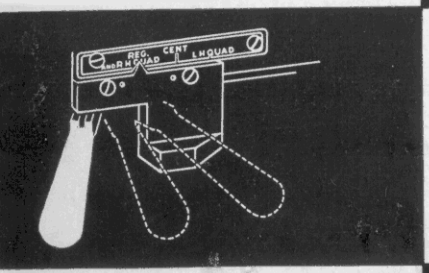
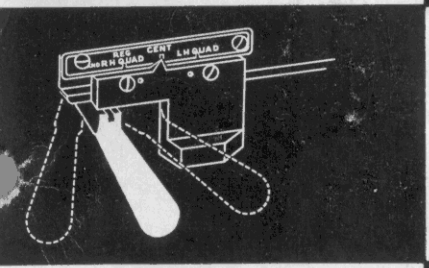
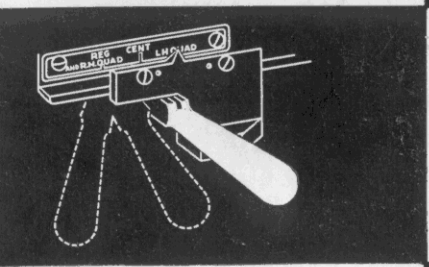
OPERATION and MAINTENANCE OF THE LINOTYPE SELF-QUADDER







THIS BOOKLET covers the Linotype Self-Quadder as applied to Linotypes Serial 61506 and up. It incorporates details of the new control rod gripping device, including the extra pressure device and the new cage containing the four control rod gripping pawls.

An appendix, added to the back of the booklet, supplies cross-index information between the reference numbers used on the various illustrations and the actual catalog numbers of these parts. This will serve as a valuable supplement to the regular Self-Quadder Parts Catalog.

Set in Corona and Erbar Families

CONTENTS

I

INTRODUCTION

The Linotype Self-Quadder automatically sets short-line measures of type in the center, or at either end of Linotype slugs, and on any length of slugs within the range of the machine. The time formerly consumed by the operator in counting quads and spaces on both sides of centered type, or in filling out short lines with quads and spaces to the right or left of the type, is no longer necessary with the Self-Quadder.

The Self-Quadder will automatically perform the functions of Right-Hand Quadding, which sets the type flush right on the slug; Left-Hand Quadding, which sets the type flush left; or Centering, which positions the type on the exact center of the measure for which the vise jaws are set. When the Self-Quadder is set for Quadding, these operations will be performed, regardless of the length of line or type, whether using a single matrix or a nearly full line of matrices. If no matrices are sent through, the machine will cast blank slugs in any of the quadding positions, by virtue of the vise jaws closing against each other.

The precision, sturdiness and simplicity of operation of the Self-Quadder makes its use indispensable on otherwise tedious and difficult composition. It is one of the greatest time-savers ever applied to the Linotype machine, and greatly increases the operator's efficiency.

Spaceband wedge action, or spaceband drive, for the purpose of justifying lines, is made inoperative while the Self-Quadder is in use. This gives positive uniform spacing between words of all quadded lines. Additional thin, en, or em spaces can be automatically dropped with each spaceband for wider spacing when required, or these spaces may be used alone without spacebands, but controlled from the spaceband keylever.

Quadded lines are made tight through the action of the extra pressure device, which exerts sufficient pressure on the vise jaws to tighten the line of matrices securely. This extra pressure device comes into action just before the cast takes place, so that normal alignments of the matrices, both vertically and horizontally, are freely permitted.

The Self-Quadder is disconnected from operation when it is set for "Regular." The machine will then operate as a regular machine, or a machine not equipped with the Self-Quadder. All lines will then justify to the full length of the measure for which the vise jaws are set.

Linotypes equipped with the new improved Self-Quadder described in this booklet

have the positive action control rod gripping device which replaces the former toggle lock. The control rod gripping device is an outstanding development in that it is rugged and positive in action, and has simplified the overall maintenance of quadders by completely eliminating several points of adjustments.

All new machines, including those equipped with Self-Quadders, are provided with additional safety devices for the protection of the machine, matrices, and the operator. At the start of a line-casting cycle the pump stop is forcibly placed in safety position. This remains here until the vise jaws close against the matrices, or the line is justified tight. In case of an accidental short line being sent in with wide open jaws, where operator failed to place controls for quadding, there is an additional positive pump stop action.

Another separate pump stop lever, operating from the metal pot action, does not release the pump until pot is correctly locked up against molds. In addition to these automatic safeties, the pump stop can always be closed manually by pushing the stop lever to the left, definitely preventing any cast from taking place where it is undesired, such as when running through pi lines. Thus, all new machines are provided with five controls on the pump stop action for assured safety.

An additional improvement used on all new machines is the mold slide safety stop, which brings the machine to a full clutch throw-out stop if any improper combination of mold and filling piece were used, or if anything interferes with the normal first advance of the mold disk.

II

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 to the second elevator bar, and thus needs no manual positioning. The assembling elevator is designed so that one or more matrices can be assembled and delivered into the first elevator jaws without the necessity of moving the delivery slide long finger over to the right to support them. The long finger may be left at 30 ems for all composition, if desired.

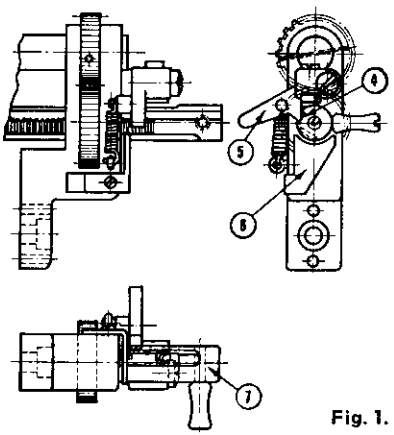


Fig. 1.

To Set the Left-Hand Vise Jaw for required length, lift the latch *5*, Fig. 1, on the adjusting bar *7*, located at right-hand end of the vise frame. Pull the adjusting bar to the right as far as possible, then turn it clockwise one-quarter of a turn. The left-hand vise jaw can then be moved until the desired length of line is indicated by the em scale pointer *6*. Now turn the adjusting bar counter-clockwise until the locking latch enters the retaining slot *4*, and push the adjusting bar to the left as far as possible so that the latch will hold it within the vise frame. This is to prevent the adjusting bar from moving with the vise jaws when quadding.

Four Positions of Self-Quadder Control

There are four positions of control of the Self-Quadder available to the operator. These are:

1. Regular, when 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. No quadding action

takes place when operating on "Regular." The selector handle *110*, Fig. 2, is placed to the left as far as it will go, so that pointer *103* is under "Reg. and R.H. Quad" on the indicator plate, and then the stud shifter lever *107* is pushed back or inward.

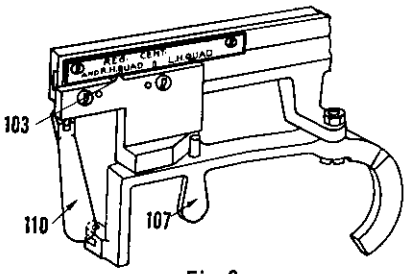


Fig. 2.

2. Right-Hand Quadding, when the left-hand vise jaw moves over to the right until it stops against the matrices, making the line cast flush right. The selector handle *110* is placed in the left-hand position, the same as for "Regular," so that the pointer is under "Reg. and R.H. Quad," and then the stud shifter lever *107* is pulled outward or to the front.

3. Centering, when both vise jaws move together in unison, bringing the line of matrices to the exact center of the measure. This position is attained by placing the selector handle *110* so that the pointer is directly under the mark below "Cent." of the indicator plate.

4. Left-Hand Quadding, when the right-hand vise jaw alone moves over to the left, until it forces the matrices against the left-hand jaw, making the line cast flush left. The selector handle *110* is placed to the right as far as it will go, for this position, with the pointer under "L.H. Quad," on the indicator plate.

Mechanics of Self-Quadder Control

In order to understand the simplicity of the Self-Quadder, a right front view of the vise frame assembly, with the first elevator slide and galley brackets removed, is shown in Fig. 3. The selector handle *110* is keyed directly to the pointer plate *103*, which is attached to the horizontal slide *111*. The right end of this slide has a gear rack *12*, which engages the pinion *14*. Back of this pinion and on the same shaft is a small bevel gear *8*, which meshes with a similar bevel gear *72* in the top of the control rod latch *1*, when the control rod *3* returns upward to its normal position. The limits of motion, right and left, of the selector handle, the slide, and the gear rack are determined by the fixed rack stop bar *33*.

Fig. 6 shows a front view plan of the vise frame, detailing the vise jaw operating levers and links, and showing their fulcrum centers to the right and left of the control rod. The control rod latch *1*, which is keyed to the top end of the quadder control rod *3*, mechanically determines which of the quadding operations are to be performed by its relative position of rotation. When the selector handle *110* moves the pointer *103* from "R.H. Quad" to "Cent." the pinion and bevel gears rotate the latch one-quarter of a revolution, or exactly 90 degrees. Moving the selector handle from "Cent." to "L.H. Quad" turns the latch another one-quarter of a revolution. Thus, all functions of control are performed in two 90-degree turns of the latch.

Fig. 4 shows a top view of the control rod latch in its three positions, and the relative methods of engagement with the vise jaw operating levers. The top ledge of the latch can be divided into four quarters for reference. With latch shown in position for "Regular," the back quarter is cut away, making this a no-ledge. The front quarter is one-half cut away, making this a half-ledge. The right and left sides are uncut, and thus both have full-ledges.

Regular. (Fig. 4A.) When the control rod latch descends in this position, the fixed stud *109* in the right-hand vise jaw operating lever *2* is not engaged, and this jaw

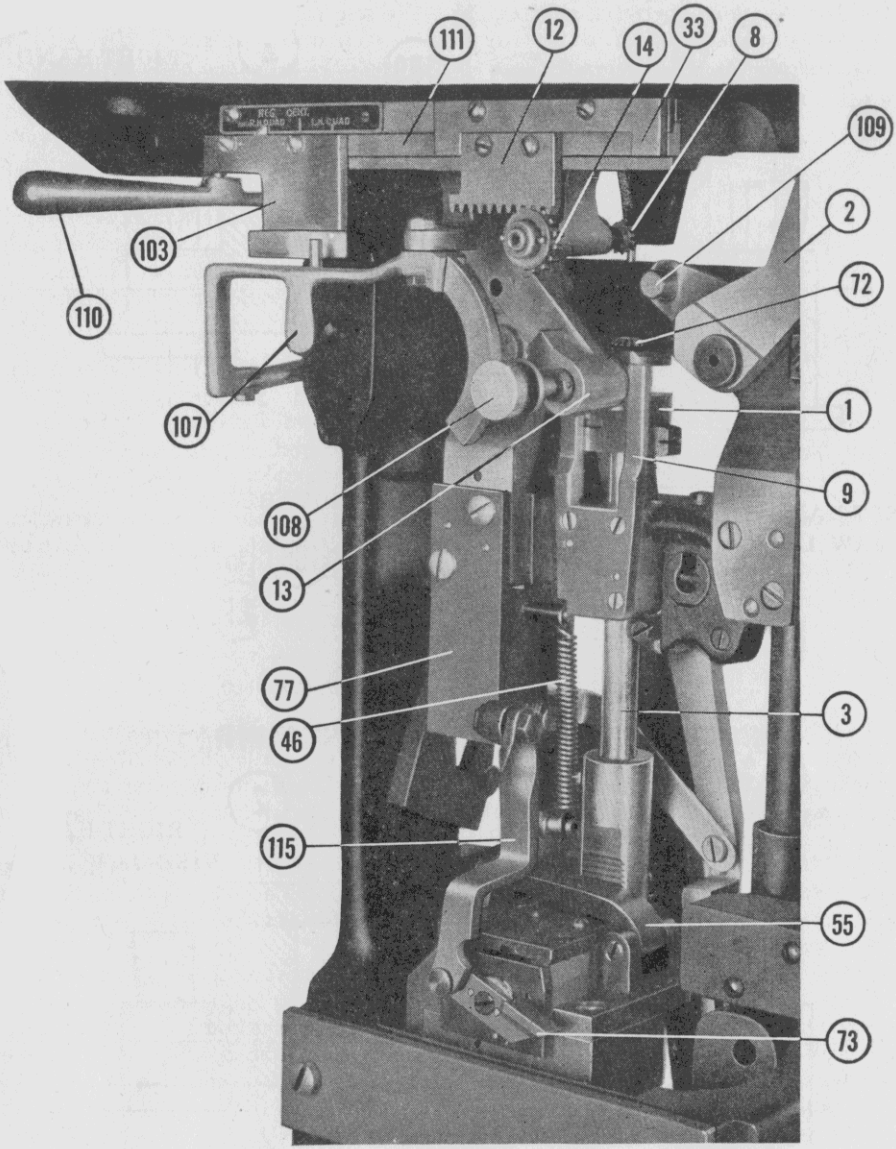


Fig. 3. Right front view of the Self-Quadder mechanism in the vise frame, showing method of control from the selector handle to control rod latch. View shows machine performing the right-hand quadding operation, with control rod down, and the control rod lock in the locked position.

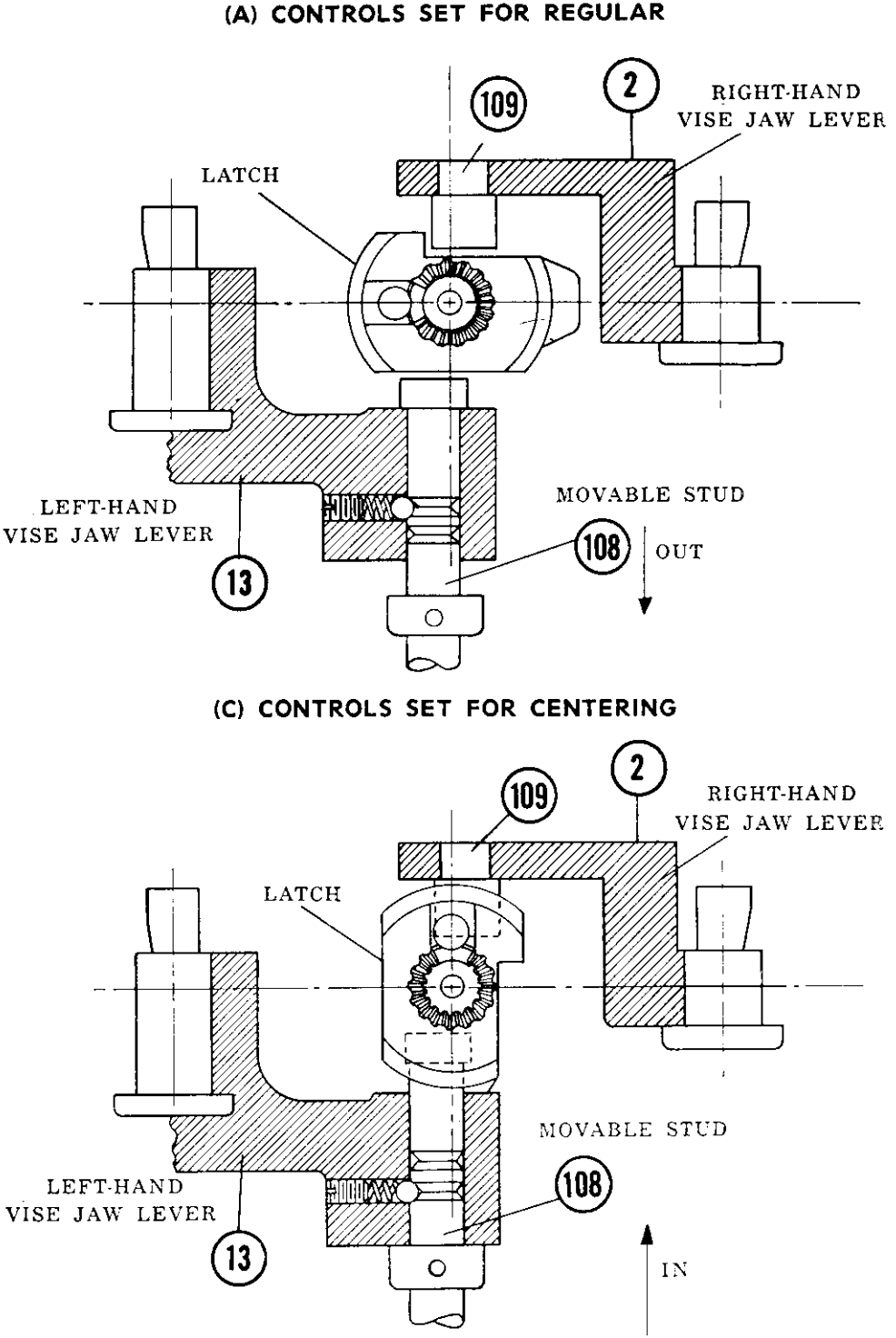
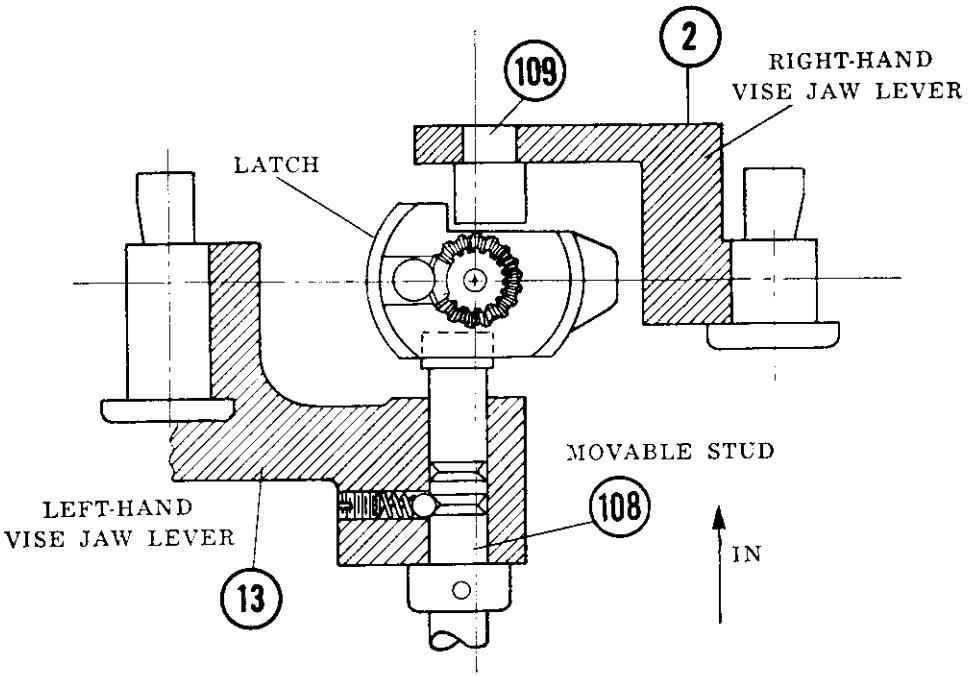
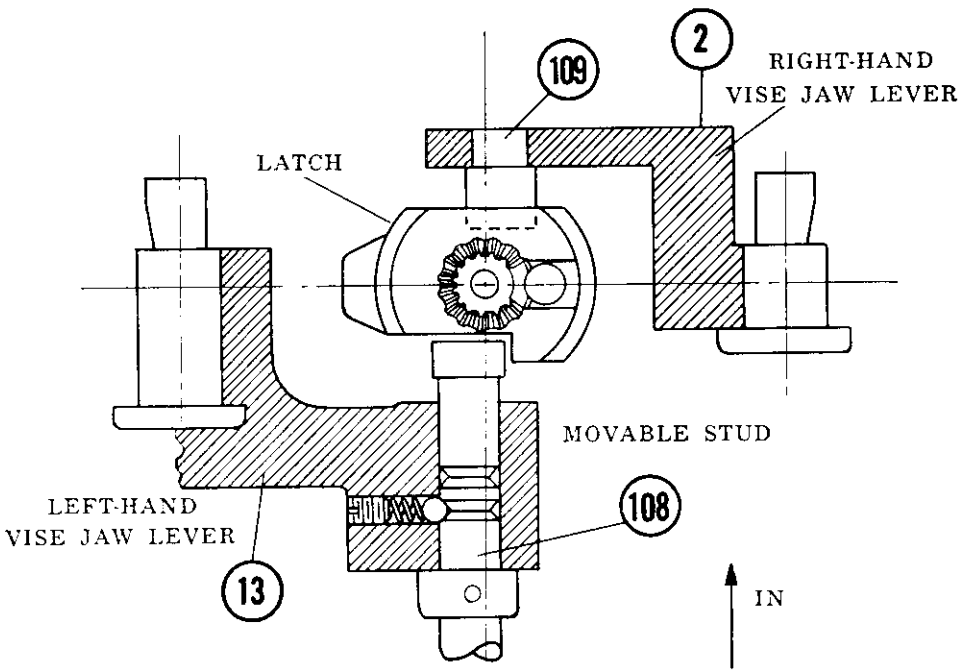


Fig. 4. Top view of control rod latch in its three positions, and the four positions of quadder

(B) CONTROLS SET FOR RIGHT-HAND QUADDING



(D) CONTROLS SET FOR LEFT-HAND QUADDING



controls, revealing the method of engagement of the latch and the vise jaw operating levers.

remains stationary. With the movable stud *108* in the left-hand vise jaw operating lever *13* out to the front, the latch makes no engagement here either, and thus the downstroke of the control rod and latch will not move either vise jaw, and the machine will operate as "Regular."

Right-Hand Quadding. (Fig. 4B.) When the stud shifting lever *107* is pulled out, this forces the movable stud *108* back under the half-ledge of the latch, and thus the left-hand vise jaw operating lever *13* is brought into action with the descent of the control rod, and the left-hand vise jaw moves over to the right.

Centering. (Fig. 4C.) Moving the selector handle over from "Reg. and R.H. Quad" to "Cent." imparts a 90-degree turn to the latch, and here there is a full-ledge over the fixed stud *109* at the back as well as over the movable stud *108* at the front. The downstroke of the control rod latch thus pulls both vise jaws together uniformly and the machine performs the Centering operation.

Left-Hand Quadding. (Fig. 4D.) When the selector handle is moved from "Cent." to "L.H. Quad," this again rotates the latch another 90 degrees, and brings the no-ledge to the front, and the half-ledge to the back. Descent of the control rod latch imparts no action to the left-hand vise jaw, but the half-ledge engages the fixed stud *109* at the back, and thus causes the right-hand vise jaw to move over to the left.

Caution to Operators

From the foregoing description it is obvious that the selector handle *110* should not be moved after the machine has started a line-casting cycle. Once the control rod latch has moved downward, the small bevel gears *8* and *72*, Fig. 3, no longer mesh, and any movement of the selector handle and gear rack would cause the latch to be "out-of-time" with the indicator upon its return to the normal position.

After the machine starts a line-casting cycle neither the selector handle nor the stud shifting lever should be moved or changed until the machine has reached transfer position. This timing allows the control rod latch to return to its normal top position after the cast, re-engaging the bevel gears *8* and *72* in full mesh, after which it is permissible to change the controls. It is very important that this timing delay in changing the controls be fully observed.

Uniform Space Control

The keyboards of all Linotypes equipped with the new Self-Quadder have em, en, and thin space release buttons which, when moved to the left, connect the regular spaceband keylever to these space channels. Thus, a thin space, an em space, or an en space may be dropped along with the spaceband at one stroke of the spaceband lever.

Since justification of the spacebands does not take place when the machine is quadding, one or the other of these additional spaces may be required to provide the correct spacing between display words in a line. This allows typographically correct uniform spacing and should be used accordingly. On certain types of composition where measured spacing is required while quadding, the spacebands may be locked out by means of a stop cam located on the front of the spaceband box, and thus matrix spaces alone may be dropped by the action of the spaceband keylever. An example of this type of composition is typewriter reproduction copy, where typewriter spaces are used only between words, and the lines are all cast flush left, with the Self-Quadder controls set for "L.H. Quad."

Assembling Elevator

The assembling elevator is equipped with the new cam-operated gate. When this elevator is down in the assembling position, a cam plate, operating against an extension at the left side of the gate, opens it about .010" to permit the matrices and spacebands to assemble freely. Just below the back rail on the back plate is a new matrix retaining rail, positioned so that it supports the upper back lugs of matrices, and prevents them from falling over.

When a line of matrices has been assembled and the assembling elevator is raised slightly, the gate extension leaves its contact with the cam plate and the gate closes against the top lugs of the matrices. This combination of gate closing and the supporting back rail holds a single matrix, or any length of line, from falling to the left without the guidance of the delivery slide long finger, which may be left at 30 ems for all measures.

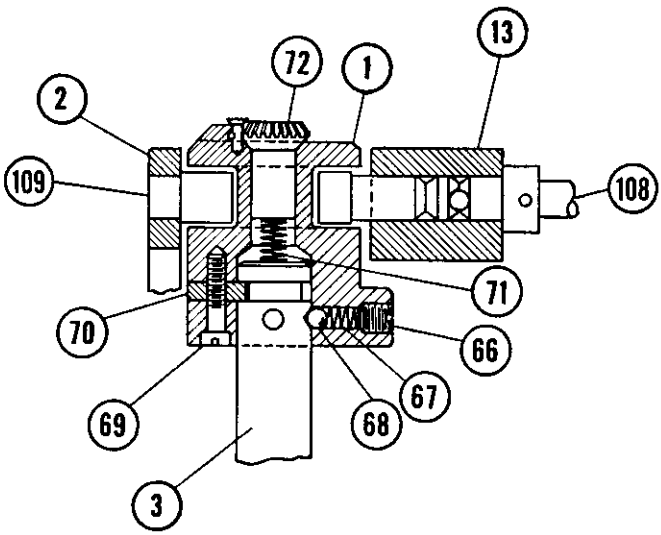


Fig. 5. Left-hand side cross-sectional view of the control rod latch in operating position for "Centering." This shows how the vise jaw operating lever studs enter under the top ledge of the latch to control vise jaw movements. The lower portion of the latch returns the vise jaws to normal positions. The key 70 holds the latch to top of control rod, and permits rotary motion. The ball 68 under pressure from the spring 67 enters three hemispherical indentations around top end of control rod which steady latch in each position of control.

Delivery Slide

As the line is transferred from the assembling elevator to the delivery channel, the short finger closes the open space between the two fingers and the matrices, and the long finger is automatically locked and held in this position by means of a ratchet on the slide, thus holding the matrices firmly together until they are delivered to the first elevator jaws. When the delivery slide returns to its position over the assembling elevator, the ratchet releases and the long finger returns to the 30-em position, or wherever the long finger clamp has been placed.

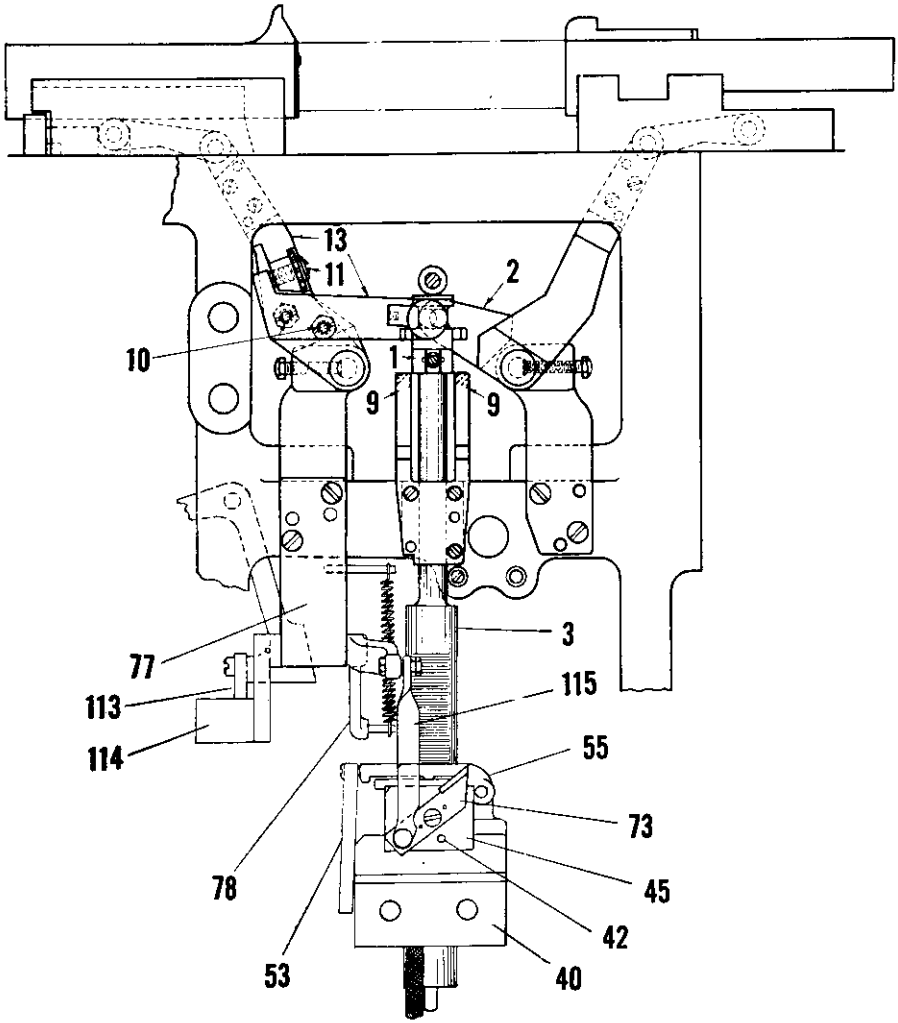


Fig. 6. Front plan view of vise, control rod, latch and vise jaw operating levers.

III

SELF-QUADDER MACHINE ACTIONS

To understand the basic motions involved in the action of the Linotype Self-Quadder, a left-hand side view is shown in Fig. 7. There are two additional cams mounted to the left of the first elevator cam, and attached to same. The outside cam, which is the main quadding cam, supplies the basic motion and timing to the levers which connect to the control rod latch, thus imparting to the vise jaws the movements required in quadding.

This main quadding cam *57*, Fig. 7, has a lever *17* and roll *18* follower, which transmits the cam action to the lever extension arm *35* through the adjusting screw *21*. The extension arm *35* is fitted with a heavy spring *20* which is anchored to the base of the machine. This spring *20* returns the vise jaw mechanism to normal positions after the slug is cast. The return action is cushioned by means of an air cylinder *22*, so that precision adjustments are not disturbed.

The lever extension arm *35* transmits its motion to the two front control rod levers, *15* and *39*, under the vise frame, through a sliding block arrangement. These levers, *15* and *39*, shown in enlarged detail in Fig. 8, pivot on the same shaft which is attached to the base of the machine. Since cam action is positive and has the same distance of travel each revolution, this motion is connected directly to the outside control rod lever *39* only, through the sliding block. The inside control rod lever *15*, which links directly to the control rod, and thus will have a variable motion depending on the amount of vise jaw travel, has an overthrow spring drive from the outside control rod lever *39*.

This overthrow compression spring *60*, Fig. 8, is mounted in a barrel attached to the inside lever *15*, and bears with a fixed pressure against a contact plate on the outside lever *39*. The normal relative position of these two levers is maintained through a pair of hardened steel contact shoes on the opposite side of the shaft from the spring contact plate. Thus, the inside lever will follow the cam action motion of the outside lever during the start of the quadding operation, but when the vise jaws come together on a line of matrices, the inside lever will stop moving, while the outside lever completes the cam lever motion. The spring *60* compresses slightly during this overthrow motion, and maintains a fixed initial pressure between the vise jaws until after the cast is completed.

Fig. 7 and Fig. 8 show the link connecting the inside control rod lever *15* to the bottom of the control rod *3*, and Fig. 6 shows a front view of the control rod and

how it is mounted in two bearings holding it in rigid alignment at the center of the vise frame. The method by which the control rod connects to the vise jaws through the control rod latch, and performs the different quadding operations, has been fully described in the previous section, under the heading: "Mechanics of Self-Quadder Control."

When the preliminary motions of the quadder have been completed, bringing the vise jaws together against the matrices, the main quadding cam 57, Fig. 7, has forced the roll *18* to the high contour of the cam, as illustrated in Fig. 12. These preliminary actions are completed before the time that first justification would normally begin. Thus, the mold disk first advance follows and then the metal pot starts forward for its first lockup for the purpose of face alignment.

Control Rod Lock

The forward motion of the metal pot starts a second sequence of operations which are equally important to the proper performance of the quadder, and have their resultant effect in applying the extra pressure to the vise jaws during the cast. The focal point of these actions is in the control rod locking mechanism which is partially seen in a front view of the lower bracket of the control rod in Fig. 6. A left-hand side view of the external mechanism that operates the control rod lock is shown

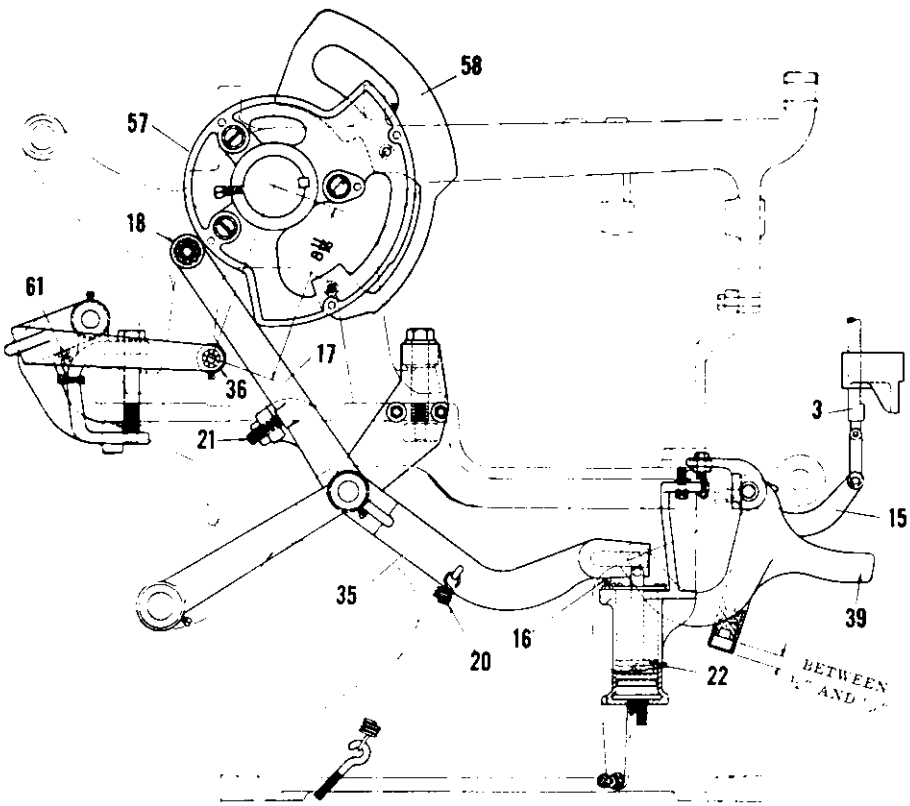


Fig. 7. Left-hand side view of the Self-Quadder mechanism.

in Fig. 8. Amplified details of the internal mechanism of the control rod lock are shown in three left-hand side cross-sectional views, in Figs. 9, 10 and 11. Fig. 9 shows the lock at normal released position.

As the metal pot rocks forward on its first lockup, a spring plunger *112*, contained in a bracket *117*, Fig. 8, attached to the left-hand pot leg, bears against a floating lever *113*, which is attached to the left-hand justification stop *105*. The forward thrust is transmitted through the operating lever *114*, the lever *78*, and the link *115*, to the release lever *73* at the front of the control rod lock. This release lever *73* is rigidly attached to the front end of a double-threaded worm screw *116*, Fig. 9. As viewed from the front of the machine, Fig. 6, the forward motion of the pot rotates this lever *73* clockwise about 60 degrees, causing the worm screw *116* to force the four spring driven ratchet pawls *74*, against the front of the control rod *3*, with the results shown in Fig. 10. The four ratchet pawls *74* have differentially located ratchet teeth, so that, regardless of where the control rod comes to a stop on its downward stroke, there will be at least one ratchet pawl making full mesh with the correspondingly shaped ratchet teeth of the control rod, as indicated by the mesh of No. 2 pawl, counting from the top, in Fig. 10.

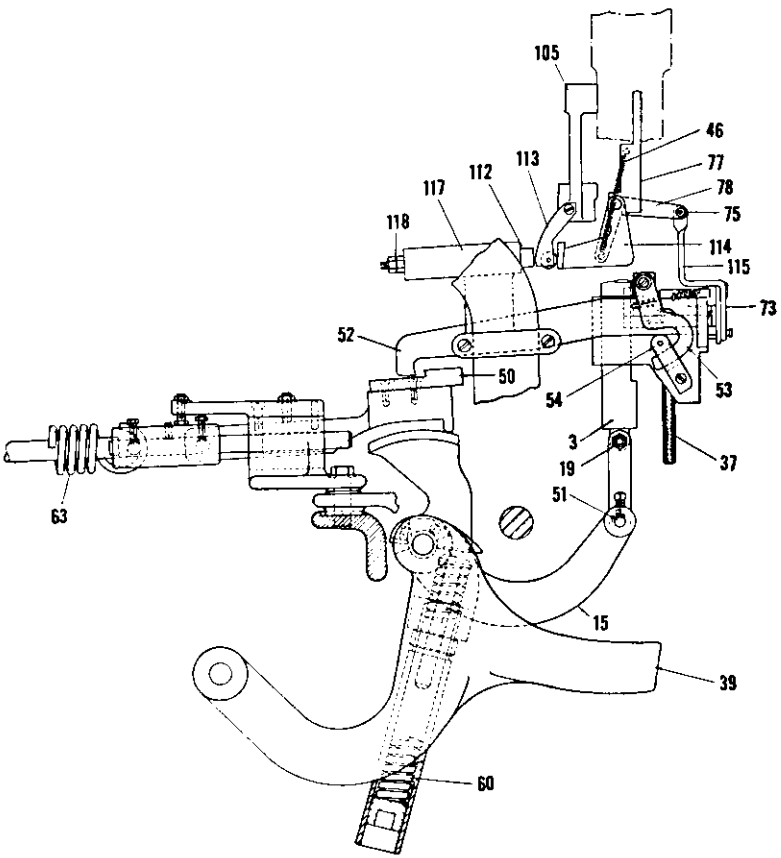


Fig. 8. View showing the mechanism for locking control rod, and applying the extra pressure to the vise jaws after the control rod is in locked position.

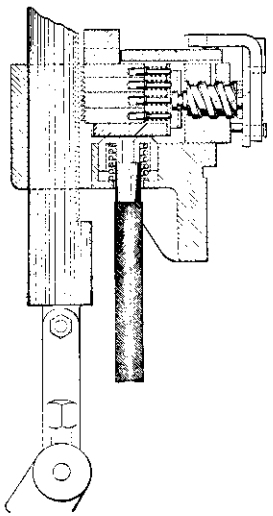


Fig. 9. View of the control rod locking mechanism in the normal position.

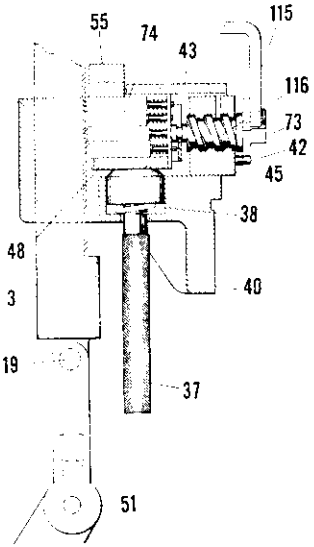


Fig. 10. View of the control rod locking mechanism in the locked position.

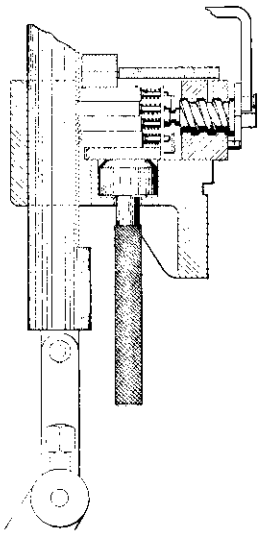


Fig. 11. View of the control rod locking mechanism in locked position, with extra pressure being applied.

The four ratchet pawls are contained within, and move as a unit in a block *48*, Fig. 10. This block is normally held upward against the cover plate *43* by the pressure of the block support plunger *37*, which contains a coil spring *38* under compression.

At this point in the machine cycle the lock has no effect as yet on the quadding action, since the vise jaws are being held together by the initial pressure of the compression spring *60* in the barrel attached to the inside control rod lever *15*, Fig. 8. As the metal pot recedes from its first lockup, the lock remains in the position shown in Fig. 10 due to the overthrow action of the balance spring *46*, Fig. 8, swinging to the front of the pivot center of the operating lever *114*. The first elevator then rises for the alignment of the matrices vertically with the mold grooves.

Extra Pressure Device

Following the rise of the first elevator, the extra pressure cam *58*, Fig. 12, forces the roll *36* downward on the high contour of the cam. This action is transmitted through the large horizontal tension spring *63* and suitable linkage to the shoe guide *55*, on top of the ratchet pawls *74*, Fig. 10, forcing them downward as shown in an exaggerated motion in Fig. 11. Actually, the ratchet pawls will be able to force the control rod down only partially, since the extra pressure is simply tightening the line of matrices between the closed vise jaws.

Details of the extra pressure linkage at the front of the machine are shown in Fig. 8. The front end of the horizontal tension spring *63* links to the shoe *50*, which engages the cam-operating link *52*, pulling it backward against cam *53*. This cam is guided by a roll *54*, so that when forced backward, its upper end which is pivoted on the shoe guide *55*, is pulled downward, applying downward pressure to the ratchet

pawls *74*, and in turn extra pressure to the control rod and vise jaws. When this action is complete, the metal pot locks up the second time and the slug is cast.

Release After Cast

After the slug is cast, the extra pressure is released and the main quadding cam *57* recedes from the roll *18*, relieving downward pressure on the control rod *3*. This results in the control rod lock returning to the position shown in Fig. 10, and in so doing allows the control rod to rise slightly, relieving all pressure of the vise jaws against the line of matrices. The overthrow compression spring *60* in the barrel attached to the inside control rod lever *15* has allowed the outside lever *39* to return to its normal relative position to the inside lever, due to the force of the compression spring *60* and the return spring *20* attached to the lever extension arm *35*, this motion being cushioned by the air cylinder *22*. The immediate result of these actions is a force acting upward on the control rod, which slightly opens the vise jaws, although the control rod lock remains engaged at this moment. This allows the first elevator jaws to rise freely with the line of matrices, and raise them high enough out of the vise jaws, so the return action of the vise jaws does not tend to pull matrices from the ends of the line.

Return to Normal Positions

When the first elevator slide has risen about two inches from the casting position,

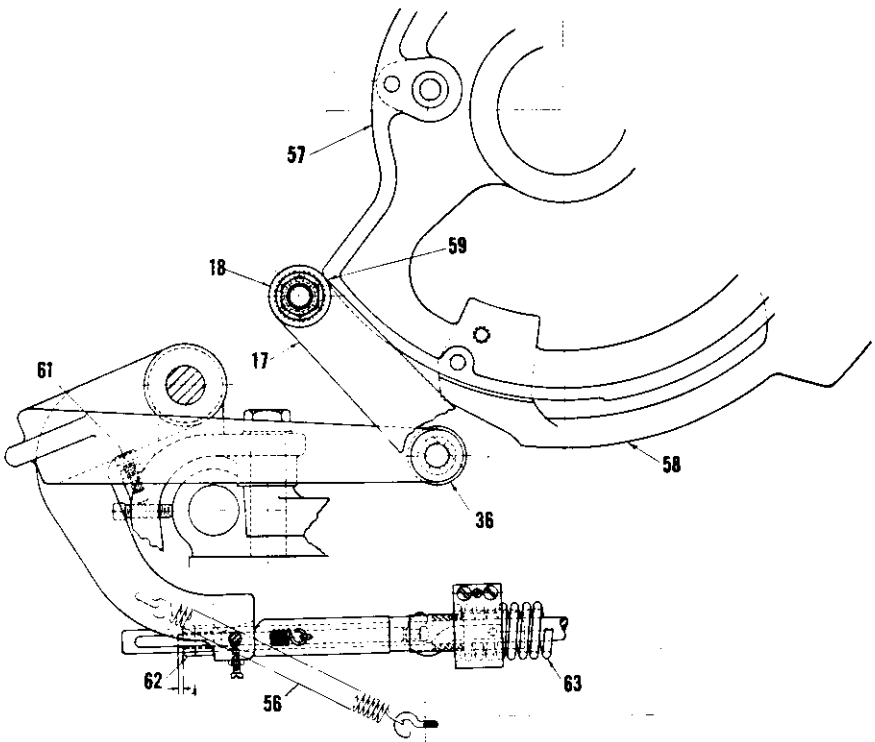


Fig. 12. Left-hand side view of the extra pressure cam and lever, with main quadding cam holding roll 18 at start of high contour.

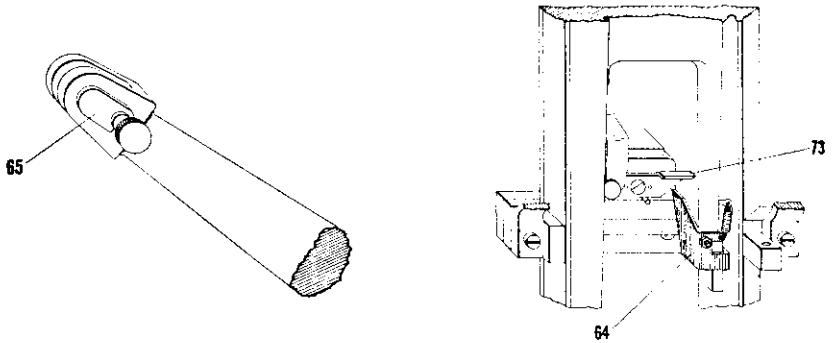


Fig. 13. View at left is first elevator lever link hinge pin. View at right showing control rod lock releasing mechanism. The releasing latch 64, attached to the first elevator slide, engages lock release lever 73, turning it counter-clockwise when elevator rises, releasing the control rod lock, allowing vise jaws to return to normal.

a lock release lever latch *64*, attached to the front of the first elevator slide, Fig. 13, engages the overhanging ledge of the control rod lock release lever *73*, and moving upward, rotates it counter-clockwise; the worm screw pulling the ratchet pawl block *48* forward, disengaging the ratchet pawls *74* from the control rod *3*. This permits the control rod to move upward and return the vise jaws to their normal positions, due to the force of the quadder return spring *20*; the action being slightly retarded by the air cylinder *22*. This completes the cycle of the vise jaw quadding actions.

IV

ADJUSTMENTS AND OPERATING DETAILS

In order that the Self-Quadder may be maintained at the highest operating efficiency, all adjustments and details of the mechanism are described in the following pages, so that the machinist and operator may familiarize himself with these parts, and be able to give the machine the necessary maintenance.

All adjustments are correctly made when the machine is built and erected, and since several of them are fixed dimensional adjustments, they will not likely need any resetting for the life of the machine. These will be referred to as permanent fixed adjustments, and will not require routine checking, nor should they be changed once they have been correctly made.

To facilitate the identification of the reference numbers used in this manual, a complete index of these parts has been added to the last pages, and the corresponding part numbers as listed in the Self-Quadder Parts Catalog No. 31, revised and reprinted March, 1949, have been given. For simplicity, all part numbers have been chosen for the 30-em machines only, and where a different part is used for the 42-em machines, such is usually indicated in the pages of the parts catalog in proximity to the 30-em machine parts. In ordering all parts for the 42-em machines, this fact should be emphasized on the parts order.

Normal Position of the Machine—When the machine comes to a stop at the end of a line-casting cycle, and with the vise closed, this is referred to as the normal position of the machine. Reference is frequently made to this machine position.

Basic Adjustments

There are only three fundamental points of adjustment between the quadder cam, the levers, the control rod, the latch, and the vise jaws to be checked at regular intervals. These are all made while the machine is in the normal position.

1. Clearance between the cam roll *18*, Fig. 7, and the quadder cam *57*, should be adjusted in the following manner: Turn the machine by hand until the first elevator slide is fully down on the vise cap. Then, by means of screw *21*, adjust cam lever *17* so that cam roll *18* just makes contact with quadder cam *57*.

2. The lever extension arm *35* should rest on the adjusting screw *16*, located on top of the air cushion cylinder bracket. This condition should be tested by raising

the lever extension arm slightly and inserting a sheet of paper between the lever and the screw *16*. The paper will be clamped firmly when the lever rests on the screw.

3. The end play of the right-hand vise jaw should be approximately .010". This is slightly more than one-half point, and less than one point, printers' measure. This is determined by placing the index finger of the right hand at the right end of the jaw, and the index finger of the left hand at the left end of the jaw, and moving the jaw endwise. This test should only be made with the Self-Quadder set for "Regular."

It is very essential that this slight end play clearance of the right-hand vise jaw be present. It is also very important that this clearance does not become excessive, since it determines the height to which the vise jaw control rod and latch rises at the normal position of the machine, and thus determines the mesh of the small bevel gears *8* and *72*, Fig. 3.

If there is no clearance, the gears will bind and the latch will not be free to turn on the control rod for changing the selector handle positions.

If the end play of the right-hand vise jaw is excessive, for instance as much as $\frac{1}{15}$", this will indicate that the small bevel gears will be separated in their mesh, and may very possibly slip out of timing when the selector handle is moved. This will not only cause rapid deterioration of the gear teeth, but may cause failure of the quadder control, due to the latch being set at some position other than one of the three positions shown in Fig. 4, or in the latch acquiring a position which does not correspond to the indicator *103*, Fig. 3, of the selector handle *110*.

Adjustment For Height of the Control Rod and Latch is determined by the amount of end play in the right-hand vise jaw. The machine should be in the normal position, and the quadder controls set for "Regular." Adjustment is made with the screw *16*, Fig. 7, on top of the air cylinder. Raising this screw increases the end play, and lowering it decreases the end play. Before testing, make sure that there is a clearance between the cam roll *18* and the cam *57*. Then push lever *39* down slightly and release quickly, to make sure that the extension arm *35* rests firmly on the adjustment screw *16*. When the proper .010" end play adjustment of the right-hand vise jaw has been made, check, and if necessary, reset the adjustment between the cam roll *18* and the cam *57*, by means of the screw *21*, as already explained under Basic Adjustment No. 1.

Retiming Quadder Controls to Selector Handle—In case the bevel gears *8* and *72*, Fig. 3, have become out-of-time so that the latch *1* is in one of the right angle positions shown in Fig. 4, but with the indicator *103* pointing to a quadder control setting which differs from the action of the vise jaws, the re-timing is simple. Push lever *39*, Fig. 7, down and note the action of the vise jaws. Holding this lever down, change the selector handle *110* so that indicator *103*, Fig. 3, points to the quadding operation which is being performed, then allow the lever *39* to return to normal. This out-of-time condition can be caused by moving the selector handle after the machine has started on a line-casting cycle, or moving the selector handle with the vise open, or by some interference with the return of the control rod and latch to its normal top position.

If quadder controls were set for "Regular," when the selector handle was changed at the improper time, this can cause the movable stud *108* to project above the top ledge of the latch, preventing full return of the latch to normal. In this case, depress lever *39*, and set controls for "Regular," pushing in the stud shifting lever *107*, which will then allow the latch to return to normal height.

If the bevel gears *8* and *72* have become out-of-time, due to excessive end play of the right-hand vise jaw, so that the latch is at an angular position other than those shown in Fig. 4, it cannot descend with the quadder cam action, due to the latch guide *9*, Fig. 3, preventing movement of this type. In this case, depress lever *39*, Fig.

7, until the bevel gears disengage, and turn the latch by hand until it is in a right angle position such as shown in Fig. 4. It may be necessary to move both the right-hand and left-hand vise jaws inward, so that their lever studs will enter under the top ledge of the latch.

Since it is sometimes difficult to make this type of correction, holding the lever *39* down slightly against the force of the return spring *20*, it may be easier to lift the spring *20* off the hook on the extension arm *35* temporarily. When latch has been correctly positioned in a right angle setting, and the selector handle and indicator re-timed to the vise jaw action, testing may be done by raising and lowering the lever *39* by hand before replacing the spring *20* on the extension arm.

Caution—Do not allow the machine to be operated with the controls out-of-time. This will cause undue wear of the bevel gear teeth. Do not open the vise at any time when the roll *18*, Fig. 7, is on the high portion of the quadder cam *57*. This will cause undue strains to be set up, and throw out the adjustment for height of the control rod and latch. If it is desired to open the vise after the machine has started around, but before the cast has taken place, back machine up until the roll *18* drops back to the low contour of the cam *57*, as shown in Fig. 7. If the control rod lock has become engaged, release this by turning the release lever *73* to the position shown in Fig. 6 before opening the vise. If desired to open the vise after the cast has taken place, and before the first elevator has started to rise, turn machine forward enough so that roll *18* can drop to the low contour of the cam *57*. The release lever *73* must be turned to normal position shown in Fig. 6 so that roll *18* can drop to low point of cam *57*.

Adjustment for Exact Centering is accomplished by having the left-hand vise jaw operating lever *13*, Fig. 6, made in two parts, both pivoting on the same fulcrum stud, but separated by an adjusting screw *11*. To adjust for exact center, proceed as follows:

Set the margins for both ends of a 30-em slug, or the longest measure used, and with the selector handle and controls on "Regular" cast a full line with spacebands.

Then with the selector handle set for "Centering," cast and recast a single character, such as cap M or H, with the measure still the same. Place the two slugs back to back, or with the smooth sides together, and check the alignment of the characters at center. This will determine which way the left-hand vise jaw should be moved to position the character for exact centering on the slug.

If correction is needed, first loosen the lock nut on the adjusting screw *11*. This is a splined nut which is tightened or loosened by tapping with the end of a screw driver. Then loosen the two hexagon headed screws *10*, Fig. 6, which hold the two sections of the lever *13* together as a unit. They will be found by opening the vise, down under the left-hand vise jaw, first removing the two metal guards. A specially formed $\frac{1}{16}$" end wrench is supplied with the Self-Quadder for these screws.

Turning the adjusting screw *11*, Fig. 6, clockwise will move the left-hand vise jaw to the right, and turning it counter-clockwise will move the jaw to the left. After making an adjustment to this screw, tighten the two screws *10* while holding the left-hand vise jaw firmly to the left. This holds the adjusting screw *11* against its banking point. When correct adjustment for exact center is attained, lock the splined nut on the screw *11*.

Air Cushion Cylinder

The air cushion cylinder *22*, shown in Fig. 7, and in enlarged detail in Fig. 14, controls the action of the vise jaws as they return to normal position. There is a regulating valve *34*, Fig. 14, below the cylinder which serves as an air check and controls

the speed of the return motion of the jaws.

If the jaws snap back too fast, loosen the lock nut and turn the adjusting screw up into the cylinder which will restrict the flow of air and slow down the movement of the jaws. After adjusting the screw, the lock nut should be tightened to maintain the adjustment.

The return action of the vise jaws should take about one second for a full 30-em stroke, but it is very essential that the motion of return be fully complete at all times. This action is similar to that which controls the delivery of matrices into the first elevator jaws, an air cylinder of the same size being used in each instance to properly regulate the speed of movement.

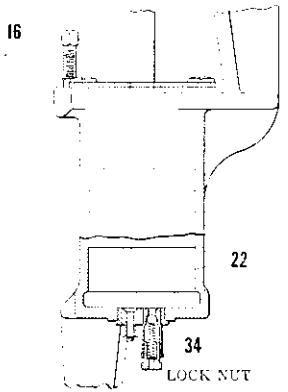


Fig. 14. View of the air cushion cylinder, which controls the return movement of the vise jaws.

Control Rod Lock

All adjustments of the control rod lock, shown in Figs. 8, 9, 10 and 11, are permanent fixed adjustments, with the exception of the spring plunger *112*, Fig. 8. This will have to be changed only when the adjustment of the pot legs has been materially altered when adjusting for pot lockup. The spring plunger *112* should just clear the floating lever *113* when the machine is in normal position. Adjustment to plunger *112* is made by means of the two lock nuts *118* at back of bracket *117*.

Extra Pressure Device

All adjustments of the extra pressure device, shown in Figs. 7, 8 and 12, are permanent fixed adjustments. The extra pressure cam roll *36*, Fig. 7, is shown in normal position of the machine. From the center of the roll *36* to the center of the main cam shaft measures 8¼". This dimensional adjustment is made with the banking screw *61*; the spring *56*, Fig. 12, holding the lever firmly against this screw. This setting allows the roll *36* to just make light contact with the low contour of the extra pressure cam *58* when cams revolve.

The spring *56* should always be in good condition to make sure that the lever rests on adjusting screw *61*, except when the extra pressure cam *58* depresses roll *36*.

The adjusting nuts *62* at the back end of the spring eyebolt are adjusted at the factory and should not be disturbed.

The extra pressure link adjusting shoe *50*, Fig. 8, can be moved forward or backward, but its position should be permanently set so that the operating link *52* just clears the corner of the shoe *50* when vise is opened in the normal position of the machine.

First Elevator Jaw Matrix Detent

The first elevator front jaw is equipped with a matrix detent or pressure bar *23*, Fig. 15. Its purpose is to steady the last matrix of each line, when the quadder is set for centering or left-hand quadding. In these positions, the detent comes in contact with the last matrix due to light spring pressure, and prevents it from turning or falling out of the jaws as the first elevator rises after casting. Its action is equally effective in recasting. This detent should be kept clean and in good operating condition at all times.

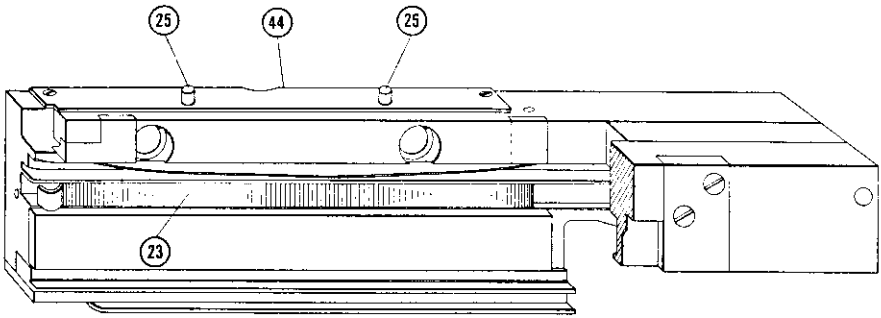


Fig. 15. Back view of the first elevator front jaw showing matrix detent in position.

The detent is depressed by the action of the line stop to allow the line of matrices to enter the first elevator jaws. As the matrices enter the jaws, the line stop is forced outward allowing the detent to hold the matrices in position. When the line of matrices is being transferred to the second elevator bar, the transfer rod attached to the transfer slide carries the line stop back to the right, and fully within the jaws. At the transfer position the plungers *25* are depressed, which action withdraws the matrix detent so that there is no pressure against the matrices at this position. It is important that the transfer rod should carry the line stop fully to the right end of the first elevator jaws to be in position for the next line of matrices to enter.

Pot Pump Stop Safeties

The pot pump stop safety of the Self-Quadding machines has its action dependent upon the closing of the vise jaws against each other or on a line of matrices between them at any point in the 30 ems of travel of the vise jaws. The basic operating motion of the pump stop safety starts with the left-hand vise jaw safety detent operating lever *26*, Figs. 16 and 17. From the lever *26*, the action moves through the safety detent *30* to the operating pawl *31*, which transmits the motion to the horizontal safety detent bar *28*, and by means of a lever at the right end, moves the adjusting shoe *29* which is attached to the pump stop lever operating lever *27*, thus swinging the stop lever *32*, Fig. 18, out from under the catch block on the pump lever.

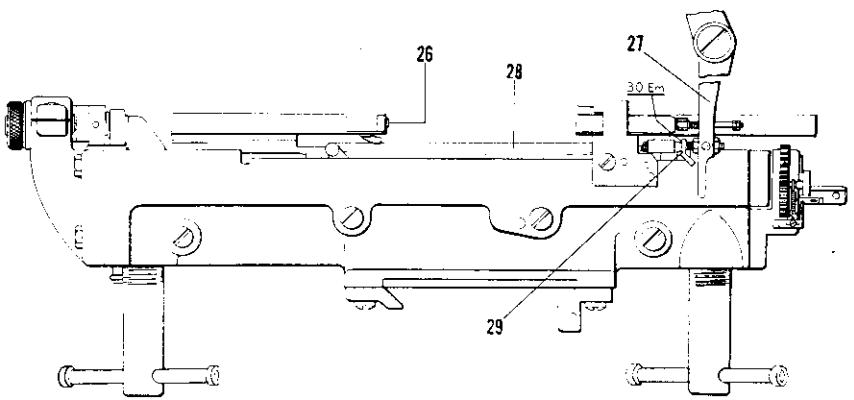


Fig. 16. Top view of the vise cap and vise jaws showing the vise jaw left-hand safety detent and the pump stop operating lever mechanism.

Left-Hand Vise Jaw Safety Detent Operating Lever 26, Figs. 16 and 17, and associated parts, should be kept clean and free from small particles of metal which may prevent free operation. The operating lever *26* should always extend beyond the face of the left-hand vise jaw when machine is in normal position. If this lever remains depressed or flush with the face of the vise jaw, the pump stop lever *32* will be open, which would allow the machine to cast, even though the vise jaws did not close tightly, or though a "Regular" line did not justify. The detent bar *28*, Figs. 16 and 17, must be parallel with the vise cap. If this bar becomes bent or damaged, it should be straightened or replaced with a new one, otherwise the pump stop action will not function properly.

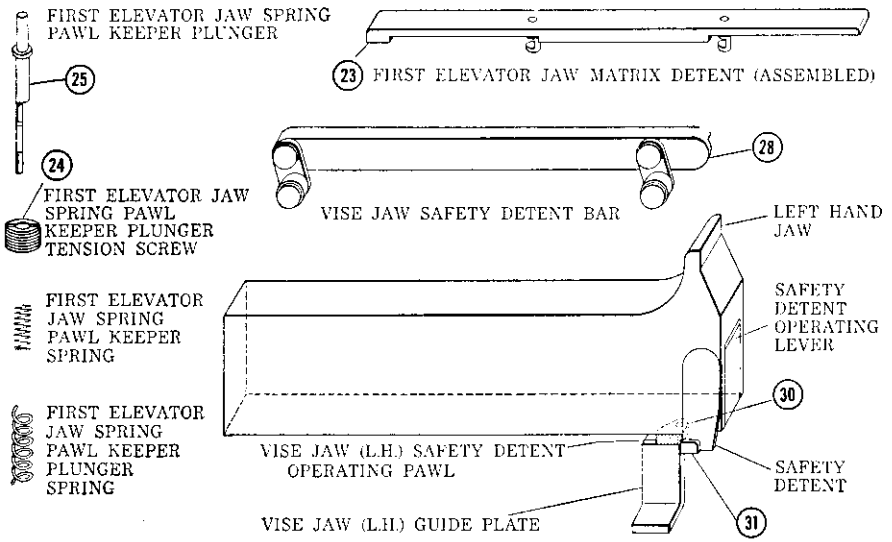


Fig. 17. View showing details of the vise jaw left-hand safety detent and also details of first elevator jaw matrix detent.

Pump Stop Lever—The adjusting shoe *29*, Fig. 18, on the pump stop operating lever *27*, should be adjusted so that the stop lever *32* will just clear the catch block on the pump lever by .010" when plunger descends, with vise jaws closed on matrices. This is a very important adjustment and should be checked often. Adjustment of the shoe *29* is made by means of a lock nut on either side of the lever *27*. Likewise, it is important that the stop lever *32* swing back under the catch block at least .015" when the machine is in normal position. The spring on the stop lever *32* should be sufficiently light to permit the safety detent operating lever *26* to move the stop lever freely.

Pot Pump Lever Stop Lever Return Lever—At the start of each line-casting cycle, mechanism shown in Fig. 19 provides a positive return of the stop lever *32* under the catch block of the pump lever. The actuating cam *99* bears against the roll *94*, attached to the return lever *98*, when the first elevator slide is about half way down to the vise cap, at the start of a line-casting cycle. An adjusting screw *96* at the front end of this lever *98* bears against the fork of the pump stop operating lever *27*, thus insuring the closing of the stop lever *32* under the catch block of the pump lever, if for any reason it has not been returned by action of its own spring. At the same time pressure is applied to the safety detent operating lever *26*, extending it from the face of the jaw, and thus putting the pump stop mechanism in the "safe" position.

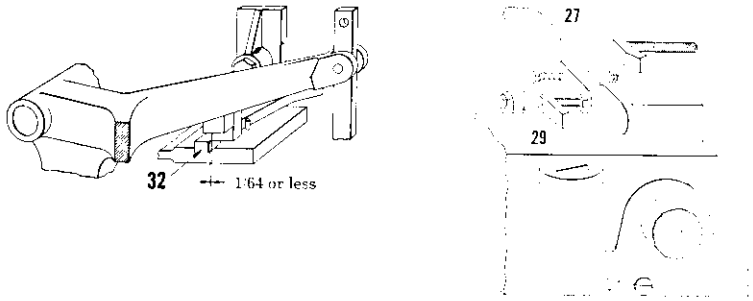


Fig. 18. View of the pump stop lever at left, and the pot pump stop lever operating lever at right.

Adjustment of the Pump Stop Return Lever—Adjust return lever stop screw *93*, Fig. 19, so that return lever *98* will clear the mold cam and driving gear about 1/64" or less when machine is in normal position. Secure the stop screw with the lock nut *95*.

Rotate the machine slowly so that the roll *94* is on the high portion of the actuating cam *99*, and then adjust screw *96* until it contacts the lever *27*, and firmly holds the stop lever *32* against its stop pin in the "safe" position. Secure the adjusting screw *96* with the lock nut *97*.

Justification Lever Auxiliary Pump Stop—When machine is operating in the "Regular" position, and the justification levers rise for spaceband drive, an auxiliary pump stop action will take place when the spaceband driver rises all the way, as would happen when a loose line of matrices is sent through. This auxiliary stop provides a safety if the operator sends in short lines, with the quadder controls erroneously set for "Regular" when he intended to have the machine perform a quadding operation.

Fig. 20 shows the mechanism for operating the justification lever auxiliary pump stop. The pump stop lever *32* has an extension below the lever *27* which is forcibly moved to close the stop lever when the justification lever rises to its maximum height.

Adjustment of Justification Lever Pump Stop—First remove the plunger pin for safety. Set quadder controls for "Regular," and without matrices or spacebands in the first elevator jaws, run the machine around to the point where the metal pot recedes from the first lockup, and stop the machine at this point. At this point, the justification lever should be up as far as it can go, on its second drive, which is just before the pot has started to rock forward the second time. Check the justification

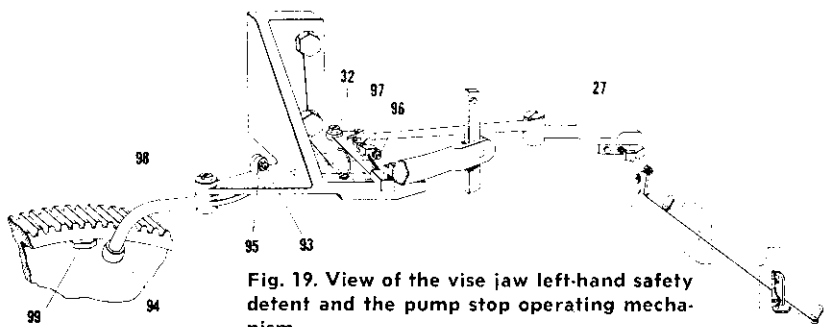


Fig. 19. View of the vise jaw left-hand safety detent and the pump stop operating mechanism.

lever roll to see that it is clear of the justification cam; if it is still in contact with the cam it may be necessary to turn machine forward slightly, so that the roll is free.

At this point, the cone at the top end of the upper operating rod *125*, Fig. 20, should just firmly hold the stop lever *32* against its stop pin, so that it is in a positive "safe" position. If the lever *32* can be moved out from under the catch block with light pressure, readjustment is needed. To adjust, loosen the set screw *130* in the bracket *128* on the justification lever, then loosen lock nuts *129* on the lower operating rod *126*. Raise the lower operating rod *126* with the adjusting nuts *129* until the arm *127* holds the upper operating rod *125* against the extension on the stop lever *32*, so that this lever cannot be swung out from under the catch block. Tighten the lock nuts *129* and the set screw *130*. This adjustment is to be made only in the above described machine position.

It is important for this adjustment not to be set too tight, but just enough to hold the stop lever *32* firmly in "safe" position. When the machine is returned to the normal position, test the upper operating rod *125*, Fig. 20, to see that it will fall freely of its own weight, and not bind against the slot in the arm *127*. In normal position the stop lever *32* should be free to swing out against its spring and return of its own freely.

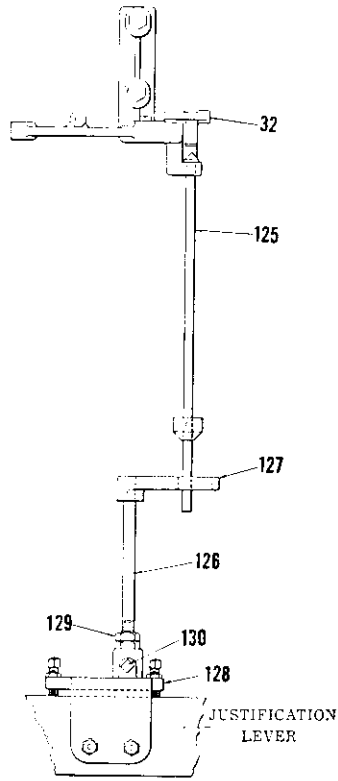


Fig. 20. View of the justification lever pump stop safety device and details. This additional pump stop safety functions only when controls are set for "regular," and justification lever rises all the way on a loose line.

Control of the Spaceband Driver

The arrangement shown in Fig. 21 consists of two justification stops, *105* and *106*, whose action is controlled by the movement of the stud shifting lever *107*. This mechanism permits the spaceband driver to rise when the machine is used as "Regular" and prevents the spaceband driver from rising when the machine is being operated in any quadding position.

When operating as "Regular," the selector handle is in the position shown in Fig. 21. The stud shifting lever *107* is pushed inward, disengaging the vise jaws from the control rod latch. This action, by means of suitable linkage arrangement moves the stops *105* and *106* out of the path of the sleeve *79* and the collar *80*, permitting the spaceband driver to rise for spaceband justification.

When operated for "R.H. Quad." the stud shifting lever *107* is pulled outward, connecting the left-hand vise jaw to the control rod latch, and moving the stops *105* and *106* into position to prevent the spaceband driver from rising. With the controls set for "Cent." or "L.H. Quad." the cam action of the lower portion of the pointer plate *103* on the pin *102* in the stud shifting lever *107* forces the stops *105* and *106* over to the right, preventing spaceband drive.

An adjustable link *104* is provided to locate the stops *105* and *106* correctly when they are in position to prevent the spaceband driver from rising. Adjustment of the link *104* is made to correspond with the in and out motion of the stud shifting lever *107*.

Vise Jaw Control Rod Levers

Fig. 8 shows a view of the overthrow compression spring *60* in the spring barrel attached to the inside control rod lever *15*. The spring barrel is threaded into the bottom of the lever *15*, and is secured by means of a locking collar. The compression spring *60* is held in a permanent fixed adjustment by means of a brass threaded plug which is screwed up from the bottom of the spring barrel, so that the bottom of the plug is from $\frac{1}{2}$ to $\frac{5}{16}$ of an inch from the end of the barrel. A $\frac{1}{2}$" square socket wrench is supplied with the Self-Quadder for adjustment and removal of this brass plug and compression spring.

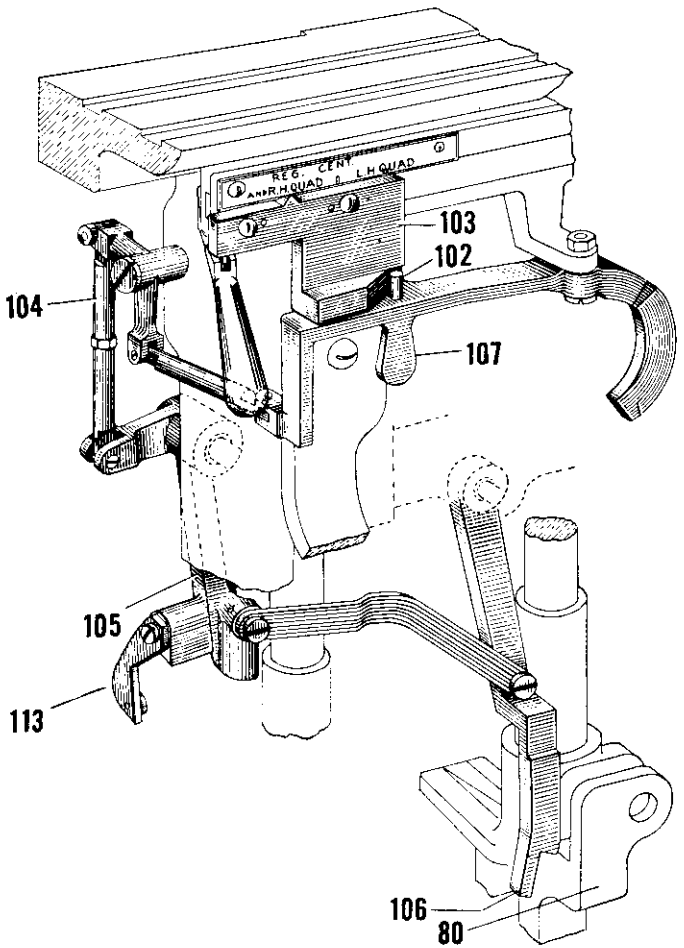


Fig. 21. Arrangement of levers for the control of spaceband driver.

V

CARE AND MAINTENANCE

Lubrication—All moving parts of the Linotype Self-Quadder, except the internal parts of the control rod lock, which are above the control rod levers *15* and *39*, should be lubricated with a Special Self-Quadder Vise Jaw Oil, X-1805. The pivot bearings of the levers *15* and *39*, and all points of lubrication of the heavier levers should have Linotype Oil, X-24. The control rod lock, when removed for cleaning, is packed with pure vaseline or light petrolatum.

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 Self-Quadder Vise Jaw Oil X-1805 in a small oil can with long slender spout.

Apply one drop of oil between stud on safety detent *31*, Fig. 17, and operating pawl *30*. Also wipe a film of oil on back contact surface of safety detent bar *28*, and apply one drop of oil to both hinge points at each end of this bar, and the lever at the right end.

The above points should be lubricated daily, but avoid excess.

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 *65*, Fig. 13, and taking off the stop block at bottom of slide, so it can be pulled up without disturbing the slide gibs. Then remove the vise jaw wedge bracket at left end of vise; also remove the em scale measure bracket at right end of vise. The supporting plate under the right end of the vise cap will have to be removed unless the right hand jaw can be moved to the left, clearing this plate. After removing the four screws from the cap it can be lifted off.

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, then replace the four screws in the vise cap. Align the left end of the cap with the vise frame

before tightening the four screws. Replace the wedge bracket, the supporting plate under the right end of vise cap, the em scale measure set bracket, and the first elevator slide and details.

Lowering the Vise to Second Position to Remove Mold Slide From Machine—Put quadder controls on "Centering." Advance the machine so that first elevator drops to vise cap. Disconnect the link connecting the bottom of the control rod *3* with the control rod lever *15*, by taking out link stud *51*. The control rod should not be allowed to drop down. The vise can now be lowered into second position, making sure that end of lever *15* does not rub against lower end of control rod *3*. In returning the vise to closed position, make sure that the control rod link is properly connected and that link screws are tight, but without binding. It is very important that the link be disconnected before attempting to lower vise to second position, to prevent breakage and change of adjustments. In order to call attention to the necessity of disconnecting this link before lowering vise, a second cotter pin is inserted in the left end of the vise frame rest, which must be removed to allow lowering of the vise.

When cleaning the vise frame assembly with compressed air it has been found good practice to hang a piece of canvas or heavy paper behind the vise to shield the rest of the machine.

Cleaning or Repairing Vise Jaw Control Rod Latch

If metal or dirt should accumulate beneath or on top of the small bevel gear *72*, Fig. 3, in control rod latch *1*, this part should be removed for cleaning. An enlarged cross-sectional view of the latch is shown in Fig. 5, from the left-hand side, with the latch in "Centering" position. The bevel gear *72* has a small amount of resilient vertical motion, due to a compression spring *71* under it. This permits full mesh with the bevel gear *8*, when the control rod is up in the normal position, and compensates for slight tolerances in the .010" end play of the right-hand vise jaw. This bevel gear *72* should be free to move up and down.

To remove the vise control rod latch, take out the first elevator slide, and remove the return spring *20*, Fig. 7, from the extension arm *35*. This can also be done without removing return spring *20* if lever *39* is held by foot pressure. Back out set screw *66*, Fig. 5, about two turns to relieve the pressure of spring *67* against the ball *68*. Then remove the key screw *69*, and key *70*. The spring *71* under the bevel gear *72* will now force the latch upward. Care should be exercised in removing the latch from the end of the control rod, tipping the latch so that ball *68* is retained in the latch, when latch is removed. Clean all metal and dirt from these parts, and make certain that the bevel gear is free to move up and down with the spring *71* pressure. If gear teeth are badly worn or damaged, this part should be replaced. Reassembly of latch to machine is made in reverse order. Retime the latch to the selector handle indicator.

Cleaning and Lubricating Control Rod Lock

The ratchet pawl assembly should be removed about every two months for cleaning and lubricating. If machine is equipped with Mohr Saw, this part should be taken out once a month.

To remove the ratchet pawl assembly, take out the first elevator slide by disconnecting the link hinge pin *65*, Fig. 13, and removing the stop block on bottom of the slide. This will permit the slide to be withdrawn without disturbing the slide gibs. Then take out connecting link stud *75*, Fig. 8. Remove two front screws holding the adjusting worm screw block *45*, Fig. 6, to lower control rod bracket *40*. Pull down the knurled handle of ratchet pawl block support *37*, Fig. 9, and slide the assembly out front, taking care not to drop the back block *48* containing the ratchet pawls.

All metal dust and particles should be removed from the ratchet teeth of the pawls, as well as the control rod, which would prevent proper engagement of the ratchet teeth. If ratchet pawls are removed from the block, they should be replaced in proper order (number 1 on top), numbers being etched on the bottom of each pawl. The pawl assembly, as well as the worm screw and block, should be thoroughly cleaned and repacked with pure light vaseline or petrolatum. This helps prevent metal dust from entering the moving parts in addition to providing lubrication. Replacement of this assembly is made in reverse order of dismantling.

The bearing surfaces of the worm screw *116* should be oiled occasionally with regular Linotype Oil X-24. An oil hole on the front side of the control rod lock is provided for this purpose.

Caution—The double-threaded worm screw *116* can be inserted in its companion block, starting with the wrong thread. However, if started properly, when screw is in all the way, the lever *73* should stop against the pin *42* on the lower right side of its pivot center.

Cleaning and Repairing First Elevator Jaws

Remove line stop from jaws and then take off the first elevator back jaw. To remove the matrix detent, or pressure bar *23*, Fig. 15, from the front jaw, first remove duplex rail lever cover plate *44*. Remove the collar screws *24* with special wrench A-799 supplied with Self-Quadders. Then depress matrix detent into the front jaw and pull out plungers and springs *25*. Removal of the plungers will permit the matrix detent *23* to come out of the jaw. Recessed in the jaw will be found two small coil springs which press against the detent shoes that are attached to detent *23*. As all parts are now removed, the front jaw can be cleaned.

Reassembling these parts, you first place the small coil springs back in the recesses, then push the detent *23* back against these springs, and holding it back, return the plungers *25* with their springs to their position. The collar screws *24*, Fig. 17, are turned down against the plunger flange to an adjustment which permits the matrix detent *23* to have about .025″ in and out motion. The matrix detent *23* must work freely without sticking.

Cleaning Air Cushion Cylinder

If the air cushion *22*, Fig. 7, does not retard the return motion of the vise jaws properly, it may need cleaning and oiling, as well as readjustment. Metal particles will accumulate on top of the piston in spite of the covers and guards designed to prevent this. The piston should be removed for cleaning about every three months.

Remove the link stud from extension arm *35*, and take off cover on air cylinder by removing two shoulder screws, 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 to outside of piston and leather packing when returning same to cylinder. Readjustment of the valve *34*, Fig. 14, is usually necessary when the piston has been cleaned and oiled. Test vise jaw return on both long measures as well as short measures, to see that vise jaws will return properly.

VI

RESILIENT MOLD CAM LEVER AND MOLD SLIDE SAFETY

The following discussion of the Resilient Mold Cam Lever and the Mold Slide Safety are incorporated in this manual because both features are now standard equipment on all new Linotypes, either Self-Quadder equipped or otherwise. Neither feature is directly associated with the performance of the quadding or centering operations, but both serve as valuable safety devices which can prevent damage to matrices, molds, etc., when certain types of interferences occur on the machine.

Adjustment of the Mold Cam Lever

All new machines have the resilient mold cam lever, which replaces the old solid lever with the eccentric stud adjustment. The new style lever shown in Fig. 22 is made in two sections, *86* and *87*, which are pivoted together at the bottom ends by stud *85*. The upper ends are normally held in fixed relative adjustment by means of the tie bolt *100*, with a compression spring *88* between the levers. The mold cam lever roll *91* is attached to the main lever *86*, and the mold cam roll *84* is attached to the auxiliary lever *87*.

To make proper adjustment of the mold cam lever, remove the first elevator back jaw, set quadder on "Regular," and set left-hand vise jaw measure to about 4 ems. It is essential that the first elevator slide and front jaw be in the machine when making this adjustment.

Run machine to the point where the metal pot recedes from the first pot lockup. Then with the driving motor turned off, slowly turn machine forward by hand until the second mold cam shoe high portion *83*, Fig. 22, is in contact with the mold cam lever roll *91*. This position is just before the pot rocks forward for the second lockup, at which point there should be a space of about $\frac{3}{32}$" between the mouthpiece and the mold. Test for this clearance by rocking the pot forward by hand or with a lever, to make certain that the pot mouthpiece is not against the mold; such condition could only exist if there were an improper adjustment of the back lock nuts on the pot lever eyebolt.

Then forcibly push the mold disk back so that roll *91* is in hard contact with the second mold cam shoe *83*, and measure the clearance between the face of the mold and the back of the vise jaws. By having the measure set for about 4 ems, this gives

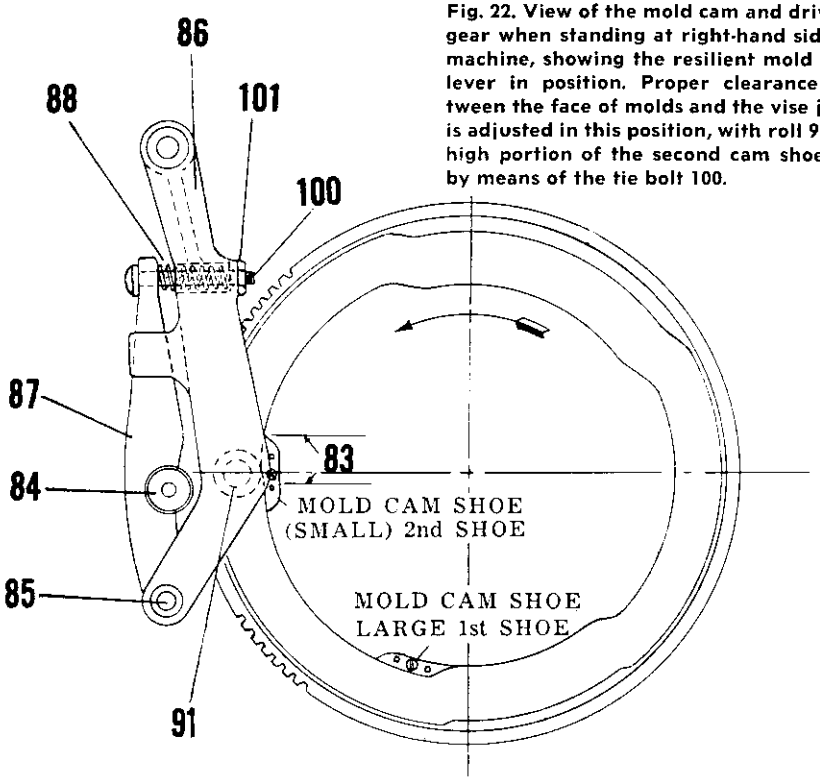


Fig. 22. View of the mold cam and driving gear when standing at right-hand side of machine, showing the resilient mold cam lever in position. Proper clearance between the face of molds and the vise jaws is adjusted in this position, with roll 91 on high portion of the second cam shoe 83, by means of the tie bolt 100.

a large area for using a thickness feeler gauge between the molds and the jaws. This should be not less than .003" and not more than .005".

Adjustment is made with the tie-bolt *100*, Fig. 22, at the back of the machine. Turning the bolt clockwise will decrease the clearance, and turning it counterclockwise will increase the clearance. After making each adjustment, push the mold disk back again to insure the roll *91* being in contact with the cam shoe *83* before taking a measurement. Lock the tie-bolt *100* with the nut *101*. Make sure that the tie-bolt *100* does not turn while locking the nut. After tightening the nut *101* recheck the clearance between mold and vise jaws.

Mold Slide Safety Stop

Machines equipped with a mold slide safety stop attachment will throw out the driving clutch and bring the machine to a full stop if there is interference with the normal first advance of the mold slide. Interference due to the wrong combination of molds and filling pieces being used, or improper alignment of molds due to the mold disk being out of time will stop the machine and prevent damage which might otherwise result.

Fig. 23 shows a view of the mold slide safety stop attachment from the right side of the machine. Attached to the upper automatic stopping lever *124*, is a mold safety slide *120* held in a bracket. It is normally pulled toward the back of the machine by means of a tension spring *123*, and retained in its bracket by the rear anchor screw of this spring. Attached to the delivery and transfer cam is a mold safety stop *92*.

Just as the mold slide advances on the first mold cam shoe, this stop *92* would catch on the mold safety slide *120*, and thus stop the machine by disengaging the main driving clutch, if the safety slide *120* were not pushed forward by the normal action of the mold safety slide control lever *89* and the adjusting screw *121*. Attached to the top of the slide *120* is the slide control *119*, which acts as a contact finger with the adjusting screw *121*.

The mold safety slide control lever *89*, Fig. 23, is pivoted to the mold cam lever *86* at its upper end, and is linked to the auxiliary mold cam lever *87* by means of the link *90*. The bottom end of the control lever *89* has two adjusting screws; the upper, *121*, being the sensitive adjustment screw for normal safety.

The operation of the mold slide safety is based on the resilient action of the mold cam lever. If an obstruction prevents the mold slide from moving forward, this resistance to the forward motion of the mold cam lever assembly compresses the spring *88* as the first mold cam shoe moves against the roll *91*. As the auxiliary lever *87* closes in toward the main lever *86*, the link *90* moves the lower end of the control lever *89* backwards. The compound linkage gives a multiplied motion to the adjusting screw *121*. This backward movement of the lower end of the control lever *89* and the screw *121* allows the safety slide *120* to project abnormally to the rear and

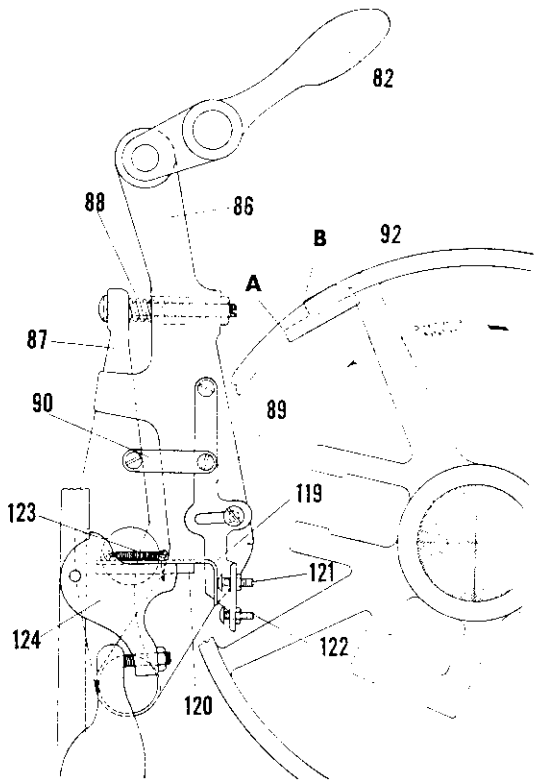


Fig. 23. View of the mold slide safety stop attachment from right side of the machine. The operating lever and link are attached to the resilient mold cam lever, and the mold safety slide is attached to the upper automatic stopping lever. The stop 92 is attached to the delivery and transfer cam.

into the path of the mold safety stop *92*, which moves into this position at this time, thus stopping the machine by forcing the upper stopping lever *124* downward, and throwing out the main driving clutch.

To Adjust Mold Slide Safety—This adjustment must be made after the mold cam lever has been adjusted for a clearance of .003" to .005" between the mold and the vise jaws. Make sure that the front of the molds are clean and that no obstruction interferes with the advance of the mold disk. Start machine and allow the first elevator slide to drop down to the vise cap. Turn off the driving motor, and when driving gear wheel comes to a stop, pull out the starting and stopping lever at front of machine. Moving cams forward and backward by hand, adjust the upper screw *121* on the control lever *89* so that as the first mold cam shoe pushes the mold slide forward, the mold safety slide *120* will advance so that it will just clear the mold safety stop *92* at the point marked "B." To obtain the best close adjustment, move screw *121* backwards first and keep advancing it until it just clears. The machine should be backed up by hand until the mold slide has moved backwards about one-quarter of an inch, and then make test on the normal forward cam motion of the mold slide, moving machine slowly by hand.

The lower adjusting screw *122* will make contact with the mold safety slide control *119* only when the mold cam lever handle *82* is in the down position at back, which is the released position for pulling the mold slide forward. This prevents the upper screw *121* from being broken when the mold slide is re-engaged. Adjust the lower screw *122* so that its head will not extend quite as much as the head of upper screw *121*. After making the adjustment on the screw *121*, test the machine under normal operating conditions with power on. If shoe *92* has a tendency to catch on slide *120*, and there is no interference with the advance of the mold slide, turn screw *121* forward slightly so that it will just clear. Lock nuts are provided on both adjusting screws, *121* and *122*, to maintain the settings.

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