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TELETYPE

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ADJUSTMENTS

TELETYPE AUTOMATIC WHEATSTONE

PERFORATOR SET

TELETYPE
CORPORATION
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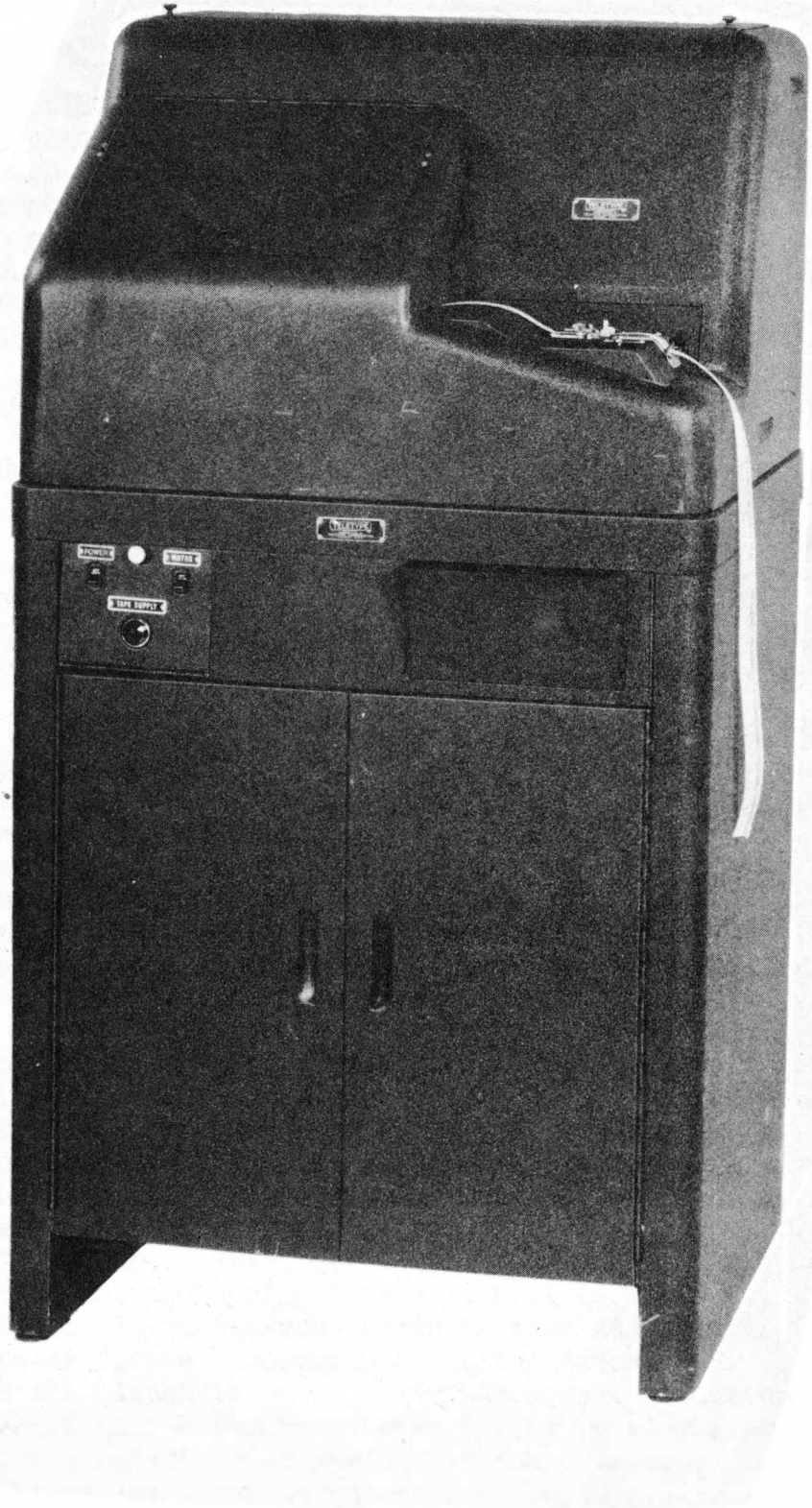
POWER
MOTOR
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C O N T E N T S

ADJUSTMENTS

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ADJUSTMENTS

GENERAL

This bulletin contains requirements and adjusting procedure for the maintenance of the TELETYPE AUTOMATIC WHEATSTONE PERFORATOR SET. Adjustments are arranged in a sequence that would be followed if a complete readjustment of the unit were undertaken. In following such a procedure, parts and assemblies which are removed to facilitate adjustments should not be replaced until all other adjustments are made which would be facilitated by the removal of these parts or assemblies. If one adjustment is changed, related adjustments should be checked, because a change in one adjustment may affect related adjustments. These facts should be kept in mind when a single adjustment is to be made.

The spring tension values given in this bulletin 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.

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

SPEED SETTING

When governed motors are used, a tuning fork 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 alternate black and white spots (Figure 38).

To check speed, the target should be well illumined. Tap the 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.

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

To adjust the motor speed proceed as follows: If the motor is running too slow, operate the speed adjusting lever (Figure 38), if the motor is running fast, operate the governor adjusting bracket (Figure 38).

Before adjusting it will be necessary to remove the main cover, the transmitter unit cover and the Wheatstone Perforator. To remove the transmitter unit cover, remove the two thumb screws and slide the cover toward the front of the unit so that it is disengaged from the lugs on the left end of the tape guide plate and lift the cover off the unit. To remove the perforator, proceed as follows: Remove the perforator plug and the plug on the tape-out signal contacts cord from the receptacles on the table. Hold the latch release lever (Figure 30) operated and slide the perforator toward the rear, being careful not to damage or distort the connecting links and lift the Wheatstone Perforator off the operating unit.

SELECTOR UNIT

Remove the selector unit from the frame in the following manner: Remove the three motor unit mounting screws and remove the motor unit. Remove the four selector unit base plate mounting screws and remove the Jones receptacle from the plug on the toggle switch mounting bracket. Then lift the right end of the selector unit and slowly pull toward the front of the table, so that the transfer bars of the selector unit will be disengaged from the code bar links.

SELECTOR SHAFT ALIGNMENT ADJUSTMENT (Figure 1)

With the clutch disengaged, the selector shaft should be free in its bearings. To adjust, loosen the rear bearing bracket mounting screws and position the bracket for lateral freeness. If a bind exists due to horizontal misalignment, place the proper number of shims between the rear bearing bracket and the selector base plate to correct the horizontal misalignment. Tighten the bearing bracket mounting screws and recheck the shaft for freeness.

SELECTOR SHAFT CLUTCH ADJUSTMENT (Figure 2)

With the selector shaft in the stop position and the clutch members fully disengaged, there should be .020" to .030" clearance between the high parts of the clutch members, when the play in the shaft is taken up toward the front of the unit. To adjust, loosen the front bearing lock nuts and position the front bearing. Tighten the lock nuts.

SELECTOR SHAFT END PLAY ADJUSTMENT (Figure 1)

With the clutch engaged, the shaft should have some end play, not more than .004". To adjust, loosen the set screws on the set collar next to the thrust bearing and position the set collar. Tighten the set screws.

SELECTOR SHAFT CLUTCH SPRING COMPRESSION (Figure 1)

With the clutch members engaged and the shaft rotated backward just enough to eliminate frictional contact between the clutch teeth, apply the push end of a 12 lb. scale to the lug on the driven clutch member and push in a direction as nearly parallel to the shaft as possible. It should require a pressure of 3 to 8-1/2 lbs. to just separate the clutch members.

SELECTOR SHAFT DETENT LEVER SPRING TENSION (Figure 3)

With the selector shaft in the stop position, hook a 64 oz. scale over the end of the detent lever at the spring hole and pull to the left in line with the spring. It should require a pull of 40 to 56 ozs. to start the detent moving away from its cam.

SELECTOR CLUTCH RESET BAIL ADJUSTMENT (Figure 4)

With the clutch reset bail roller on the peak of the reset bail cam there should be .010" to .020" clearance between the clutch throwout lever and the face of the driven clutch member. To adjust, position the clutch reset bail adjusting screw.

START MAGNET COIL ADJUSTMENT

With the armature held against the magnet cores, the surfaces of the magnet core ends and the armature, should meet squarely. Gauge by eye. To adjust, loosen the start magnet coil mounting screws and position the start magnet assembly. Tighten the mounting screws. See Figure 4 for location of parts.

NOTE: If a light background is held behind the magnet coils it will be easier to check the above adjustment.

LOAD RESISTOR CONTACT SPRING ADJUSTMENT (Figure 5)

(1) The lower (short) contact spring should be straight and at right angles to the contact bracket. To adjust, bend the short contact spring.

(2) With the magnet armature held against the magnet cores, there should be some clearance between bottom surface of the bakelite tip on the upper (long) contact spring and the top surface of the armature.

(3) With the magnet held operated, hook an 8 oz. scale over the upper (long) contact spring at the contact point and pull vertically upwards at right angles to separate the contact points. It should require 3 to 4 ozs. to separate the contact points. To adjust, bend the upper (long) contact spring.

LOAD RESISTOR CONTACT SPRING GAP ADJUSTMENT (Figure 4)

With the selector shaft in the stop position and the armature in its unoperated position, there should be .010" to .015" clearance between the contact points. To adjust, loosen the contact assembly bracket mounting screw and position the bracket. Tighten the mounting screws.

START MAGNET ARMATURE LATCH ADJUSTMENT

(1) With the clutch reset bail roller on the peak of its cam, there should be a clearance of .008" to .015" between the clutch throwout lever extension and the lower shoulder on the start magnet armature

latch extension when the play in the start magnet armature is taken up in a direction to make this clearance a minimum. To adjust, loosen the armature latch extension mounting screws and position the armature latch extension vertically. Tighten the top mounting screws so that the latch extension is held friction tight. See Figure 4.

(2) With the selector shaft in the stop position and the start magnet armature held against the pole faces of the start magnet, hold the latching edge of the clutch throwout lever extension opposite the latching edge of the start magnet armature latch extension. There should be a clearance of .030" to .050" between vertical side of the clutch throwout lever extension and the vertical edge of the upper shoulder on the start magnet armature latch extension. To adjust, position the magnet armature latch extension horizontally. See Figure 5. Tighten both mounting screws and recheck adjustment (1).

SELECTOR SHAFT CLUTCH THROWOUT LEVER SPRING TENSION (Figure 5)

With the selector shaft in the stop position, operate the start magnet armature so that the clutch throwout lever extension is unlatched. Hook the pull end of a 12 lb. scale on the end of the clutch throwout lever extension at the spring hole and pull to the left in line with the spring. It should require 3 to 4 lbs. to start the lever moving.

START MAGNET ARMATURE SPRING TENSION (Figure 4)

With the reset bail roller on the peak of its cam, and the bakelite insulator on the upper (long) load resistor contact held away from the start magnet armature, apply the push end of an 8 oz. scale to the center of the start magnet armature and push vertically downward. It should require 4 to 5-1/2 ozs. to start the armature moving.

TAPE GUIDE PLATE ADJUSTMENT (Figure 6)

Place a piece of perforated tape in the tape guide and engage the feed holes on the pins in the feed wheel. There should be equal clearance between the edges of the tape and shoulder on the tape guide. To adjust, loosen the tape guide mounting screws and position the guide. Tighten the mounting screws.

REMOVE THE FRONT TOP PLATE BEARING MOUNTING SCREWS AND BEARING. UNHOOK THE TOP PLATE SPRINGS AND RAISE THE TOP PLATE, BEING CAREFUL NOT TO DAMAGE THE CABLE CONNECTED TO THE CONTACT ASSEMBLIES ON THE TOP PLATE. See Figures 6 and 14 for location of parts.

FEED ROLL RELEASE LEVER DETENT SPRING ADJUSTMENT (Figure 7)
See Note (A)

With the feed roll release lever in its operated position, hook a 32 oz. scale in the detenting portion of the spring and pull in line with the feed roll release lever. It should require from 19 to 23 ozs. to start the detent spring moving. To adjust, position the spring.

Note (A) This adjustment should be checked with the top plate raised.

FEED ROLL RELEASE CONTACT SPRING ADJUSTMENT (Figure 8) See Note (A)

With the feed roll release lever in its unoperated position, hook an 8 oz. scale over the long contact spring at the point and pull at right angles to the contact spring. It should require 4 to 5 ozs. to just open the contacts. To adjust, bend the long contact spring.

FEED ROLL RELEASE LEVER CONTACT GAP ADJUSTMENT (Figure 8) See Note (A)

With the feed roll release lever in its operated position, there should be a clearance of .010" to .020" between the contact points. To adjust, bend the short contact spring.

FEED ROLL RELEASE LEVER CLEARANCE ADJUSTMENT (Figure 8) See Note (A)

With the feed roll release lever in its unoperated position, there should be some clearance, not more than .012" between the camming part of the feed roll release lever and the molded bakelite tip on the long contact spring. To adjust, bend the long contact spring at the molded bakelite tip. Recheck the release lever contact spring tension and contact gap adjustments.

TAPE FEED PAWL SPRING TENSION (Figure 9) See Note (A)

Rotate the motor until the feed pawl is in its uppermost position. Apply the push end of an 8 oz. scale to the feeding tip of the tape feed pawl and push horizontally toward the left. It should require 1 to 2 ozs. to hold the feed pawl in a vertical position. To adjust, loosen the feed pawl mounting screw and position the feed pawl spring. Tighten the mounting screw.

FEED WHEEL DETENT LEVER SPRING TENSION (Figure 10) See Note (A)

With the feed roll release lever in its unoperated position, make sure that the feed wheel detent roller is resting in the hollow between two teeth on the feed wheel ratchet. Hook a 32 oz. scale over the end of the detent lever and pull horizontally against the tension of the spring.

(A) When the detent lever shown in Figure 10A is used, it should require 15 to 18 ozs. to start the detent lever moving.

(B) When the detent lever shown in Figure 10B is used, it should require 12 to 15 ozs. to start the detent lever moving.

END-OF-TAPE STOP CONTACT PIN GUIDE ADJUSTMENT See Note (A)

The end-of-tape stop contact pin should be centrally located in the contact pin clearance hole of the tape retainer lid. Gauge by eye. To adjust, loosen the stop pin guide mounting screws and position the guide. Locate the feed wheel shaft bearings so that the feed wheel shaft is free with not over .002" end play (gauge by feel) before tightening the mounting screws. See Figure 11 for location of parts.

Note (A) This adjustment should be checked with the top plate raised.

END-OF-TAPE STOP CONTACT SPRING ADJUSTMENT (Figure 11) See Note (A)

(1) Place a straightedge across the top of the tape guide plate, directly over the end-of-tape stop pin. There should be .020" to .025" clearance between the bottom of the straightedge and the upper end of the stop pin. To adjust, bend the upper contact spring.

(2) When the lower contact spring is resting against its stiffener, the contact points should be separated by .008" to .012". To adjust, bend the lower contact spring stiffener.

(3) Place a piece of tape in the guide and close the retaining lid. It should require a pressure of 20 to 25 grams (applied at the contact point of the lower contact spring) to just open the contact points. To adjust, bend the lower contact spring. Remove the tape and re-check adjustment (2).

TAPE RETAINING LID LATCH WEARING STRIP SHIMS ADJUSTMENT

With a .003" thickness gauge placed between the retaining lid and the front guide rail on the tape guide plate, the latch should not close freely. With the thickness gauge removed and the retaining lid held against the front guide rail on the tape guide plate, the latch should operate freely under its own spring tension. To adjust, increase or decrease the number of shims installed between the latch wearing strip and the top plate. See Figure 12 for location of parts.

LOWER THE TRANSMITTER TOP PLATE. WHEN DOING THIS, HOLD THE FEED PAWL UP SO THAT IT ENGAGES THE FEED WHEEL RATCHET AND ALSO ENGAGES THE GUIDE LUG (ON THE TOP PLATE) ON THE GUIDE NUT AND REPLACE THE TOP PLATE SPRINGS. REPLACE THE FRONT BEARING AND ITS MOUNTING SCREWS AND TIGHTEN THE MOUNTING SCREWS.

NOTE: There should be at least .020" clearance between the sides of the feed pawl spring and the tape contact lever guide when the feed pawl is in its uppermost position. If this clearance does not exist, refine the TAPE FEED PAWL SPRING TENSION ADJUSTMENT within its specified limits to obtain this clearance.

RETAINING LID LATCH SPRING TENSION (Figure 12)

With the slope on the lid latch resting against the top plate (not latched), hook an 8 oz. scale over the upper end of the latch and pull at right angles to the formed upper end of the latch. It should require 1-1/2 to 7 ozs. to start the latch moving on its pivots.

TAPE SPACE ADJUSTMENT (Figure 13)

The clearance between the tape guide and the retaining lid plate should be .011" to .014" throughout the area of the retaining lid plate when the retaining lid is latched closed and the play taken up in a direction to make this clearance a minimum. To adjust, increase or decrease the number of shims installed between the retaining lid and the retaining lid plate.

Note (A) This adjustment should be checked with the top plate raised.

TOP PLATE ADJUSTMENT (Figure 13)

Rotate the selector shaft so that the selector lever bail rotates the selector levers clockwise against their stop (selector levers down), the tape pins should be flush with or slightly below the upper surface of the tape guide. To adjust, loosen the two top plate adjusting screw lock nuts and position the adjusting screws. Tighten the lock nuts.

TOP PLATE UPSTOP SCREW ADJUSTMENT (Figure 14)

There should be .010" to .020" clearance between the top plate upstop screw and the frame casting. To adjust, loosen the top plate upstop screw lock nut and position the upstop screw. Tighten the lock nut.

TOP PLATE SPRING TENSION (Figure 14)

Hook a 32 oz. scale under the right-hand edge of the top plate and pull vertically upward. It should require 14 to 26 ozs. to start the top plate moving upward.

FEED WHEEL DETENT ADJUSTMENT (Figure 6)

Obtain a piece of tape with a series of LETTERS perforations. Either regular or chadless tape may be used. Check the tape to determine if the spacing of the perforations meets the requirement of ten holes to the inch. (If chadless tape is used, fold the lids of one set of perforations backwards so that the lids do not obstruct the holes). Engage the feed hole perforations with the feed wheel so that the unobstructed holes are directly over the tape pins. Trip the selector shaft clutch and rotate the shaft until the tape pins are flush with the bottom of the tape. With the detent roller resting in an indent between two teeth of the feed wheel ratchet and the play of the tape on the feed wheel taken up to the left, the tape pin farthest to the right should just clear the right edge of its associated code hole. To adjust, loosen the detent bracket mounting screws and position the detent bracket (hold the feed pawl away from the feed ratchet when making this adjustment). Tighten the mounting screws.

NOTE: Recheck the FEED ROLL RELEASE LEVER DETENT SPRING TENSION.

TOP PLATE GUIDE NUT ADJUSTMENT (Figure 6)

Place a piece of tape perforated with the LETTERS combination in the tape guide. Engage the feed holes on the pins of the feed wheel and rotate the selector shaft until the sensing pins are fully raised. The tape pins should be located centrally (from front to rear) with respect to the holes in the tape. To adjust, loosen the top plate guide nut lock nut and position the top plate. Tighten the lock nut.

RETAINING LID PLATE ADJUSTMENT

Place a piece of tape (either chadless or regular) perforated with the LETTERS combination in the tape guide and engage the feed holes with the pins on the feed wheel and close the tape retaining lid. The edges of the plate should be parallel with the shoulders on the tape guide and when the

selector shaft is rotated until the tape pins raise the lids, (when chadless tape is used) the lid plate should not interfere. When regular perforated tape is used, the lid plate should be positioned so that it is parallel to the shoulders on the tape guide and the openings in the plate should be centrally located with respect to the tape pins when the pins are in their uppermost position. To adjust, loosen the retaining lid mounting screws and position the plate. See Figures 12 and 13 for location of parts.

GUIDE RAILS ADJUSTMENT

(1) The transfer T levers should line up with the transfer bars and they should be free in the transfer bar guide. To adjust, loosen the guide rail and selecting assembly mounting screws and the mounting screws of the eccentric washer (which serves as the left hand stop for the selector assembly). Position the selecting assembly to meet the foregoing requirements.

(2) (Preliminary) Position the assembly so that when all tape selector lever pins are fully raised and the tape bail transfer roller is on the peak of its cam, the center of the vertical leg of the T levers is approximately in line with the center of the hole in the transfer bar guide. Tighten the assembly mounting screws. Place the guide rails tightly against the base plate of the selecting assembly and tighten the screws. Move the eccentric washer against the left edge of the base plate and tighten its mounting screw. See Figures 14 and 18 for location of parts.

SELECTOR LEVER BAIL ADJUSTING SCREW ADJUSTMENT (Figure 15)

NOTE: In order to check this adjustment, it will be necessary to remake it.

With the selector shaft in its stop position, loosen the lock nut and turn the selector lever bail adjusting screw in or out, until the selector levers are just touching their stops. Then loosen the adjusting screw one-half turn and tighten the lock nut. Recheck the top plate adjustment and check to see that there is some clearance between the bail and the selector levers, when the bail roller is on the low part of its cam. If there is no clearance, refine the top plate adjustment.

TRANSFER BAIL ECCENTRIC SHAFT ADJUSTMENT

Insert a piece of tape (perforated with alternate R and Y combinations) in the tape guide and engage the feed holes in the tape on the feed wheel and close the retaining lid. Rotate the selector shaft slowly until the transfer T levers engage the selector levers. Under this condition, the amount of bite of the selector levers on the transfer T levers, should be the same, within .010", for selector levers in both right and left positions. See Figure 18. Check this adjustment with both R and Y combinations selected. To adjust, loosen the lock nut of the transfer bail eccentric shaft (Figure 14) and position the shaft. Tighten the lock nut.

TRANSFER BAIL SPRING TENSION (Figure 14)

With the selector shaft in the stop position, apply the push end of a 12 lb. scale to the transfer bail directly over the bail roller screw and push vertically downward. It should require 3 to 5 lbs. to start the bail roller moving away from its cam.

TRANSFER BAIL YIELD SPRING TENSION (Figure 16)

With the selector shaft in the stop position, hold the transfer bail in the downward position and apply the push end of a 12 lb. scale to the end of the transfer bail directly over the transfer bail roller screw and push vertically downward. It should require not less than 10-1/2 lbs. to start the transfer bail roller arm moving away from the transfer bail adjusting screw.

SELECTOR LEVER BAIL SPRING TENSION (Figure 17)

Rotate the selector shaft so that the selector lever bail roller is on the low part of its cam. With the sensing pins held down, hook a 32 oz. scale under the bail at the spring hole and pull in line with the spring. It should require 20 to 28 ozs. to start the bail moving.

SELECTOR LEVER BAIL YIELD SPRING TENSION (Figure 17)

Rotate the selector shaft so that the selector lever bail roller is on the low part of its cam. Unhook the selector lever bail spring. Hook a 12 lb. scale over the upright projection on the left end of the bail and pull horizontally to the right. It should require 7-1/2 to 9-1/2 lbs. to start the bail moving. Replace the selector lever bail spring.

TAPE FEED BAIL ADJUSTING SCREW ADJUSTMENT (Figure 10)

With the selector shaft in the stop position, there should be some clearance, not more than .006" between the face of the feed pawl and the face of the first tooth below the horizontal center line of the feed wheel ratchet. To adjust, loosen the tape feed bail adjusting screw lock nut and position the adjusting screw. Tighten the lock nut.

TAPE FEED BAIL SPRING TENSION (Figure 9)

With the selector shaft in the stop position, apply the push end of a 12 lb. scale to the head of the tape feed bail adjusting screw and push vertically downward. It should require 3 to 4 lbs. to start the bail moving.

SELECTOR LEVER SPRING TENSION (Figure 17)

Rotate the selector shaft until the selector lever bail roller and the transfer bail roller are on the low part of their respective cams. Hold the selector lever bail down until the yield spring is fully compressed. Hook an 8 oz. scale under the left end of each selector lever and pull vertically upward. It should require 1-3/4 to 2-1/2 ozs. to start each selector lever moving.

TIGHT-TAPE STOP MECHANISM ADJUSTMENT (Figure 19)

(1) With the tight-tape stop rod rotated so that the contact operating post does not rest against the contact spring, there should be .015" to .025" clearance between the inner contact spring insulator and the bracket. There should also be a clearance of .015" to .025" between the contact points on the contact springs. To adjust, bend the contact springs.

(2) With the tight-tape stop lever in the operated position, the lever should be horizontal and should be positioned so as not to strike the cover. To adjust, loosen the contact operating post and position the collar. Tighten the contact operating post.

(3) When the tight-tape stop lever is horizontal, the spring post on the left collar should be approximately 45 degrees below horizontal and toward the front of the selector assembly. To adjust, position the collar on the tight-tape lever, using care to provide some end play.

(4) With the tight-tape stop lever in the operated position (horizontal), hook an 8 ounce scale over the front contact at the contact point and pull at right angles to the contact. It should require from 1-1/2 to 2-1/2 ounces to just separate the contact points.

OPERATING UNIT

OPERATING SHAFT CLUTCH THROWOUT LEVER BRACKET ADJUSTMENT (Figure 20)

With the operating shaft in the stop position and the clutch members fully disengaged, there should be .020" to .030" clearance between the high parts of the clutch members, when the play between the clutch members is taken up in a direction to make the clearance a minimum. To adjust, loosen the nut on the eccentric stop which locates the bracket, loosen the two bracket mounting screws and position the bracket. Hold the bracket against the shoulder on the frame casting and tighten the mounting screws. Position the eccentric stop so that it rests against the frame casting and tighten its mounting nut.

OPERATING SHAFT CLUTCH SPRING COMPRESSION

With the clutch members engaged and the shaft rotated backward just enough to eliminate frictional contact between the clutch teeth, apply the push end of a 12 lb. scale to the lug on the driven clutch member and push in a direction as nearly parallel to the shaft as possible. It should require a pressure of 3 to 8-1/2 lbs. to just separate the clutch members. See Figure 1 for method used.

CODE LEVER BAIL THRUST PLATES ADJUSTMENT (Figure 21)

The following adjustment is made at the factory and should not require readjustment unless the code lever bail assembly has been dismantled or damaged.

With the operating shaft in the stop position, the lower end of the two code lever bail thrust plates should rest on the top surface of the code lever bail arms. To adjust, loosen the mounting screws and position the thrust plates. Tighten the mounting screws.

CODE BAR RIGHT GUIDE PRELIMINARY ADJUSTMENT

NOTE: For units on which the code bar right guide has elongated mounting holes.

The prongs on the code levers in positions Nos. 1, 21, and 45 should have a full bite on the corresponding prongs on the code bars, when the code bars are moved fully to the MARKING and SPACING positions and also that the code bars are free in the guides. To adjust, loosen the right guide mounting screws and position the guide. Tighten the mounting screws. See Figure 21 for location of parts.

CODE BAR GUIDES SHIMS ADJUSTMENT (Figure 21)

With the operating shaft in its stop position, there should be .025" to .045" clearance between the top of the projections of the front code bar and the corresponding top of the front projections on the code levers, when the code bar is in either the MARKING or SPACING position. To adjust, add or remove the shims under the right and left code bar guides.

NOTE: Recheck the Code Bar Right Guide Preliminary Adjustment.

CODE BAR CENTER SUPPORT ADJUSTMENT (Figure 22)

With the operating shaft in the stop position and the code bars resting on the bottom of the slots in their end guide blocks, there should be some clearance, not more than .012" between the bottom of the code bars and the top of the center support plate. To adjust, increase or decrease the number of shims under the center support plate.

LOAD COMPENSATING CAMS ADJUSTMENT (Figure 20)

NOTE: To check the following adjustment, it will be necessary to remake it.

Remove the two compensating cam follower springs and loosen the set screws of each compensating cam. With the operating shaft in the stop position, rotate each cam so that the follower is on the low part of flat of the cam and against the spacer on the operating shaft. Now push the follower up against the cam manually until there is no further rotation of the cam. Tighten the cam set screws and repeat this procedure for the other cam.

LOAD COMPENSATING CAM FOLLOWER ADJUSTMENT (Figure 20)

The load compensating cam follower rollers should line up with their respective cams. To adjust, loosen the set screws and position the collar on the cam follower shaft. Tighten the set screws.

LOAD COMPENSATING CAM FOLLOWER SPRINGS TENSION

With the operating shaft in the stop position, unhook the upper loops of the compensating cam follower springs and hook a 12 lb. scale in the eye of the cam follower springs and pull vertically upward. It should require 10 to 12 lbs. to extend the springs to their position length. Replace the springs on the cam followers. See Figure 20 for location of parts.

CODE LEVER SPRING TENSION (Figure 21)

With the operating shaft in the stop position, hook a 32 oz. scale in the slot of each code lever (except the shift or unshift code levers which are located at the extreme ends and combination code lever which is located in slot No. 2) and pull vertically upward. It should require 20 to 24 ozs. to start each code lever moving from the operating bail.

COMBINATION CODE LEVER SPRING TENSION (Figure 21)

With the BLANK combination selected, rotate the selector shaft manually until the code lever operating bail is at the bottom of its travel and the combination code lever is fully selected. Hook a 64 oz. scale under the combination code lever adjacent to the spring loop and pull vertically upward. It should require 45 to 54 ozs. to start the code lever moving away from the operating bail.

SHIFT AND UNSHIFT CODE LEVER SPRING TENSION (Figure 21)

With the operating shaft in the stop position, hook a 32 oz. scale in the slot of the shift and unshift code levers and pull vertically upward. It should require 12 to 16 ozs. to start each lever moving away from the operating bail.

CARRIAGE RETURN-LINE FEED LATCH ADJUSTMENT (Figure 23)

Rotate the operating shaft until the latch lever roller is on the high part of its cam. There should be .010" to .020" clearance between the rear surface of the carriage return-line feed lever and the vertical surface of the upper latch stop. To adjust, loosen the upper clamp screw and rotate the latch lever with respect to the latch lever cam follower arm. Tighten the clamping screw.

CARRIAGE RETURN-LINE FEED LATCH SPRING TENSION (Figure 23)

With the carriage return-line feed lever latch follower on the high part of its cam, hook a 32 oz. scale under the upper anchor of the latch spring and pull approximately in line with the spring. It should require 8 to 12 ozs. to move the roller away from the cam.

CARRIAGE RETURN-LINE FEED LEVER SPRING TENSION

With the operating unit shaft in the stop position, the carriage return-line feed lever in its unlatched position and the latch held away from the lever, hook a 32 oz. scale just above the spring hole and pull to the left at right angles to the lever. It should require 7 to 11 ozs. to start the lever moving.

SHIFT BELL CRANK SPRING TENSION (Figure 24)

With the shift code bar in the unshift position (toward the left) and the shift bell crank in contact with the lug on the code bar, unhook the shift spring from the shift bell crank and hook a 32 oz. scale in the spring eye. It should require a pull of 16 to 24 ozs. to stretch the spring to its position length. Replace the spring.

YIELD LEVER SPRING TENSION (Figure 24)

With the shift bell crank in its unlatched position, hook a 32 oz. scale over the yield lever just above the spring loop and pull as nearly in line with the spring as possible. It should require 10 to 14 ozs. to start the yield lever moving away from the lug on the shift bar.

UNSHIFT BELL CRANK SPRING TENSION (Figure 24)

With the operating shaft in its stop position and the shift bell crank unlatched, hook an 8 oz. scale over the unshift bell crank at the spring hole and pull in line with the spring. It should require 3-1/2 to 4-1/2 ozs. to start the bell crank moving.

REPLACE THE SELECTOR UNIT, POSITION THE TRANSFER BARS AND CODE BARS TO THE LEFT AND REVERSE THE PROCEDURE FOLLOWED IN REMOVING THE SELECTOR UNIT. MAKE CERTAIN THAT THE TRANSFER BARS AND THE CODE BARS ARE FULLY ENGAGED. REPLACE AND TIGHTEN THE MOUNTING SCREWS.

GEAR PLAY

There should be a minimum amount of gear play between the selector shaft steel gear and the operating shaft gear. To adjust proceed as follows: Remove the front and rear selector unit mounting screws and add or remove shims between the bottom of the selector unit base plate and the left rear and front bosses on the operating unit frame. Replace the mounting screws and recheck the gear play.

TIMING ADJUSTMENT (Figure 25)

The index mark on the operating shaft gear should line up with the index mark on the selector shaft steel gear. To adjust, remove the mounting screw from the selector shaft steel gear and slide the gear to the rear of the shaft. With both shafts in their stop positions (clutches fully disengaged), mesh the teeth so that the index marks are in line and rotate the selector shaft steel gear to a position where its mounting screw can be installed. Replace and tighten the mounting screws.

MOTOR PLATE ADJUSTMENT

(1) The lateral alignment of the motor pinion and the selector shaft gear should be such that the center line of the gear coincides with a vertical line through the center of the hole in the motor pinion. To adjust, loosen the four motor mounting screws and position the motor. Tighten the mounting screws.

(2) There should be a barely perceptible amount of backlash between the motor pinion and the highest point of the selector shaft gear. Check for one complete revolution. To adust, loosen the three motor plate mounting screws and the lock nut on the adjusting screw and position the adjusting screw. Tighten the mounting screws and lock nut.

OPERATING SHAFT CLUTCH RESET BAIL ADJUSTMENT (Figure 26)

With the reset bail roller on the peak of its cam, there should be .010" to .020" clearance between the clutch throwout lever and the clutch throwout lever latch. To adjust, loosen the reset bail adjusting screw lock nut and position the adjusting screw. Tighten the lock nut.

OPERATING SHAFT CLUTCH THROWOUT LEVER LATCH SPRING TENSION (Figure 26)

With the reset bail cam roller on the high part of its cam, hook the pull end of an 8 oz. scale under the forward end of the latch and pull vertically upward. It should require 3 to 4 ozs. to start the latch moving.

OPERATING SHAFT CLUTCH THROWOUT LEVER SPRING TENSION (Figure 26)

With the clutch throwout lever in its latched position, unhook the clutch throwout lever spring from its support and hook a 64 oz. scale in the spring eye. It should require 30 to 40 ozs. to stretch the spring to its position length.

OPERATING SHAFT DETENT LEVER SPRING TENSION (Figure 27)

With the operating shaft in the stop position (clutch fully disengaged) hook a 12 lb. scale under the detent lever approximately between the spring and roller and pull vertically upward. It should require 4-1/2 to 5-1/2 lbs. to start the lever moving away from its cam.

OPERATING SHAFT CLUTCH THROWOUT LEVER LATCH ADJUSTMENT (Figure 28)

With the trip lever cam follower on the peak of its cam, there should be .010" to .020" clearance between the clutch throwout lever and the vertical edge in the upper step of the clutch throwout lever latch. To adjust, loosen the latch extension mounting screws and position the extension. Tighten the mounting screws.

CODE BAR VERTICAL LINK BRACKET ADJUSTMENT

With the selector shaft in its stop position, place a piece of perforated tape having alternate R and Y combinations in the tape guide engaging the feed holes on the pins of the feed wheel and close the retaining lid. Rotate the selector shaft until the selector lever bail roller just reaches the low part of its cam. Hold the transfer bar detent away from the transfer bars. When the transfer bail is operated manually to its extreme limit by depressing the bail at the roller, alternate code bars should be moved to the right and left. At least one code bar in each direction should be against its stop. Check this adjustment with both R and Y combinations. To adjust, loosen the code bar vertical link bracket mounting screws and

position the bracket. See Figure 18 for location of parts. Tighten the mounting screws.

TRANSFER BAR DETENT ADJUSTMENT

With the selector shaft in the stop position and the No. 1, 3, and 5 transfer bars moved to the marking position and the No. 2 and 4 transfer bars in the spacing position, at least one code bar in each position should be held fully operated by the detent roller. There may be some play, not more than .015" in the remaining code bars, measured between the code bars and their stops. To adjust, loosen the mounting screws for the left transfer bar guide and position the guide. Check to see that the transfer levers are free in the guide. Tighten the mounting screws. See Figure 18 for location of parts.

TRANSFER BAR DETENT SPRING TENSION (Figure 18)

Hook a 32 oz. scale under the transfer bar detent roller mounting screw nut and pull vertically upward. It should require 12 to 18 ozs. to start the detent moving away from the transfer bars.

TRANSFER BAIL ADJUSTING SCREW ADJUSTMENT (Figure 18)

Insert a piece of perforated tape having alternate R and Y combinations in the tape guide, engaging the feed holes on the pins of the feed wheel and close the retaining lid. Rotate the selector shaft until the transfer bail roller is on the high part of the transfer cam. Hold the transfer bar detent roller away from the transfer bars. There should be some clearance, not more than .020" between the shoulders on the code bars and code bar stops for both R and Y combinations. To adjust, loosen the transfer bail adjusting screw lock nut and position the adjusting screw. Tighten the lock nut.

NOTE: If necessary, Section 2 of the GUIDE RAILS ADJUSTMENT may be refined to aid in meeting this requirement.

PERFORATOR LATCH AND LEVER ADJUSTMENT (Figure 30)

(1) The lower extension of each perforator latch should be resting up against its stop post. To adjust, loosen the set screws and position the latches. Tighten the set screws.

(2) With the latches resting against their stop posts, the top edge of the latch lever should be parallel with the underside of the casting on which the left-hand retaining plate is mounted. Gauge by eye. To adjust, loosen the set screw and position the latch lever. Tighten the set screw

PERFORATOR LATCH SPRING TENSION (Figure 30)

With the lower extension of each perforator latch resting against its stop post, unhook the left latch spring from the latch. Hook an 8 oz. scale in the spring eye and pull horizontally toward the rear of the unit. It should require 2-1/2 to 6 ozs. to pull the spring to its position length. Replace the spring. Check the right latch spring in the same manner.

WHEATSTONE PERFORATOR SPECIAL ADJUSTMENTS - SEE BULLETIN NO. 125 FOR STANDARD ADJUSTMENTS

COMBINATION RELEASE LINK SPRING TENSION (Figure 31)

With the Wheatstone Perforator resting on its back, hook an 8 oz. scale over the lower spring anchor of the combination release link and pull in line with the spring. It should require 2 to 4 ozs. to just start the lever moving.

COMBINATION KEY LEVER LINK YIELD SPRING TENSION (Figure 29)

With the Wheatstone Perforator resting on its back and the combination key lever held up against its upstop, hook a 32 oz. scale over the lower extension of the combination key lever link assembly. Pulling in line with the spring, it should require 14 to 18 ozs. to start the lower portion of the combination key lever link moving.

PERFORATOR RETAINING PLATES ADJUSTMENT

(1) With the perforator in its latched position on the operating unit and the perforator feet against their left hand retaining plates, there should be some clearance, not over .010" between the side of the combination key lever link and the right side of the combination code lever at the closest point. To adjust, position the left hand retaining plates and spacer plates by means of their mounting screws.

(2) The perforator should slide freely from the forward latched position to the rear position with a minimum amount of side play. To adjust position the right hand retaining plates and spacer plates by means of their mounting screws.

NOTE: If the locating brackets interfere with making the above adjustment, loosen their mounting screws and move the brackets out of the way.

KEY LEVER LINKS AND PERFORATOR FEET SHIMS ADJUSTMENT (Figure 32)

(1) With the perforator in its installed position on the operating unit, rotate the operating shaft until the code levers are resting on the code bars. There should be some clearance not more than .010" between the top of the key lever and the roller on the key lever link when the play in the link is taken up in a direction to make this clearance a maximum. To adjust, bend the goosenecks on the links.

NOTE: If this clearance exceeds .015" on any key lever add shims between the four mounting feet and perforator casting. Then refine the adjustment by bending the goosenecks.

(2) With the operating shaft in the stop position operate the latch lever and slide the perforator toward the back of the unit. Then slide the unit forward and check that the rollers on the lower edge of the link and the formed portion of the combination link engage the camming surface of code lever slots. To adjust, refine adjustment No.1.

PERFORATOR LOCATING BRACKET ADJUSTMENT

When the perforator is latched in its installed position on the operating unit and the left-hand perforator feet are in contact with their left-hand retaining plates, the left-hand front locating bracket should be in contact with the left-hand side of the perforator casting. With the right-hand perforator feet in contact with their right-hand retaining plates, the right-hand front locating bracket should be in contact with right-hand side of the perforator casting. With the perforator unlatched and moved to the rear of the operating unit, the rear locating brackets should limit the side play to a minimum. To adjust, loosen the locating bracket mounting screws and position the brackets. Tighten the mounting screws.

COMBINATION KEY LEVER LINK ADJUSTMENT

With the Wheatstone Perforator in its operating position on the operating unit, and the combination key lever link roller just touching the top of the key lever on the perforator, there should be some clearance, not more than .010" between the bottom of the button on the combination selector lever and the top of the combination key lever link extension. To adjust, bend the gooseneck of the combination key lever link.

COMBINATION KEY LEVER LINK LATCH ADJUSTMENT

(1) With the combination key lever in its latched position, the key lever should be held fully operated against its downstop. To adjust, loosen the combination key lever latch mounting screws and position the latch. Tighten the mounting screws. See Figure 33 for location of parts.

(2) With the Wheatstone Perforator in its operating position on the operating unit, the operating unit in its stop position and the combination key lever in its latched position, there should be some clearance between the lower end of the combination link and the code lever operating bail. If necessary, refine the adjustment 1.

COMBINATION LATCH SPRING TENSION (Figure 34)

Unhook the left end of the combination latch spring and check to determine that the combination ley lever link is unlatched. Hook an 8 oz. scale in the spring eye and pull horizontally to the left. It should require 1-1/2 to 2-1/2 ozs. to extend the spring to its position length.

WHEATSTONE PERFORATOR TAPE-OUT CONTACTS ADJUSTMENT (Figure 35)

NOTE: Remove the tape reel mounting bracket mounting screws and remove the tape reel assembly. Remove the front mounting screw for the tape-out contact mechanism bracket. Loosen the rear mounting screw and pivot the bracket so that the short contact spring is accessible.

(1) With the short contact spring resting against its stiffener, hook an 8 oz. scale over the spring at the contact and pull at right angles to the contact spring. It should require 1-1/2 to 2-1/2 ozs. to move the contact spring away from its stiffener. To adjust, bend the short contact spring.

(2) There should be a clearance of .015" to .025" between the contact points. To adjust, bend the long contact spring.

REPLACE THE TAPE-OUT CONTACT MECHANISM BRACKET AND TAPE REEL ASSEMBLY AND TIGHTEN THE MOUNTING SCREWS.

TAPE-OUT CONTACT ARM ADJUSTMENT

(1) With the contact arm resting against the outer rim of the tape reel, there should be some clearance, approximately 1/16" between the horizontal surface of the tape reel and the end of the tape-out arm. To adjust, loosen the set screws in the upper set collar and position the set collar. Tighten the set screws.

(2) With the tape reel end of the tape-out contact arm approximately 5/8" from the wood filler on the tape reel, the tape-out contact arm lever should just touch the insulator of the long contact spring in approximately the center of its width. To adjust, loosen the set screws on the tape-out arm lever and position the lever. Tighten the set screws.

(3) Check the tape-out arm for binds in its full travel. If a bind occurs, reposition the upper set collar and recheck adjustment (1).

(4) Place a full roll of tape in the tape reel and see that the tape-out contact arm is resting against the outer surface of the roll of tape. Unhook the tape-out arm spring from the spring post and hook an 8 oz. scale in the spring and pull horizontally toward the rear of the unit. It should require 3-1/2 to 5 ozs. to stretch the spring to its position length. (Figure 35). Replace the spring.

SYNCHRONOUS MOTOR ADJUSTMENTS

STARTING SWITCH ADJUSTMENTS

The following requirements should not be checked unless there is reason to believe that the starting switch is out of adjustment.

(1) Remove the motor unit from the base and remove the motor fan and pinion.

(2) Remove the switch end shield screws and the switch commutator mounting screws. Remove the switch end shield.

(3) Pull out the rotor until the brush holder spring is accessible and remove the spring.

(4) The tension of the spring for 60 cycle motors should measure 3 to 3-3/4 ozs. when extended to a length of five inches, using an 8 oz. scale. The tension of the spring for 50 cycle motors should measure 1-1/2 to 2-1/2 ozs. when extended to a length of five inches, using an 8 oz. scale.

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

(6) The brush holder stop pins should be safely within the holes of the fibre 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.

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

(8) Replace the switch commutator screws and tighten the two screws alternately a little at a time until both screws are tight.

(9) Replace the switch end shield screws, using the same precaution in tightening as above.

(10) Apply the push end of a 12 lb. scale against the fan end of the shaft and push parallel to the shaft. It should require at least 7 lbs. pressure to start the shaft moving.

(11) Replace the motor fan and pinion. Replace the motor on the base and remake the motor position adjustments.

GOVERNOR ADJUSTMENTS

SPEED ADJUSTING WHEEL FRICTION WASHER ADJUSTMENTS (Figure 36) See Note (B)

In order to check this adjustment, it will be necessary that the speed adjusting spring should be adjusted so that it requires a pull of 13 to 14 ozs. to separate the governor contacts. To measure, hook a 32 oz. scale over the contact spring next to the contact and pull parallel to the speed adjusting spring. Adjust to the proper tension by means of the speed adjusting wheel.

Insert a bank pin radially in the leather of the adjusting wheel, hook a 32 oz. scale over the pin at the periphery of the wheel and pull at right angles to the radius. 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.

GOVERNOR SHIMS ADJUSTMENT See Note (B)

With the governor speed adjusting lever in its unoperated position, there should be at least .006" clearance between the wearing strip and the adjusting wheel when the adjusting wheel is opposite the wearing strip and all the end thrust of the motor armature is taken up in a direction to make this clearance a minimum. Adjust by increasing or decreasing the number of shims on the armature shaft between the governor hub and the end frame casting of the motor. See Figure 38 for location of parts.

NOTE (B) These requirements should be checked with the governor adjusting bracket, the brush spring plate, the governor cover and target removed.

INNER AND OUTER DISC CONTACT SPRING ADJUSTMENT (Figure 37) See Note (B)

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

(2) Place a D socket wrench over the nut located in the center of the governor cover. With a six inch 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". To adjust, bend the inner and outer disc contact springs.

SPEED ADJUSTING LEVER STOP PLATE ADJUSTMENT

There should be .006" to .050" clearance between the speed adjusting lever wearing strip and the governor shell when the speed adjusting lever is held against the stop plate. To adjust, loosen the stop plate mounting screws and position the plate. Tighten the screws. See Figure 38 for location of parts.

GOVERNOR BRUSH SPRING PLATE BRACKET ADJUSTMENT (Figure 39)

The 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 line with the outer surface of that part of the governor cover on which the target is mounted.

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

To adjust, position the brush spring plate bracket by means of its enlarged mounting holes.

GOVERNOR BRUSH SPRING PRESSURE ADJUSTMENT (Figure 38)

(1) The carbon brushes should exert a pressure of 4-1/2 to 5-1/2 ozs. against their associated discs. To measure, apply an 8 oz. scale to the spring near the carbon brush and push or pull horizontally until the brush starts to move away from the disc.

NOTE (B) These requirements should be checked with the governor adjusting bracket, the brush spring plate, the governor cover and target removed.

(2) Both carbon brushes should lie flat against their associated discs and the outer edges of the brushes should be flush with, or not more than 3/64" inside of, the outer edges of the discs.

To adjust for these requirements, remove the brush springs and bend them, if necessary. Reinstall springs and position them properly. Tighten the screws.

NOTE: If necessary, level off brushes by passing a piece of No. 0000 sandpaper between the brush and disc.

GOVERNOR ADJUSTING BRACKET ADJUSTMENT (Figure 38)

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.

INSTALLATION OF OPERATION UNIT ON TABLE AND COVER ADJUSTMENT

OPERATING UNIT FOOT PLATE ADJUSTMENT

When the operating unit is placed on its table, the feet should be properly seated in their respective lord mounting discs and the unit should be approximately centrally located on the table. To adjust, loosen the foot plate mounting screw and position the plate which does seat properly. Tighten the mounting screws.

MAIN COVER TAPE CHUTE ADJUSTMENT

With the operating unit in place on the table and the Wheatstone Perforator in its operating position, thread the tape through the die block and perforate the tape so that it engages the pins of the feed wheel and perforate a length of tape. Place the main cover over the operating unit and thread the perforated tape through the tape chute in the cover. Hold the tape taut and in a straight line, under this condition, there should be some clearance between the bottom edge of the tape and the bottom of the tape chute. (This clearance should be held to a minimum within the limits provided by the mounting holes.) To adjust, loosen the tape chute mounting screws and position the chute. Tighten the mounting screws.

LUBRICATION

GENERAL

The oil and grease specified in the supplement furnished with this bulletin should be used to lubricate the Wheatstone Perforator Operating Unit.

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 except where the use of grease or oil-grease-oil is specified.

NOTE: Oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 lbs.
Apply grease to both loops of all helical springs that exert a nominal tension of 2-1/2 lbs. or more.

SELECTOR UNIT

1. Tape lid - at bearings and latch pivot.
2. Top plate - at bearings.
3. Tape-out pin - at guide holes.
4. Tape feed roll - at bearings and ratchet surfaces.
5. Feed roll detent lever - at bearing and detent roller.
6. Selector levers - at bearings and guide slots.
7. Tape feed lever - at bearing, adjusting screw, and cam roller - oil-grease-oil at roller.
8. Feed pawl - at bearing.
9. Transfer bail bearings - two oil holes.
10. Transfer "T" levers - at bearings.
11. Transfer bail cam follower arm - at oil hole, adjusting screw head, and cam roller - oil-grease-oil at roller.
12. Selector lever bail - at bearings and point of contact with selector levers.
13. Selector lever bail cam follower arm - at bearings, adjusting screw, and cam roller - oil-grease-oil at adjusting screw and roller.

14. Selector shaft - front oiler and rear bearing.
15. Selector shaft cams and gears - grease.
16. Cam rollers, 5 - oil-grease-oil.
17. Selector shaft clutch throwout lever bearing - oiler.
18. Start magnet armature - at bearings and latching surfaces.
19. Motor pinion - grease.
20. Transfer bars - at guide and detents.
21. Transfer bar detent lever - at bearings and roller pilot screws.

OPERATING UNIT

1. Operating shaft - oiler in hex. nut.
2. Operating shaft ball bearings
3. Operating shaft cam and gear - grease.
4. Operating shaft clutch throwout lever bearing - oiler.
5. Operating shaft detent lever - at bearing and roller - oil-grease-oil at roller.

6. Operating shaft clutch throwout lever latch - at bearing, latch, and point of engagement with trip lever.
7. Transfer bar links - at bearings, guide slots, and points of engagement with transfer bars and code bars.
8. Code lever bail ball bearing eccentrics - at ball bearings.
9. Code lever bail - at front and rear bearings - saturate felt oilers.
10. Code lever bail - grease top edge.
11. Code levers - at bearings, guide slots, and slots which engage key lever links.
12. Code bars - at end and center guides.
13. Shift code bar mechanism - at pivot points, latching surfaces and at slots of code lever slides.
14. Operating shaft clutch trip lever - at bearing.
15. Perforator latch bearing rod - at bearing.

WHEATSTONE PERFORATOR

1. Tape reel - bearings.
2. Tape-out contact arm - bearings.
3. Tape-out contact insulator - film of grease.
4. Key lever links - guide slots and rollers.

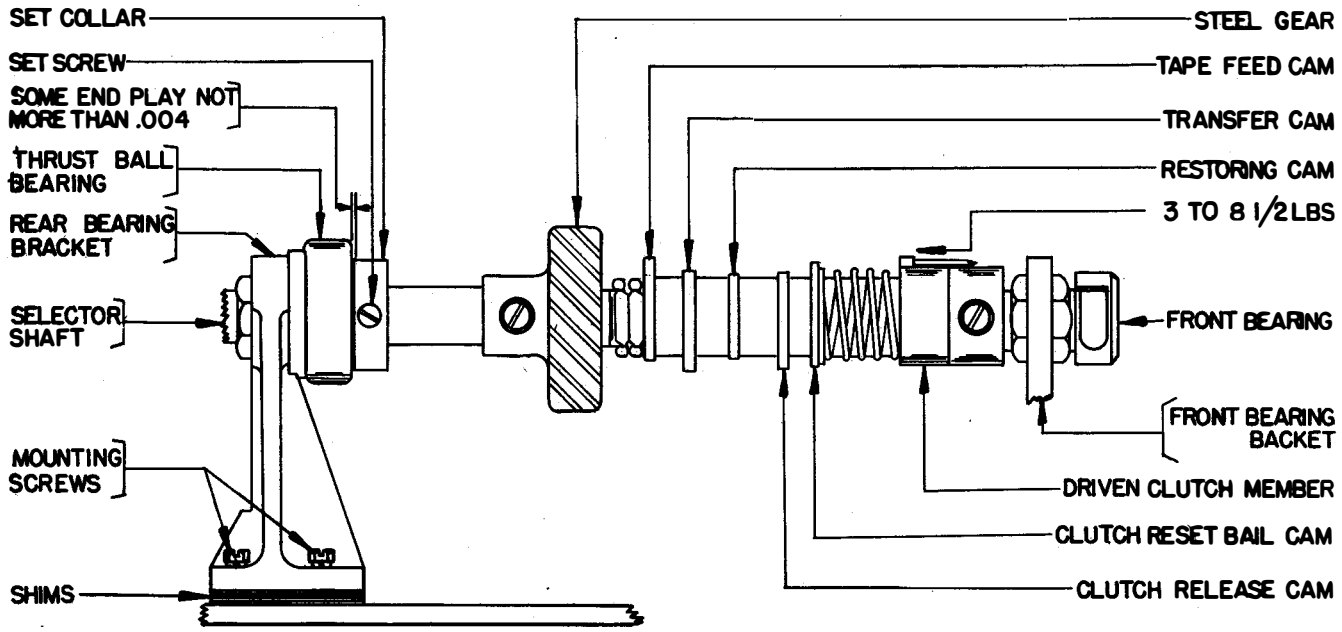


FIGURE 1

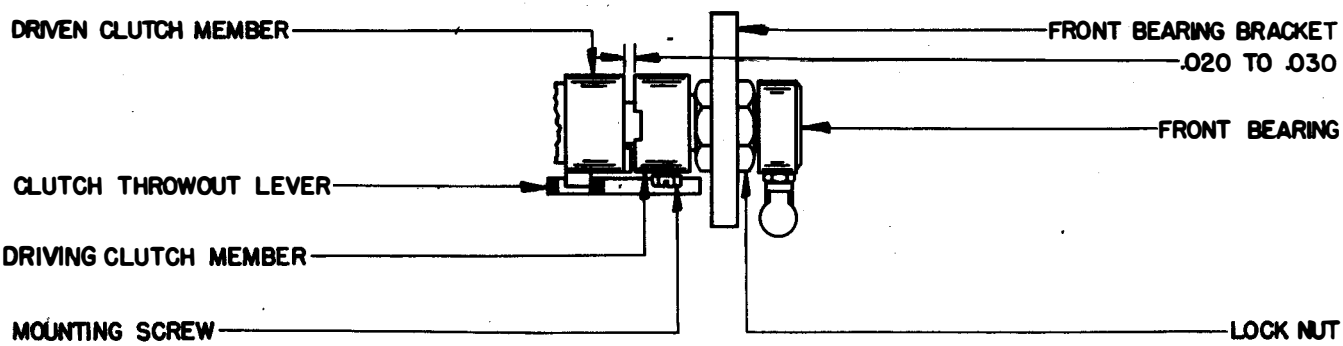


FIGURE 2

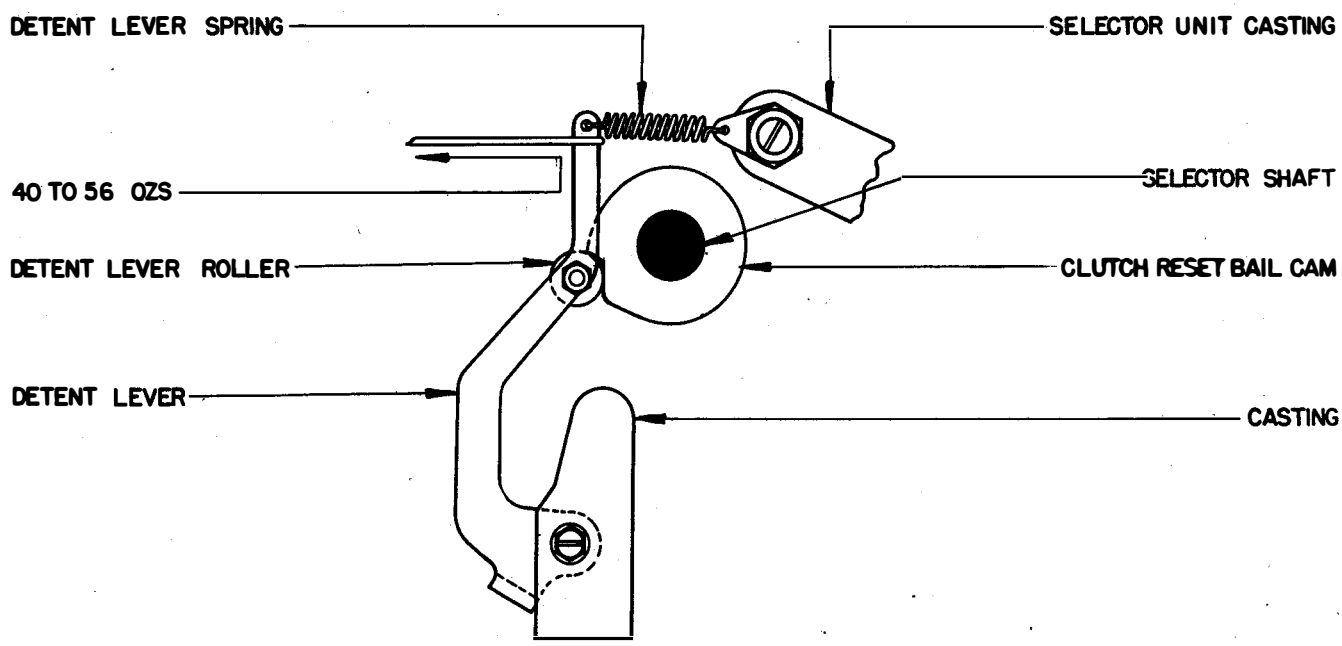


FIGURE 3

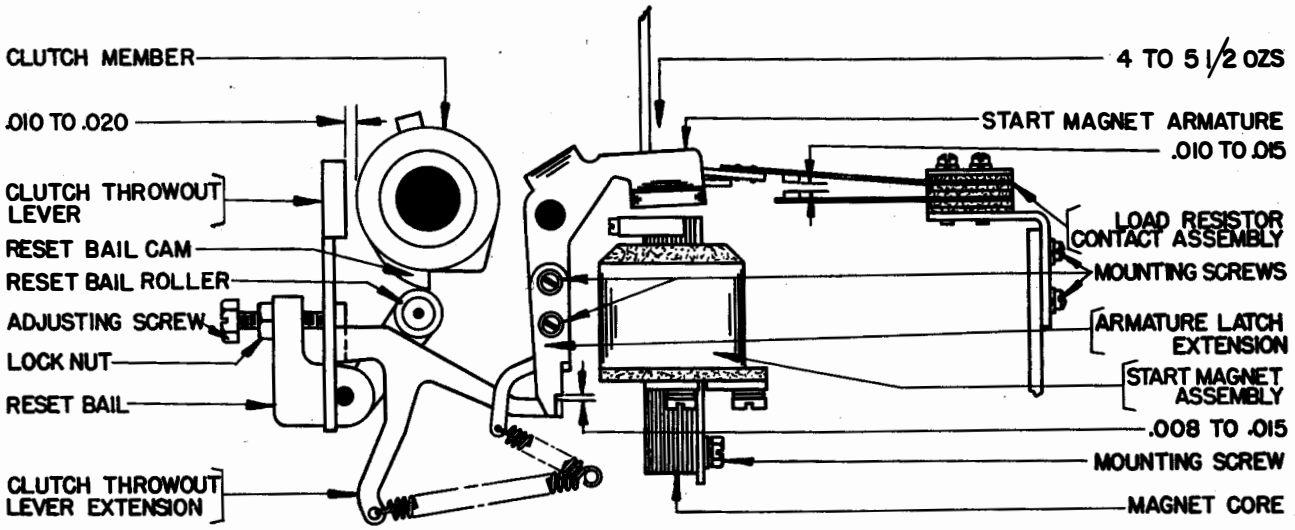


FIGURE 4

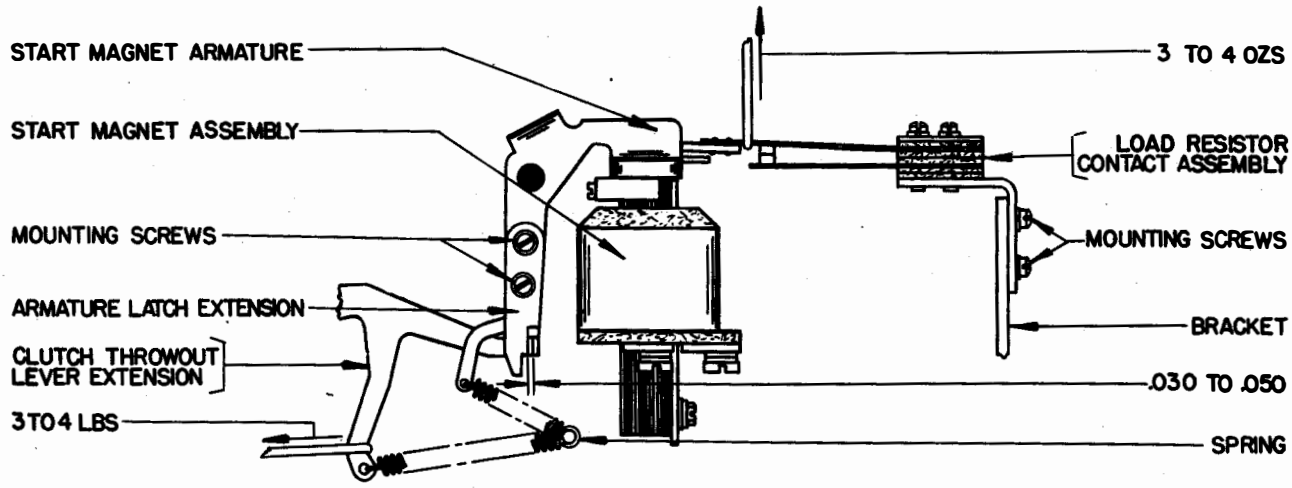


FIGURE 5

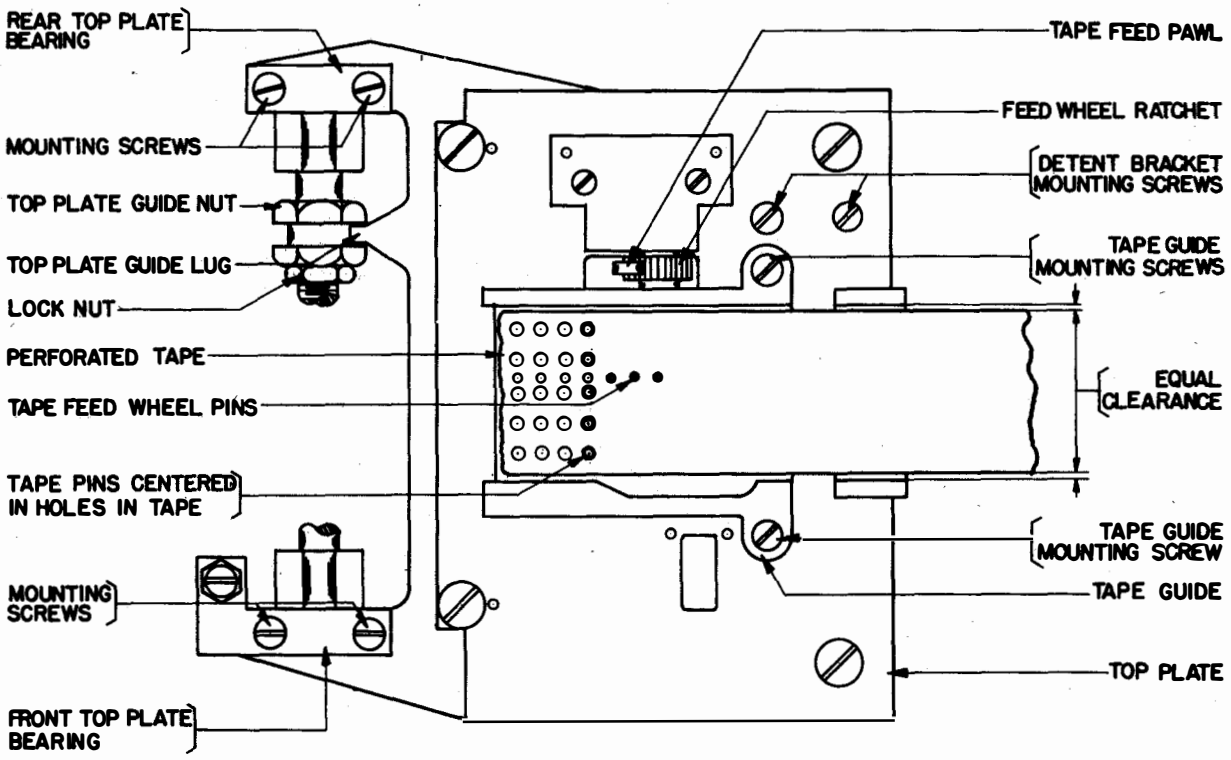


FIGURE 6

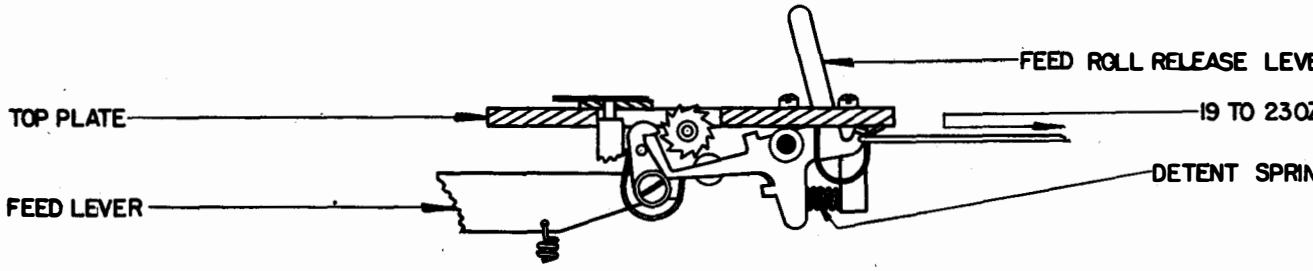


FIGURE 7

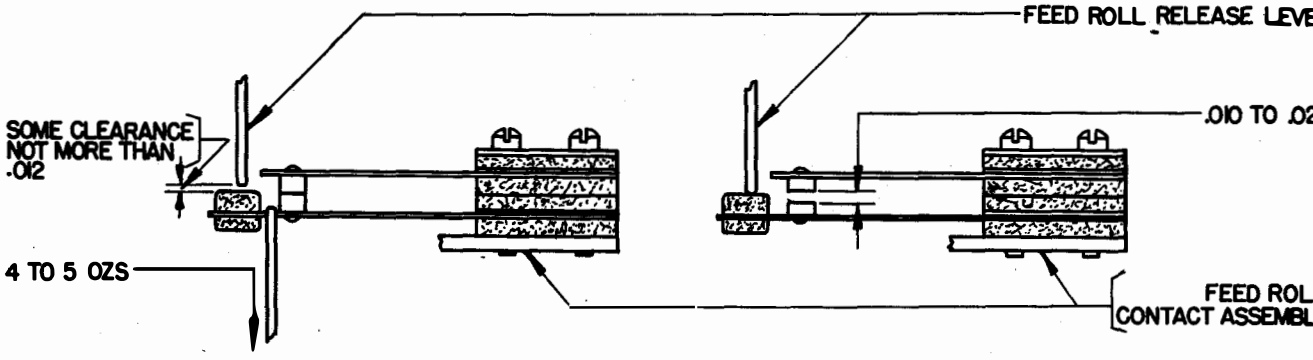


FIGURE 8

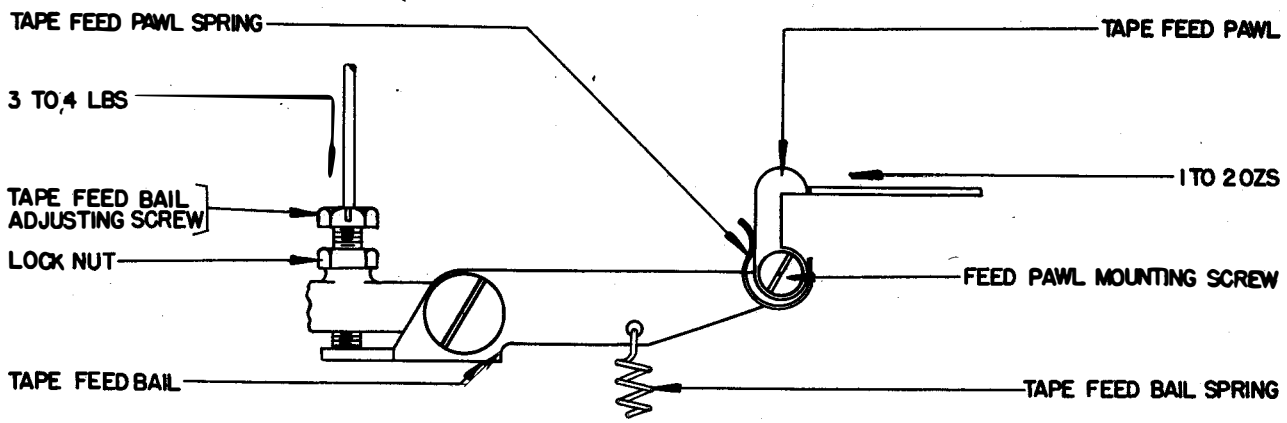


FIGURE 9

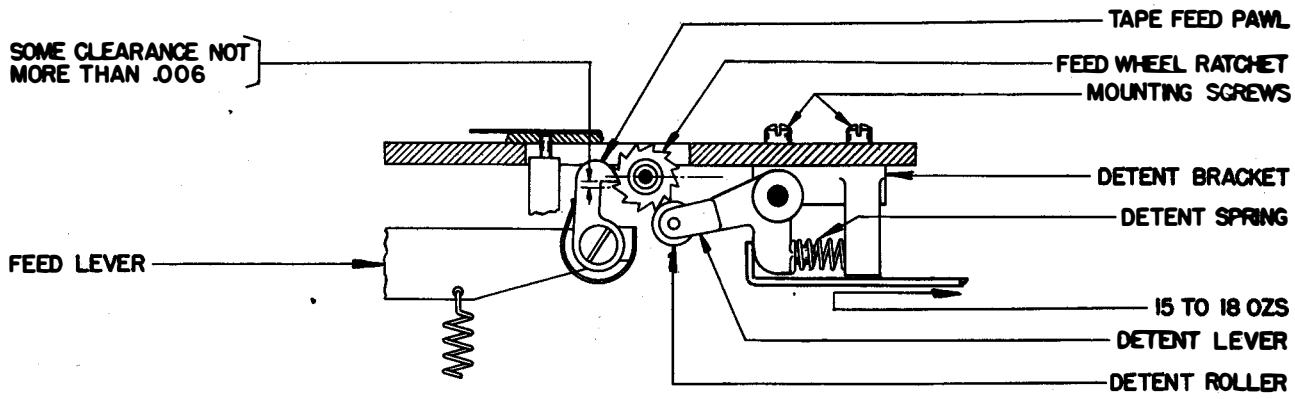


FIGURE 10 A

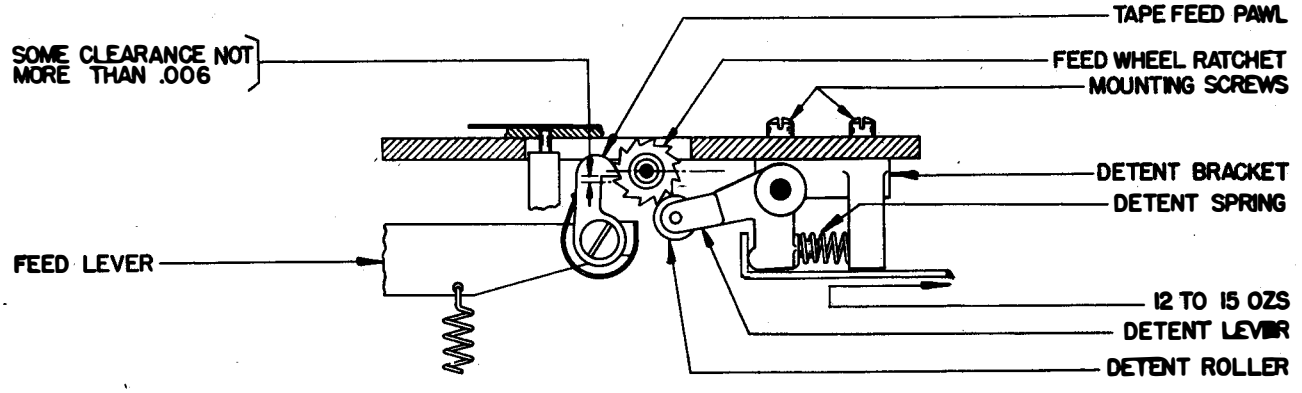


FIGURE 10 B

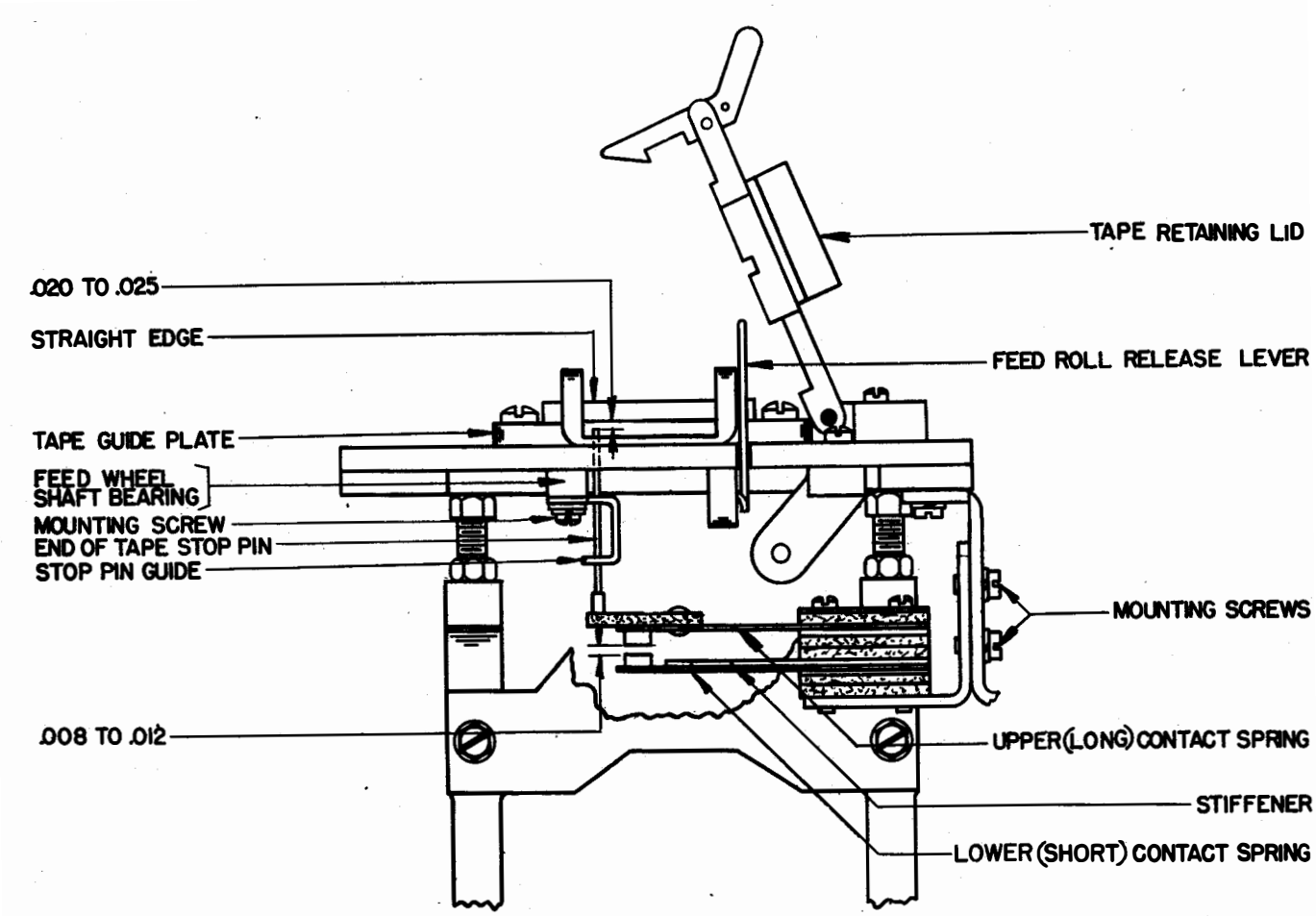


FIGURE 11

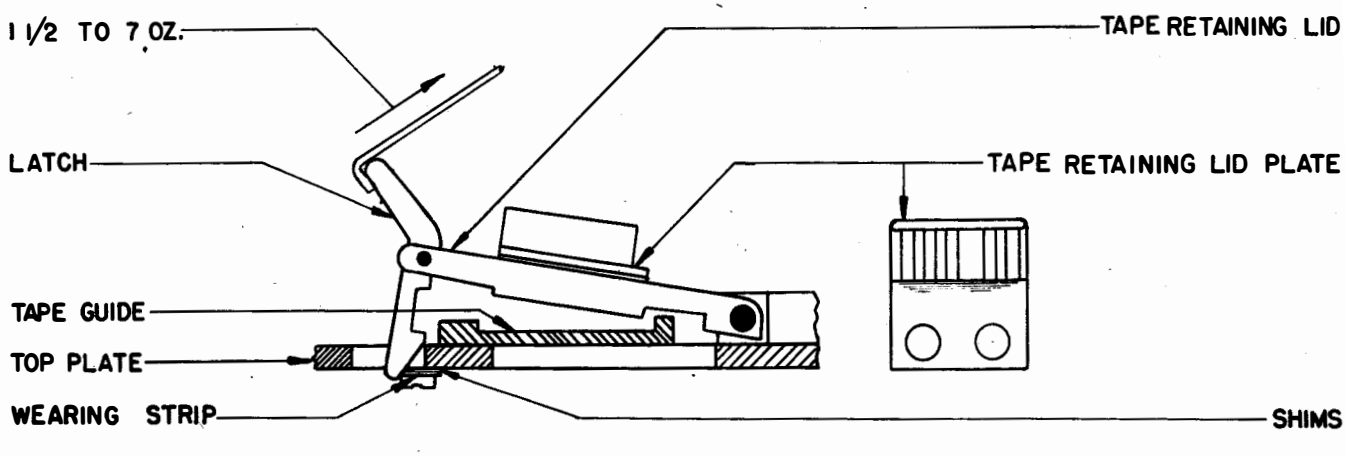


FIGURE 12

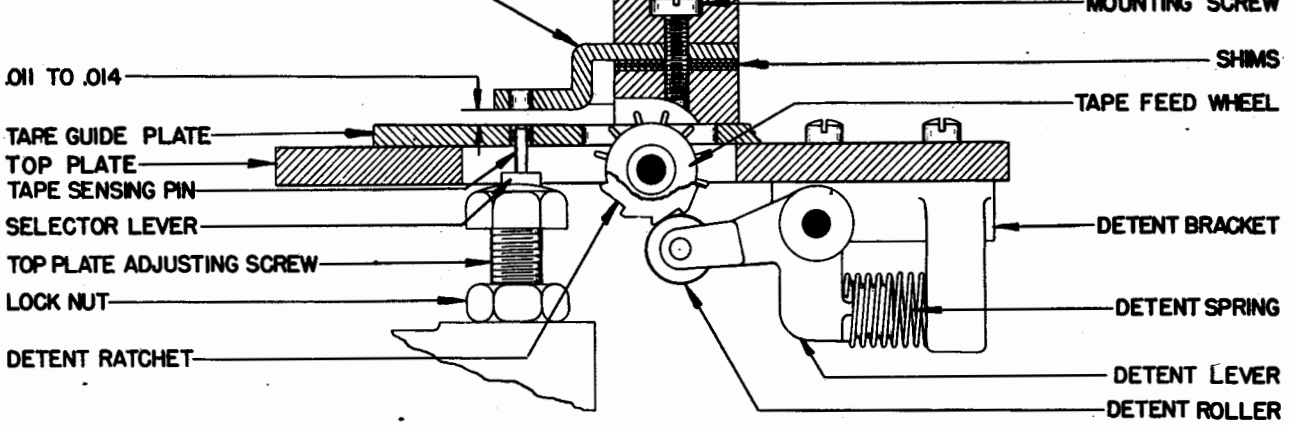


FIGURE 13

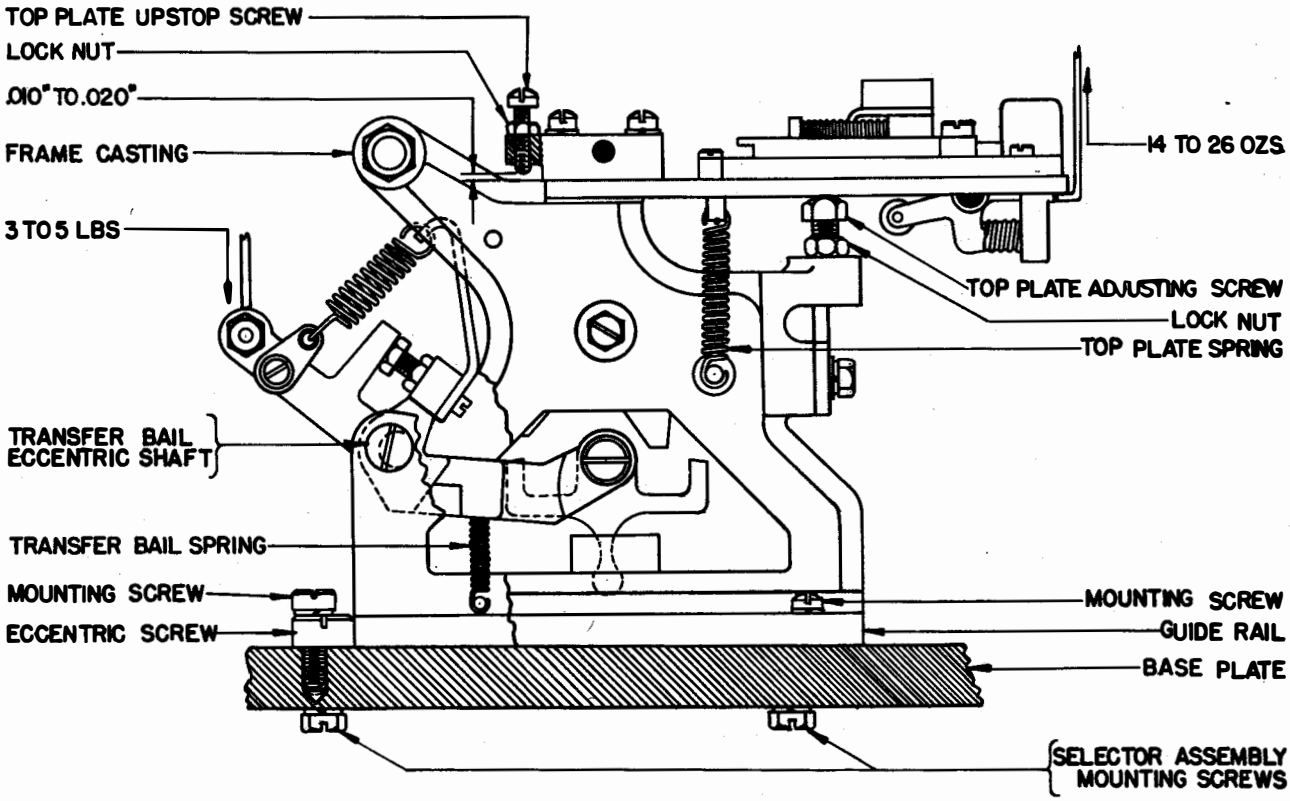


FIGURE 14

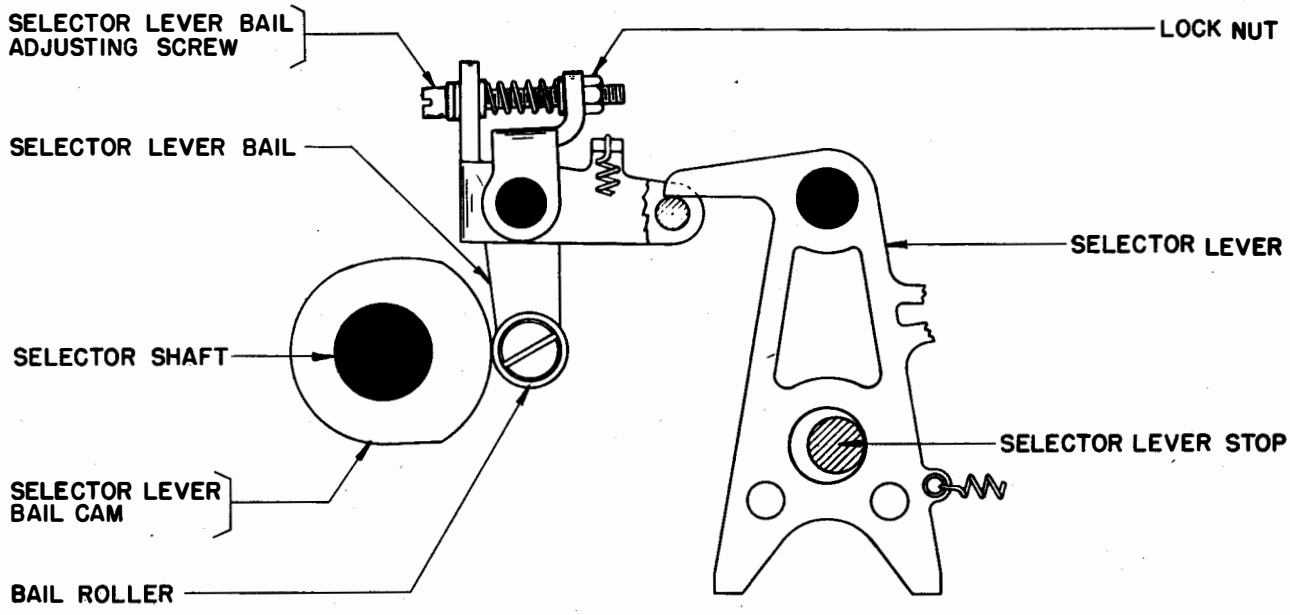


FIGURE 15

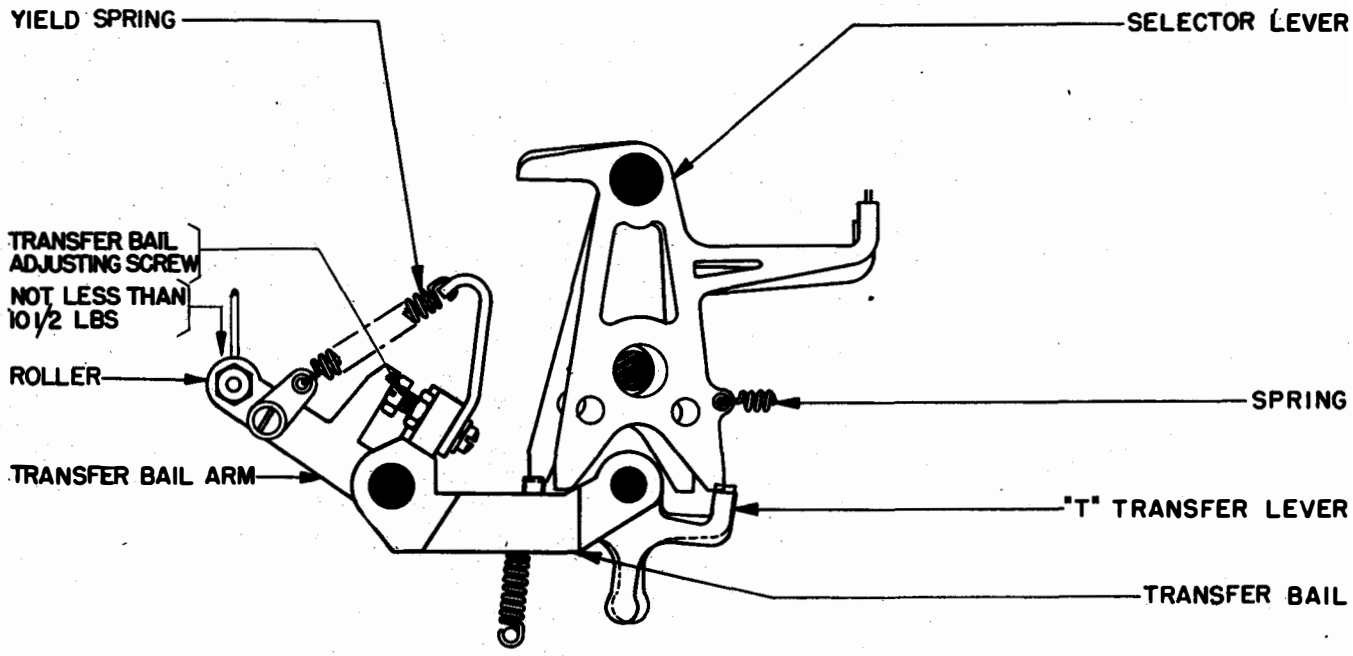


FIGURE 16

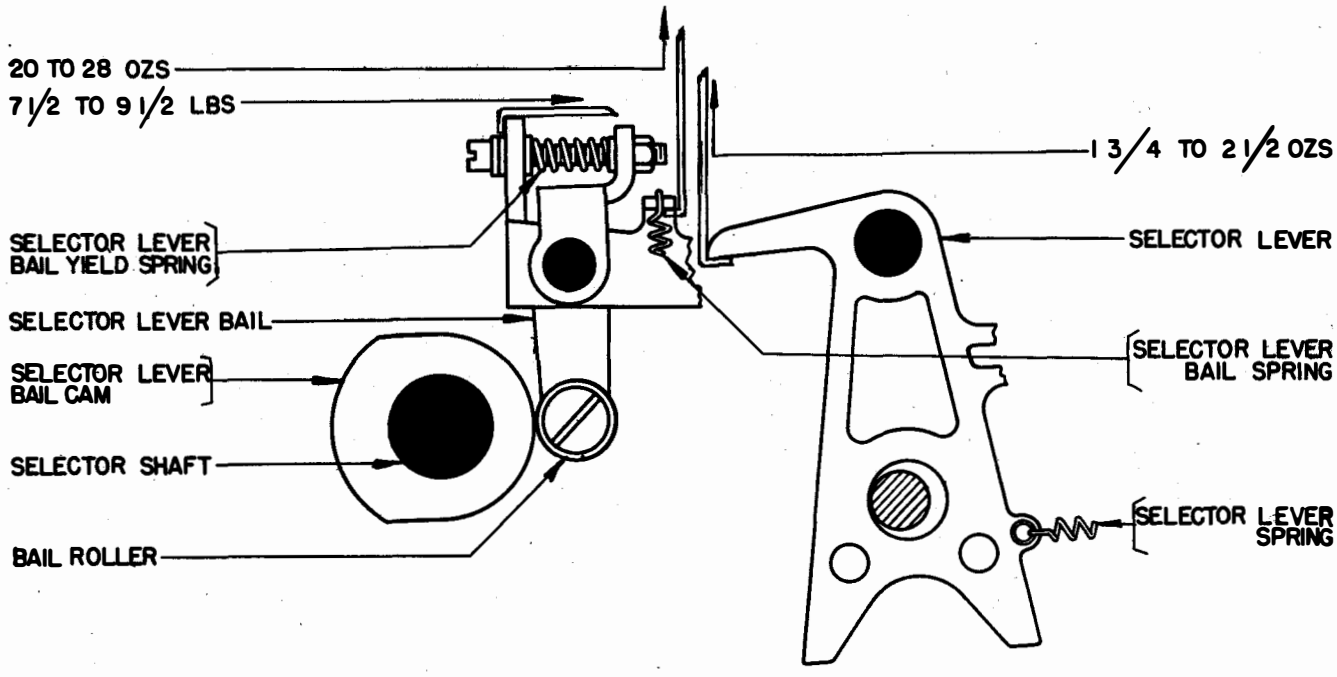
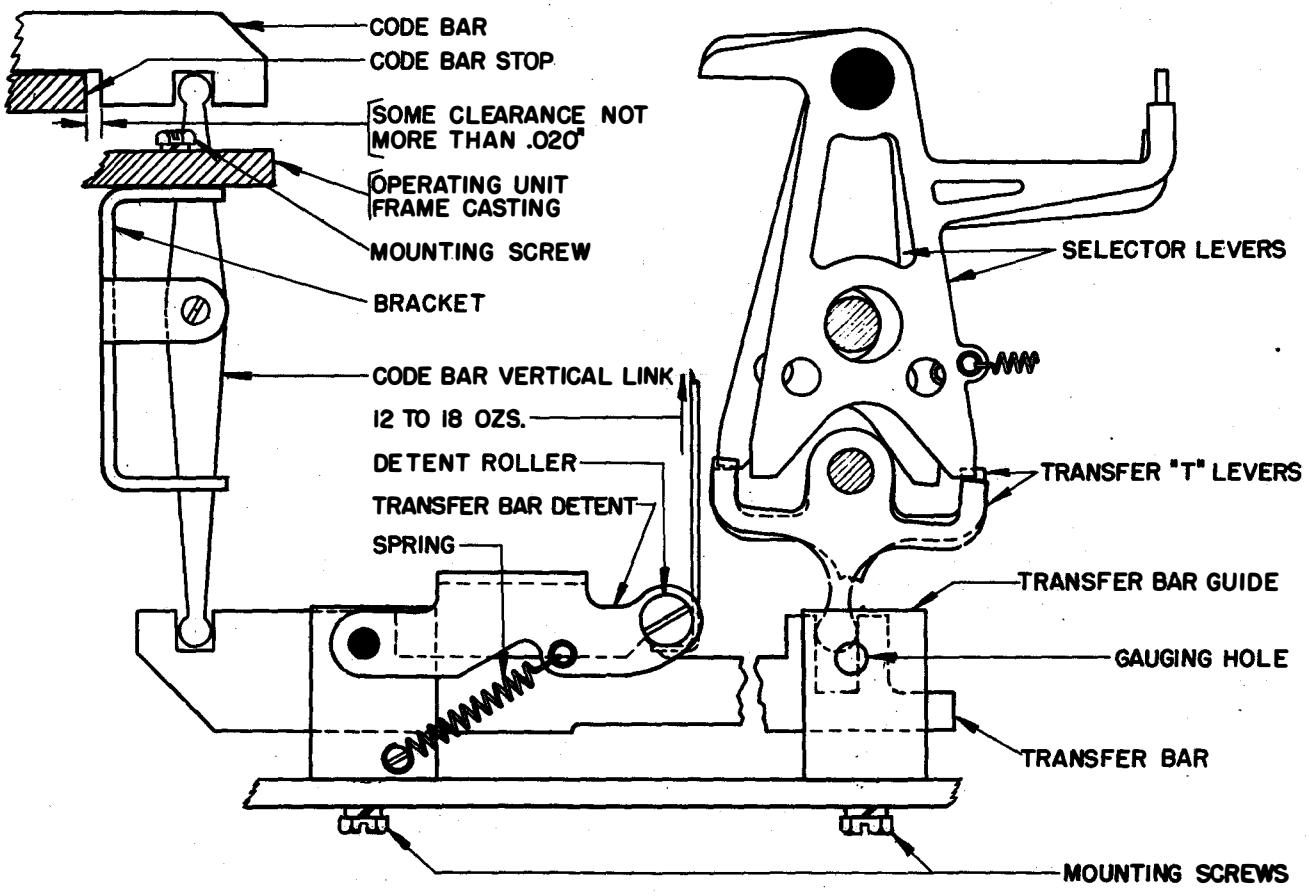


FIGURE 17



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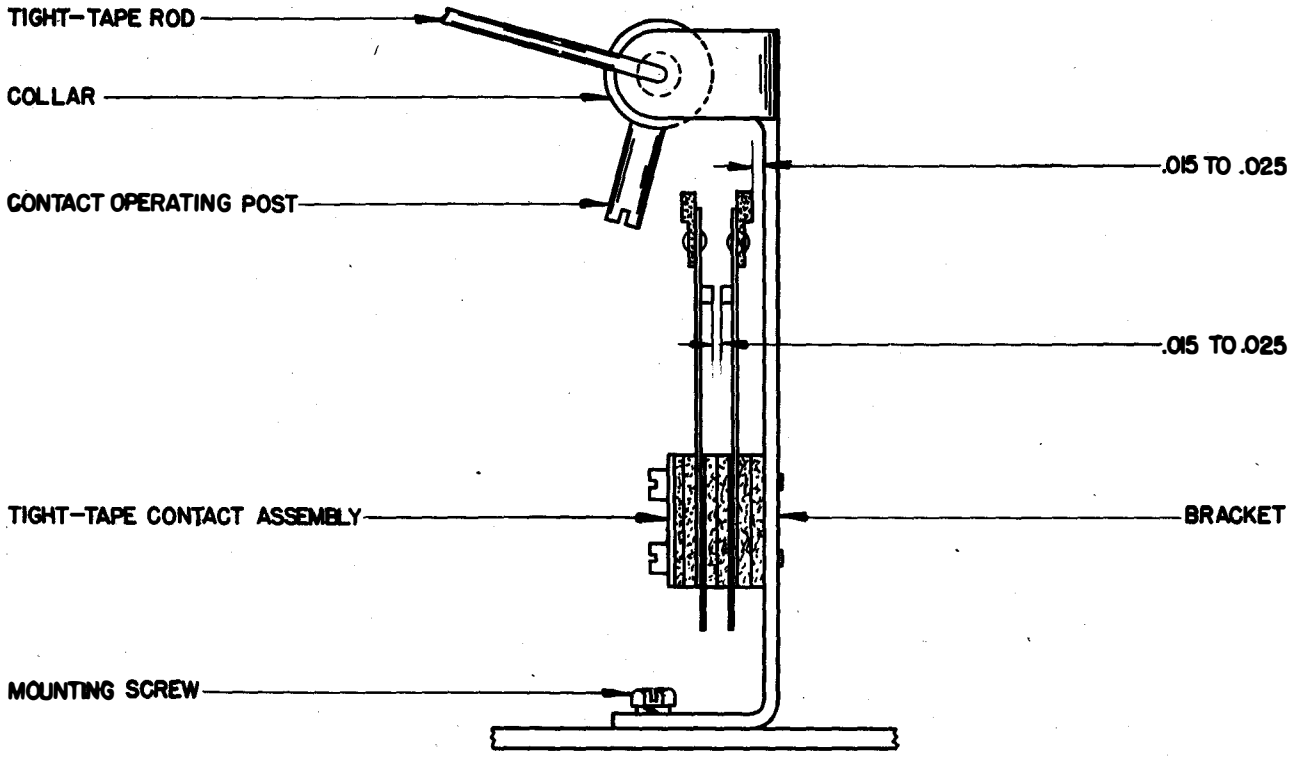

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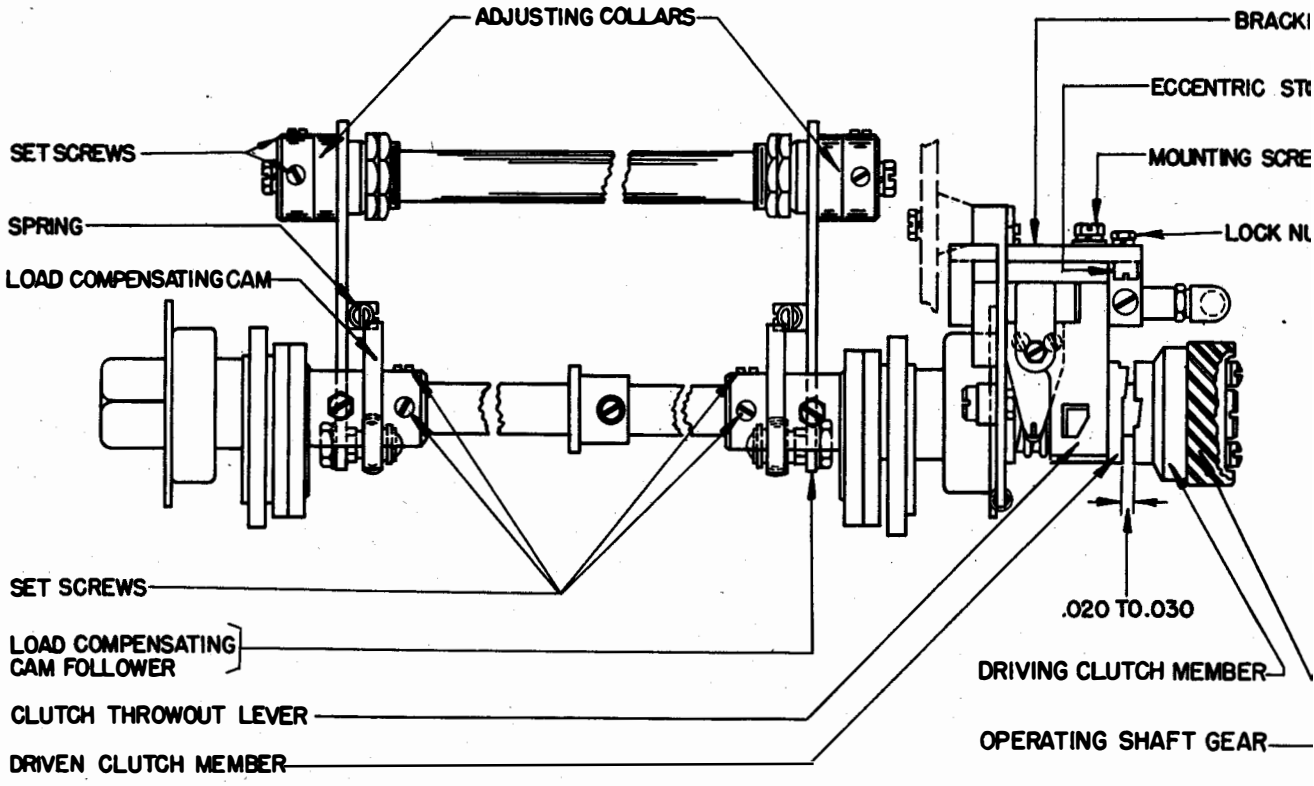

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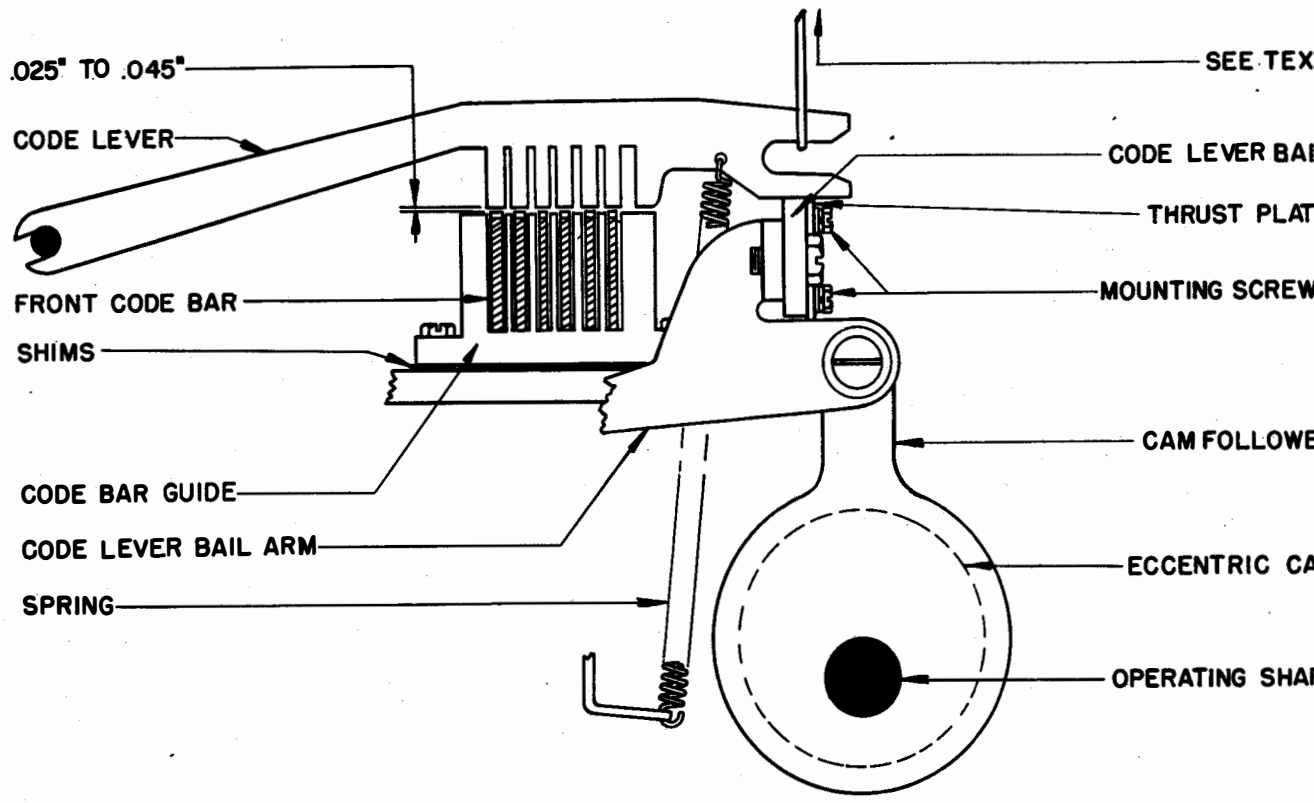

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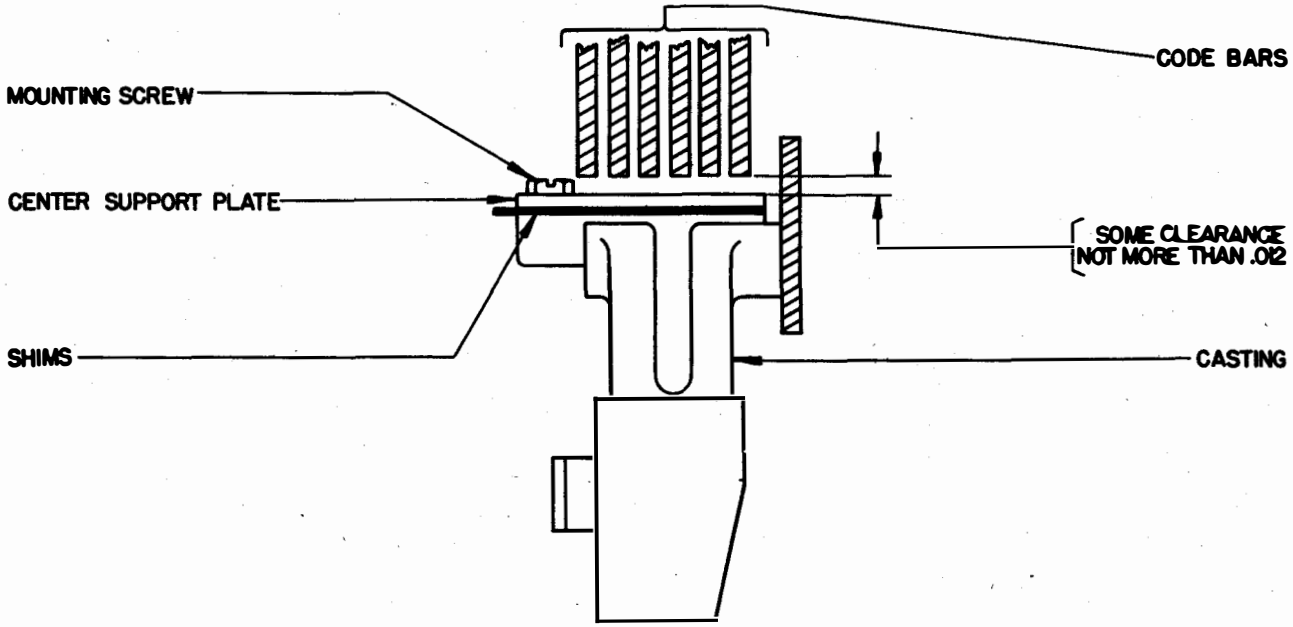

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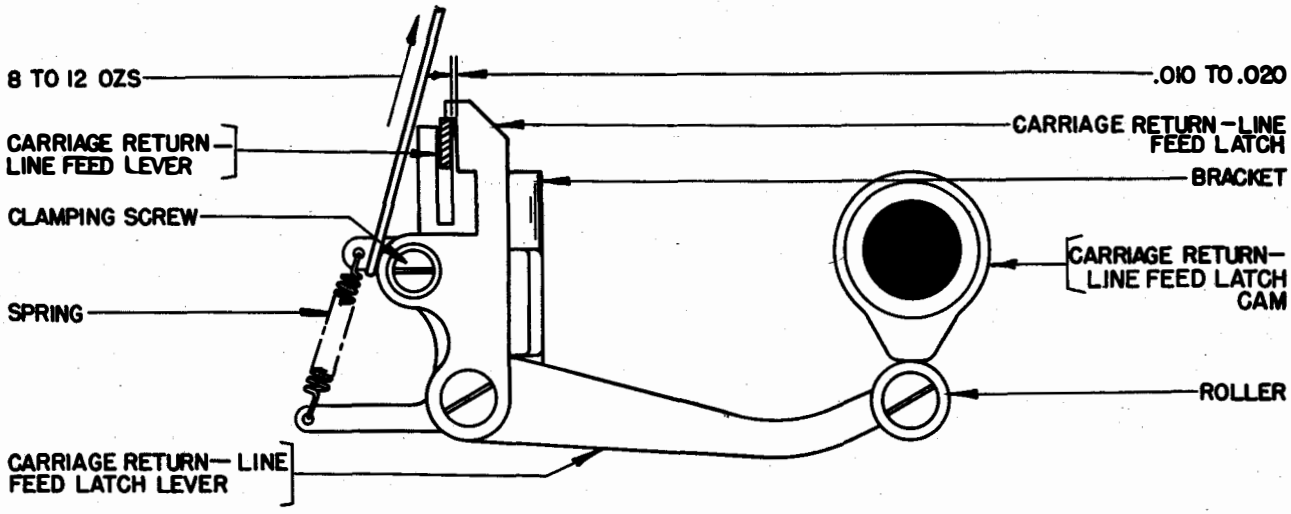

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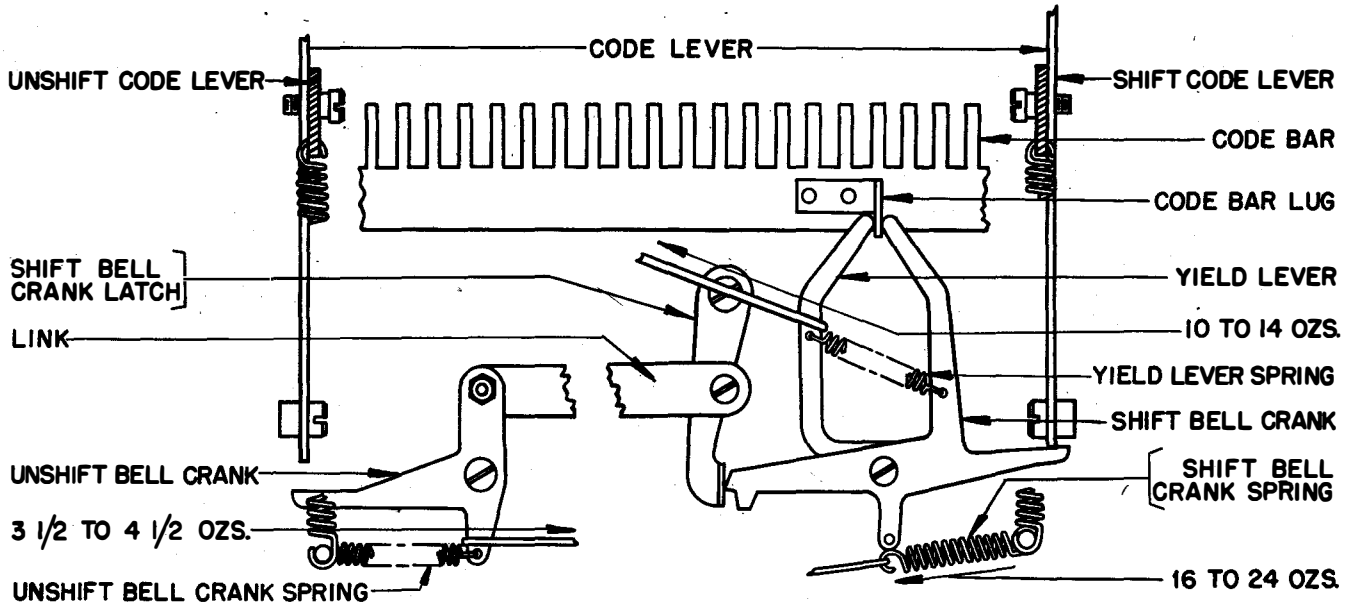

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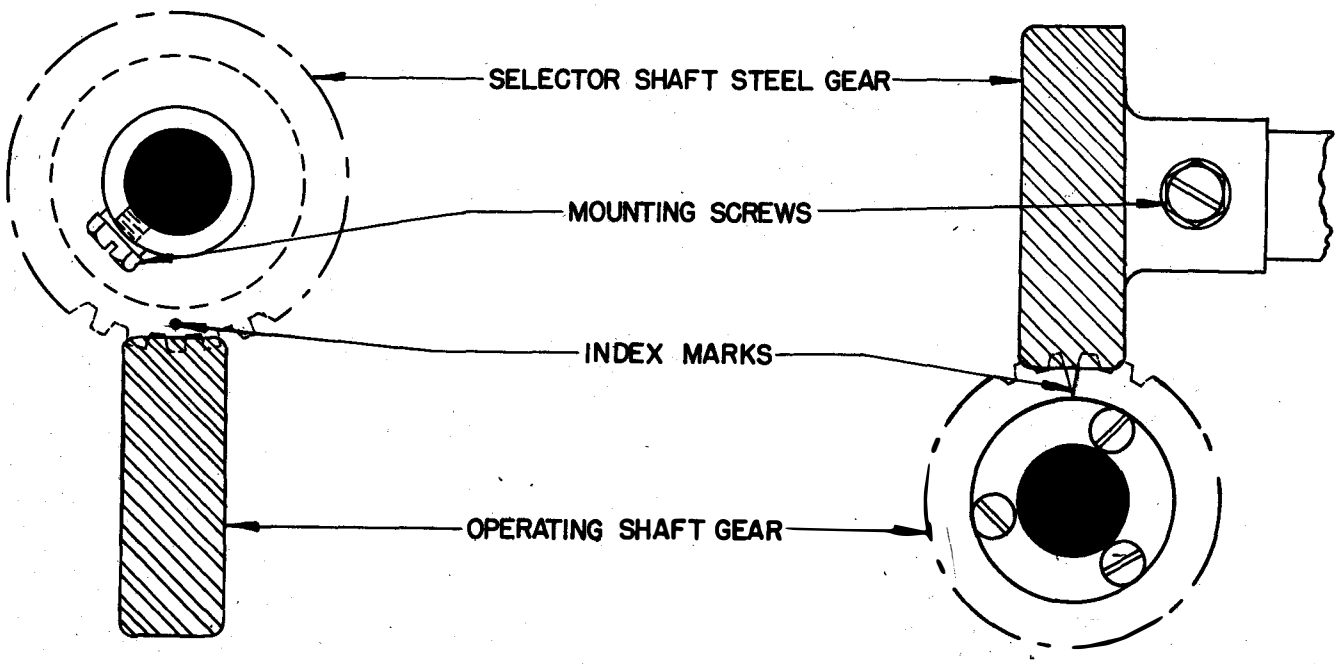

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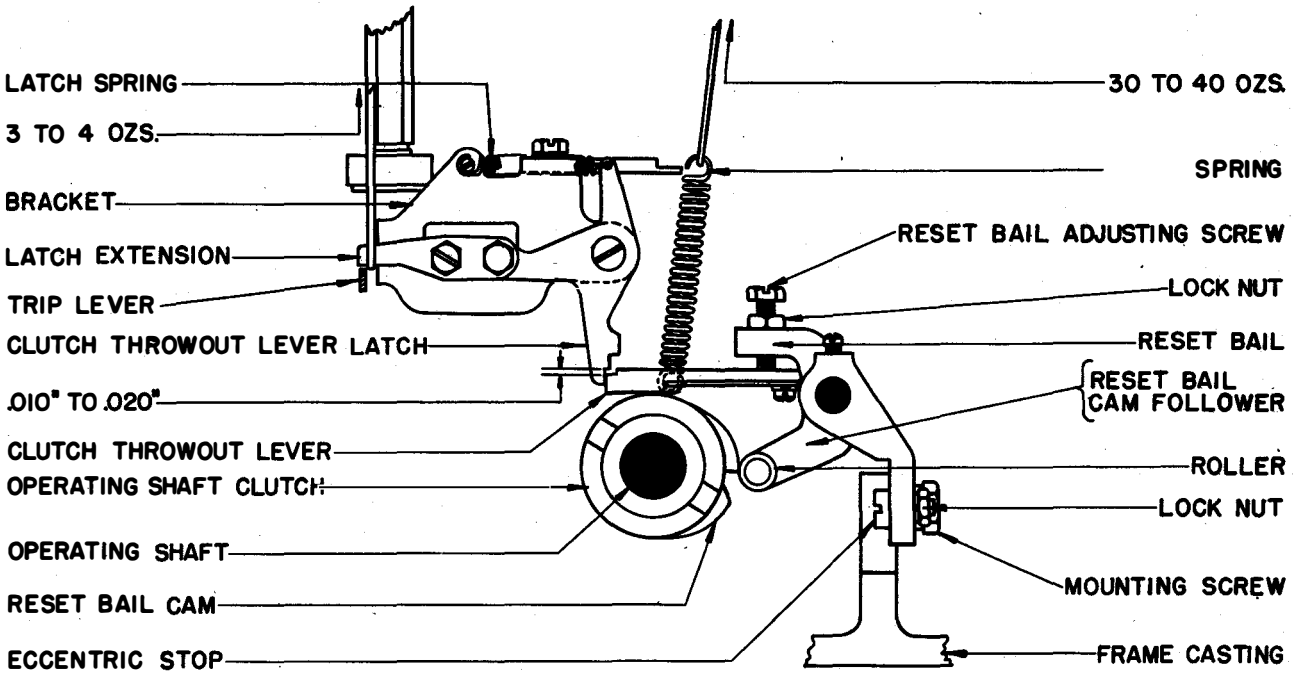

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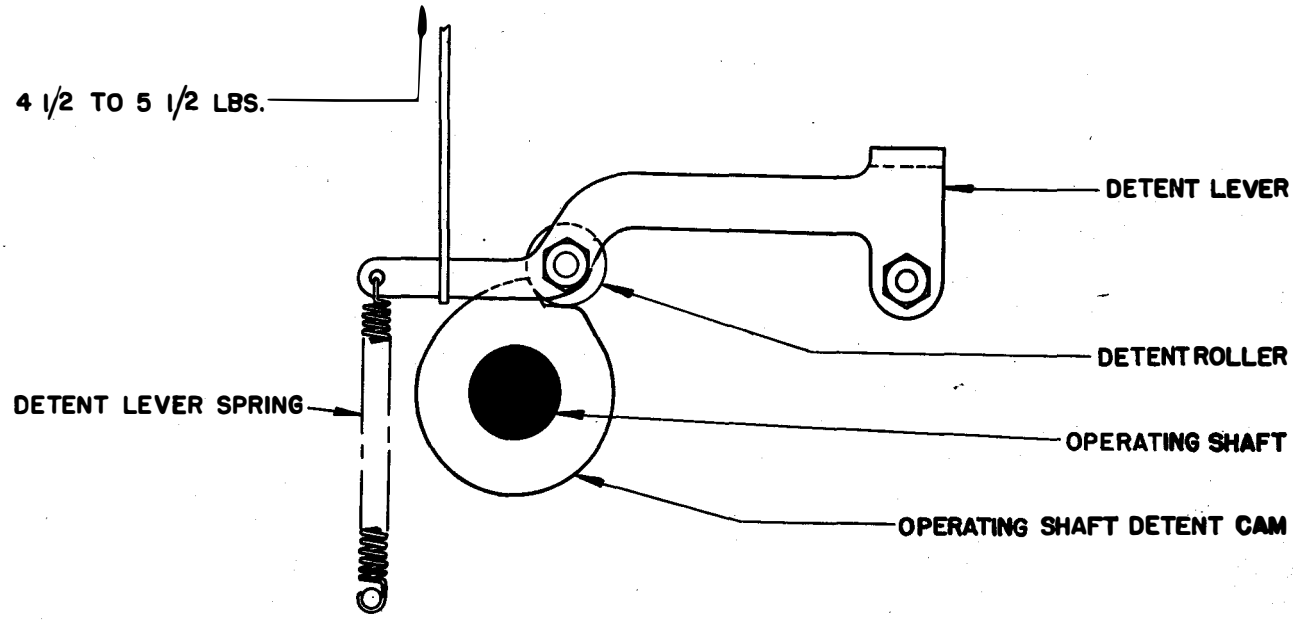

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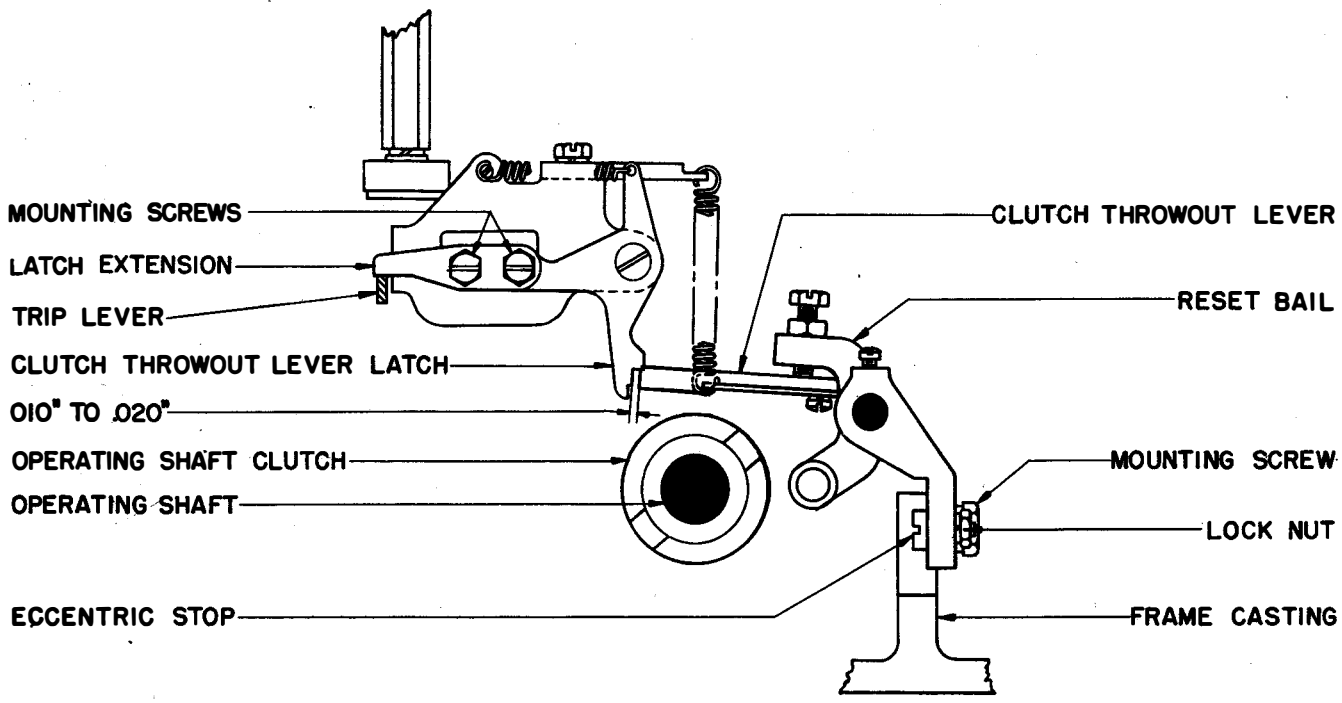

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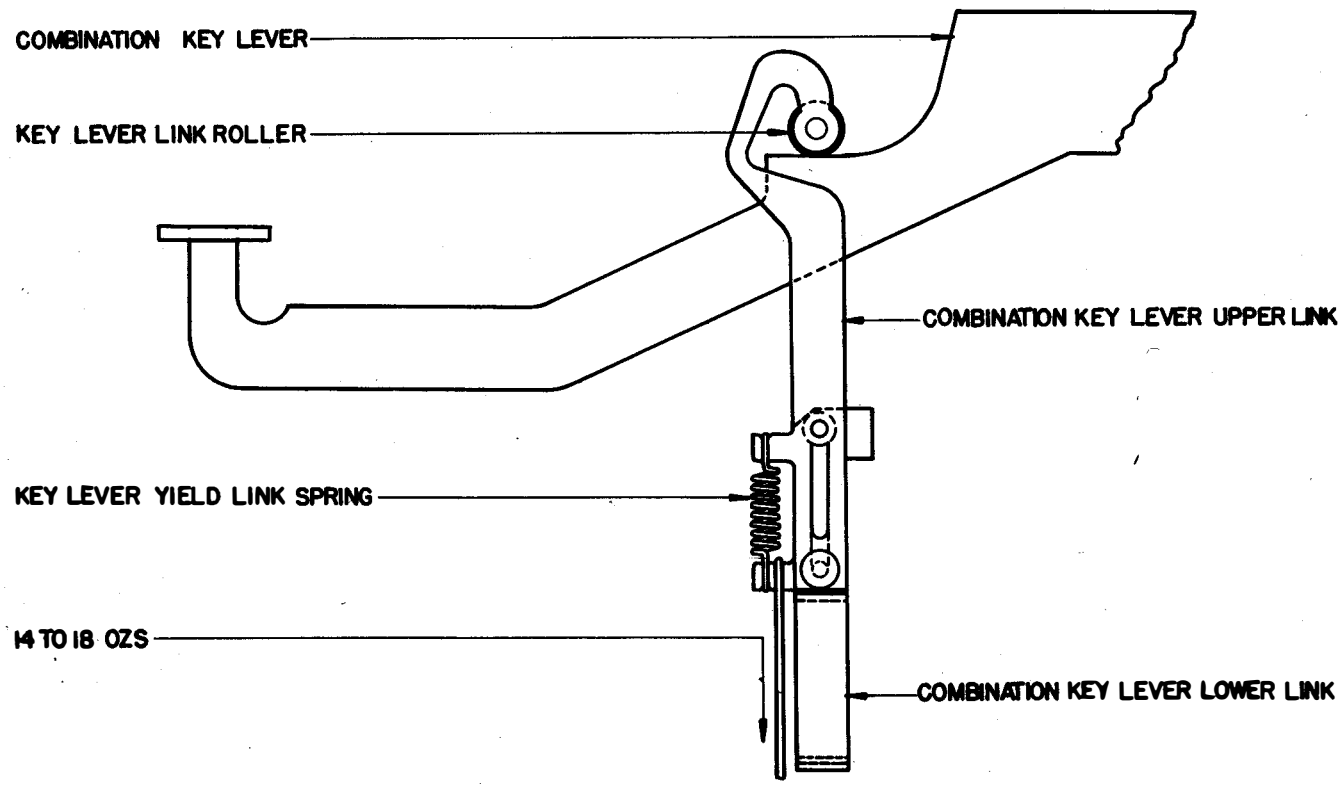

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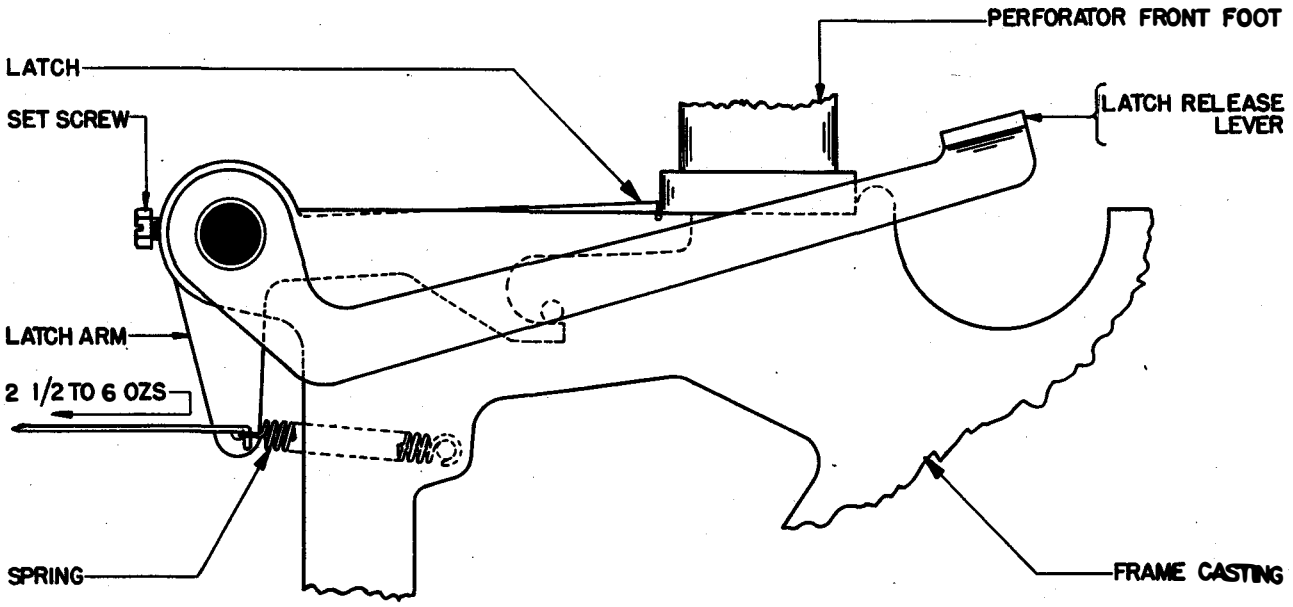


FIGURE 30

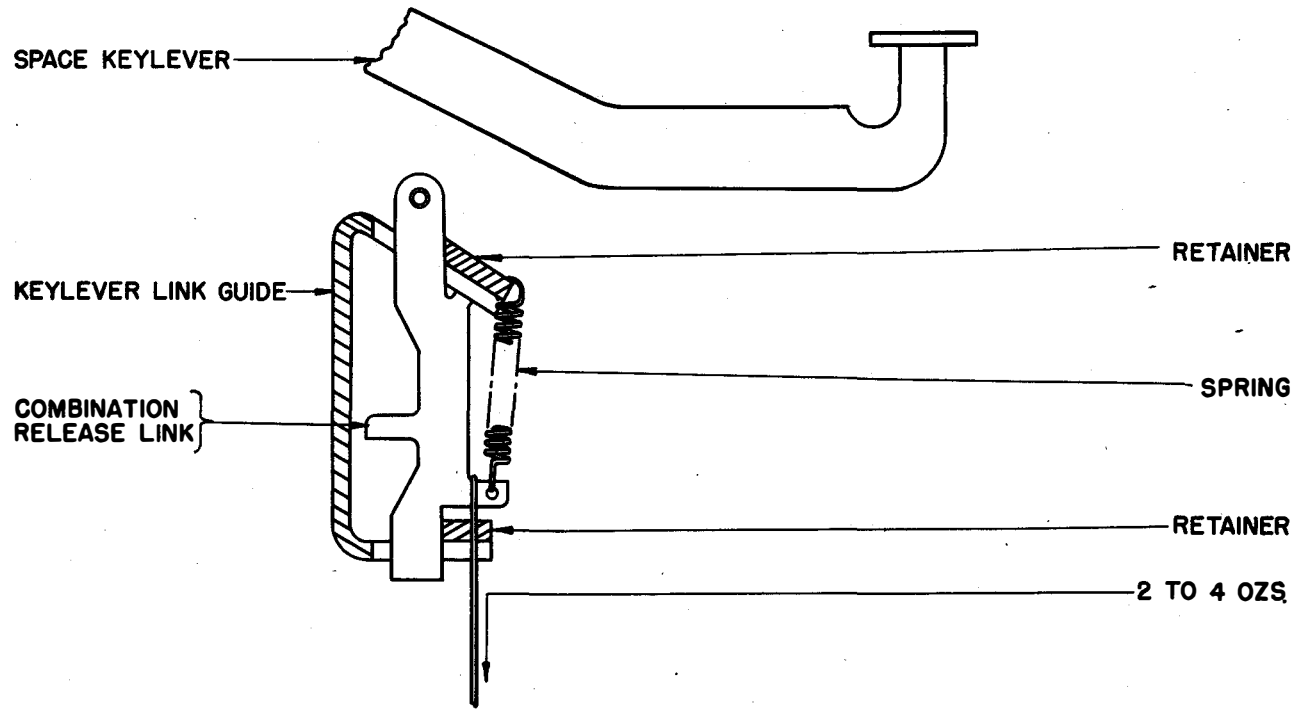
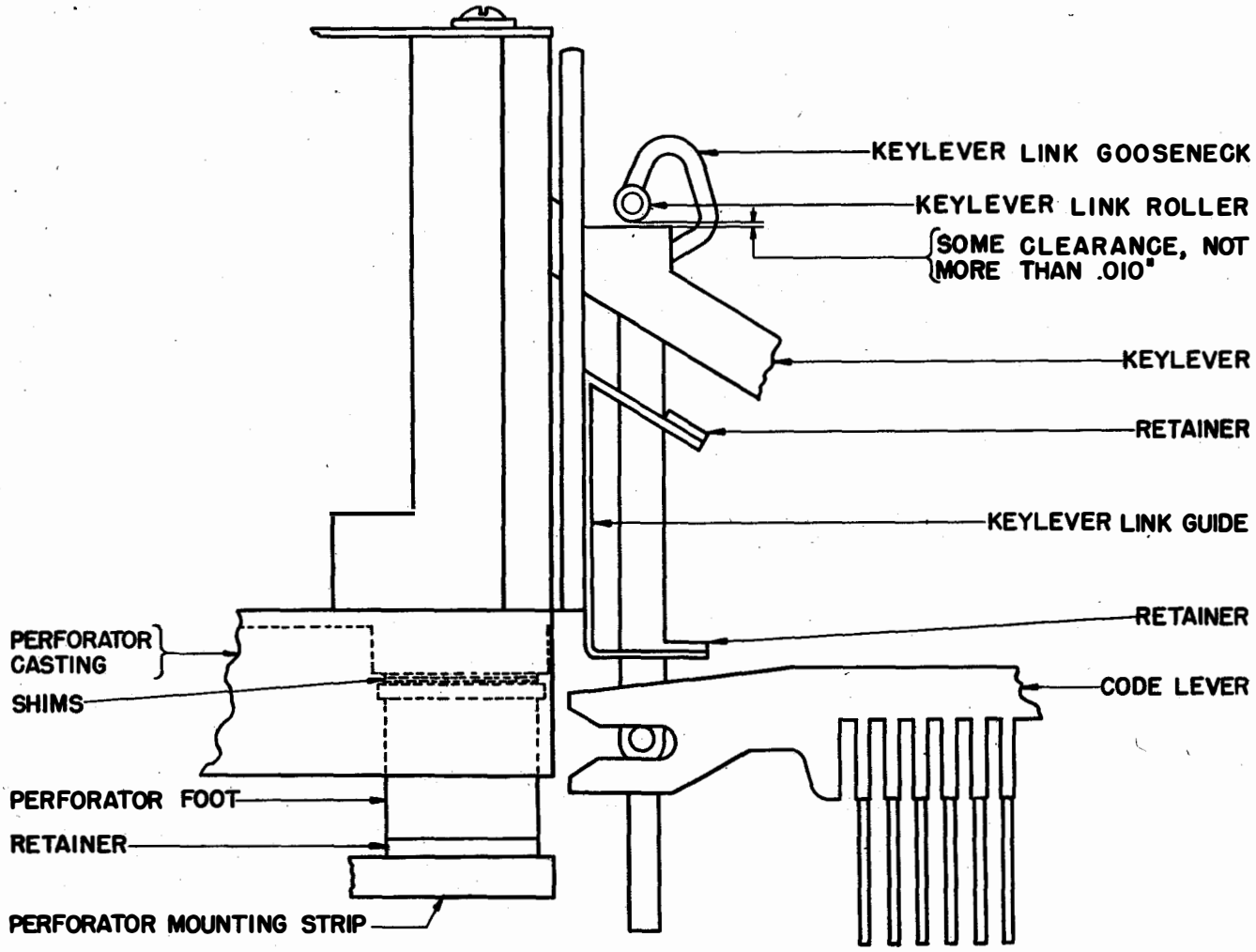


FIGURE 31



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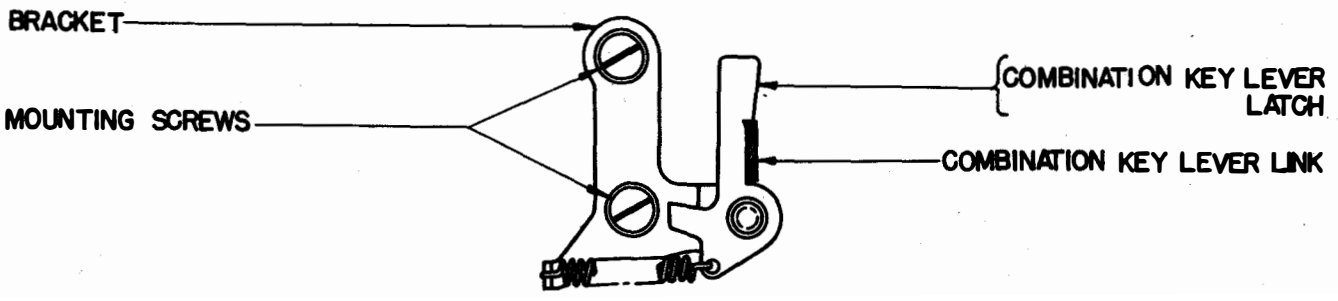


FIGURE 33

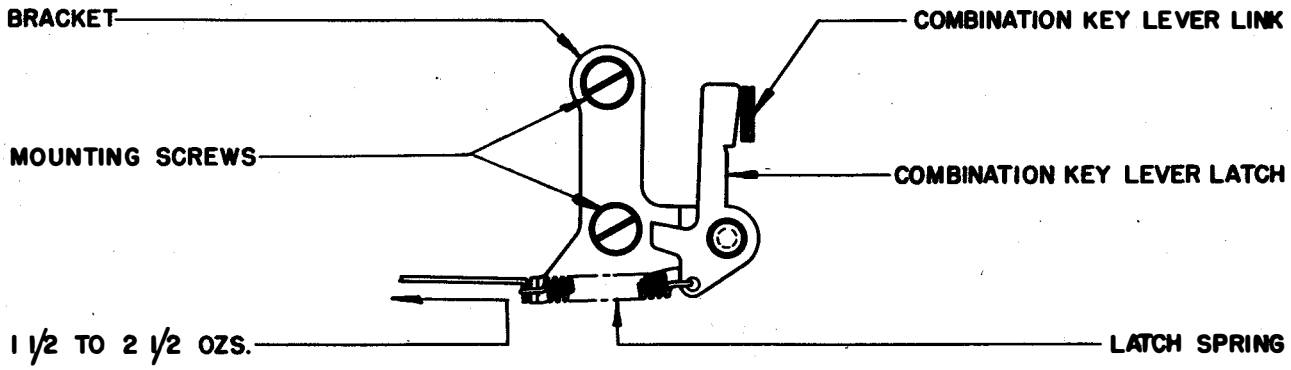
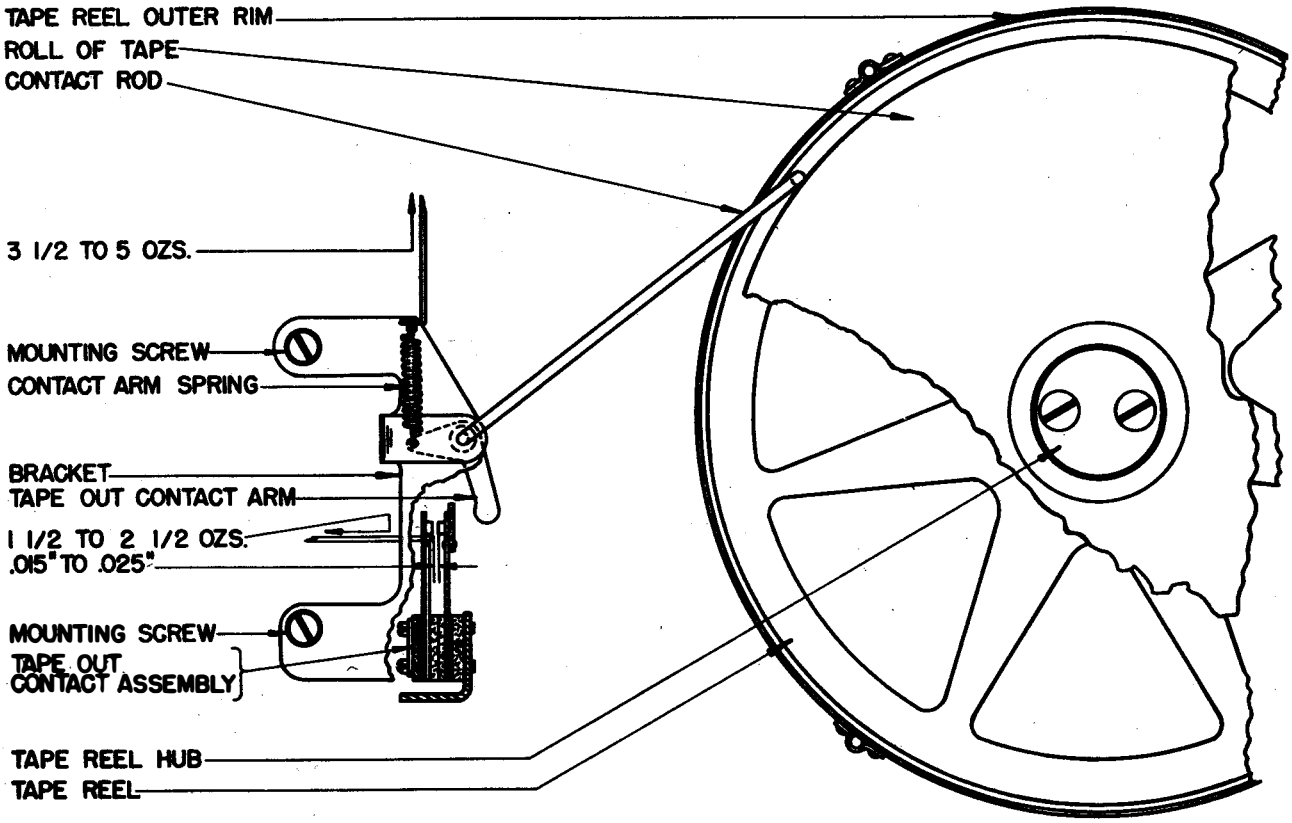


FIGURE 34



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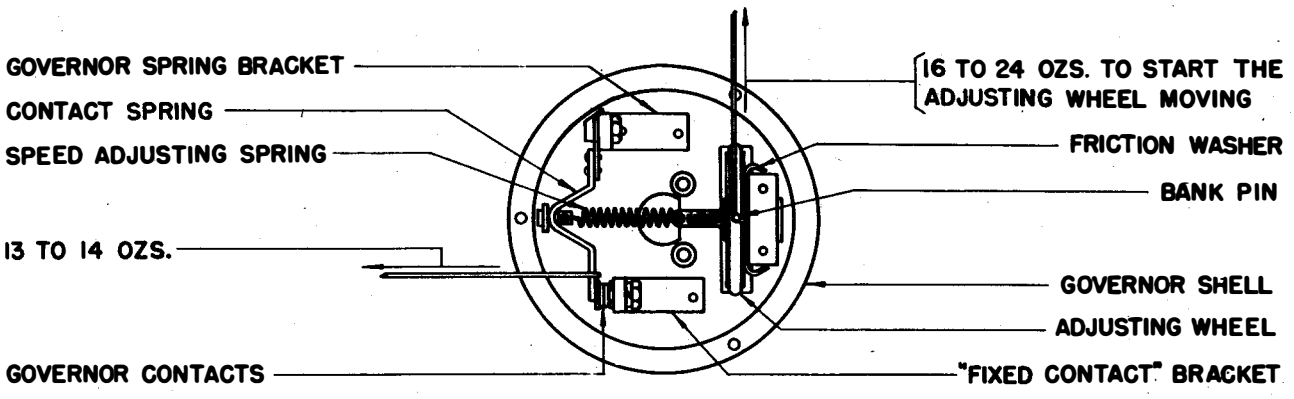

FIGURE 36

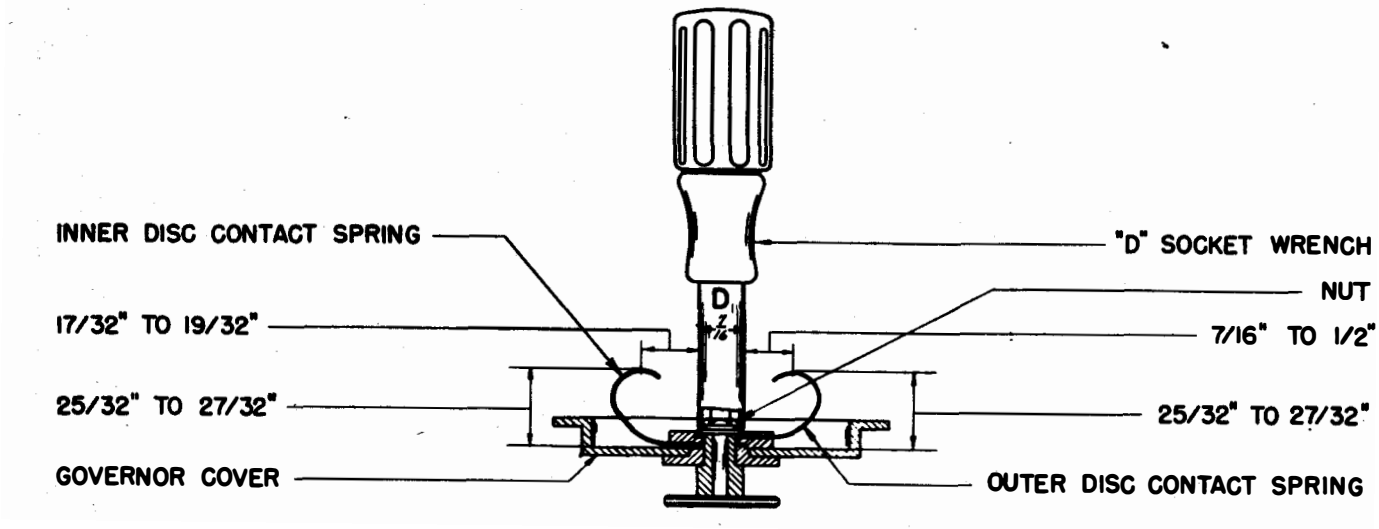

FIGURE 37

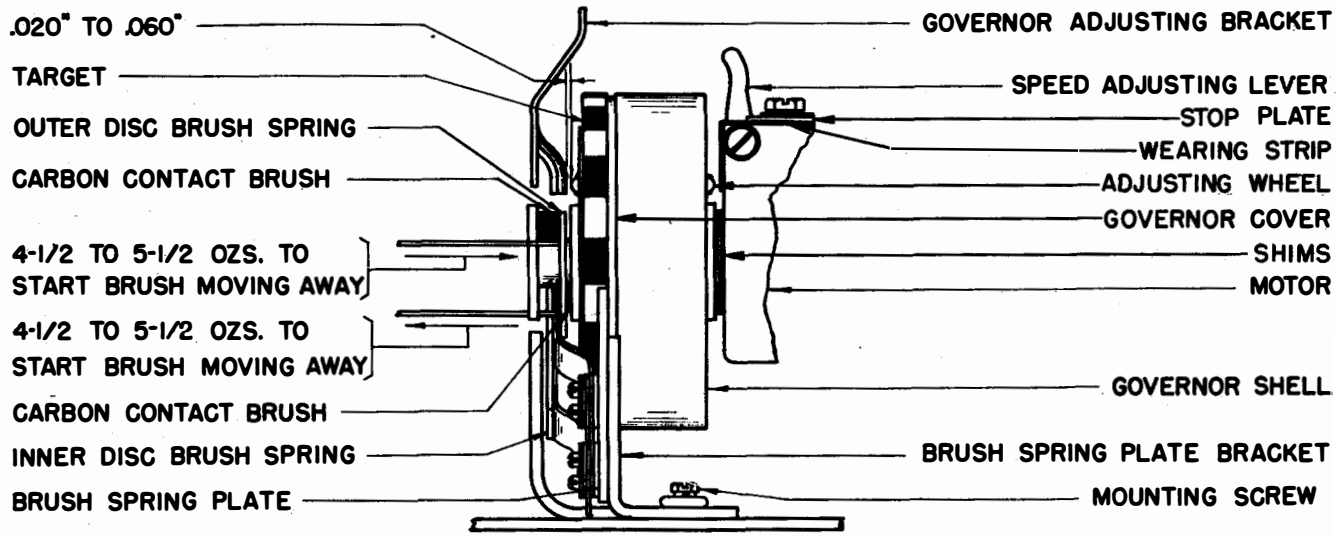

FIGURE 38

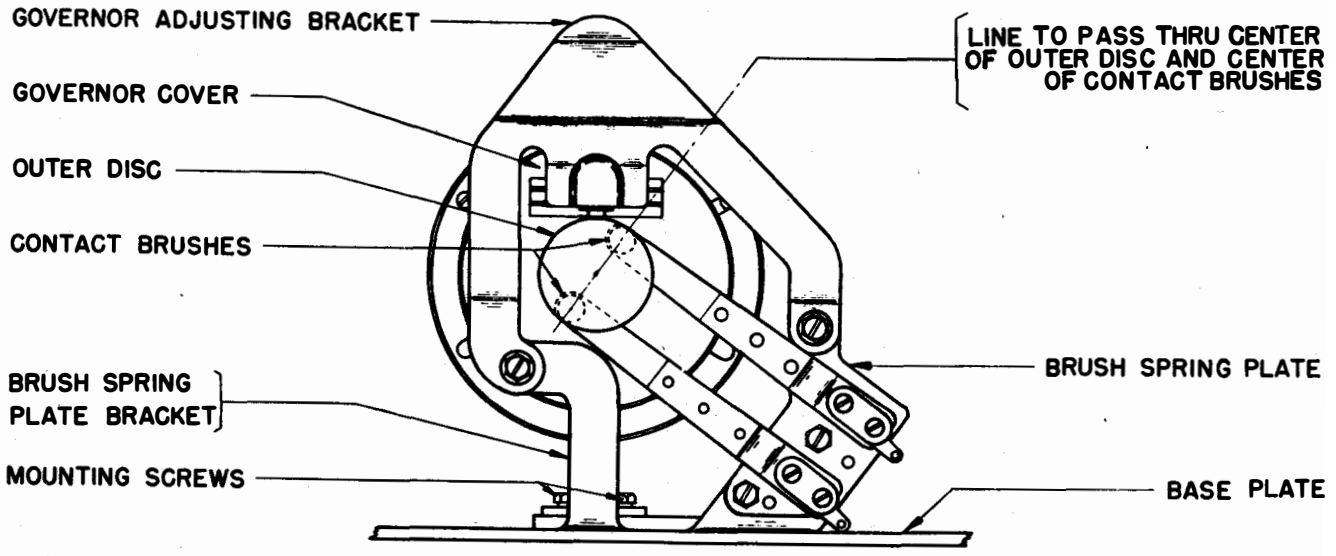

FIGURE 39

Teletype Corporation
Chicago, Illinois, U.S.A.

EE-512
Issue 1, Page 1
September, 1945

CHANGES IN BULLETIN NO. 192 (Issue 1) ADJUSTMENTS TELETYPE AUTOMATIC WHEATSTONE PERFORATOR SET

Page 5

FEED ROLL RELEASE LEVER CLEARANCE ADJUSTMENT (Figure 8):

Omit this adjustment and add the following paragraph to the FEED ROLL RELEASE LEVER CONTACT GAP ADJUSTMENT (Figure 8).

"With the feed roll release lever in its unoperated position, there should be at least .005" clearance between the camming surface of the feed roll release lever and the molded bakelite tip on the long contact spring. If necessary, refine the contact gap adjustment to obtain this clearance."

Page 8

GUIDE RAILS ADJUSTMENT

Change Section (2) of this adjustment to read as follows:

"(2) (Preliminary) Position the assembly to the right or left so that its mounting screws are approximately in the center of the enlarged mounting holes in the base plate. Tighten the assembly mounting screws. Place the guide rails tightly against the sides of the selector assembly and tighten the screws. Move the eccentric screw against the selecting assembly and tighten its mounting screw. See Figures 14 and 18 for location of parts."

Page 12

CARRIAGE RETURN - LINE FEED LATCH SPRING TENSION (Figure 23)

Change the requirement of this spring tension to read 5 to 8 ozs. instead of 8 to 12 ozs.

Page 13

UNSHIFT BELL CRANK SPRING TENSION (Figure 24)

Change the requirement of this spring tension to read 3-1/2 to 6 ozs. instead of 3-1/2 to 4-1/2 ozs.

Page 14

OPERATING SHAFT CLUTCH THROWOUT LEVER LATCH SPRING TENSION (Figure 26)

Change the requirement of this spring tension to read 4 to 6 ozs. instead of 3 to 4 ozs.

Page 15

TRANSFER BAIL ADJUSTING SCREW ADJUSTMENT (Figure 18)

Omit the note from this adjustment and add the same note to CODE BAR VERTICAL LINK BRACKET ADJUSTMENT.

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KEYLEVER LINKS AND PERFORATOR FEET SHIMS ADJUSTMENT (Figure 32)

Change Section (1) of this adjustment to read as follows:

With the perforator in its installed position on the operating unit, and the carriage return - line feed bell crank in its lower latched position, rotate the operating shaft until the code levers are resting on the code bars. Under these conditions, there should be .010" to .020" clearance between the top of each key lever and the roller on its associated keylever link gooseneck, when the play in the link gooseneck is taken up in a direction to make this clearance a maximum. To adjust, bend the gooseneck portion of the links.

Note: If this clearance exceeds .025" on the majority of keylevers, add shims between the four mounting feet and the perforator casting. Then refine the adjustment by bending the goosenecks.

* * *

Teletype Corporation
Chicago, Illinois, U.S.A.

EE-549
Issue 1
June, 1946

ADDITION TO BULLETIN 192, ISSUE 1 TELETYPE AUTOMATIC WHEATSTONE PERFORATOR SET

Page 15

Add the following adjustment immediately after the "PERFORATOR LATCH SPRING TENSION (Figure 30)":

SHIFT BELL CRANK EXTENSION ADJUSTMENT

With the shift code bar (rear bar) in the unshift (letters) position and the shift code lever resting against the code bars, but not selected, there should be some clearance, not more than .010", between the shift code lever slide and the shift bell crank extension. To adjust, loosen the bell crank extension clamping screws and position the extension. Tighten the clamping screws.

NOTE: With the shift code lever (figures) in its fully selected position, the shift bell crank should be in its fully latched position on the shift bell crank latch. If this requirement is not obtained refine the above adjustment.

* * *

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12/13/47 JMC

Teletype Corporation
Chicago, Illinois, U.S.A.

EE-553
Issue 1, Page 1
September, 1946

ADDITION TO BULLETIN 192 (ISSUE 2) ADJUSTMENTS - TELETYPE AUTOMATIC WHEATSTONE PERFORATOR SET

Add the following Wheatstone perforator pulsing unit adjustments directly after the last adjustment on page 15:

RELAY ADJUSTMENTS

(1) With the contacts held closed there should be a clearance of .002" to .004" between the armature and magnet core. To adjust, position the lower contact screw.

NOTE: If necessary, back off the armature backstop screw to provide sufficient travel of the armature.

(2) With the armature resting against the backstop nut, there should be a clearance of .010" to .015" between the contact points. To adjust, position the backstop nut.

(3) When the push end of an 8 oz. scale is applied vertically at a point on the armature just back of the backstop nut, it should require 1 to 1-1/2 ozs. to just start the armature moving. To adjust, position the armature spring bracket by means of its mounting screw.

NOTE: It will be necessary to remove the perforator from the operating unit in order to check the spring tension.

CAM OPERATED CONTACT ADJUSTMENTS

The following adjustments apply to both contact assemblies except as specified below:

(1) The cam follower should ride centrally on the cam and the contacts should be in alignment. To adjust, loosen the contact pileup mounting screws and position the assembly. Tighten the mounting screws.

(2) With the cam follower resting on the high part of the cam there should be some clearance, not more than .010", between the short contact spring and its stiffener, measured at a point closest to the contact. To adjust, bend the stiffener.

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(3) Upper Contact Assembly
With the cam follower resting on the high part of the cam, hook an 8 oz. scale over the short contact spring at the contact point and pull at right angle to the spring. It should require a pull of 2 to 4 ozs. to separate the contact points. Also the contact surfaces should meet squarely. To adjust, bend the short contact spring.

(4) Lower Contact Assembly
With the cam follower resting on the high part of the cam, hook an 8 oz. scale over the short contact spring at the contact point and pull as nearly as possible at a right angle to the spring. It should require a pull of 1-1/2 to 3-1/2 ozs. to separate the contact points. Also the contact points should meet squarely. To adjust, bend the short contact spring.

(5) With the cam follower on the low part of the cam there should be .010" to .020" clearance between the contact points. To adjust, bend the long contact spring stiffener.

(6) With the cam follower on the low part of the cam the long contact spring should exert some pressure, not over 2 Ozs., against its stiffener. Measure by hooking an 8 oz. scale under the spring at the contact point and pulling at a right angle to the spring.

(7) With the cam follower on the high part of its cam there should be at least .010" clearance between the long contact stiffener and the cam follower. If necessary to adjust, refine adjustments (2) and (5) within the limits specified.

CAM POSITION ADJUSTMENT

With the operating unit main shaft in the stop position, the line on the side of the low part of the cam should line up with the leading edge of the lower contact cam follower. To adjust, loosen its left thread lock nut and position the cam. Tighten the lock nut.

UPPER CONTACT BRACKET POSITION ADJUSTMENT

With the operating unit main shaft in the stop position, the line on the side of the high part of the cam should line up with the leading edge of the upper contact cam follower. To adjust, loosen the two contact bracket mounting screws and position the bracket. Tighten the mounting screws. Recheck upper contact adjustments.

* * *

Teletype Corporation
Chicago, Illinois, U.S.A.

EE-560
Issue 1
October, 1946

ADDITION TO BULLETIN 192 (ISSUE 1)
ADJUSTMENTS - TELETYPE AUTOMATIC WHEATSTONE PERFORATOR SET

Page 17

COMBINATION KEY LEVER LINK LATCH ADJUSTMENT

Add a third paragraph and note to this adjustment as follows:

(3) With the perforator in the installed position on the operating unit and the combination key in its fully latched position select the space combination and slowly rotate the main shaft until the keyboard contact just closes. There should be some clearance not more than .020" between the extension on the combination release link and the combination key lever latch. To adjust, loosen the combination key lever latch mounting screws and position the latch. Tighten the mounting screws.

NOTE: It is permissible to increase the clearance between the space key bar and its left link roller (by readjustment of the link) to a maximum of .045", if necessary, to meet the above requirement.

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