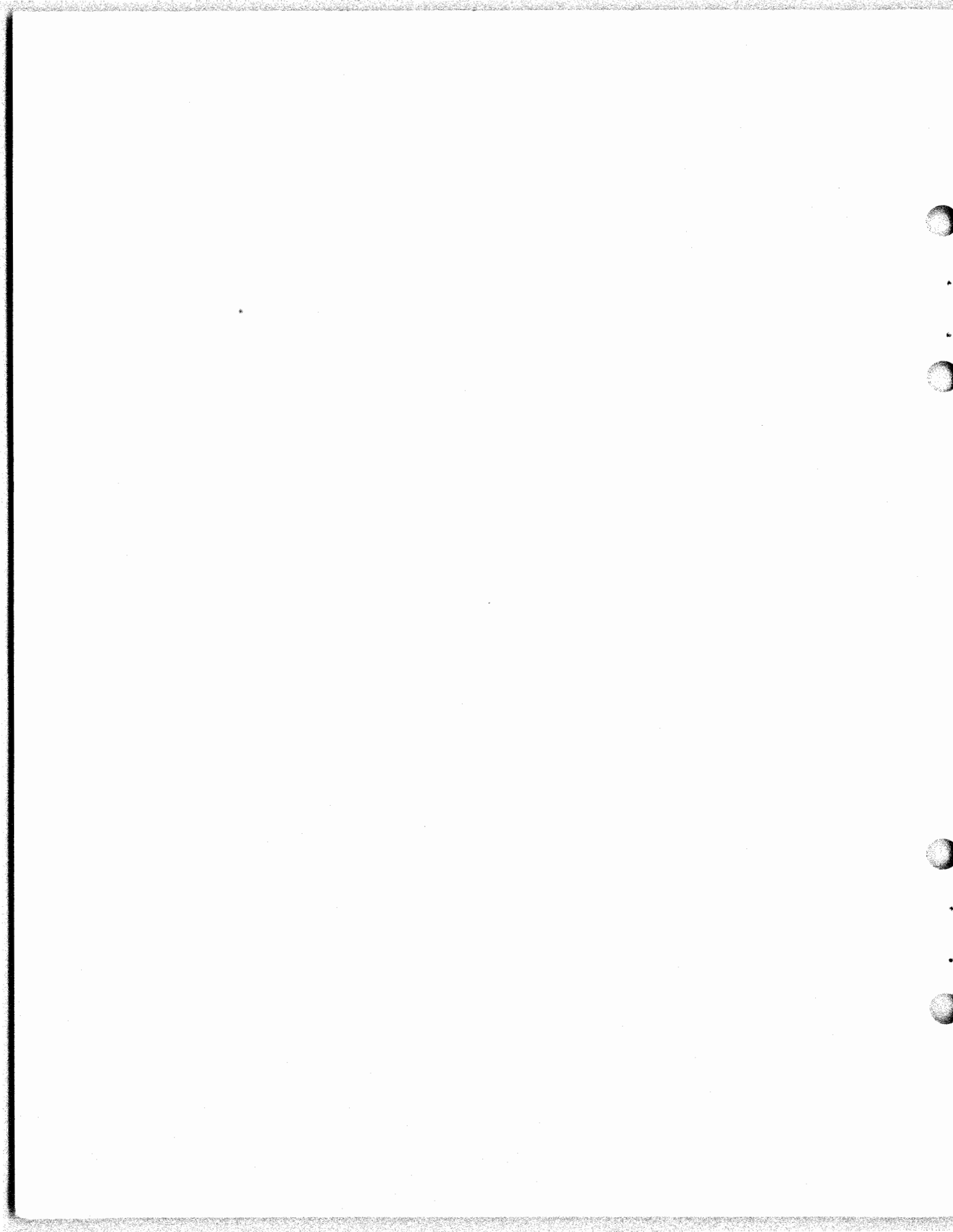
NOTE

If facilities for transmitting

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biased test signals to the receiving unit are available, the index arm should be set at the optimum

setting for the reception of biased signals.



ADJUSTMENTS

1. SELECTOR SEPARATOR PLATES

NOTE: The separator-plate leaf springs are adjusted during the initial assembly of the unit and should require attention only if the selector has been damaged or dismantled. If it is found necessary to check the adjustment, extreme care should be exercised in the removal and replacement of the selector-lever springs to guard against distorting them. The subsequent selector adjustments will be facilitated if the swords and selector levers are replaced in the identical positions they formerly occupied.

The leaf springs should exert a light pressure against the swords. To adjust, bend the leaf springs at the narrow portions so that the ends of the springs are .050" to .060" below the under surface of the straight portions.

2. MAIN SHAFT (Figures 2, 11 and 51 for location of parts)

The selector cams on the selector cam sleeve should line up with their respective selector levers. Check by rotating the main shaft. To adjust, loosen the screw in the gear hub and the screw in the ratchet hub assembly and position the main shaft. Tighten the gear hub mounting screw.

3. OPERATING ECCENTRIC ASSEMBLY (Figure 2)

The operating eccentric assembly on the main shaft should have some end play, not more than .006". To adjust, position the ratchet hub assembly by means of its mounting screw, being careful to eliminate any binds between the drive links and the link brackets on the main-bail and stripper-bail operating bars. Tighten the ratchet-hub assembly mounting screw.

4. CLUTCH-PAWL SPRING TENSION (Figure 3)

With the unit resting on its front

side, rotate the main shaft until the clutch pawl is in a vertical position. Rotate the shaft backward slightly so that the pawl just fails to touch any ratchet tooth. With an 8 oz. scale hooked to the clutch pawl at the spring hole and pulled in line with the spring, it should require from 3-1/2 to 4-1/2 ozs. to start the clutch pawl moving.

REMOVE THE BLOCKING AND LATCHING LEVER ASSEMBLY.

5. MAIN-BAIL OPERATING BAR (Figure 2)

The main-bail operating bar should have some end play, not more than .006". Adjust by means of the pilot screws.

6. STRIPPER-BAIL OPERATING BAR (Figure 4)

The stripper-bail operating bar located directly below vane No.2) should have some end play, not more than .006". Adjust by means of the pilot screws.

NOTE: Make certain there are no binds between the drive links and their associated link brackets.

7. MAIN BAIL REINFORCING PLATE (Figure 5)

NOTE: This adjustment is made at the factory before the main-bail is assembled in the unit and should not be made unless the main-bail reinforcing plate has been removed.

The horizontal leg of the main-bail reinforcing plate should contact the lower edge of the main-bail along its entire length. To adjust, position the plate by means of its enlarged mounting holes.

8. SELECTOR VANES GUIDE BRACKET (Figure 6)

The selector vanes should have some end play, not more than .010". To adjust, loosen the vane guide bracket mounting screws and position the vane

guide bracket. Tighten the screws.

9. MAIN BAIL HEIGHT (Figure 7)

With the main shaft in the stop position there should be a clearance of .055" to .065" between the No. 5 vane and the associated projection of the right and left vane lock levers at their closest points. To adjust, raise or lower the main bail by means of the two eccentric shoulder screws which connect the links to the bail (being sure to keep the indicating mark in the front half of the circle.)

10. VANE STOP POSITION (Figure 8)

With the vanes in the SPACING position they should be approximately in the center of the blocking extensions on the FIGURES code lever. To adjust, position the left vane stop by means of its mounting screws. Make certain that the right vane stop and the operating push bar bracket do not interfere with the adjustment. With the vanes in the spacing position and resting against the extensions on the left vane stop, position the right vane stop by means of its mounting screws so that its extensions just touch at least one of the vanes.

11. SELECTOR-VANE OPERATING PUSH BAR BRACKET (Figures 8 and 9).

The selector vanes should have full travel between their stops and there should be some clearance between the top of the vanes and the top of the slots in the vane operating push bars. To adjust, loosen the selector-vane operating push bar bracket mounting screws and position the bracket by means of its elongated mounting holes. Tighten the screws.

12. SELECTOR-VANE OPERATING PUSH BAR COMBS (Figure 9)

The selector-vane operating push bars should be aligned with the selector transfer levers and should operate without binding. To adjust, loosen the

front and rear selector-vane operating push bar combs. Locate the front comb, so that the push bars are in line with the transfer levers and the comb teeth are parallel to the selector-vane operating push bars. Tighten the screws in front comb. Locate the rear comb so as to eliminate any bind between the push bars and the combs. Tighten the screws in the rear comb.

NOTE: There should be some clearance, not more than .010", between the bottom of the bracket and the top surface of the selector-vane operating push-bars. (Check both front and rear.)

13. SELECTOR-VANE SPRING TENSION (Figure 9)

With the swords held away from the transfer levers, place the push end of an 8 oz. scale against each operating push bar and push horizontally. It should require 1/4 to 1 oz. to start the operating push bar moving. See Figures 9 and 10 for location of parts.

14. SIXTH-VANE POSITIONING SPRINGS (Figure 9)

With the main shaft in its stop position and the sixth-vane detent levers held clear, the vane should remain in either its marking or spacing position. To adjust, when this condition cannot be met, unhook the sixth-vane positioning springs and remove any twist that may be in them. Rehook springs.

15. SIXTH-VANE DETENT LEVER SPRING TENSION (Figure 10)

With the 6th vane in the MARKING (activated) position, hook an 8 oz. scale to the spring eye of the detent lever and pull horizontally and in line with the spring. It should require from 3/4 to 1-1/2 ozs. to start the lever moving away from the vane. Check both, left and right springs in the same manner.

THE HOLDING-MAGNET SELECTOR
SHOULD MEET THE FOLLOWING REQUIREMENTS:

NOTE: Arrange the unit in a vertical position through use of the unit supports, so that the selector mechanism is upward.

REMOVE THE RANGE-FINDER ASSEMBLY

16. ARMATURE LEVER PIVOT SCREW (Figures 11 and 12)

With the armature lever spring and the selector arm spring unhooked, the armature lever should be free on its pivots with barely perceptible end play. To adjust, loosen the armature lever pivot screw lock nut and position the armature lever by means of its upper pivot screw. Tighten the lock nut.

17. SELECTOR MAGNET (Figure 13)

When the armature is in its operated position, it should touch both magnet cores at approximately the centers of their pole faces. The cores should be centrally located with respect to the armature as gauged by eye when holding a light background behind the magnet and the armature assembly. To adjust remove the selector-magnet bracket from the unit and reposition the magnet core assembly by means of its mounting screws while holding the assembly so that the cores are vertical. The armature should rest against the pole faces by its own weight. Replace the selector-magnet bracket.

18. SELECTOR-ARM PIVOT SCREW (Figures 12 and 14)

With the armature lever spring, the selector-arm spring and selector-arm stop-detent spring unhooked, the selector arm should be free on its pivots with barely perceptible end play, and the locking lever should overtravel the top and bottom edges of the locking wedge. There should be a minimum clearance of .008" between the selector arm and the armature lever. There

should also be a minimum clearance of .010" between the selector arm and the selector-arm stop detent when the play in the detent is taken up in a direction to make this clearance a minimum. The end play may be adjusted by means of the upper pivot screw. If the minimum clearance requirements are not met, it will be necessary to remove the selector-magnet bracket and the selector-arm bracket and to adjust both pivot screws of the selector arm.

19. SELECTOR-ARM BRACKET (Figure 11)

a. The selector-arm bracket should be positioned so as to provide some clearance, not more than .040", between each sword and either stop post, under the following conditions:

b. Remove the locking-lever spring, the armature spring, and the selector-arm spring. Rotate the main shaft until the No. 1 selector lever is resting on the peak of its cam. With the selector arm in its SPACING position, move the spacing arm of the No. 1 sword against the selector-arm extension. Then rotate the selector arm slowly toward the MARKING position until it just leaves the spacing arm of the No. 1 sword. There should be some clearance, not more than .040", between the No. 1 sword and the spacing stop post.

c. With the selector arm in its MARKING position, move the marking arm of the No. 1 sword against the selector-arm extension. Then rotate the selector arm slowly toward the SPACING position until it just leaves the marking arm of the No. 1 sword. There should be some clearance, not more than .040", between the No. 1 sword and the marking stop post.

d. With each selector lever on the peak of its cam, each associated sword should be tried for the foregoing requirement of some clearance, not more than .040". To adjust, loosen the selector-arm-bracket mounting screws just enough to make the bracket friction

tight. Then, to equalize the clearance between the swords and the stop posts, loosen the centralizing eccentric-screw lock nut and turn the eccentric screw clockwise to provide more clearance on the SPACING side, or counterclockwise to provide more clearance on the MARKING side.

NOTE: Make certain that the selector-arm stop detent does not interfere with the adjustment.

e. The centralizing eccentric screw should always be located so that its indicating line is adjacent to the marked scale which has been provided on the bracket to aid in gauging the amount the screw must be turned. Tighten the lock nut when the selector arm has been centralized. To obtain the "some clearance, not more than .040", requirement between the swords and the stop posts, insert the 90783 adjusting wrench in one of the two holes provided and turn the wrench to move the bracket closer to or farther from the swords as required. Then tighten the selector-arm-bracket mounting screws. Replace the locking-lever spring and armature lever spring.

20. LOCKING WEDGE (Figure 15 A)

With the locking lever on any peak of its cam, the end of the locking wedge should clear the locking lever by .006" to .010" when the end of the wedge is held in line with the locking lever. To adjust, loosen the locking-wedge mounting screw and position the locking wedge in its guide; then tighten the mounting screw.

21. LOCKING LEVER SPRING TENSION (Figure 15 A)

With the locking lever on the high part of its cam, hook an 8 oz. scale on the end of the locking lever at the spring hole and pull in line with the spring. It should require from 4 to 5-1/2 ozs. to start the lever moving away from the cam.

22. SELECTOR-ARM STOP DETENT (Figure 14)

a. With the selector-arm spring removed and the locking lever on the low part of its cam, there should be an equal amount of clearance, within .003", between the sides of the locking wedge and the locking lever when the selector arm is in the MARKING or SPACING position.

NOTE: When checking the MARKING position, be sure that the selector-arm operating screw does not interfere with the movement of the selector arm.

b. To adjust, loosen the screw that mounts the selector-arm stop-detent eccentric post just enough to make the post friction tight. Position the stop detent by turning the post; then tighten the post mounting screw.

REPLACE THE SELECTOR-ARM SPRING

23. SELECTOR-ARM STOP-DETENT SPRING TENSION (Figure 14)

Unhook the stop-detent spring from the locking lever guide and hook an 8 oz. scale in the springeye. It should require 4 to 5 ozs. to pull the spring to its position length. Rehook the spring.

24. SELECTOR-LEVER SPRING TENSION (Figure 15 B)

With the transfer levers in the MARKING position and the main bail in its highest position, move the swords manually to the SPACING position. Hook a 32 oz. scale to the end of each selector lever at the selector cam sleeve and pull radially to the selecting shaft. It should require 6 to 10 ozs. to start each selector lever moving.

NOTE: Before checking the tension of the selector-lever springs, make sure the selector levers are free and without bind.

25. SELECTOR-MAGNET-BRACKET POSITION,
PRELIMINARY (Figure 16)

From the normal STOP position of the selector cam sleeve, rotate the sleeve until the locking lever just drops off the high part of its cam; then rotate the sleeve backward until the rotation is stopped by the locking lever. There should be a clearance of .058" to .065" between the armature lever and the face of a tooth on the armature cam. To adjust, loosen the selector-magnet-bracket mounting screws and the selector-magnet-bracket adjusting-arm mounting screws just enough to make the bracket and adjusting arm friction tight. Then position the selector-magnet bracket by means of the adjusting arm. Use the 90783 adjusting wrench. To do this, insert the adjusting wrench in the hole above the end of the adjusting arm and rotate the wrench. Tighten the bracket and adjusting-arm mounting screws.

NOTE: When checking this requirement, the armature lever should be held approximately .045" from the bottom of the notch of its cam.

26. SELECTOR-MAGNET BRACKET (Figure 13)

NOTE: When making this adjustment, the selector arm should be kept in the MARKING position.

a. With the selector magnet energized, the clearance between the selector-arm operating screw and the selector arm should be .004" to .006" greater when the armature extension is on a peak of its cam than when the armature extension is opposite an indent on the cam.

b. To adjust, de-energize the magnet and rotate the selector cam sleeve until the armature lever is resting on a peak of the armature cam. While holding the cam sleeve in this position, turn the main shaft to a point where it moves the armature lever the greatest distance.

c. With the selector magnet still

de-energized, loosen the selector-magnet-bracket mounting screws, the adjusting-screw lock nut, and, by means of its adjusting screw, rotate the selector-magnet bracket so that the armature just touches the pole-faces; then turn the adjusting screw an additional one-tenth of a turn counterclockwise. This will press the armature firmly against the magnet cores. (While making the one-tenth of a turn adjustment, be careful to avoid lost motion by taking up the slack in the adjusting screw.)

d. With the selector magnet energized, measure the clearance between the selector-arm operating screw and the selector arm. If there is no clearance, back off the selector-arm operating screw to provide at least .006" clearance. Then rotate the selector cam sleeve so that the armature lever is opposite an indent of its cam and again measure the clearance between the selector-arm operating screw and the selector arm. If the difference in the two clearances exceeds .006", the selector-magnet-bracket adjusting screw should be turned clockwise. If the difference in the clearance is less than .004", turn the screw counterclockwise. Tighten the selector-magnet-bracket mounting screws and adjusting-screw lock nut.

27. SELECTOR MAGNET BRACKET POSITION
(FINAL)

a. Rotate the main shaft so that it is in its "Stop Position." Manually place and hold the selector arm in its "MARKING" position. Then rotate the main shaft slowly until the locking lever cam follower just drops off the high part of the locking lever cam. Release the selector arm making certain that it is locked in the "MARKING" position by the locking lever.

b. Rotate the main shaft very slowly in a "backward" direction (counterclockwise) just enough so that the locking lever cam is bearing against the locking lever.

c. With the main shaft, selector arm, the locking lever, and the selector cam sleeve so positioned (as described in Item Nos. a and b) loosen the armature bracket clamping screws and adjust the armature bracket link, by means of the No.90783 Wrench, until there is a clearance of .058" to .065" between the tip of the armature lever cam follower and the "Drop-Off" face of the armature lever "flutter" cam. Tighten very carefully the armature bracket clamping screws.

NOTE: When making or checking this adjustment hold and slide the wire "feeler" gage against the face of the armature lever "flutter" cam.

Recheck Item No. 26 a.

28. ARMATURE LEVER SPRING TENSION ADJUSTMENT (Figure 13)

Unhook the armature lever spring from its spring arm and rotate the main shaft until the armature lever is on the high part of the armature cam. With a 32 oz. scale hooked in its spring eye, pull the spring to its position length. It should require the following spring tensions:

a. If a distortion test set is available, the spring tension should be set at the optimum value within the limits of 13 to 24 ozs. when range is being checked.

b. If no distortion test set is available, the spring tension should be 17 to 19 ozs., except when the coils are connected in parallel without a 1000 ohm shunt. Under this latter condition the tension should be 13 to 15 ozs. To adjust, loosen the spring-arm mounting nut and position the spring arm. Then tighten the mounting nut. Recheck the armature lever spring tension.

NOTE: The 1000 ohm resistor may be connected across the selector-magnet coils when it is desirable to reduce the negative internal bias.

29. SELECTOR-ARM OPERATING SCREW (Figure 17)

With the selector magnet energized and the selector cam sleeve rotated so that the selector arm is in the MARKING position and the armature extension is opposite an indent of its cam, there should be a clearance of .003" to .006" between the selector-arm operating screw and the selector arm. To adjust, loosen the selector arm operating-screw lock nut and position the screw; then tighten the lock nut.

a. Unhook the selector-arm stop-detent spring. With the armature lever on a high part of its cam and the lock-in lever held away from the locking wedge, hook an 8 oz. scale over the end of the locking wedge, and pull parallel to the selector-arm spring. It should require 1-1/4 to 1-3/4 ozs. to start the selector arm moving. Replace the detent spring.

30. STOP-LEVER ECCENTRIC SCREW (Figure 19)

The stop lever on the range-finder assembly should overtravel the latching face of the trip latch some, but not more than .006". To adjust, loosen the lock nut on the stop-lever eccentric screw and position the screw. Tighten the lock nut and make certain that the tightening of the nut does not disturb the adjustment.

31. TRIP-LATCH SPRING COMPRESSION (Figure 19)

NOTE: When measuring this requirement, the range-finder assembly should be held in a horizontal position.

Apply the push end of an 8 oz. scale, held in a vertical position, to the trip latch as near the stop as possible. It should require 1 to 1-1/2 ozs., when pushing upward, to start the trip latch moving.

32. STOP-LEVER SPRING TENSION (Figure 20)

NOTE: Be sure that the stop-lever eccentric has been adjusted before checking this requirement.

With the trip-latch plunger held operated, hook an 8 oz. scale on the

end of the stop lever of the range-finder assembly and pull horizontally at a right angle to the stop lever. It should require $3/4$ to $1-1/4$ ozs. to start the lever moving.

REPLACE THE RANGE-FINDER ASSEMBLY.
IN REPLACING THE RANGE FINDER, AVOID
JAMMING THE TRIP-LATCH PLUNGER
AGAINST THE ARMATURE TRIP-OFF SCREW.

33. SELECTOR STOP ARM AND STOP LEVER ENGAGEMENT (Figure 21)
(Applies to range finder with positioning link)

With the selector magnet armature in the SPACING position, rotate the selector cam sleeve until the stop arm moves the stop lever to its maximum travel beyond the step of the trip latch. Loosen the range scale assembly mounting screws and the positioning link mounting screw just enough to make them friction tight. Position the range scale assembly so that the overtravel of the stop lever beyond the trip latch is at least half but not more than the width of the stop lever. This should be checked with the range indicator set at 15, 60 and 105 on the range scale. Tighten the mounting screws and the positioning link screw.

34. TRIP-OFF SCREW (Figures 19 and 22)

a. There should be some clearance, not more than .002", between the stop lever and the trip latch when the armature is in the unoperated position and the selector cam sleeve is rotated until the stopping edge of the stop lever is directly below the latching surface of the trip latch. While checking the above clearance take up the play in the stop lever with a screw driver applied axially adjacent to the spring hole as close to the bearing as possible with thrust in the direction of the trip latch.

b. The trip-latch plunger should have at least .002" end play when the armature is held in the attracted position and the stop lever is against its ec-

centric screw. See Figure 18. To adjust, loosen the trip-off-screw lock nut and position the screw to meet the first requirement. The latter requirement serves as a check on the trip-off screw adjustment and also on the adjustment of the selector-magnet bracket.

END OF HOLDING MAGNET SELECTOR ADJUSTMENTS

35. CLUTCH TRIP-LEVER AND BLOCKING-LEVER SHAFT (Figure 23)

The clutch trip lever should be centered on its cam and there should be some end play, not more than .006" in the clutch trip and blocking lever shaft. Adjust by means of the pilot screws.

36. CLUTCH BLOCKING-LEVER (Figure 3)

There should be some clearance, not more than .010" between the clutch blocking lever and the tip of the clutch lever when the clutch trip lever is on the peak of its cam and when the clutch lever is fully in line with the blocking surface of the blocking lever. To check this clearance, it will be necessary to hold the selector cam sleeve stationary and rotate the main shaft. To adjust loosen the blocking lever clamp screw friction tight and position the clutch blocking lever on its bracket. Tighten the clamping screw.

In order to meet the requirements in the preceding paragraphs, it may be necessary to use the clearance in the mounting holes of the clutch trip-lever. If the clutch trip lever is repositioned on its shaft, recheck the clutch trip-lever and blocking-lever shaft adjustment.

37. CLUTCH BLOCKING LEVER ECCENTRIC BACKSTOP (See Figures 3 and 42 for location of parts)

There should be some clearance, not more than .010", between the clutch blocking lever and the closest point on the clutch pawl or clutch lever for

that portion of the revolution of the cam sleeve assembly where the clutch trip-lever is on the low part of its cam. To adjust, position the eccentric backstop post.

38. CLUTCH LEVER AND BLOCKING LEVER ENGAGEMENT (Figure 24)

When the magnet armature is held operated and the main shaft rotated to the stop position, the clutch blocking lever should engage the clutch lever by at least .020". If necessary, refine the adjustments obtained by rotating the clutch blocking lever eccentric backstop adjustment.

39. CLUTCH DETENT LEVER ECCENTRIC (Figure 25)

a. With the operating eccentric assembly held in its full stop position, and with the high part of the detent eccentric away from the main shaft, there should be from .003" to .006" clearance between the end of the detent lever and the shoulder of the notch of the detent cam. This requirement should be met with the main shaft rotated to the position which gives the least amount of clearance, to minimize the effect of eccentricity of the shaft.

b. To check, block the selector armature in the operated position and rotate the main shaft to the stop position. Pull lightly on the drive arm stud to bring the clutch pawl against the bottom of its guide slot (full stop position) and observe by eye that there is some clearance between the end of the detent lever and the shoulder in the notch of the cam as the main shaft is rotated throughout a complete revolution. It may be necessary to reposition the detent lever eccentric to obtain this clearance. Continue to pull forward on the drive arm stud and rotate the main shaft to the position that gives the minimum clearance between the end of the detent lever and the shoulder of the notch of the cam; note this position. To adjust, loosen the stud mounting nut and position the

eccentric stud. Tighten the mounting nut. Unblock the selector armature.

40. CLUTCH DETENT-LEVER SPRING TENSION (Figure 25)

With the detent lever on the high part of its cam, it should require from 3-1/2 to 4-1/2 ozs. to start the detent lever moving when an 8 oz. scale is applied to the lever at the cam end and pulled at right angle to the lever.

41. CLUTCH TRIP BAIL (Figure 26)

Remove the code-levers from positions 8 thru 11. Rotate the main shaft until the operating levers in positions 8 thru 11 are raised to their highest positions by the pull bars, and until the tip of the clutch-lever is opposite the clutch blocking lever. There should be at least .010" clearance between the tip of the clutch lever and the clutch blocking lever. Also make sure there is some clearance at the further most point of the clutch blocking lever travel. To adjust, loosen the two bail mounting screws and position the clutch trip bail against the operating lever yokes by means of the elongated holes. Tighten the mounting screws.

42. STRIPPER BAIL ASSEMBLY (Figure 28)

The stripper bail assembly should be approximately centered on its pilot screws with some end play, not more than .010". With the stripper bail in its rearmost position, there should be at least .010" clearance between the extreme left hand pull bar and the stripper bail left hand reset screw post; also the left and right stripper bail links should be free from binds. Adjust by means of the pilot screws.

NOTE: The latch bail backstop should be positioned midway between function lever extensions No. 17 and 18 and should be rotated out of the way in order not to interfere with the adjustments.

43. LATCH BAIL SHAFT (Figure 29)

With the FIGURES combination selected, the sixth vane in the activated (rear) position, all pull bars in their unlatched (down) position and with the stripper bail latch in the upper notch of the latch bail, rotate the main shaft until the extensions "U" of the right-hand (Y) and left-hand (H) function lever assemblies are at their closest point to the latch bail. There should be from .050" to .055" clearance between the right-hand (Y) function lever extension "U" and the latch bail. Also, this clearance should exist between the left-hand (H) function lever extension "U" and the latch bail when the (H) and (Y) code levers are interchanged. Both sides should be nearly equal. To adjust, rotate the large headed eccentric shoulder screws located on the stripper bail assembly, so that the indicating mark is in a downward position. Back off the stripper bail reset adjusting screws, if necessary, to a position where they will not interfere with this adjustment. Remove the stripper bail springs. Loosen the right-hand nut on the latch bail shaft, position the shaft to obtain the .050" to .055" clearance for the (Y) function lever extension "U" and tighten the nut friction tight. Interchange the (H) and (Y) code levers; loosen the left-hand shaft nut and position the shaft to meet the requirement for the (H) function lever extension "U". Tighten both shaft nuts.

NOTE: Both stripper bail extensions should be resting on the upper notches of their latches or if one is resting on its latch notch there should be not more than .015" clearance between the other extension and its upper latch notch. If necessary, reposition the stripper bail pilot posts making use of available play in mounting holes. Recheck the .050" to .055" clearance between latch bail and function lever extensions "U".

Replace the stripper bail springs and restore the code-levers to their proper locations.

44. LATCH-BAIL SPRING TENSION (Figure 30)

With the stripper bail in its forward position latched, and held away from the latch bail, hook an 8 oz. scale over the right latch-bail spring post and pull in line with the spring. It should require 1 to 2 ozs. to start the latch bail moving. Check the left latch-bail spring in the same manner.

45. STRIPPER BAIL SPRING TENSION (Figure 30)

With the stripper bail in its forward position and latched, unhook the stripper bail springs from the stripper bail spring post (one at a time). It should require from 5 to 7 ozs. to pull each spring to its position length when applying an 8 oz. scale. Rehook springs.

46. PULL BAR COMB (See Figure 27)

The pull bar comb should be so positioned that there is no bind between the pull bars and the comb. Gauge by eye and touch.

To adjust, position the comb with its three mounting screws friction tight. To gain access to the comb mounting screws it may be necessary to remove the interfering function levers. Tighten the mounting screws and replace the function levers.

47. FRONT (CODE LEVER) FUNCTION LEVER COMB (Figure 31)

The side of the function lever comb with the greater dimension from the upper corner of the slanted surface to the first slot should be on the right hand side and the comb should be positioned so as to prevent any bind on the code and function levers when they are lifted from their slots. To adjust, position the comb by means of its mounting screws.

48. PULL BAR SPRING TENSION (Figure 27)

With the function levers in their ex-

treme upper position and the pull bars against the function-lever extension (not latched), it should require from 1/2 to 1-1/2 ozs. to start each pull bar moving when the push end of an 8 oz. scale is applied horizontally to the lever at the spring lug.

49. BLOCKING AND LATCHING LEVER SHAFTS (Figure 32)

With both combs mounted to the blocking and latching lever mounting plate, the shafts should be parallel to each other within .010". To adjust, loosen the mounting screws which mount the latching-lever shaft brackets. Place a .156" gauge at the right end between the shaft and the upper comb and tighten the right end mounting screws. Adjust the left end in the same manner. Position the middle brackets until the shaft is free and tighten the mounting screws. To adjust the blocking-lever shaft, proceed in the same manner using a .281" gauge between the shaft and the bottom comb.

50. BLOCKING AND LATCHING LEVER SPRING TENSION (Figure 27)

It should require from 1 to 2-1/2 ozs. to start the blocking lever moving when an 8 oz. scale is hooked to it, just above the top comb, and pulled horizontally and parallel to the spring.

NOTE: When bridge nuts and unblocking keys are used, remove them before taking the spring tension. After replacing them, recheck for binds.

51. MULTIPLE BLOCKING-BAIL SPRING TENSION (Figure 33)

With the bail in its "blocking" position, hook an 8 oz. scale over the extreme upper end of the bail and pull horizontally at right angle to the bail. It should require from 2 to 4 ozs. to just start the bail moving.

52. LATCHING-LEVER SPRING TENSION IN POSITION 8-9-10 (Figure 34)

Hook an 8 oz. scale over each of the

latch-levers in positions 8-9-10 at the spring eye and pull horizontally and in line with the springs. It should require from 1 to 2 ozs. to just start each of these levers moving.

53. R-Y TEST MECHANISM ALIGNMENT (See Figure 35)

a. With the R-Y test levers in the "on" position (white indicator showing) position the R-Y test mechanism mounting bracket by means of its two mounting screws so that the "R" trip-off lever safely engages the R-Y latch approximately in the center (vertically) of the operating surface of the latch.

b. With the levers in the "off" position (green indicator showing) make certain that there is a safe clearance between the "R" trip-off lever and the operating lever. Tighten the mounting screws.

54. BLOCKING AND LATCHING LEVER ASSEMBLY TOP-COMB (Figure 36)

Loosen the mounting screws of the blocking and latching lever assembly top comb and take up the available clearance in the screw holes by pushing the comb to the rear in order to obtain maximum engagement between blocking levers and function levers. Tighten mounting screws and check to see that all levers move freely in their slots.

55. BLOCKING AND LATCHING LEVER MOUNTING PLATE SUPPORTS POSITION PRELIMINARY (Figure 37)

a. Position the eccentrics which support the blocking and latching lever assembly mounting plate so that the high part of each eccentric is toward the left of the unit.

b. Loosen the lock nut on the positioning screw, located on the left side-frame, and back off the screw so that it does not interfere with the positioning of the blocking and latching lever assembly.

56. BLOCKING AND LATCHING LEVER ASSEMBLY LOWER COMB (Figure 32)

The blocking and latching levers should move freely in their combs without bind. To adjust loosen the lower comb mounting screws friction tight. Position the comb to the right or left.

REMOUNT THE BLOCKING AND LATCHING LEVER ASSEMBLY.

57. BLOCKING AND LATCHING LEVER ASSEMBLY-HORIZONTAL (Figure 27 for location of parts)

NOTE: It may be necessary to reposition the front function lever comb, the pull bar comb and the blocking and latching - lever lower comb to the right or left to meet the following requirement:

The sides of the blocking levers should be as close as possible to their associated code levers without exerting any pressure on them and the latching levers should be in line with and riding on the latching extensions of the operating levers; gauge by eye as viewed from the front. To adjust: Loosen the right and left-hand mounting plate mounting screws to friction tight and reposition the plate; tighten the screws. Turn in the positioning screw until it just touches the mounting plate and tighten the lock nut while holding the screw with a screwdriver in order not to disturb its position. Recheck to see that the blocking and latching levers, the function and code levers and the pull bars do not bind in their comb slots.

58. STRIPPER BAIL ECCENTRIC SHOULDER SCREWS (Figure 38)

a. With the stripper bail latched, rotate the main shaft until the stripper bail is in its extreme forward position. Hold the clutch pawl disengaged and continue to rotate the main shaft until the position of the main shaft is found which, due to eccentricity, gives the least travel to the stripper bail in its forward position. Turn the right-hand stripper bail eccentric shoulder screw,

less than 90° in either direction (keeping the indicating mark in the lower half of the circle) so that there is from .055" to .070" clearance between the latching extension of the No. 31 contact operating lever and its associated latch lever. Tighten the eccentric shoulder screw lock nut, while holding the screw in its position with a screw driver.

b. With the main shaft and stripper bail in the same position as described above, turn the left-hand stripper bail eccentric shoulder screw less than 90° in either direction (keeping the indicating mark in the lower half of the circle), so that the clearance between the latching extension of No. 1 contact operating lever and its associated latch lever is within .055" to .070" and within .010" of the corresponding clearance of No. 31 contact operating lever on the right-hand side. Tighten the eccentric shoulder screw lock nut while holding the screw in position with a screwdriver.

c. Recheck the right-hand stripper bail eccentric shoulder screw adjustment.

59. BLOCKING AND LATCHING LEVER ASSEMBLY VERTICAL (Figure 39)

With the stripper bail latched, the R-Y test lever in its "off" position and the main shaft rotated until the stripper bail is in its extreme forward position and with all the pull bars in their unlatched (down) position, there should be from .025" to .035" clearance between the lower surface of the stripper bail and the upper surface of the latch lever projections in position No. 6 and No. 29. This clearance may be .020" to .040" in position No. 17. To adjust, loosen the blocking and latching lever assembly plate mounting screws and move the assembly up or down by turning the eccentrics which support the blocking and latching lever assembly mounting plate. While making this adjustment, take up the play in the stripper bail to reduce to a minimum the clearance be-

tween the lower surface of the stripper bail and the upper surface of the latch levers. After moving the assembly either up or down to meet the adjustment requirement, it will be necessary to again rotate the main shaft to repeat the set-up condition for checking the .025" to .035" clearance. (This recycling is required because the stripper bail in its foremost position, rests against the latching levers and is inclined to follow any upward or downward movement of the mounting plate.) The clearances may be checked readily through the openings in the assembly mounting plate. Tighten the plate mounting screws.

60. R-Y CONTACT OPERATING PLUNGER ALIGNMENT (Figure 35)

See that the R-Y latch lever engages the contact operating plunger approximately in the center. If necessary refine the R-Y text mechanism mounting bracket adjustment.

61. R-Y TEST MECHANISM LATCH (Figure 35)

a. With the R-Y test levers in the "ON" position (white indicator showing) and with the stripper bail latched, rotate the main shaft until the stripper bail is in its extreme forward position. Hold the clutch pawl disengaged and continue to rotate the main shaft until the position of the main shaft is found which, due to eccentricity, gives the least travel to the stripper bail in its forward position. Locate the lever mounting bracket by means of the clamp plate and screws so that there is some clearance, not more than .010", between the rear edge of the upper step of the operating lever and the lower rear edge of the latching surface of the latch. To check, manually move the operating lever down until the two respective edges are in line. Tighten the two clamping screws. The clearance may be easily checked through the elongated opening in the right-hand side frame.

b. With the R-Y levers in the "on" position (white indicator showing) and

with the main shaft in its "stop" position, the upper R-Y contacts should be closed and the contact plunger should be free with some end play. It may be necessary to shorten the plunger.

62. BLOCKING AND LATCHING LEVER ASSEMBLY LOWER COMB (Figure 40)

With the main bail in its lowermost position and any blocking lever in its blocking position, there should be not more than .050" clearance between the rear edge of the upper projection of the blocking lever and the front edge of its associated function lever, and the clearance between the lower front edge of the blocking lever and the bottom of its slot in the lower comb should not exceed .010". To adjust, position the lower comb, with its mounting screws loosened, toward the front or rear of the unit while being careful not to disturb the alignment between the latching levers and the latching extensions of the operating levers.

NOTE: Make certain that blocking levers with lower extensions safely unblock their function levers when the associated contact operating levers are selected and that all other blocking levers safely unblock their function levers when blocking wedges are installed.

REMOVE THE BLOCKING AND LATCHING LEVER ASSEMBLY

63. BLOCKING AND LATCHING LEVER ASSEMBLY LOWER COMB, FINAL (Figure 32)

Tighten the blocking and latching lever assembly lower comb mounting screws (which were left friction tight for adjustment purposes) being careful not to disturb the comb position.

64. R-Y TEST-MECHANISM FRONT PLATE BRACKET (Figure 35)

Position the R-Y test mechanism front plate bracket by means of the two mounting screws so that its front surface is approximately parallel to the front surface of the number plate of the blocking and latching lever assembly. Make certain that the levers move freely in

their slots and that they latch safely in all positions.

65. STRIPPER BAIL RESET SCREWS (Figure 29)

NOTE: When making this adjustment, see that the latch bail backstop does not interfere.

With the stripper bail in its rearmost position, the stripper bail extensions should overtravel their notches on the latch bail (left and right side) by .015" to .025", when the main shaft is rotated (with the clutch held disengaged) to a position which gives the least amount of overtravel. To adjust, hold the selector armature operated and rotate the main shaft until the selector cam sleeve is in its stop position. Release the main shaft clutch blocking lever and unlatch the stripper bail. Rotate the main shaft until all pull bars are stripped off the function levers and continue to rotate the main shaft until the stripper bail is in its rearmost position. Hold the clutch pawl disengaged from the ratched and keep on rotating the main shaft to a position which gives the least amount of overtravel. Loosen the lock nuts of the stripper bail reset screws and turn both the right and left reset screws approximately even to provide the required overtravel; tighten the lock nuts of both screws.

66. LATCH BAIL BACKSTOP (Figure 41)

Position the latch bail backstop on the bail shaft so that it is located midway between the No. 17 and 18 function lever extensions. With the stripper bail in its fully latched position (latches resting against the front edges of the stripper bail extensions), rotate the latch bail backstop on its shaft so that its stop surface just touches, or is within .002" of touching the top surface of the latch bail. Tighten the clamp screw.

67. CONTACT OPERATING LEVER SPRING TENSION (Figure 27)

With the unit resting on its rear side, and with the operating levers in their unoperated position, apply the scale to the end of each lever and pull horizontally and at right angles to the left as viewed from the rangefinder end. It should require:

From 6 to 8-1/2 ozs. for levers with associated contacts, or from 1-1/2 to 2-1/2 ozs. for levers without associated contacts

to just start each operating lever moving.

NOTE: When measuring this tension, hold the contact spring clear for levers with associated contacts.

68. FUNCTION-LEVER SPRING TENSION (Figures 27 and 29)

With the unit in its upright position, the main shaft in its stop position and all pull-bars unlatched, hook the scale under each function-lever, in front of the front function-lever comb and pull vertically upward. It should require:

From 1 to 2 ozs. for function levers without extension "U" or From 12 to 15 ozs. for function levers with extension "U"

to just start each function lever moving.

69. VANE LOCKING-LEVER SPRING TENSION (Figure 7)

With the unit in its upright position, rotate the main shaft until the main bail is in its uppermost position. Hook an 8 oz. scale to each locking lever just to the rear of its vertical portion and pull vertically upward. It should require from 1 to 2 ozs. to start each locking lever moving.

70. CLUTCH TRIP-LEVER SPRING TENSION (Figure 42)

With the unit in its upright position, rotate the main shaft until the clutch

trip-lever is on the peak of its cam. Hook an 8 oz. scale under the trip-lever, at the spring-hole, by inserting the shaft of the scale toward the lever from a point to the rear of the vane push-bar bracket and pull in line with the spring. It should require from 3 to 4-1/2 ozs. to just start the lever moving.

REMOUNT THE BLOCKING AND
LATCHING LEVER ASSEMBLY

REMOVE THE LOWER CONTACT GUARD
AND THE CONTACT BAR ASSEMBLY

71. CONTACT OPERATING LEVER YOKE YIELD
SPRING TENSION (Figure 43)

With the unit resting on its rear side, hook a 32 oz. scale over the spring extension of the yoke and pull horizontally in line with the spring. It should require from 8 to 10 ozs. to start the yoke moving.

72. TRANSMITTER START CONTACT OPERATING
LEVER YOKE YIELD SPRING TENSION
(Figure 44)

With the unit resting on its back side, hook a 64 oz. scale over the spring extension of the yoke and pull horizontally and in line with the spring. It should require from 40 ozs. to 50 ozs. to start the yoke moving.

73. SELECTOR UNIT CONTACT CHECK (Figures
45, 46 and 47)

NOTE: The parts of the contact assemblies used on the sequential selector are designed so as to require no adjustment after they are assembled. If, however, the springs should become distorted they may be restored to their normal condition by bending them to meet the following requirements;

REMOVE THE UPPER CONTACT GUARD

a. Each portion of the bifurcated short springs should have a tension of

1 to 2-1/4 ozs. against its associated backstop. Check with an 8 oz. scale hooked as close as possible to and below the contact point of the short contact spring and pull horizontally at right angle to the backstop. The contact swinger (middle spring) should be held clear when checking the upper spring. (Figure 45).

b. It should require from 2 to 3-1/2 ozs. to just separate the contacts of the swinger from the contacts of the upper spring. Check by hooking an 8 oz. scale to the swinger above and as close as possible to the contact point and pulling horizontally at right angle to the spring. (Figure 46).

c. There should be a minimum clearance of .015" between the contacts of the swinger and the contacts of the lower springs. (Figure 47).

REPLACE THE UPPER CONTACT GUARD

REMOUNT THE CONTACT BAR ASSEMBLY

74. CONTACT BAR (Figure 48)

a. With the contact operating lever in its unlatched position there should be some clearance, not more than .010", between the lower bifurcated contact springs and their associated backstops measured at the end of the backstop, on at least one contact pile-up. This clearance should not exceed .025" on any of the other contact pile-ups. To adjust, loosen the screws which mount the mounting-bar brackets to the side frame and rotate the contact mounting bar to obtain the clearance. Tighten the screws.

b. The bakelite insulator of each contact spring should be centered under its respective plunger. To adjust, loosen the screws which mount the contact mounting bar to its brackets. Position the bar assembly, and tighten the mounting screws.

75. UNIVERSAL CONTACT LEVER
(Figure 49)

With the stripper bail in its extreme forward position, there should be some clearance, not more than .010" between the lower bifurcated contact springs and their associated backstops measured at the end of the backstop. Adjust by means of the two universal contact lever mounting screws.

REMOUNT THE LOWER CONTACT GUARD

76. NO-CODE CLIPS (Figure 50)

a. The no-code clip has been designed to block operation of a function lever not equipped with a code lever. To install or remove these clips, place the unit in its normal upright position and remove the code levers of any function levers which are to be disabled from operation. Then proceed as outlined in the following paragraph.

b. Rotate the main shaft to its stop position. See that all the pull bars are disengaged from their function lever extensions. Install the clip on the desired function lever by sliding the clip over the narrow part of the function lever just behind the pull bar extension (use pointed tweezers or long nose pliers). The open side of the clip should be toward the stud-side of the function lever and the curved end should be up and extend toward the pivoted end of the lever. Slide the clip against the rear function lever comb and raise the lever far enough to hook the curved end of the clip over the top-edge of the comb. On units equipped with the blocking and latching lever assembly, loosen the assembly mounting screws and tilt the assembly forward so that the function lever extensions may pass the rear edge of the upper blocking and latching lever comb when raising the function levers.

c. To remove a clip in order to restore a function lever to its operating condition, follow the reverse procedure as outlined above and replace the code levers.

77. SELECTOR CLUTCH TORQUE (Figure 51)

The clutch torque should be measured after the motor has been running at least ten minutes with the cam sleeve stationary. Hook a 32 oz. scale to the selector cam-sleeve stop arm and pull at right angle to the stop arm. It should require 14 to 18 ozs. to hold the selector cam sleeve stationary while the shaft is turning. To adjust, regulate the clutch torque by positioning the capstan nut in the proper direction with a screwdriver.

"H" ANSWER-BACK MECHANISM

78. LATCH AND BAIL SHAFT END PLAY (Figure 52)

The latch bail shaft should have some end play, not more than .006". To adjust, position the trip latch and the trip-latch bail by means of the mounting screws.

79. CAM FOLLOWER RESET (Figure 53)

With the cam follower resting on the highest part of the cam and the trip and auxiliary latches latched, there should be a clearance of .015" to .025" between the cam follower lever and latching surface of the trip latch. To adjust, loosen the clamping screw and position the cam follower lever to meet the above requirement. Tighten the screw.

80. TRIP LATCH BAIL BLADE (Figure 54)

With any one of the four operating levers associated with the transmitter start pattern in their latched position and with the cam follower on the low part of its cam, there should be a clearance of .005" to .025" between the trip latch and the end of the cam follower lever at the closest point. Move the cam follower manually throughout its entire travel. Move auxiliary latch out of way. To adjust, (take out code levers No. 8 and 11 and locate the blade to meet the requirement. Check each of the four levers separately) loosen the two blade mounting screws and position the blade so that individually each of the four operating levers engaging this

blade will meet this requirement. Tighten the two screws and restore code levers No. 8 and 11.

REMOVE ALL "NO-CODE CLIPS"

81. TRANSMITTER START LEVERS BLOCKING BAIL SCREW (Figure 55)

With the four transmitter start function levers fully selected and the "H" answer back cam follower latched, there should be a clearance of .015" to .025" between the rear edge of the blocking bail blade and the front edge on the blocking projection of the function lever with the least clearance. To adjust, loosen the lock nut and position the adjusting screw to meet this requirement. Tighten the lock nut. To select the function levers, remove the 4 code levers and manually raise the space contact operating lever to its latched position and rotate the main shaft until the main bail is in its lowest position. Tighten the lock-nut and replace the code levers.

82. TRANSMITTER START LEVERS BLOCKING BAIL BLADE (Figure 56)

With the Sequential Selector unit in the stop position and by manually raising the four operating levers associated with the transmitter start positions to their latched position, there should be from .015" to .025" between the blocking bail blade and the projections on the function levers. To adjust, loosen the two blade mounting screws and position the blade to meet the above requirement. Tighten the two screws.

83. CAM FOLLOWER SPRING TENSION (Figure 57)

With the unit on its front side, the cam follower on the highest part of the cam and with the hook end of a 32 oz. scale hooked at the end of the cam follower lever and pulled at a right angle, it should require from 9 to 11 ozs. to start the cam follower moving. Hold off auxiliary latch.

84. TRIP LATCH SPRING TENSION (Figure 58)

With the unit on its front side, the trip latch unlatched, and with the push end of an 8 oz. scale applied at the extreme end of the latch at a right angle to the latch, it should require from 5-1/2 to 6-1/2 ozs. to start the latch moving.

85. TRANSFER START LEVERS BLOCKING BAIL YIELD SPRING TENSION (Figure 55)

With the unit in the normal stop and operating position and with the push end of a 32 oz. scale applied against the blocking bail just below the left blade mounting screw it should require from 4 to 10 ozs. to start the bail moving.

NOTE: If the above spring tension is not met, it may be necessary to reposition the trip latch bail and the trip latch on the shaft by utilizing the clearance in the mounting holes and readjusting the trip latch bail blade.

86. AUXILIARY LATCH SPRING TENSION (Figure 59)

With the unit in the normal operating position and with the auxiliary latch on the highest part of its cam and the trip latch latched, apply the push end of an 8 oz. scale to the extreme end of the auxiliary latch. It should require from 3 to 4 oz. to start the auxiliary latch moving.

87. PRINTER CUT-ON LEVERS BLOCKING BAIL (Figures 60, 61 and 62)

(Unit to be placed in normal operating position for following adjustments:)

a. With the selector unit in the stop position and the "space" contact operating lever in its latched position there should be from .015" to .025" clearance between the top of the blocking blade and the bottom of the stop lugs on the function levers. There should also be some end play, not more than .006", of

the blocking blade on its shaft. To adjust, loosen the blocking blade mounting screws and the eccentric screws, and position the blade vertically for the .015" to .025" clearance. Move the blade mounting arms horizontally for the end play adjustment. Retighten blade mounting screws and then position eccentric stops against blocking bail blade and tighten eccentric screws.

b. With the SPACE contact operating lever in its unlatched position and with all the common function levers fully selected there should be from .015" to .035" clearance between the front of the stop lugs on the function levers and the rear of the blocking blade. (Figure 61). To select the function levers, remove the two extreme end code levers and the middle code lever in the range of the printer cut-on bail and manually raise the space contact operating lever to its latched position and rotate the main shaft until the main bail is in its lowest position. Check this at the two extreme end levers and the middle lever in the range of the printer cut-on bail. To adjust, loosen lock nut, position the blocking bail set screw and tighten the lock nut. Replace all code levers.

c. With the selector unit in its stop position, apply the hook end of a 32 oz. scale on the blocking blade operating bail just above the set screw and pull outward in line with the spring. It should require from 6 to 14 ozs. to start the bail moving away from the extension on the space operating lever. (Figure 62).

d. With the push end of a 32 oz. scale applied to the right-hand blocking blade mounting arm, in line with the spring, it should require from 4 to 10 ozs. to just start the blocking blade assembly moving away from the blocking blade operating bail set screw. (Figure 62).

REPLACE ALL "NO-CODE CLIPS"

88. "H" DISTRIBUTOR CONTACT (FIGURES 63, 64, 65 and 66)

The following preliminary adjustments

under a., b., and c., are to be made with the contact assembly and bracket removed from unit.

a. Position the short contact spring, so that there is a clearance of .020" to .030" between the tip of the spring and the tip of the backstop plate, (Figure 63A). To adjust, back off the backstop screw and bend the short contact spring to meet this requirement.

b. With the short contact spring positioned by means of the backstop screw so that it is approximately parallel with the backstop plate, (Figure 63B), there should be a pressure between the spring and backstop screw of at least 8 ozs., measured by applying the push end of a 32 oz. scale to the end of the short contact spring. Hold the long contact spring away from the short contact spring when checking this tension. If necessary, adjust by bending the short contact spring.

c. With the long contact spring resting against the short contact spring, it should require a pressure of $4\frac{1}{2}$ to $5\frac{1}{2}$ ozs. to open the associated contacts when the push end of an 8 oz. scale is applied to the longer contact spring just above the contact point, (Figure 64). To adjust, bend the long contact spring.

REMOUNT CONTACT ASSEMBLY AND BRACKET

d. There should be a clearance of .010" to .020" between the bakelite tip of the long contact spring and the cam follower when the cam follower is on the (small lobe) "MARKING" portion for the Number 3 pulse of the cam, (Figure 65). To adjust, loosen the contact bracket mounting screws and position the bracket to meet this requirement. Tighten the mounting screws.

e. With the cam follower on the low part of the cam there should be a .020" to .025" gap between the contact points, (Figure 66). To adjust, loosen the nut and position the eccentric stop post with the high side of the eccentric furthest away from the follower pivot point. Tighten the post mounting-nut.

f. If a stroboscope is available the contact closure timing may be refined in the following manner:

(1) Run the cam sleeve continuously by unhooking the trip-latch release spring, holding the trip latch operated and blocking the main shaft clutch trip lever in its operated position.

(2) With the DXD operating at the same speed as the cam sleeve assembly, the length of the selecting pulses should be as follows:

From beginning of start pulse (0 indication on DXD scale) to beginning of 3rd pulse MARKING should read 342.7 ± 5.7 scale divisions.

From beginning of start pulse (0 indication on DXD scale) to end of 3rd pulse MARKING should read 457 ± 5.7 scale divisions.

From beginning of start pulse (0 indication on DXD scale) to beginning of 5th pulse MARKING should read 571.3 ± 5.7 scale divisions.

Orient the DXD scale so that the start-pulse "0" indication on the scale is in line with the beginning of the transmitter START-PULSE (end of longest light image).

(3) To obtain the correct signal length it may be necessary to refine the adjustment for the clearance between the tip of the long contact spring and the cam follower. This may be done by readjusting the backstop screw for the short contact spring. Recheck the contact gap.

MECHANICAL TIMER

REMOVE THE MECHANICAL TIMER FROM THE UNIT.

89. TIMER SHAFT END PLAY (Figure 67)

The timer shaft should have some end play, not more than .002". Adjust by positioning the collar on the timer shaft.

90. CAM FOLLOWER (Figure 67)

All cam followers should ride fully on their respective cams. Adjust by positioning the collars associated with the cam followers.

91. BLOCKING BALL SPRING TENSION (Figure 68)

With the trip bar held free in its slot, hook an 8 oz. scale at the spring hole of the blocking bail and pull in line with the spring. It should require from $1/4$ to $3/4$ ozs. to just start the blocking bail moving.

92. CONTACT LEVER SPRING TENSION (Figure 69)

Rotate the timer shaft until the contact lever is on the peak of its cam and unhook the contact bail and holding lever spring from the contact lever. Hook a 32 oz. scale at the spring hole and pull horizontally in line with the contact-lever spring. It should require from 14 to 17 ozs. to just start the lever moving. Replace the contact bail and holding lever spring.

93. CONTACT BAIL LATCH SPRING TENSION (Figure 69)

Rotate the timer shaft to its stop position and apply the push end of an 8 oz. scale to the latch directly above the spring hole. Push horizontally and at right angle to the long portion of the lever. It should require from $1/4$ to $3/4$ ozs. to just start the latch moving.

94. CONTACT-BAIL BLOCKING LEVER SPRING TENSION (Figure 70)

With the cam sleeve in its stop position and the blocking lever latch held clear of the contact-bail blocking lever, apply the push end of an 8 oz. scale to the contact bail blocking lever at the spring hole and push horizontally at right angle to the long portion of the lever. It should require from $1/2$ to 1 oz. to start the lever moving.

95. BLOCKING-BAR OPERATING LEVER SPRING TENSION (Figure 71)

With the operating lever on the low part of its cam, apply the push-end of an 8 oz. scale to the operating lever at the spring hole and push horizontally at right angle to the long portion of the lever. It should require from $3/4$ to $1-1/4$ ozs. to just start the lever moving. Make sure that the blocking bar does not interfere with this check.

96. BLOCKING LEVER LATCH SPRING TENSION (Figure 72)

With the cam sleeve in its stop position, hook an 8 oz. scale over the latch at the spring hole and pull horizontally in line with the spring. It should require from $1/4$ to $3/4$ oz. to just start the latch moving.

97. TRIP BAR SPRING TENSION (Figure 73)

With the cam sleeve in its stop position, apply the push-end of an 8 oz. scale to the top surface of the trip bar and push horizontally in line with the bar. It should require from $3/4$ to $1-1/4$ ozs. to just start the trip bar moving.

98. TIMER CONTACTS (Figures 74, 75 and 76)

a. The insulator of the swinger contact spring should be approximately centered with respect to the contact bail extension. To adjust, loosen the contact assembly mounting screws and position the assembly. Tighten the mounting screws.

b. Hook an 8 oz. scale as close as possible to the contact point of the short contact spring and pull horizontally at right angle to the backstop. Each portion of the bifurcated short springs should have a tension of 1 to $2-1/4$ ozs. against its associated backstop, (Figure 74). The contact swinger should be held clear when checking the upper spring. To adjust, bend the con-

tact spring.

c. Hook an 8 oz. scale to the swinger at the contact point and pull horizontally at right angle to the spring. It should require 1 to $2-1/2$ ozs. (Figure 75) to just separate the contacts of the swinger from the contacts of the upper spring. To adjust, bend the swinger contact spring.

d. There should be at least .015" clearance between the contacts of the swinger and the contacts of the lower spring. (Figure 76). To adjust, refine b. and c. above.

REPLACE THE MECHANICAL TIMER

99. TIMER POSITION

There should be a barely perceptible amount of backlash between the timer gear and the pinion on the main shaft. To adjust, loosen the timer mechanism mounting screws, press the right-hand end of the timer (as viewed from the rear with the unit resting on its top) down against its mounting screw and partially tighten the right-hand mounting screw. Press down slowly on the left-hand side until the proper backlash is obtained. Tighten all mounting screws.

100. SENSING BAIL (See Figure 77 for Location of Parts)

The sensing bail arm should be in line with the No. 4 cam on the selector unit cam sleeve. To adjust, loosen the two screws which mount the sensing-bail bracket and position the bracket by means of its elongated mounting holes. Tighten the mounting screws.

101. SENSING BAIL ADJUSTING SCREW (Figure 77)

With the timer in its stop position, there should be some clearance, not more than .010" between the sensing-bail arm and the No. 4 cam on the selector cam sleeve throughout the entire camming area. To adjust, loosen the

sensing-bail adjusting screw lock-nut and position the screw. Tighten the locknut.

102. SENSING BAIL BRACKET (Figure 77)

When the requirements for the sensing bail adjusting screw cannot be met, it may be necessary to position the sensing-bail bracket by means of its enlarged mounting holes. When the positioning of the sensing bail bracket does not permit the clearance requirement, it may be necessary to refine the timer position adjustment. Recheck the sensing-bail adjusting screw adjustment.

103. SENSING-BAIL SPRING TENSION (Figure 77)

Unhook the sensing bail yield spring. Hook an 8 oz. scale to the end of the sensing bail at the yield spring hole and pull at right angle to the bail. It should require from 2 to 3 ozs. to start the bail moving. Rehook the yield spring.

104. SENSING-BAIL YIELD SPRING TENSION (Figure 78)

Unhook the sending bail spring from the sensing bail. Hold the latch bail against its cam. Hook an 8 oz. scale to the end of the sensing bail at the spring hole and pull at right angle to the lever. It should require from 5 to 7 ozs. to start the bail moving. Replace the sensing bail spring.

105. CONTACT MOUNTING PLATE (Figure 79)

With the space operating lever latched and the contact bail latched operated against the holding lever latch there should be a clearance of .005" to .015" between the lower short contact spring and its back stop. To adjust, loosen the four screws holding the contact mounting plate and position the plate to meet this requirement. Tighten the four plate mounting screws.

106. CONTACT HOLDING LEVER (Figure 80)

With the unit in the stop position and the "SPACE" operating lever unlatched there should be some clearance not more than .010" between the top of the contact operating bail and the lower surface of the contact bail holding lever. Adjust by means of the adjustment screw.

107. CONTACT BAIL AND HOLDING LEVER SPRING TENSION (Figure 81)

With the unit in its stop position and the space operating lever resting against its backstop, place the push end of an 8 oz. scale on the lower projection of the holding lever. It should require from 1- $\frac{1}{2}$ to 2- $\frac{1}{2}$ ozs. to first start the lever moving.

108. TIMER BLOCKING BAR (Figure 82)

With any selection, except Space, "X" or Blank, set up on the Sequential Selector, the timer blocking lever on the high part of its cam, and the code levers resting on the vanes, there should be some clearance not more than .010" between the top of the timer blocking bar and its associated function lever. To adjust, loosen the lock nut on the timer blocking bar adjusting screw and position the adjusting screw. Tighten the lock nut.

109. TIMER CLUTCH TORQUE REQUIREMENTS (Figure 83)

Remove all cam follower springs with the exception of the blocking-bail spring (No. 1 Cam). With the unit in position on the panel and operating in its stop position for at least 10 minutes, hook a 32 oz. scale under the lug on No. 1 cam and pull upward. It should require from 20 to 24 ozs. to start the cam moving away from its blocking bail.

SYNCHRONOUS MOTOR (MOUNTED ON SELECTOR PANEL)

110. STARTING SWITCH REQUIREMENTS

NOTE: These requirements should not be checked unless there is reason to believe that the starting switch is out of adjustment.

REMOVE THE MOTOR UNIT FROM THE PANEL AND REMOVE THE MOTOR FAN AND PINION

a. Remove the switch end shield screws and the switch commutator mounting screws, also the switch end shield.

b. Pull out the rotor until the brush holder spring is accessible and remove the spring.

c. Spring tension for 50 and 60 cycle motors should be 1-3/4 to 2 ozs., and 2 to 2-1/2 ozs. respectively, when extended to a length of 5 inches, using an 8 oz. scale.

d. The brush holders should be mounted by means of the center set of mounting holes and should be free.

e. The brush holder stop pins should be safely within the holes of the fiber disc when all the play in the brush holders has been taken up to make the engagement of the pins with the disc a minimum.

f. Replace the brush holder spring, making certain that the spring eyes are fully engaged with each other.

g. Replace the switch commutator screws and tighten the two screws alternately, a little at a time, until both screws are tight.

h. Replace the switch end shield screws, using the same precaution in tightening as above.

i. Apply the push end of a 12 lb. scale against the fan end of the shaft and push parallel with the shaft. It should require at least 7 lbs. pressure to start the shaft moving. (Applies to A.C., D.C., and synchronous motors).

REPLACE THE MOTOR FAN AND PINION.

REPLACE THE MOTOR UNIT ON THE PANEL.

GOVERNED MOTOR

REMOVE THE MOTOR UNIT FROM THE PANEL

REMOVE THE GOVERNOR ADJUSTING BRACKET, BRUSH SPRING PLATE, TARGET, AND GOVERNOR COVER. SEE FIGURE 84.

111. ALIGNMENT OF GOVERNOR CONTACTS (Figure 85)

a. The governor contacts should be in line and meet squarely so that maximum contact surface is provided. (Check with the retractile spring tension adjusted so that the contacts just make, or to the limit of the adjusting screw).

b. Line up edges of contacts by means of the floating contact hinge mounting screw.

c. Adjust contacts for squareness from right to left by positioning the height of the fixed contact bracket using the elongated mounting holes in the governor shell.

d. To adjust, from front to back, twist the floating contact hinge and apply pressure to the arm near the contact.

NOTE: Check by use of a .002" gauge (smaller if available). Check with gauge between edges of the contacts to make certain that the gauge enters (or does not enter) equally on all sides.

112. SPEED-ADJUSTING-WHEEL FRICTION-WASHER SPRING PRESSURE (Figure 85)

To measure this requirement remove the governor adjusting bracket and governor cover and rotate the speed adjusting wheel to a point where the governor contact pressure is 13 to 14 ozs., as indicated by hooking a 32 oz. scale over the contact spring next to the contact point and pulling parallel

to the speed adjusting spring. Then insert a bank pin (radially) in the leather rim of the speed adjusting wheel, and hook a 32 oz. scale over the pin and pull at a tangent to the periphery of the adjusting wheel. It should require 16 to 24 ozs. to start the wheel moving. To adjust the friction, remove the friction washer and bend the large projections.

113. GOVERNOR SHIMS (Figure 84)

There should be at least .006" clearance between the adjusting-lever wearing strip and the adjusting wheel when the adjusting wheel is opposite the wearing strip and the play of the armature is taken up in a direction to make this clearance a minimum by overcoming the armature end thrust spring. To adjust, install shims on the armature shaft between the governor hub and the end frame casting if necessary.

114. INNER AND OUTER DISC CONTACT SPRING ADJUSTMENT (Figure 86)

a. The inner and outer disc contact springs should conform to the following requirements, which may be checked by removing the governor cover target, and brush spring plate.

(1) The distance from the inside surface of the governor cover to the highest point on the contact springs should be $25/32"$ to $27/32"$.

(2) Place a "D" (89955) socket wrench over the nut located in the center of the governor cover that is used to hold the contact springs in place. With a 6" scale, measure the radial distance from the vertical surface of the wrench to the point where the scale touches the curved surface of the inner disc contact spring. This distance should be $17/32"$ to $19/32"$.

(3) In a similar manner, measure the distance from the wrench to the point of contact on the outer disc contact spring. This distance should be

$7/16"$ to $1/2"$.

b. These requirements may be obtained by bending the contact springs. Replace the governor cover, target, and brush spring plate.

115. GOVERNOR BRUSH-SPRING-PLATE BRACKET (Figure 87)

a. The governor brush-spring-plate bracket should be positioned to meet the following requirements:

(1) A line established by the center of the outer disc and the center of one of the brushes should pass through some portion of the other brush.

(2) The surface of the brush-spring-plate bracket, on which the brush spring plate is mounted, should be in alignment with the outer surface of that part of the governor cover on which the target is mounted (Figure 84).

(3) The bracket should be parallel to the edge of the motor base plate.

b. Adjust the brush spring plate bracket by utilizing its mounting slots.

116. GOVERNOR BRUSH SPRING PRESSURE ADJUSTMENT (Figure 84)

a. INNER DISC BRUSH SPRING: Hook an 8 oz. scale over the inner spring just in front of the carbon contact brush. Pulling horizontally away from the motor, it should require $4-1/2$ to $5-1/2$ ozs. to start the brush moving away from the disc.

b. OUTER DISC BRUSH SPRING: Apply an 8 oz. push scale against the outer brush spring, just in front of the carbon contact brush. Pushing horizontally toward the motor, it should require $4-1/2$ to $5-1/2$ ozs. to start the brush moving away from the disc.

c. To obtain the correct brush spring

pressure, remove and bend the brush springs. When the springs are replaced and the pressure obtained, make certain that the contact brushes lie flat against their respective discs, and that the outer edges of the brushes are either flush with, or not more than $3/64$ " inside the outer edges of the discs. Replace the governor adjusting bracket.

NOTE: If necessary, level off brushes by passing a piece of No. 00 sandpaper between the brush and disc.

117. GOVERNOR ADJUSTING BRACKET (Figure 84)

The adjusting surface of the governor adjusting bracket should clear the speed adjusting wheel by $.020$ " to $.060$ ". Bend the governor adjusting bracket if necessary to secure this clearance.

118. MOTOR POSITION

There should be a barely perceptible amount of backlash between the motor

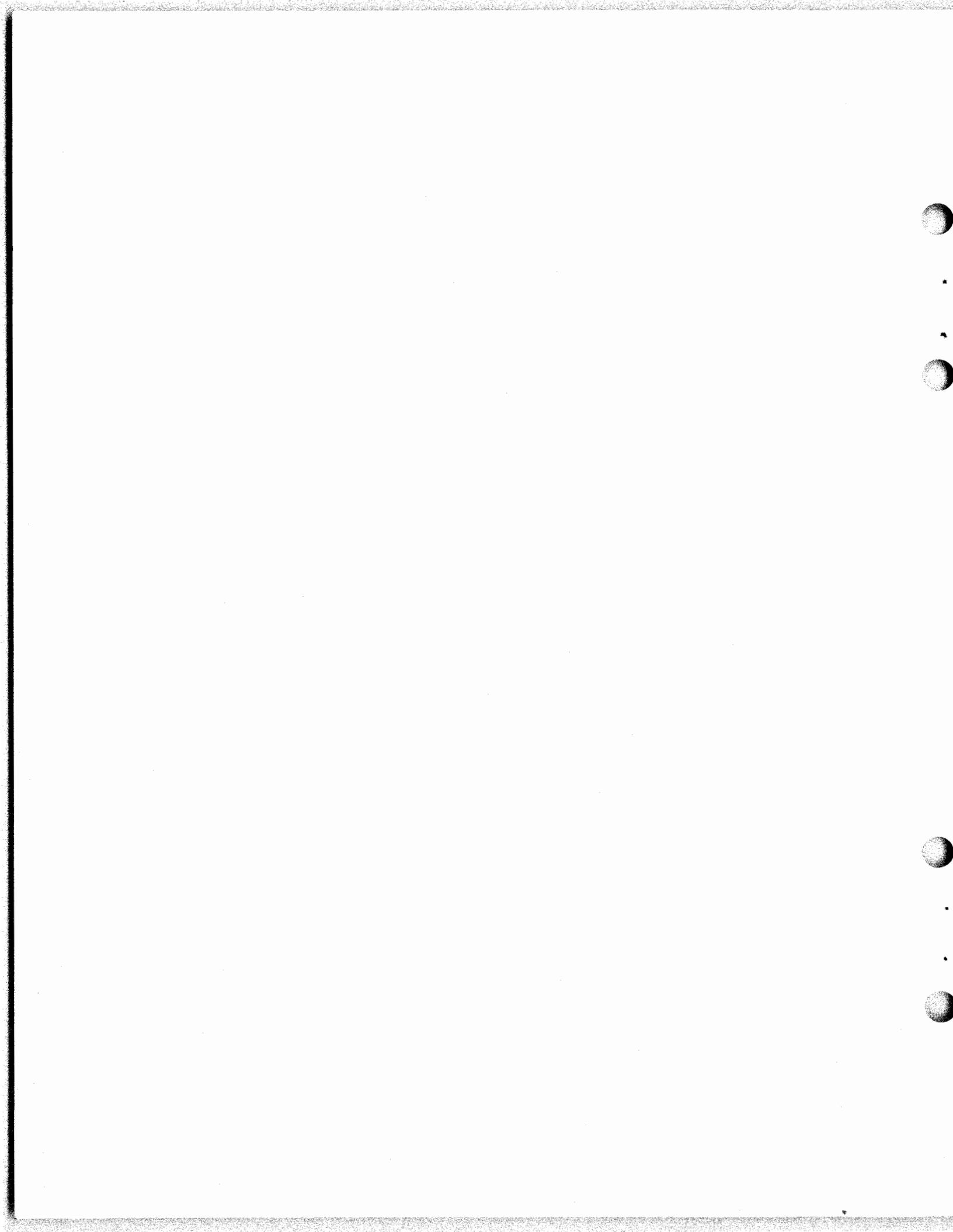
pinion and the highest point on the counter-shaft gear. Check the backlash throughout a complete revolution of the larger gear. To adjust, tighten the motor mounting screws with the motor base approximately parallel to the edges of the motor mounting plate. Position the motor pinion by means of the motor mounting plate.

119. SELECTOR-UNIT POSITION

There should be a barely perceptible amount of backlash between the main-shaft gear on the selector and the highest point on the counter-shaft gear. Check the backlash throughout a complete revolution of the larger gear. To adjust, position the selector unit by means of its eccentrics.

120. SELECTOR-PANEL SLIDE LATCH (Figure 88)

There should be no end play between the rail stop with the rail in its latched position. Gauge by eye and feel. To adjust, loosen the eccentric bushing mounting screw on each side and rotate the bushing. Tighten the screws.



SECTION 3

LUBRICATION

1. GENERAL

a. The oil and grease specified in Specification 5288S should be used to lubricate the equipment.

b. Unless otherwise specified, one or two drops of oil at each of the places indicated will be sufficient. Use oil for lubrication at all of the places listed in the following, except where the use of grease is specified. Avoid excessive lubrication. Do not allow lubricant to get on magnet pole faces, armature, or contacts.

c. Oil both loops of all helical springs.

2. LUBRICATION

SEQUENTIAL SELECTOR

a. SELECTOR MECHANISM

- (1) Armature bearings (2) very sparingly.
- (2) Trip-latch plunger, trip latch, bell crank, and stop lever on range finder assembly.
- (3) Swords and selector levers - drop oil between separator plates.
- (4) Selector transfer levers - all points of contact.
- (5) Armature locking lever - at pivot.
- (6) Selector cam sleeve - each cam peak.
- (7) Locking wedge - at point of contact.
- (8) Selector arm - at pivots and extensions.
- (9) Selector-arm detent pivots and slot.

b. MAIN SHAFT

Remove range-scale rear mounting screw and swing scale out of the way. Remove friction disc from end of shaft and fill shaft with oil. Replace disc and range scale.

- (1) Locking-lever-cam felt oil ring - saturate.
- (2) Selector-cam friction washers (2) - saturate.
- (3) Ball Bearings (2) - oil grease oil
- (4) Clutch - oil freely.
- (5) Compression spring.
- (6) Gear - grease.
- (7) Main-bail cam.
- (8) Stripper-bail cam.
- (9) Drive-pawl pivot bearing (1).
- (10) Detent eccentric (1).
- (11) Detent sleeve - grease.
- (12) "H" Answer-Back mechanism cam - grease lightly.
- (13) Ratchet clutch teeth - oil - grease oil.
- (14) Drive pawl guide.
- (15) Remove oil-plug thumb screw - fill hole with oil several times.

c. BLOCKING-LEVER ASSEMBLY

- (1) Blocking-lever pivot bearings.
- (2) Upper and lower comb guide.
- (3) Latching-lever pivot bearings.

- (4) Operating-lever camming surfaces - grease lightly.
- (5) R-Y test latching-lever pivot bearing.
- (6) R-Y test operating-lever pivot bearing and latching surfaces.

d. MAIN BAIL

- (1) Drive link (1).
- (2) Pivot bearings (2) - saturate oil wicks.
- (3) Connection-link pivot bearings (4) - saturate oil wicks.
- (4) Main-bail pivot bearings (2).
- (5) Main-bail - at points of contact with function levers - grease lightly.

e. CLUTCH TRIP-LEVER AND BLOCKING-LEVER SHAFT

- (1) Pivot bearings (2) - saturate oil wicks.
- (2) Clutch trip-lever (1) - at point of contact with cam - grease lightly.
- (3) Clutch blocking-lever (1) - at point of engagement with clutch lever grease lightly.
- (4) 6th vane operating bell cranks - pivot (2).

f. STRIPPER BAIL

- (1) Drive link (1).
- (2) Pivot bearings (2) saturate oil wicks.
- (3) Connecting-link pivot bearings (4) saturate oil wicks.
- (4) Stripper-bail-lever - pivot points (2) saturate oil wicks.

(5) Stripper-bail pivot bearings (2).

(6) Latch-bail pivot bearings (2).

(7) Extension "U" for R-Y levers and for function levers which operate pivoted latch bail at latch bail - oil - grease - oil (6).

(8) Reset screws - at point of engagement with stop posts (2) - grease.

(9) Latch-bail backstop - at point of engagement with latch bail (1).

(10) Stripper bail front and rear edge - point of contact with latching levers and pull bars - grease lightly.

(11) Latch bail latches - at point of contact with stripper bail extensions (2).

g. FUNCTION LEVERS

- (1) Pivot bearings.
- (2) Front comb (2).
- (3) Rear comb (1).
- (4) Function levers - at point of contact with blocking levers.

h. CONTACT OPERATING LEVERS

- (1) Pivot points.
- (2) Front comb (1).
- (3) Rear comb (1).
- (4) Pull-bar pivot bearing and latch.
- (5) At point of contact with latching lever surfaces.
- (6) Bearing surface of 6th vane operating yokes (2).

i. VANE ASSEMBLY

- (1) Vanes - all points of contact.
- (2) Vane extension points of contact.
- (3) Operating-link front and rear combs (2).
- (4) Vane stops - points of contact with vanes (2).
- (5) 6th vane detent lever - at point of contact with 6th vane (2).
- (6) 6th vane detent lever - pivot (2).
- (7) 6th vane operating bell cranks - at point of contact with 6th vane (2).
- (8) 6th vane operating bell cranks - at point of contact with yoke (2).

j. "H" ANSWER-BACK MECHANISM

- (1) "H" Answer-back cam - grease. Cam follower - oil at bearing and grease lightly at latching point.
- (2) Auxiliary latch - oil bearing and grease lightly at cam engaging surface and point of engagement with contact cam follower.
- (3) Answer-back trip-latch - grease lightly at point of contact with cam follower.
- (4) Insulator of long contact spring - thin film of grease at point of contact with cam follower.
- (5) Trip latch shaft - at bearings (2).
- (6) Trip latch operating bail blade - grease lightly along working edge.

- (7) Printer cut-on levers blocking bail - at bearings (2).
- (8) Printer cut-on levers blocking bail blade - grease lightly along working edge.
- (9) Printer cut-on levers operating bail - at bearings (2).
- (10) Printer cut-on levers operating bail - grease lightly at point of engagement with space operating lever.
- (11) Transmitter start levers blocking bail - at bearings (2).
- (12) Transmitter start levers blocking bail blade - grease lightly along working edge.
- (13) Clutch trip shaft bail - grease lightly at point of contact with operating lever yokes.
- (14) Multiple blocking bail - oil at bearings (2) and grease lightly at engaging surface with function levers, with combs and at pin engaging contact operating lever.

k. MECHANICAL TIMER

- (1) Clutch felts - saturate with oil.
- (2) Compression spring.
- (3) Timer shaft bearings.
- (4) Timer shaft gear - grease lightly.
- (5) Timer pinion on selector main shaft - grease lightly.
- (6) Cam bearings.
- (7) Cams - grease lightly.
- (8) Levers - bearing surfaces.

- (9) Timer blocking bar guide.
 - (10) Blocking bar - at point of engagement with function lever.
 - (11) Blocking bar pivot - eccentric screw.
 - (12) Trip bar guide.
 - (13) Trip bar - at point of contact with contact operating lever extension.
 - (14) Sensing-bail arm - at point of contact with adjusting screw.
 - (15) Contact bail - at point of contact with the spring insulator screw - grease lightly.
 - (16) Contact bail holding lever - at upper and lower guiding surfaces.
 - (17) Contact bail holding lever - adjusting screw - grease lightly at point of contact with space operating lever.
- l. MOTOR
- (1) Motor pinion - light film of grease.
 - (2) Motor bearing lubrication holes - (2) - grease - use grease gun.
- m. SELECTOR PANEL
- (1) Slides - grease.
 - (2) Latches - grease.
 - (3) Rollers - oil.
 - (4) Counter-shaft ball bearings - oil - grease - oil.

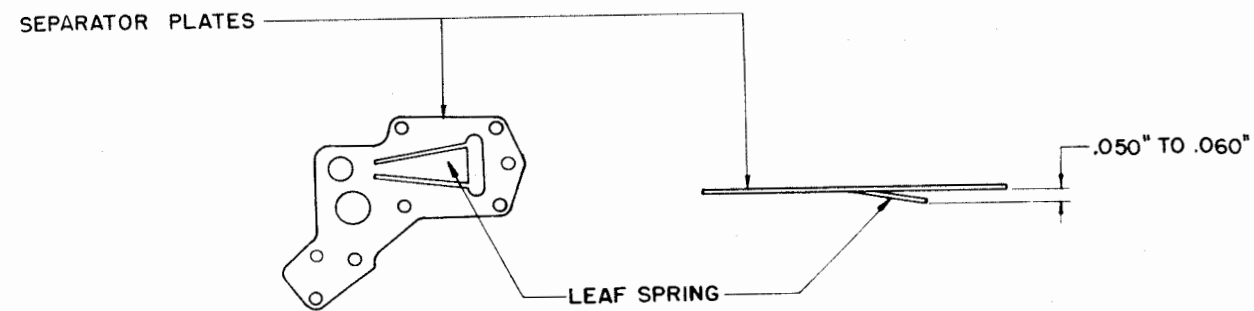


FIGURE 1
SELECTOR SEPARATOR PLATE

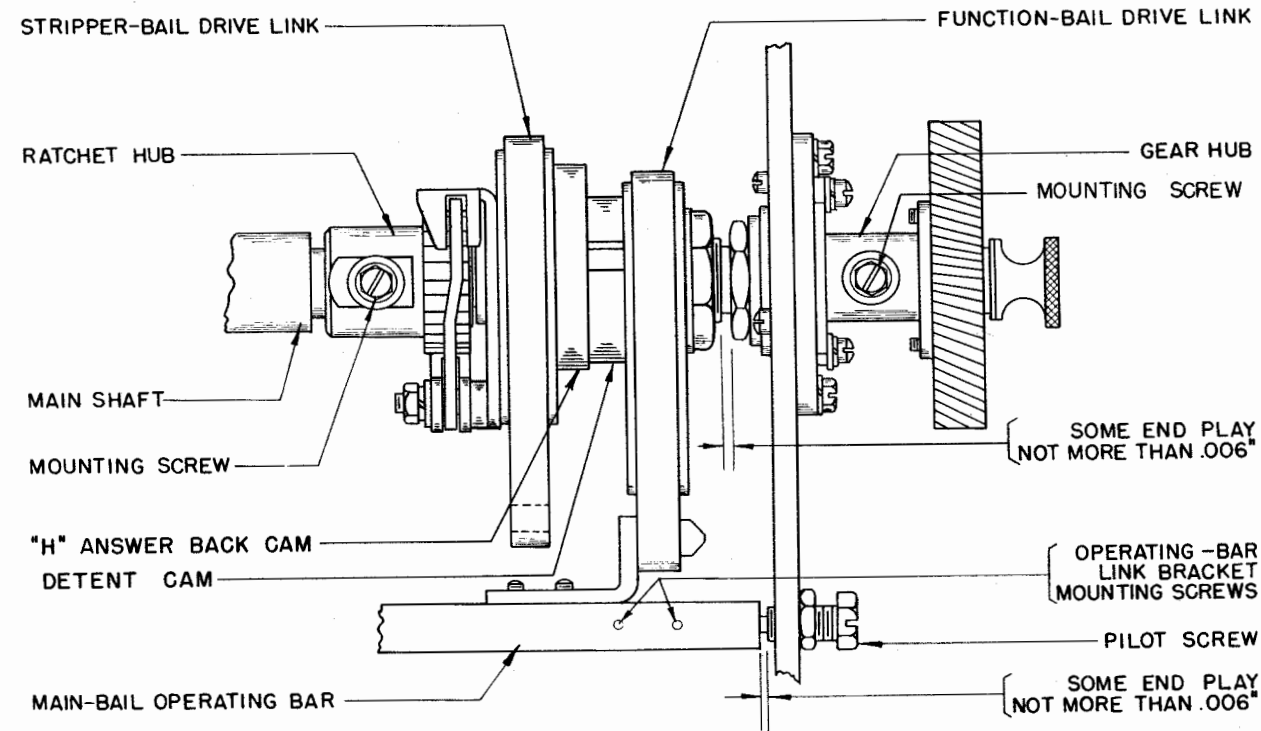


FIGURE 2
MAIN SHAFT ASSEMBLY

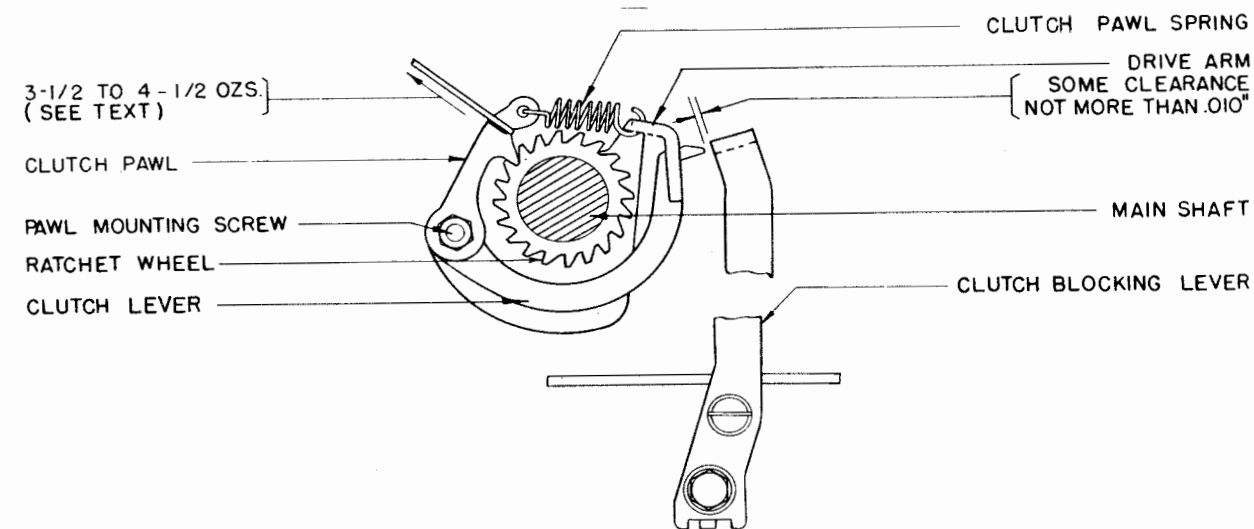


FIGURE 3
OPERATING CLUTCH MECHANISM

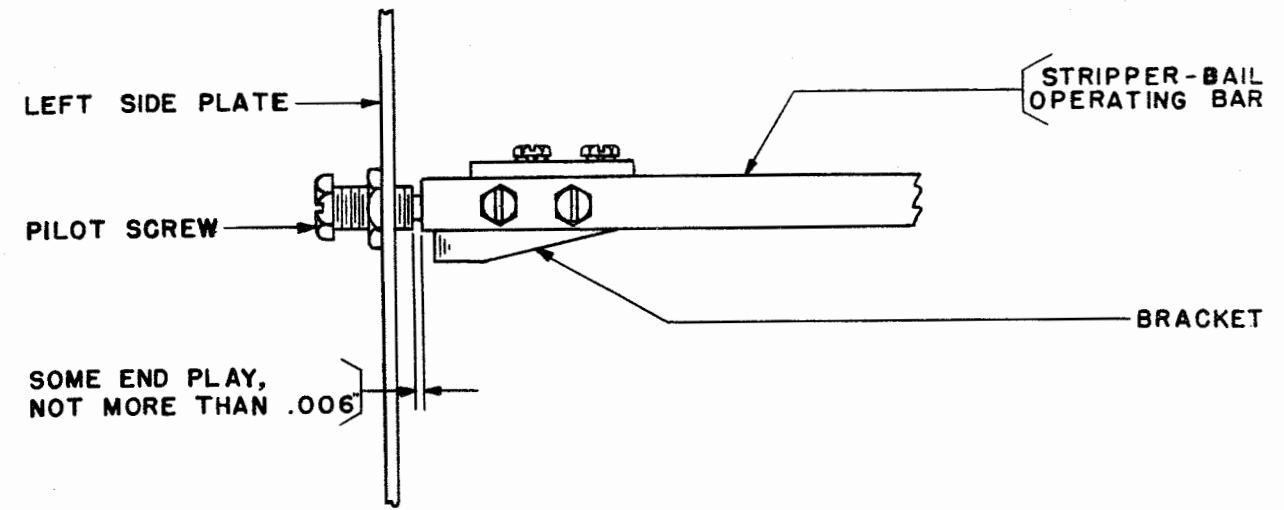


FIGURE 4
STRIPPER-BAIL OPERATING BAR

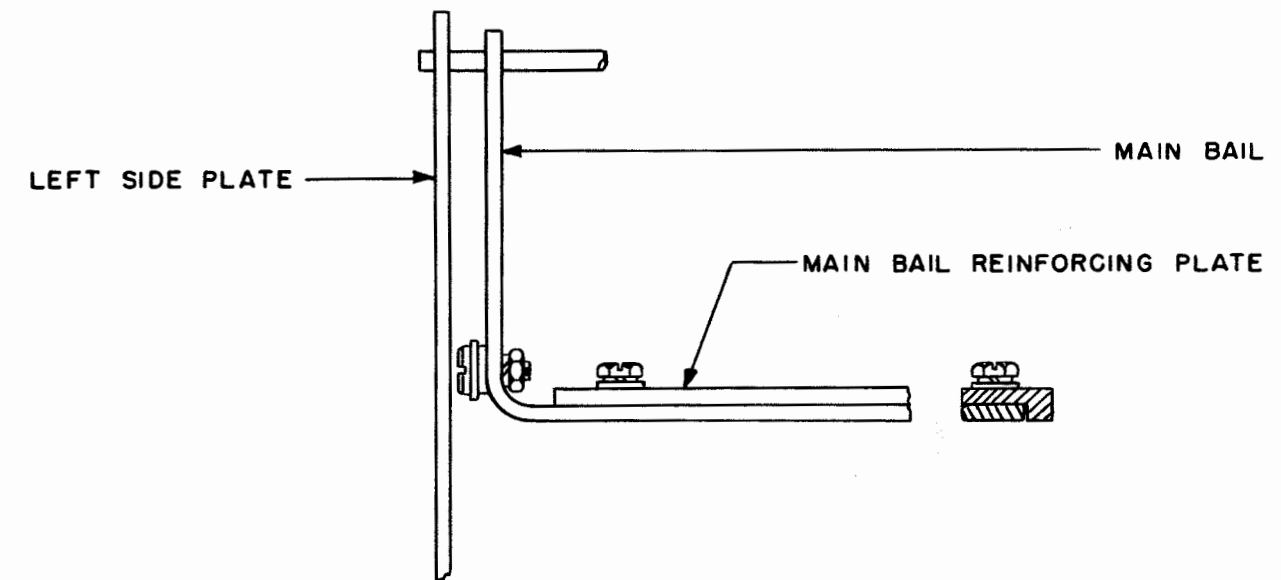


FIGURE 5
MAIN BAIL REINFORCING PLATE

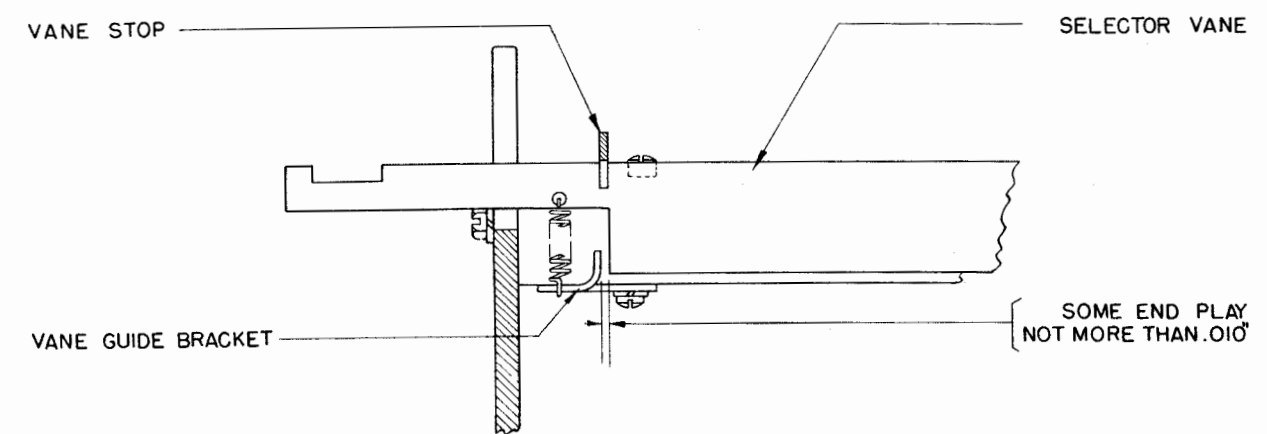


FIGURE 6
SELECTOR VANE

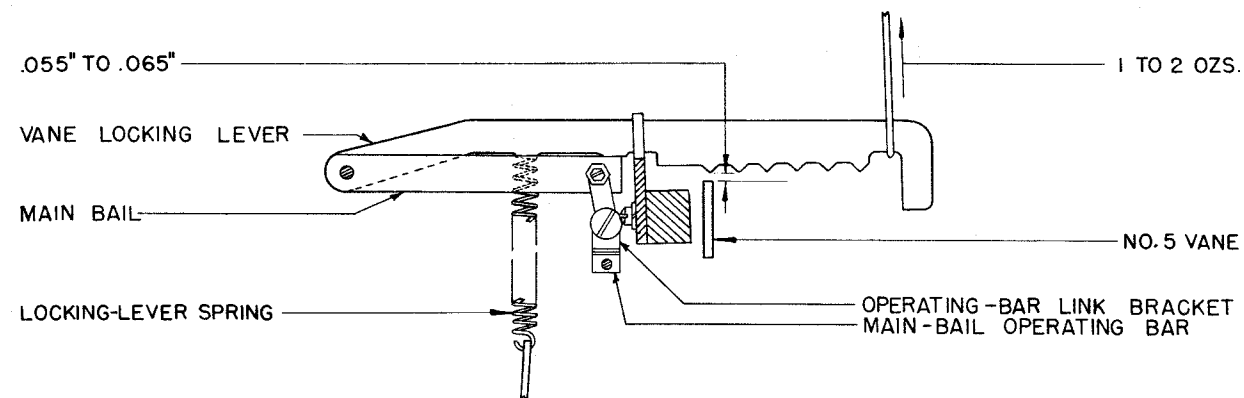


FIGURE 7
VANE LOCKING LEVER

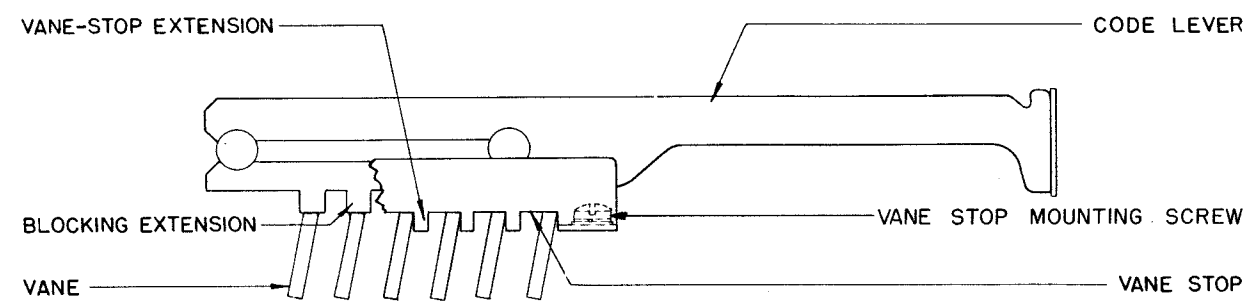


FIGURE 8
VANE STOP

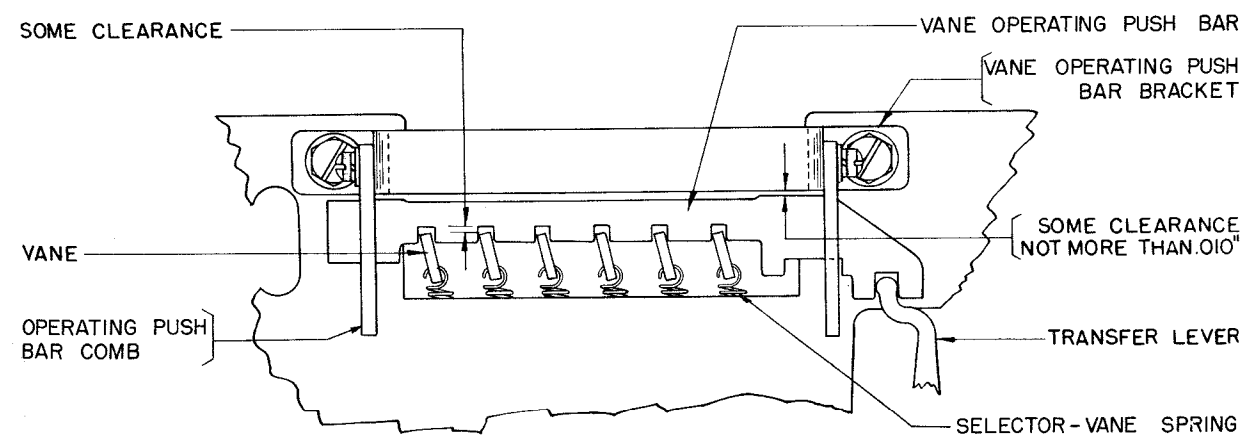


FIGURE 9
VANE OPERATING LINK ASSEMBLY

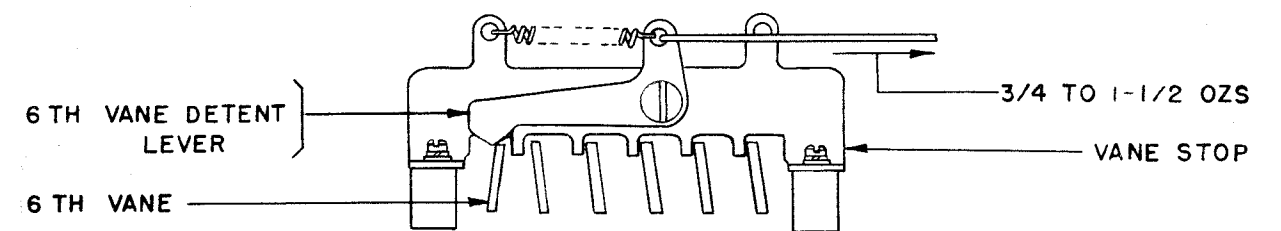


FIGURE 10
6 TH VANE DETENT LEVER SPRING

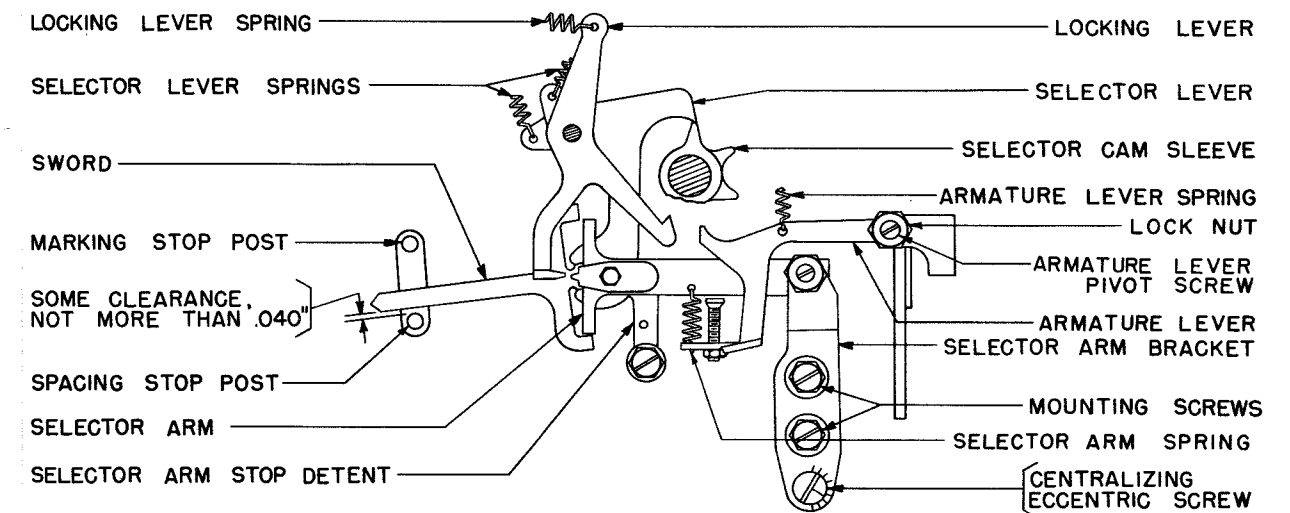


FIGURE 11
HOLDING MAGNET SELECTOR

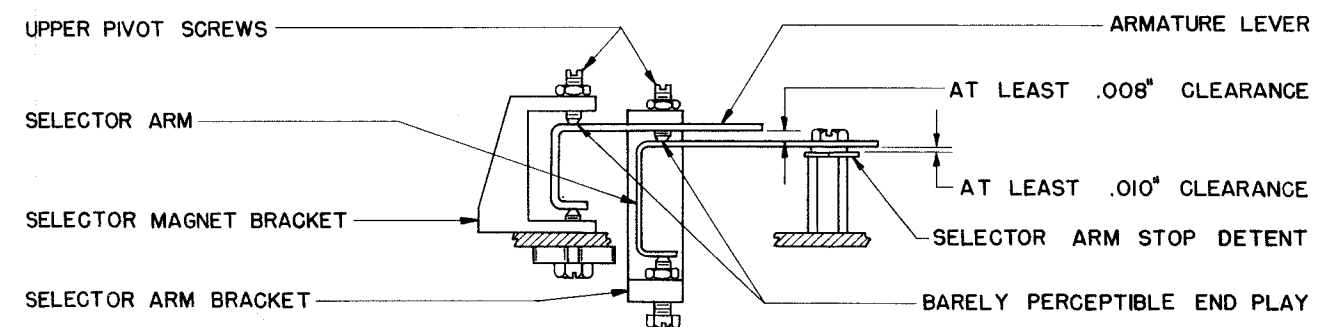


FIGURE 12
ARMATURE BRACKET

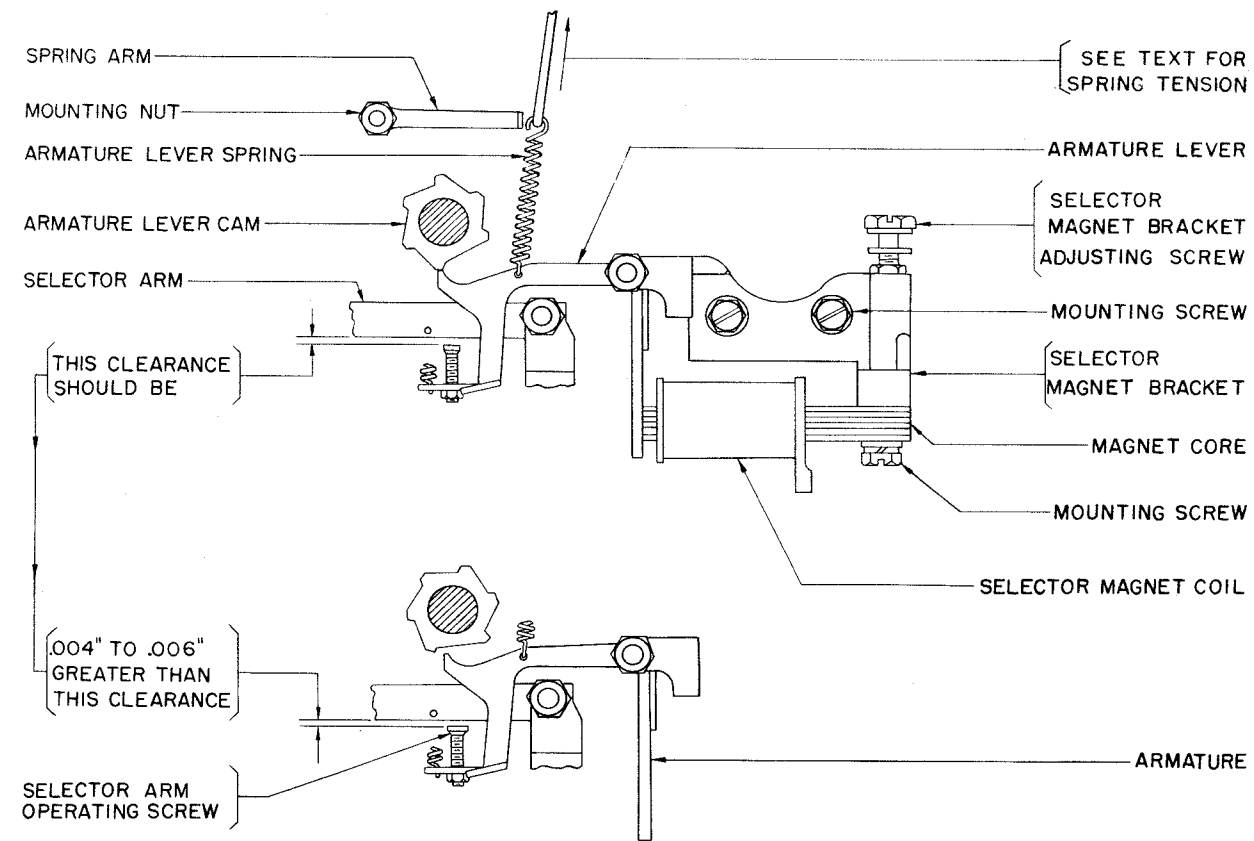


FIGURE 13
HOLDING MAGNET SELECTOR

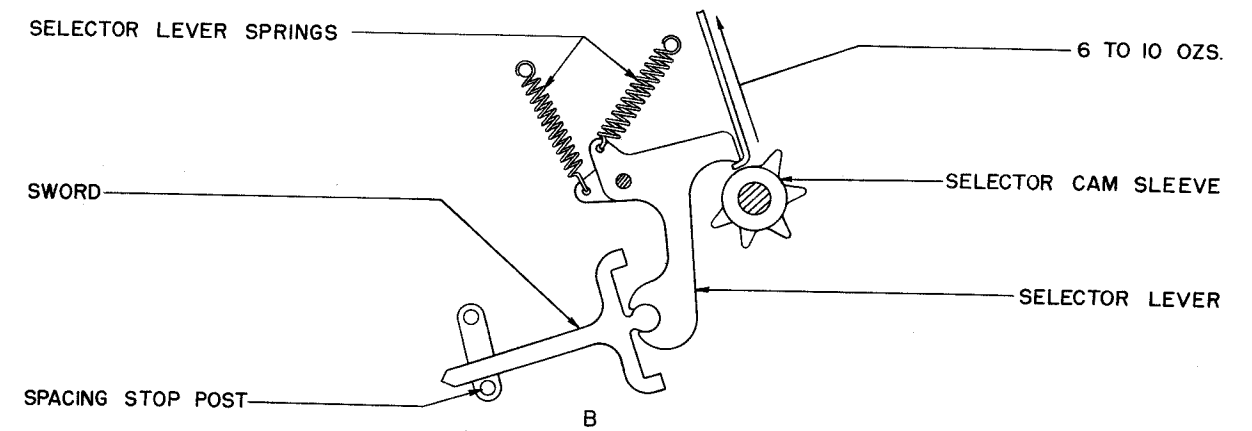
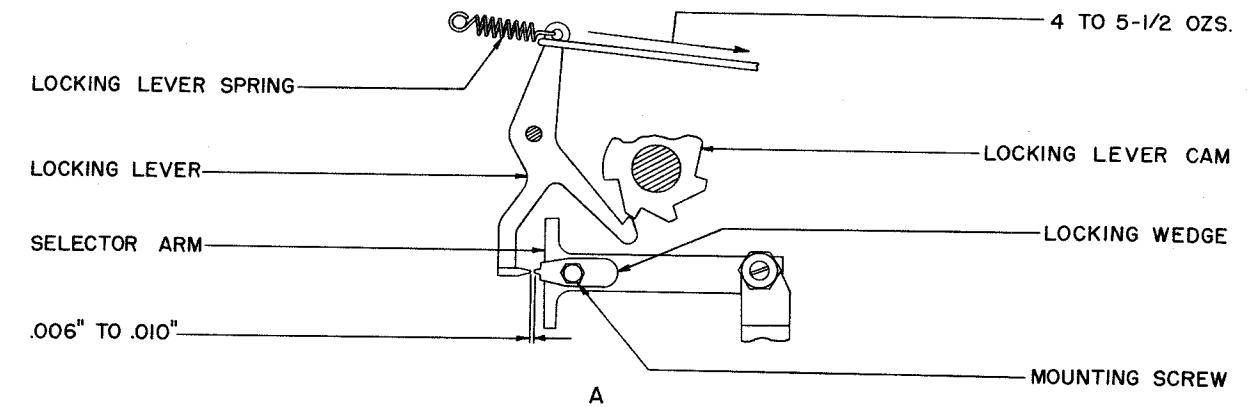


FIGURE 15
SELECTOR ARM LOCKING MECHANISM

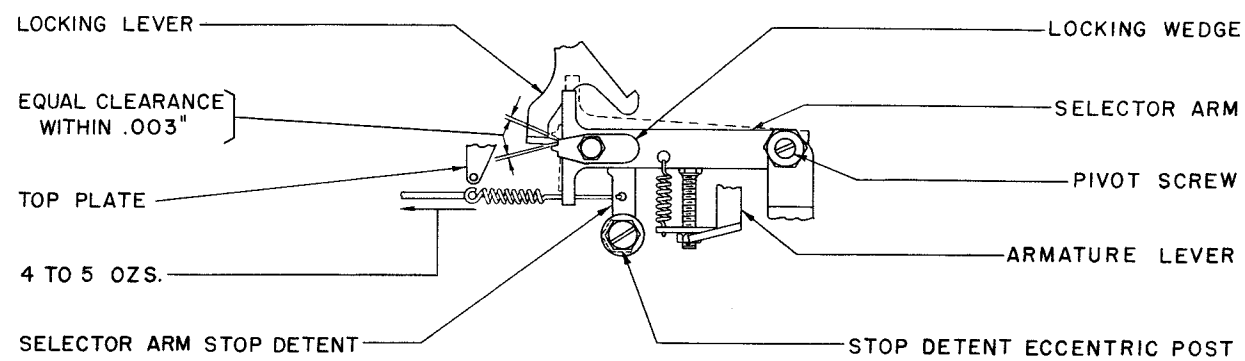


FIGURE 14
SELECTOR ARM LOCKING MECHANISM

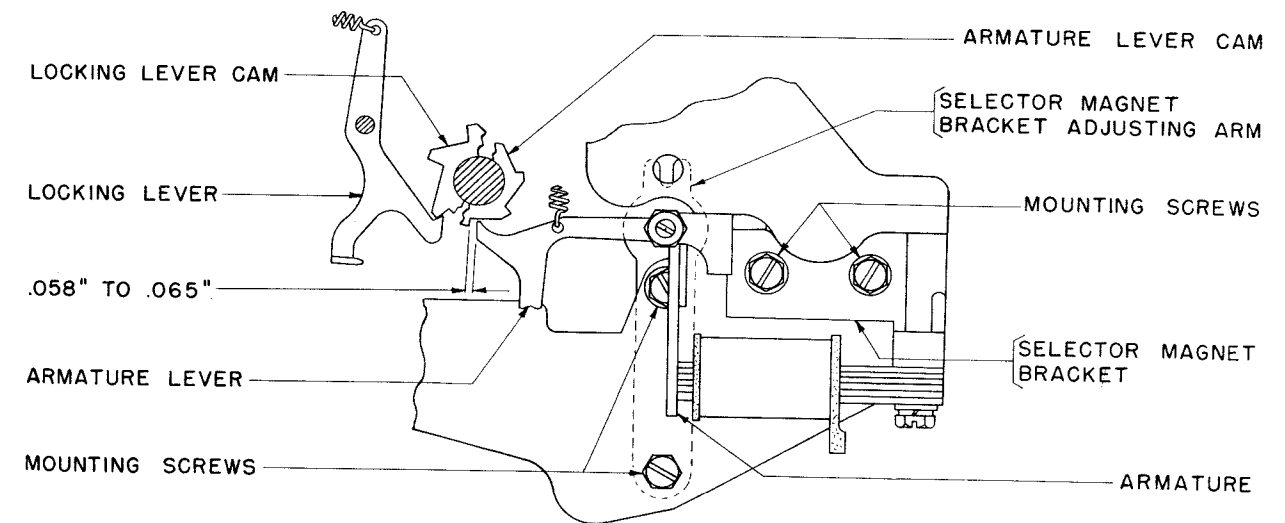


FIGURE 16
SELECTOR MAGNET BRACKET

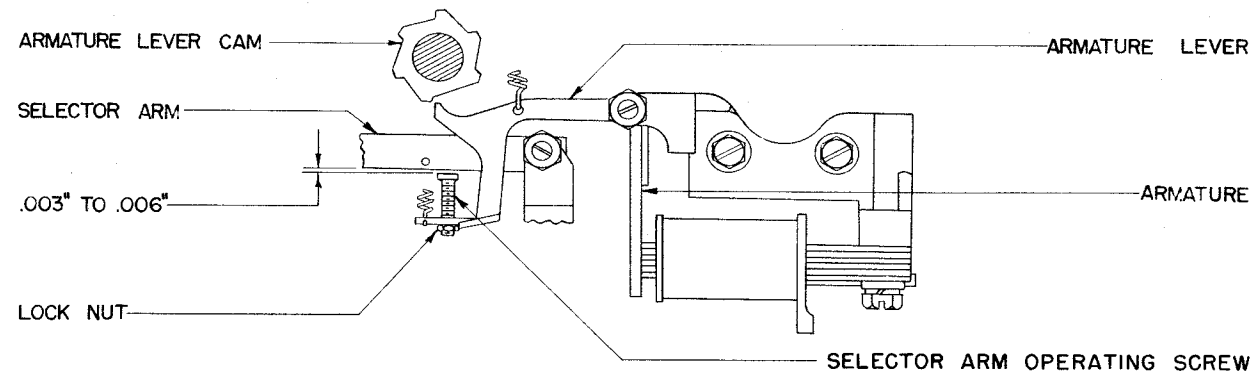


FIGURE 17
SELECTOR ARM OPERATING SCREW

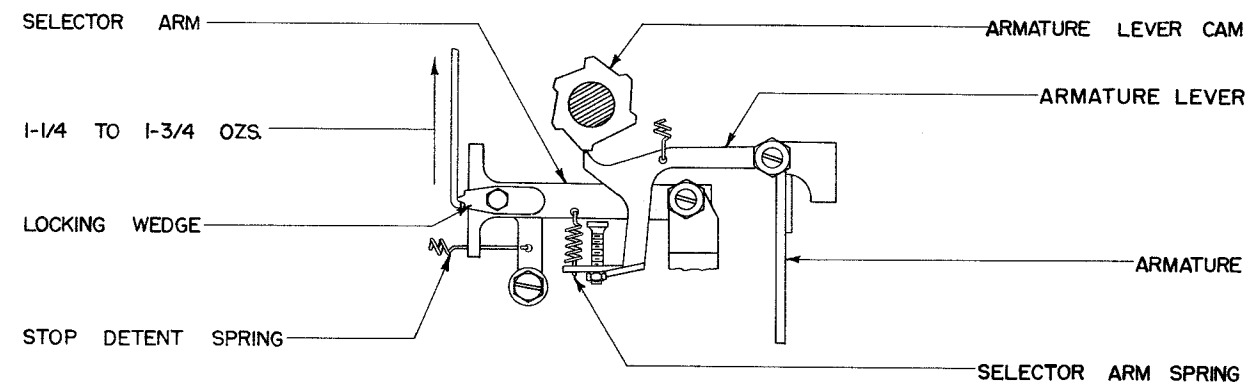


FIGURE 18
SELECTOR ARM SPRING

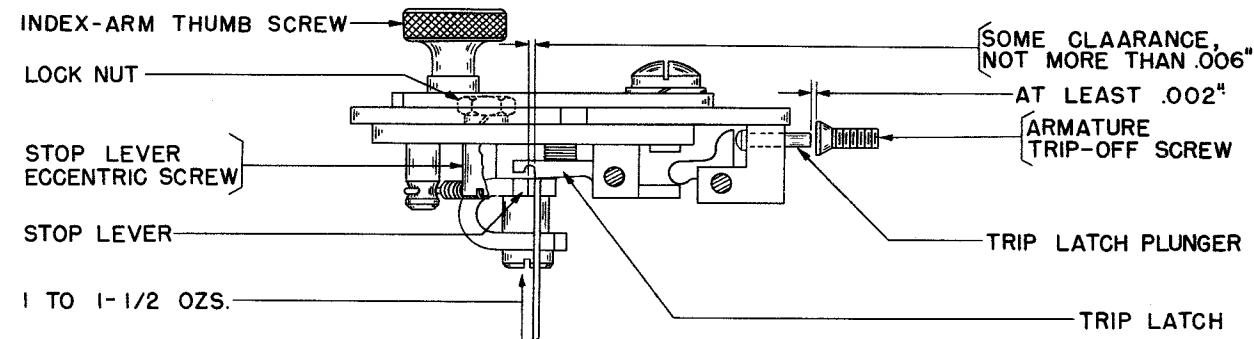


FIGURE 19
RANGE FINDER

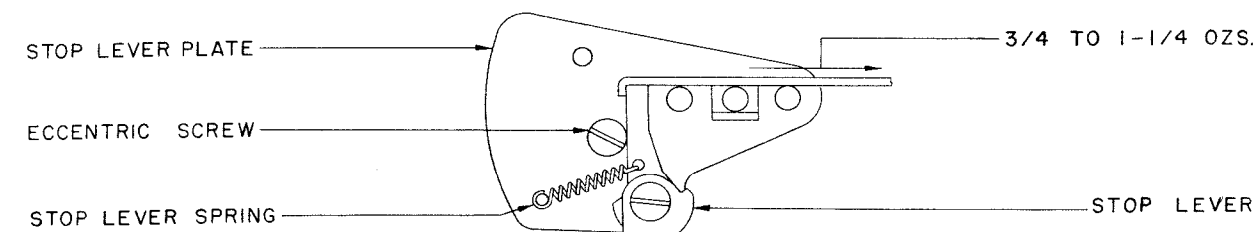


FIGURE 20
STOP LEVER

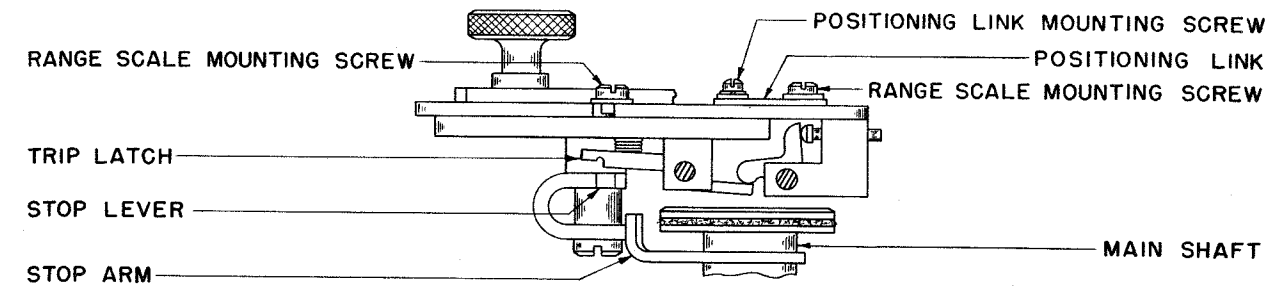


FIGURE 21
RANGE SCALE LINK

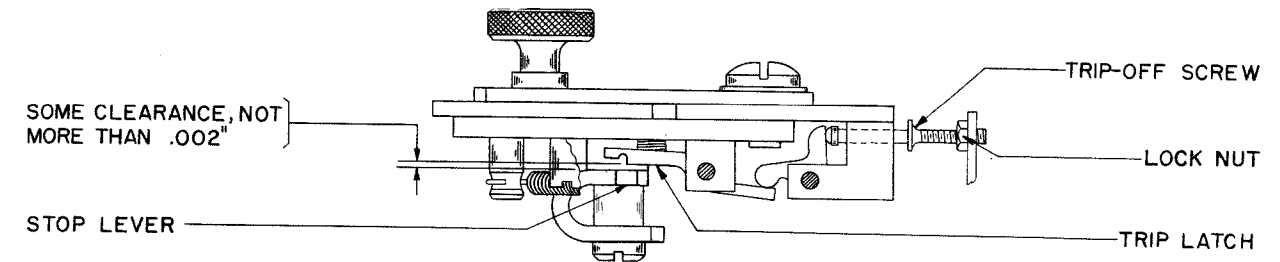


FIGURE 22
RANGE FINDER

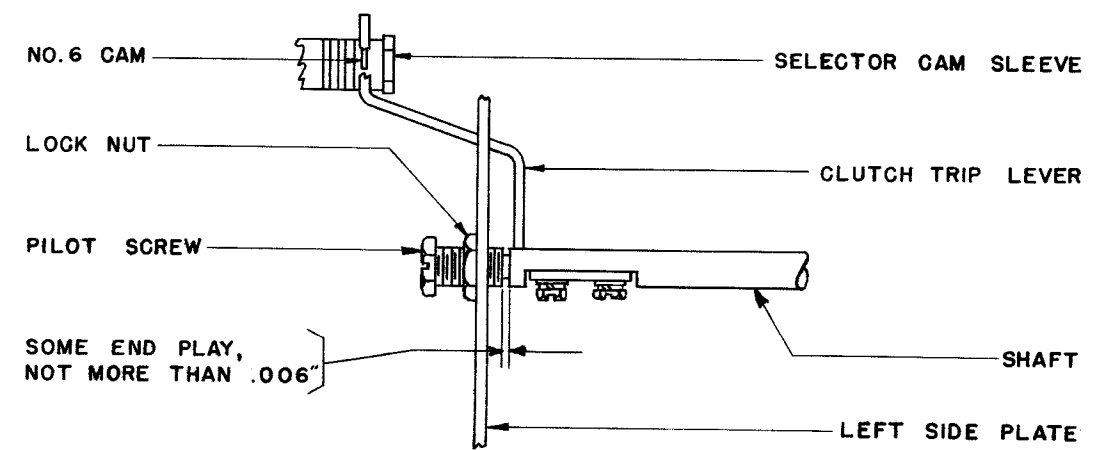


FIGURE 23
CLUTCH TRIP LEVER AND BLOCKING LEVER SHAFT

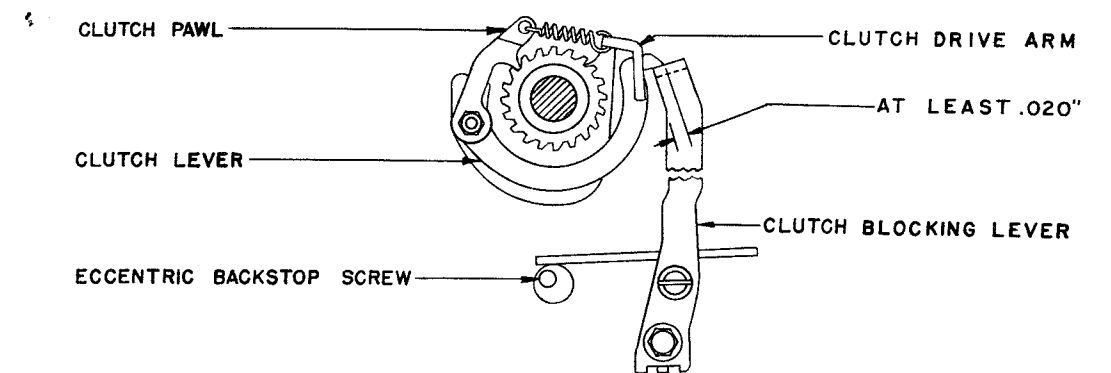


FIGURE 24
CLUTCH LEVER AND BLOCKING LEVER ENGAGEMENT

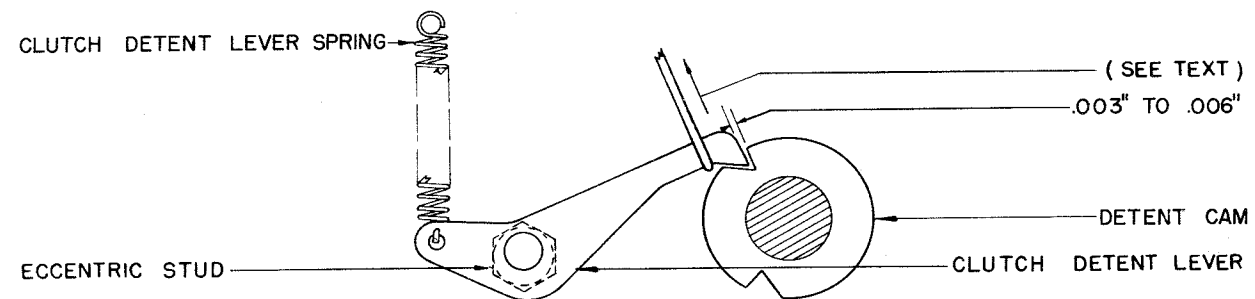


FIGURE 25
OPERATING ECCENTRIC DETENT

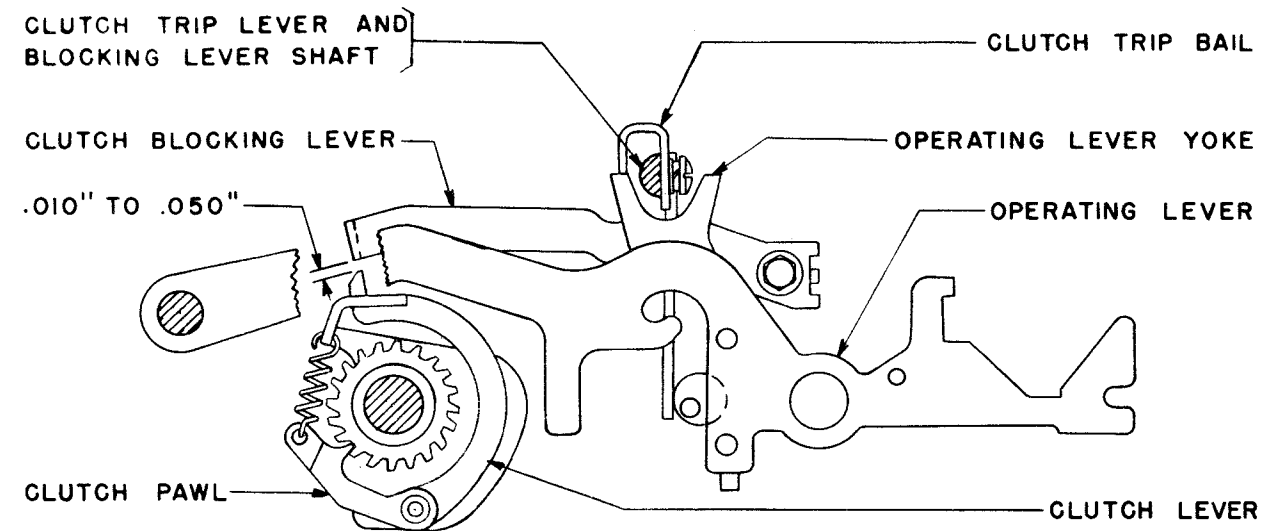


FIGURE 26
CLUTCH TRIP BAIL

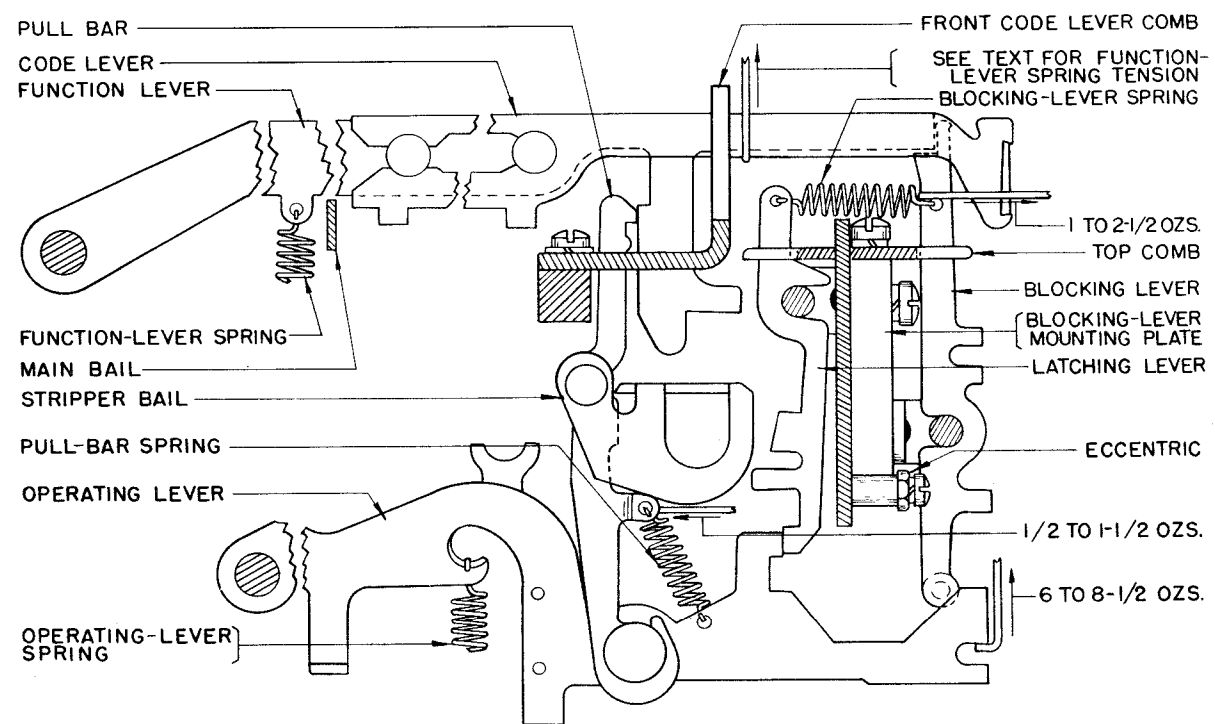


FIGURE 27
CONTACT CONTROL MECHANISM

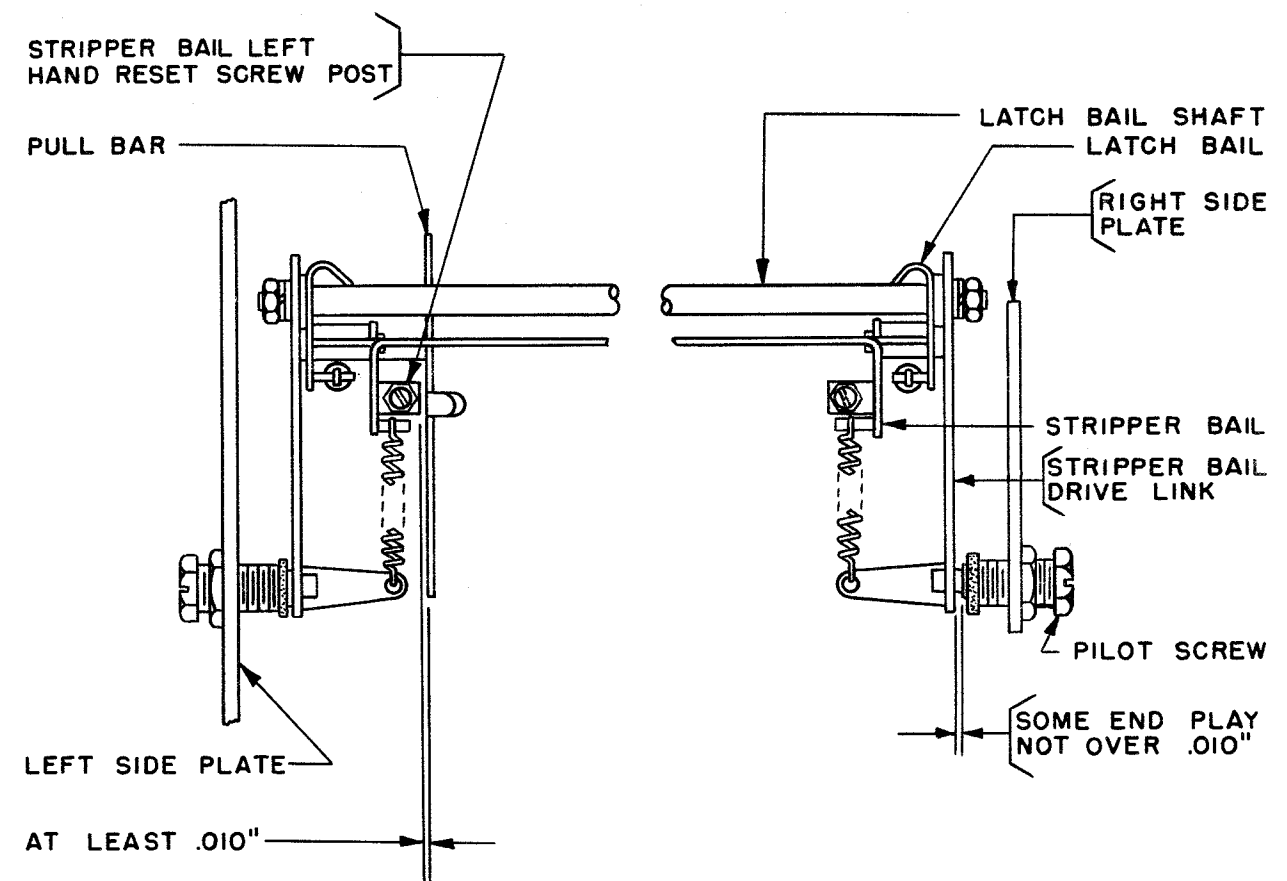


FIGURE 28
STRIPPER BAIL ASSEMBLY

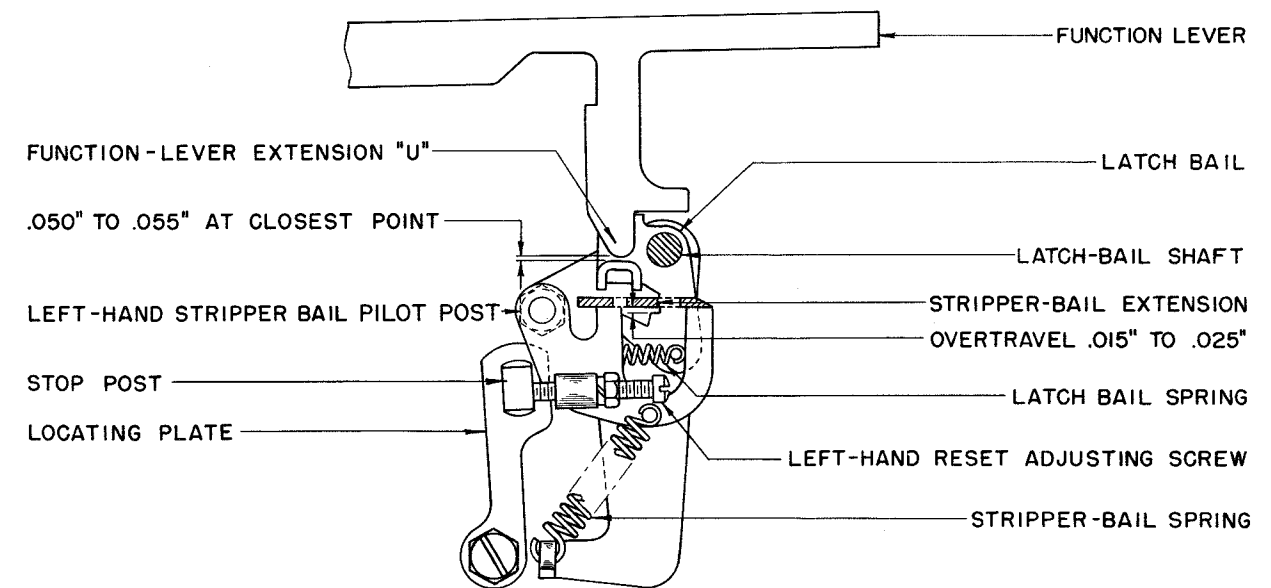


FIGURE 29
STRIPPER BAIL CONTROL MECHANISM

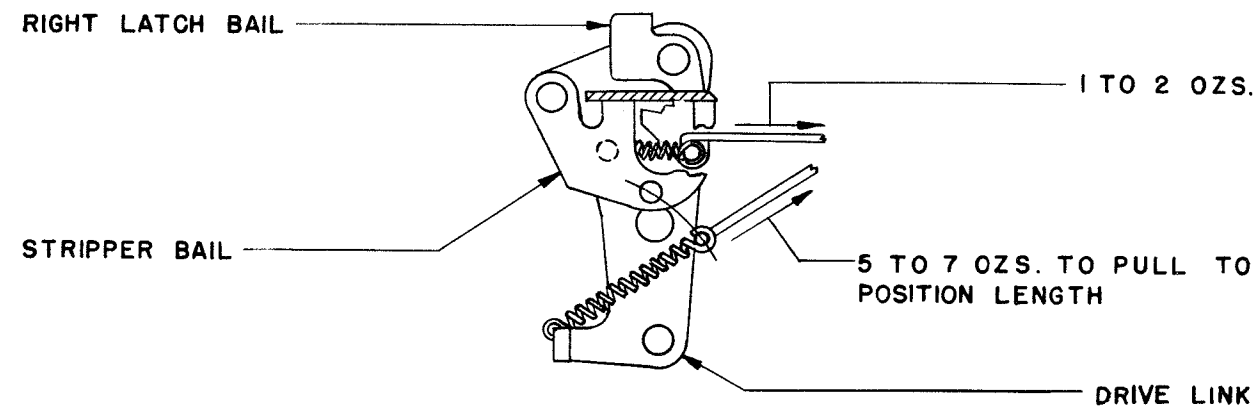


FIGURE 30
LATCH BAIL AND STRIPPER BAIL SPRINGS

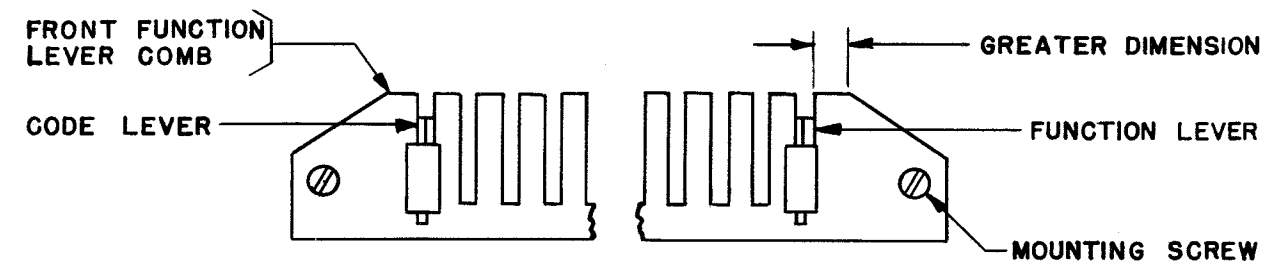


FIGURE 31
FRONT (CODE LEVER) FUNCTION LEVER COMB

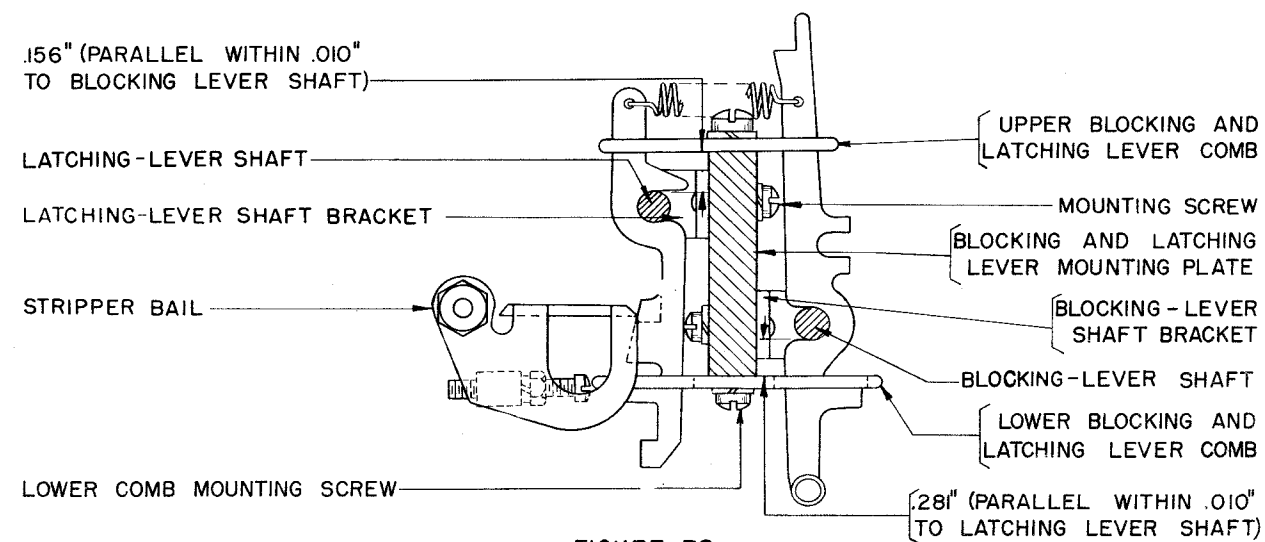


FIGURE 32
BLOCKING AND LATCHING LEVER ASSEMBLY

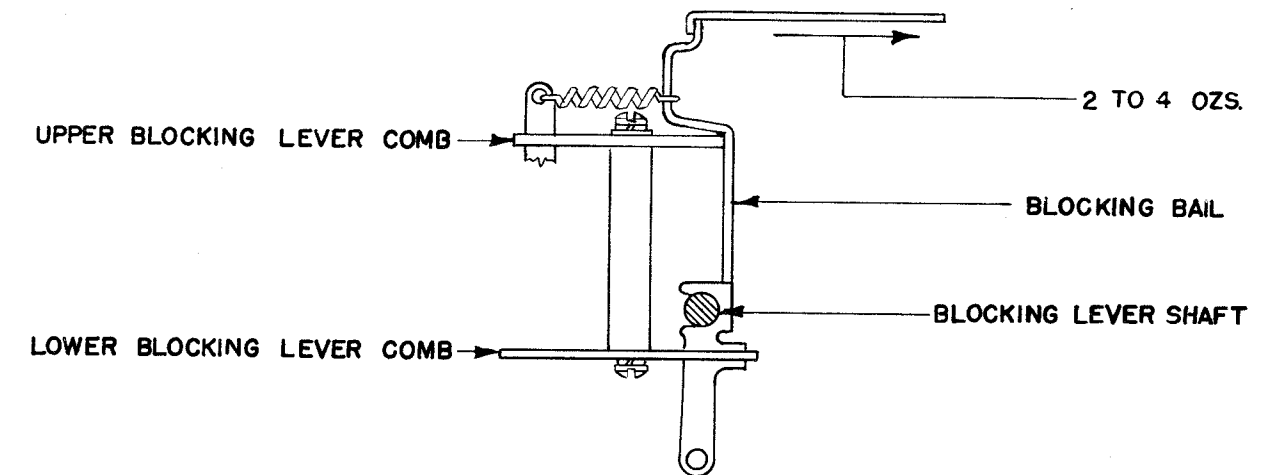


FIGURE 33
MULTIPLE BLOCKING BAIL SPRING

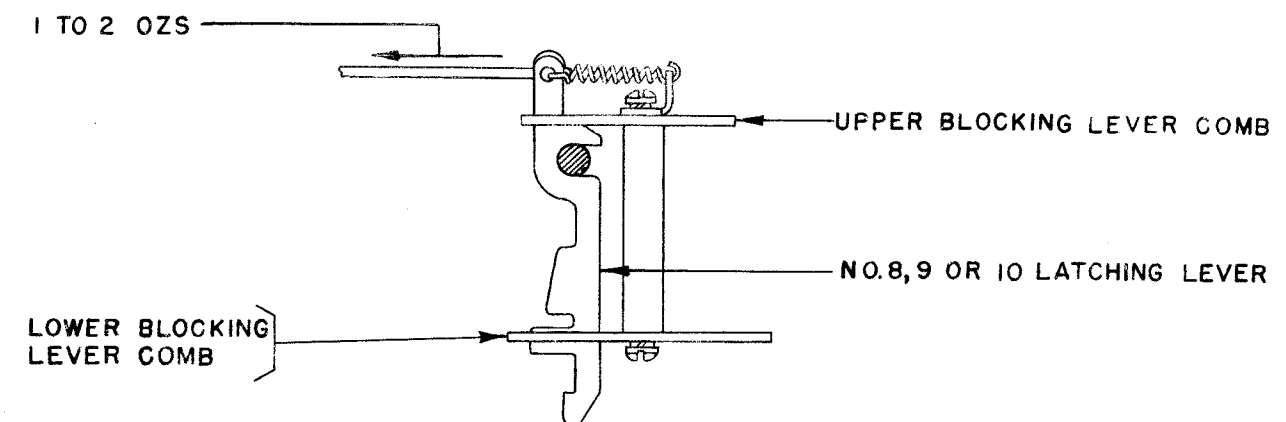


FIGURE 34
LATCHING LEVER SPRING

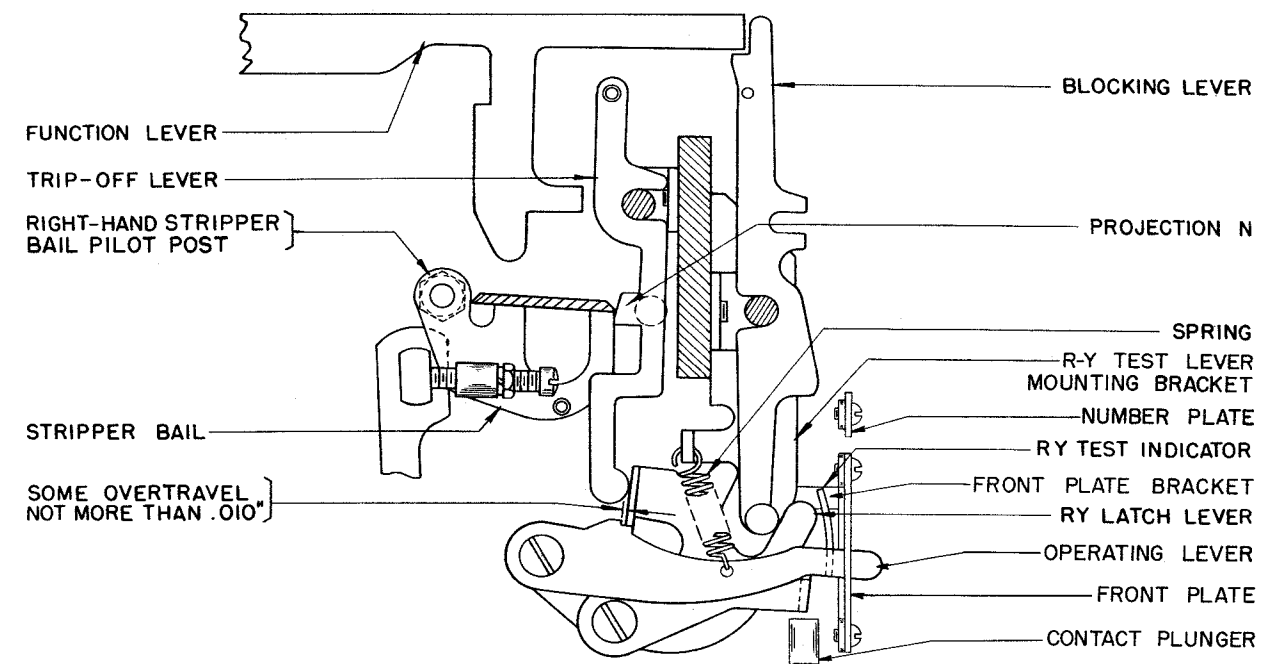


FIGURE 35
RY TEST MECHANISM

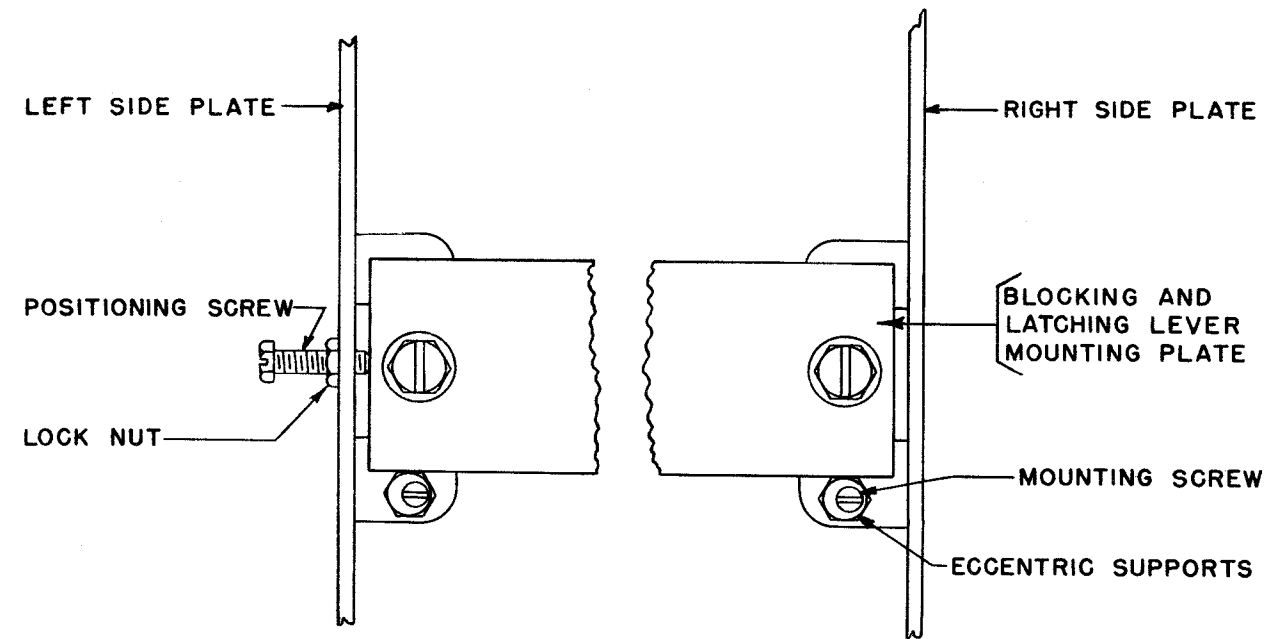


FIGURE 37
BLOCKING AND LATCHING LEVER ASSEMBLY POSITIONING ECCENTRICS

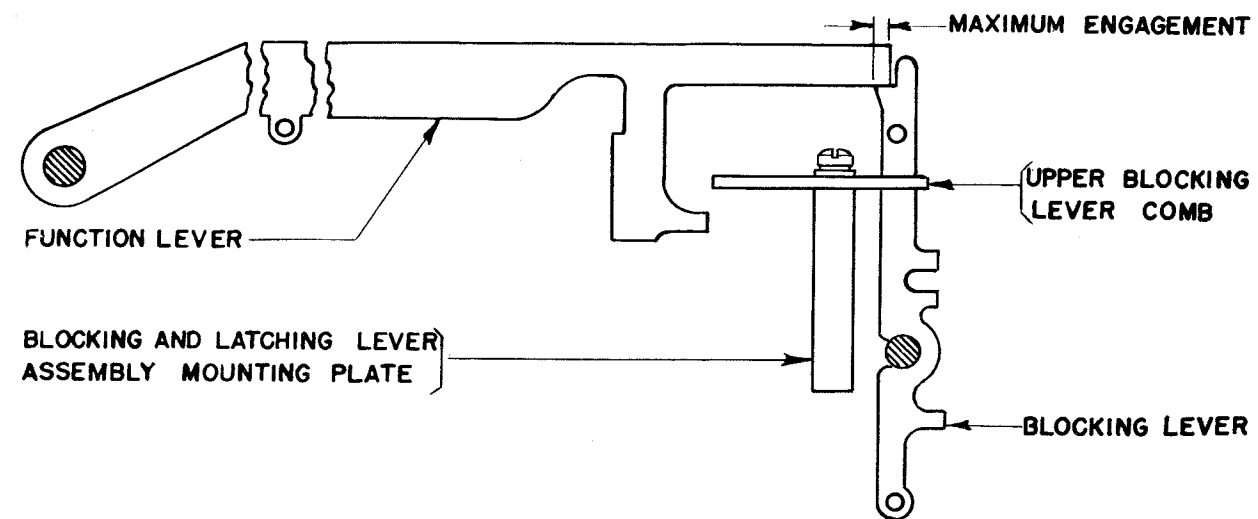


FIGURE 36
BLOCKING AND LATCHING LEVER ASSEMBLY TOP COMB

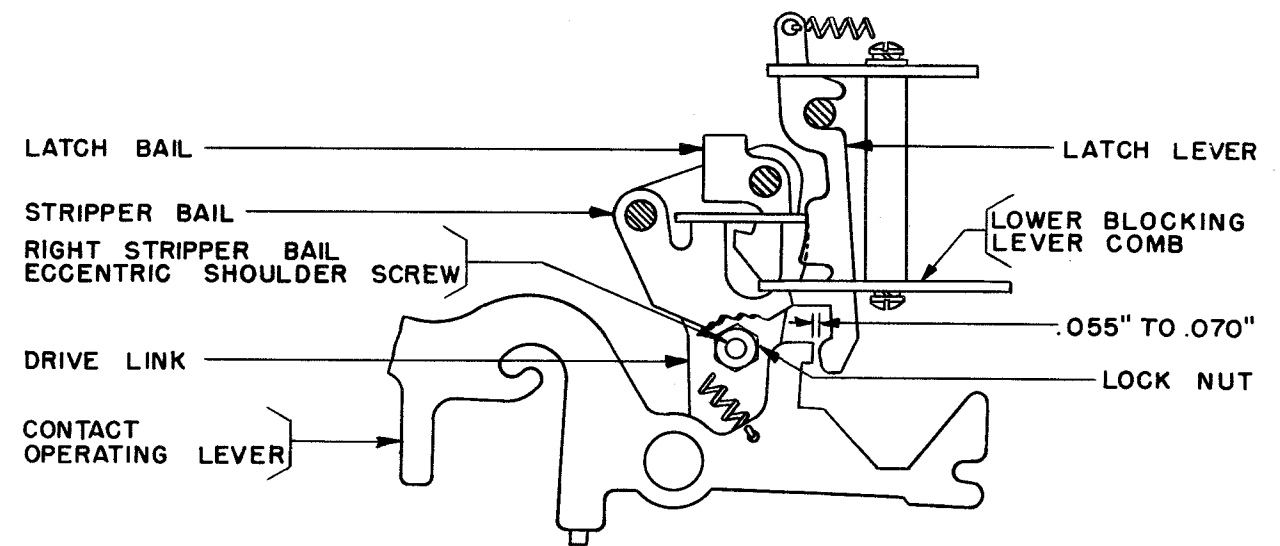


FIGURE 38
STRIPPER BAIL ECCENTRIC SHOULDER SCREW

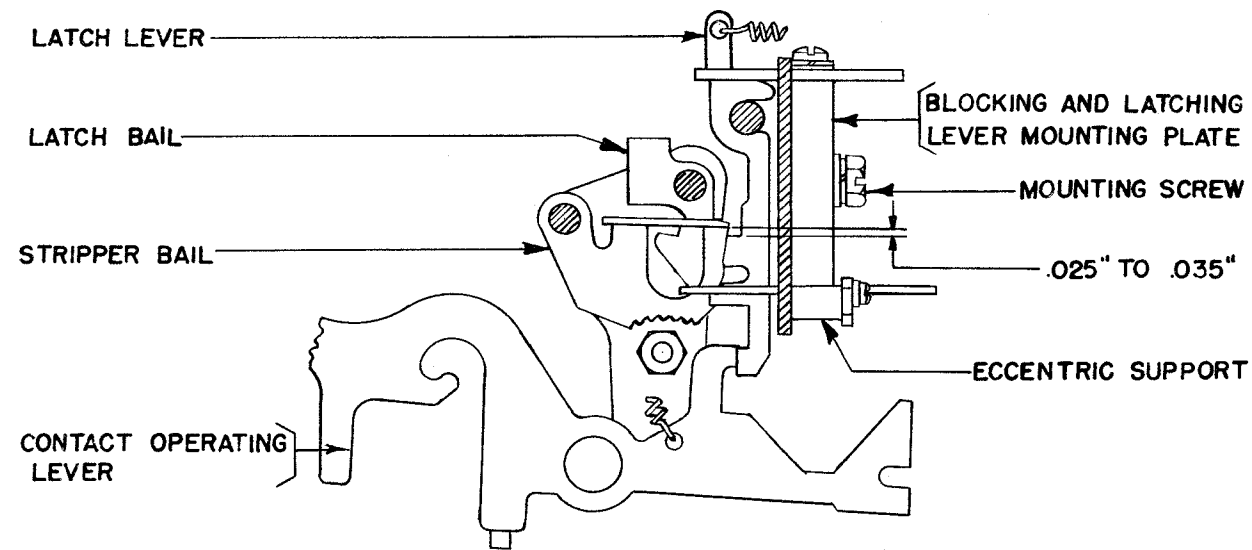


FIGURE 39
BLOCKING AND LATCHING LEVER ASSEMBLY ECCENTRICS

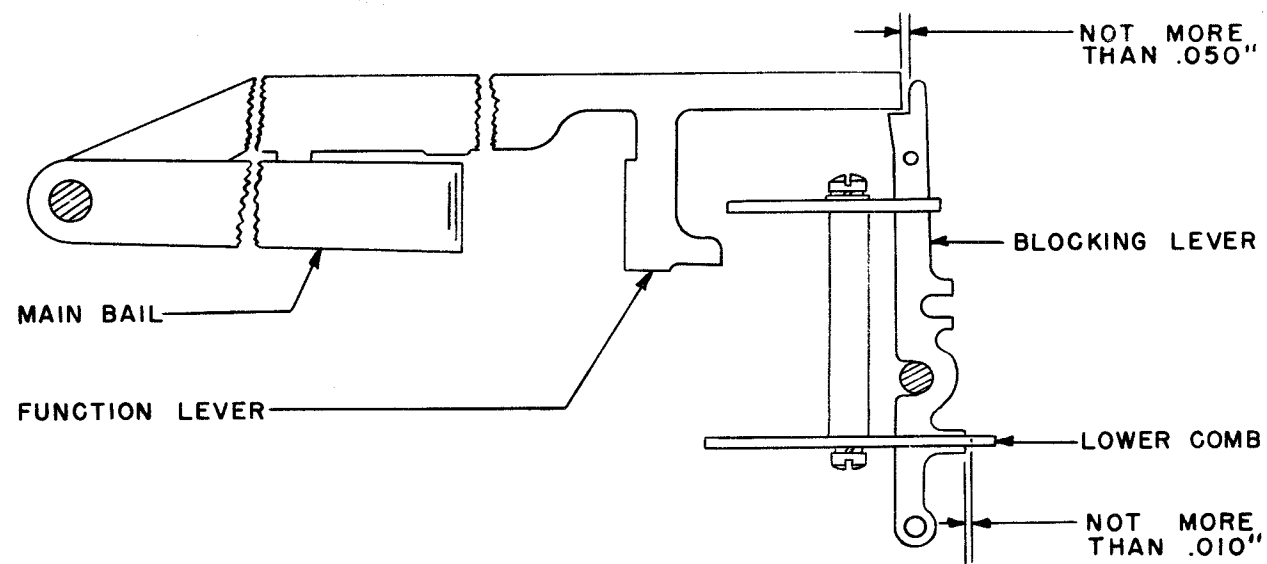


FIGURE 40
BLOCKING AND LATCHING LEVER ASSEMBLY LOWER COMB

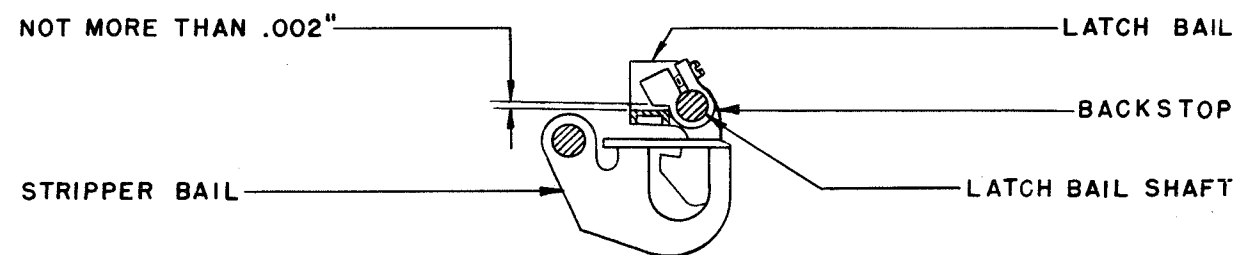


FIGURE 41
LATCH BAIL BACKSTOP

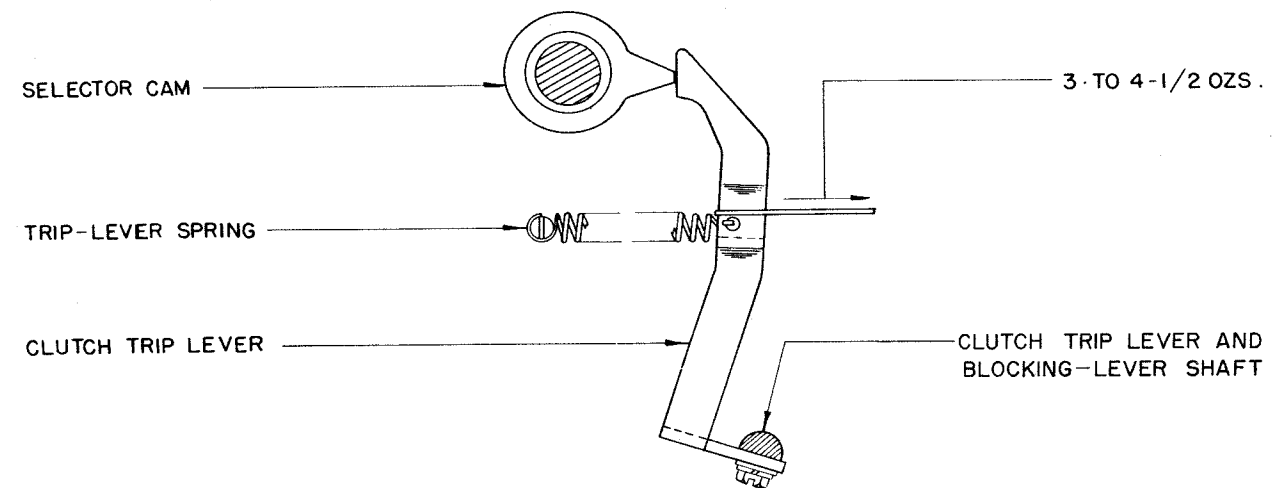


FIGURE 42
CLUTCH TRIP LEVER

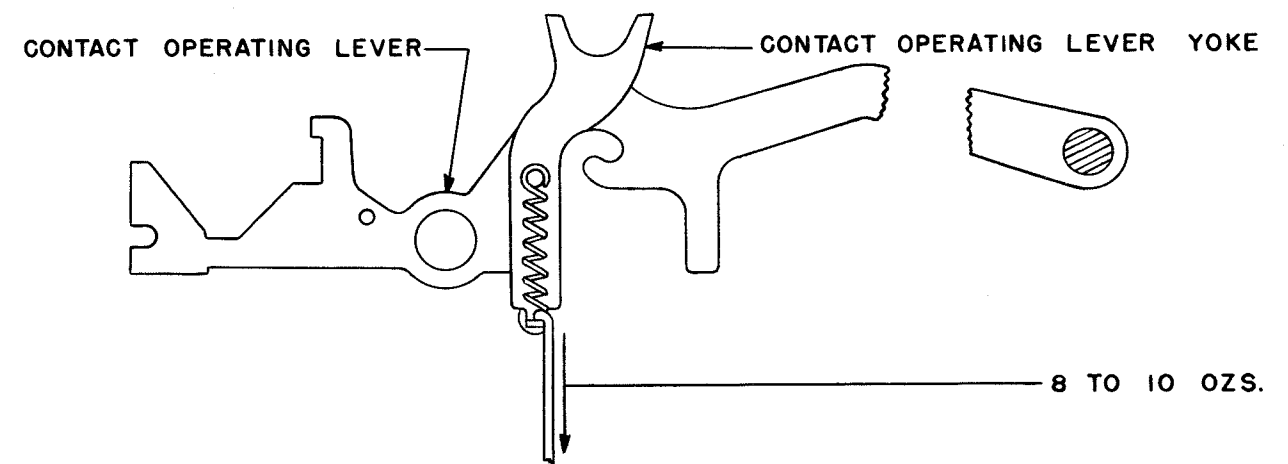


FIGURE 43
CONTACT OPERATING LEVER YOKE YIELD SPRING

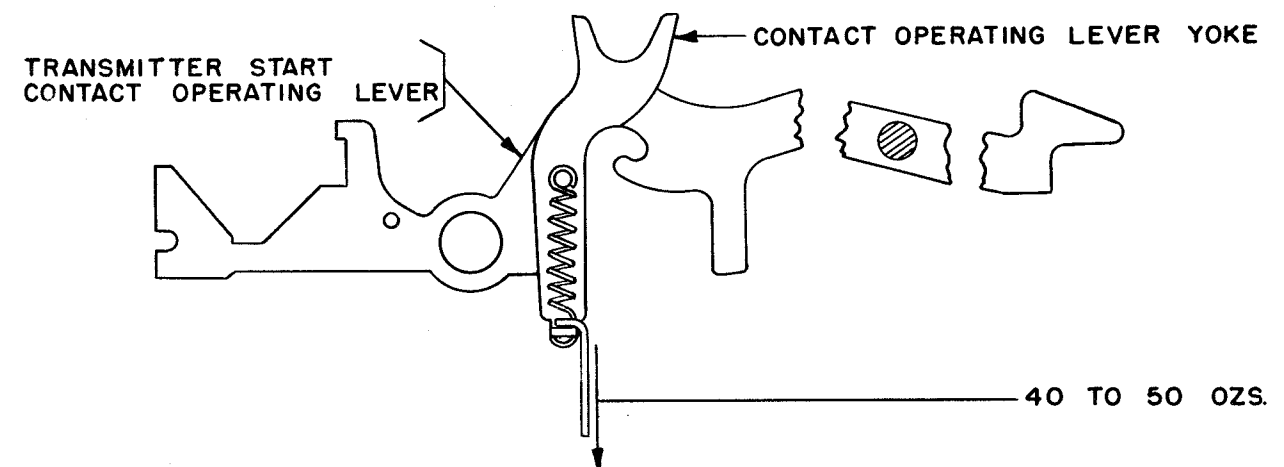


FIGURE 44
TRANSMITTER START CONTACT OPERATING LEVER YOKE YIELD SPRING

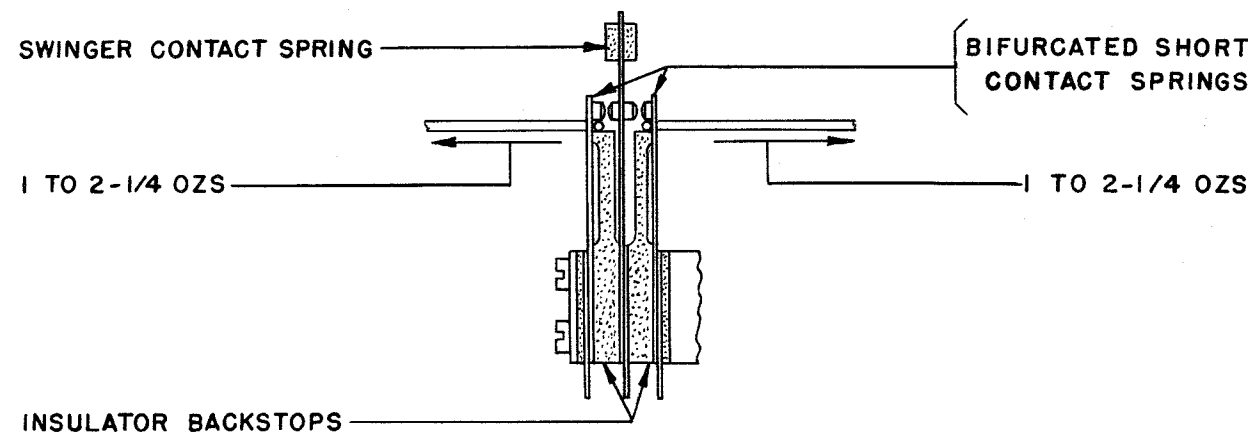


FIGURE 45

BIFURCATED SHORT CONTACT SPRINGS

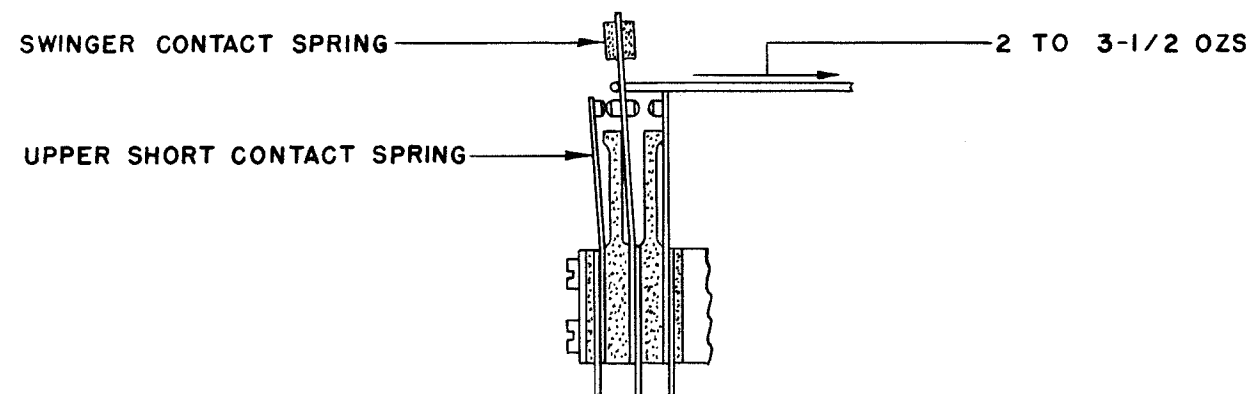


FIGURE 46

SWINGER CONTACT SPRING

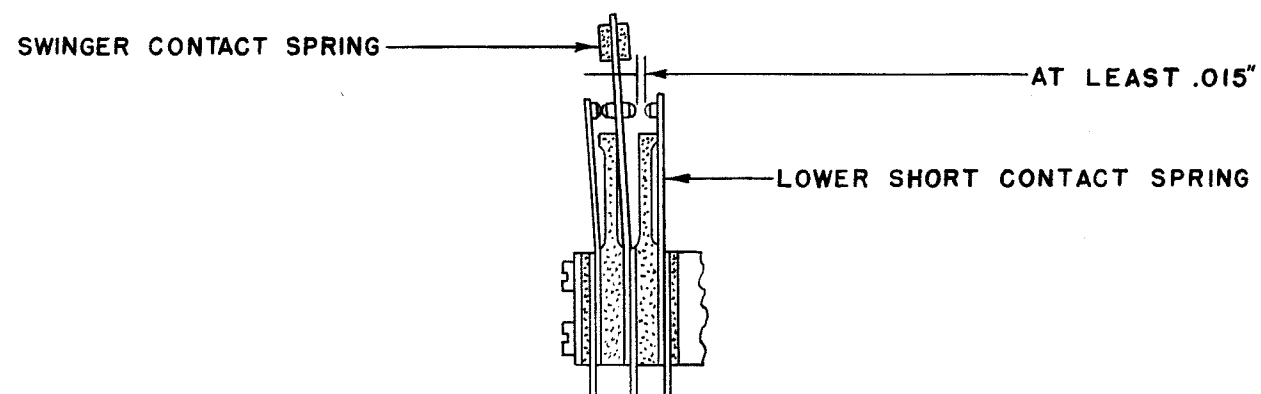


FIGURE 47

CONTACT GAP

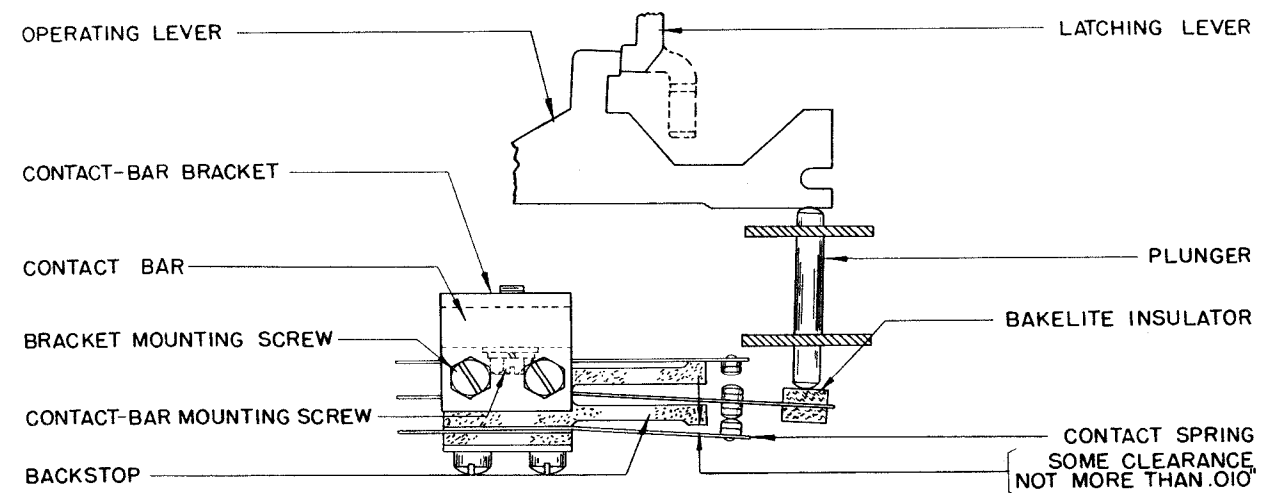


FIGURE 48
CONTACT MECHANISM

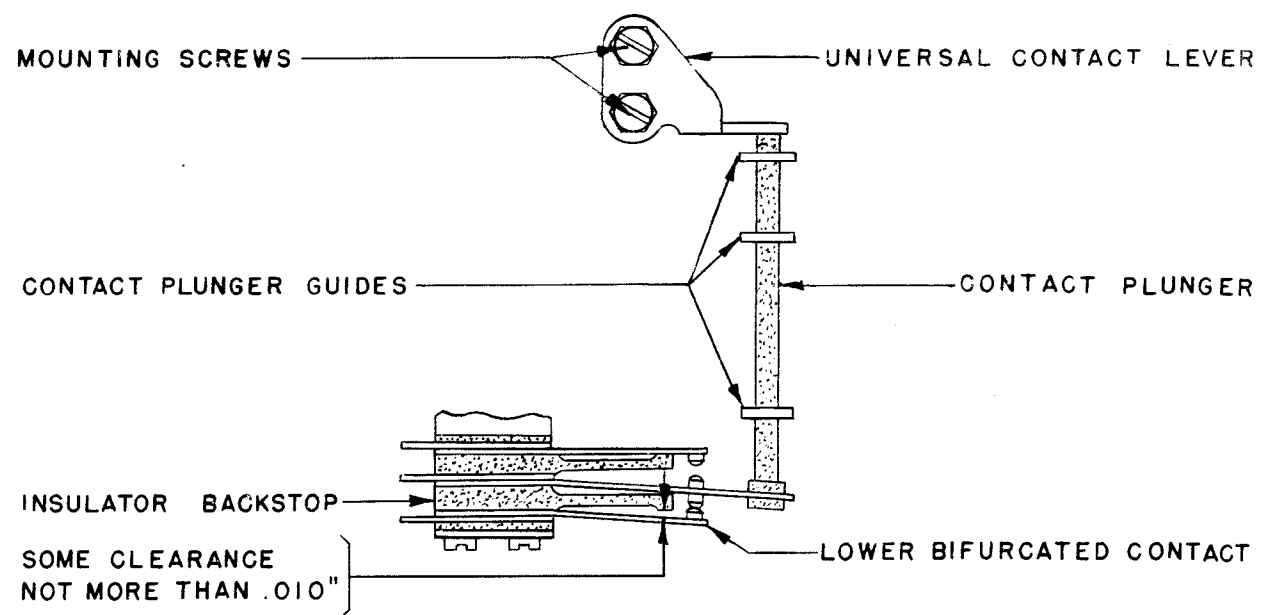


FIGURE 49

UNIVERSAL CONTACT LEVER

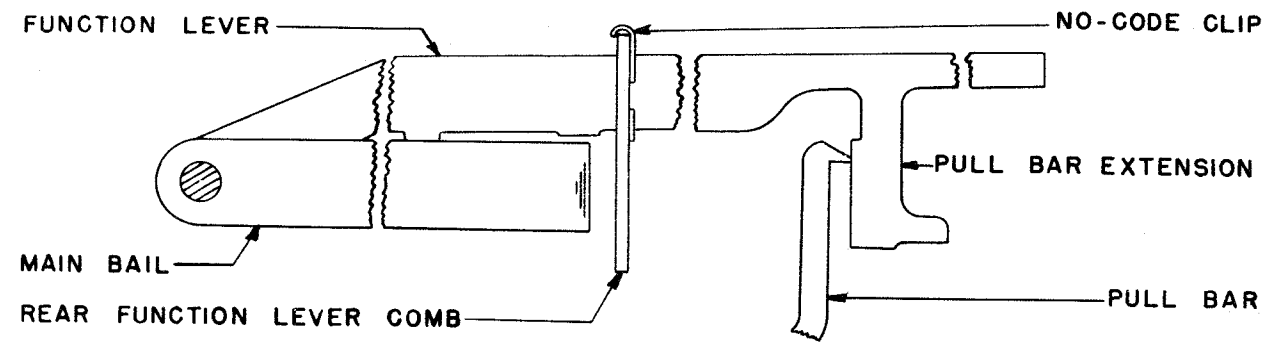


FIGURE 50
NO-CODE CLIPS

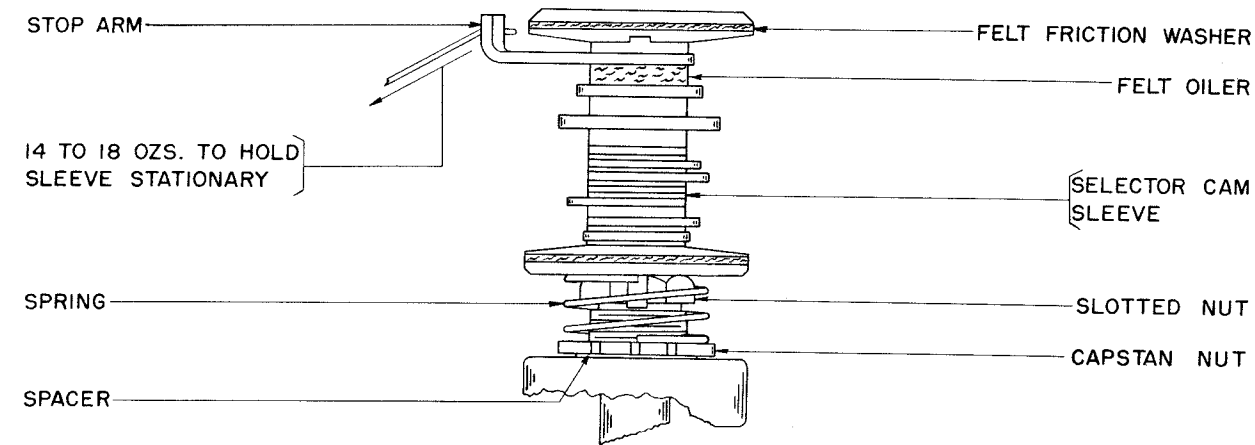


FIGURE 51
SELECTOR CAM SLEEVE

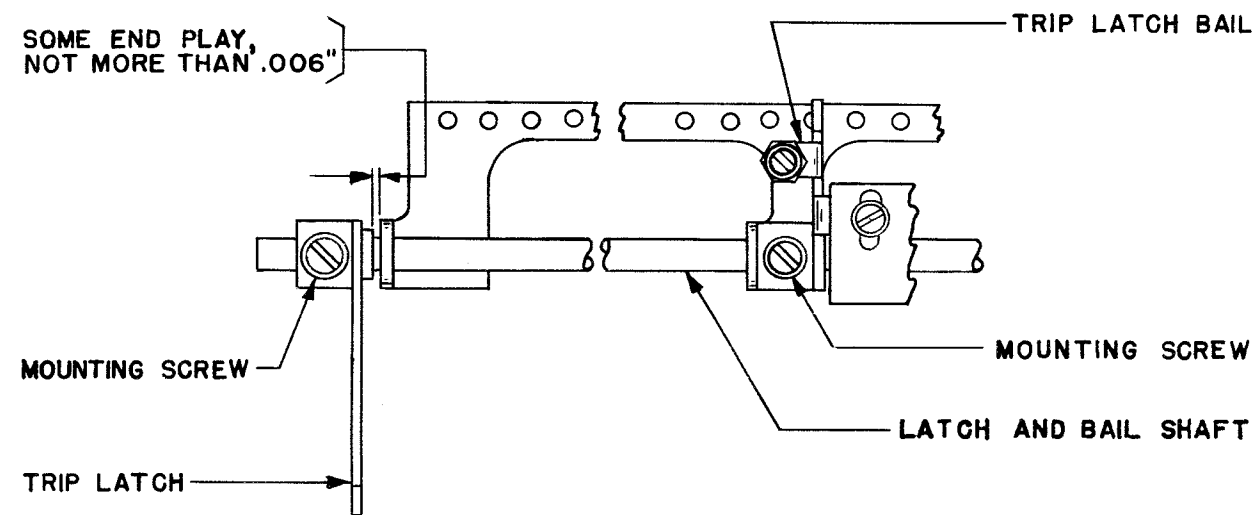


FIGURE 52
LATCH AND BAIL END PLAY

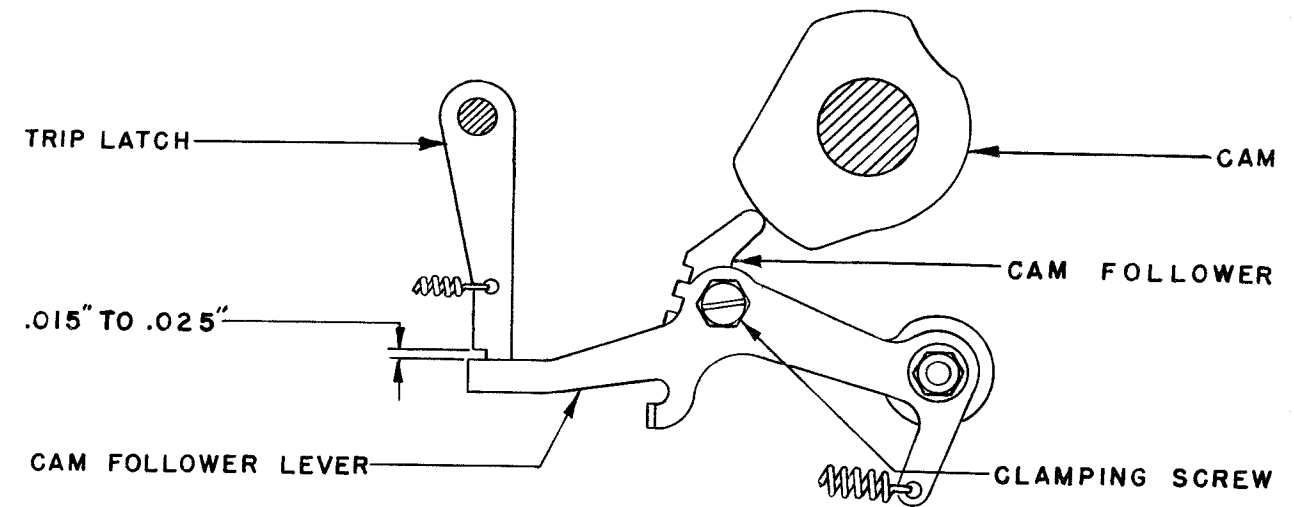


FIGURE 53
CAM FOLLOWER RESET

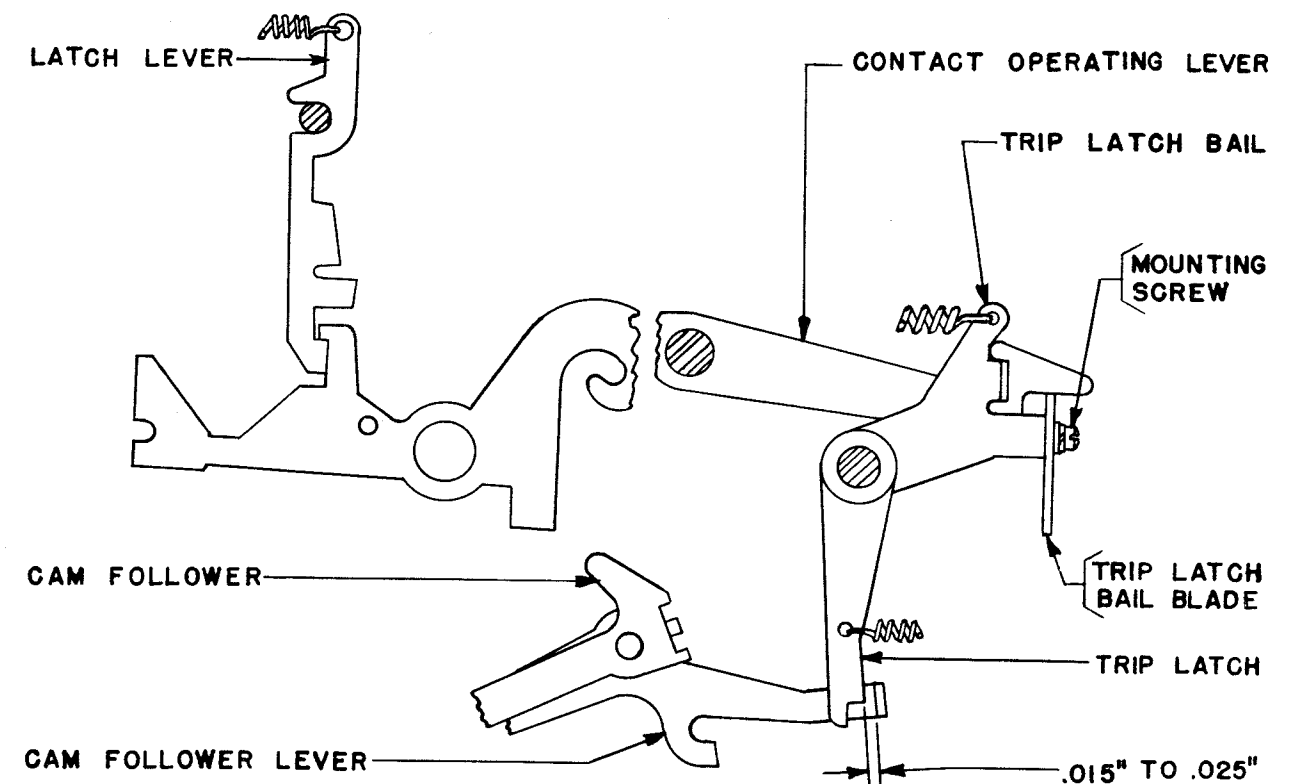


FIGURE 54
TRIP LATCH BAIL BLADE

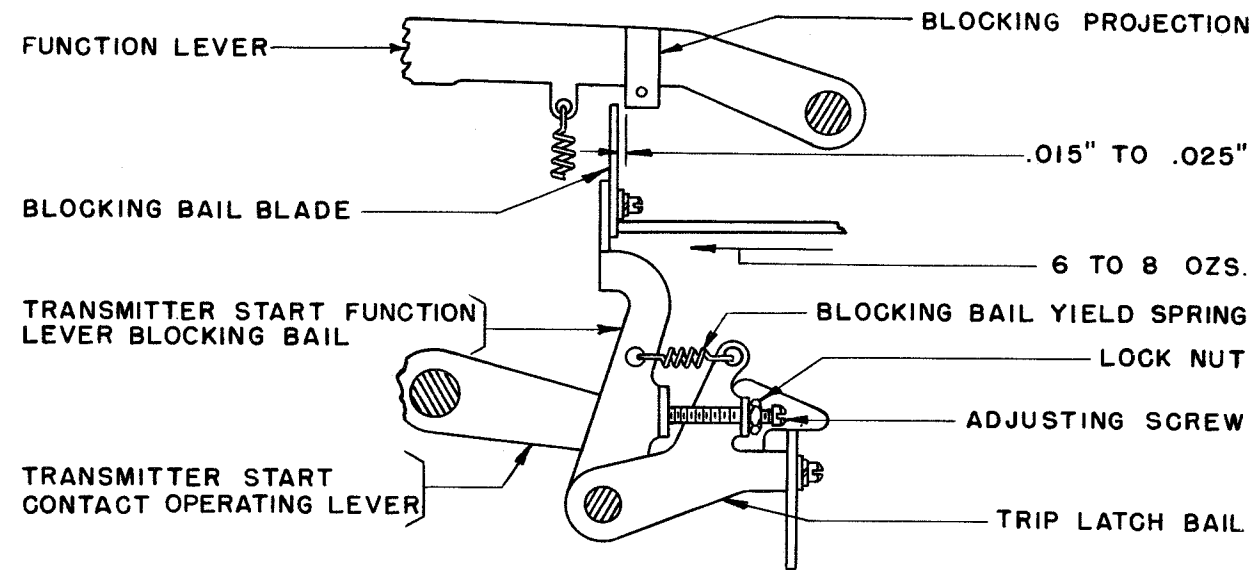


FIGURE 55

TRANSMITTER START FUNCTION LEVER BLOCKING BAIL SCREW

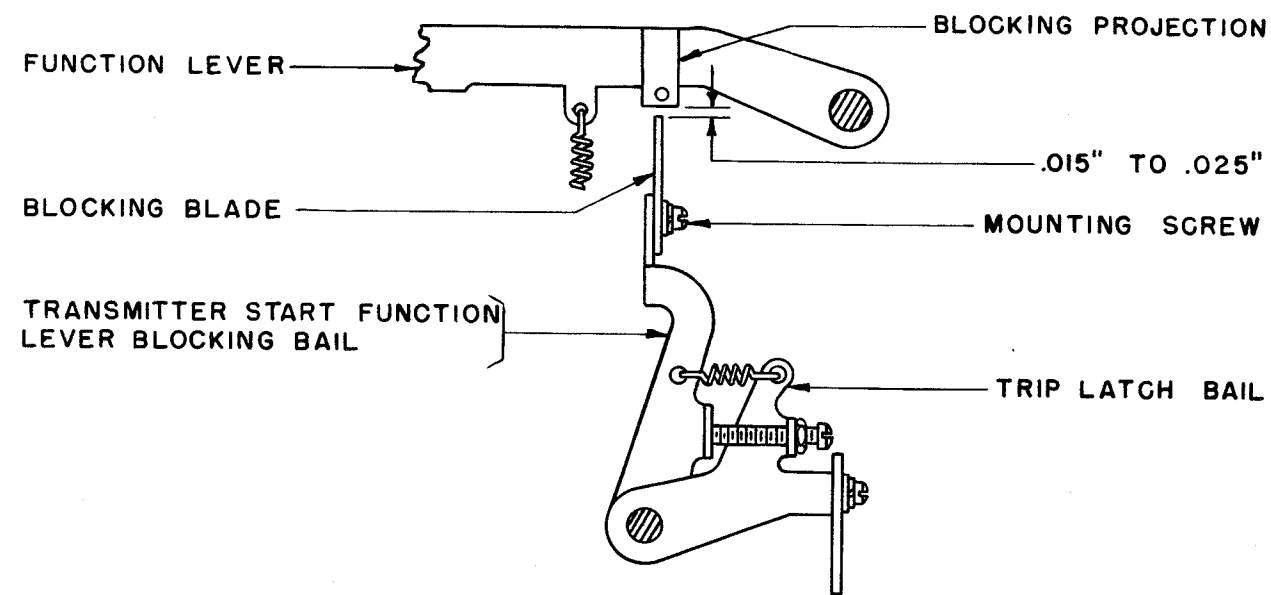


FIGURE 56

TRANSMITTER START FUNCTION LEVER BLOCKING BAIL BLADE

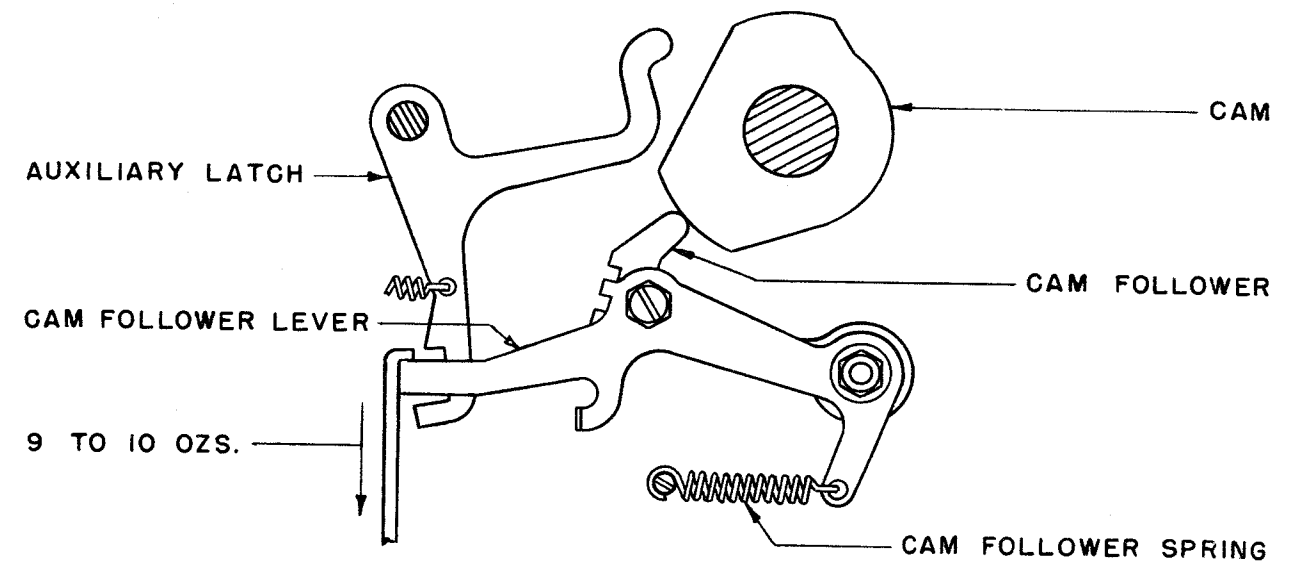


FIGURE 57

CAM FOLLOWER SPRING

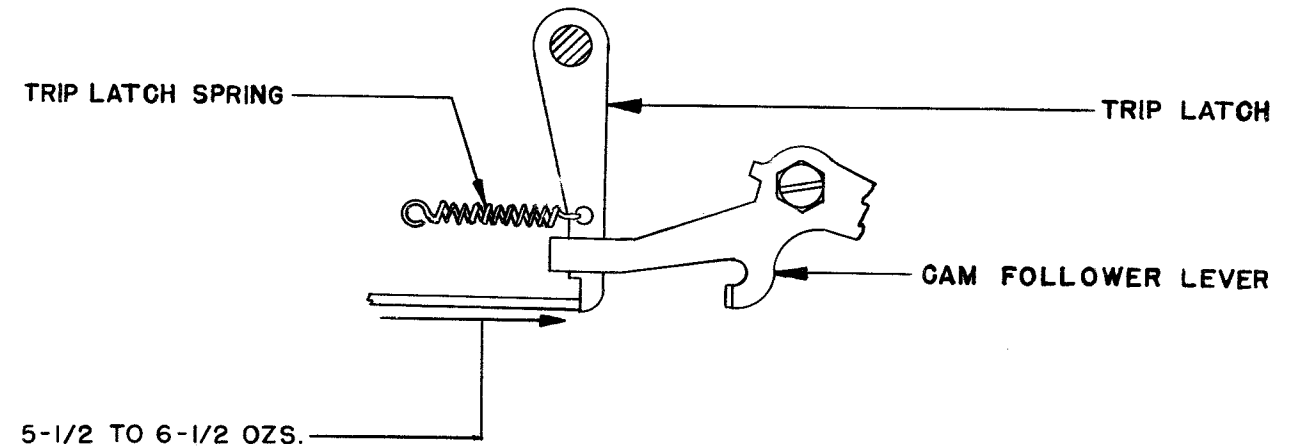


FIGURE 58

TRIP LATCH SPRING

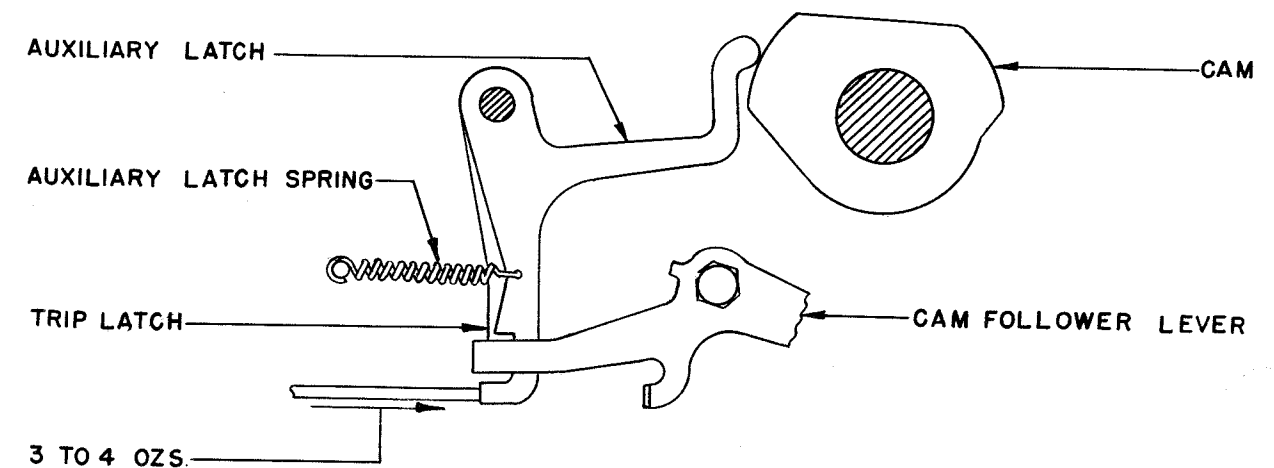


FIGURE 59

AUXILIARY LATCH SPRING

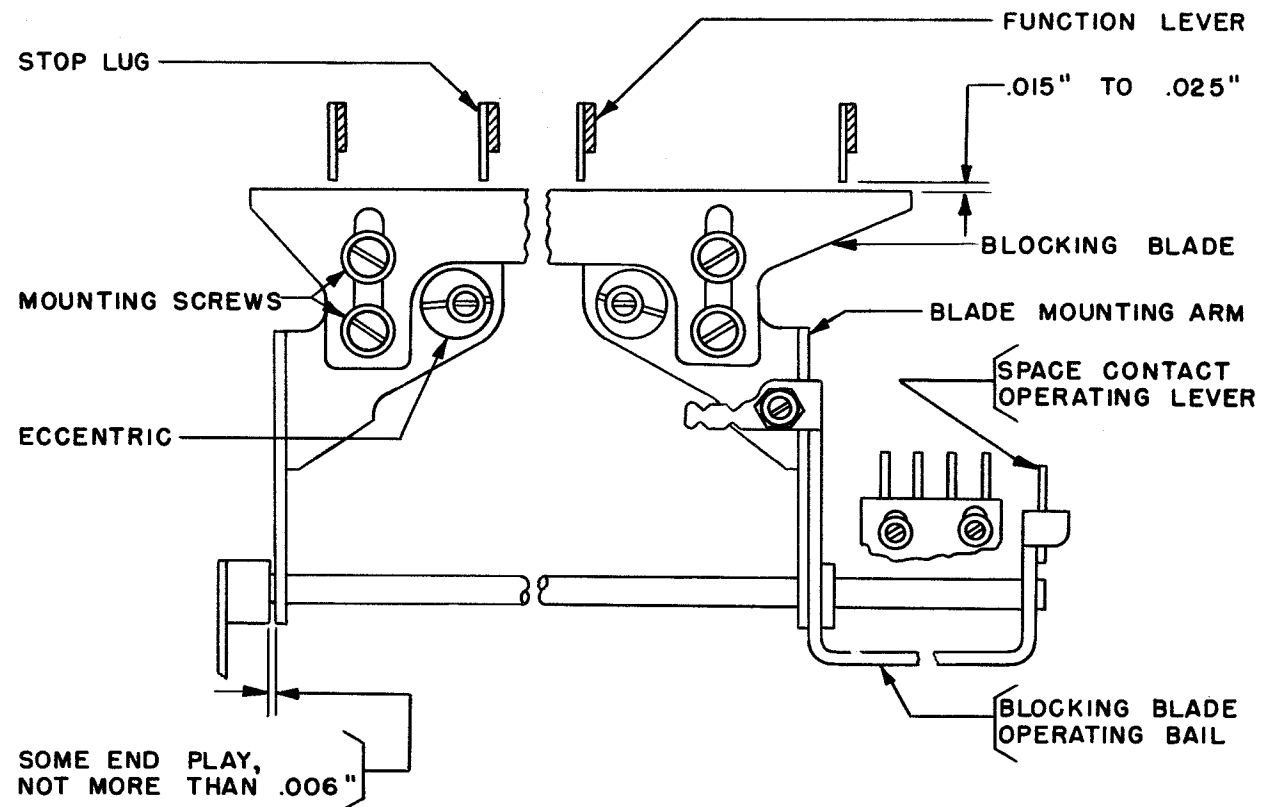


FIGURE 60
PRINTER CUT-ON FUNCTION LEVERS BLOCKING BLADE

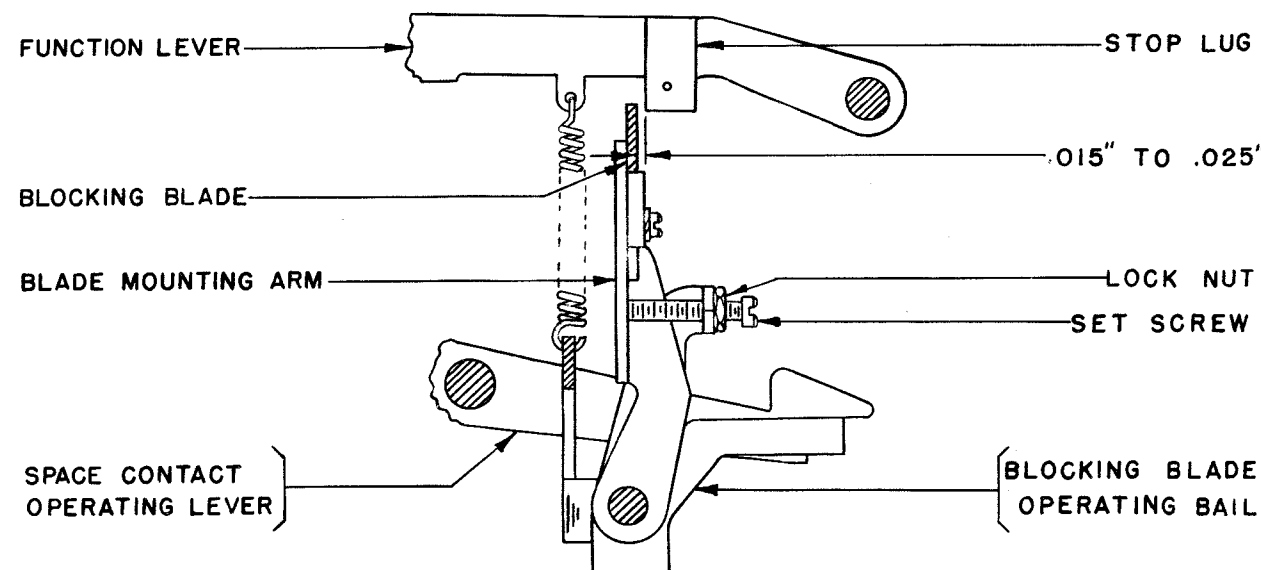


FIGURE 61
PRINTER CUT-ON FUNCTION LEVERS BLOCKING BAIL SCREW

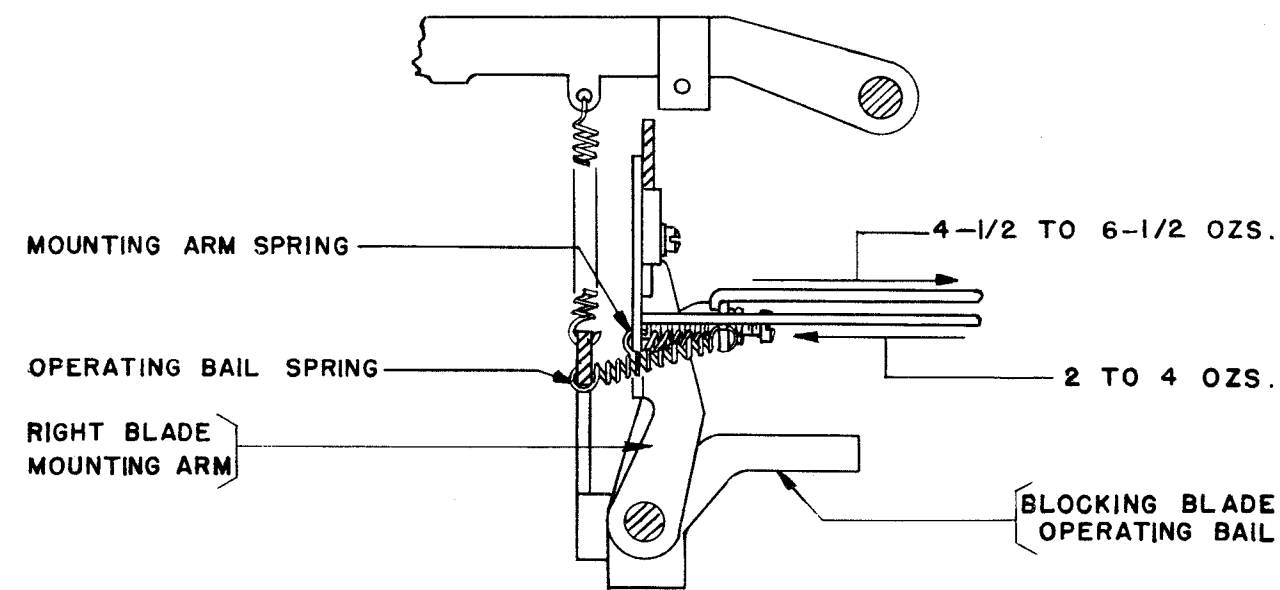


FIGURE 62
BLOCKING BAIL MOUNTING ARM AND OPERATING BAIL SPRINGS

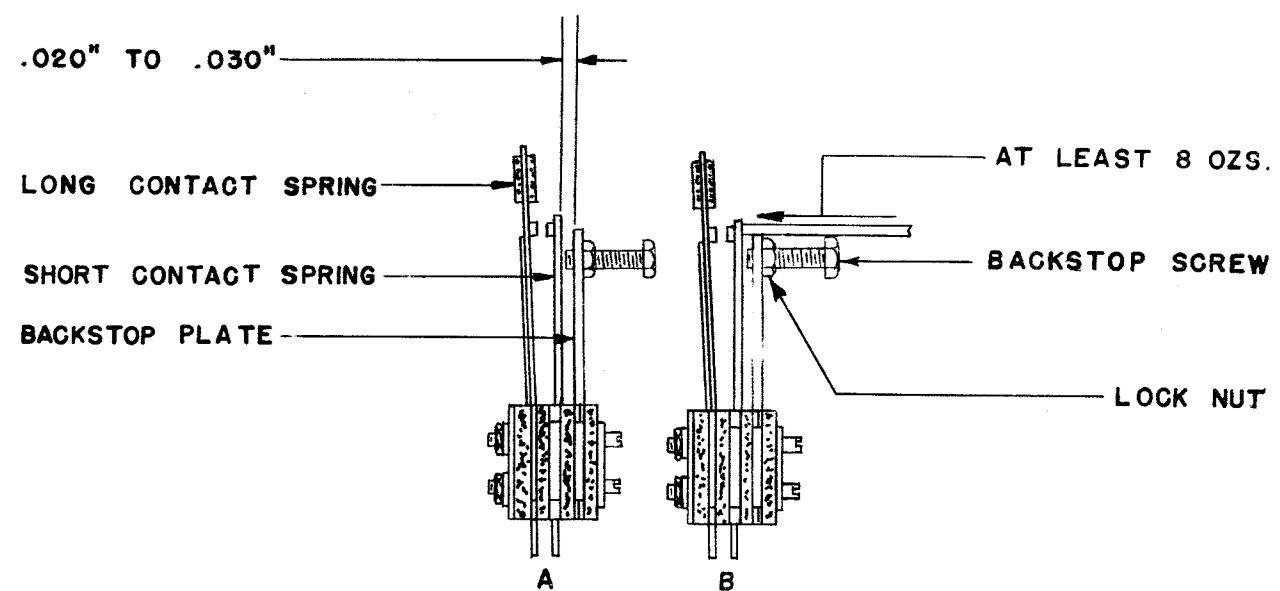


FIGURE 63
"H" DISTRIBUTOR SHORT CONTACT SPRING

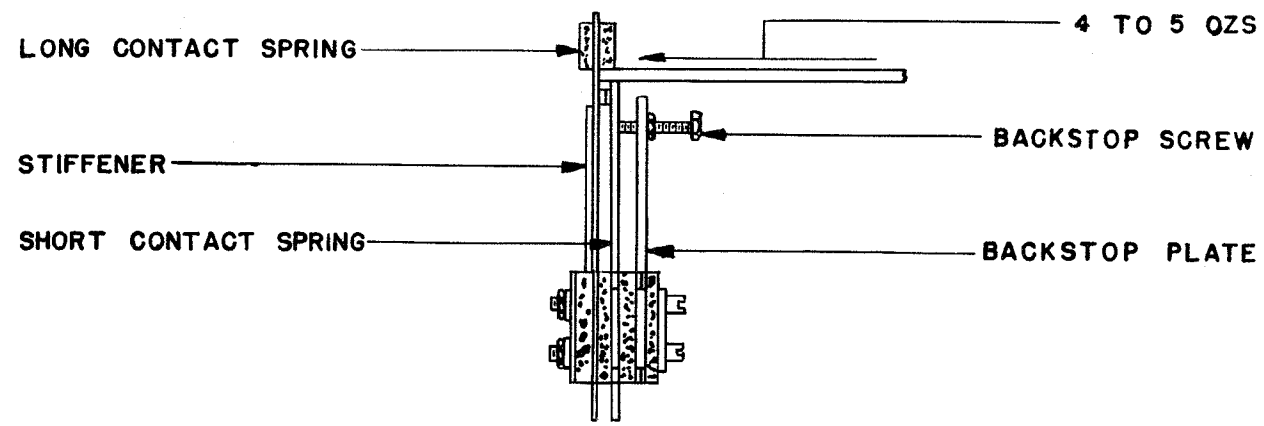


FIGURE 64

"H" DISTRIBUTOR LONG CONTACT SPRING

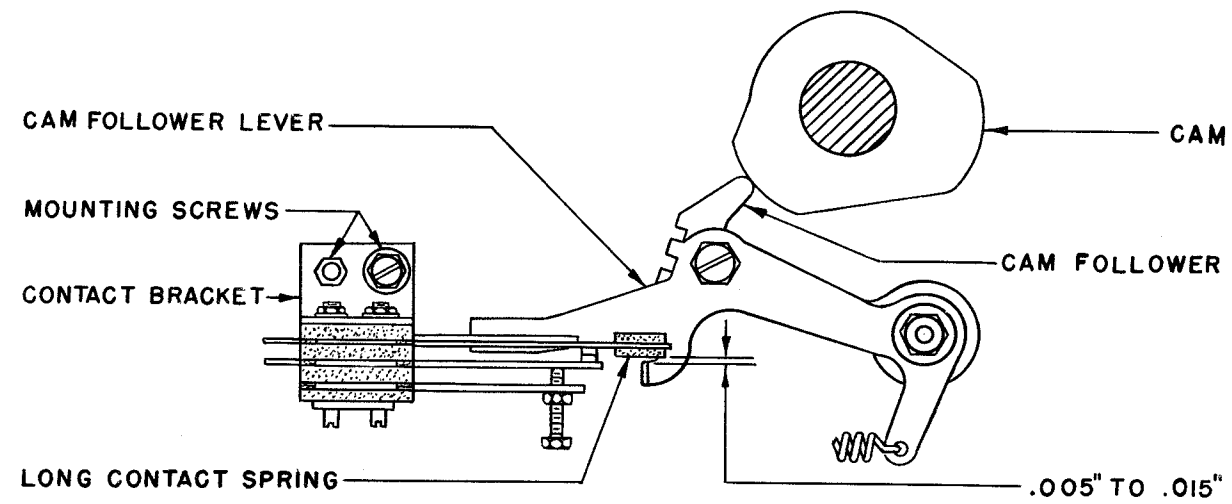


FIGURE 65

"H" DISTRIBUTOR CONTACT BRACKET

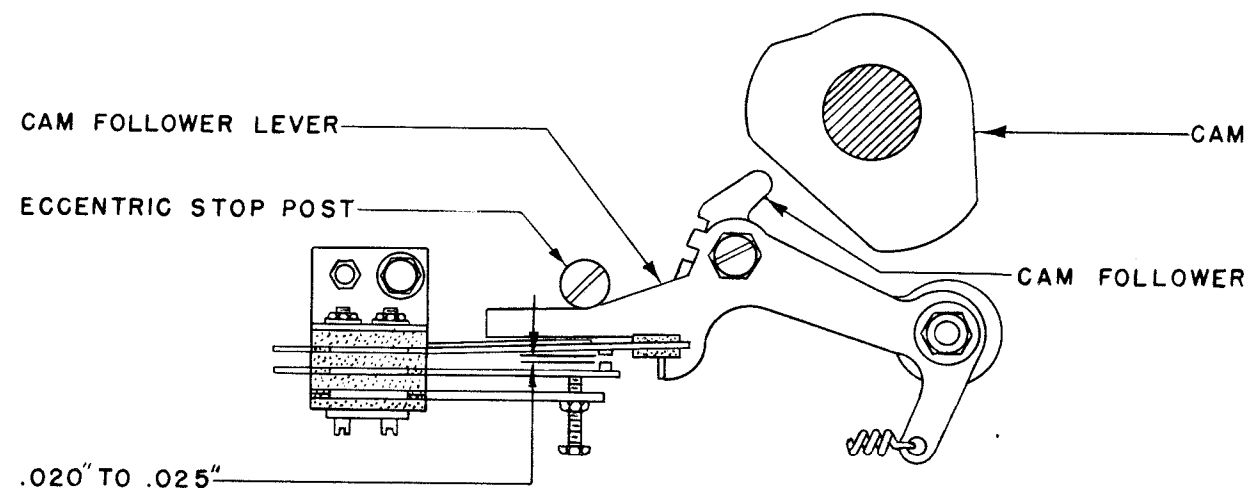


FIGURE 66

"H" DISTRIBUTOR CONTACT GAP

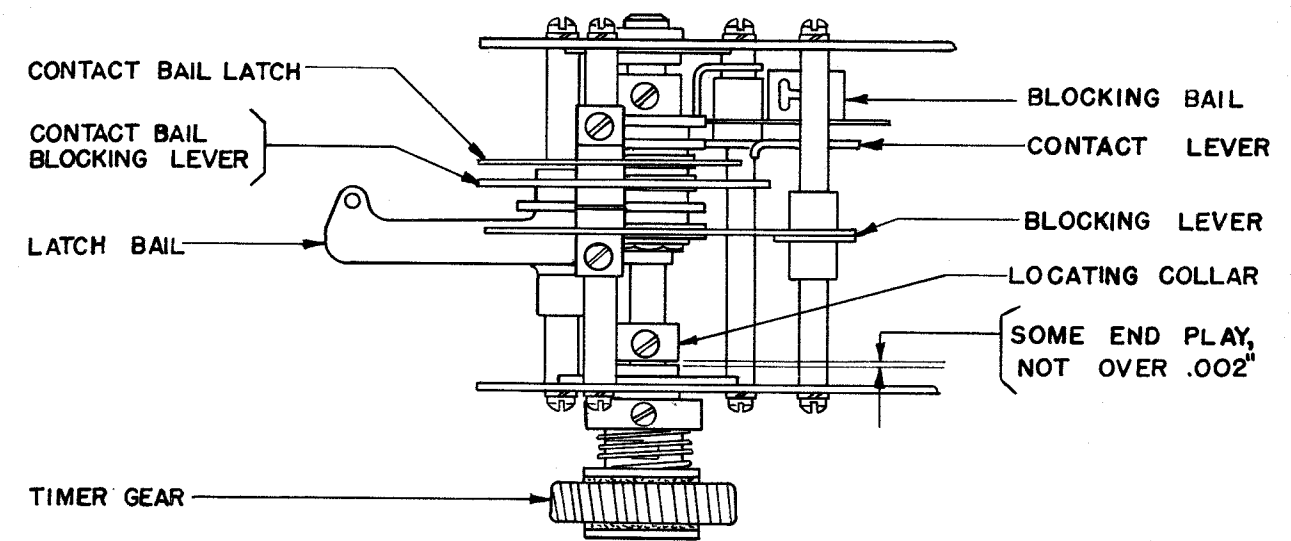


FIGURE 67

TIMER SHAFT AND CAM FOLLOWERS

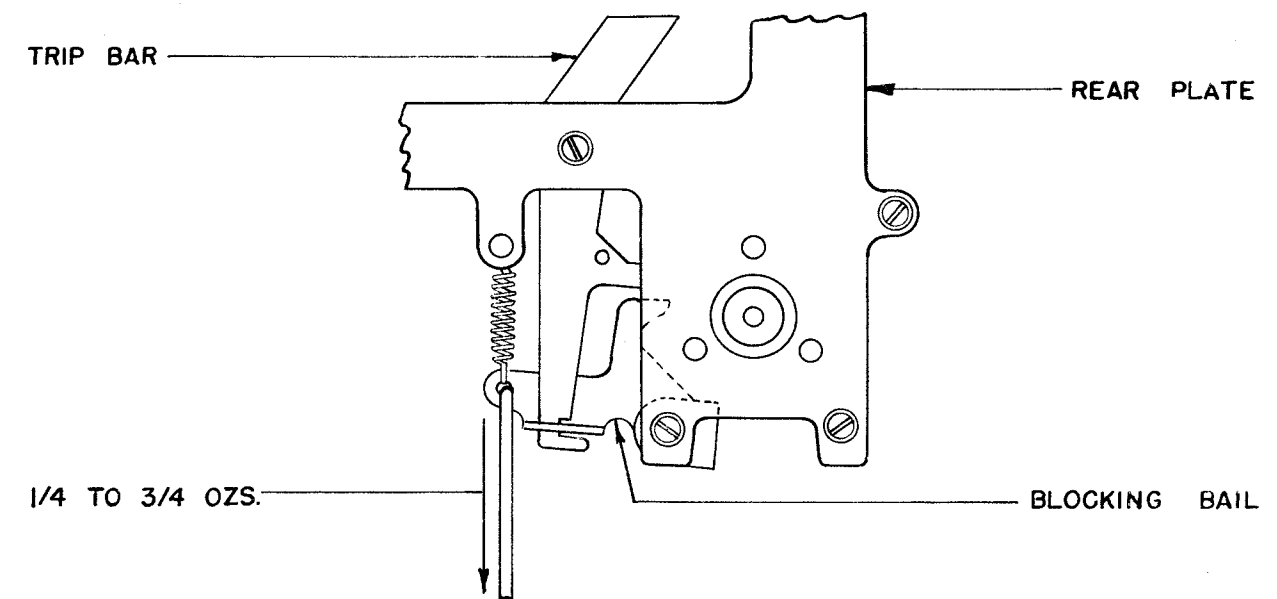


FIGURE 68

BLOCKING BAIL SPRING

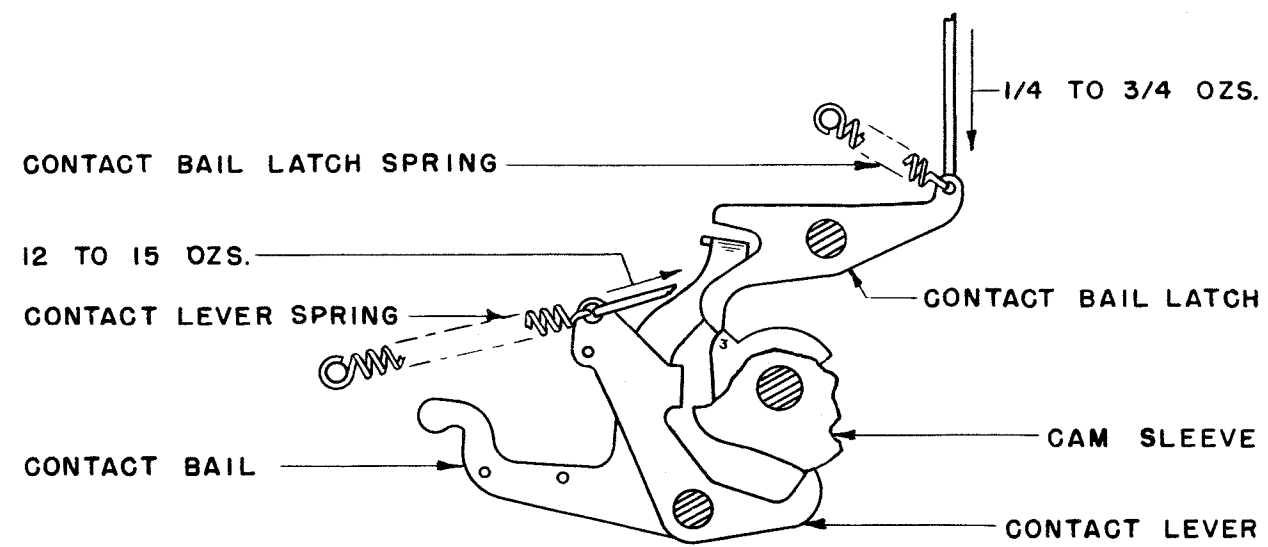


FIGURE 69
CONTACT LEVER AND CONTACT BAIL LATCH SPRING

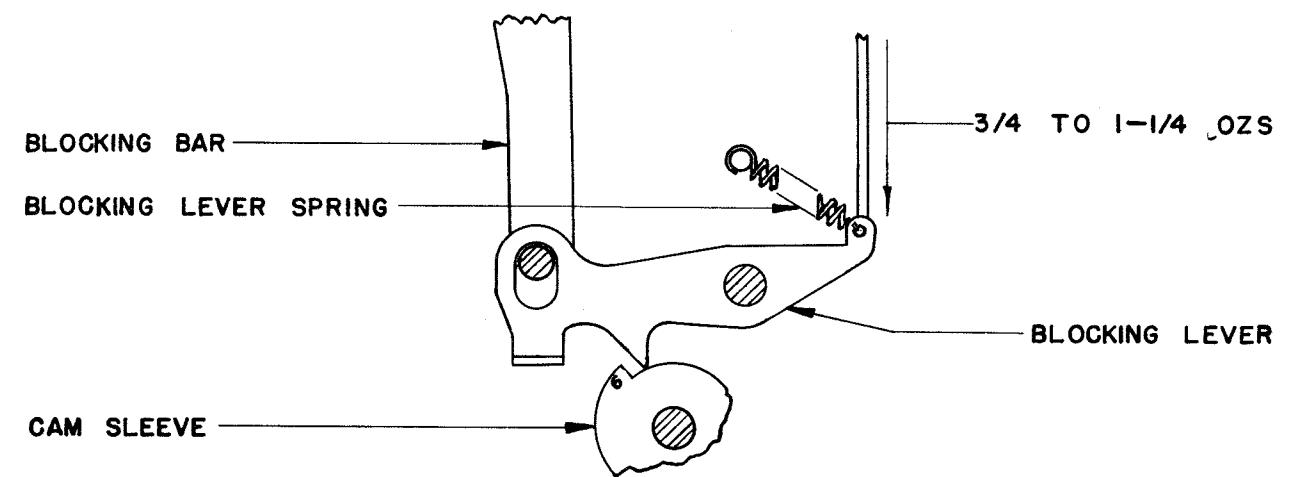


FIGURE 71
BLOCKING LEVER SPRING

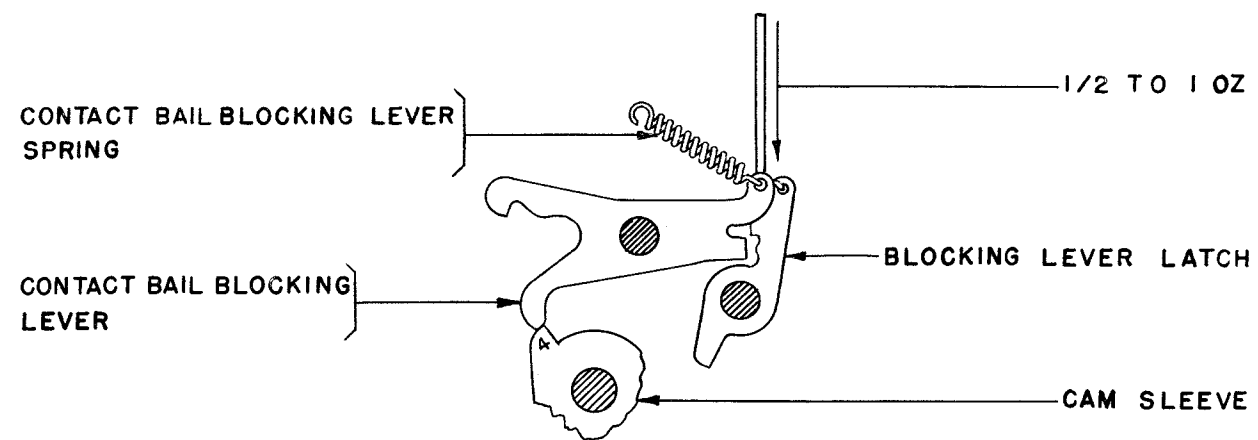


FIGURE 70
CONTACT BAIL BLOCKING LEVER SPRING

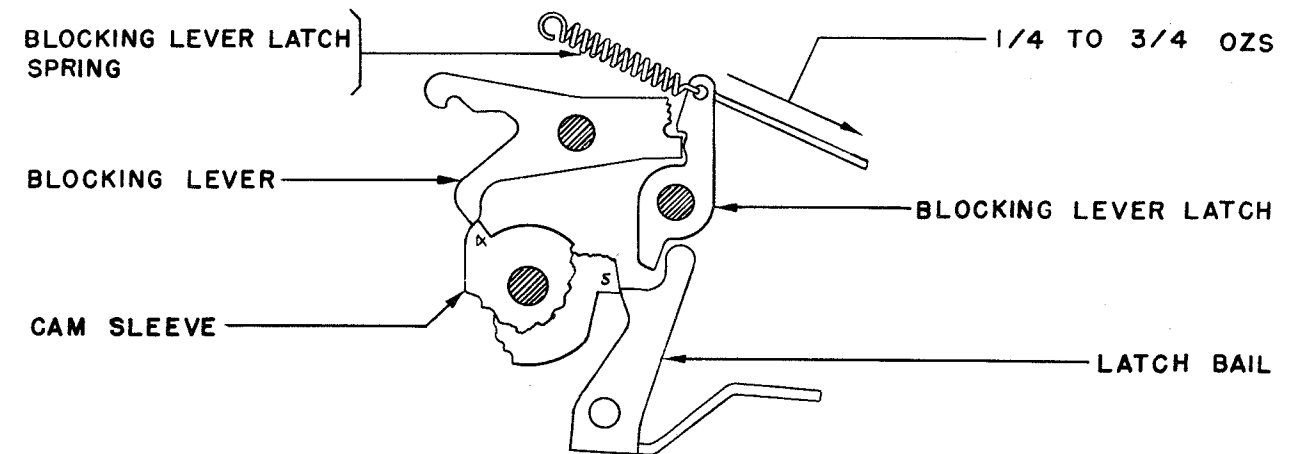


FIGURE 72
BLOCKING LEVER LATCH SPRING

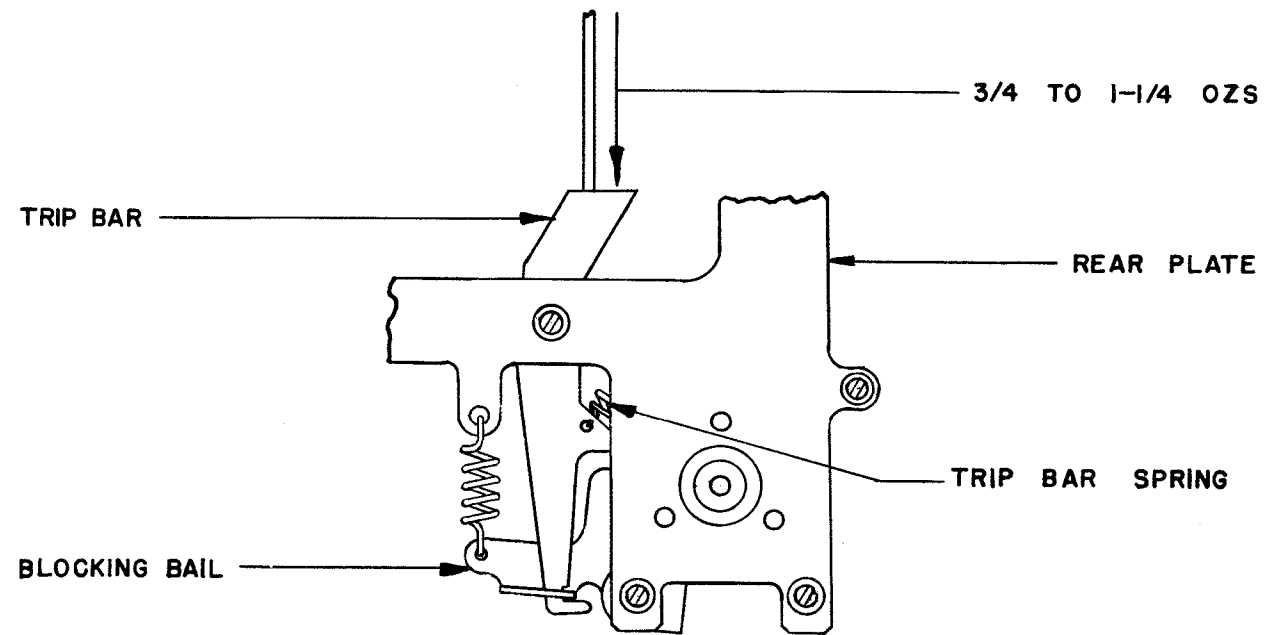


FIGURE 73
TRIP BAR SPRING

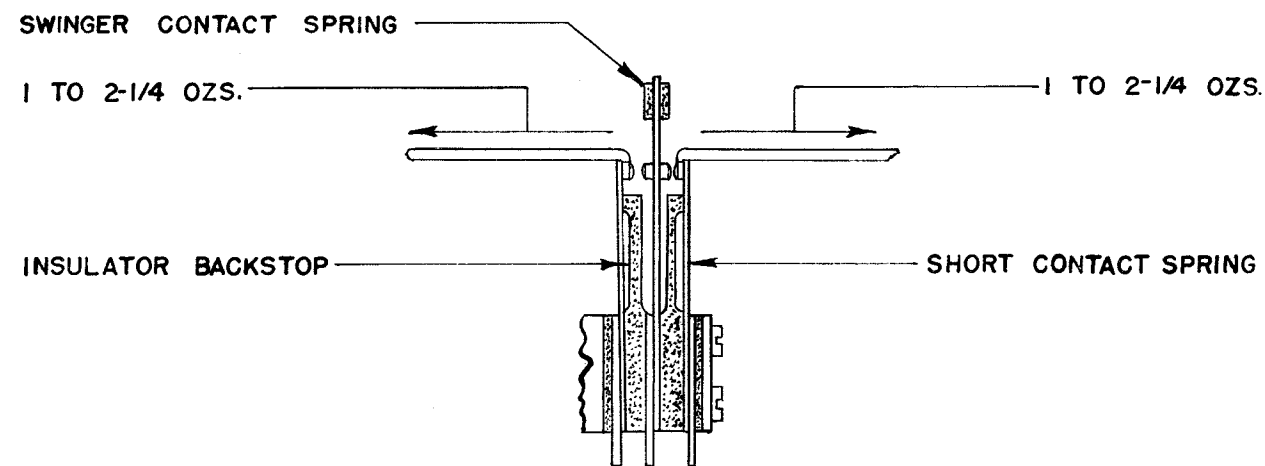


FIGURE 74
TIMER SHORT CONTACT SPRING

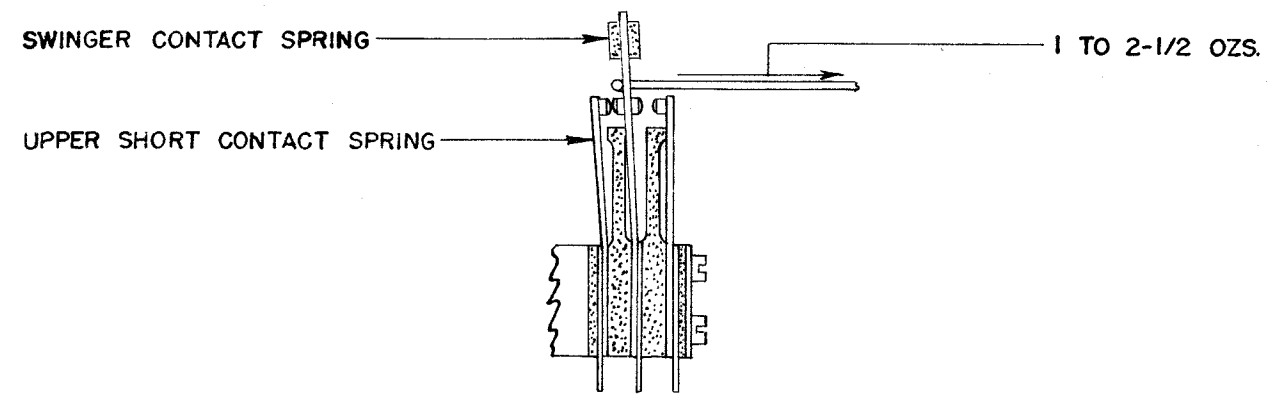


FIGURE 75
TIMER SWINGER CONTACT SPRING

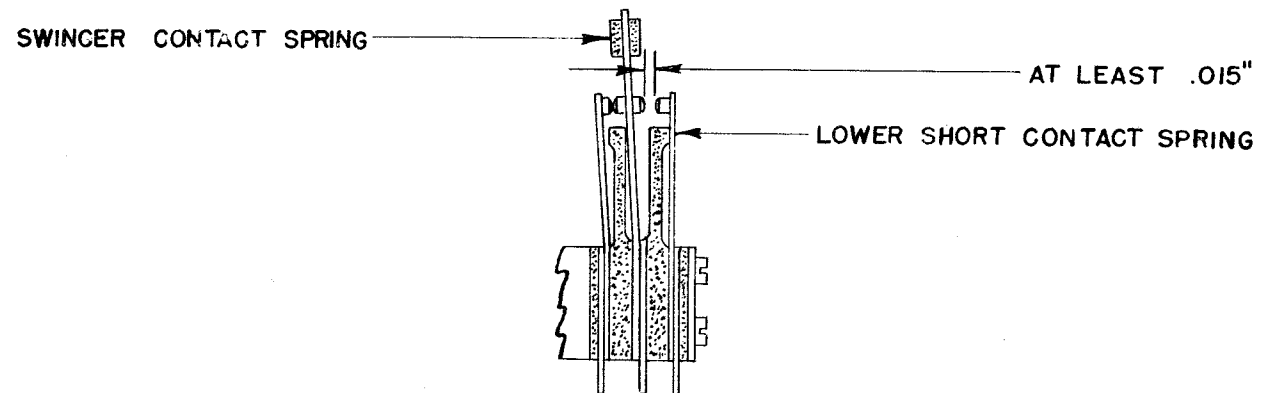


FIGURE 76
TIMER CONTACT GAP

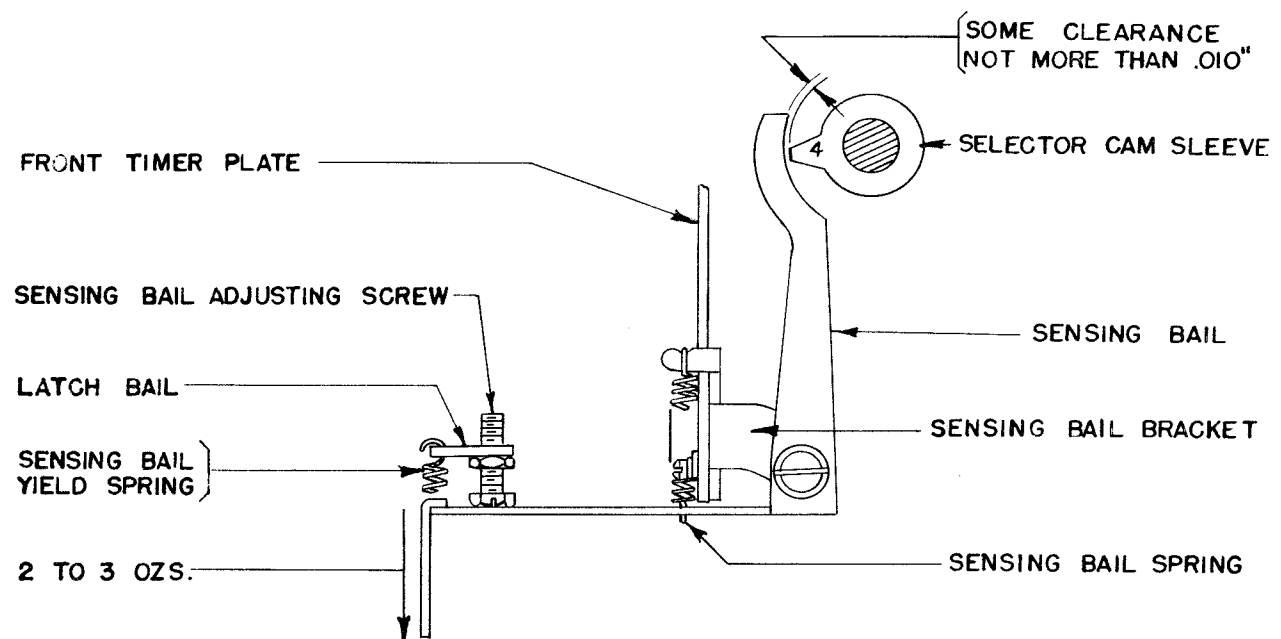


FIGURE 77
SENSING BAIL AND SPRING

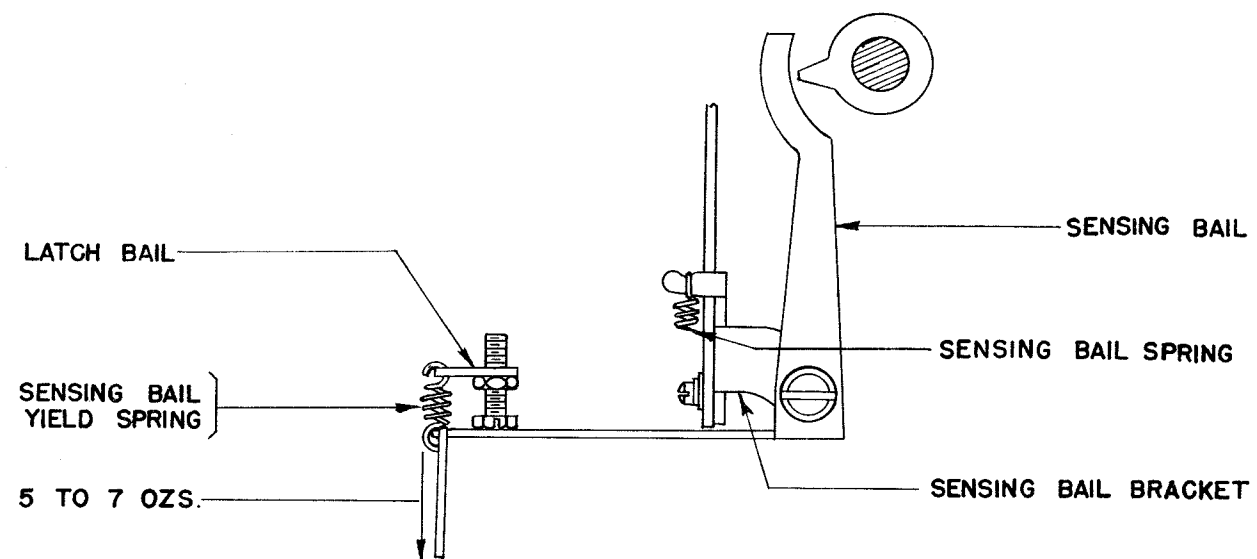


FIGURE 78
SENSING BAIL YIELD SPRING

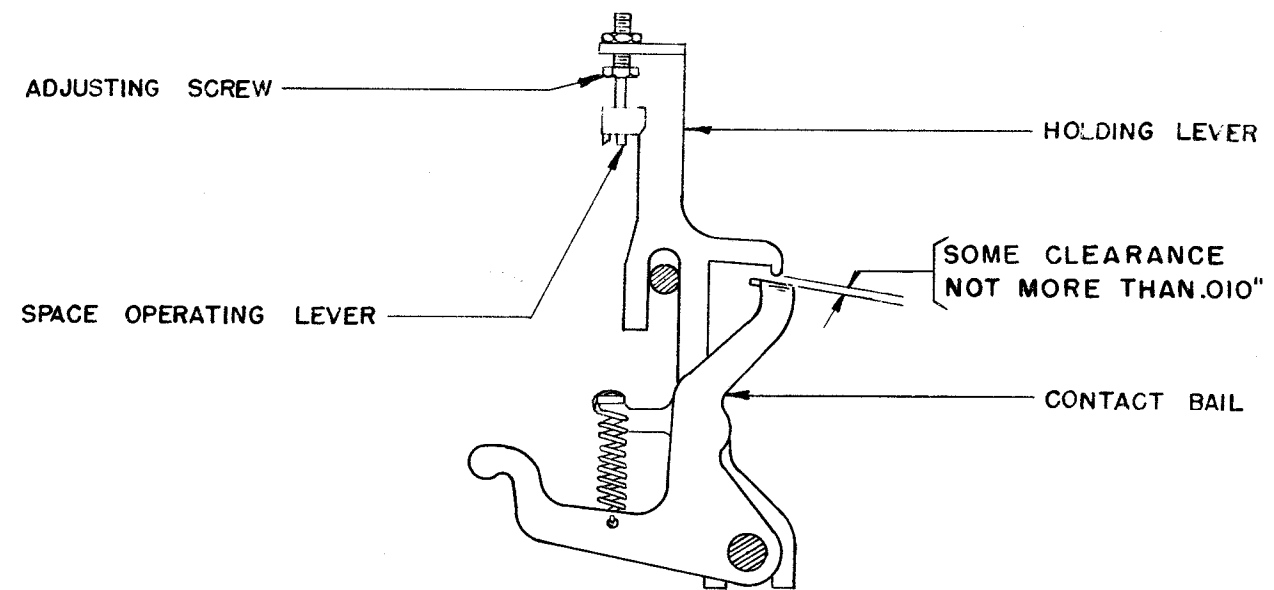


FIGURE 80
CONTACT HOLDING LEVER

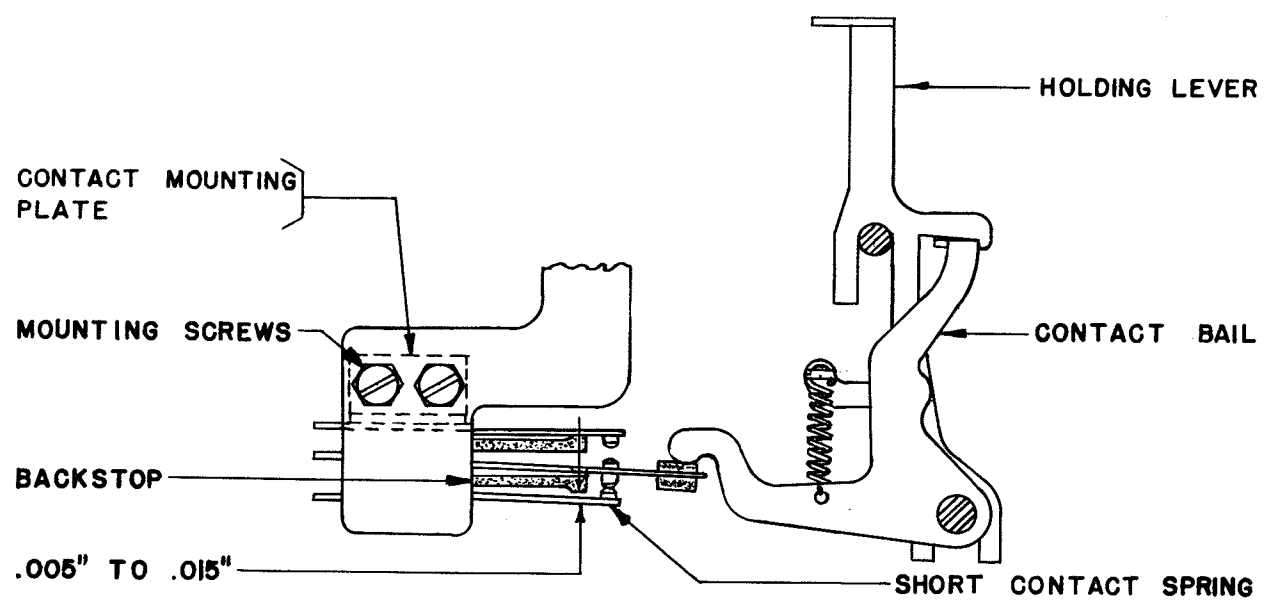


FIGURE 79
CONTACT MOUNTING PLATE

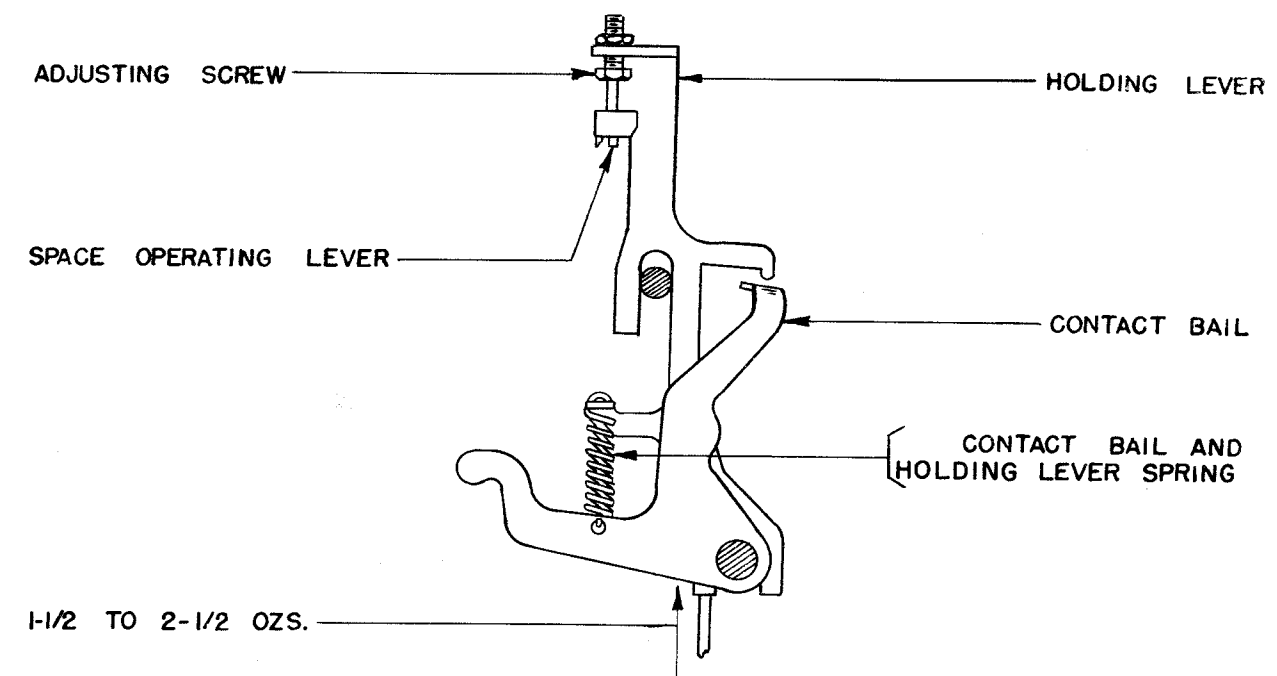


FIGURE 81
CONTACT BAIL AND HOLDING LEVER SPRING

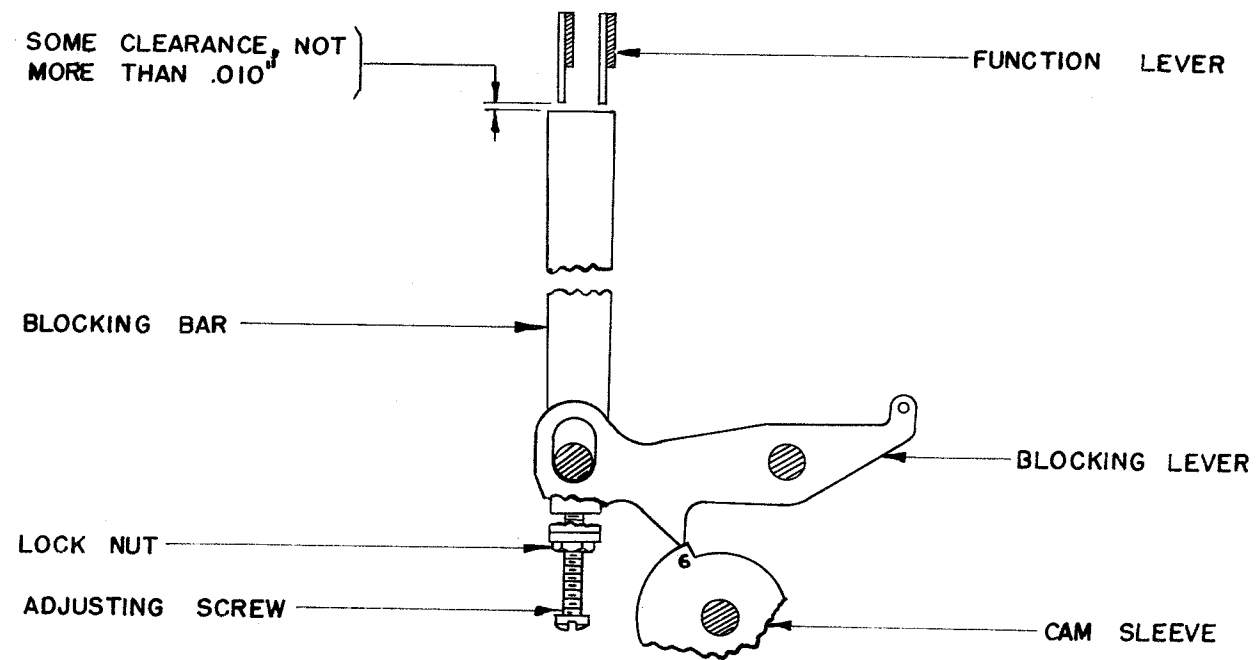


FIGURE 82
TIMER BLOCKING BAR

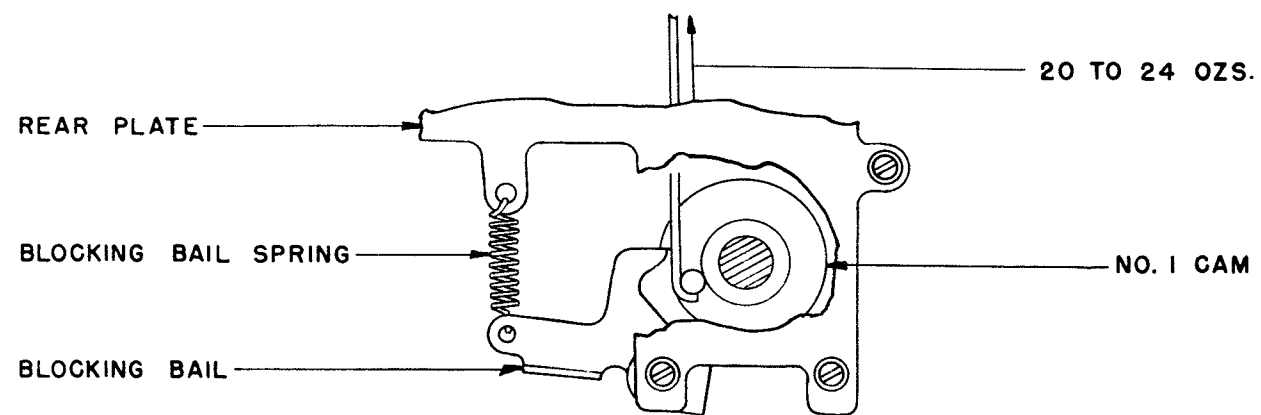


FIGURE 83
TIMER CLUTCH TORQUE

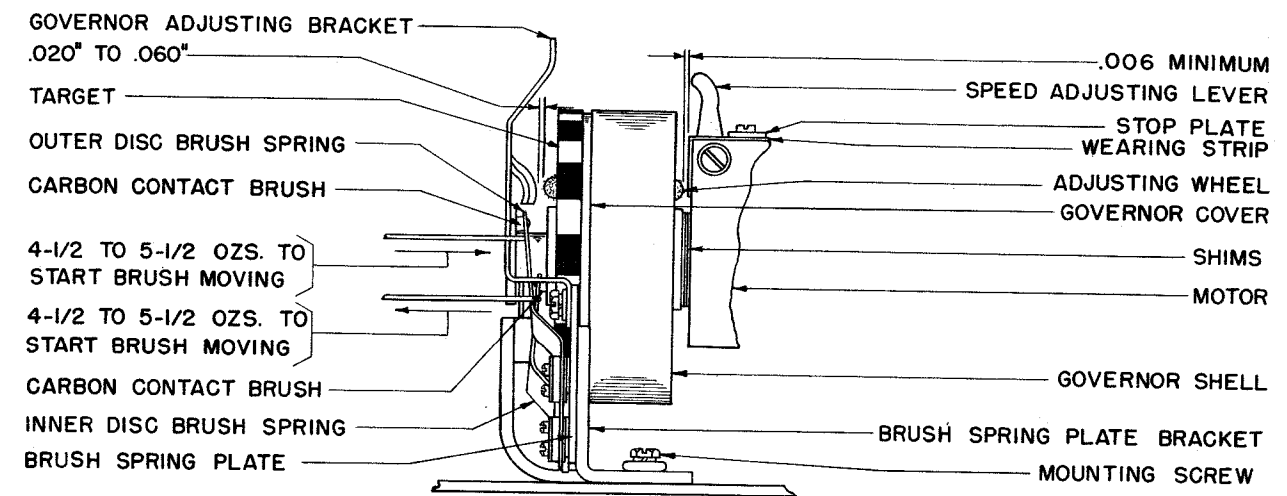


FIGURE 84
GOVERNOR-SIDE VIEW

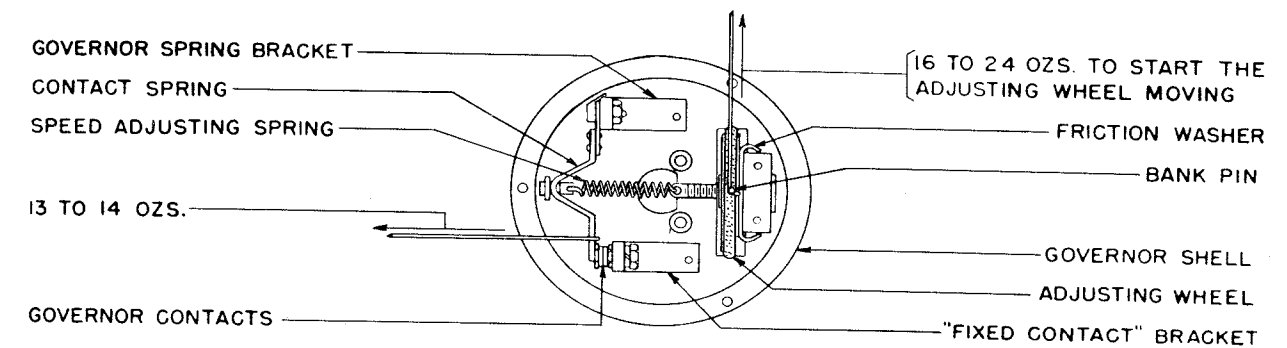


FIGURE 85
GOVERNOR SHELL

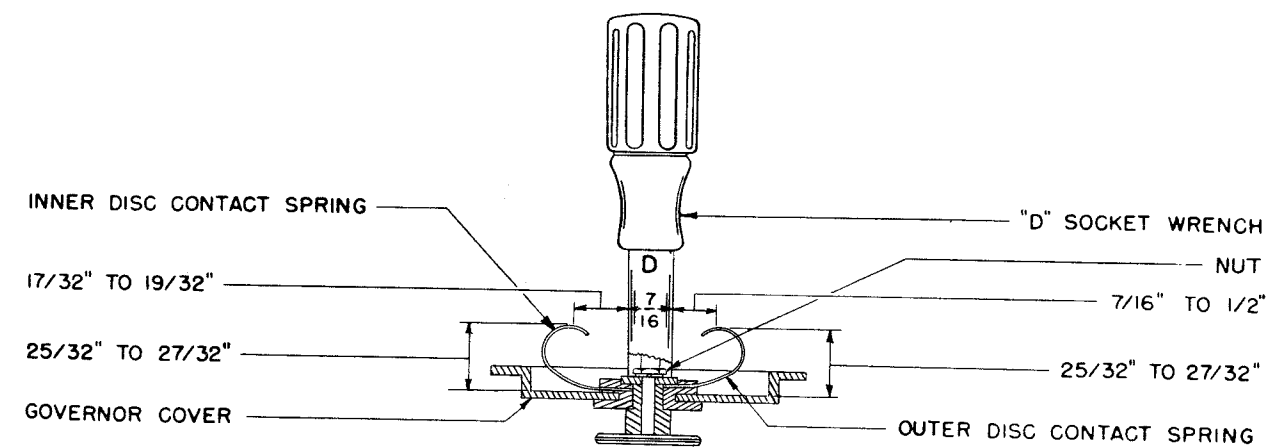


FIGURE 86
GOVERNOR COVER

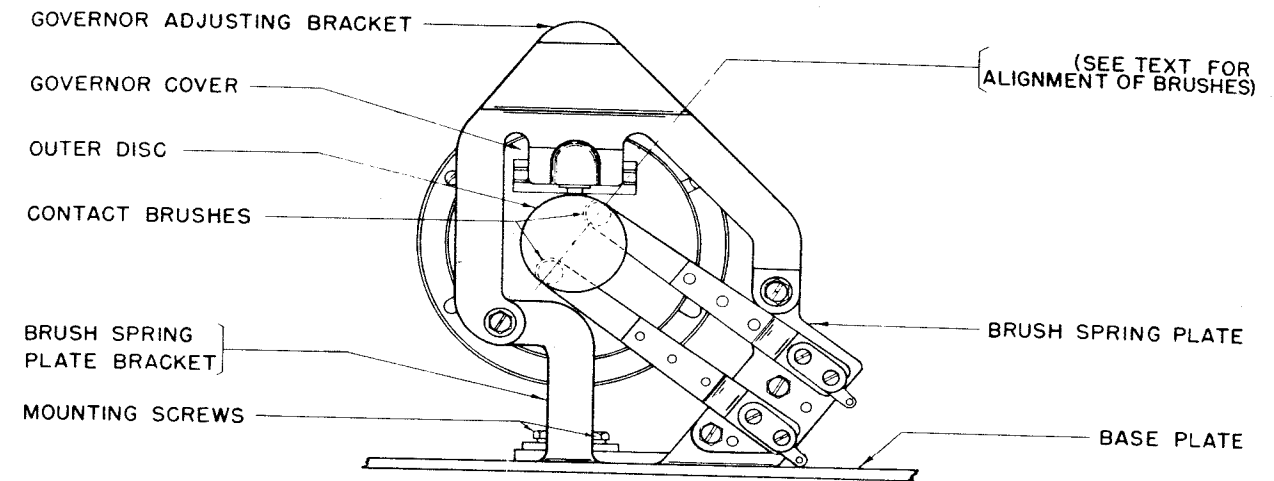


FIGURE 87
GOVERNOR - END VIEW

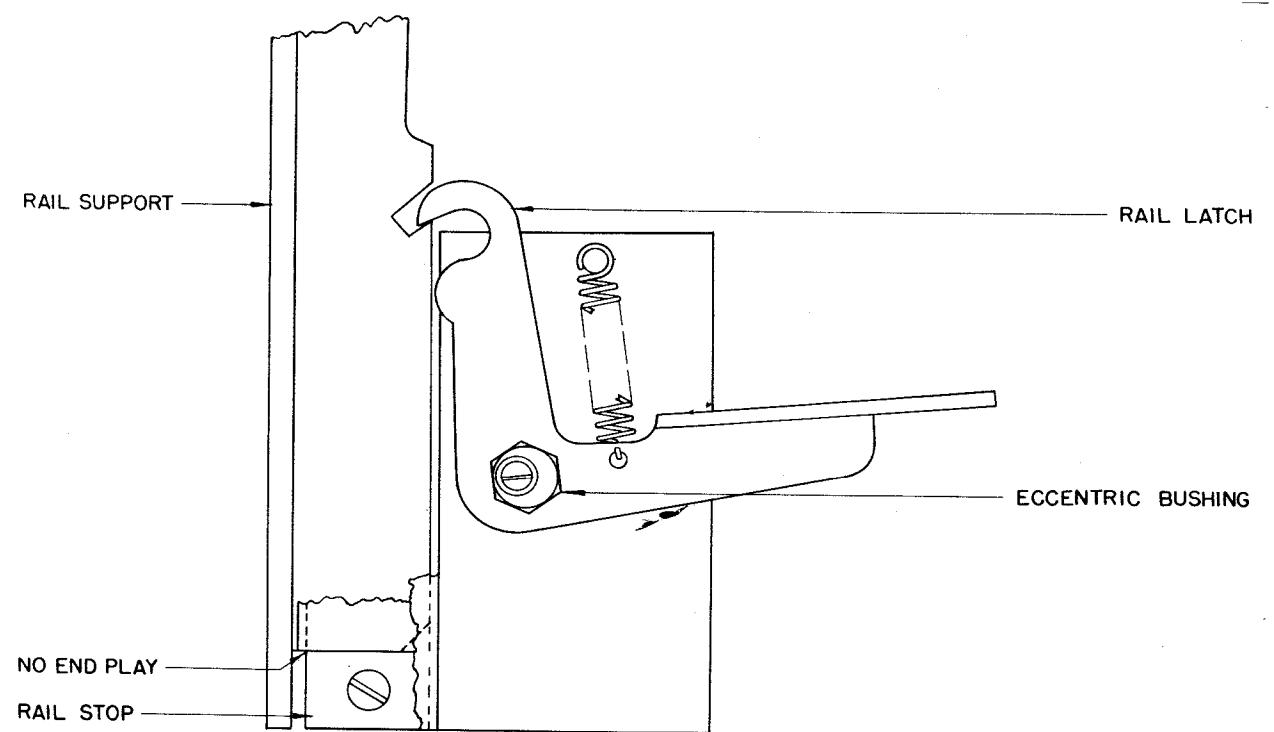


FIGURE 88
SELECTOR-PANEL LATCH

UPPER CASE		-	5	1	3	4	8	#	8	'	1	2	3	4	•	7	9	0	1	4	5	7	8	2	/	6	"	BLANK	C.R	L.F	SPACE	LTR	FIG	
LOWER CASE		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	BLANK	C.R	L.F	SPACE	LTR	FIG	
	1	●	●	●	●	●					●	●					●	●	●	●	●	●	●	●	●	●						●	●	
	2	●		●				●		●	●	●	●				●	●	●	●	●	●	●	●	●	●					●	●	●	
	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●
	5	●						●	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●	

FIGURE 89