low the movements of the box. The relationship between cam roll *25* and cam *26* is the same for both the front and the back distributor positions—the cam roll always rides on the same surface of the cam when the distributor box is in either of the two distributor positions.

It should be noted that the lifting action of the matrix lift is correctly timed with respect to the rotation of the front and back distributor screw assemblies, regardless of the tripping of the matrix lift mechanism and the shifting of the distributor box. When the distributor box comes to position opposite the front or back distributor, the font selector and matrix lift mechanism move back to normal position and the matrix lift raises each matrix when the entering point of the distributor screw threads come to position. At the instant that the font selector and matrix lift move back to normal position, the matrix lift is at its upstroke position. Continued rotation of the distributor box matrix lift cam, however, permits the lift to lower under the first matrix in the distributor box and to engage the matrix in preparation for the lifting operation. The succeeding steps in the distributing process are as outlined in preceding descriptions.

Adjustments: Distributor Box Plate Lower Rail Block. The lower rail block *14*, Fig. 149, can be adjusted horizontally to permit the matrix lifts *11* and *12* to engage the matrices by .028″. The block can be adjusted most easily with the distributor box removed from the machine. The distributor box should be in position opposite the back distributor for removal. If the box is opposite the front distributor, trip the font selector mechanism and turn the distributor screws until the distributor box arm *2* banks against screw *8*. Retract the distributor shifter, back the machine by hand until the second elevator lowers and disengages from the distributor box bar, open the channel entrance and raise the distributor back screws. Trip the font selector arm so that the matrix lift *11* and the font selector feeler will be thrown forward clear of the distributor box, disengage cam lever *19* from guide pin *24*, loosen wing nut *6* and remove the distributor box. Loosen screw *33*, adjust the block *14*, then tighten the fastening screw. The amount of engagement which the lift will have with respect to the matrix can be determined by placing a matrix in the distributor box and viewing the relationship between the front edge of block *14* and the lower front edge of the matrix. When the matrix is banking against the four vertical faces of the distributor box rails, its lower front edge should project .028″ past the face of the block.

Distributor Box Matrix Lift. When the matrix lifts *11* and *12*, Fig. 149, raise matrices into the distributor, the matrices should be lifted 1/32″ clear of the distributor lift rails *29, 30* and *31*. This precise relationship is indicated in the detail drawing, which shows the matrix lift *11* at its highest point and the upper lugs of matrix *A* lifted 1/32″ above the lift rails. The front and the back lifts are made as one part and adjustment of one lift relationship automatically sets that of the other. The height to which the matrix lifts raise the matrices is set by means of an adjusting screw *21* threaded in yoke *18*. The screw banks against an extension *20* on lift lever *15* and by turning the screw in or out, the lifts *11* and *12* can be raised or lowered with respect to the matrices in the distributor box. The upward stroke of the lifts as promoted by cam lever *19*, roll *25* and cam *26*, therefore, can be increased or decreased by adjusting screw *21*.

The matrix lift can be adjusted with the distributor box in either of its two distributing positions, but the adjustment can be made more easily if the distributor box is moved opposite the back distributor, as shown in Fig. 149. Disengage the distributor driving belt from the intermediate distributor driving pulley, turn the distributor screws by hand until the low point of cam *26* is opposite roll *25,* obtain about ten matrices which run through the back distributor and place them in the distributor box. Open the channel entrance and hang a weight on the distributor clutch lever so that the lever will be held down out of engagement with the clutch flange collar. This will make it possible to turn the distributor screws with the channel entrance open. Tilt back the magazine frame so that the front of the distributor box can be seen in relation to the lift rails.

Turn the distributor screws slowly by hand until the cam roll, *25,* Fig. 149, is on the high point of cam *26* and see whether the first matrix has been raised 1/32″ clear of the lift rails, as indicated by matrix *A* in the detail drawing. If the matrix has been raised too high, turn screw *21* clockwise to lower the lift lever *15* and lift *11*. Test the adjustment by hand with succeeding matrices and when the adjustment is correct, tighten the lock nut securely. It will be found, when the adjustment is completed, that there will be approximately 1/64″ play between lift *11* and the bottom of the matrix in the distributor box when roll *25* is on the low point of cam *26*.

Care and Maintenance. The maintenance of the mixer distributor box and matrix lift mechanism, from the standpoint of replacing parts, is the same as that of the single distributor mechanism. The parts most subject to wear are the distributor box rails and the matrix lifts.

In addition to replacing parts from time to time, the mixer distributor box and matrix lift mechanism should be cleaned and oiled at regular intervals. Graphite and other substances are carried into the box by the matrices and if not removed, will be carried into the distributor and the magazines. The front and back plates of the distributor box and the upper and lower rails require particular attention. A high grade solvent should be used for cleaning the distributor box parts. The lift rails *29, 30* and *31,* Fig. 149, are located under distributor screw bearings and become fouled with oil if too much is applied to the bearings. The rails should be inspected from time to time for this condition because matrices continually contact the rail surfaces and will carry the oil into the magazines. The faces of the matrix lifts *11* and *12* and the front surface of block *14* should be lubricated slightly with dry graphite. Cam roll *25* and cam *26* should be cleaned occasionally and a light film of oil should be applied to the face of the cam. The matrix lift cam lever *19* and yoke *18* should be oiled once a week to insure free operation on stud *16*. The face of the distributor shifter slide buffer sometimes becomes gummy and should be cleaned with gasoline.

Mixer Font Selector Mechanism

The purpose of the mixer font selector mechanism, as stated previously, is to direct matrices to the front or back distributor so that they will be returned to the magazines from which they were originally drawn. The font selector mechanism and the distributing scheme of the mixer machine are more easily under-

stood if one bears in mind that two main and two side magazines are always in operating position. As shown in Fig. 150, a double assembler entrance and escapement rod mechanism are provided so that matrices can be assembled from the upper and lower magazines simply by shifting the pivoted keyrod frame from the front set of escapement rods to the back set. When the machine is

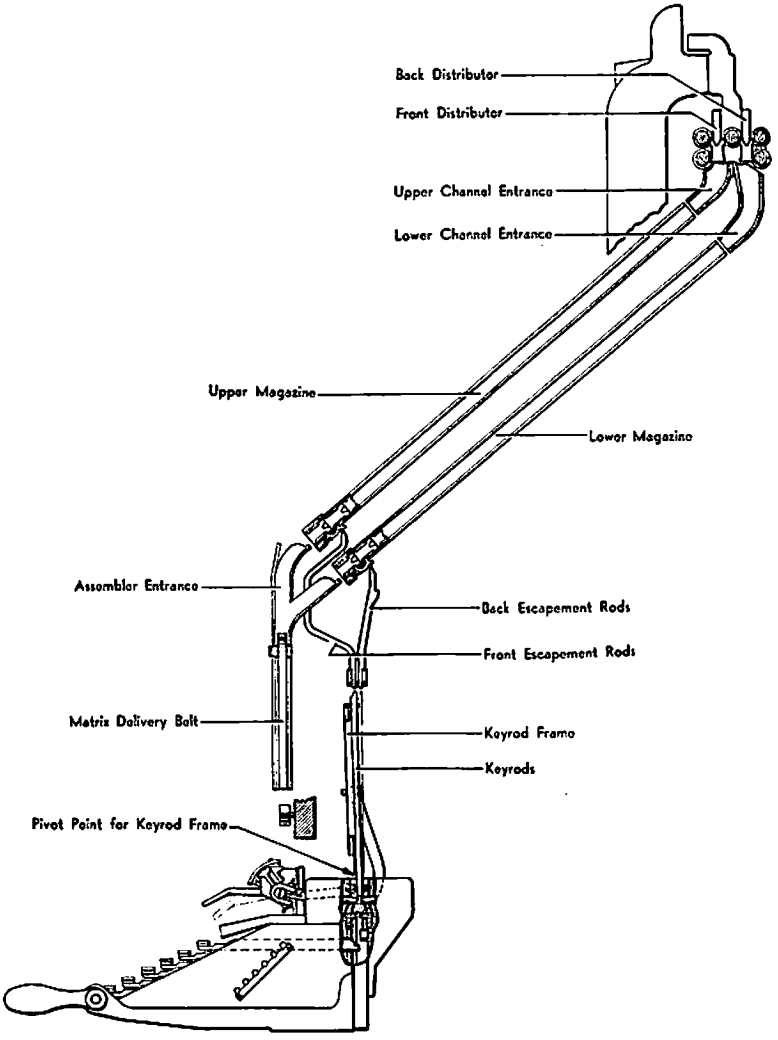


Fig. 150. Side View of the Mixer Machine, showing the double assembling, distributing and magazine assembly established for "mixed" composition. The illustration shows only the main magazine unit—when the machine is equipped with a side unit, the same basic double assembly is provided so that matrices from two side magazines can be assembled without shifting magazines. The side magazine assembler entrance is connected with the main entrance and matrices from a total of four magazines—two main and two side—can be assembled in one line in the assembling elevator without shifting magazines. The matrices are automatically distributed to the proper magazines by the double distributor unit.

equipped with a side magazine unit, the keyrod, assembler entrance and escapement rod mechanism shown for the main magazines is duplicated with a similar assembly for the side unit so that the same feature of "mixed" composition may be carried out in display sizes. The side magazine assembler entrance is connected with the main entrance and matrices from all four magazines—two main and two side—are assembled in one line in the assembling elevator.

Since the matrices in the assembled line were drawn from an upper main and side magazine and a lower main and side magazine, the distribution of the matrices involves simply the provision of a double distributor assembly, a front distributor for the upper magazines and a back distributor for the lower magazines in position. As shown in Fig. 150, the front distributor returns matrices to the upper main and side magazine and the back distributor returns matrices to the lower main and side magazine. The matrices drop respectively into the upper and lower channel entrances and return to the magazines from which they were originally drawn.

The only remaining mechanism required to insure the return of the matrices to the proper magazines is a device for directing the matrices to the proper distributor. This requirement is fulfilled by providing notches in the matrices and interposing a font selector mechanism between the distributor box and the distributor proper. One notch is provided for all matrices running in the upper main and side magazine and another notch for all matrices running in the lower main and side magazine. On the basis of these two different notches, the font selector mechanism directs the various matrices to the front or back distributor, thereby completing the double cycle of matrix assembly and distribution characteristic of the mixer machine.

The assembled font selector mechanism applied to the mixer machine is shown in Fig. 151. The mechanism consists principally of two feelers, one of which operates at the back distributor, and the other at the front distributor. Feeler *4* at the back distributor is set to align with the notch provided in the matrices running in the lower main and side magazines and permits these matrices to be lifted into the back distributor. Feeler *3* at the front distributor is set to align with the notch provided in matrices running in the upper main and side magazines and permits these matrices to be lifted into the front distributor.

The font selector feelers are fastened at the top of the font selector arms *1* and *2*, Fig. 151. Interposed between the two arms and pinned to a shaft *8* is a center arm *5*, on which are mounted two setting disks *6* and *7*. The setting disks are provided with stepped faces of varying heights, which locate the font selector feelers in the various positions corresponding to the notches cut in matrices for mixer machines. A screw *9* in the front selector arm *1* banks against disk *6* and locates feeler *3* with respect to the notch of matrices running through the front distributor; screw *10* in the back arm *2* banks against disk *7* and fulfils the same function with respect to feeler *4* and the matrices running through the back distributor.

Screws *9* and *10*, Fig. 151, are adjustable and are set so that the selector feelers are located centrally with respect to a corresponding notch in a matrix, after which all other notch locations are obtained simply by turning the selector disks until the desired notch number comes to position opposite the arrow on center

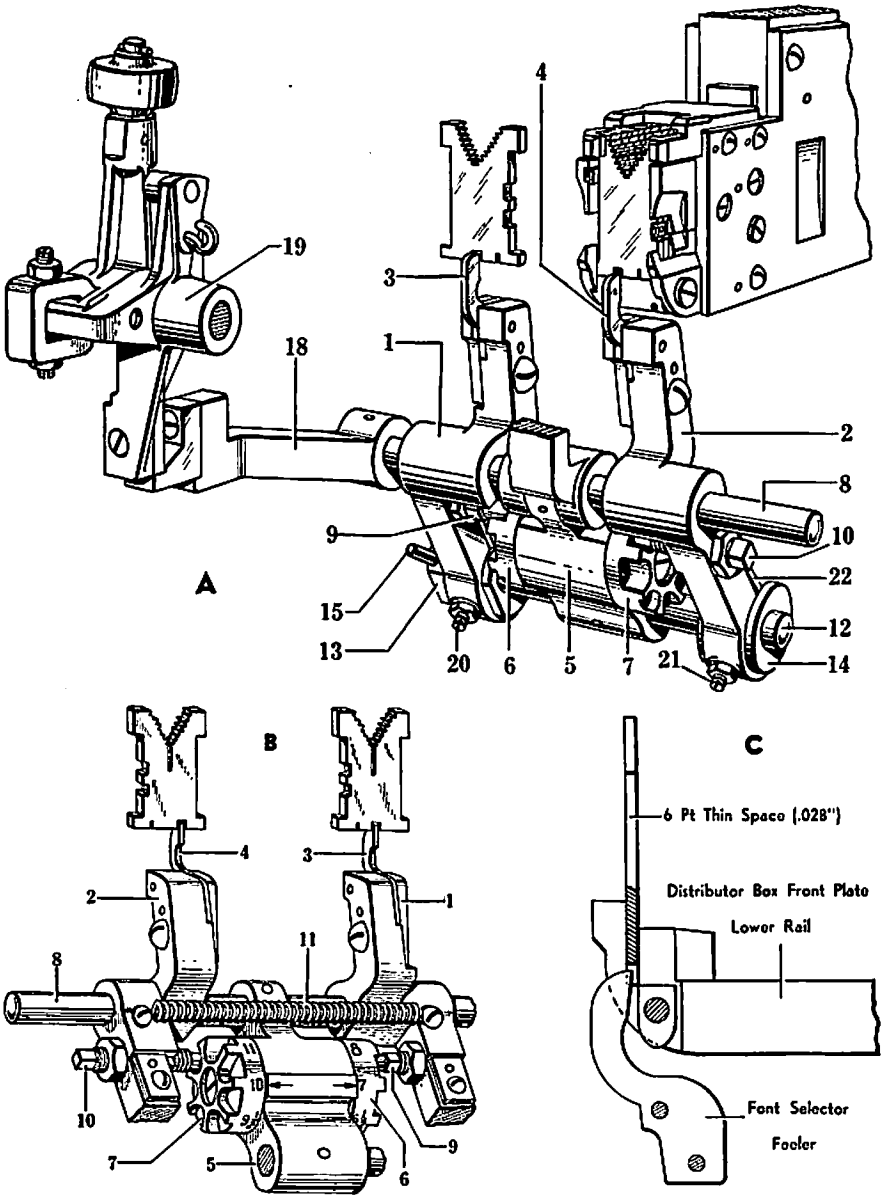


Fig. 151. Perspective Views of the Mixer Font Selector Mechanism. Drawing *A* shows the font selector mechanism in relation to the distributor box and part of the distributor box clutch tripping mechanism. Drawing *B* indicates the relationship of the font selector feelers to the notches in the matrices and shows the means provided for changing the selector notch locations of the feelers by means of disks *6* and *7*. Drawing *C* illustrates the position of one of the feelers with respect to the front edge of the matrix (a 6-point thin space). This position of the feeler is adjustable and determines the tripping of levers *18* and *19*, as described in the text.

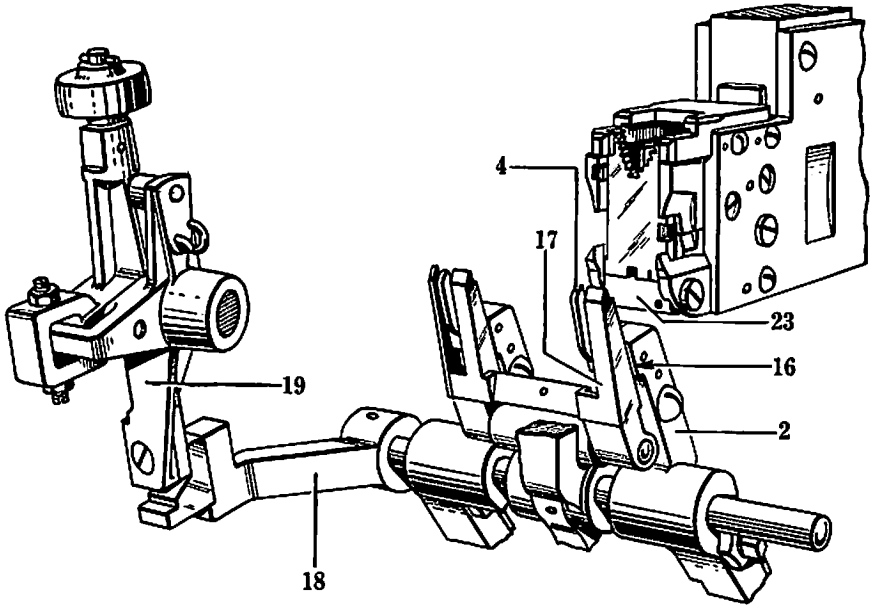
arm *5*. A spring *11* is fastened to the selector arms *1* and *2* to hold screws *9* and *10* against the selector setting disks. When changing the disk settings, it is necessary simply to pull the selector arms far enough away to clear the disks, make the settings, then permit the arms to return to position. The selector settings require changing, of course, only when the magazines are changed and the fonts of matrices placed in operation have notches different from those of the matrices previously in use. An automatic font selector mechanism has been developed to change the selector settings automatically by means of shoes fastened to the magazines. This automatic mechanism is applied to Intertype machines of the Universal design.

Operation of Font Selector Mechanism. The return of the matrices to the front or back distributor, as outlined previously, is controlled by the font selector feelers and the notches cut in the matrices. For purposes of illustration, let us assume that two main magazines are being used on a mixer machine, the upper magazine containing matrices with notch number 7 and the lower magazine containing matrices with notch number 10. These notches are indicated on the matrices in detail drawing *B*, Fig. 151. When these two fonts of matrices are placed in operation, of course, the front selector feeler *3* is set at notch number 7 by means of the front setting disk *6*, and the back feeler *4* is set at notch number 10 by means of the back setting disk *7*. The notch settings of 7 and 10 are indicated by the arrows on the center arm *5*.

Once these settings have been established, the selection of the matrices is completely automatic. When the line of matrices is moved into the distributor box, the first matrix comes to position opposite either of the two font selector feelers. If the last matrix of the preceding line was lifted into the back distributor, the first matrix of the following line will be presented to the back feeler *4*, as shown in Fig. 151. If this matrix was drawn originally from the lower magazine (notch number 10), its notch will align with the feeler, as shown in the illustration, and the matrix will be lifted into the back distributor. The notch of all succeeding matrices from the lower magazine will align similarly with the back feeler and they will be lifted into the back distributor.

When a matrix from the upper magazine (notch number 7) is presented to the back selector feeler, the alignment previously described is no longer present, because the feeler is set to align with notch location 10. This condition is indicated in the detail drawing, Fig. 152, which shows the body of the matrix banking against the back selector feeler *4*. As soon as the matrix banks against the feeler, the assembled font selector and matrix lift mechanism is thrown forward clear of the distributor box lower rails, as illustrated. When the font selector arms are thrown forward, a pad *16* on the back arm *2* bears against the matrix lift *17* and moves the lift forward. The tripping of the selector parts as just described is preparatory to the movement of the distributor box from the back distributor to the front distributor.

While the operation of the distributor box clutch mechanism will be described later, it should be noted at this point that the tripping of the font selector arms also causes the distributor box clutch tripping lever *18*, Fig. 152, to move down out of engagement with the distributor box clutch operating lever *19*. This permits the clutch to operate and the distributor box is moved to position oppo-



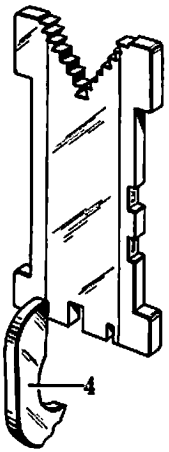


Fig. 152. Detail View of the Mixer Font Selector Parts, showing how lever *18* is disengaged from operating lever *19* when the selector notch of the matrix does not align with the back selector feeler *4*. When the parts are tripped, the back font selector arm *2* throws the matrix lift *17* forward and holds it clear of the distributor box while the box is shifting to the front distributor. When the distributor box comes to position opposite the front distributor the matrix will be presented to the front feeler and since the matrix selector notch will align with the feeler, the matrix will be raised into the front distributor. The same tripping and shifting actions occur when a matrix intended for the back distributor is presented to the front selector feeler.

site the front distributor. When the distributor box comes to position, the clutch operating lever *19,* Fig. 151, moves back to position in front of tripping lever *18* as shown, permitting the font selector feelers to return to normal position. Since the front selector feeler aligns with the notch of the matrix, the matrix lift is permitted to engage the matrix and to raise it into the front distributor.

The operation of the font selector and distributor box clutch mechanism is the same, of course, when a matrix intended for the back distributor is presented to the front selector feeler. Since the notch of the matrix does not align with the feeler, the clutch mechanism is tripped, the distributor box is moved to the back

distributor, the back feeler comes to position and since the notch of the matrix aligns with the back feeler, the matrix is permitted to pass into the back distributor to be returned to the lower magazine.

An interesting point to note in connection with the font selector is that it detects a wrong font matrix instantly and prevents the matrix from entering the distributor. The notch of the matrix will not align with either of the font selector

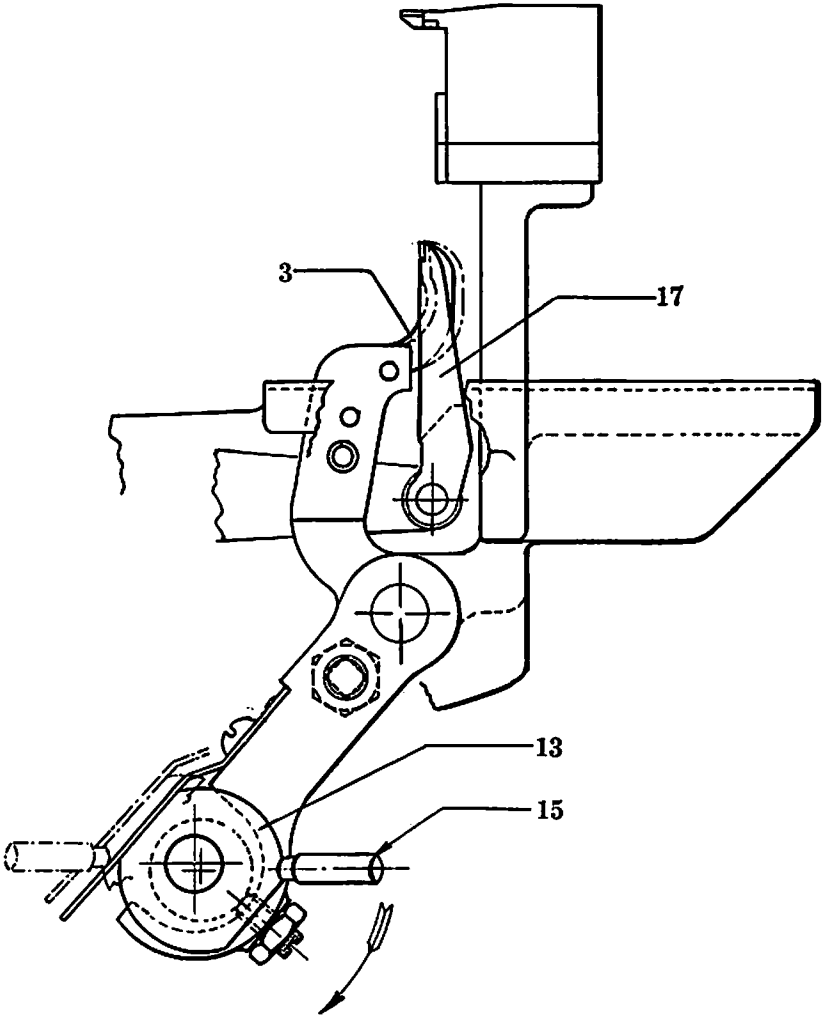


Fig. 153. Detail View of the Front Font Selector Arm, showing the eccentric bushing *13* provided for moving the front font selector feeler *3* forward to an inoperative position. This device is used when a font of matrices from a single distributor machine is to be run on a mixer machine. Such matrices, of course, do not have the mixer selector notch ordinarily required in matrices running in the mixer machine, so provision is made to render the front selector feeler inoperative. The conditions under which single distributor matrices may be run on a mixer machine are described in the text.

feelers and the distributor box will simply move from one distributor to the other until the matrix is removed from the distributor box. The same action occurs when a matrix is inadvertently reversed in the distributor box, that is, when the punch side of the matrix is facing the front of the machine. The reversed matrix will simply keep tripping the font selector feelers, thereby indicating the incorrect condition to the operator.

While the operation of the font selector mechanism was described in terms of mixer selector notches 7 and 10 for purposes of illustration, it is understood, of course, that *the same feature of automatic selection and distribution is characteristic of the other six mixer notches:* 6½, 8, 9, 9½, 11 and 12. Any pair of notches can be used if they are at least one, but more preferably, two notch numbers apart. *Matrices from two different fonts having the same selector notch cannot be "mixed" or used together in the same line* because the separation of matrices by the selector and the distribution of the matrices to either of two magazines presupposes the use of *two different selector notch locations.*

Front Font Selector Arm Bushing. The front font selector arm bushing *13,* Fig. 151, is so designed that the front font selector feeler *3* can be moved forward from its normal position and made inoperative. The hole in the bushing through which rod *12* passes is eccentric, and when the bushing is turned by means of pin *15,* feeler *3* is moved out of operation with respect to matrices passing through the front distributor.

The construction of the front selector arm bushing is shown clearly in Fig. 153. When the pin *15* and bushing *13* are in the position shown by the solid lines, the front feeler *3* is in its operative position slightly in advance of the matrix lift *17,* as illustrated. Under these conditions, the machine is being used as a mixer because the selector notch of all matrices running in the upper magazine must align with the feeler before the matrices can pass into the front distributor. When pin *15* is moved to the position shown by the dotted lines, however, feeler *3* is moved forward past the lifting edge of the lift *17* to the position indicated by the dotted outline. Under these conditions, all matrices will pass into the front distributor, whether they are provided with a selector notch or not.

The arrangement of the front selector feeler just described is particularly useful when circumstances in the composing room require that a mixer machine be used temporarily as a single distributor machine. It may be necessary, for example, that a font of matrices equipped only with the regular font distinguisher notch for the single distributor machine be transferred to a mixer machine for regular composition. By throwing the front selector feeler forward out of operation and placing the magazine in position opposite the front distributor, the matrices from this single magazine can be used in the regular way. The front font selector arm bushing is provided on both mixer models (F and G) for the purpose outlined above. Since the front distributor of the Model G is designed for 72-channel distribution, only the standard wide 72-channel magazine, such as is used on the single distributor Model H, can be transferred for use on the Model G. The front distributor of the Model F mixer is a 90-channel distributor and any standard 90-channel magazine used on the single distributor models can be transferred to the mixer for use in the manner described. It should be borne in mind, however, that *whenever the front font selector feeler is moved forward*

out of operation, only matrices from the magazine in position opposite the front distributor may be used—no " mixing" with matrices from the lower main or side magazine may be done.

When the front selector arm bushing *13,* Fig. 153, is moved back to normal position as shown by the solid lines, the "mixer" features of the machine are automatically restored and matrices from the upper and lower magazines may be assembled in the same line.

Adjustments: Font Selector Arm Locating Screws. When the mixer selector mechanism is assembled, the basic relationship between the font selector feelers *3* and *4,* Fig. 151, and the notches in the matrices is set by means of screws *9* and *10.* The screws are adjusted to locate the feelers centrally with respect to a definite notch in a matrix, after which all notch locations are obtained simply by turning the selector setting disks *6* and *7.* The basic setting of the locating screws will rarely require changing unless the lock nuts work loose.

If the locating screws require readjustment, obtain a new matrix with a selector notch, determine which notch the matrix has, then set both setting disks *6* and *7,* Fig. 151, for that notch. For example, if the matrix has notch number 7, turn both setting disks until the number 7 registers with the arrows on center arm *5.* To turn the setting disks, it is necessary only to pull the selector arms out far enough for the locating screws to clear the disks. In some instances, it may be necessary to hold the matrix lift forward to obtain sufficient space between the locating screws and the setting disks so that the disks can be turned.

In making adjustments on the mixer distributor, it is most convenient to make the back distributor adjustment first. If the distributor box is opposite the front distributor, trip the font selector mechanism by hand and turn the distributor screws until the distributor box comes to position opposite the back distributor. Raise the back distributor screws, place the matrix on the end of the second-elevator bar, move it all the way forward with the distributor shifter, then retract the shifter and lock it in its outward position. Open the channel entrance and place an extension light in front of the distributor box so that the relationship between the back feeler *4,* Fig. 151, and the notch in the matrix can be seen by looking through the distributor box. The feeler should be centrally located with respect to the matrix notch with .005″ clearance on each side of the feeler. (The feelers are .060″ thick and the selector notches in the matrices are .070″ wide.) Adjust screw *10* until the feeler is centrally located in relation to the matrix notch, then tighten the lock nut securely.

Trip the selector mechanism, turn the distributor screws until the distributor box comes to position opposite the front distributor, then adjust the front feeler *3,* Fig. 151, by means of screw *9* until the feeler is centrally located with respect to the matrix notch.

When the adjustments are completed, restore the selector disks to the proper notch settings according to the matrices that are running in the upper and lower positions.

Font Selector Arm Adjusting Screws. The font selector arm adjusting screws *20* and *21,* Fig. 151, govern the normal position of the font selector feelers *3* and *4* with respect to the front edge of the matrices as they bank against the vertical faces of the distributor box rails. The feelers are set so that they project inside

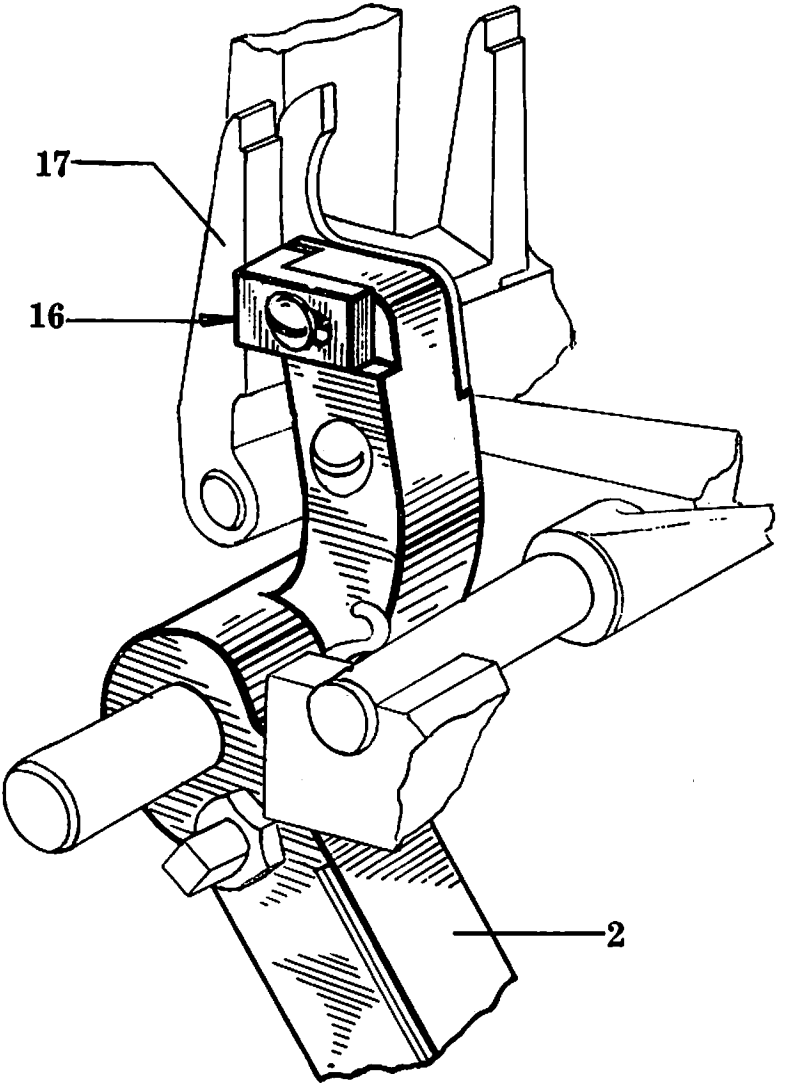


Fig. 154. The back font selector arm adjustable shoe *16* compensates for wear on the face of the matrix lift *17*. The shoe is set to within a few thousandths of the lift so that when the selector arm is tripped, the lift will be moved immediately away from the matrix.

the distributor box slightly beyond the vertical banking faces of the distributor box lower rails, as shown in detail drawing *C*. In setting the feelers so that they extend beyond the vertical faces of the rails, provision is being made, of course, for the matrices to push the feelers forward when the matrix notches do not align with the feelers. The feelers should extend far enough inside the distributor box so that the matrices will have sufficient leverage against the feelers to disengage lever *18* from operating lever *19* with a positive action. The maximum distance to which the feelers can be adjusted, however, is determined by the thinnest matrix (usually a 6-point thin space) running in the machine. The feelers should not extend more than .028" past the rail faces because they would then project past the right side of the thin space (drawing *C*, Fig. 151). If the thin space were followed by a matrix from an adjacent magazine under these conditions, the second matrix would trip the feeler before the thin space could be lifted into the distributor.

In setting the inward position of the font selector feelers, therefore, a 6-point thin space followed by a matrix from the opposite distributor are used in both the front and back distributor positions. The back feeler *4*, Fig. 151, should be set first. If the distributor box is opposite the front distributor, trip the selector by hand and turn the distributor screws until the distributor box moves to the back distributor. Obtain a lower case "m" from both the upper and lower magazine and a 6-point thin space. Scribe marks on the base of the thin space indicating the positions of the notches in both lower case 'm" matrices and file both notches in the thin space so that it will pass both feelers. Open the channel entrance and hang a weight on the distributor clutch lever so that it will be held down out of engagement with the clutch flange. Place the thin space matrix in the distributor box with the lower case "m" from the upper magazine immediately following. Turn the distributor screws slowly by hand until the thin space is lifted clear of the distributor box rails, at which point the second matrix should advance against feeler *4* and disengage lever *18* from operating lever *19*. *The font selector mechanism should not be tripped until the first matrix clears the vertical faces of the distributor box rails.* If lever *18* is tripped too soon, the distributor box might begin to move to the opposite distributor before the first matrix is clear of the box. To delay the tripping of the selector mechanism, the feeler should be moved away from the matrix by backing off adjusting screw *21*. Spring *22* will cause bushing *14* to follow the screw as it is adjusted. When the feeler is set correctly, tighten the lock nut securely.

The front feeler *3*, Fig. 151, is adjusted by the same procedure. In this case, the thin space matrix should be followed by the lower case "m" from the lower magazine. Screw *20* in the front selector arm *1* should be adjusted until the tripping lever *18* is moved down out of engagement with operating lever *19* when the thin space has been lifted clear of the distributor box rail faces and the lower case "m" advances against feeler *3*. When adjusting the front feeler, make sure that pin *15* in bushing *13* is in the position indicated in the main drawing, Fig. 151. When pin *15* is moved to the dotted position shown in Fig. 153, the front feeler *3* is made inoperative, as previously described.

Font Selector Arm Adjustable Shoe. An adjustable hardened steel shoe *16*, Fig. 154, has been added to the back font selector arm to compensate for wear

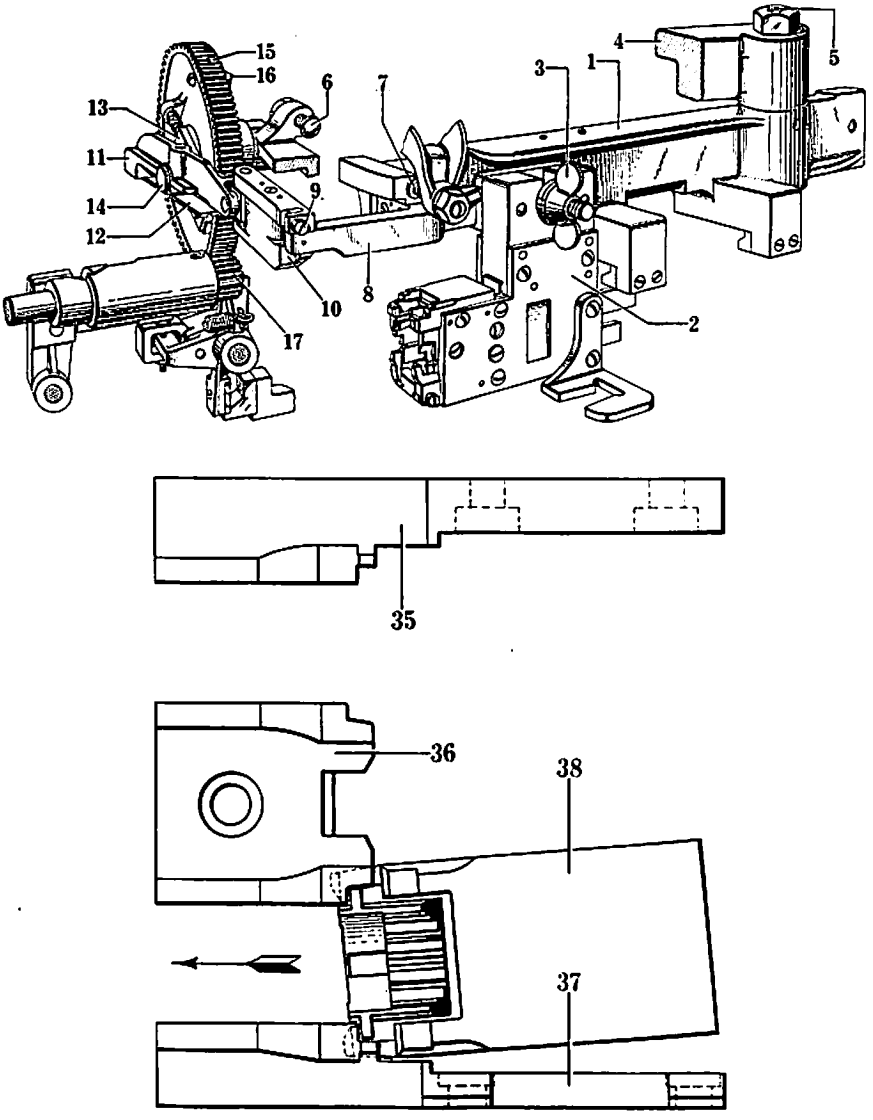


Fig. 155. Perspective View of the Mixer Distributor Box Clutch Mechanism in Assembly. The clutch parts shown in the illustration provide the driving power necessary for shifting the distributor box from one distributor to the other as the font selector mechanism is operated by the matrices in the automatic process of font selection. The detail illustration is a top view of the distributor lift rails *35, 36* and *37,* between which the matrices are lifted into the front and back distributors. When the distributor box arm *1* (main drawing) banks against stop screws *6* and *7,* the exact position of the distributor box and matrices with respect to the lift rails is determined. Screws *6* and *7* are adjusted to stop the distributor box in a precisely centralized position with respect to the lift rails, as illustrated. The procedure for adjusting the screws is outlined in the text.

on the face of the matrix lifts. It was pointed out previously that when the font selector arms are tripped by a matrix, the face of the back selector arm, shown at *16,* Fig. 152, bears against the matrix lift *17* and moves the lift forward. It is important that the forward movement of the selector arm and the lift occur almost simultaneously, because if there is any delay in the forward throw of the lift, the matrix might be raised before the distributor box begins to shift to the opposite distributor. Shoe *16,* Fig. 154, can be set in relation to the matrix lift to provide the correct action.

Before adjusting the shoe, verify the setting of the distributor box plate lower rail block *23,* Fig. 152. The block should permit the matrix lift to engage the matrix fully during the lifting operation, as previously outlined. Having made the correct matrix lift setting, the font selector arm shoe *16,* Fig. 154, should be adjusted to within a few thousandths of the matrix lift *17.* Insert a strip of newspaper between the matrix lift and the shoe, then set the shoe until the paper drags slightly as it is withdrawn. The shoe should not touch the face of the matrix lift during normal operation as otherwise the lift will have less than .028" engagement with the matrix.

Maintenance. The font selector mechanism requires occasional cleaning and lubrication to keep the parts working freely. The tripping lever shaft *8,* Fig. 151, and the center rod *12* should be kept clean and a light film of oil should be applied to the surfaces on which arms *1* and *2* slide. The stepped surfaces of the setting disks *6* and *7* should be cleaned occasionally to maintain an accurate relationship between the feelers and the notch locations of the matrices. The shoes on the tripping lever *18* and the operating lever *19* should be oiled lightly to insure free operation when the selector mechanism is tripped. Burrs on the feelers *3* and *4* may cause the selector mechanism to trip when it should remain inoperative by reason of the fact that the matrix notch cannot clear the feeler. The same condition can be caused also by distortion of the matrix near the selector notch. Burrs on the feelers can be removed with a stone. When replacing feelers, it is usually advisable to stone the sharp edges slightly to remove possible burrs. Sometimes it is necessary to grind clearance in new feelers at the point where the feeler faces the distributor box plate lower rail block. The clearance is required when the feelers cannot be adjusted sufficiently close to the matrix in the distributor box to cause the selector to trip when it should.

Mixer Distributor Box Clutch Mechanism

Up to this point in the description of the mixer distributing mechanism, the first two major assemblies, the matrix lift mechanism and the font selector mechanism, have been described in detail. In the outline of the matrix lift mechanism, the essential features of the double distributor were indicated as well as the parts provided for lifting the matrices into the front and back distributors. The description of the font selector mechanism dealt with the principle of matrix selection and indicated how the matrices were directed to the front and back distributors to be returned to the upper and lower magazines from which they were originally drawn. The third and last major assembly to be described in connection with the mixer distributor is the distributor box clutch mechanism.

This assembly of parts provides the actual driving power necessary for shifting the distributor box and matrices to the front and back distributor as the font selector is operated by the matrices in the process of selection.

The assembled mixer distributor box clutch mechanism is shown in Fig. 155. The distributor box *2* is clamped on the distributor box arm *1* by means of a wing nut *3*. The arm is pivoted on a stud *5* passing through the distributor beam *4*. The stud permits the left end of arm *1* to move between screws *6* and *7*, which stop the arm in position opposite the front and back distributors so that the dis-

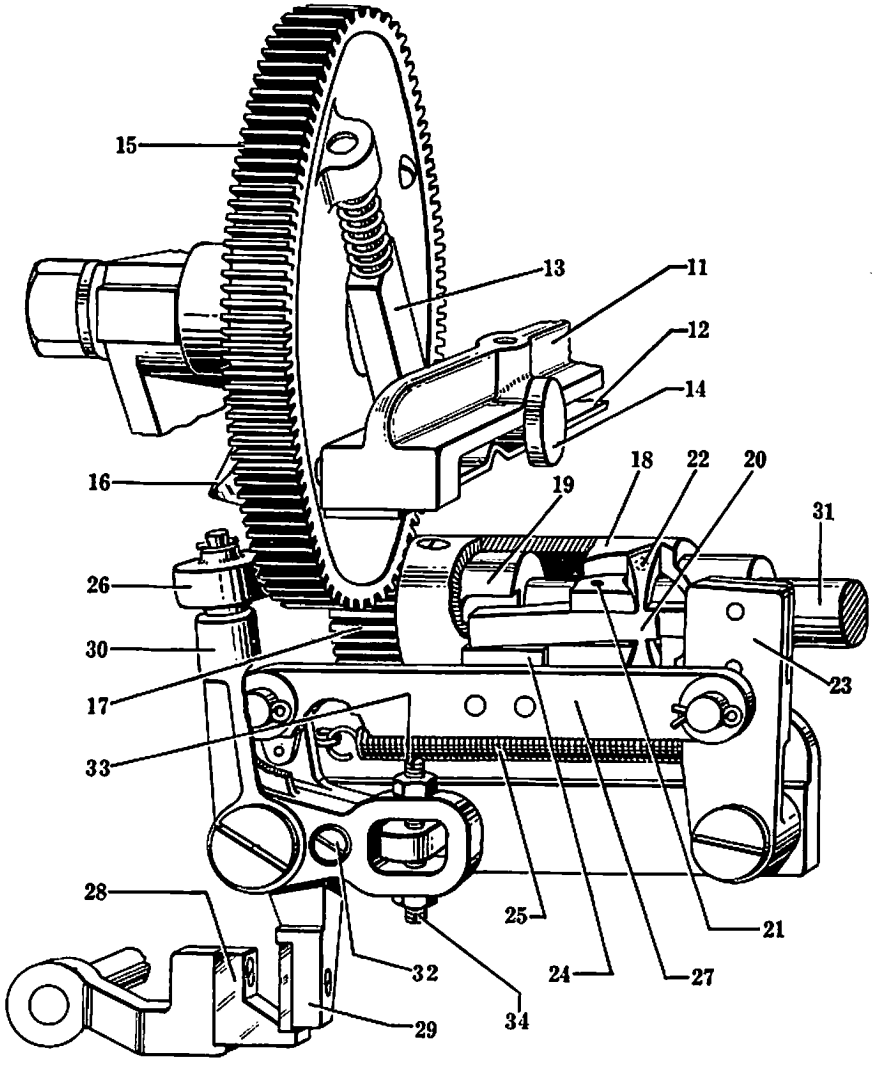


Fig. 156. Front View of the Mixer Distributor Box Clutch, showing the parts provided for engaging the shifter gear *15* with the clutch driver *19* on clutch shaft *31*.

tributor box is in precise alignment with respect to the matrix lift rails and the distributor screws.

At the left end of the distributor box arm *1*, Fig. 155, is fastened an extension *8*. The extension is connected with the distributor box shifter link *11* through connection *10* and pin *9*. The shifter link is held in engagement with a stud *14* on shifter slide *13* through action of spring *12*. The spring connection is provided to permit link *11* to disengage from stud *14* if an obstruction prevents the distributor box or other parts from moving freely from one distributor to the other. The shifter slide *13* is mounted on the shifter gear *15*, which receives movement from the shifter pinion *17* when the clutch is tripped.

A detailed view of the distributor clutch driving mechanism is shown in Fig. 156. The shifter pinion *17* is fastened to clutch spool *18* with two countersunk screws. Both the pinion and spool are mounted freely on clutch shaft *31*, which turns continuously with the distributor screws. Pinned to the clutch shaft inside spool *18* is a driver *19*. Pinion *17* and spool *18* are engaged with the driver by means of a pawl *20* when the font selector is tripped and moves shoe *28* down out of engagement with operating lever *29*. The pawl *20* is pivoted on a fulcrum pin *21* in the clutch spool and two compression springs *22* urge the left end of the pawl down towards the driver *19*. The pawl is held normally out of engagement with the driver by lever *23*, which bears against the right end of the pawl and causes the left end to project forward and to rest on stop *24*.

When the font selector mechanism is operated by a matrix, shoe *28*, Fig. 156, is moved down out of engagement with lever *29*, permitting spring *25* to pull cam lever *30* forward until roll *26* contacts shifter gear *15*. When the cam lever moves forward, of course, link *27* advances with it, carrying lever *23* clear of the right end of pawl *20*. This permits the compression springs *22* to force the right end of pawl *20* against the driver *19* and as the driver revolves, the pawl drops into a slot in the driver. This action engages spool *18* and pinion *17* with the driver, and as the driver revolves, pinion *17* turns the shifter gear *15*. The revolution of the shifter gear, as previously described, moves the distributor box *2*, Fig. 155, to the opposite distributor through the connections outlined — the shifter link *11*, connection *10*, extension *8* and arm *1*. The movement of arm *1* is limited by screw *6* for the front distributor and screw *7* for the back distributor.

As the distributor box arm reaches the end of its stroke and banks against the front or back distributor stop screw, a triangular cam *16*, Fig. 156, on the shifter gear banks against cam roll *26* and moves cam lever *30* and the lower end of operating lever *29* forward until the lever is clear of shoe *28*. The shoe then moves up in front of the operating lever and holds it in normal position. With the backward movement of cam lever *30*, lever *23* and stop *24* are drawn to the left. As the pawl 20 comes to position, lever *23* bears against its right end, causing the left end of the pawl to withdraw from the slot in driver *19* and to come to rest on stop *24*. The series of actions just outlined occurs whenever the distributor box is moved to the opposite distributor, whether the movement is from the back to the front distributor or vice versa.

Adjustments: Distributor Box Clutch Operating Lever. When the distributor box clutch parts are in normal position, as previously described, operating lever *29*, Fig. 156, is engaged by tripping lever shoe *28*, as illustrated. The operating

lever is returned to position in front of the shoe by cam lever *30* and either one of two cams *16* on shifter gear *15*. When the operating lever *29* is moved forward in front of shoe *28*, it should move approximately 1/32″ past the banking step of the shoe so that the shoe can rise freely to position in front of the lever. To adjust the stroke of the operating lever, trip the selector and turn the distributor screws slowly by hand until cam roll *26* is on the high point of one of the cams *16*. Then loosen clamping screw *32*, adjust screws *33* and *34* until the operating lever is 1/32″ past the step in shoe *28*, then tighten screw *32* and the lock nuts on the adjusting screws securely.

Distributor Box Arm Stop Screws. The sidewise alignment of the distributor box *2*, Fig. 155, with respect to the front and back distributors is set by means of two distributor box arm stop screws *6* and *7*. The distributor box, as shown in the illustration, is clamped on the distributor box arm *1*. When the arm is moved to its front and back positions by shifter gear *15*, screw *6* limits the front position of the arm and screw *7*, its back position. Since the distributor box *2* is clamped on the arm *1*, the sidewise alignment of the box with respect to the front and back distributors is controlled by the stop screws *6* and *7*.

The precise alignment required between the distributor box and the front and back distributors is indicated in the detail drawing, Fig. 155. This illustration is a top view of the distributor lift rails *35*, *36* and *37*, showing the relationship between the center lift rail *36*, the rear lift rail *37* and a matrix which is all the way forward against the banking faces of the distributor box upper rail buffer *38*.* When the matrix is raised out of the distributor box by the matrix lift, as previously described, the matrix is lifted between the lift rails *36* and *37* until the upper matrix lugs are above the lift rails. The revolving distributor screws then engage the matrix and convey it forward along the lift rails, which support the matrix until its teeth engage those of the distributor bar. Since the matrices for the back distributor are lifted between rails *36* and *37* and those for the front distributor between rails *35* and *36*, the positions of the distributor box must obviously be set so that the matrices are brought to position centrally between the rails for both distributor positions. *The settings of the distributor box arm stop screws 6 and 7, therefore, are extremely important because they govern the freedom with which the matrices will be lifted between the lift rails.* If the screws are not set properly, the matrices may bind against the rails as they are lifted and the upper matrix lugs will be subject to undue wear.

It is desirable when setting the distributor box arm stop screws that the relationship between the matrix and the lift rails actually be seen. Open the channel entrance and tilt back the magazine frame so that the distributor parts can be viewed from below. Obtain a 36-point capital M or W matrix—one whose body extends forward past the lugs, like the one shown in the detail drawing, Fig. 155. It is desirable to use this type of matrix when setting the stop screws because the extended body of the matrix will indicate inaccuracies in the settings more finely. If a matrix of this type is not available, Intertype Corporation will supply one on request. Set the front and back selector setting disks for the notch of the matrix. Trip the font selector arms and turn the distributor screws by hand until arm *1* banks against the back stop screw *7*. The distributor box

*These parts are also shown in perspective in Fig. 149.

will now be in position opposite the back distributor, as shown in the detail drawing. Place the matrix on the second-elevator bar and move it into the distributor box by means of the distributor shifter. Place an extension light in front of the distributor box so that the relationship between the matrix and the lift rails *36* and *37* can be seen clearly. The matrix should be centrally located between the lift rails so that it will rise freely. If the relationship between the matrix and the rails looks correct, verify the setting by turning the distributor screws slowly by hand and observing the matrix as it is lifted above the rails. *The matrix should rise freely to position without binding at any point.* If the matrix does not lift freely, determine against which rail the matrix is rubbing and adjust screw *7* accordingly. Turning the screw in will move the matrix closer to the center lift rail *36*. When the adjustment is correct, tighten the lock nut on the adjusting screw securely.

The setting of screw *6*, which locates the distributor box and matrix with respect to the front lift rail *35* and the center rail *36*, is made by the same procedure as that outlined above. The 36-point capital W should be used when making the setting. After the adjustment has been made, restore the selector setting disks to their proper settings before operating the machine.

Maintenance. Oil holes are provided in three parts of the distributor box clutch mechanism. A hole at the right end of the distributor box arm *1*, Fig. 155, supplies oil to the stud *5;* another in the shifter link *11* lubricates the stud *14;* and a hole is drilled in the stud on which shifter gear *15* is mounted. These points should be oiled once a week to keep the parts working freely. The distributor box clutch cam roll *26*, Fig. 156, should be oiled occasionally and a light film of oil should be applied to stop *24* and to the hardened plate on lever *23*. The clutch pawl *20* should pivot freely on its fulcrum pin and should be tested by hand from time to time to insure this condition. The shifter link slide *13* operates in bearings on the shifter gear *15*. The slide should be oiled occasionally and the slide spring should be tested by hand to determine whether it operates the slide positively when the distributor box shifts from one distributor to the other. If the spring is weak, the distributor box arm may not bank positively against its stop screws and the alignment of the distributor box with respect to the lift rails will be affected. Spring *12* should have sufficient tension to hold link *11* positively on stud *14* for the same reason. The tripping lever shoe *28* and the plate on lever *29* should be cleaned and oiled lightly to insure free operation.

If it is necessary to turn the distributor screws by hand, it should be borne in mind that *the screws should never be forced when obstructed.* If the distributor screws are forced forward, pawl *20*, Fig. 156, may spring out of driver *19* and may raise a burr on the carrying face of the upper front distributor screw. On model G machines, the burr may cause "r" and "d" matrices to overthrow their respective channels and to drop into the succeeding channels; a burr on the screw of an F machine may cause the same condition with "l" and "u" matrices. A burr on the distributor screw may be removed with a fine file, but care must be exercised not to undercut the face of the distributor screw thread. The basic cause of the condition, however, is that the distributor screws are forced when an obstructing condition is present. To avoid damage, therefore, the obstruction should be corrected before turning the screws by hand.