CHAPTER 24

Multiple Distributor Models 25 and 26

DISTRIBUTOR ON LINOTYPE MODELS 25 AND 26

HAVING ALREADY described the single distributor on Models 8 and 14, we now take up a description of the multiple distributor on Linotype Models 25 and 26—the mixer models which preceded Models 29 and 30.

The later simplified form of the Models 25 and 26 has two separate distributors

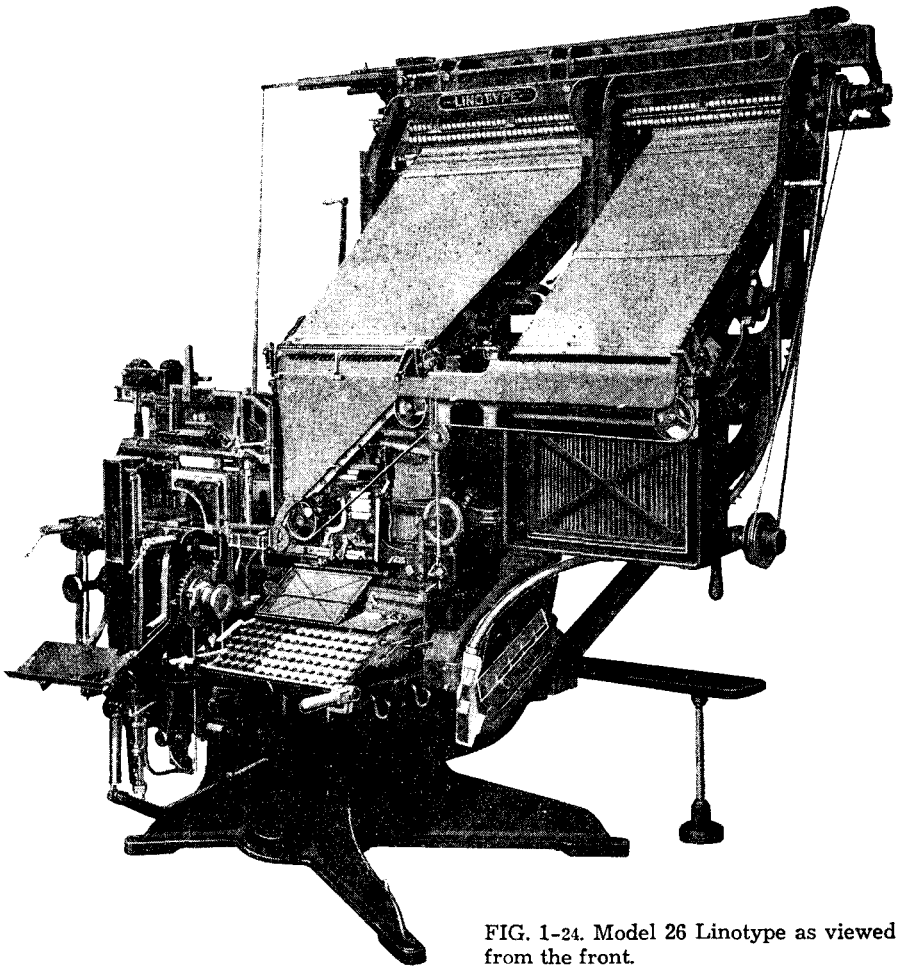

FIG. 1-24. Model 26 Linotype as viewed from the front.

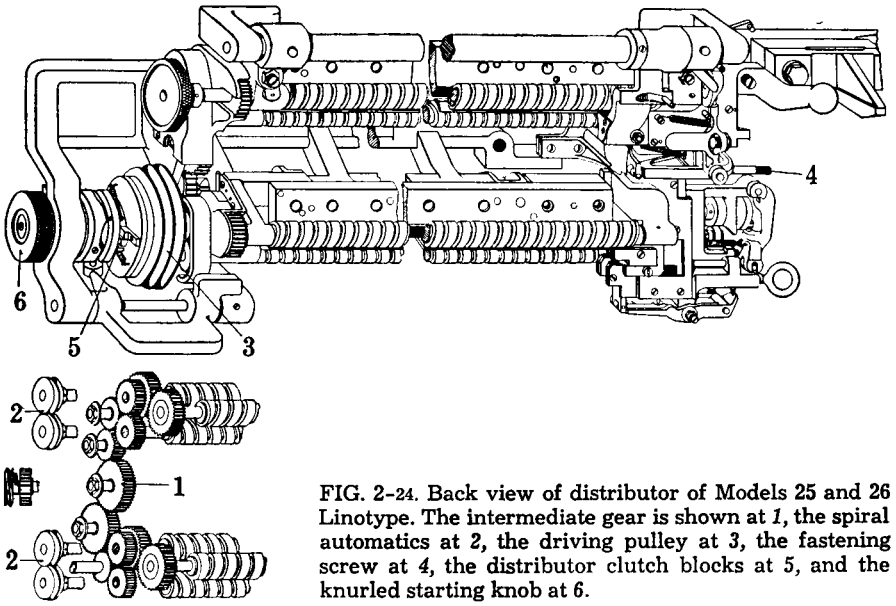

FIG. 2-24. Back view of distributor of Models 25 and 26 Linotype. The intermediate gear is shown at *1*, the spiral automatics at *2*, the driving pulley at *3*, the fastening screw at *4*, the distributor clutch blocks at *5*, and the knurled starting knob at *6*.

geared together and driven through one distributor clutch which is the same in principle as that already described in Chapter 19.

The upper distributor box on these models is similar to that already described in Chapter 18 except that this box has a bridge support adapted to hold a matrix bridge over which all matrices must pass after being lifted into the distributor screws instead of having a font distinguisher placed so as to act upon the matrices before they are lifted into the screws.

The bottoms of the matrices are notched, and a bridge is chosen which corresponds with the notching of the matrices that are to be distributed from the lower distributor bar into the upper of the two magazine levels on the machine. The matrices so notched drop about $\frac{1}{16}$" to the lower level surface of the bridge, which is just low enough to cause the matrix teeth to pass under the supporting rails on the distributor bar, upper, as the matrices continue to be conveyed along by the distributor screws. As these matrices, one at a time, reach the point where they are no longer supported by the lower level surface of the bridge, they drop down through a chute into the distributor box, lower, which distributes them to the upper of the two magazine levels.

Matrices which are not notched, or are notched so as not to correspond with the bridge, are supported while passing over the bridge by the top surface of the bridge teeth, so that the teeth on the matrices engage the supporting rails on the distributor bar, upper, and are thus conveyed along by the distributor screws and distributed to the lower of the two magazine levels on the machine.

Each channel entrance has an outlet to the pi chute, so that pi matrices may be run either with or without the bridge notches.

Raising or lowering the fronts of the magazines in order to make either one of them register with the assembler entrance and the escapement levers does not affect the rear of the magazines in any way or interrupt the distribution of matrices to both magazine levels simultaneously.

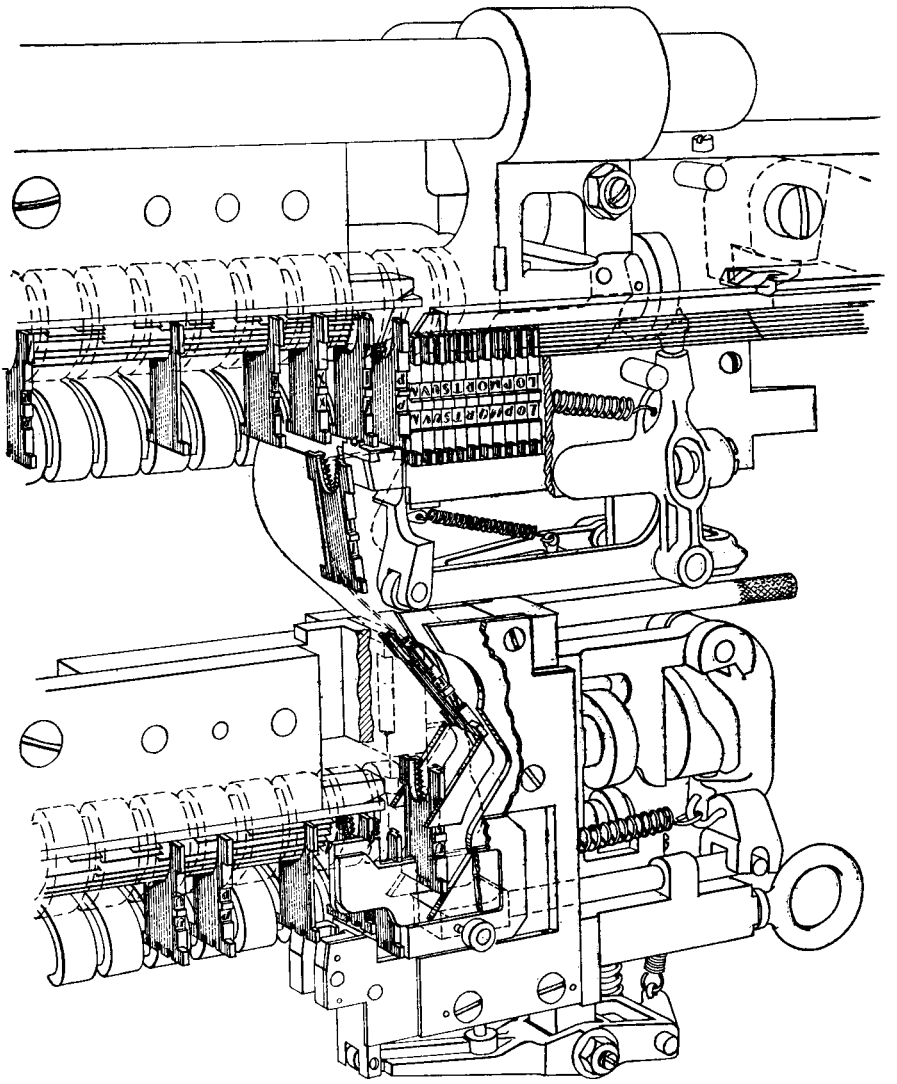

FIG. 3-24. View showing matrices being conveyed along both distributor bars on Model 25 or 26 Linotype. This view shows the distributor box, upper, and the distributor box, lower; also the chute through which matrices are guided on their way to the distributor box, lower.

Distributor Box, Lower

The action of the distributor box, lower, now used on all plural distributor Linotypes except the Model 9, is somewhat like that of the upper distributor box. No bevelled notch is required in the center of the bottom of each matrix and this in itself is of great advantage because matrices now used on all models except the Model 9 can be used on plural distributor machines equipped with this type of lower distributor box.

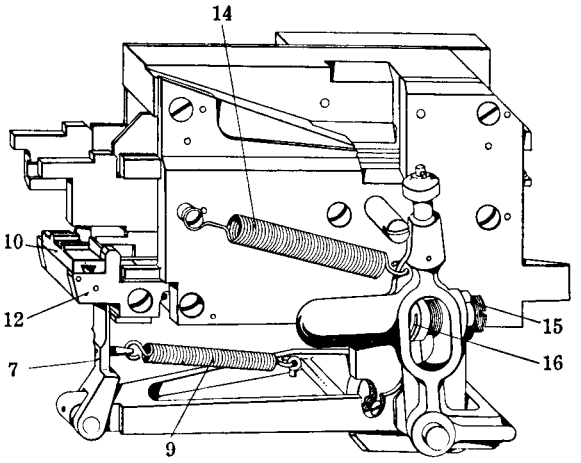

FIG. 4-24. Back view of the distributor box, upper, on Models 25 and 26 Linotype. This distributor box is similar to the box used on the single distributor machines except that it is equipped with the bridge support *12* which bears the matrix bridge *10*.

When using matrices from the upper magazine it is necessary to use a bridge that will correspond to the notch cut in the matrices for that particular magazine. The bridge support *12* has a detent in it with a spring to hold the bridge in place, and the bridge is easily removable for replacement if it is desired to run another font of matrices with a different bridge notch.

When operating the machine the matrices that are notched to correspond to the bridge are delivered to the upper magazine, while a regular font of matrices without special notching will run in the lower magazine.

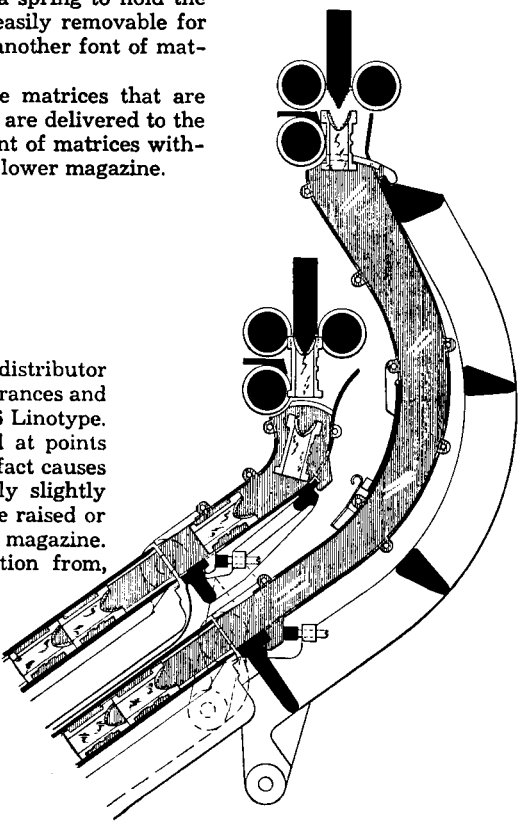

FIG. 5-24. Sectional view through distributor screws, distributor bars, channel entrances and main magazines on Models 25 and 26 Linotype.

The magazine frames are pivoted at points directly under the distributor. This fact causes the channel entrances to move only slightly when the fronts of the magazines are raised or lowered for composition from either magazine. Thus distribution to, and composition from, both magazines is continuous.

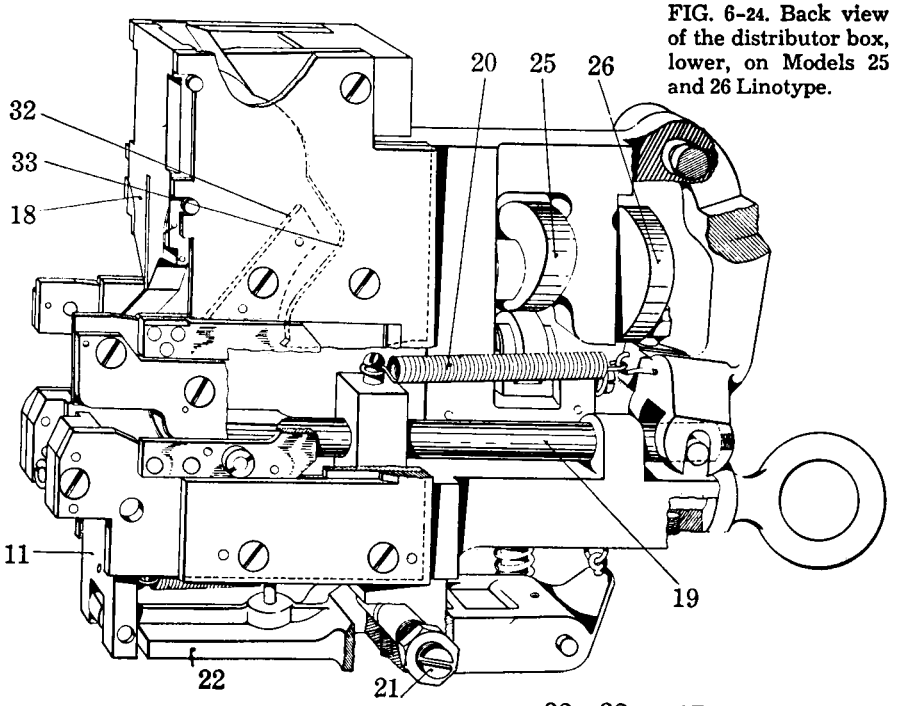

FIG. 6-24. Back view of the distributor box, lower, on Models 25 and 26 Linotype.

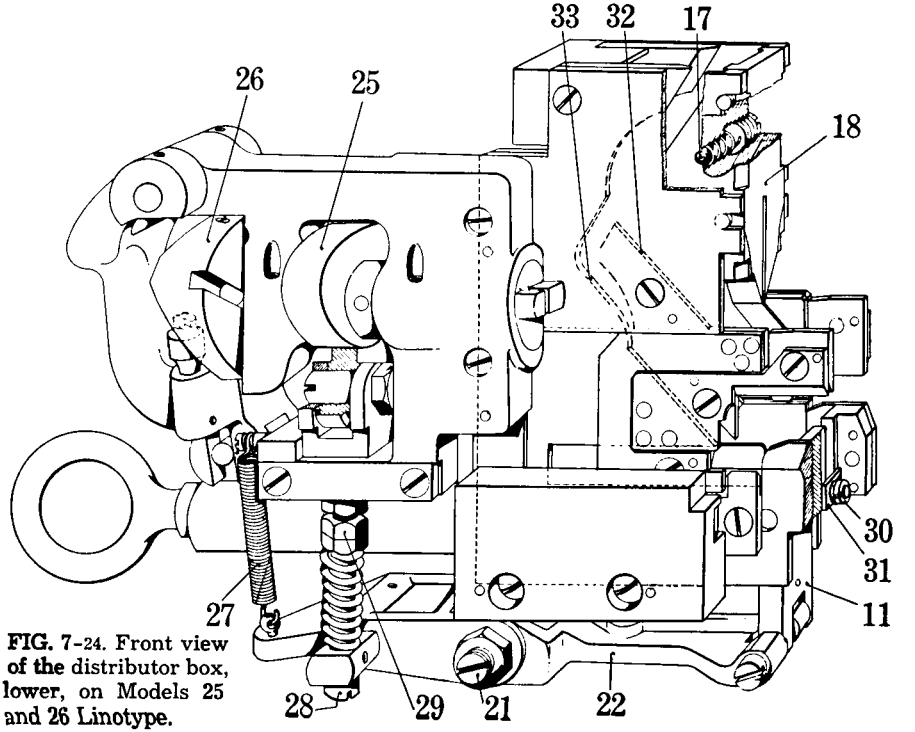

FIG. 7-24. Front view of the distributor box, lower, on Models 25 and 26 Linotype.

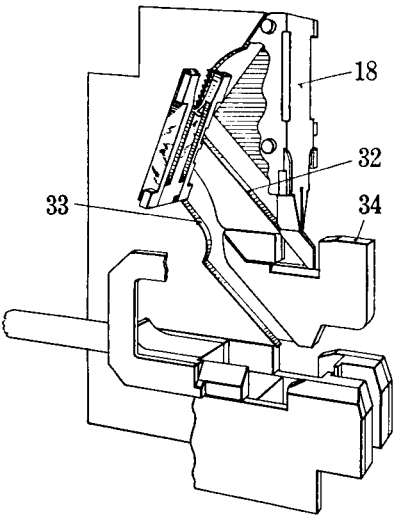

FIG. 8-24. A view of the inside of the distributor box, showing the path of the matrix as it comes from the matrix chute.

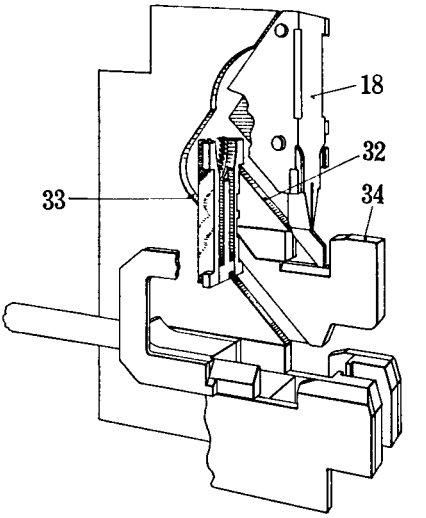

FIG. 9-24. Showing the matrix a little farther on in its descent. The top ear of the matrix is now riding on the rail *32* while the lower ear is riding on the rail *33*.

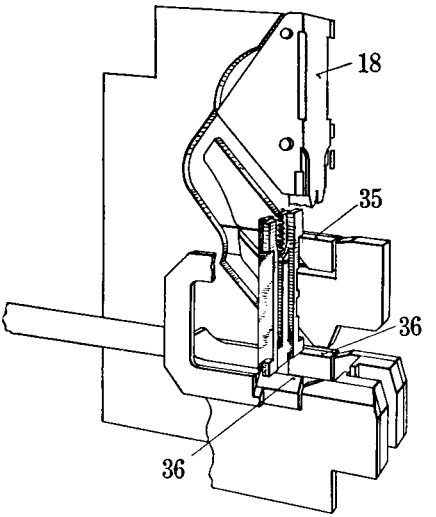

FIG. 10-24. Showing the matrix at the bottom of its descent and resting on the rails *35* and *36*.

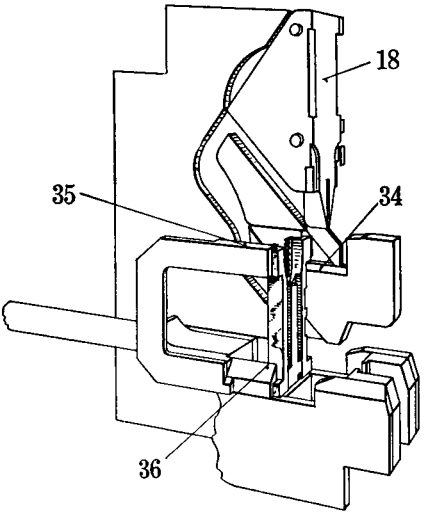

FIG. 11-24. Showing the rails *35* and *36* withdrawn and the matrix falling by gravity so that it rests on the rails *34*.

The matrix, dropping from the bridge at the end of the distributor box, upper, slides down an inclined chute against the side of which it is held by the weight of a loosely hinged chute cover acting on its other side, and enters the top of the distributor box, lower. It is then guided by rails in the box to cause it to be held vertically before it comes to a stop.

The mechanism of this box is operated by a cam shaft which is coupled to the end of the distributor screw, front upper, as the box is slid on to the distributor screw, front, bronze bearing. The cam shaft has two cams pinned to it. One of these cams operates the pusher slide lever to draw back the pusher slide against the tension of a spring which, when allowed by the cam, operates the pusher slide to push the matrix ahead by contacting the four matrix lugs, instead of contacting the body of the matrix as is done by the distributor shifter in the distributor box, upper. The other cam operates the matrix lift, through the action of the safety spring-cushioned lever link and lift lever, to lift the matrix into the distributor screws just as the matrix is lifted by the matrix lift in the distributor box, upper. Moreover, there is a matrix separating block point, equivalent to the bar point in the upper distributor box, so that only one matrix at a time can be lifted into the distributor screws in case more than one matrix should be ahead of the pusher slide. This condition seldom occurs, and is generally caused by a retardation of the first matrix while passing down through the chute, so that this matrix and the matrix immediately following it both come to a stop together on the top surface of the support lugs carried on the inside surfaces of the yoke-shaped supports which form parts of the assembled pusher slide. As the pusher slide is drawn back, the matrices drop down ahead of the front surfaces of the four lugs, and are pushed ahead by these surfaces as the pusher slide spring is allowed by the cam to again return the pusher slide, to carry the matrices ahead so that the first one is over the lift. Of course the action is similar when there is but one matrix at a time ahead of the pusher.

HAND SHIFT AND POWER SHIFT OF MAGAZINES ON MODELS 25 AND 26

As already noted, both of these models carry two main magazines on separate frames and both of these frames are hinged independently, each at a point directly under its own distributor bar. There being but one delivery level at which matrices escape from the magazines, most of these models are equipped with a hand-operated device for raising and lowering the fronts of the magazines so that either one, as desired, shall register with that level. That device consists essentially of a long two-armed lever pivoted on the intermediate bracket and which operates toggles on each side and near the front of the magazine frames. The upper arms of the toggles pivot on the lower magazine frame, and the lower arms pivot on brackets fastened to the distributor bracket of the machine. These toggles, one at each side under the lower magazine frame, are joined together at their hinge points by a rod which extends through a slot in each of the aforesaid brackets and which comes to rest against stops at the forward ends of these slots when the magazine frames have been raised to bring the lower magazine to the delivery level. Because the stops are positioned to stop the toggle hinges after the toggles have passed dead center, there is no tendency for the toggles to collapse and let the frames fall back to their lower position. This lower position is controlled by adjustable stops on the same brackets on which the lower arms of the toggles pivot, and which contain the slots already described.

The weight of the frames and magazines and matrices is counterbalanced by a large adjustable spring positioned vertically in back of the machine. Because these are mixing machines and magazines are being shifted while matrices from them are in assembly, casting and distribution, adjustment of the spring for absolute counterbalance under all possible conditions is manifestly impossible. Therefore, spring detents are provided to prevent rebound of the magazine frames when brought to their lower position at times when their combined weight is slightly reduced.

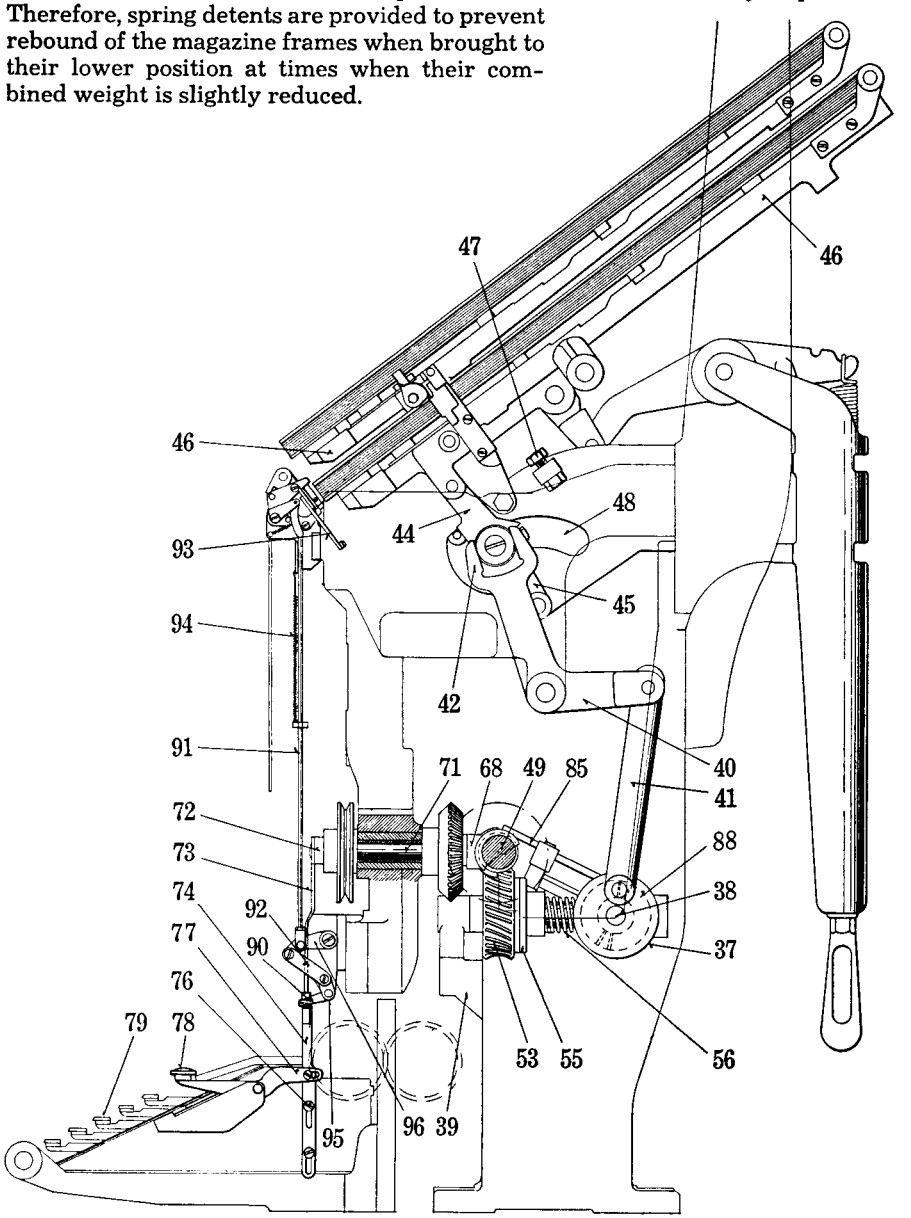

FIG. 12-24. This view is a side elevation of a Linotype equipped with the power magazine lift mechanism. In this view the lower magazine is shown in operating position.

Though the counterbalance makes raising and lowering the magazines require very little effort, yet that effort may seem appreciable over a long period, and for this reason a power lift device has been applied to many of these model Linotypes. This power lift device retains all of the elements described above except the long hand lever, and serves to connect the constantly rotating intermediate shaft with these elements when desired, and to automatically disconnect it. The device consists of a clutch mechanism and a series of gears which are thrown into

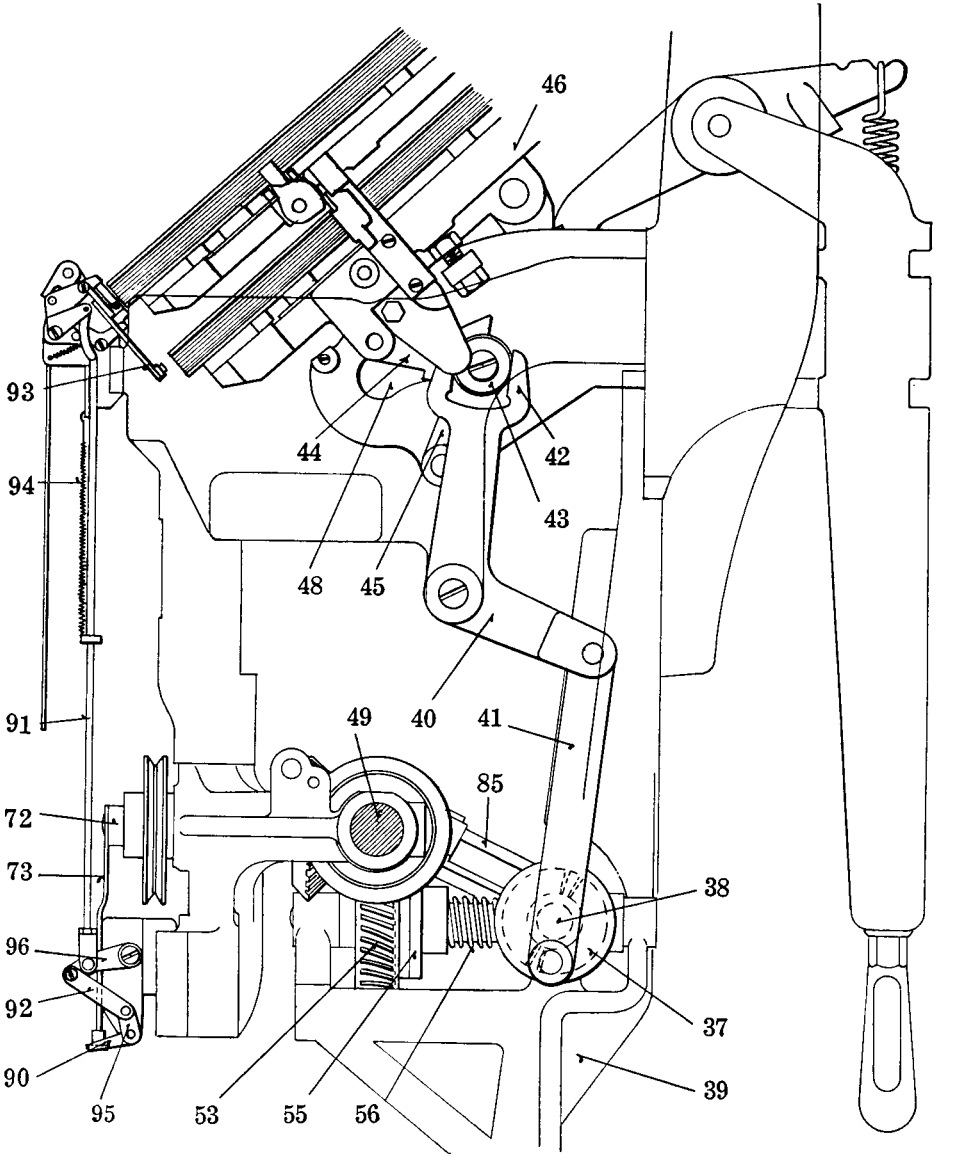

FIG. 13-24. This view is similar to Fig. 12-24, but shows the upper magazine lowered to operating position by the power magazine lift mechanism.

action by a finger key at the side of the keyboard, and automatically thrown out of action immediately after magazines have been raised or lowered.

In this device, the means employed for extending and collapsing the toggle system include a crank *37* mounted on a stub shaft *38* carried by a frame bracket *39*, a bell-crank lever *40* centrally pivoted to the machine frame, and a link *41* having its lower end connected to the crank *37* and its upper end to the rearwardly extending arm of the bell-crank lever. The upwardly extending arm of the bell-crank lever *40* is provided at its extremity with a forked member *42* straddling the end of the rod member *43* to which the toggle members *44* and *45* are connected. The arrangement of the parts is such that when the crank *37* is given a half rotation, it will in one case raise the magazines from the position shown in Fig. 13-24 to that shown in Fig. 12-24, coming to rest in the upper dead center position shown in the latter figure; whereas, in the other case, it will move the magazines from the position shown in Fig. 12-24 to that shown in Fig. 13-24, coming to rest in the lower dead center position shown in the latter figure. In this connection, it may be noted that a slight amount of lost motion is provided in the connections from the crank *37* so that it will be relieved of load as it passes through its upper and lower dead center position after having operated the toggle system in raising or lowering the magazines. To be more specific, the load upon the crank is relieved or removed when the lower shift frame *46* banks against the stops *47* in bringing the upper magazine into operative position, and the same is true when the toggle rod member *43* comes against the front ends of the slots *48* in bringing the lower magazine into operative position. The purpose of this will presently appear.

The stub shaft *38* which carries the crank *37* is adapted to be rotated by the intermediate shaft *49* and is connected to it, at will, to effect the shifting of the magazines. The connections for driving the stub shaft include a bevelled gear *50* mounted on the shaft *38* at the end opposite the crank, and a similar bevelled gear *51* meshing therewith and pinned to a short fore-and-aft shaft *52* likewise carried by the frame bracket *39*. At the front end of the shaft *52* is a worm wheel *53* adapted to be driven by an overlying worm *54* loosely mounted on the intermediate shaft *49*, the worm and wheel constituting a reduction gearing between the intermediate shaft and the stub shaft *38*. The worm wheel *53* is connected to the shaft *52* by a friction clutch *55* consisting of two friction members, one fixed to the worm wheel *53*, and the other encircling the shaft *52*, the two being held in frictional driving contact by a compression spring *56* likewise encircling the shaft. The compression spring banks against a collar *57* pinned to the shaft *52*, and is sufficiently strong to hold the members of the friction clutch in driving contact under ordinary circumstances, but in the event of an interference, preventing rotation of the stub shaft *38*, the friction members will slip relative to each other, thus preventing breakage of any of the parts.

When it is desired to shift the magazines, the worm *54* may be connected for conjoint rotation with the intermediate shaft *49* by a clutch *58*, one member *59* of which is keyed to the intermediate shaft *49* and carries one of the bevelled gears *60* which drive the assembler devices. The other clutch member *61* comprises a sleeve also loosely encircling the intermediate shaft and arranged for limited endwise movement along the shaft into and out of engagement with the clutch member *59*. At the right, the clutch member *61* is provided with teeth *62* adapted to cooperate with corresponding teeth *63* formed on the clutch member *59*, and at the left it is provided with projections *64* which enter into corresponding recesses *65* in the worm sleeve *54*, the clutch member *61* and the worm being thus splined together to permit the clutch member to be moved into engagement

with the companion clutch member *59* while maintaining its driving connection with the worm. As a result of this arrangement, when the two clutch members are engaged, the worm *54* is caused to rotate with the intermediate shaft, driving the magazine shifting mechanism, whereas when the clutch members are disengaged, the driving connection is broken.

In order to effect its operation, the clutch member *61* is provided with a pair of spaced parallel flanges *66* and *67*, forming between them a groove which receives a shifting fork *68* adapted to be actuated in one direction to engage the clutch. In order to shift the fork *68* to engage the clutch, there is provided a crank arm *69* operatively connected to the fork *68* by a crank pin *70* and carried at the rear end of a fore-and-aft shaft *71*, which extends through the sleeve carrying the gear and pulley of the assembler drive. At its front end, the shaft *71* is provided with another crank arm *72*, by means of which the shaft is rotated in a clockwise direction to effect the engagement of the clutch *58*, the means for operating the crank including two vertical slide bars *73* and *74* arranged end to end, the upper one *73* being connected, for limited vertical movement, to the front plate by pin and slot connections *75* and pivoted at its upper end to the crank arm *72*. The lower one is similarly connected by pin and slot connections *76* to the keyboard frame (which is of the swinging variety) this latter bar being pivoted to the rear end *77* of a pivoted finger key *78*. The key *78* is located at the right of the keyboard *79* and is thus positioned within convenient reach of the operator. According to this arrangement, when the key *78* is depressed the resultant upward movement of the bar *74* is transmitted to the overlying bar *73*, which, through its operation of the crank arm *72*, rotates the shaft *71* to move the clutch member *61* into engagement with the clutch member *59*; whereupon the magazine shifting mechanism is brought into operation for the selection of one magazine or the other according to the position of the crank *37*.

The clutch members are automatically disengaged when the selected magazine is arrested in its operative position in the manner before described. As shown in Fig. 14-24, there has been provided for this purpose a ball and spring detent *80* in the forked clutch shift member *68* cooperating with an overlying recess in the connecting pin *70*. When the forked member *68* is shifted to the right by the operation of the finger key *78*, the pin *70* is moved by the crank *69* through an arc to the position shown in dotted lines in Fig. 14-24, causing the ball *82* to be depressed against the force of the spring *83*, but the size of the recess in the pin is such that the ball does not pass out of the recess in this position, but merely tracks upon the side of the recess as shown, the ball *82* at all times exerting a force on the pin tending to restore it to normal position. This force of the spring is not sufficient to restore the pin *70* so long as the load of the magazines is on the clutch, but as soon as this load is removed, as when one or the other of the magazines is brought to rest in operative position by its respective stops, and the crank *37* rotated slightly past dead center, the spring *83* then exerts sufficient force to rock the crank *69* and restore the fork shifting member *68* to normal position, thereby automatically disengaging the clutch. To facilitate the operation of the ball and spring detent *80*, the cooperating teeth *62* and *63* of the clutch members *59* and *61* are tapered to eliminate any inter-surface friction during the disengagement thereof. The tension of the spring *83* may be adjusted by means of a set screw *84* threaded into the spring recess, the screw also serving to retain the spring *83* in the recess.

In order to prevent the release of the clutch *58* until the selected magazine is in its operative position, means are provided for retaining the clutch in positive engagement until that time arrives in the operation of the magazine shifting

mechanism. For this purpose, there is provided a lever *85*, pivoted intermediate of its ends on an extension of the bracket *39*, and having its forward end equipped with a bearing roller *86* projecting into the groove on the clutch sleeve member *61*, the rear end of the lever being provided with a projection *87* adapted to ride upon a face cam *88* rotating with the stub shaft *38* and formed integrally with the crank member *37*. The face cam *88* is recessed at diametrically opposite portions of its bearing surface, as at *89*, so that when either of the magazines is in operative position, one or the other of the cam recesses aligns with the projection *87* on the

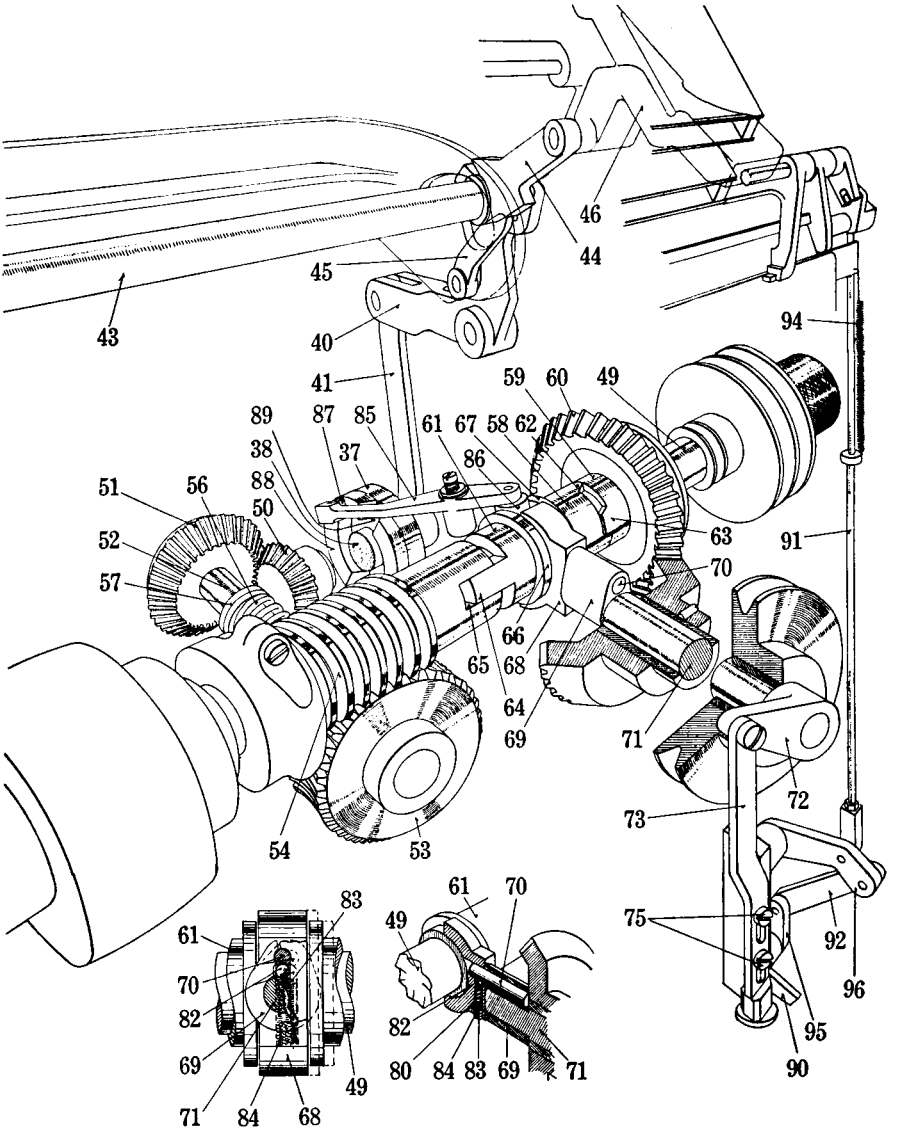

FIG. 14-24. Plan view showing details of the clutch and related parts of the power magazine lift mechanism.

lever and permits the clutch to be disengaged. When the clutch *58* is engaged by the operation of the finger key *78*, involving the movement of the clutch sleeve *61* to the right, the lever *85* will be caused to swing on its pivot to withdraw the projection *87* out of the cam recess *89*, which at the time happens to be in use, and as the stub shaft *38* commences to rotate, the lever projection will ride upon a high portion of the face cam *88* and thus hold the clutch *58* against premature disengagement until the stub shaft has rotated through 180 degrees, or what is the same thing, until the opposite recess in the cam *88* arrives adjacent the end of the lever, which position, as mentioned above, will correspond to one in which the selected magazine is in its operative position, and the load on the clutch removed.

When it is desired to raise or lower the magazines to bring the selected one into operative position, it is merely necessary to touch the finger key *78*. This operation shifts the clutch sleeve *61* to the right into engagement with the clutch member *59*, integrally secured to the intermediate shaft *49*, and thus causes the worm *54* to rotate with the shaft to effect the consequent operation of the magazine shifting mechanism. If the magazines happen to be in the upper position shown in Fig. 12-24, the bell-crank lever *40* will be rocked in a clockwise direction by the crank *37* and link *41*, as the stub shaft *38* begins to rotate and thus collapses the toggle links *44* and *45*. As the shift frame comes to rest on the set screws *47*, the crank *37* will be approaching its lower dead center position, and when it arrives in that position, the load thereon will be removed or relieved due to lost motion provided in the connections. When the load is released in this manner the spring operated detent *80* associated with the clutch will be rendered inoperative and the clutch fork member *68* shifted to disengage the clutch, it being remembered that should the load for any reason be removed from the clutch before the selected magazine has arrived in operative position, such disengagement is prevented by the end of lever *87* riding on the high part of face cam *88*. When the operator wishes to bring the lower magazine into operative position, it is only necessary again to press the finger key *78* as before, the various parts being again rendered operative to rock the bell-crank lever *40*, forwardly to straighten out the toggle joints *44* and *45*, and thus bring the lower magazine into proper position for use. The load of the magazines, in this position, being borne by the toggle members and the rod *43*, as it banks against the forward ends of the slots *48*, there is of course no load on the clutch which consequently is automatically disengaged.

To prevent the shifting of magazines if one or more matrices should protrude therefrom, or if the escapement levers are not in normal position, there has been provided a safety mechanism which operates to prevent such shifting which would result in possible breakage or distortion of parts.

As shown in Fig. 12-24, a projecting arm *90* of the lever *95*, connected by a link *92* to another lever *96*, is contacted and pushed upward by the slide bar *74* when the shift key is depressed and operates to draw the rod *91* downward. At its upper extremity there is linked to the rod *91* a bracket *93*, carrying two blades which extend across the full width of the escapement mechanism, being secured at the left-hand side of the magazine frame by a bracket similar to the bracket *93*. The blades are carried downward in front of the magazine and escapement levers with the downward movement of the rod *91*. If there is any interference with this movement of the blades, such as a protruding matrix, or an escapement lever out of position, it is impossible for the magazines to be shifted until the interference has been removed, as the projection *90* extends downward beyond the slide bar *73* and is contacted by the slide bar *74* before it reaches the slide bar *73* to operate the shifting mechanism.

Any interference with the movement of the blades will be transmitted to the projection *90*, and thus prevent the lower slide bar *74* from being raised sufficiently to contact the upper slide bar *73* to operate the shifting mechanism.

A spring *94* fastened to the rod *91* at its upper end and to the face plate of the machine at its upper end, returns the safety mechanism to normal position after each operation.

MAINTENANCE

The distributor clutch on Models 25 and 26, while slightly different in detail, has the same action as the one used with single distributor model machines, previously described in Chapter 19.

Fig. 4-24 shows a back view of the upper distributor box of Models 25 and 26 Linotype. The matrix lift *7* is adjusted by means of the adjusting screw *15* in the same manner as on the single distributor models. The matrix lift lever return spring is shown at *14* and *9* is the matrix lift spring. The cushion-spring *16* allows the vertical portion of the matrix lift lever to separate from the adjusting screw *15* if a matrix should be turned backward, or if there should be some obstruction which prevents the matrix lift from rising.

The instructions for the adjustments and general care of the upper distributor box will be found in Chapter 18.

Fig. 6-24 is a back view of the lower distributor box, showing the means of adjusting. To operate correctly the box must be kept clean, particularly the inside surface of the separating block *18* and the edges of the rails *32* and *33*, as the matrices pass down over these rails by gravity only, and gum or oil will retard their movement.

The matrix pusher *19* is operated by an end cam *26* and it must slide freely in its bearings. If it is sluggish, clean the rod and oil lightly, but do not tighten the return spring *20*. If the tension of this spring is too strong it will cause excessive wear on the distributor screw gears.

Fig. 7-24 shows a front view of the lower distributor box and the means of adjusting. If there is lost motion in the matrix lift lever *22* it can be taken up with the adjusting screws *21*. These screws have pointed ends and should be turned evenly so as not to cause a side bind on the matrix lift *11*.

Adjusting the Matrix Lift—The matrix lift is operated by the cam *25* and should lift the matrices so the upper lugs pass freely over the distributor box rails, and this adjustment is made with the screw *28* after the lock nuts *29* are loosened. If the matrices are not lifted high enough loosen the adjusting screw, or tighten the adjusting screw if the matrix lift is to be lowered. When the adjustment is correctly made, tighten lock nut.

The matrix lift on the lower distributor box is flat at the top, and it must be adjusted so that it will not lift more than one thin matrix at a time. A special wrench is needed when making this adjustment and is listed in the Linotype parts catalogue as G-3157.

The lock nuts on the matrix lift adjusting screw are shown at *30*, and under the nuts there is a thin square washer *31*. When the adjustment is being made, place two thin matrices together in the box and adjust the lift until it will not raise the second matrix.

It is advisable to rub a drop of oil occasionally on the surface where the square washer travels.

Timing the Lower Distributor Box—The lower distributor box should be timed to receive the matrix from the upper distributor when the matrix pusher is in a

certain position, and the timing is done in the following manner: Remove the distributor driving belt, then disconnect the idler gear *1*, Fig. 2-24, by removing the stud, which will leave the distributors independent of each other. Turn the lower distributor by hand in its regular direction until the matrix pusher comes all the way ahead; continue to turn until the matrix pusher prongs are about ⅛" away from the distributor box rails and leave it in that position. Run a matrix through the upper distributor box and then turn the distributor screws very slowly and watch the matrix. At the instant it drops from the distributor box rails into the lower box, stop turning and connect the two distributors with the idler gear, being careful not to move the other gears.

Referring to Fig. 7-24, the separating block *18* is shown. This separating block is held in place in the distributor box with a detent ball *17*, and spring. If matrices should clog in the box and extend up into the chute, loosen the distributor box fastening screw *4*, Fig. 2-24, and pull out on the box. This will remove the separating block from the box and the matrices can easily be removed. To start the distributor after it has been cleared of matrices, turn backward slightly on the knurled knob of the distributor clutch, pull the knob outward to allow the clutch blocks to spring into position, as described in Chapter 19.

It rarely happens, but it is possible for the springs *9* and *14*, Fig. 4-24, and the spring *27*, Fig. 7-24, to become weakened or damaged. If this should happen, the springs should be replaced with new ones.

Adjusting the Magazines—When the top magazine is being used, the lower magazine frame rests on two hexagon-head screws, and these screws are for the purpose of adjusting the upper magazines to the correct height so that the matrices will pass freely over the top of the front guide holder.

If the lower magazine is to be adjusted, it is done with eccentric pins. Underneath the lower magazine frame there are two links, one at each end, and at the bottom end of the lower links there are eccentric pins held in place by set screws.

If the magazine is to be raised, loosen the set screws and turn the eccentric pins evenly until the matrices will clear the front guide holder, then tighten set screws.