CHAPTER 18

Single Distributor, Box, and Font Distinguisher

DISTRIBUTION OF MATRICES ON SINGLE DISTRIBUTOR LINOTYPE MODELS

DISTRIBUTION OF MATRICES on the various current Linotype models is essentially the same, but, of necessity, varies somewhat according to the purpose for which the machine has been designed. The simplest form of distributor is, of course, on those machines designed for composition of matrices from one main magazine or from one main and one auxiliary magazine only.

In this chapter there is described only the distribution of matrices on such models. Descriptions of the modifications of this simple distributor are taken up separately in subsequent chapters. Figs. 52, 53, 54, 55 and 56 in Chapter 1 show the type of distributor box described in this chapter.

DISTRIBUTOR BOX

The distributor box is that part of the Linotype mechanism through which the matrices pass in going from the second elevator to the distributor screws and on to the distributor bar from which each matrix drops at its own point along the bar on the way back to its proper channel in the magazine from which it was previously released by the operator. The function of the distributor box is to both guide the matrices and also to lift them, one at a time and correctly timed, into the distributor screws which convey them along the distributor bar.

Every Linotype machine, irrespective of the special purpose for which the machine is designed, has a distributor box for the purpose above noted; and, whether on any particular model this box is referred to as the distributor box, the upper distributor box or the primary distributor box, its special function is to lift the matrices one at a time and correctly timed, into the spaces between the threads on the revolving distributor screws.

Distributor Box on Single Distributor Linotypes

The distributor box on single distributor Linotypes consists of a bracket to which the other parts of the box are attached. This bracket has a large notch in its top, and in its back surface are two dowel pins that fit into a groove on the front of the distributor beam, in order to correctly locate the distributor box. Threaded through the distributor beam, in line with the notch in the distributor box bracket is a bolt having its large head toward the front of the machine and having a handle fastened to the part which extends back of the distributor beam. The head of this bolt, being larger than the notch in the distributor box bracket, holds

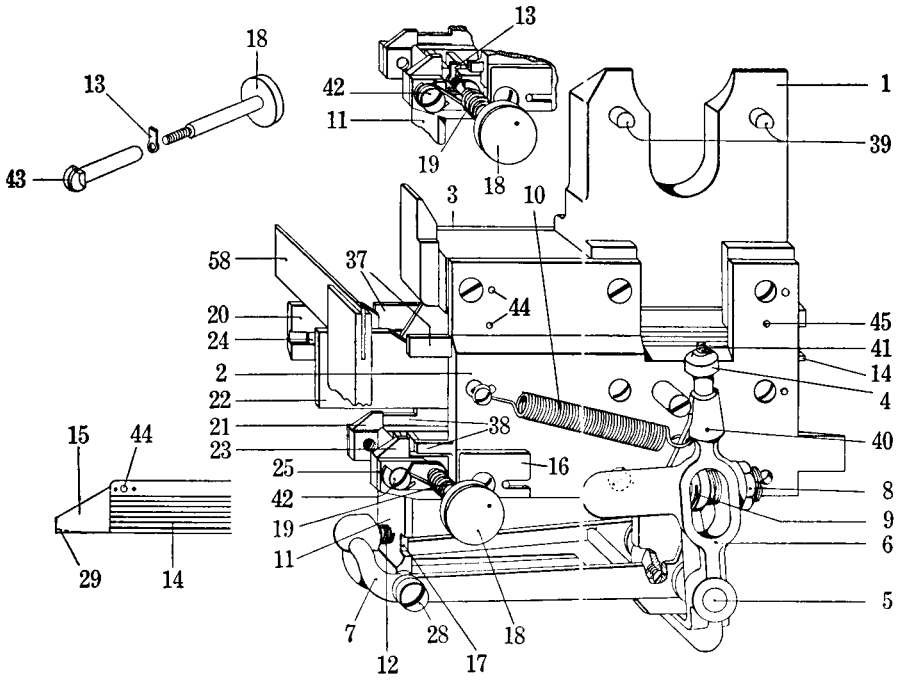

FIG. 1-18. Back view of distributor box used on the single distributor Linotype. *1* is the distributor box bracket having the notch and locating pins for attachment and location on the distributor beam. The bracket *1* carries the distributor box bar *14* on which is the bar point *15*. The bracket *1* also carries the front plate *3* and the back plate *2*.

The front plate upper rail *20* and the front plate lower rail *21* are attached to the front plate *3*. The back plate *2* has on it not only the back plate upper rail *22* and the back plate lower rail *23*, but also the hub in which is the hinge pin *5* on which the cam lever *6* and the matrix lift lever *7* are hinged. It also has on it most of the other parts of the distributor box.

The cam lever *6* and the matrix lift lever *7* are so shaped that together they form one single lever on which the two arms are adjustable with relation to each other by the adjusting screw *8* and spring held together by the safety cushion spring *9*. The cam lever *6* carries the cam roll *4* which is held against the matrix lift cam by the spring *10*. Pivoted near the end of the matrix lift lever *7* is the matrix lift *11*, which has at its top a lip extending above the surface. Its purpose is to lift the matrix into the distributor screws. This lip is held against the matrix by the spring *12*.

The matrix lift *11* has also on its back edge a cut *17* adapted to be engaged by a horizontal projection of the matrix lift stop *16* when there are no matrices in the distributor box. The matrix lift stop *16* is attached to the distributor box back plate *2* and, when engaged with the matrix lift, holds the lift lever so that the cam roll *4* touches the matrix lift cam only on its highest surface as the cam revolves. This action saves much wear on the parts and materially reduces noise. During the time when there are no matrices in the distributor box, the matrix lift *11* is held, by the spring *12*, against the vertical surface on the font distinguisher block *25*, located between the front plate *3* and the back plate *2*. When there are matrices in the distributor box the spring on the distributor shifter overcomes the force of the spring *12* and the matrix lift does not rest or rub on the block *25*. Instead, the lip at the top of

the matrix lift *11* is against the side of the matrix being lifted, and the matrix lift is also pushed out beyond the horizontal projection on the matrix lift stop *16*.

The font distinguisher *13* is on the large headed stud *18*, which slides in the font distinguisher block *25*. The spring *19* continuously holds the head of the stud *18* toward the back of the machine against a lever which is controlled for position by any one of the font distinguisher indicators on a bracket fastened to the magazine frame, and so locates the font distinguisher *13* for the font of matrices being distributed to the magazine in operating position.

The font distinguisher can be removed from the path of the matrices, by simply pressing the knob of the stud *18* as far toward the front of the machine as it will go, and then giving it a slight turn to cause the font distinguisher to enter a groove in the font distinguisher block *25*.

When there are no matrices in the distributor box, a projection on the lower end of the matrix lift stop *16* engages the matrix lift *11* by means of a slot *17* cut into the side of the lift, and locks the lift so that it is almost motionless until the pressure of the distributor shifter against one or more matrices in the box pushes the matrix lift forward off the stop *16*.

the bracket against the front of the distributor beam when the handle on the bolt is turned counter-clockwise, viewed from the back of the machine.

To remove the distributor box, the machine should be turned back by hand until the second elevator descends from the box.

The distributor shifter should next be pulled out and held out by its latch. The handle on the bolt should then be turned clockwise until the bolt head strikes the back of the distributor shifter slide casting, but should not be forced any farther. This will allow sufficient distance for removal of the distributor box without bending the upper front rail inward. If this rail should be so bent, it will bind on the matrices and cause trouble.

In a slot cut in the bottom surface of the distributor box bracket is mounted the distributor box bar on two horizontal dowel pins crosswise through and near its top. These dowels are far apart, and because the dowel hole through the bar surrounding the dowel which is nearest the second elevator is larger in diameter than the dowel extending through it, the bar pivots, within limits, around the dowel near its other end. This allows the end of the second elevator bar to engage the end of the distributor box bar to bring the two bars into exact vertical alignment at their junction. The teeth which are cut crosswise on the ends of the two bars are for this special purpose.

Extending from the other end of the distributor box bar is a thin blade set vertically into the center of the bar and having its bottom edge a continuation of the bottom line of the bar. This blade is called the distributor box bar point, and its very important function is explained later in this chapter.

Fastened to the sides of the distributor box bracket are two plates, one on the front and one on the back; and attached to these plates are the distributor box rails, upper and lower. Pivoted on a hub which is on the distributor box back plate, is a bell crank lever composed of two separate lever arms at about a right angle with each other. They are the matrix lift lever and the matrix lift cam lever. As their names indicate, these levers carry, respectively, the matrix lift and the matrix lift cam roller. Assembled together, they form a lever on which the arms are adjustable with respect to each other and which constitute still another safety device because they are held together in one direction by a compression spring which allows the cam lever to make its full motion in case there should be some obstruction which blocks or retards the movement of the matrix lift lever. The matrix lift cam is pinned to the projecting end of the distributor back screw.

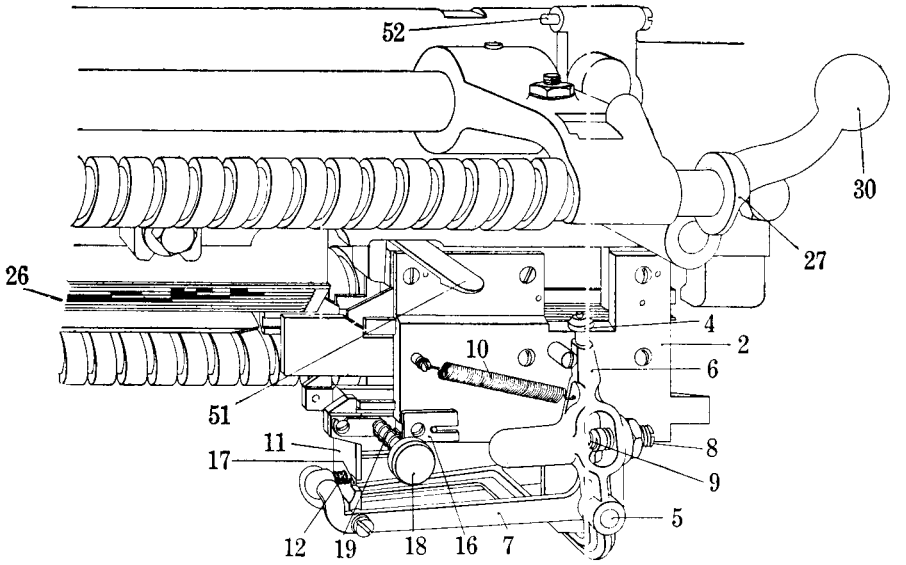

FIG. 2-18. View showing the distributor box on a single-distributor Linotype machine. The back screw is shown lifted up away from the side of the distributor box, and the matrix lift cam *27* is not shown in contact with its cam roll *4*. *2* is the distributor box back plate. The cam lever *6* and the matrix lift lever *7* act together as one lever, adjustable by the screw *8* and cushioned by the safety spring *9*. The cam roll *4* is normally held against the cam *27* by the spring *10*, and the lip on top of the matrix lift *11*, extending above the lifting surface, is held by the spring *12* against the matrix about to be lifted.

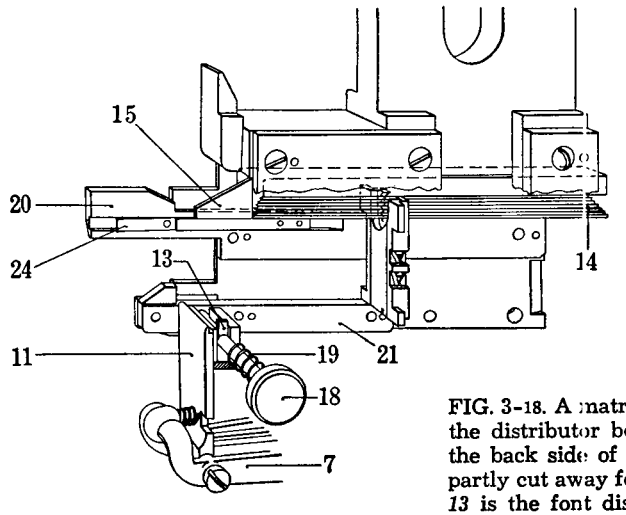

FIG. 3-18. A matrix traversing the inside of the distributor box along the toothed bar, the back side of the distributor box being partly cut away for purposes of illustration. *13* is the font distinguisher. *14* is the distributor box bar, which has in its end the bar point *15*.

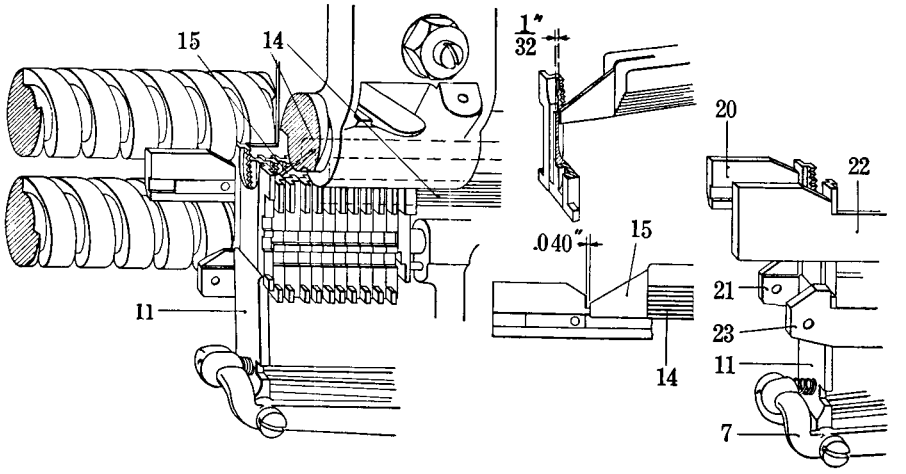

FIG. 4-18. View showing the matrix being lifted over the shoulders of the distributor box rails.

As the matrices are shifted from the second elevator bar into the distributor box, they rise very slightly so that they no longer hang on the distributor box bar, but are supported by their upper lugs on the two upper rails of the distributor box; and, the distributor shifter pushes the line of matrices so that the matrix first in the line has its four lugs against the vertical shoulders of the four distributor box rails, and is in position to be lifted up into the distributor screws by the matrix lift.

Because matrices are of many different thicknesses, set-wise, and because not more than one matrix at a time is to be lifted up to the distributor screws, it is necessary to make the lifting surface on the matrix lift less than the thickness of the thinnest matrix. It is also necessary to prevent the matrix being lifted from carrying up with it others immediately following, due to friction between the matrices as they are held together by the push of the distributor shifter against the line.

To prevent more than one matrix being lifted at a time, every matrix thicker than $\frac{1}{32}$ of an inch has in it a narrow slot extending downward below the V-shaped tooth notch toward the foot of the matrix, on the tooth web side of the matrix. Whatever may be the set-width of the matrix, the thickness of metal remaining, when measured from the bottom of the slot to the surfaces of the lugs which bear against the vertical surfaces of the distributor box rails, is constant and is $\frac{1}{32}$ of an inch. By this slot all matrices are made alike at the point which registers with the distributor box bar point and only one matrix, whatever its thickness, can be lifted up at a time past the end of the bar point, because the distance measured from the end of the bar point to the vertical surfaces on the distributor box upper and lower rails is only very slightly more than $\frac{1}{32}$ of an inch. This distance is constant for all distributor boxes, and, in order that there shall be sufficient room for large matrices to be lifted up, the end of the distributor box bar is cut away. The bar point is therefore longer than is the case in those distributor boxes designed to accommodate only smaller set size matrices.

A safety spring pinned in a groove cut into the front plate upper rail prevents any matrix which is about to be raised by the matrix lift from turning and getting

caught or improperly lifted up, when the pressure of the distributor shifter against the line of matrices is suddenly removed.

The distributor shifter buffer is allowed to travel through the distributor box just far enough to back up a $\frac{1}{32}''$ thin matrix while the matrix is being lifted, but it is stopped from farther travel in order to prevent the matrix lift from striking it when there are no matrices in the distributor box.

The matrix lift should be adjusted, by means of the screw in the matrix lift cam lever, so that the bottoms of the top lugs on matrices are lifted slightly above the tops of the upper rails.

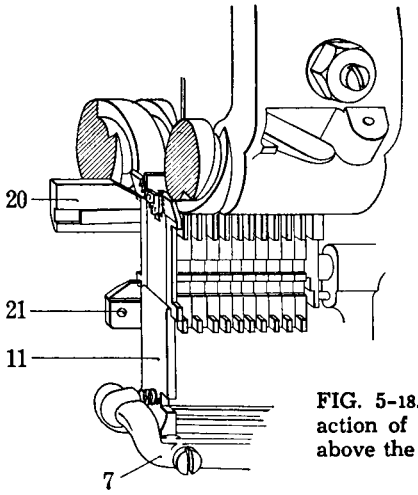

FIG. 5-18. View showing a thin matrix bent by the action of the screws because the lift has not raised it above the shoulders and the rails of the distributor box.

Font Distinguisher

The font distinguisher which consists of a thin vertical blade mounted on a large headed stud, slides in a bearing at the lower end of the distributor box, near the distributor lift. It slides crosswise in the box, and is continuously urged toward the back of the machine by a coil spring around the stud. The position of the thin vertical blade crosswise of the distributor box is determined by a hexagonal indicator adjustably fixed on a bracket attached to the frame which carries the main magazines on the machine. The bracket carrying the font distinguisher indicators has on it as many indicators as there are main magazines, and the indicators are spaced apart vertically to correspond with the vertical spacing of the magazines. As the magazines are raised or lowered, the back edge of the indicator for any magazine contacts the lower arm of a hanging lever, the upper arm of which acts against the head of the font distinguisher stud and cams it toward the front of the machine against the pressure of the coil spring around the stud. Thus the font distinguisher is automatically positioned and held until the magazines are again raised or lowered.

All matrices must pass over the font distinguisher and, when it is properly positioned for any font, all matrices with a different font notch and all matrices of the font in use which may be turned backwards are stopped by it. Matrices stopped by the font distinguisher should never be driven forward over it, but should be pushed back to the second elevator bar and the matrix from the wrong font or the turned matrix removed there. Fig. 54-1 shows the font distinguisher

and a matrix containing the font notch. Fig. 55-1 shows the hexagonal font distinguisher indicators, and their action to locate the font distinguisher in the distributor box.

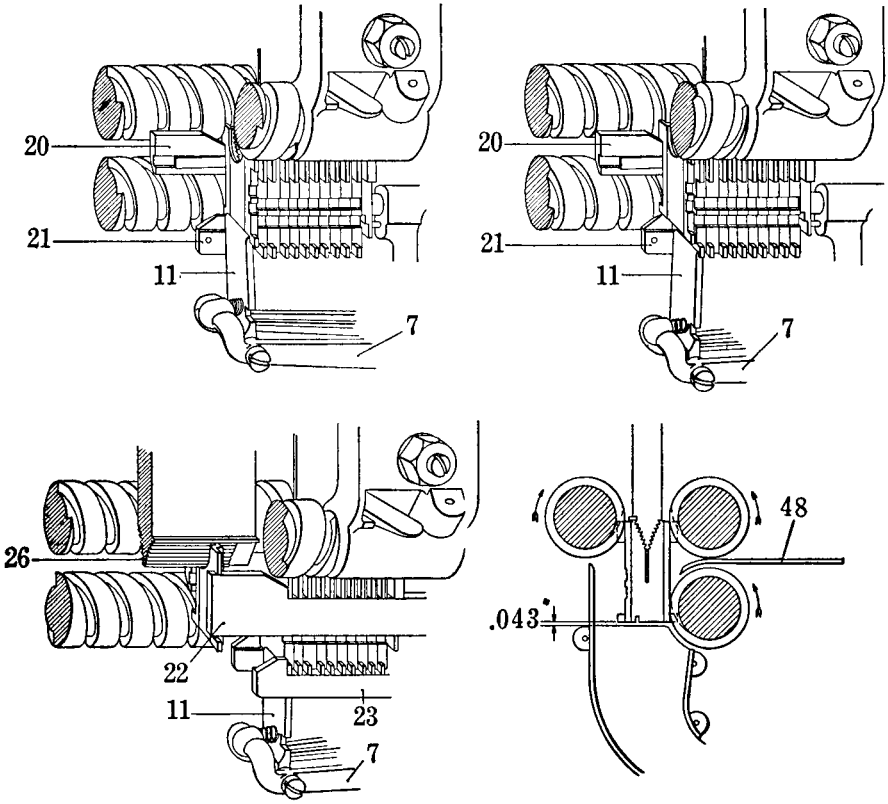

FIG. 6-18. Several views showing the action of the lift. The upper left-hand view shows the matrix just lifted over the shoulders of the rails *20* and *21*. The back rail and a part of the distributor box in this view are cut away to make the illustration more clear.

The upper right-hand view shows the matrix lifted entirely over the shoulders into the threads of the distributor screws, and the distributor lift *11* leaving the matrix and going down to its original position.

The lower left-hand view shows the matrix, having been carried up the inclined part of the rail *22*, just ready to go on to the distributor bar. The tops of the rails *20-22* are parallel with the distributor bar *26* for a short distance, and are of such a height as to bring the teeth of the matrix opposite the grooves of the distributor bar.

The further revolution of the distributor screws carries the matrix onto the distributor bar *26*, and the bar sustains the matrices by the teeth as they are being carried along the distributor bar until such time as the combination in the teeth of the matrix comes to the point on the distributor bar where the combination is cut away; whereupon the matrix, being no longer sustained, drops off the distributor bar into the channel entrance.

The lower right-hand view is a section of the three distributor screws, and the distributor bar with a matrix hanging thereon, showing the engagement of the threads of the distributor screws with the ears of the matrix. The correct .043" clearance between bottom of matrix and channel entrance partition is also indicated.

THE SINGLE DISTRIBUTOR

A single distributor machine may be described as one having a single set of distributor screws. It will distribute matrices to one main magazine or to one main and one auxiliary simultaneously. In the case of the "Two-in-One" model, there are two distributor bars, allowing distribution to either a 90- or 72-channel main magazine, but not both at the same time. The "Two-in-One" machine may carry an auxiliary unit, but all auxiliary magazines must be alike.

This latter type of machine will be described in a subsequent chapter as will the "Two-in-One" mixing machines, which carry two sets of distributor screws and two fixed distributor bars. They permit composition from and distribution to two different styles of main magazines at the same time. If the machine is equipped with auxiliary magazines matrices may be composed from either or both of them in conjunction with the main magazines.

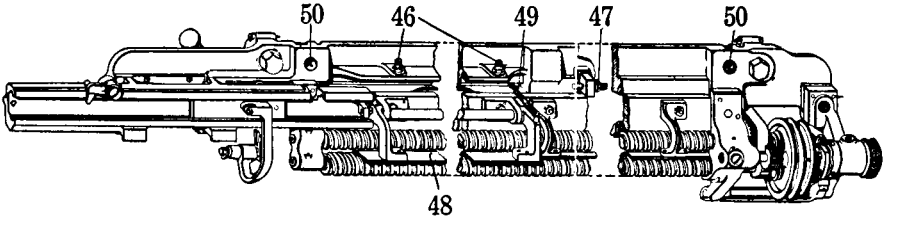

FIG. 7-18. Front view of single distributor. The distributor beam vertical adjusting screws are shown at *46*, the horizontal adjusting screw at *47*, the distributor screw guard at *48*, the distributor screw guard spring at *49*, and the tap-holes for distributor bracket bolts at *50*.

The single distributor consists essentially of the distributor beam which carries the distributor bar, the three distributor screws for conveying the matrices along the distributor bar and the driving mechanism for rotating the distributor screws. This driving mechanism for the distributor screws contains a clutch designed to be so sensitive that the slightest retardation of the rotation of the lower of the three distributor screws will disengage the clutch and thereby stop distribution until the cause has been removed.

The distributor bar is held rigidly on the distributor beam by screws and dowels. It extends down between the distributor screws, two of which are at the side of the bar toward the front of the machine and have bearings at their ends in brackets on the distributor beam. The third screw is back of the distributor bar and in the same horizontal plane as the upper screw at the front. It runs at its ends in brackets which are pinned to a shaft held in other brackets on the distributor beam, so that this screw which carries the matrix lift cam can be swung upward out of the way and held there by a detent when desired. This should not

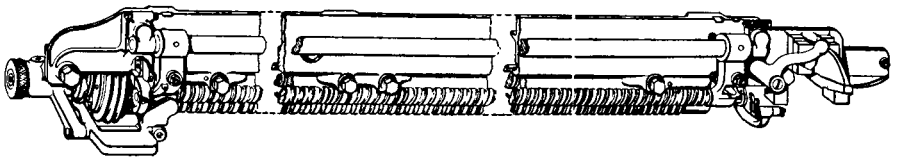

FIG. 8-18. Back view of single distributor.

be done while there are matrices on the distributor bar, as it is difficult to get their lugs correctly into the screw thread again.

At their far ends, beyond the limit of distribution of matrices, the ends of the three screws extend through their brackets and are geared together so that they turn exactly in unison except when the front lower screw rotation is retarded for any reason. Because the back distributor screw can be lifted up and rotated while its gear is out of mesh, a means is provided for correctly re-meshing its gear with its companion gear when this screw is again lowered and locked in place. This is accomplished by means of the insertion of a small pin between the teeth of one gear and cutting away a corresponding clearance from the proper tooth of its companion gear so that the gears can rotate together only when properly meshed.

Spiral Automatics

In order that any slight drag or retardation of the lower screw shall be magnified sufficiently to lock the distributor screws and thereby cause the distributor clutch to be disengaged, a very sensitive and powerful locking device, generally referred to as "the spiral automatic," is employed. This spiral automatic is actually nothing more than two similar short sections of coarse pitch V-screw threads, one section pinned to each of the front distributor screws. They are of such large diameter that the V-thread of one section extends well into the V-cut of the other section, with very little side clearance. While the two sections rotate exactly in unison this slight clearance is exactly maintained, and neither offers any obstacle to the rotation of the other. Whenever there is any retardation of the lower distributor screw, the section of V-thread screw pinned to it is also

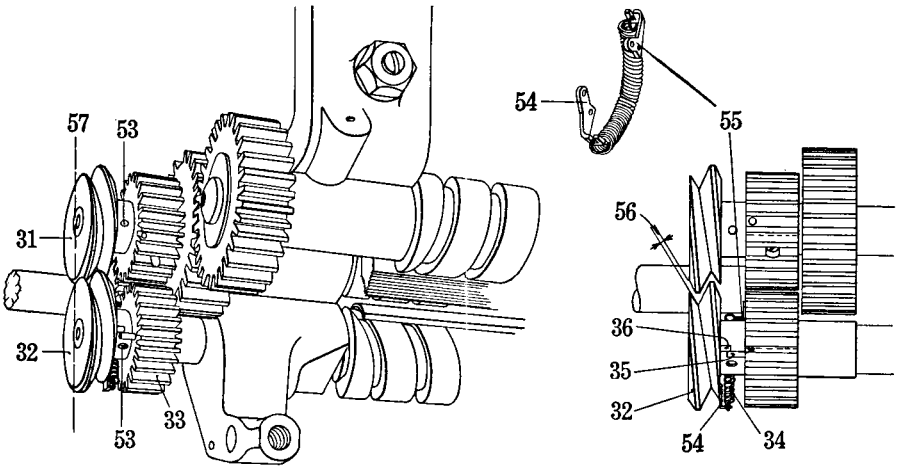

FIG. 9-18. View showing the "spiral automatic" at the ends of the two front distributor screws. The short piece of V-screw thread *31* is pinned to the end of the front distributor screw, upper; and the similar piece *32* is pinned to the end of the front distributor screw, lower.

The gear *33* is not pinned. A stop pin *35* on the side of this gear is kept normally in contact with a similar stop pin *36* on the spiral automatic *32* by a coil spring *34* having its ends connected to *32* and *33* by means of the hooks *54* and *55*. The slight clearance between the spirals is shown at *56*.

retarded sufficiently to be out of time with its companion which is pinned to the front upper distributor screw; and thus the slight side clearance is lost and the sections act upon each other as two wedging surfaces tending to move the two distributor screws longitudinally in their bearings. Since there is no room provided for such endwise movement of the screws, the spiral wedges actually lock the screws against rotation and the clutch disengages. It should be noted that in order to allow the slight out-of-timing rotation of the lower screw while the gears which drive the screws remain in proper timing, because they are meshed together, the gear on the lower screw is not pinned to the screw shaft, as is the gear on the upper screw shaft. Instead, it is loose on the screw shaft except that a pin on the side of the gear is held against a pin on the automatic by a coil spring whose ends are fastened to the two parts. While the gear and the automatic are rotating in unison, as one piece, the spring holds the two pins together. When the rotation of the lower screw, and therefore its automatic which is pinned to the screw shaft, is retarded so as to be out of timing with the companion automatic on the upper screw, the two pins part, and so allow the gears to remain properly timed together with no effect upon them other than that the teeth in mesh are held slightly tighter against each other by the tension of the coil spring.

The Distributor Bar

The distributor bar on the single distributor Linotype is similar to the distributor bars on all other models. Its length depends upon the widths of the magazines on the machines and whether or not the machine is equipped with auxiliary, or as they are sometimes called, side magazines.

The lower edge of the distributor bar is provided with seven levels of combination rails arranged symmetrically on both sides of the bar on surfaces which are at 32 degrees to the vertical center line of the bar, making an included angle of 64 degrees to agree with the tooth web of the matrices. Each matrix has a tooth combination corresponding with a combination on the distributor bar. The matrices, conveyed along the bar by the distributor screws, drop off the bar and into the channel entrance as soon as they reach the ends of the rails on the bar that no longer provide supports for their various combinations of teeth.

The system of tooth combinations used for distribution of Linotype matrices is a very ingenious and simple one. Although a knowledge of this system is not actually necessary for successful operation of the machines, Chapter 20 describes it in detail for the benefit of those operators and machinists who are sufficiently interested in the system to wish to understand it.

On the back of the distributor bar there is a brass aligning plate set into and extending along the whole length of the bar. It projects out just far enough to clear the side of the back distributor screw. This plate aids in holding the matrices vertical while being conveyed along the bar, a so to prevent their clamping on the bar at the time they drop off.

Distributor Screw Guard

The lower right-hand view in Fig. 6-18 is an end section showing a matrix being conveyed along the distributor bar by the screws. When the matrix drops off the bar, the guard *48* over the lower front screw deflects the matrix toward the back of the machine so that its upper lug cannot become caught between the threads of the lower screw. This guard is suspended on arms which hang from the distributor beam, and also acts as a safety device to prevent raising or lowering the magazine frame before all the matrices have dropped off the distributor bar into their proper magazine. Whenever the levers which locate the magazine frame

stops are operated, preparatory to raising or lowering the magazine, the matrix guard is moved by them toward the back of the machine. If there are still matrices on the distributor bar the guard will strike them and prevent the magazine frame stops from moving far enough to clear the stops on the magazine frames, thus preventing the magazine frames from being raised or lowered.

MAINTENANCE

The action of the distributing mechanism has been explained in this chapter. To keep it operating properly, attention must be given to the various parts, especially the distributor box, so that the matrices will not become bent or the combinations worn because of worn or damaged parts or parts incorrectly adjusted.

To Remove Distributor Box—If matrices get caught or bent in the distributor box, remove it from the machine. To do this, turn the main cam shaft backward until the second elevator bar clears the distributor box; pull the distributor shifter back and lock it. Then turn to the right on the distributor box bolt handle *30*, Fig. 2-18, as far as it will go. Press the bottom of the distributor box toward the back of the machine until it is released from the locating pins.

Examine the bar point *15*, Fig. 1-18, and see that the bottom is square, as shown at *29*. If the corner is rounded, as shown by the dotted lines, there is a possibility that when a matrix is being lifted in the distributor box, the rounded corner on the bar point might allow the following matrix to be lifted against the distributor screw when the first one is lifted and cause it to bind. Also see that the bar point is long enough to prevent two thin matrices from being lifted at the same time. If the two matrices were alike they would drop into the magazine at the same time and the following matrices would clog the distributor.

If the distributor rails *20* and *22*, Fig. 1-18 are worn too much, two thin matrices might be lifted at once even if the bar point is of the right length.

To disconnect the distributor box bar from the box, drive out the hinge pin *44* and the stop pin *45*.

Before the distributor box is fastened to the machine for a test, refer to Fig. 1-18, in which a narrow extension on both the front and back plates of the distributor box is shown at *37*. It is very important that these extensions be straight, as they form a guide for the matrices so that the slot will be in line with the bar point when they are being lifted.

The lower extensions *38* on the side plates should also be kept straight as they form a guide for the bottom of the matrix to keep the font notch in line with the font distinguisher. When fastening the distributor box to the machine, be sure the locating pins *39* are in place. Then bring the box back to its correct position before tightening the distributor box bolt. If care is not used when the distributor box is removed or replaced on the machine, the extensions above mentioned are apt to get bent. Never attempt to remove the distributor box when there are matrices on the box rails and the distributor bar at the same time.

Distributor Box Bar Point—The point is fastened to the distributor box bar with two rivets which must be driven out if replacement is necessary. When the new bar point is fastened in place see that the bottom is flush and straight with the bottom of the bar; also see that the point is not bent sidewise. When matrices are being raised by the matrix lift, the bar point must be exactly in line with the slot in the matrix, so there will be no interference when the matrix is lifted on the distributor box rails. Bar points are of two different lengths; the short one

is used on machines equipped with 90-channel magazines, and the long one is for machines where larger size matrices are used.

After the new bar point has been put on, test the distributor box before fastening it to the machine. Use two thin spaces that are marked .028, putting them on the distributor box bar and pushing them against the box rails with a screw driver. When the first matrix is lifted, see that there is a slight clearance between the bar point and the face of the thin space; if the distance is too great, two thin matrices might occasionally be lifted at the same time, as before mentioned. This would be especially noticeable when using thin "quotes."

Distributor Box Rails—If the distance is too great between the bar point and the matrix, it may be necessary to change the distributor box rails *20* and *22*, Fig. 1-18. These rails are of different shapes for the various models, and when ordering them it is necessary to give the serial number and model of the machine on which they are to be used.

The rails are fastened to the side plates of the distributor box with three screws in each one, and they are also doweled. After the rails are in place they should be tested with a small square, as shown at *58* in Fig 1-18, to see that the ends are the same height.

After new rails are in place, again use a thin matrix to test the proper clearance between the matrix and the bar point. If too close, use an oilstone to shorten the bar point, and when that is correct, examine the lower rails *21* and *23* for wear, and if worn replace them, as the matrix must fit squarely at each corner to be lifted properly.

The Matrix Lift—Examine the matrix lift *11* and see that the small shelf at the top is correct. If it is rounded, or not square, a matrix might slip off while being lifted, and bind against the distributor screws. Examine the matrix lift screw *28* for wear. If the stud *41*, on which the matrix lift cam *4* revolves should become worn, it can be withdrawn for replacement after the pin *40* is driven out.

Testing Distributor Box—Have the machine in normal position, remove the distributor belt, and place a matrix on the second elevator bar and allow the distributor shifter to push it against the rails of the distributor box. Turn the distributor very slowly by hand, and when the matrix has been lifted, see that it travels freely over the rails onto the distributor bar. The rails are doweled, but if the matrix should bind on either one, their position can be changed by tapping them lightly with a hammer, either up or down, as may be required.

To test the alignment of the rails in relation to the distributor bar, run the matrix just beyond the end of the rails so it is held by the distributor bar, then turn the distributor screws backward. This will show how the rails line up on the sides, and also if they are correct as to height. The matrix should have very little side play between the rails.

Adjusting Distributor Lift—The approximate adjustment may be arrived at as follows: Before sending in a line of matrices, first loosen the lock nut on the adjusting screw *8*, Fig. 1-18, and turn out on the adjusting screw, which will raise the lift above the proper height so that it cannot get under a matrix to lift it; then send in a line of matrices and allow them to go into the distributor box with the distributor running. With a screwdriver turn in on the adjusting screw *8* until the shelf on the matrix lift *11* comes under the matrix to lift it, then give a slight additional turn before tightening the lock nut. Again remove the distributor driving belt, place a matrix in the distributor box and turn by hand. When the matrix has been raised to its full height, see that the top does not bind against the distributor bar; if so, adjust accordingly. Usually, the correct setting of the

adjusting screw is to have $\frac{1}{32}$", or slightly less—never more, up and down play between the bottom of a matrix held down on the box rails and the shelf of the matrix lift, with the lift in its lowest position.

To Replace the Font Distinguisher—If it becomes broken or bent, unscrew the short stud rod *43* from the end of the stud *18*; also remove the screw *42* which holds the spring *19*. Pull out on the stud *18* until the distinguisher comes in contact with the distributor box lower rail and give it one quarter of a turn to the right which will bring the distinguisher *13* opposite the opening in the lower rail, where the stud can be withdrawn.

When the new font distinguisher is connected to the stud *18*, pass it through the slot in the block *25*; screw the distinguisher in place with the short stud rod *43* and see that it slides freely in the slot, then connect the spring *19*.

If a matrix should catch in the lift and cause the distributor to stop, turn backward very slightly on the knurled knob on the distributor clutch until the matrix is freed. Be very careful not to turn the knob too far backward on the screws as that might possibly cause two matrices to be lifted onto the distributor bar at the same time, and the narrow groove on the screws would not allow them to be carried across. If two matrices should be caught in the way just mentioned, they can be separated if caution is used. Remove the distributor driving belt, then push the matrices in the distributor box away from the rails; turn the distributor screws backward very slowly until the matrix strikes against the lift *11*; then press down on the distributor lift lever 7 (the cushion spring 9 will allow this to be done) until it clears the bottom of the matrix. Move the top of the lift to the left and continue to turn the distributor screws backward until the matrix can be pushed down into the box rails, and out of the way of the matrix lift. Then connect the driving belt and allow the matrices to distribute.

To Open Back Distributor Screw—Press up on the catch spring *51*, shown in Fig. 2-18, and swing it up until it is caught by the spring pin *52*, which will hold it in an upright position; but as before mentioned in this chapter, do not open the back screw while there are matrices on the distributor bar.

The back distributor screw gear has a locating pin between two of its teeth. When the screw is closed, the locating pin must mesh with the cut-out portion of the front gear.

Vertical Adjustment of Distributor Beam—Fig. 7-18 shows the details of the distributor beam assembled. When the matrices are being carried across on the distributor bar, the bottom of the matrices should clear the top of the channel entrance partitions by about .043", as shown in the small diagram at the lower right in Fig. 6-18. If this distance is incorrect, the distributor beam can be set for the proper clearance by means of the adjusting screws *46*.

Horizontal Adjustment of the Distributor Beam—It is very important that this adjustment of the distributor beam be correct, so that the matrices will not strike the channel entrance partitions when they drop from the distributor bar. This horizontal adjustment is made with the screw *47*, Fig. 7-18, but before making any adjustment see that none of the channel entrances are bent to the left and that the adjusting screw banks against the distributor beam bracket.

To get the proper adjustment of the distributor beam use a lower-case "t" matrix and turn the distributor screws slowly by hand. When the matrix drops from the bar note its position in relation to the channel entrance partition. When the distributor screws are turned slowly the bottom of the matrix should almost touch the partition on the right, as the momentum will carry it slightly farther when the distributor is running at normal speed. Also try a matrix in the same

way on the "cap" side; and if the setting shows to be incorrect, the distributor beam should be adjusted.

If the matrix drops too late loosen the adjusting screw *47* a fraction of a turn, then loosen the screws *50* in the distributor beam, and with a piece of metal drive it over until the adjusting screw rests against the frame; then tighten the screws *50*, and test as before. If the matrix drops too soon, reverse the operation.

When making this adjustment, be careful not to overdo the movement of the distributor beam, as a few thousandths of an inch will make a great difference in the operation of the distributor.

The matrix guard, which is shown at *48*, must be free in its bearings, as it is moved backward every time a magazine is raised or lowered, and must be returned to position by the spring *49* when the magazine is seated. If it fails to return, the matrices cannot go on to the distributor bar.

Spiral Automatics – Fig. 9-18 shows the spiral automatics *31* and *32*. Each of these is fastened to the distributor screws with taper pins *53*.

The lower spiral *32* has a spring hook *54*, and a similar hook *55*, is on the loose spur gear *33*. If it should become necessary to replace these hooks, the spirals must be removed from the distributor screws.

Before the spiral automatics are removed refer to Fig. 9-18, in which is shown a convenient method of marking the spirals and the ends of the upper and lower distributor screws. Use a straight-edge and make a heavy mark, as shown at *57*. This marking must be made slightly off-center, so that when the parts are assembled, and these marks are made to align with each other, the original timing of the distributor will not have been changed.

If the spring hooks on both the spiral automatic and loose distributor spur gear are to be replaced, it will be necessary to remove both the upper and lower spirals by driving out the hub pins *53*, which will allow the loose spur gear *33* to be taken off. The spring hooks *54* and *55* are fastened to the spiral and gear with two rivets. On the Models 8 and 14 the hooks are the same, but on some other models they are curved in opposite directions.

When reassembling the spirals, bring the marks at the ends of the distributor screws in line with the marks on the spirals and be sure that the pins *35* and *36* are in position to be held together by the spring *34*.

Do not have too much tension on the spring *34*. It should be just strong enough to keep the pins *35* and *36* from separating, so that if a thin matrix should bind against the lower distributor screw, the ears of the matrix will not be bent.

If the lower distributor screw does not run freely, do not tighten the spring to force it to turn, but ease the bearing surfaces.

If the lower distributor screw is gummy and will not run forward, a simple way to ease it is as follows: Put the distributor driving belt on the pulleys without crossing, which will run the distributor screws backward. Pour a few drops of kerosene in the bearings to cut the gum, allow the screws to run for a few minutes and then wipe off the excess kerosene and follow up with oil. This will generally correct the trouble.

CAUTION – Oil should be used very sparingly in the distributor screw bearings. If an excessive amount of oil is used, it will get on the distributor screws, and from there it will be transferred to the lugs of the matrices. A few minutes spent in keeping the distributor screws clean will save hours of time that would otherwise have to be spent in cleaning matrices and magazines.