CHAPTER 10

First Elevator and Vise Automatic

THE DELIVERY OF the composed line of matrices and spacebands into the first elevator jaw has been described in Chapter 9. This jaw, which supports the line during alignment with the mold, justification, casting, withdrawal of the cast slug and the final transfer for distribution of the matrices and spacebands, is carried at the top of a long, cast iron slide, called the first elevator slide. This slide is positioned at the left front of the machine, and is guided by four gibs so that it has a vertical movement which is imparted to it by the first elevator cam on the cam shaft through a long cam lever pivoted on a shaft at the rear of the machine and having two arms adjustable with relation to each other, the adjustable arm carrying the cam roller being called the "auxiliary lever," and also a connecting link capable of compression in length but not capable of elongation during the operation of the machine.

The first elevator cam imparts motion to the lever to lift the first elevator, whose own weight is sufficient to cause the cam roller to follow the contour of the cam to control the downward movement of the first elevator slide.

The "first elevator jaw" is built up of the front jaw, the back jaw and a separating block of a thickness to exactly allow the entrance and removal of the matrices and spacebands. The front jaw is keyed and screwed to the first elevator slide casting, and the back jaw is held to it by screws passing through the separating block, which is at the left-hand end, leaving the right-hand end open. This open end is supported against whatever strain there may be tending to pull it toward the back of the machine when the cast is withdrawn from the line of matrices. The support for this purpose is shown at *14* on block *13* which is fastened to the vise cap, as illustrated in Fig. 5-10.

At the open end are two small spring pawls which are forced outward by the incoming line of matrices and spacebands, thus allowing the line to pass through, but spring back as soon as the last matrix of the line has been pushed past them by the short finger of the line delivery carriage. These pawls prevent matrices from falling to the right and out of the jaw during the movements of the first elevator slide. To prevent matrices twisting or falling out of the left end of the line, there is the line stop, as shown in Fig. 2-10. This stop is automatically returned to normal position at the right, ready to receive the end matrix of the incoming line. A finger attached to the elevator transfer slide carries the stop to the right as the matrices are being transferred from the first to the second elevator. This finger is shown at *34*, in Fig. 4-17.

The first elevator jaws contain rails to support the matrices and also grooves which support the ears of the spaceband sleeves against both downward and upward movement. The front jaw also has a duplex rail to hold matrices in the raised or auxiliary position during the justification and casting operations, being so held by two duplex rail levers and two coil springs. This duplex rail is auto-

matically retracted by its two levers coming in contact with two operating blocks when the first elevator is lifted to its extreme upward or transfer position.

The retraction of the duplex rail allows matrices which may have been supported on it to drop to the regular or normal level on to the fixed rails of both front and back elevator jaws.

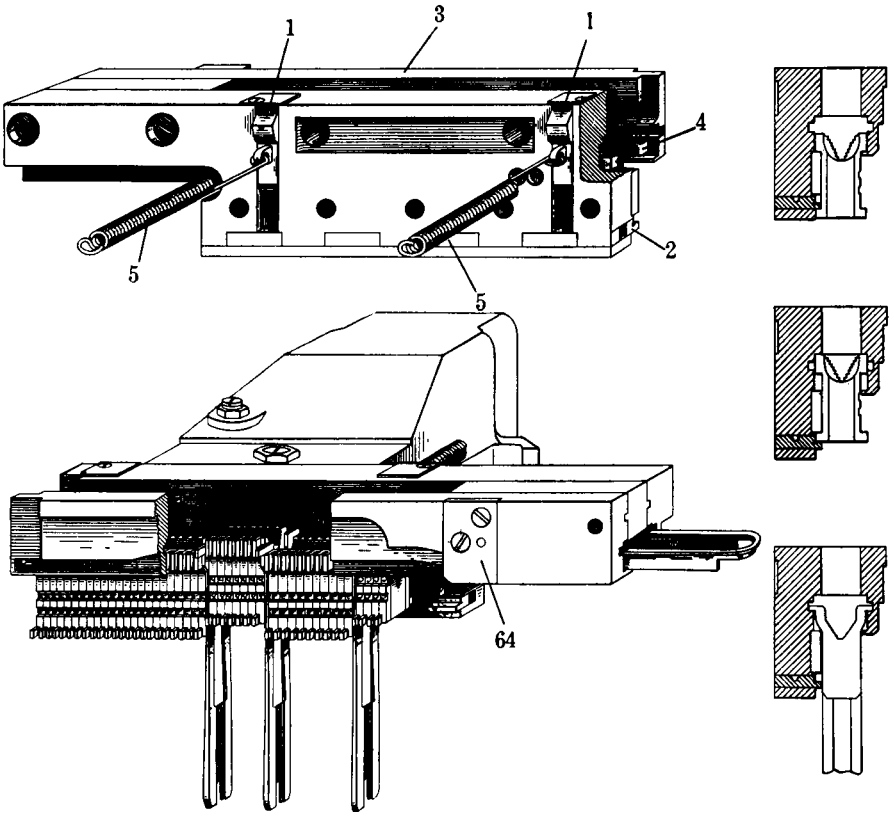

FIG. 1-10. Front view of the first elevator jaw. The lower figure is a view of the jaw from the rear of the machine, with the jaw partly broken away to show the different positions of the matrices and spacebands. 5-5 are the springs which return the shelf, called the duplex rail, upon which the matrices stand. *1-1* are the levers which move the shelf *2* in or out of position. The shelf *2* sustains the matrices which are in the auxiliary or upper position until the matrices are in position to be transferred to the second elevator bar. When, through the lever *1*, the shelf is withdrawn, it allows all the matrices to drop to the lower, or regular position, so that they may pass into the transfer channel and on to the second elevator for distribution.

The sectional views shown at the right illustrate the two positions in which the matrix may be supported in the first elevator jaw; and the spaceband, having ears wider than the matrix, running in the proper groove.

The top sectional view shows the matrix in the lower or regular position. The view second from the top shows the matrix in the upper or auxiliary position. The bottom view shows the spaceband in its groove.

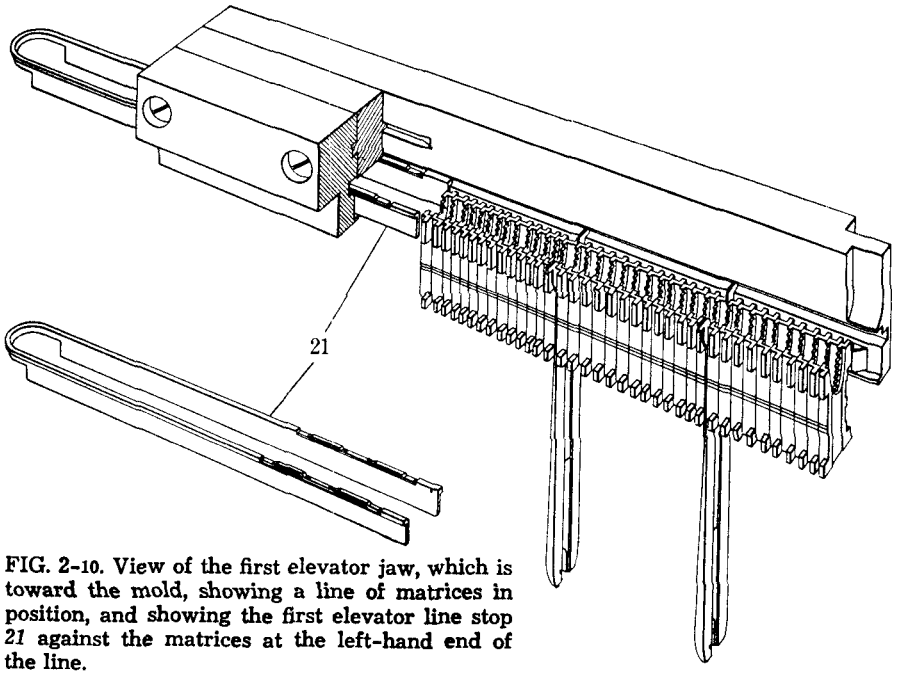

FIG. 2-10. View of the first elevator jaw, which is toward the mold, showing a line of matrices in position, and showing the first elevator line stop *21* against the matrices at the left-hand end of the line.

The Connecting Link

The connecting link consists of a casing, or tube, inside of which is a compression spring. This casing has two screw caps, one at the top and one at the bottom. The screw cap at the top has its hole threaded to receive a left-hand screw eyebolt; and the screw cap at the bottom has through it a clearance hole for an eyebolt on which is cut a right-hand thread. This eyebolt screws into a nut which is slidable inside the casing but is prevented from turning with reference to the casing. The spring is held under compression between the slidable nut and the top cap. The bottom cap forms the stop for the slidable nut, and the assembled link is retained at its adjusted length by a detent spring which is fastened to the lower eyebolt and holds in one of a series of slots cut in the circumference of the flange on the bottom cap. And, because the screw threads on the eyebolts are of the same pitch, and one is a right-hand thread while the other is a left-hand thread, the measurement from the cap to the hole in the lower eyebolt will always be $\frac{1}{16}$" more than the corresponding measurement in the case of the upper eyebolt; and the compression of the spring is not changed if the casing is turned to make a fine adjustment while on the machine.

The connecting link between the first elevator slide and the first elevator cam lever is, as before stated, compressible, but not extensible in length, except by manual adjustment. It is fastened to the first elevator slide by a pin through a jawed lug on the slide and the upper eyebolt of the link, and to the lever by a wing-pin through the jawed end of the lever and the lower eyebolt of the link. The link, when adjusted to the dimensions shown in Fig. 4-10, is ordinarily correct for the machine when first set up; and though it is possible to readjust it while in place, it is seldom necessary.

Adjustment for Normal Position of First Elevator

It is very seldom necessary to adjust the auxiliary lever, which carries the cam roller, with relation to the long lever, the front end of which holds the connecting link. But if it does appear necessary to adjust it, this should not be attempted without thoroughly checking the dimensions on the link; and if they do not agree with those given in Fig. 4-10, adjust the link parts until they do. Then the auxiliary lever may be adjusted as shown in Fig. 3-10.

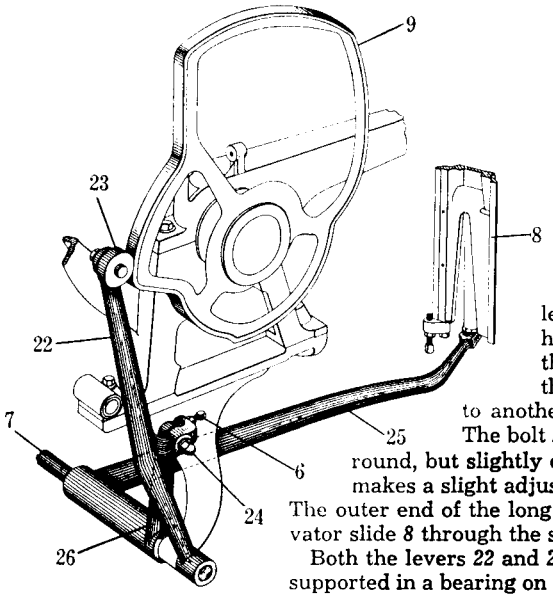

FIG. 3-10. View of the first elevator slide cam. In this view *9* is the cam surface. This surface has a very peculiar shape and gives to the first elevator five different movements in the course of one revolution of the cam shaft.

The cam surface *9* acts upon the lever *22* through the roll *23*. This lever has a lug, or projection upon it, and in this lug, or projection, a bolt *24* passes through connecting elevator lever *22* to another lever *25* through a short arm *26*. The bolt *24* passes through a hole which is not round, but slightly enlarged laterally, and a set screw *6* makes a slight adjustment between the levers *22* and *25*. The outer end of the long lever *25* connects with the first elevator slide *8* through the spring link.

Both the levers *22* and *25* are mounted on a shaft *7* which is supported in a bearing on the base.

Wear on the cam and cam roller may make this adjustment necessary. It should be made by first loosening the connecting or binding screw, then turning the adjusting screw, and of course, tightening the lock nut on adjusting screw when the adjustment is satisfactorily made.

Because the position of the first elevator when receiving the line from the line delivery slide is the only one at which both the auxiliary lever roller is riding on the cam and the connecting link is not under compression, the adjustment of the auxiliary lever should be made at that point, which is the normal or stopping position of the machine. It is only at this point that it is allowable to adjust the connecting link while it is on the machine, and then only slightly, to provide a finer adjustment for this position than can be made by adjusting the auxiliary lever. The first elevator jaw should align with the line delivery channel so that its rails are just a little below those of the line delivery channel.

On all the later Linotypes, the two right-hand first elevator slide gibs are doweled to the vise frames and any excessive looseness of the slide is taken up by adjustment of the two left-hand gibs. There should be about .005″ clearance allowed.

Movement of the First Elevator

The movement of the first elevator consists of four separate strokes. The first stroke starts when the cam shaft begins to revolve, after the starting pawl has

been tripped by the delivery of the line into first elevator jaw (as described in Chapter 9). The first elevator cam allows the first elevator slide to descend by its own weight, carrying with it the first elevator jaw in which is a line of matrices. This descent is about five inches, and is called the casting stroke of the slide.

It is very important that the first elevator jaw should descend to exactly the right position, so that when the mold is advanced the lower lugs of the matrices shall enter the aligning grooves in the mold freely, without rubbing either the top or bottom surfaces of the grooves. There should be .010″ clearance over the tops of the lower lugs of the matrices. This clearance is provided by the proper adjustment of the center screw in the overhanging portion of the first elevator slide, to which portion the jaws are attached. This center screw banks on the top of the vise frame, and because the first elevator cam lever roller is not resting on the cam surface at this time, this adjustment is independent of the adjustment of the auxiliary cam lever.

To adjust the center screw to obtain the proper .010″ clearance, disconnect the pot plunger rod pin, turn the machine ahead until the first elevator slide descends and rests on top of the vise cap. Select two new matrices; and, with the vise open, place one matrix in the first elevator jaw just inside the pawls, and another at the other end, or about 30 picas away. Then close the vise and lock securely. Disconnect the mold slide lever and pull the mold disk ahead on the locking studs by hand. With the left hand, raise the elevator until the lugs of the matrices bank firmly in the aligning groove in the mold. Turn the center screw with the right hand until it is resting on the vise cap. On all new machines this center screw is ½″ diameter, 12-pitch, right-hand. Next turn the screw back just slightly less than ⅛ of a revolution, which allows the elevator to fall .010″, then lock securely with the lock nut. When using display matrices punched in the 45-point alignment and the auxiliary position of duplex display matrices it is necessary to make this setting about .005″.

This is one of the most important adjustments on the machine, and it should last indefinitely.

If after long use of the machine, this clearance should become more than .010″, it is well to examine the locking studs on the mold disk and the stud blocks on the vise frame for wear. An occasional test is well worth while in order to keep good alignment of the characters on the slug, and may save much expense for new matrices.

The second stroke is a short upward stroke for alignment. With matrices in the first elevator jaw, this stroke is obviously .010″; and the spring in the connecting link is compressed an amount equal to the difference between .010″ and approximately $\frac{5}{16}$″, which is approximately the upward stroke when there are no matrices in the jaw and therefore no compression of link. When large matrices and duplex-display matrices, which are punched ⅛″ below the auxiliary position, are used, a special shoe is applied to the first elevator cam in order to lift the slide sufficiently.

The third stroke is a long upward stroke of about thirteen inches to the transfer position. The adjustment for the exact stopping position is controlled by the square-head adjusting screw on the bottom of the slide at the right coming in contact with the vise frame. Here again the spring in the connecting link is compressed. This adjustment being for the purpose of distribution, it is considered more in detail in that portion of this book.

The fourth stroke is downward to the normal position to again register with the line delivery channel. This adjustment, by means of the auxiliary lever, has already been described.

There should be noted here an action which takes place between the second and third strokes of the first elevator. Just after the cast has been made, a slight depression in the surface of the first elevator cam relieves the pressure which has operated to compress the spring in the connecting link, and thereby allows the mold to withdraw from the line of matrices, free from the strain of the pressure between the tops of the lower lugs of the matrices and the top of the aligning groove of the mold. This also saves the aligning tops of the matrix lower lugs.

The Vise Automatic

It is very important that the first elevator jaw should descend to exactly the right position in the vise, so that when the mold is advanced the lower ears of the matrices may enter the grooves of the mold. If for any reason the elevator slide should not descend to the proper position, when the mold comes forward, it would smash or cut the ears of the matrices, because the ears do not enter the grooves in the mold. While this failure on the first elevator slide to descend to the proper position does not very often happen, it is necessary to provide a device to prevent damage to the matrices and the machine in case of such a failure to descend. This device is called the "vise automatic." It consists mainly of a vertical rod passing through a hole in the vise cap, and a sliding plunger which is pushed forward by the mold disk. The upper end of this rod is directly under an adjustable screw in the first elevator slide, so that when the first elevator slide descends it pushes the rod downward a short distance, approximately $\frac{1}{32}''$. There is mounted on this rod a projecting piece of steel with a sharp edge, as shown in Fig. 4-10. Mounted in the vise frame is the plunger, called the "vise automatic mold disk stop dog," also shown in Fig. 4-10. When the mold disk comes forward it presses the plunger forward in its guide, and if this comes in contact with the sharp edge, previously mentioned, it carries the vise automatic rod toward the front of the machine. The lower end of the vise automatic rod connects with a short lever which in turn operates through a series of levers to release the clutch, so that the cam shaft stops.

Ordinarily, the descending first elevator slide, coming down upon the vise automatic rod, pushes the sharp edge downward so that the plunger operated by the advancing mold disk will just pass over it, as shown in Fig. 4-10. This clearance should be quite small; always less than $\frac{1}{64}''$. If the first elevator jaw comes within .010″ of the proper position, the ears of the matrices will not be damaged. The descent of the elevator slide and the register of the matrices with the mold is controlled by an adjustable stop consisting of a screw and nut in the elevator slide, as shown at *29* in Fig. 4-10. This adjustable stop when properly set seldom needs any adjustment, and should not be touched, except when it is jarred loose by accident. The proper setting of this stop, however, is very important in relation to the vise automatic, for if the elevator jaw is not in proper position, the ears of the matrices will not register with the grooves in the mold, and there will be trouble. When the vise automatic is properly set, however, it is almost impossible for the ears of the matrices to be damaged during the casting operation.

The proper method for setting this adjustable stop, called the "center screw," has already been described in this chapter.

The proper setting of the adjusting screw for operating the vise automatic can be tested by first having the machine in normal position and placing a thin space matrix on the vise cap under the center adjusting screw in the first elevator slide. When the machine is started, by pulling out the starting lever, this thin

space should stop the machine by allowing the vise automatic to operate. When the thin space matrix is removed, the machine should start again.

The machine will not stop when making this test if the lip of the disk dog, or the pawl, is damaged. If so, they should be replaced with new parts, as the vise automatic should always be in perfect working condition.

It should be here noted that when the slug is to be ejected, the mold disk advances toward the front of the machine in order to bring the slug, then held in the mold, close to the trimming knives between which it is to be pushed by the ejector lever.

At that time the vise automatic mold disk dog is pushed forward, and the vise automatic stop rod is not held down by the adjusting screw 27 in the top of the first elevator from descending its full distance, and a filling piece of the same vise automatic stop rod were not held down by some other means.

As shown in Fig. 4-10, that means consists of a bell-crank lever *62*, the horizontal arm of which presses down on a pin projecting from the right-hand side of the vise automatic stop rod *28*. The vertical arm of this lever has a cam roller *63* which rolls or rests on the back surface of the first elevator slide *8* while the lever is in operation, and dips into a hollow on the back of the slide when the movement of the vise automatic stop rod is controlled by the adjusting screw *27* in the top of the first elevator slide.

In case the elevator slide does not descend to the proper distance and the plunger operated by the advancing mold disk stops the machine, as previously described, it is necessary for the operator to turn the cam shaft of the machine backward slightly by hand and find out why the first elevator jaw has not come down to its proper position. This is usually caused by a tight line.

A tight line is one where the matrices and spacebands make the line a little too long to descend between the jaws that determine the length of the line.

It is often possible for the operator, by pushing downward upon the first elevator slide, to crowd the line through if it is only slightly too long. This is bad practice, and does great damage to the matrices and to the machine. It is much better to remove a matrix or two from the line, which can be done by lifting up the first elevator slide, and then allowing the line to cast. Of course this slug has to be thrown away and the line reset properly.

A detailed description of the mechanism controlled by the vise automatic to throw out the clutch to stop the machine is contained in Chapter 21 of this book.

The Simple Two-Letter Attachment

This attachment allows operators to cast one, or as many whole lines as may be desired, from characters in the auxiliary position on two-letter matrices, by setting the matrices in the normal way on the lower, or regular, rail of the assembling elevator. And, because matrices for display faces, from 18 point to 36 point inclusive are punched in the auxiliary position on the matrix, this attachment is used also when setting these matrices, and larger point sizes of display matrices.

The attachment consists essentially of a filling piece $\frac{7}{32}''$ thick to prevent the first elevator slide. Therefore, the rotation of the cam shaft would stop if the thickness, hinged to it, in order to operate the vise automatic.

These filling pieces are mounted on top of the vise cap so as to be, when in use, between the bottoms of the two adjusting screws in the top of the first elevator slide and the top surface of the vise cap; and so as to be easily thrown over to the left out of position when not in use.

There is also a simple means to prevent the operator from raising the as-

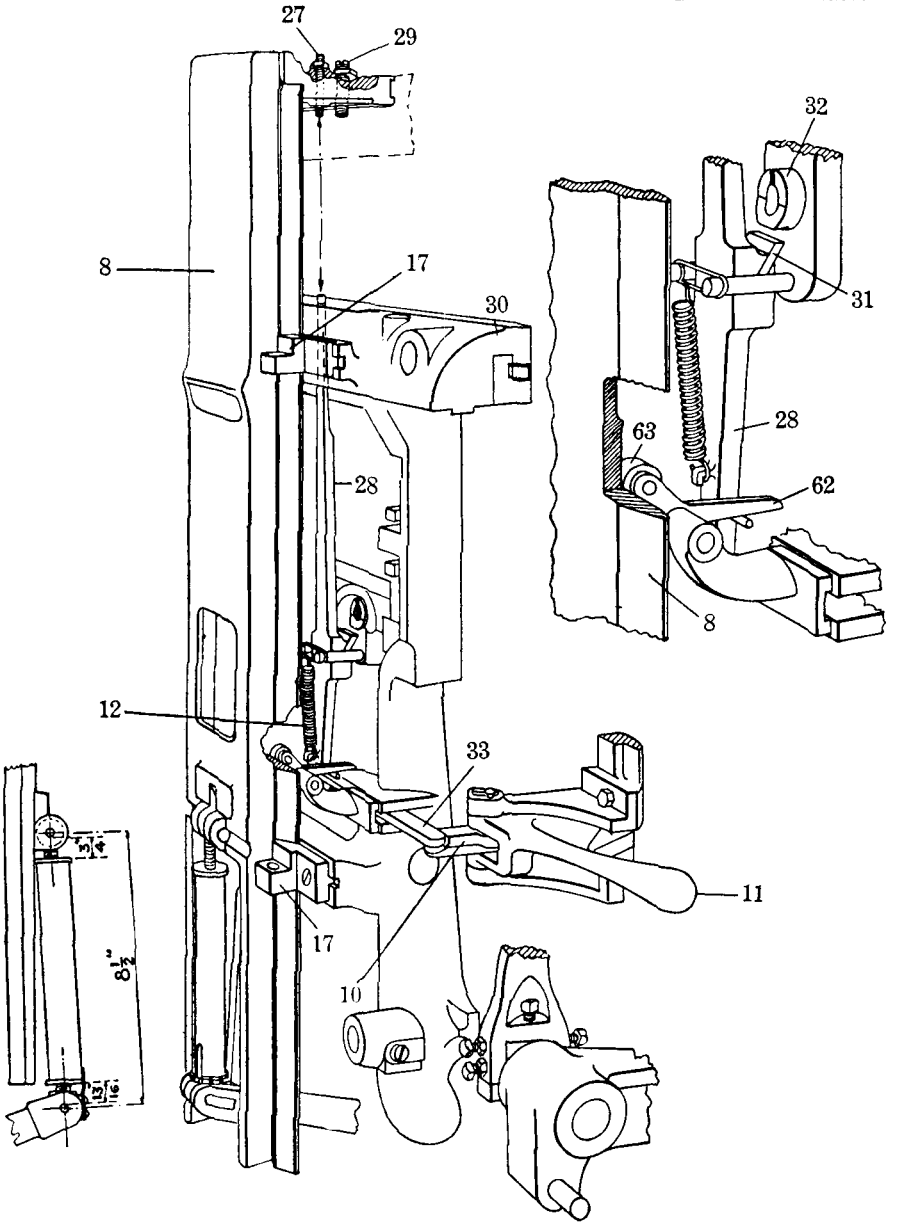

FIG. 4-10. *View of* the first elevator and its connection; also view of stop screw and adjusting screw for the automatic *stop* rod, showing the vise automatic mold disk dog *32* just passing over the lip *31* on the automatic stop *rod.*

The first elevator slide *8* is a long casting which rides in gibs *17* upon the vise frame. Mounted in the top of the slide *8* is the screw *27* which, when the slide descends, strikes directly upon the automatic stop rod *28.* This screw is adjustable so as to depress the *stop* rod to a greater or less extent. The stop rod, passing through the vise cap *30* is held up by the spring *12* and has on it a shoulder which banks on the under

side of the vise cap. Also mounted in the top of the slide is the center stop screw *29* which strikes upon the top of the vise cap. This screw is adjustable to limit the downward movement of the first elevator slide. That adjustment has already been explained earlier in this chapter.

When the screw *29* strikes upon the top of the vise cap and stops the downward movement of the slide, the screw *27* should depress the automatic stop rod *28* so that the top of the pawl *31* will come just below (about .010") the bottom edge of the mold disk dog *32*, which is pushed foward by the mold opposite the one in use on the disk. If the pawl *31* is not below the mold disk dog *32*, the dog striking it will push the stop rod *28* toward the front of the machine, and the stop rod striking against the lever *33* will cause the other end of this lever to push the stop bar *10* toward the back of the machine to throw out the clutch and stop the machine. The adjustment of the stop screw 29 should be made before the adjustment of the screw *27*.

The control handle *11* is for manually starting and stopping the rotation of the cam shaft.

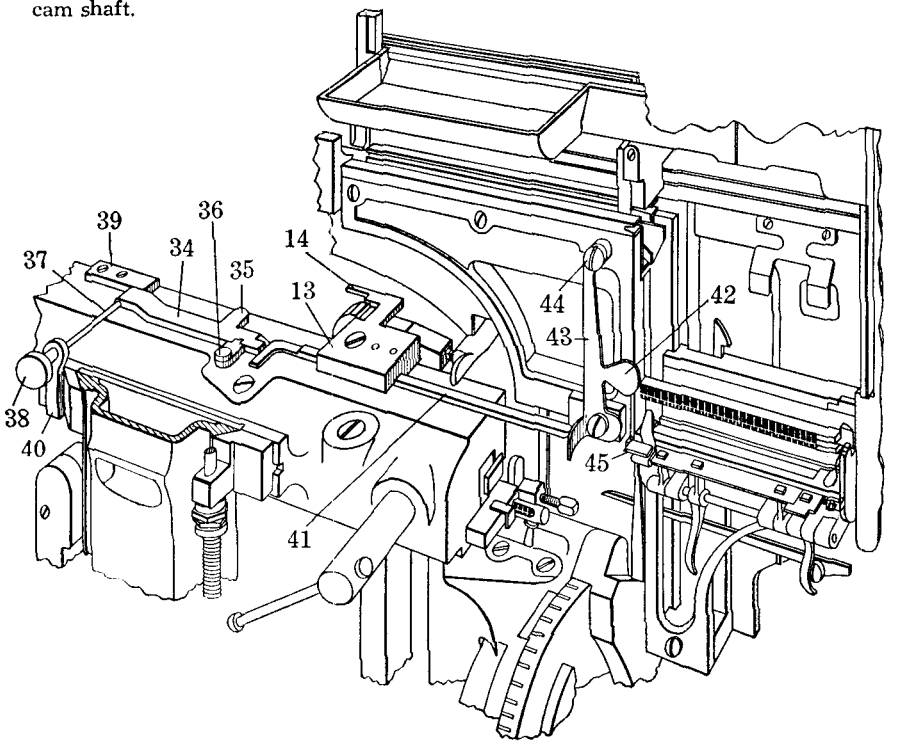

FIG. 5-10. View of simple two-letter attachment. In this view *34* is the main section of the filling piece on which *35* is the portion which is placed under the center screw in the top of the first elevator slide, and *36* is the filling piece over the vise automatic rod. The filling piece *36* is hinged to the main piece *34* so as to allow it a vertical movement. The unit comprising *34*, *35* and *36* can be easily thrown over to the left, out of use, because the main section is pinned to a rod *37* which has on its end knob *38*, and has bearings in blocks *39* and *40*. The slide *41* is merely a distance piece, the right-hand end of which serves to hold the auxiliary line safety lever *43* hinged at *44* from being moved to the left in case the projection *42* on it is contacted by the projection *45* on the duplex rail of the assembling elevator. Because the matrices must always be assembled on the lower rail of the assembling elevator when the simple two-letter attachment is in use, the duplex rail should be out, and this safety prevents raising the assembling elevator if this rail is not out.

sembling elevator to send in a line, in case the duplex rail of that elevator should, inadvertently, have been pushed in.

The filling pieces are $\frac{7}{32}$″ thick because that is the distance between the regular and auxiliary positions of the characters on the two-letter matrices, and because one-letter matrices for certain display faces are punched in the auxiliary position. Other, and very large point sizes of display faces are punched still ⅛″ lower on the matrix. Such faces, of course, require the use of filling pieces $\frac{11}{32}$″ in thickness in order to hold the first elevator high enough to bring their character punchings in proper alignment with the mold cavity. And, of course, such molds have the proper aligning surface for the tops of the bottom lugs of the matrices.

Besides, when display molds are used, there are fastened at the left of each

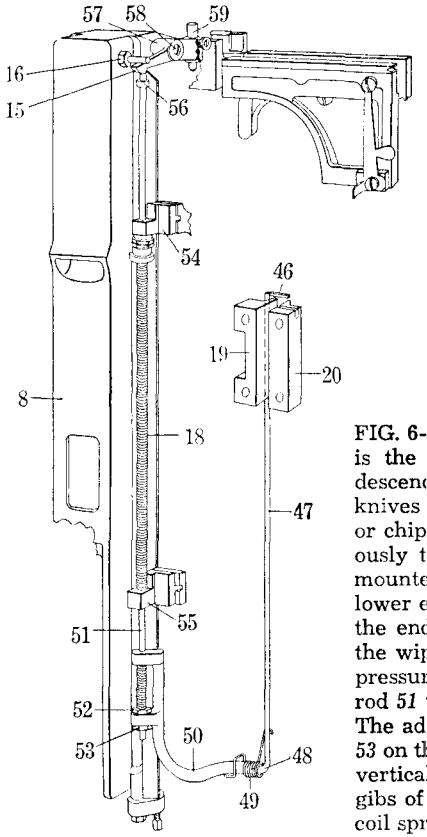

FIG. 6-10. View of wiper for the trimming knives. *46* is the "flag" which, when the first elevator slide descends, passes over the edges of the trimming knives *19* and *20* to wipe them clean of any shavings or chips of type metal trimmed from the slug previously trimmed by them. This "flag" or wiper *46*, is mounted on the upper end of the vertical rod *47*, the lower end of which is free to turn in a bearing *48* on the end of the arm *50*. The torsion spring *49* keeps the wiper *46* against the knife edges with a uniform pressure. The arm *50* is adjustably held on the slide rod *51* which passes through two lugs on the arm *50*. The adjustment is provided by two lock nuts *52* and *53* on the threaded end of the rod *51*. The rod *51* slides vertically in bearings *54* and *55* on the right-hand gibs of the first elevator slide. The long compression coil spring *18* returns and holds the slide rod *51* to its

up, or normal, position, stopped by the bottom surface of the bearing *54*. The first elevator slide *8*, has mounted on the top of its overhanging top portion, the lever *57* on the stud *58*. The front end *15*, of the lever *57*, is stopped and backed by the stud *16*, also mounted on the first elevator slide; and the back end of the lever *57*, has on it an adjustable plunger *59*, which when the first elevator nears the end of its downward stroke, contacts with the top of the vise cap, and operates the downstroke knife wiper *46*.

There are three settings of this adjustable plunger. The plunger is set in the first position when no filling piece is used under the stop screw on the first elevator slide; in the second position when the $\frac{7}{32}$″ filling piece is used; and, in the third position when the $\frac{11}{32}$″ filling piece is used.

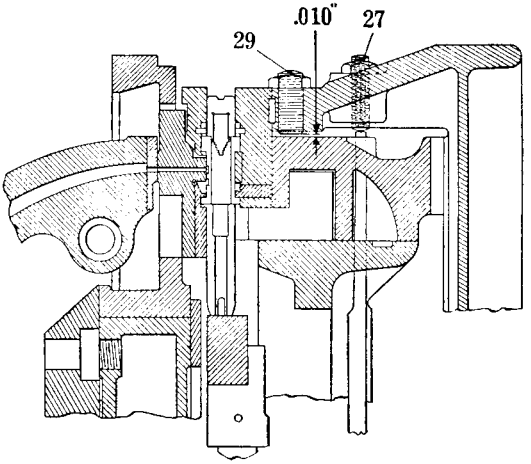

FIG. 7-10. This sectional view shows the "lockup" when the simple two-letter attachment is not in use. The view shows the first elevator jaws, the vise cap, the line of matrices and spacebands, the mold against them and the pot mouthpiece against the mold; at the time the cast takes place. It shows also the vise automatic rod depressed by adjusting screw 27.

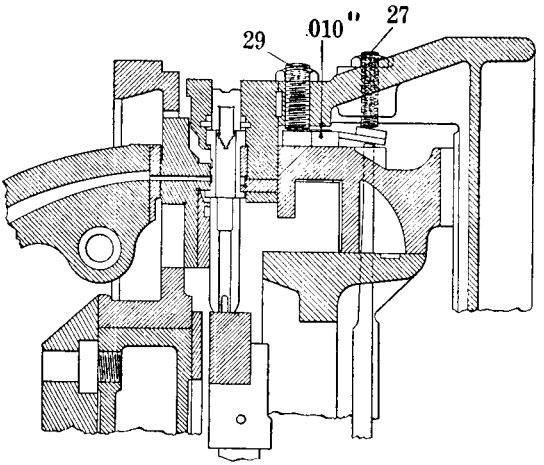

FIG. 8-10. This sectional view shows the "lockup" when the simple two-letter attachment is in use. Otherwise it is exactly the same as Fig. 7-10.

such mold on the mold disk, a block, the top surface of which comes in contact with the bottom surface of the safety plate *64*, Fig. 1-10, on the first elevator jaw as the first elevator descends, in case the operator has forgotten to throw over into operating position the above described filling pieces. Because this safety prevents the vise automatic rod from being depressed, the forward movement of the mold disk causes the cam shaft of the machine to stop rotating, by means of the vise automatic, before the metal pot pump operates. This is an important "safety."

The Knife Wiper

As the cast Linotype slug is ejected from the mold it is pushed between two trimming knives; and, in order to keep the cutting edges of these knives clear of chips of metal, a knife wiper is provided as shown in Fig. 6-10. The "flag," which contacts the cutting edges of these knives, is of brass which cannot injure them, even though it is held against them by spring tension, thereby assuring uniform contact with the edges to be cleaned.

The wiping operation is a downward stroke, so that the "flag" remains clear of whatever chips it may have wiped off the knives.

MAINTENANCE

How to Remove a Squirt—The first elevator jaw is a very important part of the Linotype machine, and great care must be used when making repairs, especially when cleaning out a squirt.

Theoretically the various automatics make it impossible for the machine to squirt, but in practice this occasionally happens, and then it is necessary to remove the metal from the elevator jaws, and if caution is not used, the back jaw is likely to become bent.

If the squirt takes place in such a manner that the metal holds the first elevator down tight on the vise cap, do not attempt to open the vise until you have first removed the back jaw support *14*, Fig. 5-10. Then remove the wing-pin from the bottom of the connecting link where it is fastened to the first elevator lever. After this is done remove the two screws at the left-hand end of the elevator jaw, then turn the vise locking screws to the open position, and press the jaw apart. At the same time allow the vise to open to the first position, and then pry the line of matrices from the front jaw.

After this is done it usually happens that a long strip of metal has formed between the duplex rail and the matrix adjusting bar and this must be driven out, but do not use a steel tool for this purpose, as the jaw might be damaged. Use a piece of brass, or even a six-point slug from the Linotype will usually remove it.

After all metal has been removed, try the duplex rail and see that it works freely, and has not been bent. If the rail should bind, it is possible a small piece of metal may be between the duplex rail and the jaw, and it will then be necessary to remove the bottom plate, which is held to the jaw with five screws.

The front jaw is held to the elevator slide with two three-eighths screws and a key to hold it in alignment, and if it becomes necessary to remove it, make a small scratch from the jaw to the elevator head, as it is possible to get a slight variation when replacing, as there are no dowels.

Before replacing the back jaw, examine carefully to see that the lower edge is in exact alignment with the top, using a straight edge, or the edge of a spaceband will do. (See Fig. 9-10.)

When replacing the back jaw, be sure the two jaws and separating blocks are exactly even at the ends. The long screw goes at the left end, and the shorter one is made to clear the safety plate on the back jaw.

After the elevator jaw has been assembled, try a matrix between the jaws, and see that it slides freely the entire length (30 picas) in both the lower and upper positions, and also check distance between jaws, to make sure there is not too much clearance. Also try a spaceband in the grooves to see that there is no obstruction.

It is always the safest plan to remove the back jaw on any kind of squirt, as this will leave the front jaw open to inspect for any particles of remaining metal.

When a squirt has been removed from the elevator jaw, examine the left-hand vise jaw to see that it slides freely. It is possible that some metal particles might make it bind.

Principal Causes of Squirts—(1) The vise automatic not properly set to throw out the clutch and stop the machine if the first elevator does not seat on the vise cap, which may be caused by some obstruction, or an "overset" line, too wide to go between the vise jaws.

The failure of the automatic to operate may be due to a broken spring in the

vise automatic mold disk stop dog, or the spring may be too weak, or clogged with metal.

(2) On machines where the simple two-letter attachment, or "flap" as it is sometimes called, is used, and the machine is not equipped with the safety device as shown at *42* in Fig. 5-10, and the "flap" is thrown in place to hold the elevator slide in the raised position, and the line is assembled with matrices on the upper rail, it will cause a squirt for the reason that the line of matrices will be doubly raised and the lugs will be too high to enter the mold groove.

(3) As every line set varies in width, the long finger on the line delivery slide must immediately "take up," or in other words, when the line of matrices starts across, the finger must not start over until the matrices have come against it, and it must stay against them until the line has been transferred to the elevator jaw.

If the long finger does not have this "take up" and the line is sent in just about the time the machine comes to normal position, the matrices are likely to twist sideways, and leave an open space for metal to come through if the line is widely spaced (not full).

(4) Failure of mold disk slide to come ahead far enough to catch the lugs of the matrices. This could be caused by the eccentric screw which controls the slide working loose. (Refer to mold disk slide setting, Chapter 12.)

(5) Particular care should be given to the pot pump stop as described in Chapter 13. The lever which controls this reaches to the end of the right-hand vise jaw, and has an adjusting screw which rests against the jaw and should be adjusted so the stop will just clear the block on the plunger lever, when the line is fully justified. Too much clearance will allow a line that is not quite full to cast, and will possibly show hair lines.

The spring on the pump stop should have sufficient strength to hold the stop under the plunger lever block in case a *very* short line is sent in as this creates a slight pressure on the right-hand jaw when the justification levers operate, so the spring on the line stop must be strong enough to overcome this pressure.

Sometimes a slight splash of metal gets under the stop and makes it bind; also on some old machines the plunger lever block comes below the stop so it cannot drop under. Usually this is caused by wear on the pot pump lever cam, a worn cam roll, or roll pin.

Setting the Vise Automatic—As most of the damage to matrices takes place in the elevator jaw, the part of this chapter dealing with the setting of the vise automatic should be carefully studied. As a simple aid to the setting of the automatic, proceed in the following manner:

First check the center screw in the elevator head, as described previously in this chapter, to be sure the matrix lugs have the proper .010″ clearance in the mold groove, then put the machine in normal position.

Pull out the plunger rod pin for safety, shut off power, and with starting lever out, trip the clutch automatic by hand and turn machine slowly ahead until the elevator slide head center screw just touches the vise cap, and stop turning before the mold slide has started forward. With the machine in this position, with starting lever still out, the exact relation of the pawl *31*, Fig. 4-10, on the automatic stop rod *28*, and the point of the vise automatic mold disk stop dog *32* can be clearly seen, and if a close adjustment is wanted on the automatic stop rod, it can be seen just how much room there is between the two points as shown in Fig. 4-10. If the setting is to be made on an old machine, be sure the pawl on the stop rod is tight in its bearing. If loose, tighten it, as this will make a difference in the clearance between the pawl points.

To remove the stop rod *28*, Fig. 4-10, have the machine in normal position with the vise closed, and unhook the end of the spring *12* from the stop rod, then push the starting lever in and the rod will drop down. To tighten the pawl in the rod, use a hammer and drive back on the split part of the rod just below the pawl. When attaching the rod, see that the pin on the side at the lower end is under the bell crank lever *62*.

Now place a thick matrix on vise cap under the center screw of elevator slide cap and see how far ahead the mold disk dog moves forward before it strikes the pawl on the rod. This distance should be very slight, otherwise if a tight line should be sent in, and the points are too far apart, the action of the clutch throwout would be too late, and the machine would over-run and allow the mold to press against the line of matrices with possible damage.

If everything checks correctly, but the clearance is too much, it may be overcome by bending the stop rod to bring the points closer.

The clutch leathers must be free from grit, and the face of the driving pulley must be clean.

The thickness of the clutch leathers makes a difference in the distance between the mold disk stop dog and the automatic stop rod pawl. The thicker the leathers the greater the distance will be between the points, consequently the later the clutch will be thrown out. The setting of the clutch is described in Chapter 21.

First Elevator Jaws—The matrix retaining pawls should both have the same amount of tension; this will make a smoother action as the line of matrices enters the elevator jaw, and will be of help when the line of matrices is transferred to the second elevator.

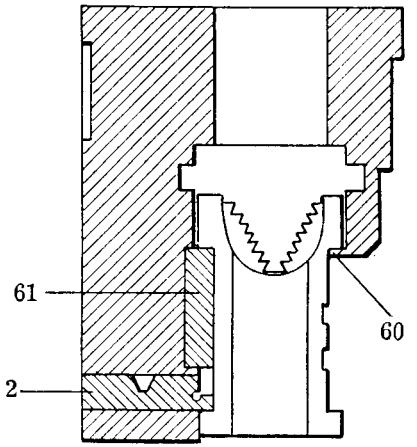

FIG. 9-10. *60* is the lower ledge of the first elevator back jaw; *61* is the matrix adjusting bar on the front jaw; *2* is the duplex rail.

As shown in Fig. 9-10, the distance between *60* and *61* must be as close as possible without binding the matrix on the sides.

When the line of matrices goes down in the vise jaws, there is a slight side pressure on the end matrix on the right-hand side, as it comes in contact with the vise jaw, due to pressure of the pot pump stop spring which moves the jaw slightly to the left, and if the matrix fits too loosely between *60* and *61*, the lower front lug of the matrix is apt to slide out from under the duplex rail, and raise up enough to cause the lower back lug to be sheared off when the mold advances. This is especially true when the line is fully spaced out.

The diagram shows the top lug of the matrix resting on the matrix adjusting bar *61* and the lower lug under the duplex rail, and this should be a close fit.

If alignment is poor, examine the top of the matrix adjusting bar, and if wear shows at this point, replace it, or it is possible to remove the bar, which is held to the front elevator jaw with five screws, and reverse it by turning inside out, but be sure to taper the edges before replacing so the matrices will not bind as they enter the elevator jaw. Also examine the under part of the duplex rail for any undue wear at that point.

When the matrices are in the raised position in the elevator jaws, the alignment is held in place by the bottom lug only, and if that part is worn too much, it will be difficult to get a good alignment.

The duplex rail *2* should be examined occasionally to make sure it does not travel too far ahead.

On all late model machines the duplex rail has a small block fastened at each end to control the forward movement of the rail, and these blocks replace the pins which were formerly used for this purpose. The blocks provide a sturdy banking surface and should last indefinitely.

On the older model machines the duplex rail is made with two pins on its lower surface, and these slide in grooves cut in the lower cap, the pins acting as a stop when the springs force it forward.

The duplex rail should be in exact line with face of the matrix adjusting bar. If the stop pins mentioned above should become worn, the rail may come too far forward; and if so, it can be brought back to the proper position by replacing the worn pins with new ones.

Line Stop—On all late model machines the line stop *21* as shown in Fig. 2-10, is automatically carried to the right each time a line of matrices is transferred to the second elevator.

The tension should be heavy enough to hold the matrices in place, and weak enough so it will not retard a line of matrices when entering the first elevator jaws. Its tension may be increased by widening the open end gap.

The most important function of the line stop is to prevent the matrices from spreading when recasting, and if the matrices are in the raised position in the elevator jaws, to keep the end matrix from falling sideways to the left when the elevator slide is on its upward movement.

First Elevator Slide Safety Stop Plate—When using head-letter molds, see that the elevator jaw has a safety stop plate *64*, Fig. 1-10, and a stop block at the end of the mold.

The object of this safety device is to throw out the clutch if the "flap" is not thrown into position, otherwise the line of matrices would be in the lower position in the elevator jaws, and the advancing mold would strike the back jaw.

Elevator Slide—The elevator slide should be oiled occasionally on the sides where it travels between the gibs. The slide must work freely so its position will be correct to receive the incoming line of matrices. As before mentioned in this chapter, this setting should be slightly below the delivery channel.

The only other part of the elevator slide that needs oil will be the two levers that operate the duplex rail (Fig. 1-10). A small amount of oil rubbed on with the finger tip will be sufficient. Also oil the pins at the ends of the connecting link.