

INSTRUCTIONS
FOR THE
OPERATION, ADJUSTMENT AND MAINTENANCE
OF THE M.L. QUADDER

Sales-Service Mergenthaler Linotype Company Brooklyn 5, N.Y.
December 10, 1951 Service Instruction No. 8

These instruction sheets constitute advance information on the operation, adjustment and maintenance of the M.L. Quadder and will serve until complete instructions are released. While the instructions are based on the manually controlled M.L. Quadder, they can also be used for the electrically controlled M.L. Quadder.

The manual quadder differs from the electric quadder in the method of selecting the quadder functions desired. In the electric quadder, there is a solenoid control unit assembly which is fastened to the lower right-hand side of the quadder housing which automatically selects the quadding functions.

Instructions on the solenoid control unit assembly, together with complete electrical instructions on the electric quadder, will be covered in a separate set of service instruction sheets.

INSTRUCTIONS FOR OPERATING

For all composition, the operator should make the usual scale adjustments, such as setting the assembler slide, the vise jaws, ejector blade and knife block to conform with the length and point size of the slug to be cast.

The line stop in the first elevator jaws automatically returns to the right after each transfer of matrices and therefore needs no manual positioning. The assembling elevator is designed so that one or more matrices can be assembled and delivered to the first elevator jaws without the necessity of moving the delivery slide long finger over to the right to support the matrices. The long finger can be left at 30 ems for all composition if desired.

To set the left-hand vise jaw for required length of line, hold detent down and turn handle of Measure Control, Fig. XIII, as many turns as required to obtain desired measure. Scale 4 registers in picas and half picas while Scale 5 is in points. Knob 6 can be used to set measure by points if desired.

The handle is held in position by a spring and ball detent located just to the left of Cam 91, Fig. XIII. Adjustment for more or less spring tension is made by adjusting screw and lock nut, from underneath the gear cover.

The operator of the M.L.Quadder has four positions of control available: Regular, Quad Left, Center and Quad Right. These are marked on the scale as shown in Fig. XVA. The operator moves the handle 1 to any of the control positions desired. When set for reg. (regular) the line of matrices is justified by the drive and spread of the spacebands to the full measure for which the vise jaws are set.

When set for Quad L. (Quad Left), the right-hand vise jaw moves over to the left, until it forces the line of matrices against the left-hand vise jaw, making the line cast flush left.

When set for centering, both jaws move together bringing the line of matrices to the center of the measure.

When set for Quad R. (Quad Right), the left-hand vise jaw moves over to the right forcing the matrices against the right-hand vise jaw making the line cast flush right.

When quadding or centering, the spacebands do not justify but act as spaces. This gives uniform spacing regardless of the length of line or number of spacebands used. Space matrices can be used instead of spacebands if so desired.

Caution to Operators

After line-casting cycle has been started, control handle 1, Fig. XIII, should not be moved to another position until the machine reaches transfer position.

ADJUSTMENTS

In order that the M.L. Quadder may be maintained at the highest operating efficiency, all adjustments are described in the following pages, so that the machinist and operator may familiarize himself with these and be able to adjust and maintain the Quadder properly.

All adjustments are correctly made when the M.L. Quadder is assembled, and installed, and since many of these are fixed dimensional adjustments, they should not require resetting.

1. ADJUSTMENTS:

- (a) Right-hand Margin: The setting of the right-hand vise jaw for margin (to bring the type face to correct position on slug) is done in the usual manner. The right-hand vise jaw adjusting screw has been redesigned to contain a spring-pressed plunger. This plunger holds the right-hand vise jaw slightly to the left of its normal setting, and applies spring pressure to insure the plunger in the left-hand vise jaw being fully depressed when casting regular.
- (b) Centering: After right-hand vise jaw has been set for margin, cast two blank slugs. Turn slugs back to back to check for centering. If centering is not correct, move the left-hand vise jaw by means of the measure control, Fig. I, until centering is satisfactory. By moving the left-hand vise jaw to center correctly, it is possible that the reading on the horizontal Scale 4 and the circular Scale 5 will not represent the length of line to which the jaws are set. If the circular scale is off only slightly from the zero mark, the set screw holding the circular scale can be loosened and the scale turned to zero. The indicator for the horizontal scale will not line up accurately with the scale markings under these conditions, but the indicator should be close enough for most operators.

If, after the left-hand vise jaw has been moved to obtain proper centering and the reading on the horizontal and circular scale is off considerably, it will be necessary to remove the measure control cover without disturbing the scale readings. This is done by first removing the two screws holding the complete measure control to the vise. Then remove the one screw holding the cover, allowing the part of the control next to the vise to remain in position held by its dowels.

Removing the cover separates the gear fastened to the end of the brass tube from the gear in the cover. Now turn the knurled Knob 6 in the cover until the horizontal indicator lines up with the correct em marking. If the circular scale is not at zero, loosen set screw and turn

circular scale to zero and tighten set screw. Next replace the cover carefully since the two gears may not mesh exactly. If they do not mesh, turn gear on end of brass tube slightly until the two gears mesh.

- (c) Left-hand Margin: Next set left-hand vise jaw for margin. This is done in the usual manner, i.e., by turning vise jaw wedge adjusting bushing until margin is correct.
- (d) Vise Closing Wedge: The angles of the vise closing wedge and wedge block should match when the machine is in normal position. Adjustments can be made by loosening lock nut at the bottom of vise closing wedge and turning set screw. Retighten lock nut.
- (e) Vise Jaw Control Rod Lock: On vise jaw control rod locking lever operating lever link 47, Fig. VII, there is an adjusting screw 74. Adjust this screw so that the locking lever latch 48 releases the locking lever 49 when the link 47 is in its fully forward position.
- (f) Control Rod Locking Lever: When the top of the locking lever 49, Fig. VII, is even with bottom of cut-out portion of latch 48, the lever will have dropped $5/8$ " by action of spring 85, after being released. This will insure the locking lever 49 being returned to normal position by release lever 51, Fig. VIII. This can be adjusted by set-screw 55. If lever should fall further than $5/8$ ths of an inch, there is a possibility of the extension 52 not returning lever 49 to normal position.
- (g) Vise Jaw Control Rod Lock Release: Locking action should be released as line of matrices leaves vise jaws. To adjust, stop machine when first elevator rises $1-1/8$ " from casting position on its way to transfer position, then with latch 48, Fig. VIII, holding up lever 49, locate clamp 51 on mold disk pinion in position shown, so that the two levers just make contact. Should machine be equipped with a six-mold disk, position the mold disk pinion so that mold No. 1 or No. 4 is in operating position. Then position release lever as described above.
- (h) Vise Jaw Closing Lever and Pawl: With quadder set at regular, stop machine in highest first justification position. Vise jaw closing lever 33, Fig. V, should just clear screw 70. Approximately .005" is correct clearance. Turn screw 70 to adjust.

With quadder in operation, turn cam shaft by hand to move left-hand vise jaw wedge to highest point. At this point, pawl 35 should be high enough so that its banking surface will just clear latch 80, Fig. VI. At this point pawl 35 should be $1/16$ below fourth tooth. Control Rod must be in lowest position. Just before banking surface of pawl 35

clears latch 80, clearance between pawl and ratchet teeth should be $1/64$ ". For $1/16$ adjustment, bend latch 80. For the $1/64$ adjustment, grind end of latch 80. Latch spring must be strong enough to return latch 80 to normal under all conditions.

- (i) Vise Jaw Return (Fig. IX): Start machine (or turn by hand) and stop with machine in transfer position. The vise jaw return link and return mechanism should be adjusted by means of screw 61, to permit a play of approximately $.005$ " between cam 57 and roller 63.
- (j) Vise Jaw Return (Fig. IXA): Turn machine by hand to allow first elevator jaw to seat on vise cap and then push lever 65 to highest position. See if link 100 is parallel to edge of housing or perpendicular to floor. If not, loosen nuts 101 and move clamp 94 until link 100 is parallel to edge of quadder housing. Retighten clamp to housing.

Spring 96 should measure $5-3/4$ " between collars 99 and 97. If not, loosen lock nut 98, adjust nut 97 until desired dimension is obtained and tighten lock nut. Distance between A and B should be $34-19/32$ ". If it is not, loosen nut 95 and adjust until desired dimension is obtained. Retighten nut 95.
- (k) Extra Pressure Pawls: Before checking the adjustment for the extra pressure pawls, make sure pin A, Fig. VI is not bent downward. Then make certain there is $1/16$ " clearance between the extra pressure pawls 87 and 86 and the ratchet teeth with the roll 42 held by hand against the upper surface of the notch in support 43. The machine should be in normal position at this time. Adjust screws 84, Fig. VIA with lock nuts 89, to obtain the proper setting. This insures the extra pressure pawls disengaging properly from the control rod.
- (l) Timing Control Rod with Manual Control Handle: Turn manual control handle 1, Fig. XIII, to center position and adjust turnbuckles 22 until center groove of vise jaw control rod cam 23 aligns with latch 29.
- (m) Micro Switch Cam: Cam 91, Fig. XIII, is properly located and doweled when quadder is applied. No adjustments are necessary.
- (n) Control Rod Friction Stud: Vise jaw control rod friction stud 79, Fig. XII, should bear lightly against control rod 16 to hold control rod in any of its positions between first and second justification. This prevents vise jaws moving away from line of matrices. To adjust, remove locking lever 49 from friction spring stop by removing nut E-5599 and screws E-5444, Fig. VIII, and then back off the set screw 55. See also Fig. XII. Turn the friction spring stud 82, Fig. XII, in a half turn or as many half turns as

possible without binding the control rod. This increases the tension on the compression spring 81 which exerts pressure on friction stud 79 which contacts the control rod. Any excessive friction at this point, however, will bind the control rod. Replace locking lever 49 and readjust set screw 55 (see adjustment "f").

2. AIR CUSHION CYLINDER:

Set vise jaws to longest measure used and adjust vise jaw closing air cylinder, Fig. XI, with adjusting screw 77. This cushions vise jaws against line of matrices. Lock adjusting screw 77 with nut 78.

3. LEFT-HAND VISE JAW SAFETY SWITCH:

Tip should protrude .027" from face of vise jaw. If it does not, the entire switch must be removed from vise jaw for readjusting. This is done by removing four screws 75, Fig. XIV and plate 83 from end of left-hand vise jaw, and removing snap ring from around base of switch. Special pliers are available for removal of this snap ring. It will be noted that the movable tip in the plunger is held in place by a pin 73. There are four slots cut into the tip into which this pin fits. These slots represent a quarter turn and each quarter turn moves tip .008". To decrease tip extension from face of vise jaw remove pin, turn tip clockwise $1/4$ turn and replace pin. Turn counter-clockwise to increase extension.

4. JUSTIFICATION LOCK-OUT (FIG. XV):

Check cam 91 to see that, when handle 1 is moved from quad left, right or center to regular, extension 102 pushes pin 103, forcing stop lever 106 away from justification collar allowing justification to take place. Check spring 107 to see that it has sufficient spring action to move lever 106 back to justification lock-out position.

5. JUSTIFICATION LOCK-OUT (FIG. XVA):

Make sure that spring 8 pulls justification stop arm 9 against justification rod, when lever 1 is moved to quadding or centering position. See that cam 2 forces arm 9 away from justification rod when machine is set for regular.

6. VISE CLOSING LEVER SPRING:

Vise closing lever spring as shown in Fig. XVI, should be adjusted by turning down adjusting screw until there is a setting of $1-3/4$ " between the end of screw thread and top of nut. Make sure spring is part F-32 with $5/16$ " diameter wire.

CARE AND MAINTENANCE

1. VISE JAWS AND VISE CAP:

The right- and left-hand vise jaws should be kept clean and should move freely at all times. If these parts become gummy, wash down with kerosene. Do not use gasoline or naphtha. Lubricate the surface on top of the vise frame on which the vise jaw blocks slide, and also, with vise open, force oil up under the vise cap to lubricate the jaw block guides, using the Special Vise Jaw Oil X-1805 in a small oil can with long slender spout.

If metal becomes lodged under the vise cap, do not try to chip it out; considerable damage may result in such case. Remove the vise cap so metal can be removed without damage. To remove the vise cap for cleaning and repairs, first remove the first elevator slide by disconnecting link hinge pin and taking off the stop block at bottom of slide, so the slide can be pulled up without disturbing the slide gibs. Take off the back cover of the Quadder and the vise jaw closing spring. Remove the two screws which hold the Quadder to the vise cap. The Quadder will then be held in place by a screw and dowel holding it to vise frame. The measure control unit on the right side of the vise cap is next removed, and care should be taken not to disturb the scale setting. Remove the four screws in the vise cap and remove vise cap.

After cleaning and repairing, replace vise cap, making sure that the vise automatic stop rod returns to the back of the left end of the stop rod lever. Replace the four screws in vise cap but do not tighten. Align the left end of the vise cap with the vise frame and tighten the four screws. Replace top screws connecting M.L. Quadder to vise cap. Replace the vise jaw closing spring and cover. The measure control unit is then replaced, followed by the first elevator slide.

2. QUADDER HOUSING:

The back cover of the quadder housing is designed to protect the mechanism from dirt, metal chips, etc. It should be kept on at all times, except when it is necessary to remove it to clean and oil the links, levers and bearings. Linotype oil X-24 is to be used for such lubrication.

3. CLEANING AIR CUSHION CYLINDER:

If the air cushion cylinder, Fig. XI, does not retard the motion of the vise jaws properly, it may need cleaning and oiling, as well as readjustment. The piston should be removed for cleaning about every three months.

Remove the link stud 79 from arm 76, then pull out piston from cylinder. Inspect the leather piston packing and replace if necessary. Inspect the check valve in piston to see that it is clean and seats tight. Apply Linotype oil X-24 to outside of piston and leather packing when returning same to cylinder. Re-adjustment of the valve 77 is usually necessary when the piston has been cleaned and oiled. Test vise jaw motion on both long as well as short measures to see that vise jaws contact the line of matrices without too much force.

4. POSSIBLE OPERATING DIFFICULTIES:

The following are some operating difficulties and their corrections:

- (a) Vise Jaws not Returning to Normal Position: Check for binds in movement of vise jaws, linkage, or control rod. The vise jaws should move back and forth freely. If there is a bind, the over-motion spring 62, Fig. IX, or spring 96, Fig. IXA, will compress to prevent breakage, thereby allowing the vise jaws to remain partially closed. Flush out vise and vise cap where vise jaws slide, with kerosene, and oil with Special Vise Jaw Oil X-1805.

Make sure the locking mechanism has released the control rod after the first elevator has risen approximately one inch off the vise cap. (See Adjustments "f" and "g"). Make certain that the extra pressure pawls disengage. If they do not, check Adjustment "k".

- (b) Vise Jaws not Closing on Line Properly: Again check for binds or interferences in vise jaws, linkage, or control rod. A bent line stop may be binding the jaw. Try jaw motion without line stop in machine.

A sprung first elevator back jaw may be causing the trouble. This would be the case especially after cleaning out a metal squirt. With the line stop removed and the quadder control set to "Quad L", allow machine to revolve until first elevator jaw rests on vise cap. Stop machine and manually slide right-hand vise jaw to the left to check for bind. Then place something under the first elevator slide so that the first elevator jaws are just clear of vise jaws and again move right-hand jaw to see if bind has been eliminated.

Check the position of the control rod cam 23, Fig. XIII, in relation to latch 29. (See Adjustment "l").

It is possible that the air cushion cylinder adjustment, Fig. XI, is not properly made and therefore is retarding and keeping the vise jaws from closing on the line of matrices. (See Adjustment 2).

If the vise jaws do not close properly after checking to make sure vise jaws move freely and are not retarded by the air cushion cylinder, the vise jaw closing spring shown in Fig. V can be placed in lower hole.

- (c) Vise Jaws Backing Away Between First and Second Justification: This is caused by insufficient pressure of the control rod friction stud allowing the jaws to back away. See Adjustment "n".
- (d) Left-hand Vise Jaw Safety (Electric):
- (1) Poor Switch Action: This may be due to mechanical or electrical reasons. Check switch action after disconnecting the two prong Jones plug F-8505. (See wiring diagram). Terminal 1 of plug F-8505 (which has the wire 201 connected to it) should be connected to an ohmmeter. When the left-hand vise jaw safety switch is closed by pressing on the plunger the resistance should be less than one ohm. If switch is allowed to open by relieving pressure on the plunger, the resistance should be infinite. If switch is electrically defective, remove and replace. If switch is sticking, disassemble and inspect closely for cause of bind. F8503
 - (2) Defective Solenoid, F-5279: To check this solenoid, remove both leads from terminal strip F-8474 and measure resistance from either lead to machine frame. Resistance should be infinite. Then measure resistance between leads. Resistance should be between 17 and 21 ohms.
 - (3) Defective Capacitor F-8477 or Resistor F-8478: If the contact points of the left-hand vise jaw safety switch are being burned or pitted by excessive arcing, this may be due to a defective condenser or resistor since these parts comprise the arc suppression circuit which is designed to suppress excessive arcing between switch contact points.
 - (4) No Voltage: If fuse F-8652 (in fuse holder F-8654) which protects the circuit is not blown, then proceed as follows:
 - a) Start Linotype and allow machine cycle to continue until vise jaws are closed. Measure D.C. voltage at terminal strip F-8474. It should be between 18 and 24 volts.
 - b) If no voltage can be measured at terminal strip F-8474 check voltage at terminal strip F-8410 of the Rectifier Box Assembly F-8480. If 18 to 24

volt D.C. voltage is not present at terminals 3 and 4 of F-8410, measure the A.C. voltage on the same terminal strip between terminals 1 and 2. This should be about 24 volts A.C.

- F8473* on
F8475*
- F8473A 110-60-1
F8473B 220-60-1
F8475 220-60-3*
- c) If there is no voltage present on terminal strip F-8410 check across pins A and D of connector F-8402 in power supply unit. Disconnect plug F-8504 from connector in order to do this. Voltage should be approximately 24 volts A.C.
 - d) If there is no 24 volt A.C. voltage present at connector F-8402, check across terminals 1 and 4 of terminal strip F-8410. Power supply box F-8473. The voltage across terminals 1 and 4 should be the line voltage, i.e. 110 or 220 volts.
 - e) If there is voltage at the terminal strip F-8410 and no voltage at connector F-8402, check wiring for correctness and if necessary replace transformer F-8454.
 - f) If there is no voltage at terminal strip F-8410, check switch E-5239 (three phase) or F-8680 (single phase). Before replacing switch make sure that current is entering switch from power supply.

Since this safety circuit is completed by grounding through the machine frame it is important that ground (GND-203) connection of lead 301 from solenoid F-5279 to the pot pump bracket be securely fastened and kept clean of oil or corrosion. Also the wires 606 and 303, which ground the various components to one another to assure a complete circuit through the machine frame, should be securely fastened at terminal points.

(5) Pot Pump Solenoid Hum: A humming pot pump solenoid F-5279 may be caused by (1) a faulty or grounded vise jaw safety switch or, (2) a defective solenoid. To determine which is the cause, the following is suggested:

- a) Check vise jaw switch as outlined previously.
- b) Check resistance of solenoid to see if it is defective or not.

It is possible that over a period of several years the rectifier F-8476 located in the Rectifier Box F-8480 will age to the extent that it may not have the minimum 18 volt D.C. output to operate the electrical components of the circuit. In this case either the 26 volt tap of the transformer in the Power Supply Unit F-8473 can be used, or the rectifier F-8476 can be replaced.

Care should be exercised to keep the small cover over terminal strip F-8474 as its location in the area of the metal pot might expose the terminals to type metal splashes which would cause short circuits or undesired grounding. Also inspect and clean Micro-Switch F-8516. This should be done periodically, especially if Mohr-Saw is being used. Metal chips or dust can ground Micro-Switch.

F8614

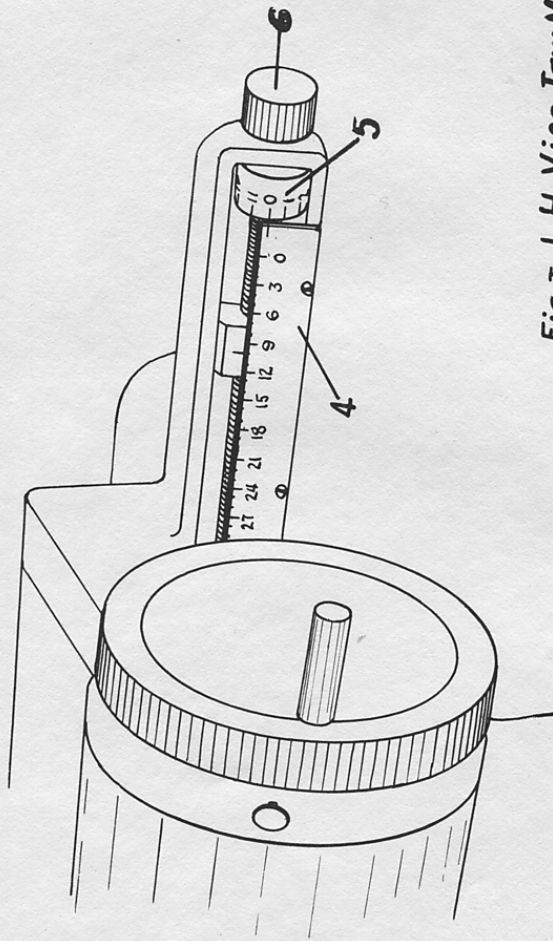


Fig. I L.H. Vise Jaw Measure Control

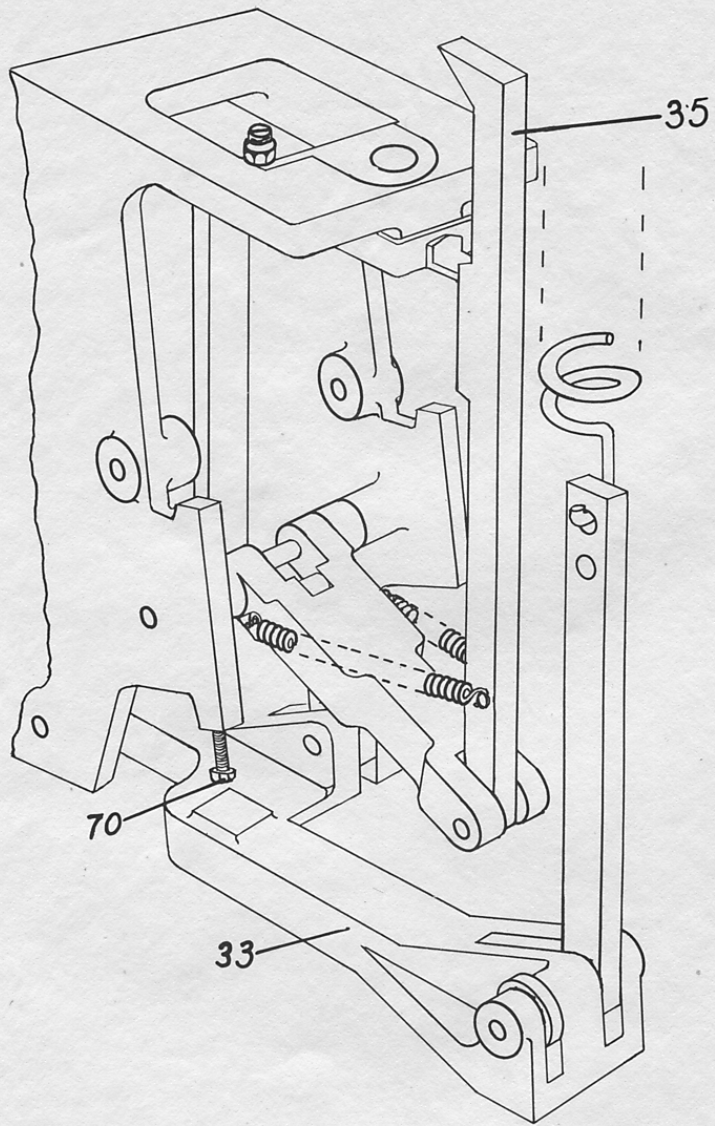
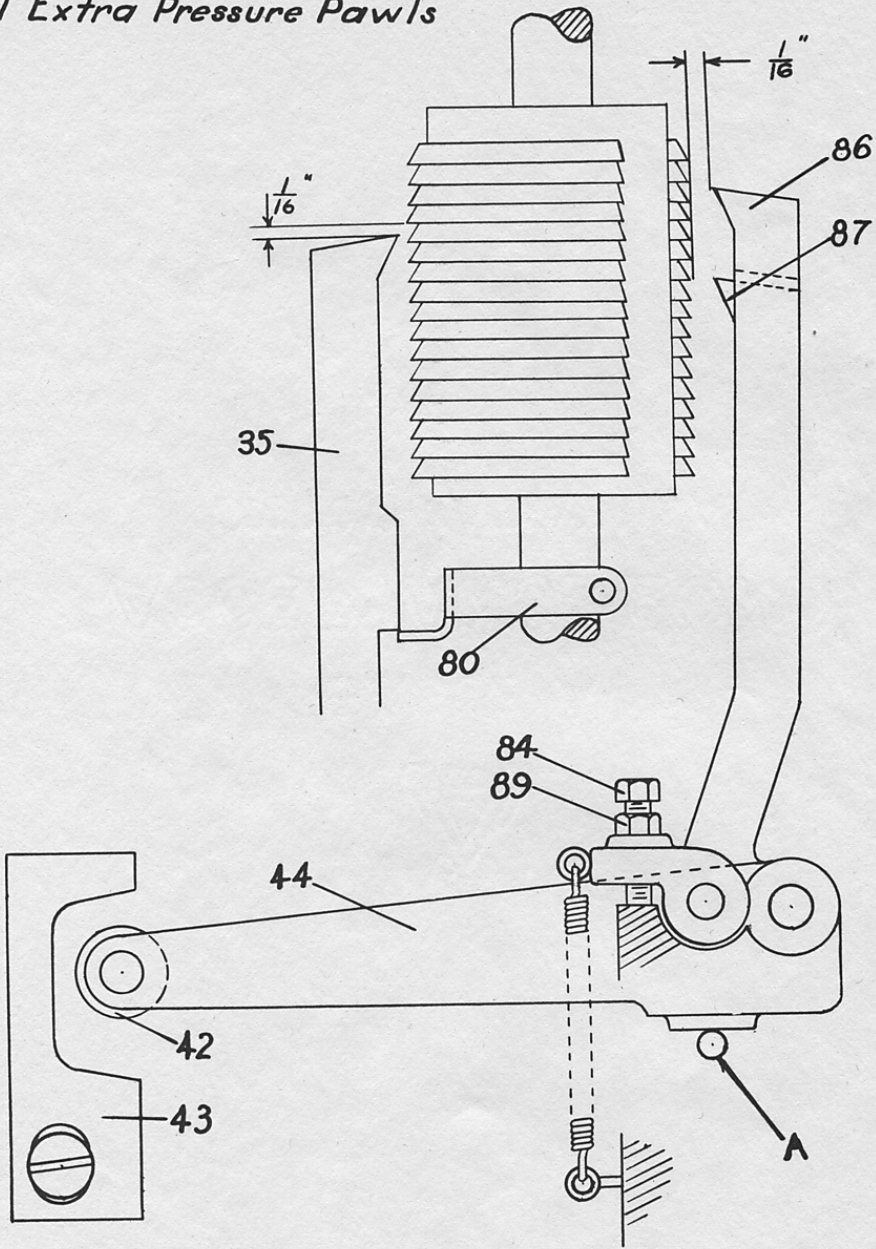


Fig. V Vise Jaw Closing Mechanism

Fig. VI Extra Pressure Pawls



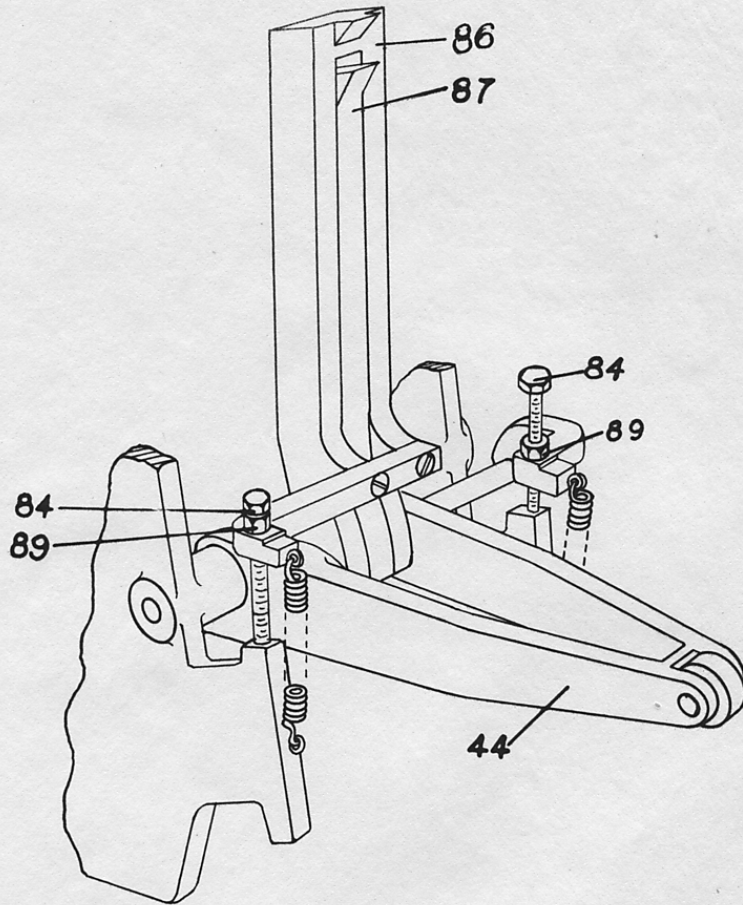


Fig. VIA EXTRA Pressure Pawls

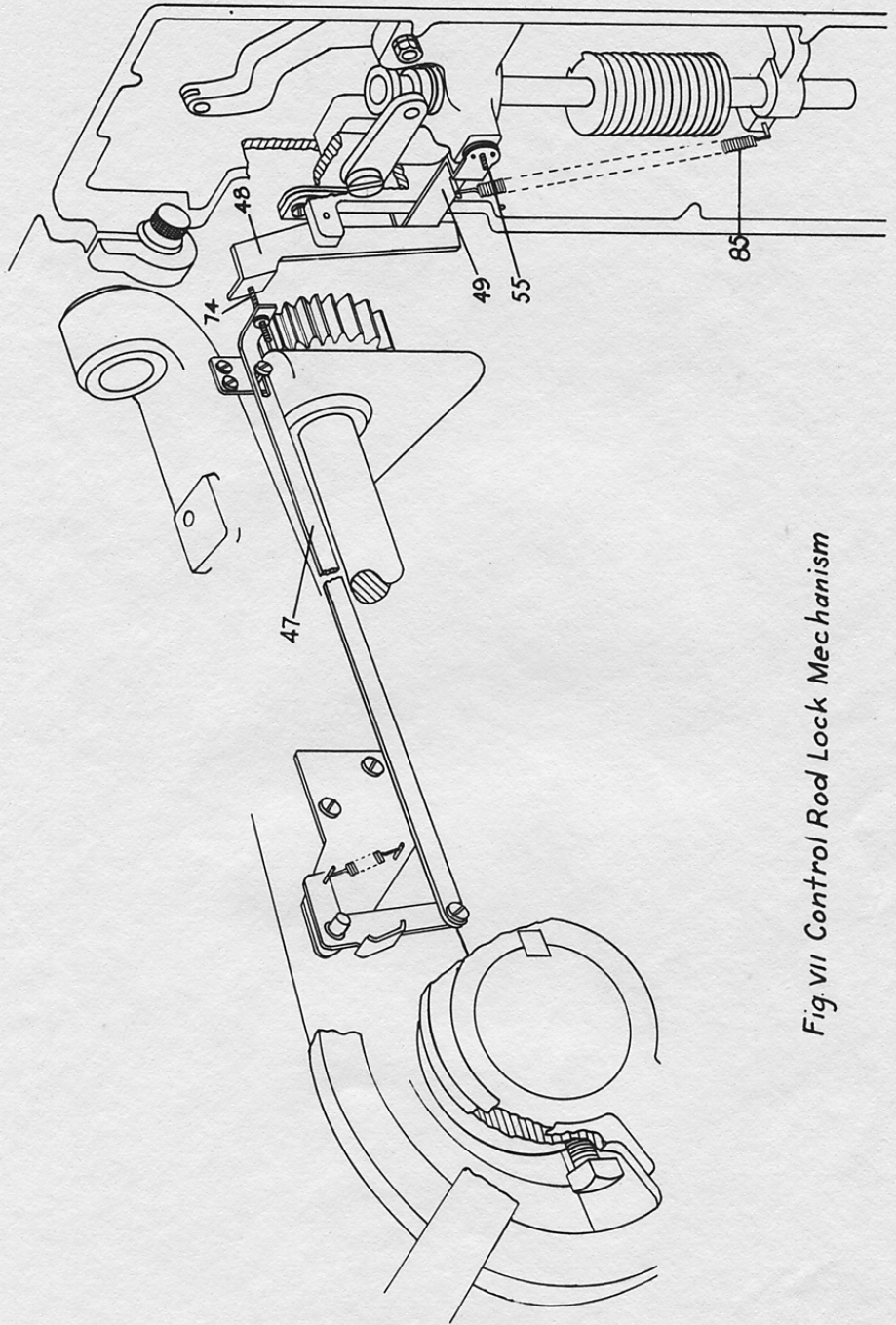


Fig. VII Control Rod Lock Mechanism

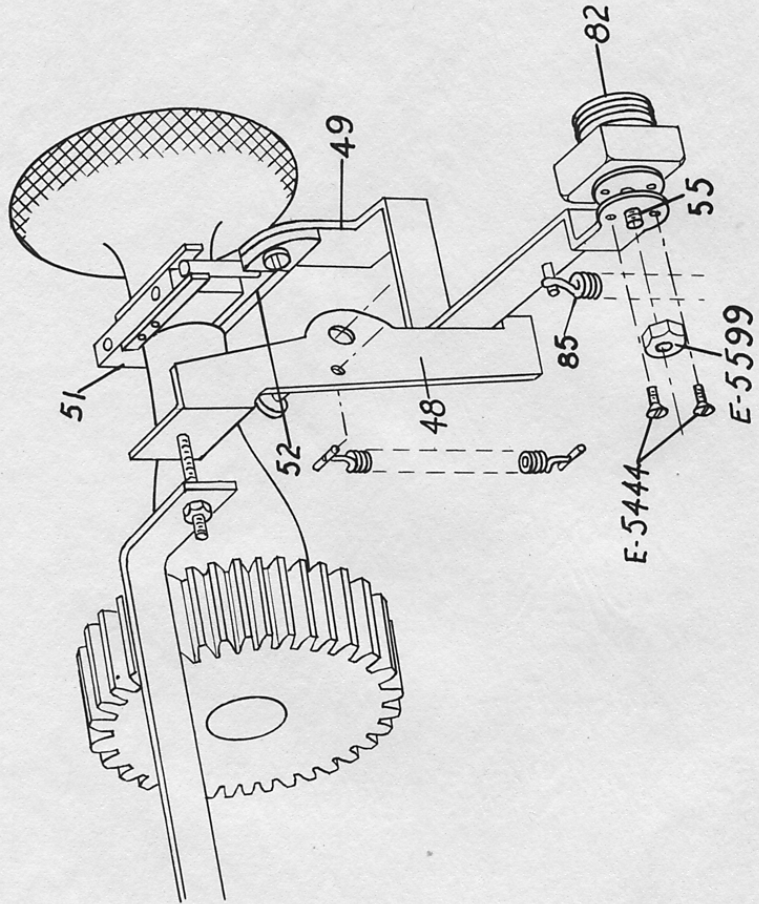


Fig. VIII Control Rod Lock

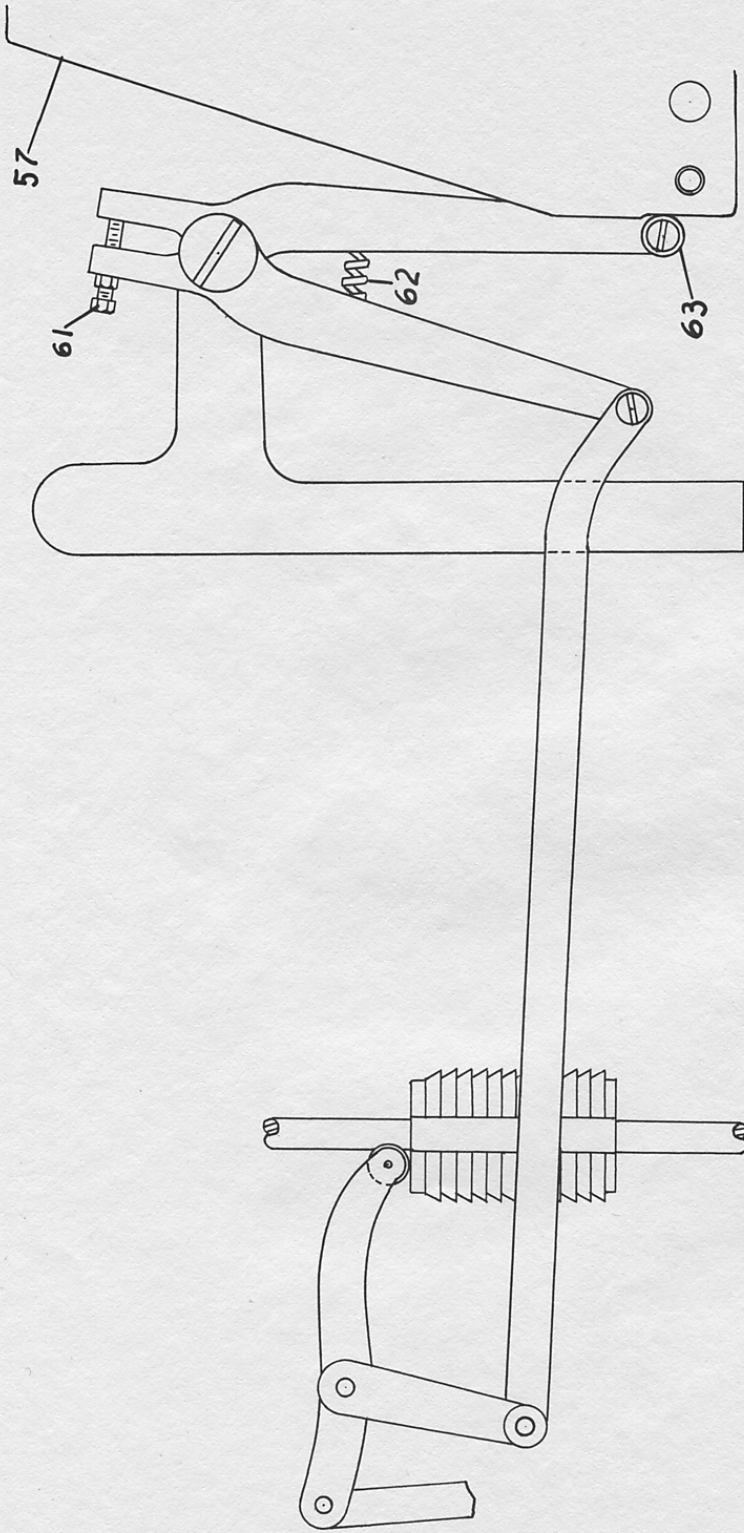


Fig. 1X Vise Jaw Return Mechanism

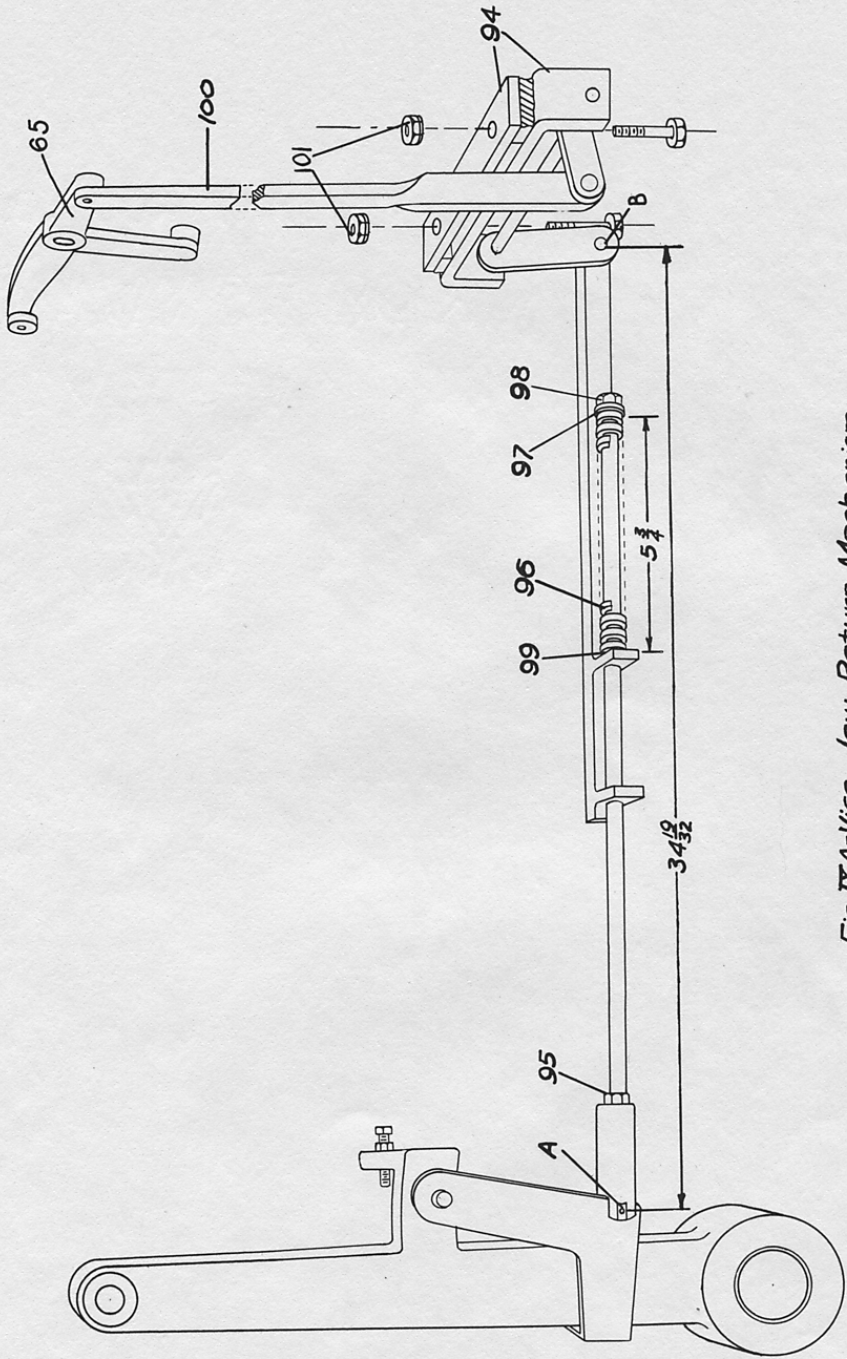


Fig IXA-Vise Jaw Return Mechanism

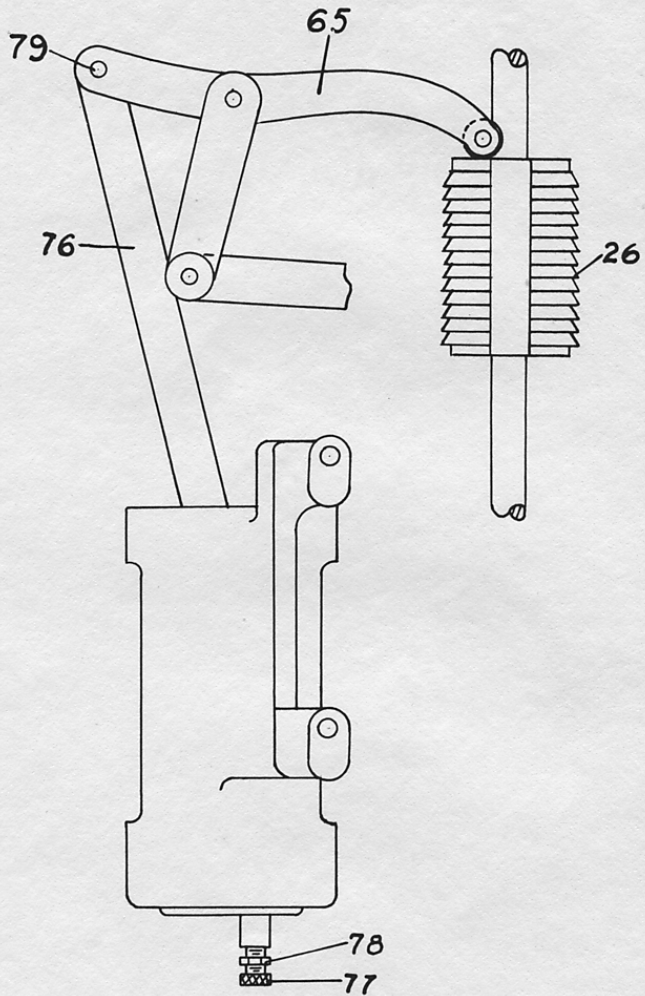


Fig. XI Air Cylinder

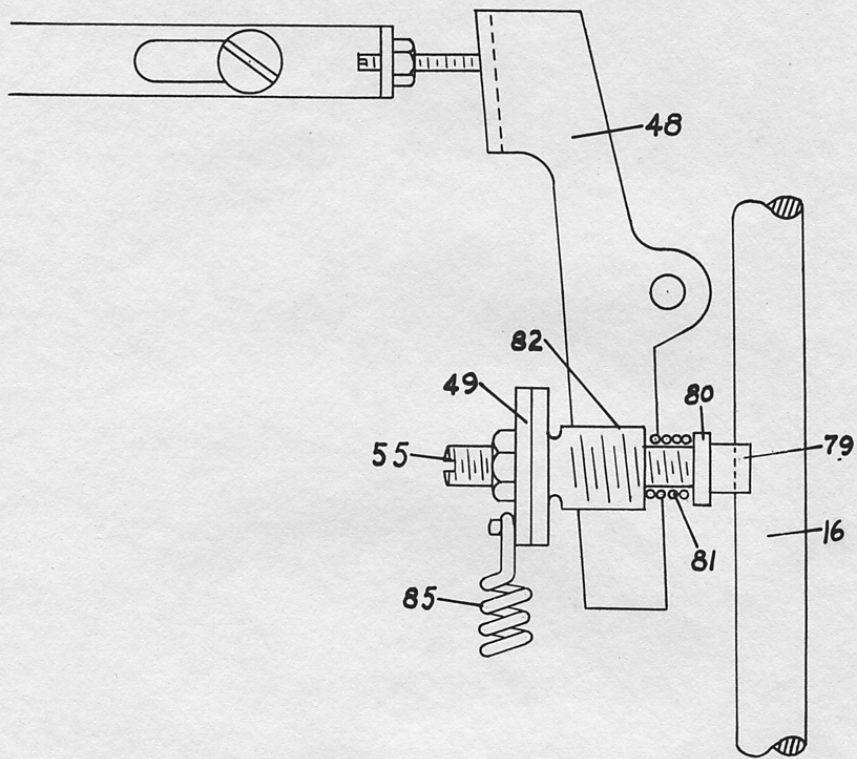


Fig. XII Control Rod Lock

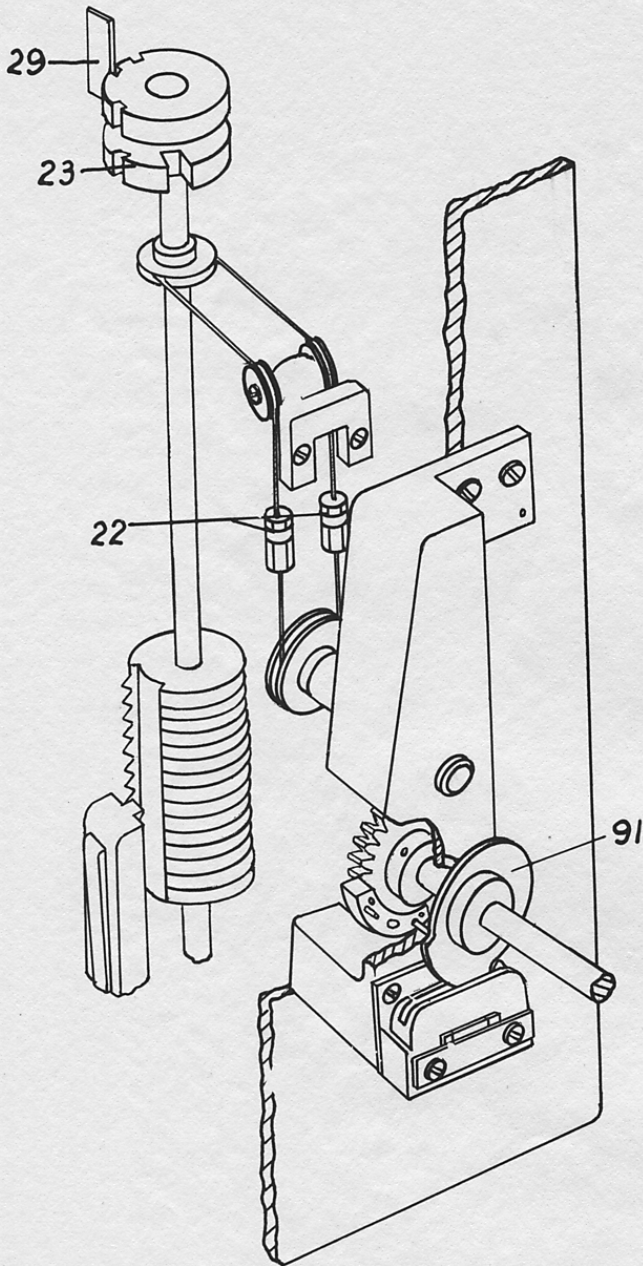


Fig. XIII Micro-Switch & Control Rod

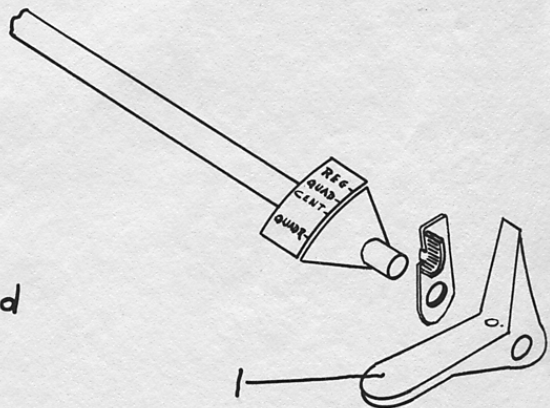
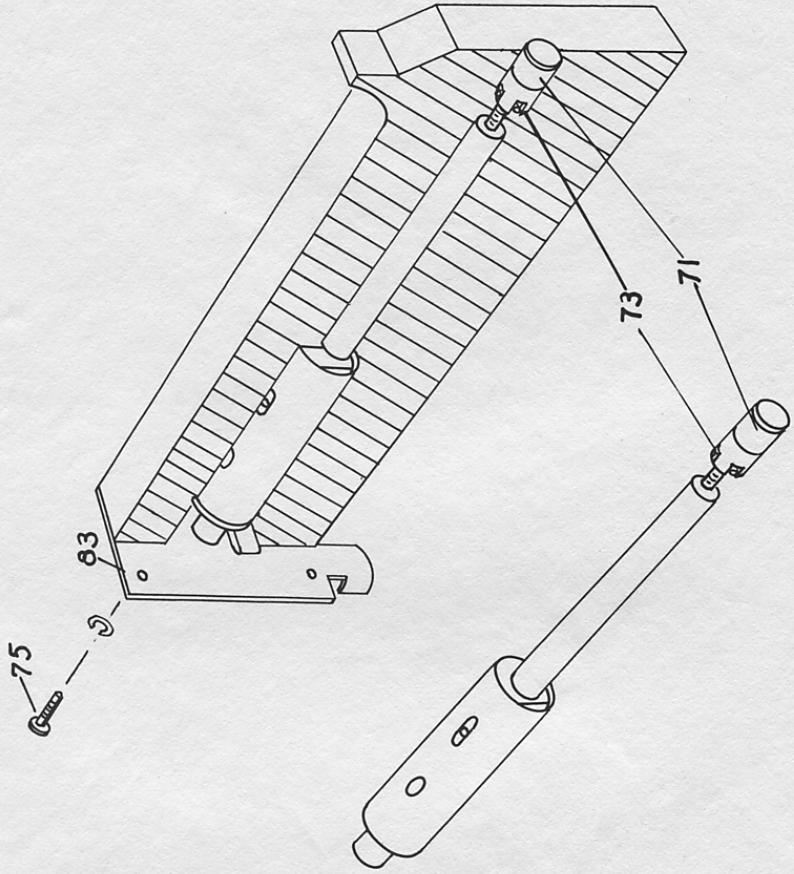


Fig xiv L.H. Vise Jaw Safety Switch



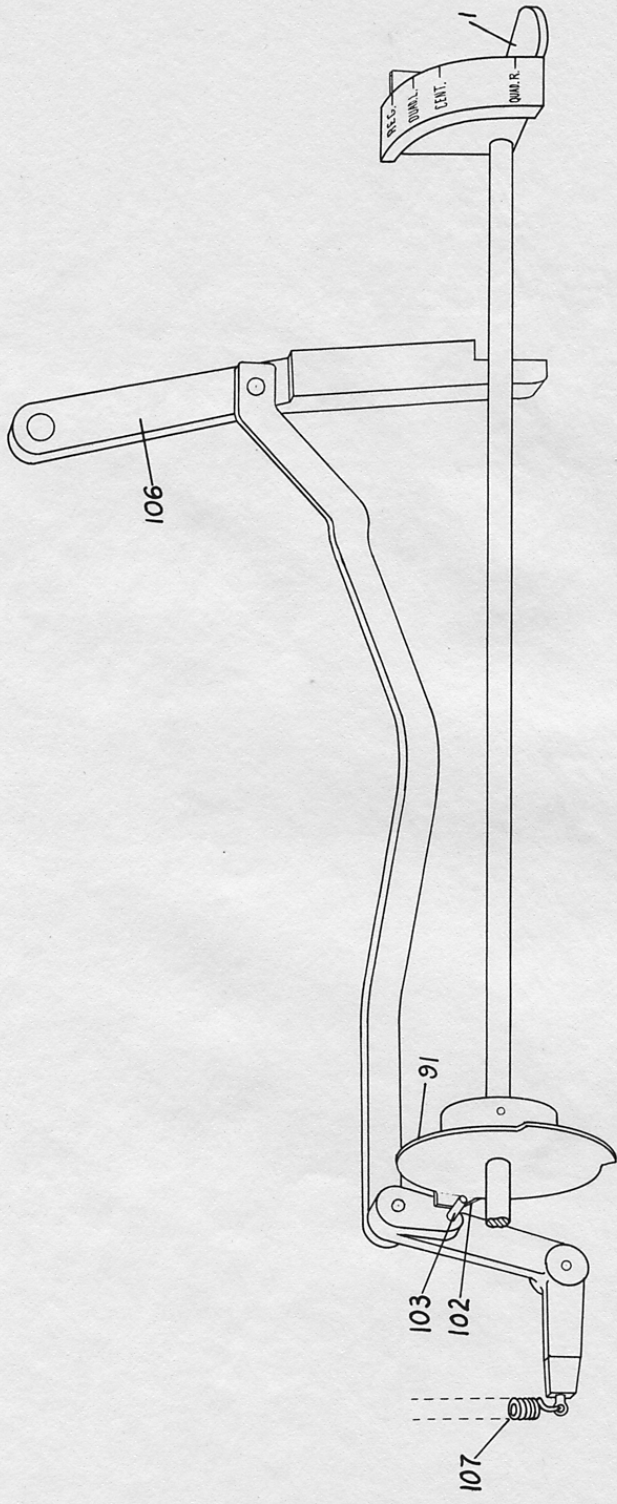


Fig. xv Justification Lockout

Fig. XVA Justification Lockout

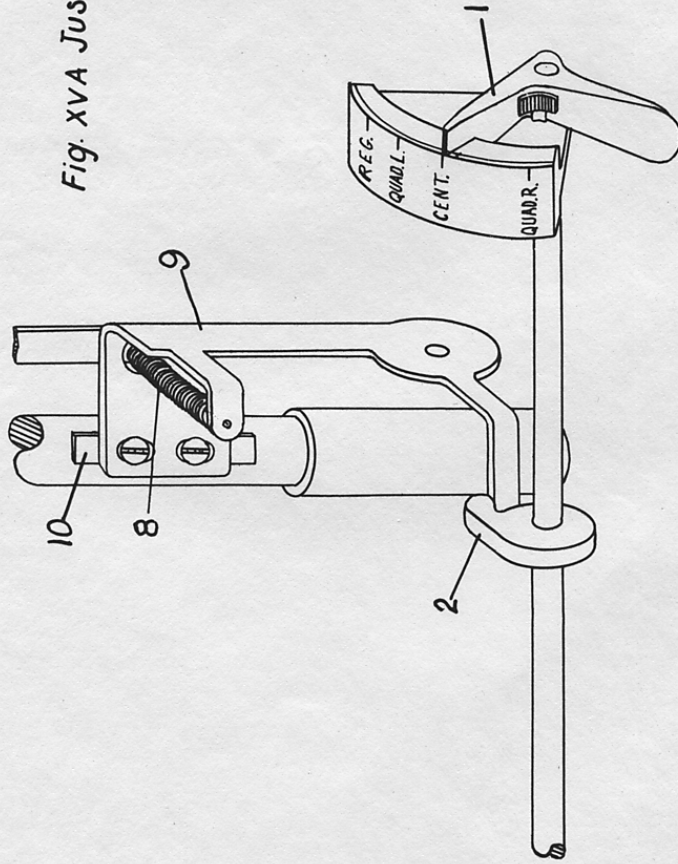
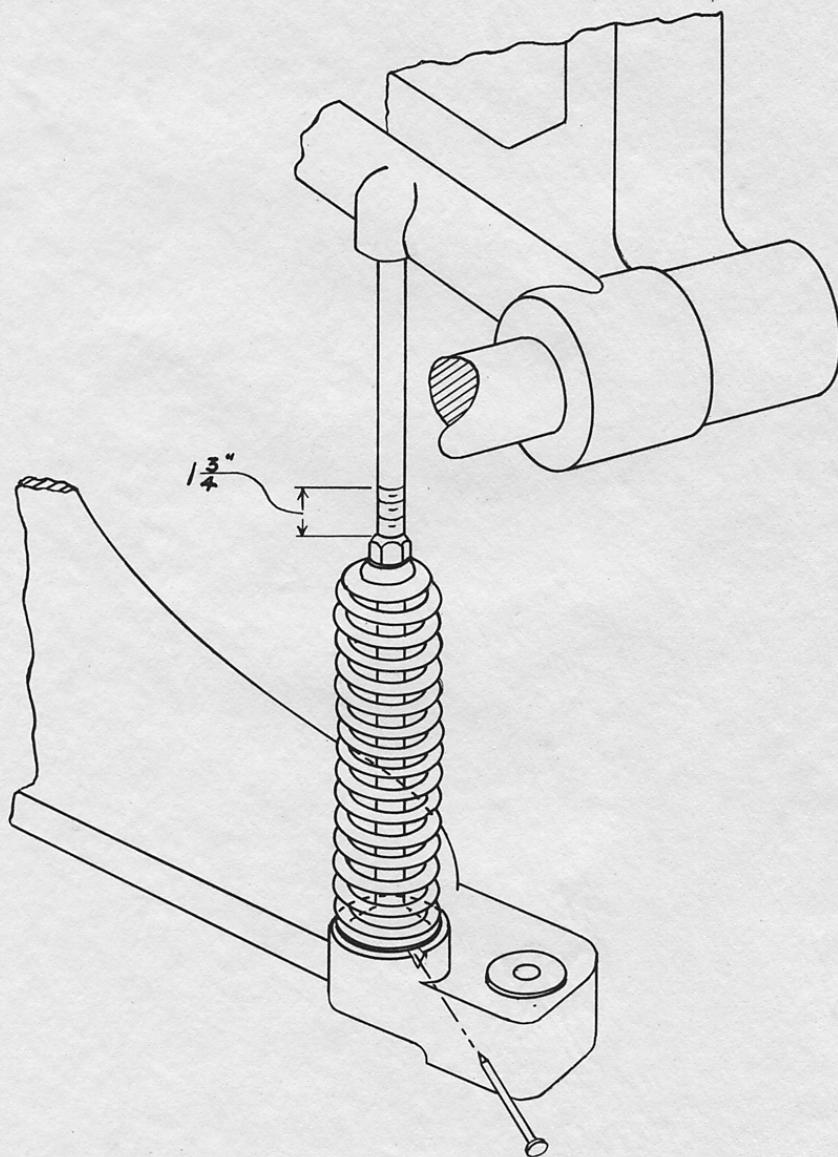
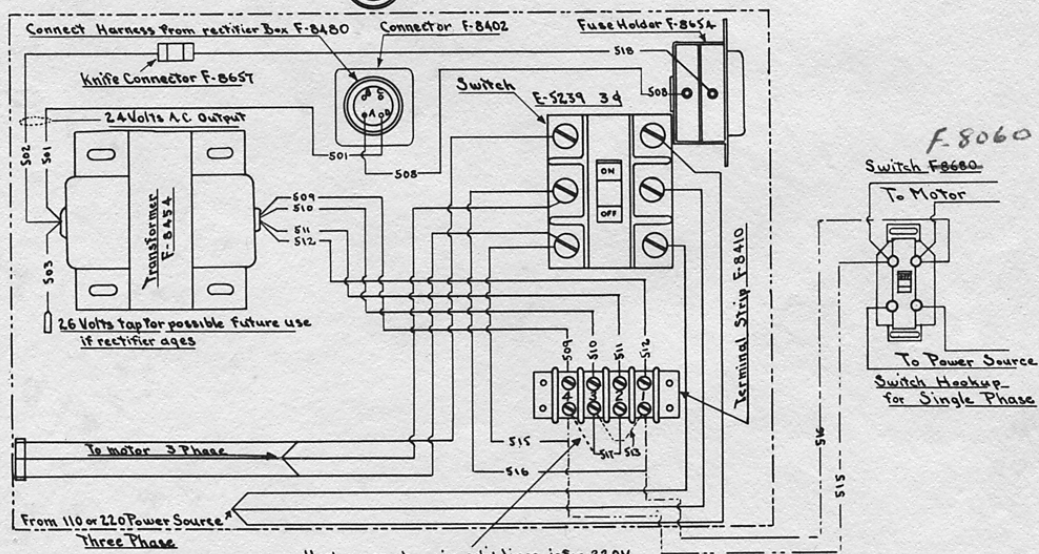
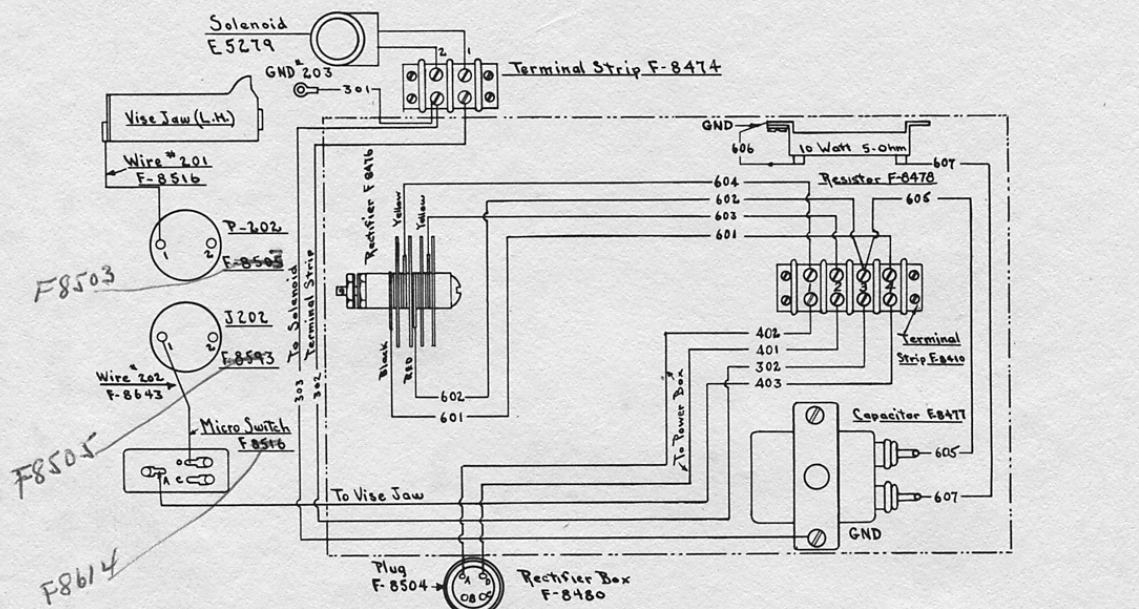


Fig. ~~VII~~ Vise Closing Lever Spring





Power Supply Box F-8473

Hook up as shown in solid lines is for 220V
 For 110V. add Jumper 515 Between Terminals 1-3
 and cont 511 to 2&4 instead 2&3

- F8473*
- F8475
- 8473A - 110 - 60 - 1
 - 8473B - 220 - 60 - 1
 - 8475 - 220 - 60 - 3