CHAPTER 19

Distributor Clutch

THE DISTRIBUTOR is driven by a long belt from the intermediate shaft. The intermediate shaft, which is belted to the main driving pulley, turns continuously while power is applied. Therefore, a sensitive clutch mechanism is provided to drive the distributor screws when desired and to cease driving them when not desired, because of faulty distribution or other reason, while still allowing the intermediate shaft to turn and all other parts of the machine, except the distributor, to function.

This sensitive mechanism is called the distributor clutch, and is mounted on the distributor beam at the extreme right side of the machine beyond the distributor screws, when the machine is viewed from the front. But because it is generally viewed and manually operated from the back of the machine, all views and descriptions of the clutch in this chapter are from that position.

DISTRIBUTOR CLUTCH ON THE SINGLE DISTRIBUTOR LINOTYPE

The distributor clutches on all models of the Linotype are essentially alike. The distributor clutch on the single distributor machine is described in this chapter because it is the one in most common use. Distributor clutches on all other models of the Linotype are just slight modifications of this one; if it is well understood others should offer no difficulty.

The distributor clutch pulley, which turns continuously, has its bearing on the distributor clutch shaft and is free to turn on the clutch shaft when disengaged. When engaged the continuously turning pulley carries around with it the clutch shaft and all the parts carried by the shaft. The distributor clutch shaft turns in bearings provided for it in brackets on the distributor beam, and it has pinned to it the small gear which drives the gears which are on the ends of the distributor screws.

It is very important to note that the distributor clutch shaft itself has little or no end-play in its bearings, also that the distributor clutch pulley has little or no end-play on the shaft, while the flange which carries the friction washer has some and the long distributor clutch flange has considerable end-play on the distributor clutch shaft.

Referring to Figs. 1 and 2-19, *1* is the distributor clutch pulley which turns continuously. When the washer *2* is pressed tightly against the side of the pulley *1* by the spring *3* around the end of the distributor clutch shaft *4* held inside of a counterbore in the end of the clutch flange *5* by the washer *6*, the shaft *4* and all the parts on it turn as a unit.

But, the washer *2* cannot be pressed tightly against the side of the pulley *1* unless the beveled surfaces of the clutch stops (right-hand) *7* on the washer flange *9* are in contact with the beveled surfaces of the clutch stops (left-hand) *8* on the flange *5*, as shown in the lower right-hand view, Fig. 2-19. When the

beveled surfaces of the clutch stops *7* and *8* are not in contact, as shown in the lower left-hand view, Fig. 2-19, the spring *3* cannot act to hold the washer *2* against the side of the pulley *1*, because the side of the knurled flange *13* fastened to the clutch flange *5* by the screws *14* then comes in contact with the end of the bearing *15* and stops the clutch flange 5. The washer flange *9* has enough end-play on the shaft *4* to allow the spring *25* to free the washer *2* from the side of the pulley *1*, which continues to turn freely on the shaft *4*. This shaft is stopped because the gear *10*, pinned to the shaft *4*, is in mesh with the distributor screw gearing which is stopped by the spiral automatic on the distributor screws, or because the clutch has been disengaged by hand.

The long shank on the distributor clutch flange 5 has pinned in it a key *11* which engages a keyway *12* in the shaft *4*. This causes the shaft *4* to always turn with the flange 5, but allows the flange 5 to slide along the shaft *4* because of the endwise clearances provided.

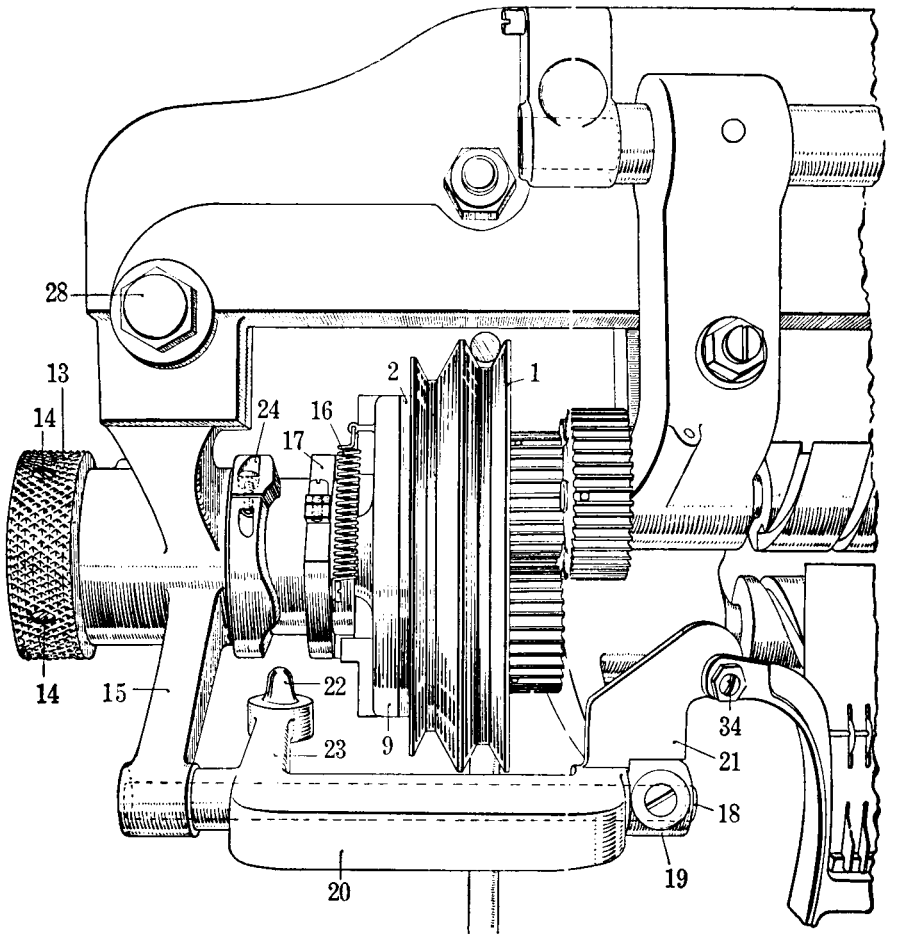

FIG. 1-19. Showing in detail the mechanism for throwing out the distributor clutch when the channel entrance is opened.

When the clutch is engaged, as shown in the lower right-hand view, Fig. 2-19, the right-hand clutch stops *7* and the left-hand clutch stops *8* are held in contact by two spiral extension springs *16*. One end of each of the springs *16* is fastened to an adjustable spring collar *17* which is around the clutch flange 5 and adjustably clamped to it. The other ends of the springs *16* are fastened to the washer

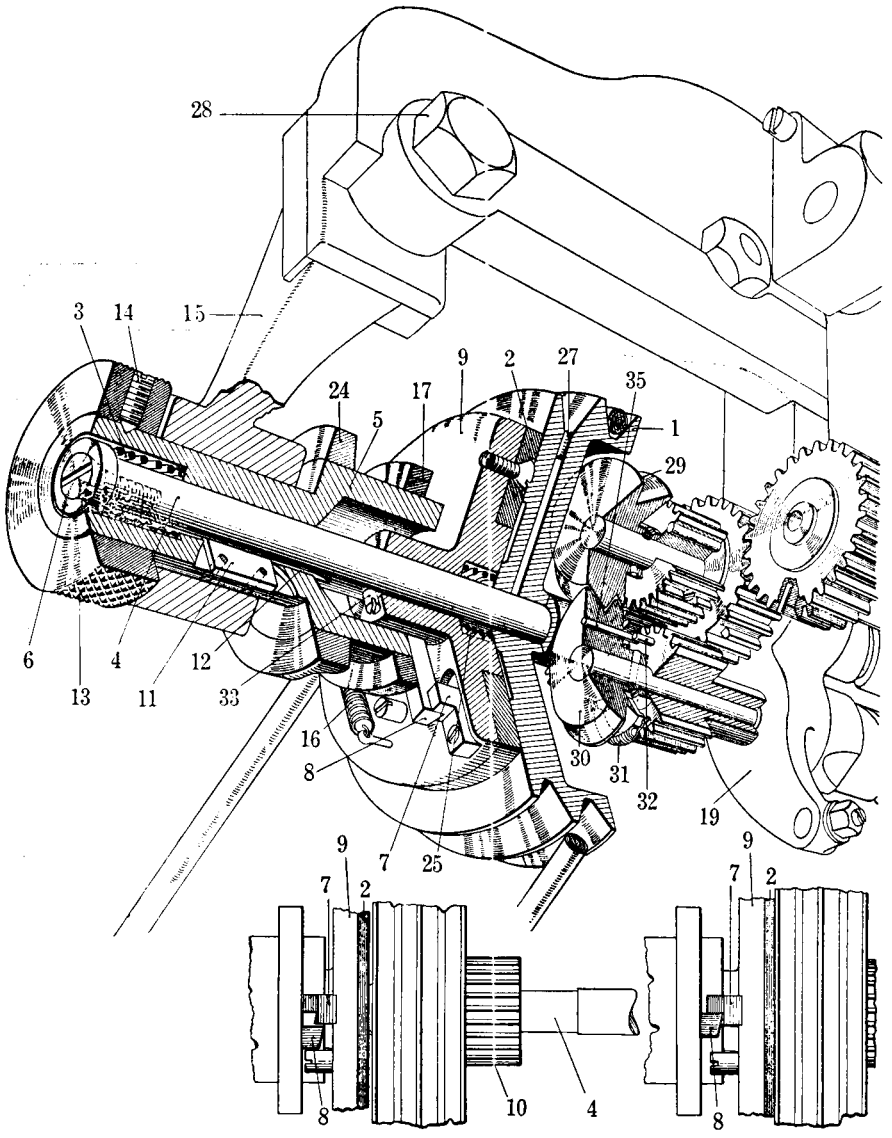

FIG. 2-19. Perspective sectional view showing details of the distributor clutch. The lower left-hand view shows the stop blocks out of mesh, their position when the distributor is stopped. The lower right-hand view shows the stop blocks in mesh to drive the distributor.

flange *9*. The springs *16* should be just strong enough to hold the clutch stops *7* and *8* together as shown on the lower right-hand view of Fig. 2-19.

Referring to Fig. 1-19, the hinge pin *18* held in brackets *15* and *19* on the distributor beam has the distributor clutch lever mounted on it. The lever *20* has a vertical arm *21* which is pushed toward the front of the machine when the channel entrance is closed, and so holds the pointed screw *22* in the horizontal arm *23* of the lever *20* out of the path of the clutch flange collar *24* clamped to the clutch flange *5*. The arm *20* is overbalanced by a horizontal weighted portion at the back. When the channel entrance is opened, the arm *23* lifts the pointed screw upward so that it contacts any one of four cam surfaces on the edge of the flange collar *24* and thereby forces the clutch flange outward sufficiently to release the clutch or hold it so that it slips, depending upon the adjustment of the collar *24* in relation to the pointed screw *22*.

Fig. 1-19 shows in detail how the distributor clutch is thrown out when the channel entrance is lowered.

The other throwout of the clutch is actuated by the spiral automatic which has already been shown in detail in Fig. 9-18, but its relation to the distributor clutch is given here briefly to describe the clutch release if matrices are clogged in the distributor box or in the channel entrance.

On the end of the upper front distributor screw there is fastened what is known as a "spiral automatic," shown at *29* in Fig. 2-19, and on the lower distributor screw there is fastened another spiral, *30*, with a pin *35* on its side. The driving gear on the lower screw is loose on the shaft, and it also has a pin *32*, in the side toward the spiral automatic. To keep the spirals synchronized the pins must bear against each other, and to maintain this position they are held together with a small spiral spring *31*, one end of which is fastened to a hook on the lower spiral, while the other end is fastened to a similar hook on the loose driving gear on the lower distributor screw.

If there is any undue pressure on the lower distributor screw, it will stop and the above mentioned pins will separate, causing the spirals to bind, the clutch stop blocks *7* and *8* to be thrown out of mesh, and the clutch washer to be withdrawn from the driving pulley.

MAINTENANCE

The lower right-hand view, Fig. 2-19, shows the clutch stops *7* and *8* in mesh when the distributor is running normally. When matrices bind against the lower distributor screw, the spirals lock and the clutch stops are separated as shown in the lower left-hand view, Fig. 2-19. In this position the distributor clutch friction washer *2* will clear the driving pulley and allow it to turn freely.

Starting the Distributor—To start the distributor after it has been cleared of matrices, close the channel entrance, grasp the knurled starting lever flange *13*, Fig. 2-19, and turn backward slightly. This will unlock the spirals and allow the bottom distributor screw to spring back to normal position with the pins resting against each other. Then pull outward on the knurled starting lever flange *13* and the extension spring *16* will bring the clutch stop blocks *7* and *8* into mesh and allow the clutch collar to bear against the side of the driving pulley to drive the distributor.

Removing the Distributor Clutch—If the distributor clutch is to be taken off for cleaning or repairs, begin by removing the knurled starting lever flange *13*, Fig. 1-19, which is fastened to the clutch flange with two screws *14*; then remove

the clutch lever hinge pin *18*, Fig. 1-19, which will release the clutch lever *20*, and remove the hexagon-head screw *28* holding the shaft bracket *15*. This bracket has two dowel pins at the top and when it is pressed out to release the dowels, be careful not to bend the main driving shaft. Take out the screw in the spring washer *6*, Fig. 2-19, to remove the spring *3*; then take out the screw *33* in the shaft, and slide the complete flange assembly off the shaft.

After the clutch has been removed as a unit from the machine it can be more easily taken apart for any necessary repairs or cleaning.

Before re-assembling, the leather friction washer *2*, Fig. 2-19, on the clutch washer flange *9* should be scraped clean and the face of the driving pulley against which the leather rests should be washed with gasoline. Also see that the screws in the clutch stop blocks *7* and *8* are tight.

Spring Tension—The tension of the extension springs *16* may be adjusted by loosening the clamp screw in the adjustable collar *17* and moving the collar in either direction to get the proper tension, which should be just enough to spring the stop blocks in mesh when the knurled starting lever flange is pulled outward to start the distributor. If the tension is too strong, it might cause the ears of the matrices to be bent should they become caught in the channel entrance and press against the lower distributor screw.

The tension of the spring *3*, Fig. 2-19, should be just strong enough to pull the distributor evenly so that when the channel entrance is opened the pointed screw will force the cam-shaped flange *24* to the left to separate the flange assembly from the driving pulley without causing the clutch stop blocks to go out of mesh, so that the distributor will start when the channel entrance is closed.

Lubrication—When re-assembling the clutch mechanism, use a small amount of oil on all bearing surfaces, and on the contact faces of the stop blocks *7* and *8*.

Fig. 2-19 shows a screw *27* which covers an oil hole which leads to the bearing of the driving pulley. This hole should be oiled occasionally.