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**T.S.A. No. 97**  
(Issued April 1961)

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# **Model PR Seventy-five Printing Reperforator**

**PROVISIONAL  
ADJUSTMENT INSTRUCTIONS**

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AN **ITT**  
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## INTRODUCTION

This addendum provides provisional adjustment instructions for the receiver-only version of the Model Seventy-five Printing Reperforator (which bears the designation 'Model PR Seventy-five'). The adjustment instructions for the keyboard and the transmitter can be found in the Creed Instruction Book No. 75 (July 1959 issue) and its associated supplements.

All references to 'left-hand' and 'right-hand' are based on the operator's view of the machine unless stated otherwise. The Translator Unit will therefore be on the right-hand side of the machine and the punch block and motor governor on the left-hand side.

The checks and adjustments which are given on the following pages should be carried out with the mechanism in the rest position, unless specifically stated otherwise. The 'rest position' can be defined as being when the selector and translator clutches are held against their detents by their respective retention rollers, when all the pins in the pin box have been set to the space position and when the run-out clutch (if fitted) is against its detent.

## MACHINE ADJUSTMENTS

### 1. Pecker Retention Arm (Figs. 1, 3 and 5)

#### (a) Horizontal Position

##### Check

- 1.1 Move the electromagnet to the 'spacing' position so that the clutch detent is released, and turn the machine by hand until trigger L, Fig.3, on the selector unit clutch, is clear of the detent A.

Check that there is a clearance of .005 - .010 in. (.13 - .25 mm.), i.e. dimension 'd', Fig.5, between the hook of retention arm A and the engagement face of lever E, when the lever is on one of the high points of its cam.

##### Action

- 1.2 If this is not so, slacken screws C (visible from the rear of the machine) until friction tight, and by means of the screwdriver slots B in the top of the bracket, move retention arm A until the correct clearance is present. Tighten screws C.

#### (b) Vertical Position

##### Check

- 1.3 Move the electromagnet armature to the 'marking' position, turn the machine by hand and check that lever E, Fig.5, passes over retention arm A with a clearance of .020 - .025 in. (.51 - .64 mm.).

##### Action

- 1.4 If adjustment is necessary, slacken rockshaft stop arm screw K, Fig.3, hold the electromagnet armature in the 'marking' position, slacken screws C, Fig.1, and position armature extension D until the correct clearance is achieved. Reposition rockshaft stop arm B, Fig.3, and tighten screws K and C.

### 2. Selector Unit Detent Clearance (Figs. 3 and 4)

##### Check

- 2.1 Slacken rockshaft stop arm screw K, Fig.3, and move the electromagnet armature to the 'spacing' position and check that there is a clearance of .005 - .010 in. (.13 - .25 mm.) i.e. dimension 'a' Fig.3 (Inset), between clutch trigger L and detent A. If this is so, reposition rockshaft stop arm B and tighten screw K.

##### Action

- 2.2 If necessary, slacken screw M, Fig.4 and, ensuring that the electromagnet armature remains at 'space', position detent A until dimension 'a', Fig.3, is set up. Tighten screw M, Fig.4. Reposition rockshaft stop arm B, Fig.3, and tighten screw K.

### 3. Camshaft Retainer (Figs. 3 and 4)

##### Check

- 3.1 Ensure that trigger L, Fig.4, is resting against the detent A and check that there is a clearance of .006 - .010 in. (.15 - .25 mm.), i.e. dimension 'c' (Inset), between the trigger L and backstop P.

##### Action

- 3.2 If this is not so, slacken capstan-headed clamp screw D, Fig.3, slightly, push the retaining lever C inwards so that the cam assembly moves clockwise (viewed from the front of the machine) and the backstop P, Fig.4 presses trigger L against detent A. Now gently move the cam assembly back until dimension 'c' is set up. Tighten screw D, Fig.3.

#### 4. Rockshaft End Play (Figs. 3 and 4)

##### Check

- 4.1 Check that there is a maximum of .003 in. (.08 mm.) end play on rockshaft N, Fig.4 and, with the latter set to 'mark', check that the pin on rockshaft stop arm B, Fig.3, is touching the edge of the unit end plate.

##### Action

- 4.2 If necessary, slacken screw K until friction tight and position rockshaft stop arm B so that the correct end play is present. Then, with the rockshaft set to 'mark', and taking care not to upset the end play turn stop arm B on the shaft until the pin just touches the edge of the unit end plate. Tighten screw K.

#### 5. Trip Operating Lever Stop (Fig.3)

##### Check

- 5.1 With the machine at rest, i.e. with the camshaft retainers on the selector and translator units engaged fully in their cams, check that trip operating lever G is against its stop and that there is a clearance of .003 - .010 in. (.08 - .25 mm.) i.e. dimension 'b', between the pin on trip link J and the bottom of the slot in bracket H.

##### Action

- 5.2 To adjust, slacken screws F until friction tight. Raise stop E as far as it will go. Pull trip link J forward against its guides and press down so that the pin on the link is at the bottom of the slot in bracket H. Maintaining this condition, measure the clearance between stop E and the surface of the unit base plate with a feeler gauge. Add a further .003 in. (.08 mm.) to the feeler gauge and re-insert between stop E and the base plate. With this increased dimension set up, tighten screws F. Dimension 'b' should now be present.

#### 6. Translator Unit Trip (Figs. 3 and 7)

##### Check

- 6.1 Lift trip link J, Fig.3, so that it engages the detent operating lever P, Fig.7, and press the link down as far as it will go. Check that, with this condition set up, the translator clutch detent is clear of the clutch trigger by 1/64 in. (.4 mm.). (This clearance is similar to dimension 'a', Fig.3).

##### Action

- 6.2 Adjust by slackening capstan-headed screw Q, Fig.7, and positioning plate N. Tighten screw Q when the correct clearance is achieved.

#### 7. Starter Trip from Electromagnet (Figs. 6 and 10)

##### Check

- 7.1 Disengage the pin on block B from wheel C, Fig.6, and depress starter beam J, Fig.10, down as far as it will go. Holding the beam in this position and with the electromagnet armature against the 'marking' stop, check that there is a clearance of no more than .006 in. (.15 mm.), i.e. dimension 'k', Fig.10, between rockshaft peg L and starter operating link O.
- 7.2 Move the electromagnet armature to the 'spacing' position and check that this action causes peg L to trip link O.

##### Action

- 7.3 If this is not so, slacken the two screws M and, with the armature in the 'marking' position, move bracket N by means of the screwdriver slots until the above conditions are satisfied. Tighten screws M.

#### 8. Selector and Translator Unit Clutch Backstop (Fig.2A)

##### Check

- 8.1 Lift the selector clutch detent and turn the machine by hand until the clutch trigger mechanism is freely accessible. Insert a short 8BA screw (represented in

the figure by S) into the hole in the clutch frame R, and turn the screw until resistance is felt. (This is the 'pick-up' point, where toggles J are beginning to expand the clutch bands L).

- 8.2 Continue to turn screw S and check that both toggles J start to move simultaneously.
- 8.3 Check also that from the 'pick-up' point mentioned above, there is a clearance of .035 - .040 in. (.90 - 1.02 mm.) i.e. dimension 'ca', between the trigger H and the backstop.
- 8.4 Lift the translator clutch abutment and carry out checks 8.1 to 8.3 above with respect to the translator clutch. In this case the clearance between the trigger H and the backstop should be .040 - .045 in. (1.02 - 1.15 mm.). If no adjustment is required, remove the 8BA screw S.

**Note:** After removing screw S, check that there is at least .010 in. (.25 mm) free movement in both the selector and translator unit clutch triggers. If there is not, dimension 'ca' must be reduced until this condition is achieved.

#### Action

- 8.5 If adjustment is required, the following procedure should be adopted:-
  - (a) Slacken the locknuts of eccentric pivots K and turn the latter until toggles J are in their maximum outward position, i.e. clutch bands L are in full contact with the clutch drum.
  - (b) Slacken nut P. Turn screw Q anti-clockwise a turn or two, then clockwise until resistance is felt. (This is the point where clutch bands L are being pushed against the clutch drum). Now turn screw Q anti-clockwise 1/8 of a turn (45°) so that the bands are just clear of the drum and clamp screw Q in this position with nut P.
  - (c) Insert a short 8BA screw (S in the figure) into the hole in frame R and turn the screw until trigger H is hard up against frame R. Now turn screw S 1/4 turns in an anti-clockwise direction.
  - (d) With the trigger thus positioned, turn eccentric pivots K (using the outer range of throw) until toggles J are 'bottomed' in the 'V's of the trigger H. Tighten the locknuts of pivots K. *Remove screw S.*
  - (e) If the two eccentric pivots K are seriously unbalanced i.e. one is at the limit of its adjustment, it may be necessary to remove clip M and re-orientate the eccentric trunnion block which is located on pivot N. If this should prove necessary, the adjustment procedure set out in sections (a), (b), (c) and (d) should be repeated with the trunnion block in its new position.

### 9. Starter Trip from Translator Clutch (Figs. 6 and 8)

#### Check

- 9.1 Lift the abutment on the translator unit clutch so that the clutch is tripped and allow the detent to rest on top of the trigger. In this condition there should be a gap of .005 - .010 in. (.13 - .25 mm.), i.e. dimension 'f', Fig.6, between starter wheel C and the pin on arm B.

#### Action

- 9.2 To adjust, slacken screw A, Fig.8, which clamps the fork lever B, and turn the trip shaft C until the correct clearance is obtained. Tighten screw A.

### 10. Traverse Multiplying Lever Pivot (Fig.12)

**Note:** The adjustment is applicable to keyboard machines only. In the case of receiver machines the pivot should be clamped in its mid-position.

#### Check

- 10.1 Check that, with the translator pin box in either position, the ends of the selector frames are in alignment with the pins.

#### Action

- 10.2 To adjust, slacken nut D and nut B, and move the pivot of multiplying lever A to suit both positions of the pin box. Tighten nut B and carry out adjustment 9 before tightening nut D.

### 11. Traverse Multiplying Lever Stop Pin (Fig.12)

#### Check

- 11.1 Set the machine up so that it is at rest with the translator unit pin box in its forward position, i.e. nearest the front of the machine.
- 11.2 Lift the translator unit clutch abutment and turn the machine by hand until the function bars are released.
- 11.3 Lightly pull the traverse multiplying lever A outwards so that any backlash in the system is taken up. Check that there is a clearance 'l' (inset) between the rear end of the slot in lever A and pin C.
- 11.4 Return the machine to the rest position. Lift the translator unit clutch abutment and turn the machine by hand until the function bars are released.
- 11.5 Lightly push the traverse multiplying lever A inwards so that the backlash in the system is taken up. Check that a clearance equal to dimension 'l' now exists between pin C and the front end of the slot in lever A.

#### Action

- 11.6 If necessary, slacken nut D and position pin C until both of the above conditions are satisfied. Tighten nut D.

### 12. Pecker Clearance (Figs. 5 and 13)

#### Check

- 12.1 Lift the translator abutment and turn the translator shaft through two complete revolutions to reset all pins in the pin box to the space condition. Return the shaft to the rest condition and check that all pins have been reset.
- 12.2 Move the electromagnet to space. Turn the machine by hand until the pecker is opposite the first (inner) pin, and striker lever E, Fig.5, is held from following its cam by the hook of retention arm A.
- 12.3 Lightly press pecker L, Fig.13, towards pin G to take up any play that may be present and check that the pecker is clear of the pin by an estimated  $1/32 - 3/64$  in. (.8 - 1.2 mm.), i.e. dimension 'm'.
- 12.4 Repeat this procedure with the pecker opposite the fifth (outer) pin, i.e. at the other end of the traverse.

#### Action

- 12.5 If adjustment is necessary, remove the keyboard (if fitted), and stand the machine on its back. Disconnect pecker frame return spring K, Fig.13, slacken nuts J until friction tight, and, whilst ensuring that the striker driven arm is against the striker lever in the selector unit, position pecker frame H on its shaft until the correct clearance is present at both ends of the traverse. Tighten nuts J, reconnect pecker frame return spring K and replace the keyboard (if fitted).

### 13. Pecker Traverse (Fig.12)

#### Check

- 13.1 Lift the detent on the selector unit, move the electromagnet armature to 'mark' and turn the machine slowly by hand. Check that each pin is struck by the pecker and that the area of contact between the pecker and pins is as great as possible over the complete traverse.
- 13.2 Repeat this check with the pin box in its alternative position.

Action

- 13.3 Adjust, if necessary, by slackening screws F and moving traverse pivot bracket E until the above conditions are satisfied for both sets of pins. Tighten screws F.

14. Typehead Carriage End Play (Fig.25)

Check

- 14.1 Check that there is a maximum of .005 in. (.13 mm.) end play on the typehead carriage E.

Action

- 14.2 If the end play is excessive, remove screws J, hold the carriage so that the gears and racks remain in mesh and lift off bracket K. Add shims No.2003/277 (.005 in.) as necessary between the bracket and carriage until the end play is below the above limit. Replace screws J.

Note: Bracket K should always be clamped in its extreme left-hand position (viewed from the front of the machine).

15. Print Spring (Figs. 27 and 106)

Check

- 15.1 Stand the machine on its back and check that a force of approximately 3 lb. (1.36 kg.) applied to the print beam L, Fig.27, at F just moves the beam.

Action

- 15.2 To adjust, slacken locknut A, Fig.106, and turn screw B until the correct tension is present. Tighten Locknut A.

16. Typehead/Platen Clearance (Figs. 27 and 30)

Check

- 16.1 Set up the letter 'X' combination (1-345) on the pins. Lift the translator unit abutment and turn the machine by hand until the print lever K, Fig.30, is on the highest point of its cam (just prior to fall off). Check that, with the machine in this condition, there is a clearance of approximately ½ in. (12.7 mm.), i.e., dimension 'aa', Fig.27, between the typehead M and platen N.

Action

- 16.2 Continue to turn the translator shaft until the typehead moves forward to print. Turn the machine on its back and remove screw J and retainer plate K from the vertical link block G. Disconnect print beam L from block G and slacken locknut H. Turn block G clockwise to increase or anti-clockwise to decrease dimension 'aa'. Re-connect print beam L to block G and re-fit retainer plate K and screw J.

- 16.3 Re-check dimension 'aa' and repeat the procedure if necessary until the dimension is set up. Tighten locknut H.

17. Print Beam Stop Screw

Check

- 17.1 With the typehead forward in the printing position, check that there is a clearance of 5/32 - 7/32 in. (4.0 - 5.6 mm.) between the platen and typehead.

Action

- 17.2 If this is not the case, turn the machine on its back and disconnect the print spring. Add or remove shims No. PW.5199 (.005 in.) as necessary under the print beam stop screw until the above dimension is satisfied. Re-fit the print spring.

18. Corrector Lever (Figs. 32 and 108)

Check

- 18.1 With the typehead forward in the printing position, gently push the typehead towards the platen and check that the corrector lever, Fig.32, is fully engaged

with the corrector wheel when the typehead is within  $7/64 - 1/8$  in. (2.8 - 3.2 mm.) of the platen.

Action

- 18.2 If this condition is not present, it will be necessary to adjust screw A, Fig.108, which is located on the perforator unit casting, until the condition is satisfied.

19. Typehead Corrector (Figs. 25, 32 and 35)

Note: When pushing the typehead against the platen to check printing, push the typehead casting and not the actual typehead.

Check

- 19.1 With the typehead forward in the printing position, press the typehead against the platen and check that the letter 'X' thus printed is equal in density on both sides of the character. (N.B.: Differences in density between the upper and lower legs should be ignored at this point).

Action

- 19.2 If necessary, slacken screw H, Fig.32, and turn the eccentric pivot of corrector lever E until the letter 'X' is correctly positioned. Holding the pivot in this position with a spanner, tighten screw H, Fig.32.

Check

- 19.3 Pull the typehead back so that the corrector is out of engagement, and check, by attempting to turn the typehead, that the backlash is equal in both directions.

Action

- 19.4 If necessary, slacken nut H, Fig.25, and turn the typehead clockwise or anti-clockwise until the backlash is equal in both directions. When this condition is satisfied, insert a tommy pin into hole G, Fig.35, and, holding the spline shaft with the pin, tighten nut H, Fig.25.

20. Ink Ribbon Unit Pawls (Figs. 28 and 30)

Check

- 20.1 Remove the ink ribbon spools.
- 20.2 Set up any print character on the pins, trip the translator clutch and turn the machine by hand until print lever K, Fig.30, is on the highest point of its cam. With the machine in this condition check that there is a clearance of  $1/2$  to  $3/4$  of the teeth pitch, i.e. dimension 'ac', Fig.28 (inset B), between retention pawl S and a tooth of ratchet wheel Q.

Action

- 20.3 To adjust, slacken screws R, move the pawl mounting bracket until dimension 'ac' is set up and tighten screws R.

Check

- 20.4 Continue to turn the machine by hand until the print operation takes place and, holding the typehead against the platen, check that feed pawl P is resting in a tooth of ratchet wheel Q, and is clear of the next tooth by  $1/4$  to  $1/2$  of the teeth pitch, i.e., dimension 'ab', Fig.28 (inset A). Replace the ink ribbon spools unless action is required.

Action

- 20.5 If adjustment is necessary, slacken screw T (accessible through the right-hand unit side-plate), and turn eccentric U until dimension 'ab' is set up. Clamp eccentric U in this position with screw T and replace the ink ribbon spools.

21. Ribbon Jumper (Figs. 25 and 107)

Check

- 21.1 Set up any printing character (preferably on the top row of the typehead), trip the translator clutch and turn the machine by hand until the printing operation



takes place. Press the typehead against the platen and check that the upper edge of the ink ribbon is approximately 1/32 in. (.8 mm.) above the type which is in contact with the platen.

Action

- 21.2 Adjust the height of the ribbon jumper if necessary, by slackening screws D and re-positioning the jumper arm Q, Fig. 107. Tighten screws D.

22. Typehead Height - Initial Setting (Figs. 25 and 35)

Check

- 22.1 Set up the letter 'K' combination (1234-) on the pins, trip the translator unit clutch and turn the machine by hand until the printing operation has taken place and the aggregate motion levers have ceased to move. Push the typehead against the platen and observe whether the density of the 'K' thus printed is equal at the top and bottom of the character.

Action

- 22.2 If this is not so, slacken nut L, Fig.25, until friction tight, insert a tommy pin into hole D, Fig.35, and turn the spline shaft until the correct height is set up. Hold the spline shaft with the tommy pin and tighten nut L, Fig.25.

23. No.5 Aggregate Motion Lever (Fig.36)

Check

- 23.1 With the machine set up as in Instruction 22.1, pull the typehead back so that the corrector is out of engagement and check, by attempting to turn the typehead, that the backlash is equal in both directions.

Action

- 23.2 If necessary, slacken screw J on No.5 bellcrank lever H (nearest the front of the machine) until friction tight, and adjust the pivot until the backlash is equal in both directions.

24. No.4 Aggregate Motion Lever

Check

- 24.1 Set up the letter 'Q' combination (123-5) on the pins, trip the translator unit clutch and turn the machine by hand until the printing operation has taken place and the aggregate motion levers have ceased to move.
- 24.2 Pull the typehead back so that the corrector is out of engagement, and check, by attempting to turn the typehead, that the backlash is equal in both directions.

Action

- 24.3 If this is not so, adjust the pivot of No.4 bellcrank lever until the correct condition is set up.

25. No.1 Aggregate Motion Lever

Check

- 25.1 Repeat the above procedure, selecting the letter 'V' (-2345).

Action

- 25.2 Adjust the pivot of No.1 aggregate bellcrank lever.

26. No.3 Aggregate Motion Lever

Check

- 26.1 Repeat the above procedure, selecting the letter 'B' (1--45).

Action

26.2 Adjust the pivot of No.3 aggregate bellcrank lever.

27. Typehead Height - Preliminary Setting (Figs. 29 and 36)

Check

27.1 Set up the letter 'K' (1234-) on the pins, trip the translator clutch and turn the machine by hand until the printing operation takes place and the aggregate motion levers cease to move. Press the typehead against the platen so that letter 'K' is printed.

27.2 Repeat this procedure, selecting letter 'X'. Check that the character is equal in density at the top and bottom, and that it is in line with the letter 'K' printed immediately before.

Action

27.3 Adjust by slackening the pivot screw J, Fig.36, of No.2 aggregate bellcrank and raising or lowering the pivot in its slot until the correct typehead height is achieved. Tighten screw J.

Check

27.4 Move shift lever A, Fig.29, to the 'Figures' position, i.e. to the right looking from the rear of the machine. Set up the letter combination corresponding to figure '8', trip the translator unit clutch and turn the machine by hand until the printing operation has taken place and the aggregate motion levers have ceased to move. Press the typehead against the platen and check that the printed character is equal in density at top and bottom and is in line with the letters 'K' and 'X' previously printed.

Action

27.5 Adjust by slackening the pivot screw of the shift bellcrank lever H, Fig.29 (similar to pivot screw J, Fig.36), raising or lowering the pivot in its slot until the correct typehead height is achieved and clamping in this position.

28. Motor Speed

Check

28.1 Ensure that the gears fitted are suitable for the operating speed of the machine.

28.2 Switch on the machine and allow it to run with both clutches latched up. Using Fork Stroboscope No. TA.1117/140, check that the motor is running slightly fast.

28.3 Transmit character '5' (Figs. Shift, ----5) into the machine at cadence speed. Observe that the motor is running slow by an amount similar to the 'fast' error noted in Instruction 28.2.

Note: This procedure checks the motor speed under minimum and maximum load conditions, as the load varies depending upon the combination set up on the pins.

Action

28.4 Adjust the governor by means of the screw visible through the governor cover, until conditions 28.2 and 28.3 are satisfied.

29. Selector Camshaft Retainer - Final Check (Fig.4)

Check

29.1 Trip the selector clutch several times and check that when the clutch comes to rest there is still some clearance between the clutch trigger L and its back-stop, P, i.e. dimension 'c'.

Action

29.2 If this is not so, refine adjustment 3.2.

### 30. Typehead Height - Final Check

#### Check

- 30.1 Print a line consisting of all characters on the top level of the typehead. Then print alongside a line consisting of all second level characters. Print a further line of top lever characters and, using these as a reference, check that the second level is at the correct height. Check also that the upper and lower legs of the characters are of equal density.
- 30.2 Repeat this procedure with each level in turn, using the top level as a reference.

#### Action

- 30.3 If this is not so, refine adjustment 27 and, if necessary, adjustment 22.

Note: On later machines, a stop block, mounted between the narrow and wide rack guides, can be used to eliminate any tendency for the 4th layer to lift too high, by limiting the backward movement of the lift rack.

### 31. Starter Switch Timing (Figs. 6, 10 and 11)

Note: The starter switch may be adjusted to give a delay of between 60 and 110 seconds at 50 bauds, or 40 to 75 seconds at 75 bauds, from the receipt of the last signal to the switching off of the motor. These values are minimum values, i.e. assuming that the pin on block B, Fig.6, is picked up immediately by a feed hole in starter wheel C. Therefore, the actual delays will, in general, be greater than this, depending upon the position of the starter wheel when the last character is received.

#### Check

- 31.1 Ensure that the plate on link Q, Fig.11, is in the correct position for the operating speed of the machine, i.e. fully raised on 45.5 and 50 baud machines, and fully lowered on 75 baud machines.
- 31.2 If this is not so, slacken screws P and raise or lower the plate as necessary. Tighten screws P.
- 31.3 Ensure that the machine is in the rest condition, i.e. with both clutches latched up. Disengage the pin on block B, Fig.6, from starter wheel C and allow the right-hand end of starter beam J, Fig.10, to rise as far as it will go.
- 31.4 Run the machine or turn it over by hand until the starter pin on block B, Fig.6, drops into a feed hole on starter wheel C.
- 31.5 From this point, run the machine and check that the motor switches off after the required delay.

#### Action

- 31.6 If necessary, adjust the delay as follows:-
  - (a) Slacken the locknut of screw R, Fig.11, and unscrew it as far as possible.
  - (b) Repeat 57.3 and 57.4.
  - (c) From this point, run the machine until the required moment of switch-off is reached and switch off the machine.
  - (d) Steady link Q, Fig.11, and turn screw R until the microswitch under the main base just operates. Clamp screw R with the locknut.

### 32. Punch Link Setting (Fig.109)

#### Check

- 32.1 With the machine in the rest position, ensure that cam rollers B and C are touching their respective cams.

Action

- 32.2 If this is not so, tilt the machine on its back, slacken the nut behind roller C (accessible through a hole in the base casting) and turn eccentric A until the correct condition is obtained. Tighten the nut.

33. Selector Levers (Figs. 110 and 111)

Check

- 33.1 Turn the machine to the rest position and check that the blocks F, Fig.111, are against pin H. Operate the "T" key (code ----5) if the machine is fitted with a keyboard. If the machine has no keyboard, set the 5th element pin in the pin box to the mark position. Lift the translator detent and turn the machine through about half a revolution of the translator camshaft and check that the 5th element punch selector lever D, Fig.110 (the bottom one), just covers punch E, as shown in the inset.

Action

- 33.2 If necessary, slacken the socket-headed grub screw G, Fig.111, and slide the cable sleeve in or out until the required condition is obtained. Tighten screw G.
- 33.3 Repeat 33.1 and, if necessary, 33.2 for each selector lever in turn until all five cables have been correctly adjusted.

Check

- 33.4 With the machine in the rest position and all pins set to space, trip the translator clutch and turn the machine by hand until the selecting levers D, Fig.110, have moved to the limit of their excursion towards the front of the machine. Check that selector levers D are now clear of punches E by approximately 1/32 in. (.8 mm.). This ensures that the cables are moving freely.

Action

- 33.5 If necessary, free the cables and repeat adjustments 33.1 to 33.4 inclusive until the condition in check 33.4 is satisfied.

34. Punch Stroke - Initial Setting (Figs. 106, 109 and 110)

Check

- 34.1 With the machine in the rest position, check that the endwise movement of punches E, Fig.110, is between .003 - .030 in. (.08 - .76 mm.). Check also that all slack movement in punching link L, Fig.109, is taken up by the punch retraction spring C, Fig.106.

Action

- 34.2 Slacken 6BA locknut K, Fig.109, and unscrew link J until it is slack and the punches have little or no endwise movement. Slowly re-tighten link J until the slack is just taken up and then tighten by a further half-turn. Tighten locknut K. Check that the end shake of the punches lies within the limits laid down in check 34.1 above. If the endwise movement is not within limits, refine the adjustment of link J.

35. Tape Feed Lever (Fig.112)

Check

- 35.1 Turn the machine to the rest position and hold roller T down on to its cam. Hold block R against feed lever Q, and check that there is a clearance of up to .005 in. (.13 mm.), i.e. dimension 'cb', between stop plate S and rack U.

Action

- 35.2 If necessary, slacken the locknut of eccentric pivot V and turn the pivot to obtain clearance 'cb'. Tighten the locknut.

36. Tape Feed (Figs. 99, 112, 113, 114 and 120)

Check

- 36.1 With the machine in the rest position, lift the tape-feed vertical link A, Fig.120, until block B is touching rack C. Check that there is an estimated clearance of .020 - .035 in. (.51 - .90 mm.) i.e., dimension 'cl' between feed lever D and latch E.

Action

- 36.2 If necessary, slacken screw F to friction tight and move block B up or down to achieve dimension 'cl'. Tighten screw F.

Check

- 36.3 Check that throwout lever C, Fig.114, is clear of feed pawl D by approximately 1/16 in. (1.6 mm.).

- 36.4 If necessary, slacken the 8 BA locknut securing screw A and turn the screw clockwise to obtain this condition. Tighten the locknut.

Check

- 36.5 Check that back-feed pawl E is clear of its ratchet.

Action

- 36.6 If necessary, slacken the nut securing stop pin B and move the stop pin to satisfy check 36.5. Tighten the nut.

Check

- 36.7 With the machine in the rest position, check that the feed pawl is operating on the correct tooth. The capstan head screw W, Fig.113, (also shown at F on Fig.114) should be directly behind the feed spindle centreline.

Action

- 36.8 If the feed pawl is operating in the wrong tooth, slacken the nut securing eccentric P, Fig.112, and turn the eccentric to the top mid-position. Tighten the nut. Remove the circlip and shim securing block N and slide the block and rod X off pivot Y. Slacken nut M and screw block N along the thread to obtain the required setting, taking care that there is always at least 1/8 in. (3.2 mm.) of threaded rod left in the block. Replace block N on pivot Y. Replace the shim and circlip and tighten nut M carefully, making sure that the block moves freely on pivot Y.

Check

- 36.9 Feed a length of punched tape into the punch block. With the machine in the rest position, turn feed knob V, Fig.99, in an anti-clockwise direction until resistance is felt. This movement should be approximately equal to 1/4 of the feed hole diameter and it can be checked by sighting at position Z, Fig.113.

Action

- 36.10 If necessary, slacken the nut securing eccentric P, Fig.112, and turn the eccentric using the top half of its throw to obtain the required setting. Tighten the nut.

Check

- 36.11 Set up any 'feeding' character on the pin box. Trip the translator clutch and turn the machine by hand until feed lever Q, Fig.112, has moved fully to the right. Check, by turning feed knob V, Fig.99, that the tape feed spindle has turned through only one pitch. By turning feed knob V clockwise check that there is some backward movement present. Return the machine to the rest position. Repeat the check using the runout shaft instead of the translator shaft.

Action

- 36.12 If either condition in 36.11 is not satisfied, refine adjustment 36.10.

### 37. Tape Feed Latch (Figs. 99, 113 and 115)

#### Check

- 37.1 Check that the slot between the tines of the tape guide M, Fig.99, is centrally disposed about the teeth of feed wheel R.
- 37.2 Insert a length of tape punched with feed holes into the perforator and check that the tips of the tines are just touching the tape. This check may be carried out as follows:-
- Raise the retention lever L, Fig.115, out of engagement with the sprocket wheel K. Raise the guide M, Fig.99, and turn knob V, noting the force required to do so. Lower the guide M on to the tape, and turn the knob V again. There should be no discernible difference in the force required to turn the knob. Check also that there is no gap between the tips of the tines and the tape.

#### Action

- 37.3 If either of these checks is not satisfied, remove spring K, Fig.99, slacken nut U and turn eccentric screw T until the hook of latch J is disengaged from frame Q, as shown by dimension 'f'.
- 37.4 Slacken screws S and, pressing the tape lightly on to the rollers with guide M, slide the latter backwards and forwards until its curved underside is positioned concentrically with the rollers, ensuring that the slot in the guide remains centrally disposed with respect to the feed wheel teeth R. Tighten screws S.
- 37.5 Replace spring K. Insert two thicknesses of tape punched with feed holes, into the perforator. Adjust eccentric T until, with the guide M resting on the tape, the hook of latch J is just touching the engagement face of frame Q, i.e. dimension 'f' is no longer present. Clamp eccentric T with its locknut U.
- 37.6 Remove one thickness of tape. Slacken screws S again and move guide M towards frame Q until the tips of the tines on guide M just touch the tape. Ensure that the slot in guide M is still centrally disposed about the feed wheel teeth and tighten screws S.

### 38. Feed Hole Pitch (Fig.115)

#### Check

- 38.1 Perforate a length of tape and check the pitch of the feed holes over a length of not less than ten inches of tape. It should either be constant, or increase or decrease regularly, so that the total change of pitch is not greater than half a feed hole pitch in the ten inches of tape.

#### Action

- 38.2 If the feed hole pitch is irregular, refine adjustments 37.3 to 37.6 inclusive.
- 38.3 If the feed hole pitch varies regularly, but the cumulative variation over ten inches is greater than half a feed hole pitch, slacken the nut securing eccentric J and turn the eccentric until the feed hole pitch is regular. Tighten the nut.
- 38.4 If necessary, refine adjustments 36 and 38.3 until the condition is satisfied.

### 39. Back Space (Figs. 113 and 114)

#### Check

- 39.1 Press lightly on roller H to bring back-feed pawl E into contact with its ratchet, and check that the tip of pawl E lies in the middle of the ratchet tooth, as shown in the inset of Fig.114.

#### Action

- 39.2 If necessary, set bracket G to obtain the required condition.

#### Check

- 39.3 Feed a length of punched tape into the punch block. Slacken the 8BA locknut securing screw A and turn the screw anti-clockwise until feed pawl D has been

moved out of engagement with the ratchet by lever C. Press roller H towards the rear of the machine until it is hard against its stop. Hold it in this position and turn feed knob V, Fig.99, clockwise until resistance is felt. This movement should be approximately equal to  $\frac{1}{2}$  of the feed hole diameter and can be checked by sighting at position Z, Fig.113.

Action

39.4 If necessary, slacken the nut securing stop pin B, Fig.114, and slide the pin in its slot until the required condition is obtained. Tighten the nut.

Check

39.5 With the back-feed lever in the rest position, check that the back-feed pawl E is clear of its ratchet. This can be checked by turning feed knob V, Fig.99, in a clockwise direction. If the knob can turn, the pawl is clear of its ratchet.

Action

39.6 If feed knob V cannot be turned as in 39.5, refine 39.4.

39.7 With the machine in the rest position, slacken the 8BA locknut of screw A, Fig.114, and turn the screw clockwise until there is a clearance of .005 - .015 in. (.13 - .38 mm.), i.e. dimension 'cc' between throwout lever C and feed pawl D. Tighten the nut.

Check

39.8 Press roller H several times in the direction of the arrow. Check that, each time the roller is pressed, the feed spindle is rotated in an anti-clockwise direction by one complete pitch, and then located securely by the retention roller.

Action

39.9 If necessary, refine 39.4 and 39.7.

40. Runout Control Lever (Fig.116)

Check

40.1 With the machine in the rest position, check that trip lever L and runout control cam lever M are each within .005 in. (.13 mm.), i.e. dimension 'cd', of the underside of control lever P.

Action

40.2 Slacken nut N and push screw K and lever M down as far as they will go. Tighten nut N friction tight and gently prise lever M upwards until its tail just touches control lever P. Tighten nut N. Hold roller Q down on its cam when finalizing this adjustment.

Check

40.3 Trip the selector clutch and turn the machine by hand, so that control lever P is lifted by lever L. Check that the bend in shaft T does not foul any other component during its movement.

Action

40.4 Slacken the screw and nut securing lever P and re-position the lever on shaft T until the foul is cleared.

41. Runout Disablement Pin (Figs. 116 and 117)

Check

41.1 With the machine in the rest position and all three clutches disengaged, check that lever S, Fig.117, is so positioned axially along shaft T that the disablement pin R is approximately at right angles to detent lever U.

Action

41.2 If necessary, slacken screw V and move lever S along shaft T to satisfy the condition required.

Check

- 41.3 Check that the engagement between pin R and detent lever U is about half the thickness of the lever U, i.e. approximately 1/32 in. (.8 mm.).

Action

- 41.4 Hold control lever P, Fig.116, down on to levers L and M, and position lever S, Fig.117, on shaft T to obtain the required condition. Tighten screw V.

42. Runout Clutch Detent (Fig.118)

Check

- 42.1 With the runout shaft in the rest position, trip the clutch by depressing lever D, Fig.118. Check that there is a clearance of 1/64 - 1/32 in. (.4 - .8 mm.), i.e. dimension 'ce', between pawl A and detent B, Fig.118 (inset).

Action

- 42.2 Slacken the nut of eccentric E and turn the eccentric (accessible from the front of the machine) to obtain the required clearance. Tighten the nut.

Check

- 42.3 Return the runout shaft to its rest position. Check that there is an engagement of 3/64 - 1/16 in. (1.2 - 1.6 mm.) i.e. dimension 'cf', between detent B and pawl A.

Action

- 42.4 Note: This adjustment should not normally require attention at routine maintenance visits.

Remove the Selector Unit. Slacken screws G and ease rack C up or down to satisfy dimension 'cf', ensuring that lever H is resting in the bottom of its slot in rack C. Tighten screws G. Replace the Selector Unit.

43. Motor Start (Figs. 6 and 118)

Check

- 43.1 Check that there is a clearance of more than .005 in. (.13 mm.), i.e., dimension 'cg', between the tail of lever D, Fig.118, and trip lever J. Check also that, when lever D is depressed, there is a clearance of .005 - .015 in. (.13 - .38 mm.), i.e. dimension 'f', Fig.6, between starter wheel C and the pin on arm B.

Action

- 43.2 Slacken screw K, Fig.118, and move trip lever J around its shaft to obtain the required clearance. Tighten screw K.

44. Punching - Final Adjustment (Figs.111 and 118)

Check

- 44.1 Load two tapes into the punch block. Switch on the motor. Press the top end of the transfer levers K, Fig.111, towards the left to set up an all-mark condition at the punch block. Hold down lever D, Fig.118, until about 12 inches of tape has been produced. Check that a regular series of clean, round holes has been perforated in the tape. Repeat this check using the translator shaft instead of the runout shaft and again check the quality of the perforations.

Action

- 44.2 If the holes are not fully punched or the punches drag in their holes, refine adjustment 34.2.

45. Printing Position - Final Adjustment (Fig.119)

Check

- 45.1 Print and punch a sample of tape containing all the characters available. Check that these characters are centrally disposed between the feed holes.



Action

- 45.2 Slacken nut N. Slacken nuts M and adjust them along screw P until the required condition is achieved. Lock nuts M together and tighten nut N.

46. Tape Feed Suppression (Figs. 29 and 120)

Check

- 46.1 Turn the machine to the rest position. Move shift lever A, Fig.29, to the 'Letters' shift position, (i.e. to the left, looking from the rear of the machine). Set up a combination on the pins in the pin box which will suppress the tape feed action in 'Figures' shift only, (i.e. 'Bell', 12-4 -, the secondary of the letter 'J' on standard machines). Trip the translator clutch and turn the machine by hand until the function selection has taken place, and the 'Bell' function bar G, Fig.120, has moved as far as possible towards the rear of the machine. Check that, with set collar K against bracket J, there is a clearance of .005 - .010 in. (.13 - .25 mm.), i.e., dimension 'ch', between suppression spade H and 'Bell' function bar G.

Action

- 46.2 If necessary, slacken screw L and move set collar K along the suppression shaft P until the required clearance is obtained. Tighten screw L, taking care that the head of the screw clears bracket J.

Check

- 46.3 With the machine set up as in 46.1, check that there is a clearance of .002 - .010 in. (.05 - .25 mm.), i.e. dimension 'cj', between pin on block M and latch E.

Action

- 46.4 Slacken screw N. Hold collar K against bracket J and move block M along shaft Q to obtain clearance 'cj'. Tighten screw N.

Check

- 46.5 With the machine set up as in 46.1, except that shift lever A, Fig.29, should be set to the 'Figures' position, check that tape feed lever D, Fig.120, clears latch E by more than .010 in. (.25 mm.) i.e. dimension 'ck'. Check also that lever D does not foul print shackle P.

Action

- 46.6 If necessary, refine adjustment 46.4.

47. Runout Keybar (Fig.121)

Check

- 47.1 With cover unit fitted and lids closed, depress the runout button (located on the top of the case) and check that it operates approximately 1/16 in. (1.6 mm.) before reaching its bottom stop.

Action

- 47.2 If necessary, slacken nut P, Fig.121, and move lever Q to obtain the required condition. Tighten nut P.

48. Back Space Lever (Fig.122)

Check

- 48.1 Open and close the front cover lid, and check that there is a clearance of 1/32 - 1/16 in. (.8 - 1.6 mm.), i.e. dimension 'cm', between block S, Fig.122, and roller R. Check also that the rounded part of block S engages the centre of roller R when the keybar is depressed.

Action

- 48.2 If necessary, adjust block S.

(a) Vertically, by slackening screw T and moving the block up or down in its slot. Tighten screw T, or

(b) Horizontally, by slackening nut U and swinging lever V. Tighten nut U.

**Check**

48.3 With the lid closed, check that the keybar operates the back space mechanism correctly.

**Action**

48.4 If necessary, refine adjustment 48.2.

**AMENDMENTS TO INSTRUCTION BOOK No.75 (JULY 1959 ISSUE)  
APPLICABLE ONLY TO MODEL PR SEVENTY-FIVE PRINTING  
REPERFORATORS WHICH ARE FITTED WITH A TRANSMITTER**

**Amendment No. 1**

On pages 35 and 36, amend paragraph 59 - Lagweight Spring - as follows:-

(a) 59.1 to 59.11 as for Instruction Book No.75.

(b) Delete existing paragraph 59.12 and insert the following:-

59.12 Remove the tape from the punch head. Mark the feed knob with a pencil line and make a corresponding mark on the punch block casting.

(c) Delete existing paragraph 59.13 and insert the following:-

59.13 Runout 'Space' from the keyboard and note the number of revolutions made by the feed knob in one minute.

For 45.5 baud operation this should be 22-3/4 revolutions

"	50	"	"	"	"	25	"
"	75	"	"	"	"	37-1/2	"

(d) 59.14 to 59.16 as for Instruction Book No.75.

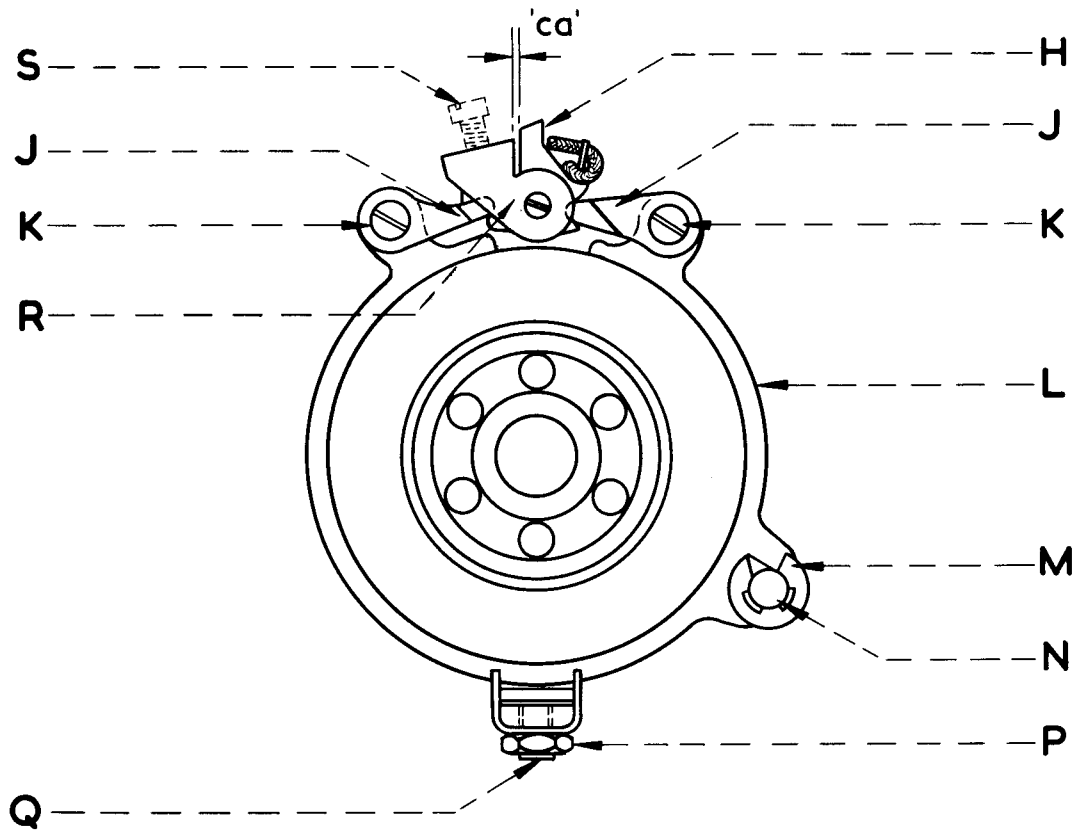


FIG.2A

DIMENSIONS

'ca'	FOR SELECTOR UNIT:-	.035 - .040	INCH	(.90-1.02 MM)
	FOR TRANSLATOR UNIT:-	.040 - .045	INCH	(1.02-1.15 MM)

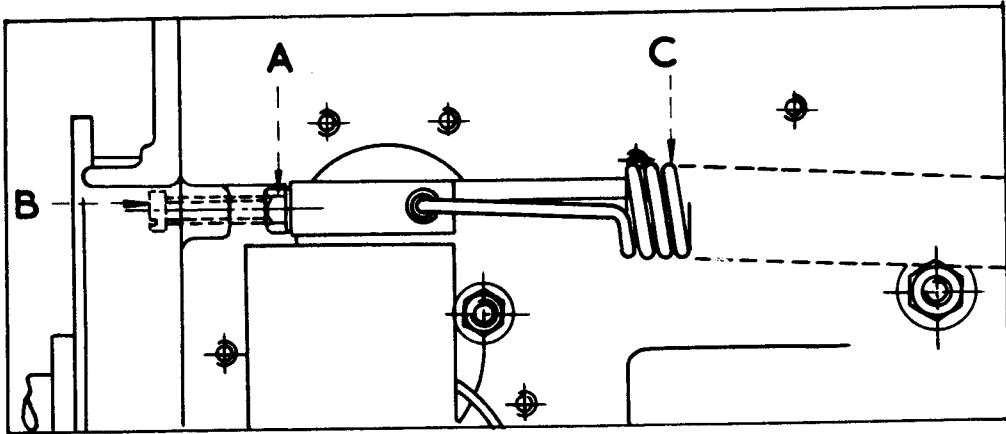


FIG. 106

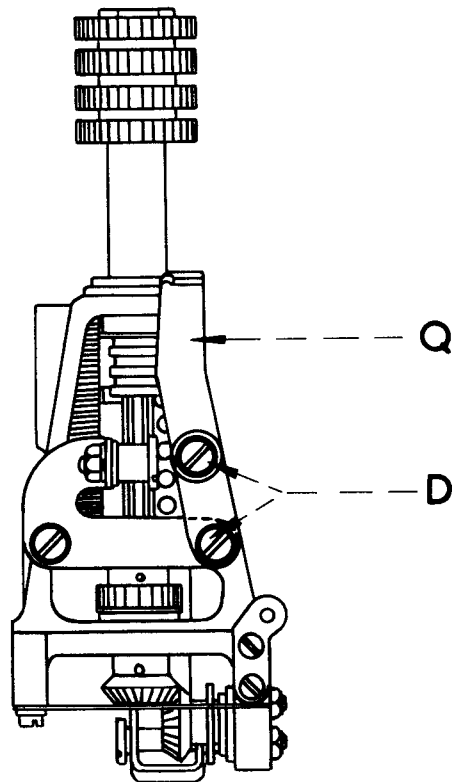


FIG. 107

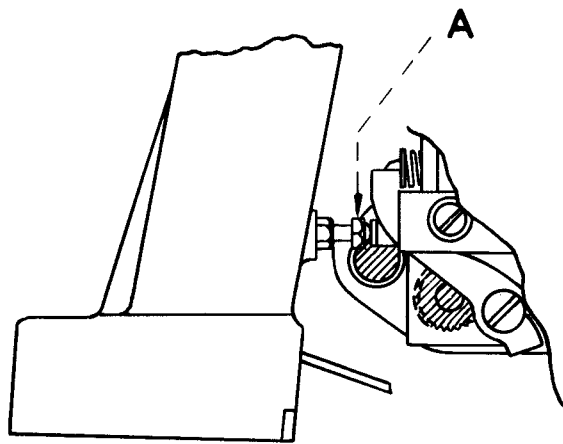


FIG. 108

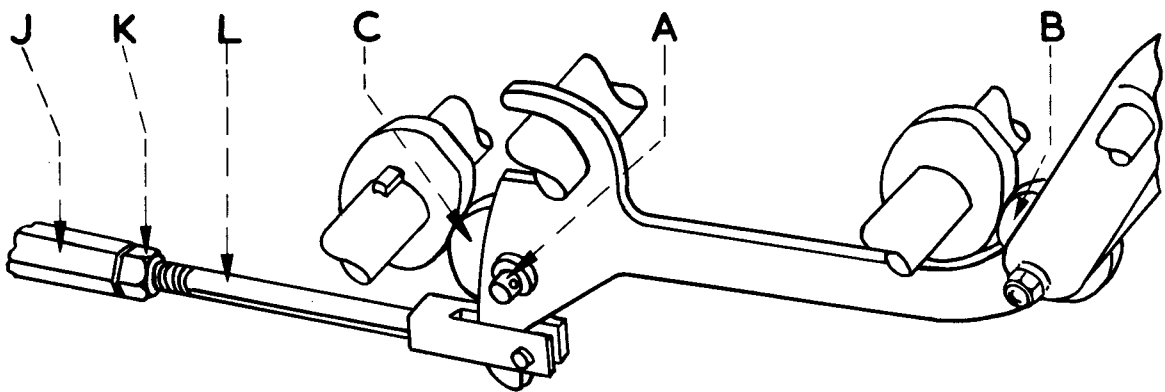


FIG. 109

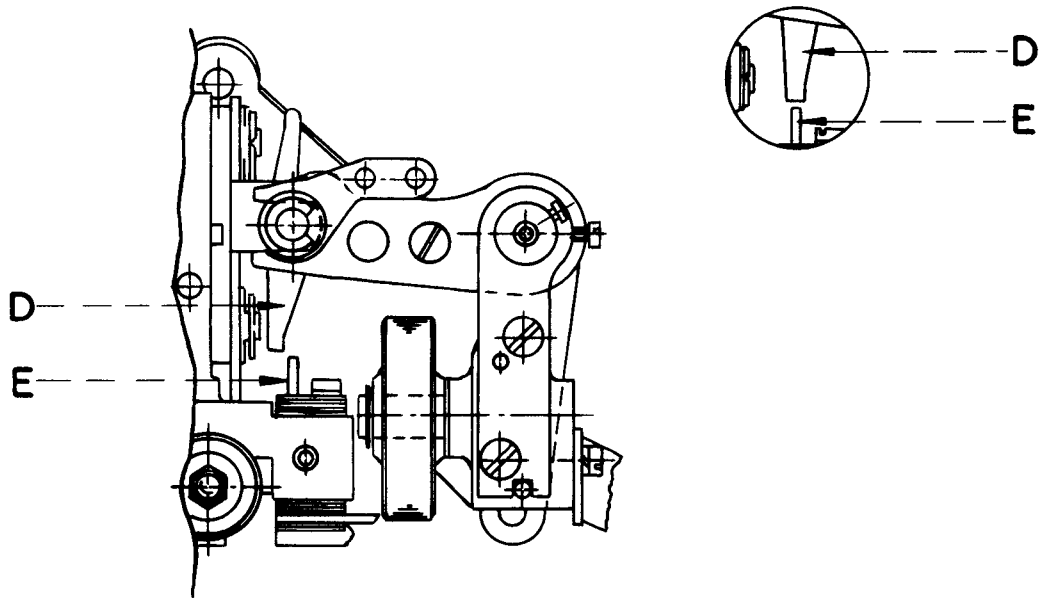


FIG. 110

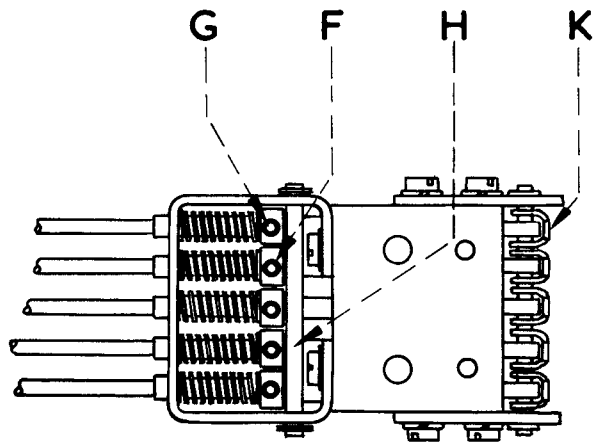
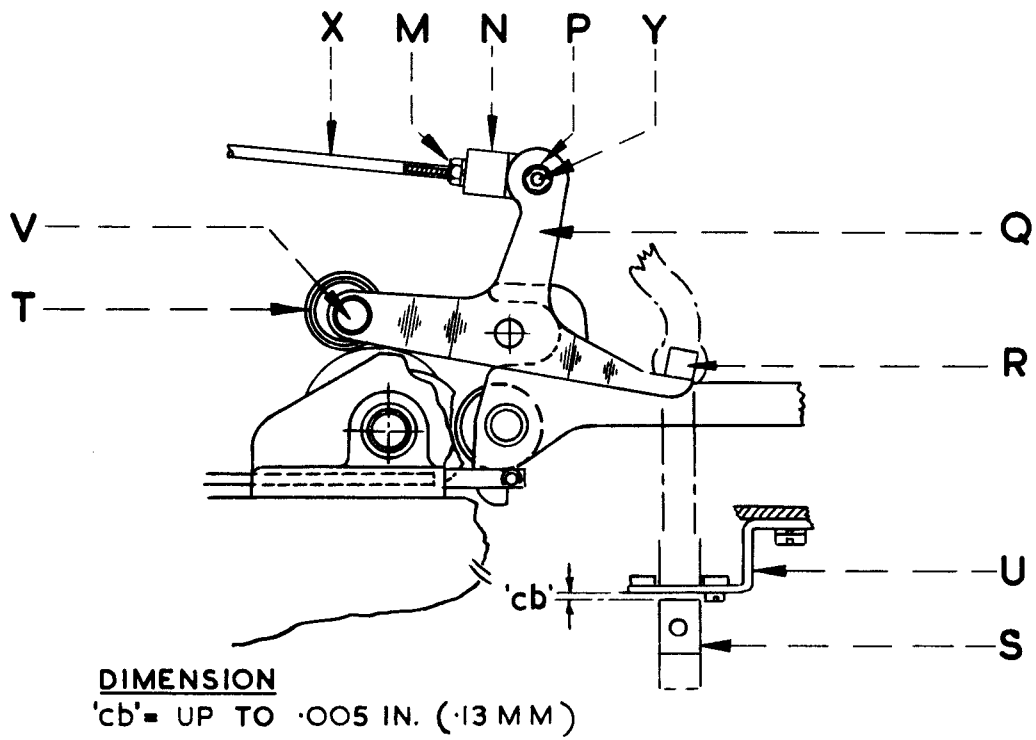
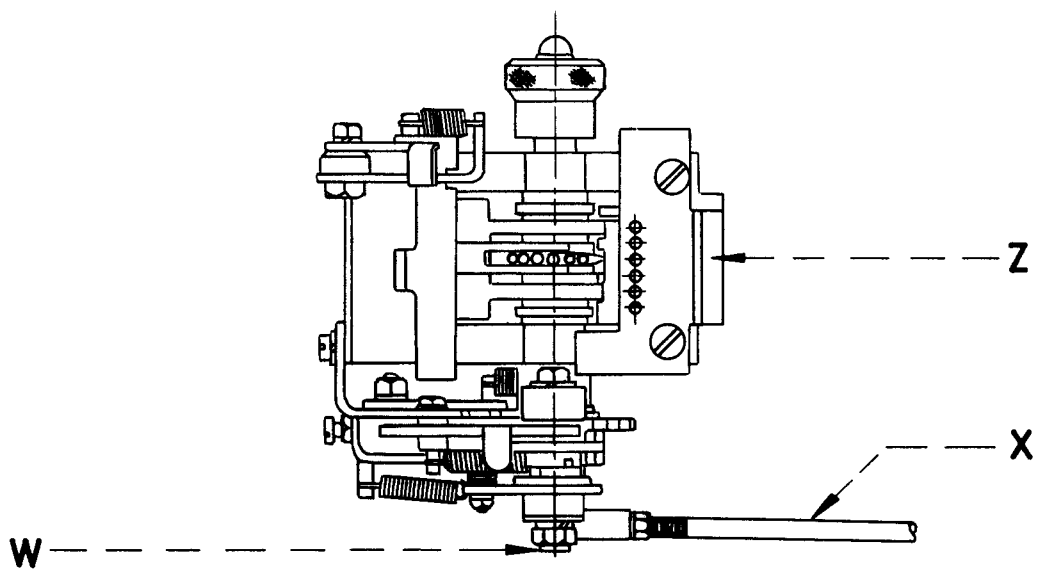


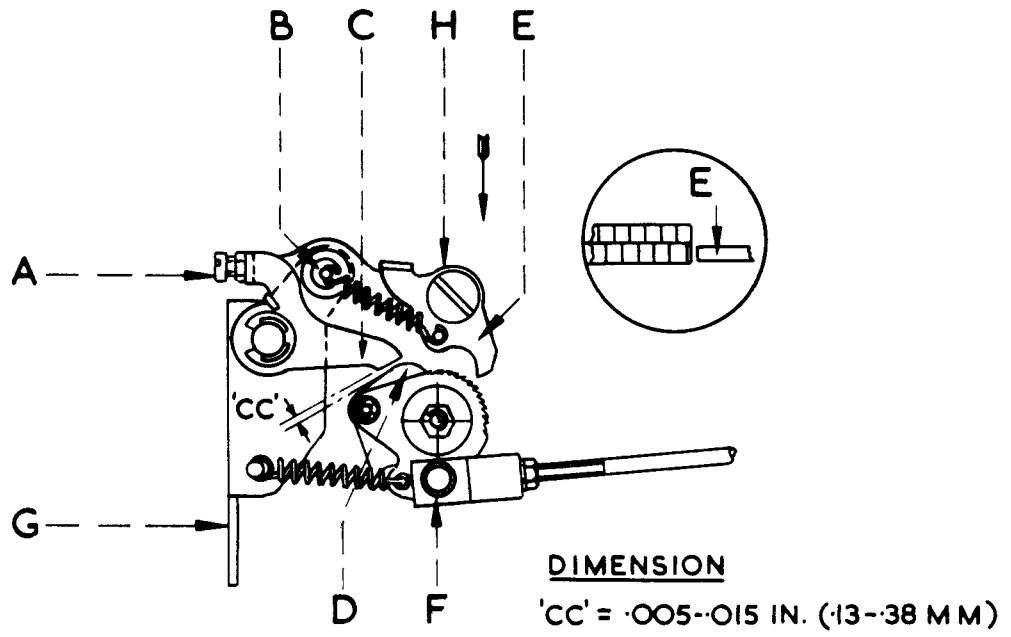
FIG. 111



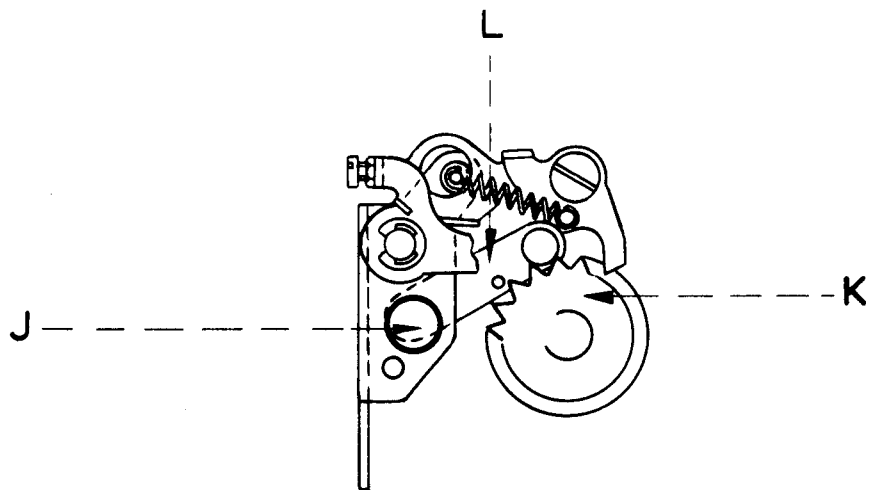
**FIG. 112**



**FIG. 113**



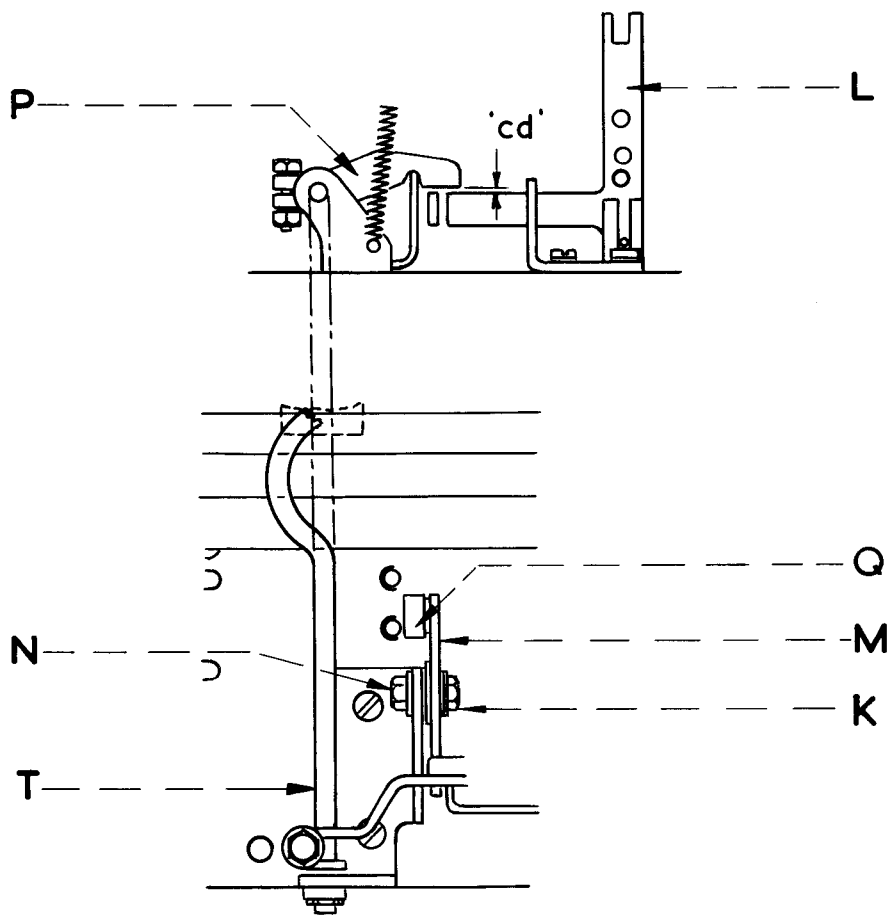
**FIG. 114**



**FIG. 115**

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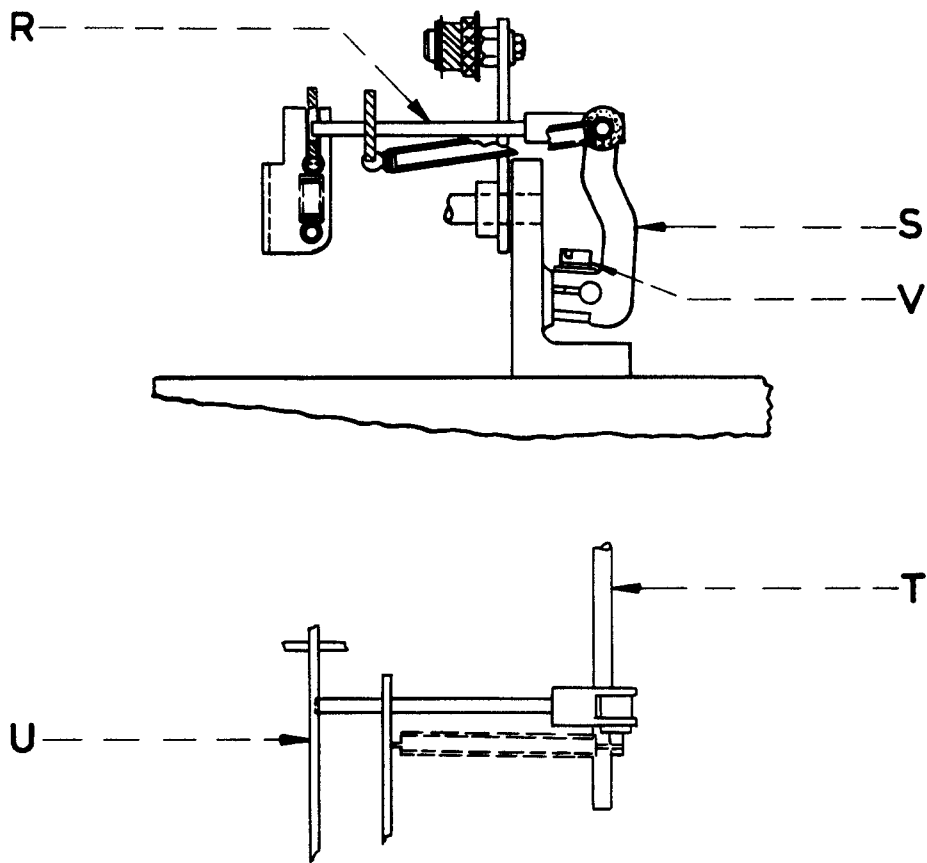




DIMENSION

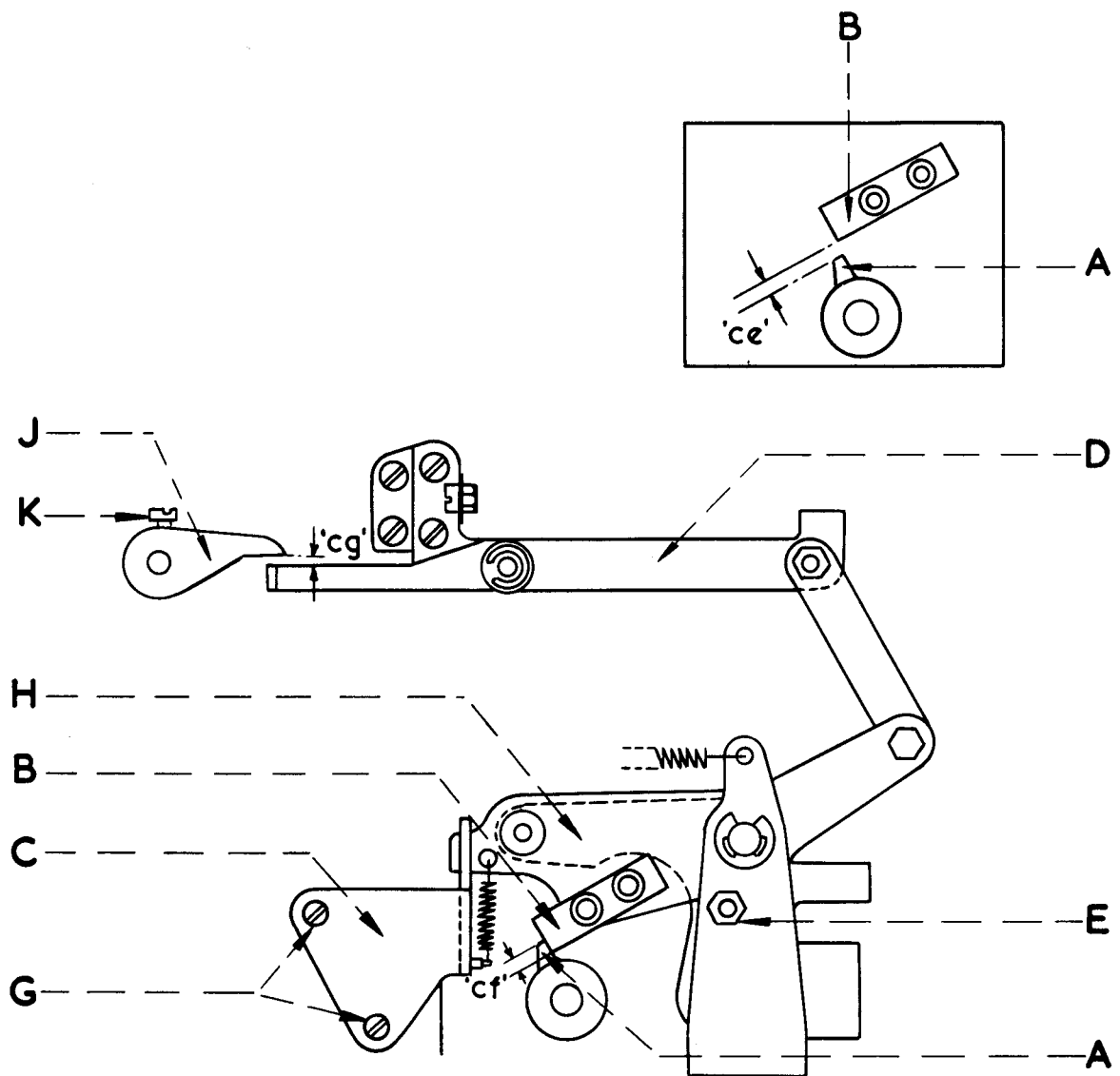
'cd' = UP TO .005 IN. (.13 MM)

FIG. 116



**FIG. 117**

EL34/143



DIMENSIONS

'ce' =  $\frac{1}{64} - \frac{1}{32}$  IN. (.4 - .8 MM)

'cf' =  $\frac{3}{64} - \frac{1}{16}$  IN. (1.2 - 1.6 MM)

'cg' = MORE THAN .005 IN. (.13MM)

FIG. 118

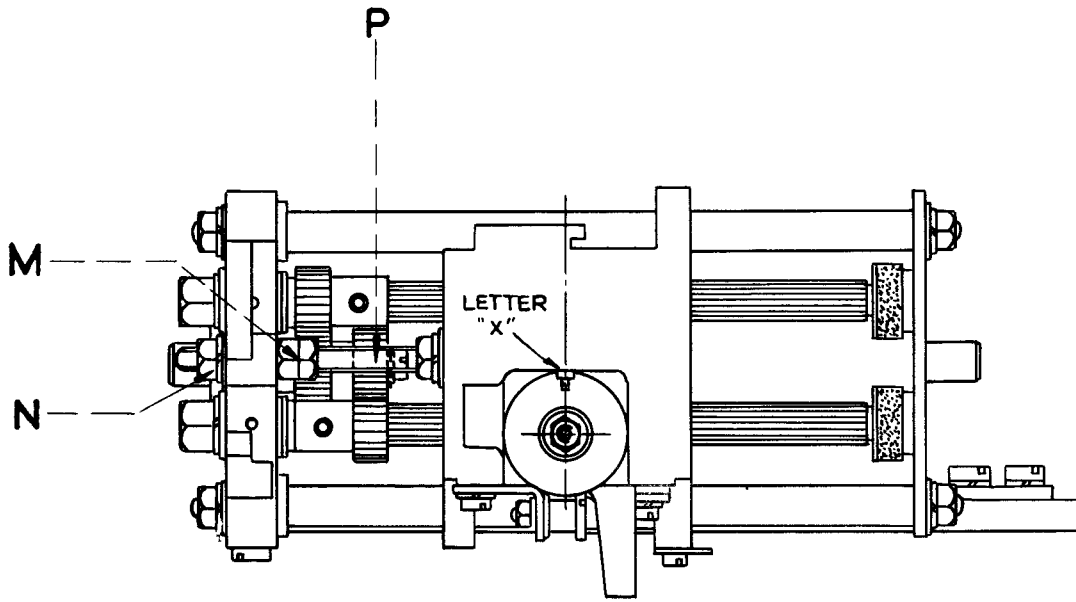
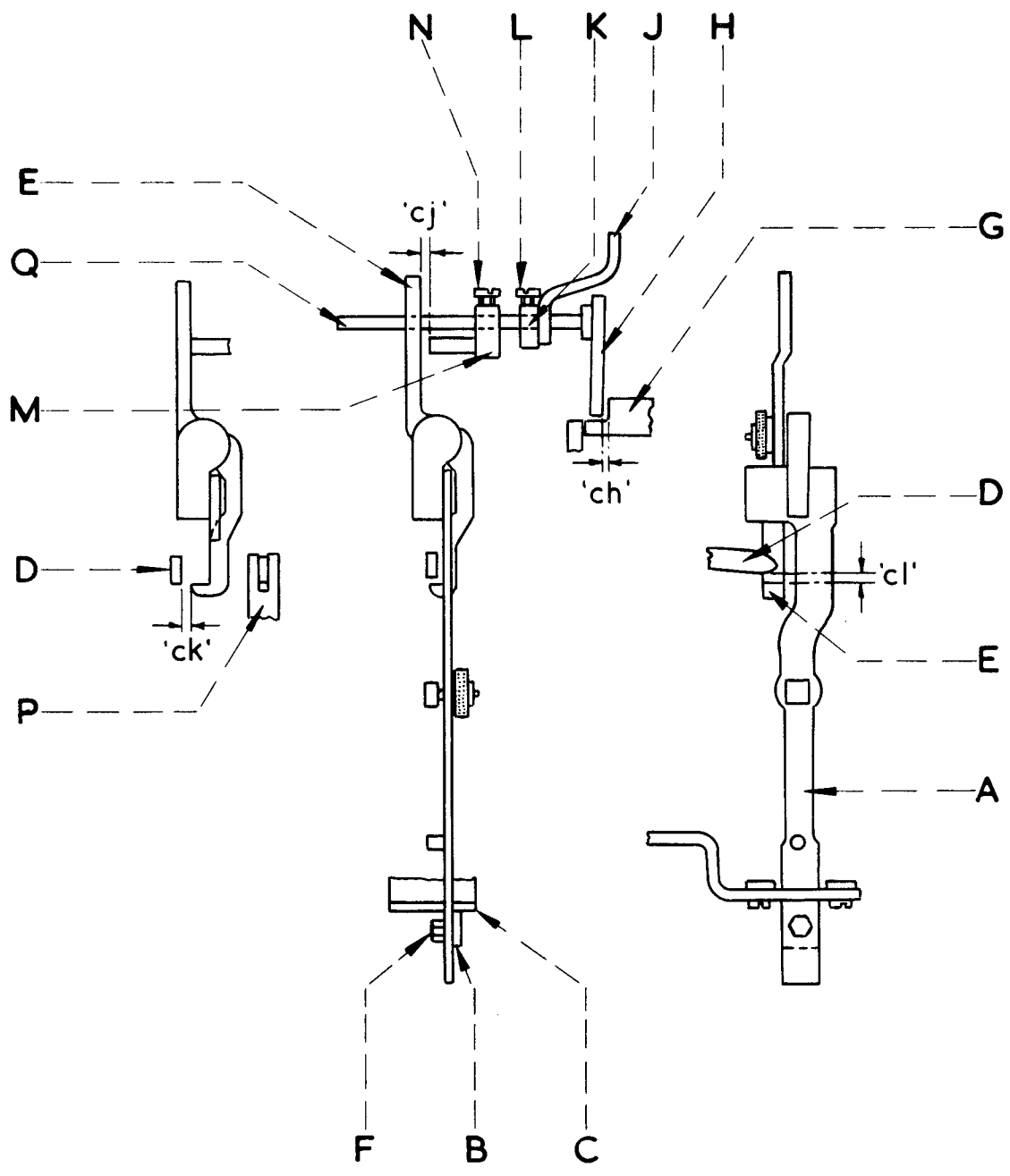


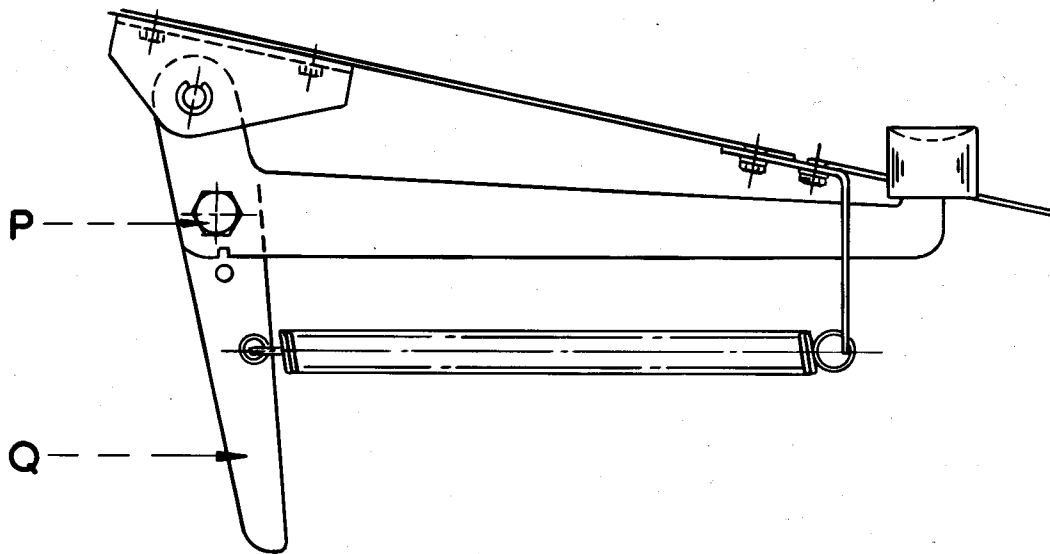
FIG. 119



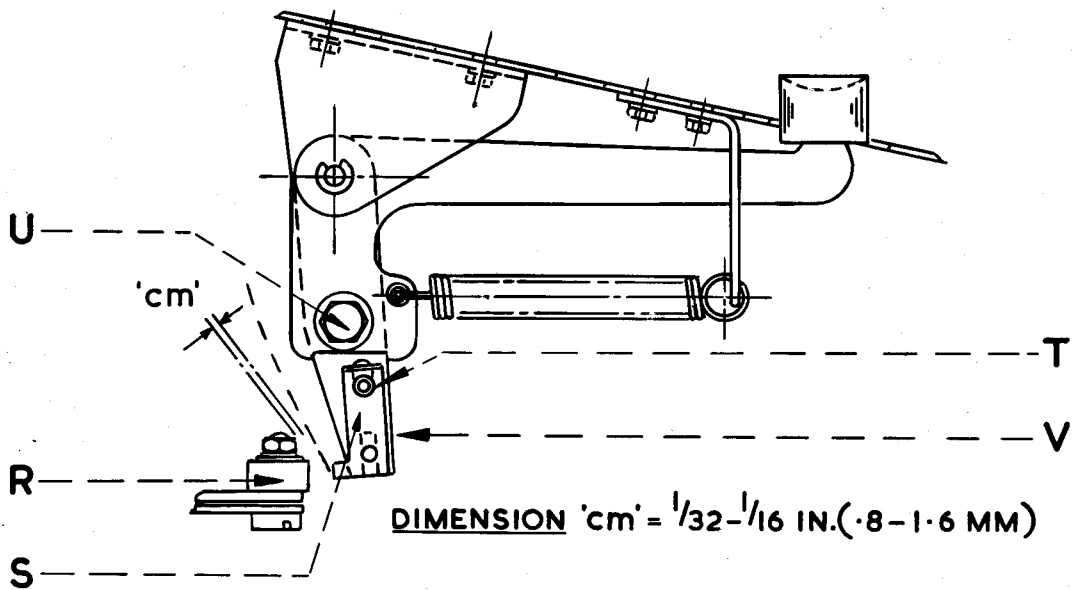
**DIMENSIONS**

- 'ch' = .005 - .010 IN. (.13 - .25 MM)
- 'cj' = .002 - .010 IN. (.05 - .25 MM)
- 'ck' = MORE THAN .010 IN. (.25 MM)
- 'cl' = .025 - .035 IN. (.51 - .90 MM)

**FIG. 120**



**FIG. 121**



**FIG. 122**