on the channel entrance automatic stopping bar *17*. The plate on the stopping bar contacts the clutch lever plate when the channel entrance is closed and permits the distributor clutch to operate.

If a channel of the channel entrance becomes clogged with matrices, however, the last matrix in the clogged channel will be moved against the left-hand partition. The partitions, as shown in Fig. 177, register with lugs on the stopping bar *17*. When the partition is moved to the left, therefore, plate *16* on the stopping bar is moved in the same direction until it is clear of the clutch lever plate *15*. A compression spring in back of clutch lever *11* then causes screw *10* to engage collar *9* and to disengage the clutch by drawing the washer under flange *3* away from clutch pulley *1*. When the channel entrance is opened to clear the stop, bar *17* is drawn back to position by a spring. When the channel entrance is closed, therefore, plate *16* will contact plate *15* and will cause the clutch to resume operation.

Adjustments: Distributor Clutch Lever Plate. The clutch lever adjusting plate *15*, Fig. 177, can be set in relation to the stopping bar plate *16*. The clutch lever plate is provided with elongated slots to permit sidewise location. When the channel entrance is closed, the stopping bar plate should have 1/32″ engagement with the clutch lever plate, as shown in the detail drawing. Adjust the clutch lever plate *15* to provide the correct engagement, then tighten the binding screws. *It is important that no more than 1/32″ engagement be provided between the two plates.* If the relationship exceeds the specified amount, the channel entrance partitions will have to move a greater distance to throw out the distributor clutch. This will subject the partitions to unnecessary strain and may cause the tops of the partitions to set permanently in incorrect positions.

Distributor Clutch Lever Pawl Screw. After the clutch lever plate has been set as described, the pawl screw *10*, Fig. 177, should be set so that there will be approximately 1/16″ clearance between the top of the screw and the revolving flange collar *9*. Make sure that the channel entrance is fully closed when setting the pawl screw and lock the setting with the nut provided.

Distributor Clutch Flange Spring Adjusting Collar. An adjusting collar *7*, Fig. 176, has been provided recently for adjusting the tension of the distributor clutch flange spring *6*. The collar is threaded on the end of the clutch shaft and can be advanced or withdrawn with respect to the spring after lock screw *13* is loosened slightly. Turning the collar clockwise will increase the tension of the spring. In adjusting the collar, it is necessary only to provide sufficient tension so that the clutch will turn the distributor screws at a continuously uniform speed. If the clutch spring is put under too much tension, the friction washer *5* may not be withdrawn fully from pulley *1* when the clutch is disengaged and the face of the washer will be worn unnecessarily. Indication of excessive spring pressure will be that screw *10* binds tightly against collar *9* when the clutch is disengaged. Turn lock screw *13* up tightly when the adjustment is correct.

Removal of Parts and Maintenance. To remove the distributor clutch, open the channel entrance, loosen screw *19*, Fig. 177, remove pin *18* and take out the clutch lever *11*. There is a small compression spring at the right end of the clutch lever which will drop out with the lever. Loosen the set screw in knob *14* and remove the knob. Remove screw *21*, spring the top part of bracket *20* away from

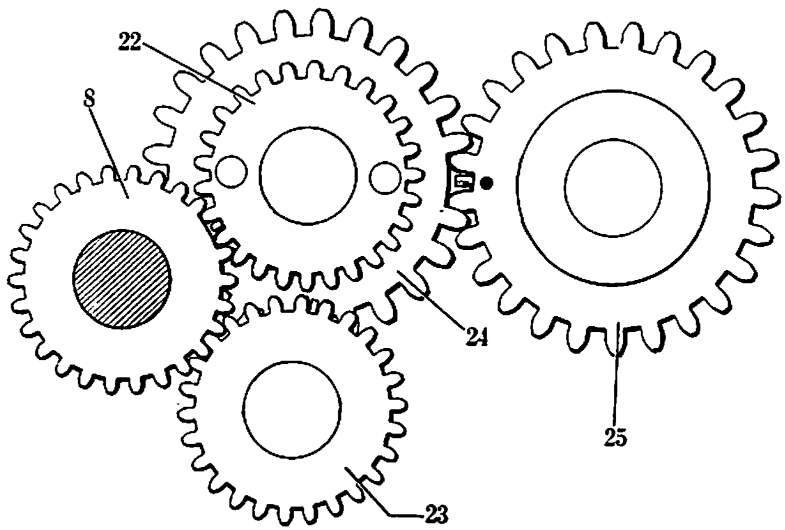

Fig. 178. Single Distributor Screw Gears. This illustration is designed to show the timed relationship of the gears. The distributor clutch shaft gear *8* meshes with gear *22* on the upper front distributor screw and with gear *23* on the lower front distributor screw. The back distributor screw gear *25* is turned by the large gear *24* on the upper front distributor screw.

the distributor beam, then remove the bracket. Remove screw *13*, turn collar *7*, Fig. 176, off shaft *2*, then remove the clutch spring. Flange *3* and pulley *1* may now be taken off the shaft. If it is necessary to remove the clutch shaft, take out the pilot screw in the left-hand distributor front screw bracket. The pilot screw enters a groove in the left end of the shaft and prevents it from moving sidewise.

In replacing the clutch shaft and gear, it should be noted that the gear must be meshed in the correct relationship with the distributor front screw gears. The distributor clutch shaft gear is shown at *8*, Fig. 178. The gear meshes with gear *22* on the upper front distributor screw and with gear *23* on the lower front screw. One tooth in gear *8* is partially cut out to clear timing pins in gears *22* and *23*. The gears will be properly timed when the cut-out tooth coincides with the timing pins when the screws are rotated. *This timed relationship is extremely important* in that it causes the open or entering points of the distributor screw threads at the left end of the distributor to come to position simultaneously so that the matrices can be lifted into the threads of the distributor screws. The timing also causes the distributor screw threads to engage the three matrix lugs simultaneously and to convey the matrices along the distributor bar at right angles to the bar.

It will be noted also that the distributor back screw gear *25*, Fig. 178, is driven by the large gear *24* on the distributor upper front screw. Gear *25* is provided with a timing pin which must be matched with the cut-out tooth in gear *24* whenever the hinged distributor back screw is returned to position.

Before outlining the maintenance of the distributor clutch, it will be helpful at this point to describe the double distributor screw gear assembly, shown in

Fig. 179. The gears pinned to the five distributor screws are designated by titles according to the screws to which they are attached. The upper front, lower front and middle screw gears respectively are attached to the three distributor screws which convey matrices along the front distributor bar. The middle, upper back and lower back screw gears are attached to the distributor screws which convey matrices along the back distributor bar. It will be noted that the middle distributor screw serves both distributors: it serves as the back screw for the front distributor, and also serves as the front screw for the back distributor.

The driving power for turning the double distributor screws is furnished by the distributor clutch shaft gear *8*, Fig. 179. The clutch gear turns the upper and lower front gears. The upper front gear transmits motion to the middle screw gear through idle gear *26*. The back distributor screws are driven by gears *27* and *28*. Gear *28* turns the upper back screw gear, which likewise transmits its motion to the lower back screw gear through idle gear *29*.

It will be noted in Fig. 179 that the latest double distributor screw gears are provided with numbers to facilitate the timing of the distributor screws when the back screw assembly is returned to position. The purpose in providing pairs of numbers instead of the two punch marks previously used is to make retiming possible with only a slight turn of the large middle screw gear *27*. It is desirable to reduce the turning of the middle distributor screw to a minimum because if there are matrices on the distributor bars, they may be turned out of position and will make it difficult to return the distributor back screws to operating position. The numbers on gears *27* and *28*, therefore, make it possible to time the gears in any of five positions. In timing the gears, it is necessary only to turn the free back gear *28* until the correct number is opposite the corresponding number on gear *27*.

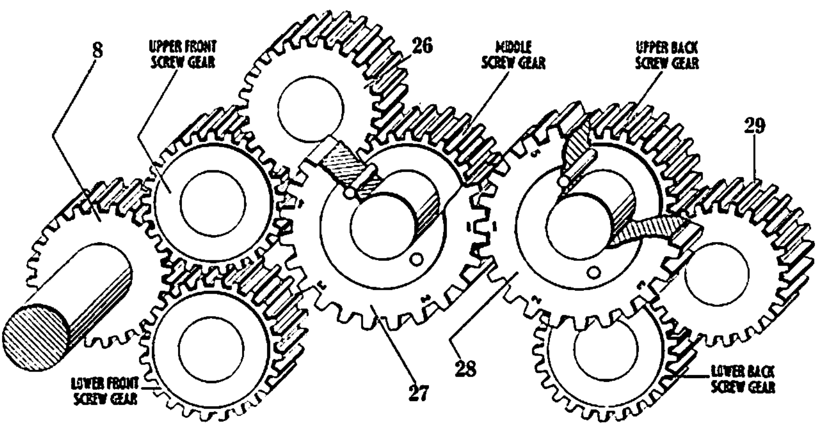

Fig. 179. Double Distributor Screw Gears. The distributor clutch shaft gear *8* imparts movement to the gear assembly. The clutch shaft gear turns the upper and lower front screw gears. The upper front gear transmits motion to the middle screw gear through idle gear *26*. The back distributor screws are driven by gears *27* and *28*. Gear *28* turns upper back gear, which likewise transmits motion to the lower back screw gear through the idle gear *29*.

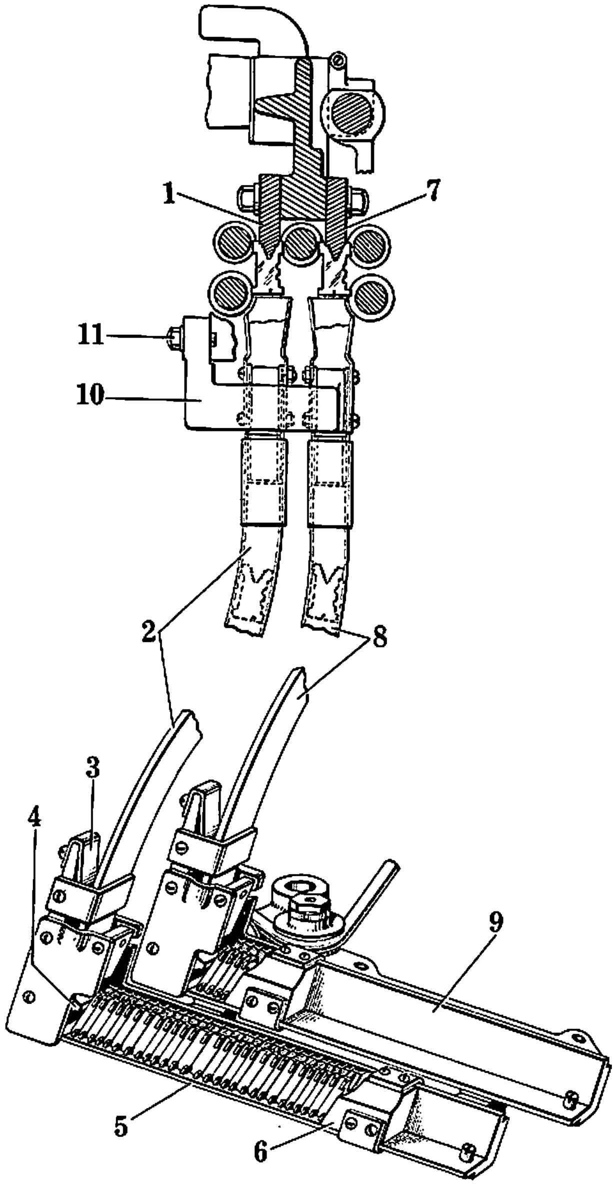

Fig. 180. Double Distributor Pi Stacker. Pi matrices from the front distributor bar *1* enter the front tube *2* and assemble on the lower frame *5*. Pi matrices from the back distributor bar *7* pass through tube *8* and assemble on the upper frame *9*.

From the standpoint of distributor clutch maintenance, it will be noted that one oil hole is provided at the front of the clutch bracket *20,* Fig. 177, and two oiling points are provided in the clutch lever *11.* A hole plugged by screw *12,* Fig. 176, is also provided for the clutch pulley *1.* These points should be lubricated once a week, but oil should be applied sparingly, especially in the clutch pulley. From the standpoint of replacement, it will be noted that plates *15* and *16,* Fig. 177, are hardened to resist wear and will last for a long period if they are treated with reasonable care. If the operative edges of the plates become rounded, however, the distributor clutch may disengage inadvertently during normal operation. It will be necessary under these conditions to replace the worn plates. With regard to maintenance of the distributor screws and other parts of the distributor proper, the procedure has been described already in connection with the distributor. See the outline on maintenance under the heading of "The Single Distributor."

The Pi Stacker

The function of the pi stacker mechanism is to act as a supplementary storage unit for those matrices not intended to run in the magazines. In certain classes of printing, it is necessary to have a set of special characters available for use in conjunction with matrices from a number of different magazines. Such special characters include fractions, mathematical signs, chemical symbols, code characters, commercial abbreviations, directory signs, reference marks, ligatures, etc. Characters of this nature are stored in the pi stacker frame at the right of the main keyboard and are inserted in the line by hand as they are required. Since these matrices, which are referred to as "pi" matrices, are not intended to run in the magazines, all seven of the combination teeth are left intact in the process of manufacture. The matrices, therefore, are conveyed along the entire length of the distributor bar to the pi stacker tubes, through which they are guided back to the pi stacker frame at the front of the machine.

The pi stacker applied to Intertype double distributor machines is shown in Fig. 180. The single distributor pi stacker is similar in all essential details of construction except that only one pi stacker tube and one frame are provided to receive the matrices from the single distributor. In the case of the double distributor machine, matrices from the front distributor bar *1* are guided through the front pi tube *2* to the lower pi stacker frame *5.* A spring *3* is provided to direct the matrices properly to the star wheel *4,* which moves the matrices to the right on the frame. Block *6* is free to slide on the frame as the matrices are assembled and serves to hold the matrices upright. Matrices from the back distributor bar *7* pass through tube *8* and are assembled on the upper frame *9* by a similar star wheel. Both of the pi stacker star wheels are driven by a pulley on the intermediate shaft of the machine.

Adjustment and Maintenance. The entrances at the upper ends of the pi tubes can be adjusted sidewise with respect to the distributing mechanism. The pi tube entrances are fastened to bracket *10,* Fig. 180, which is clamped in position by screw *11.* The assembled unit can be moved for location after the screw is loosened. Set the pi chute bracket so that the matrices drop properly into the entrances and tighten the screw. Make sure also that the channel entrance clears the pi tube entrances as it is closed.

From the standpoint of maintenance, the pi stacker frames should be dusted occasionally and the ends of the star wheel shafts should be wiped with a clean cloth. Oil tubes are provided for the two star wheel shafts and pulleys and also for the idle pulley. These points should be oiled sparingly so that the matrices and the pi stacker frames will not be fouled.

The Driving Mechanism

The driving mechanism of the Intertype machine consists basically of a friction clutch and a pulley driven by a line shaft or by an individual motor mounted on the frame of the machine. When the machine is in operation, the driving pulley turns continuously and supplies the drive necessary for operating the various parts of the assembling and distributing units of the machine. This drive is transmitted by the intermediate shaft, which is connected with the driving pulley by a belt. The friction clutch assembly, which turns the assembled cam shaft of the machine, is engaged with the driving pulley when the casting operation is occurring, while the matrices and spacebands are in the process of being transferred for distribution and while the slug is being ejected from the mold. The operation of the friction clutch, therefore, may be regarded as intermittent in that the clutch engages the driving pulley only when the cams are to be turned.

Before describing the driving mechanism in relation to the cams and the starting and stopping mechanism, it is necessary first to indicate the construction of the driving shaft and the friction clutch. A sectional view of these parts is shown in Fig. 181. The driving shaft *1* is supported in a bearing fastened to the base and in a bearing in the right-hand cam shaft bracket. On the end of the shaft is fastened the friction clutch arm *2*, which is keyed in position and clamped on the shaft by a screw. Two friction shoes *3* are mounted on rods *5* which slide in bearings in the clutch arm. Attached to the friction shoes are links *6*, which engage a collar *7* on clutch rod *9*. Fulcrum screw *8* connects collar *7* with the clutch rod.

It will be noted that the end of the driving shaft *1*, Fig. 181, is made hollow to receive the clutch rod *9* and its spring *12*. The spring is held between an adjusting bushing *10* and a collar *13* on the clutch rod and normally urges the clutch rod *9* to the right (viewed from the rear of the machine). The clutch rod is connected by screw *14* with the clutch flange *15*. The screw passes through a hole in the clutch rod and through an elongated slot in the driving shaft. This arrangement permits flange *15* to move endwise with the clutch rod *9* as the clutch is operated.

While the automatic and manual operation of the clutch is described under succeeding paragraph headings, it should be noted at this point that the position of the clutch flange *15*, Fig. 182, determines whether the friction clutch will be engaged with the driving pulley or will be disengaged and held in an inoperative position. The clutch flange is operated by the automatic stop forked lever *16*. If the forked lever moves the clutch flange to the left, clutch rod *9*, Fig. 181, will be moved in the same direction against tension of spring *12*. The friction link

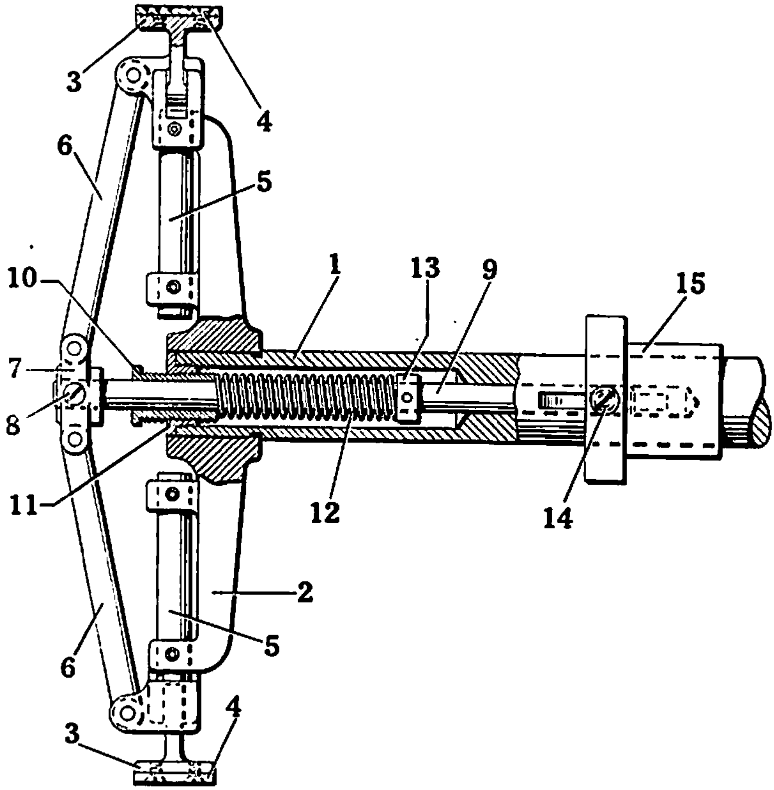

Fig. 181. Driving Shaft Friction Clutch. The driving shaft *1* and the friction clutch arm *2* are shown partly in section to indicate the parts inserted in the shaft. The clutch is engaged whenever spring *12* is permitted to move rod *9* to the right, thereby pressing friction shoe buffers *4* against the revolving driving gear pulley. Whenever flange *15* moves the clutch rod to the left, the buffers are disengaged from the driving pulley and the cams are stopped.

collar *7* will then cause links *6* to draw the friction shoe buffers *4* away from the driving pulley and the cam shaft will be held in a stationary position. Whenever the clutch flange *15* is free to move to the right, however, spring *12* causes clutch rod *9* to move collar *7* in the same direction and links *6* press the friction shoe buffers *4* against the rotating driving pulley. This causes the assembled cam shaft to turn and to operate the various parts concerned with the casting of the slug and the transfer of the matrix line.

Automatic Operation of Driving Mechanism. The driving shaft friction clutch and the vertical starting lever are shown in their assembled relationship in Fig. 182. The various parts are shown as they appear when the cam shaft is stationary and the machine is in normal position. The friction shoe buffers *4*, as indicated in the drawing, are disengaged from the revolving driving pulley *17*. The pressure for disengaging the buffers from the pulley is imparted by a pawl *22* and a series of levers connected with the clutch. The pawl is mounted in the

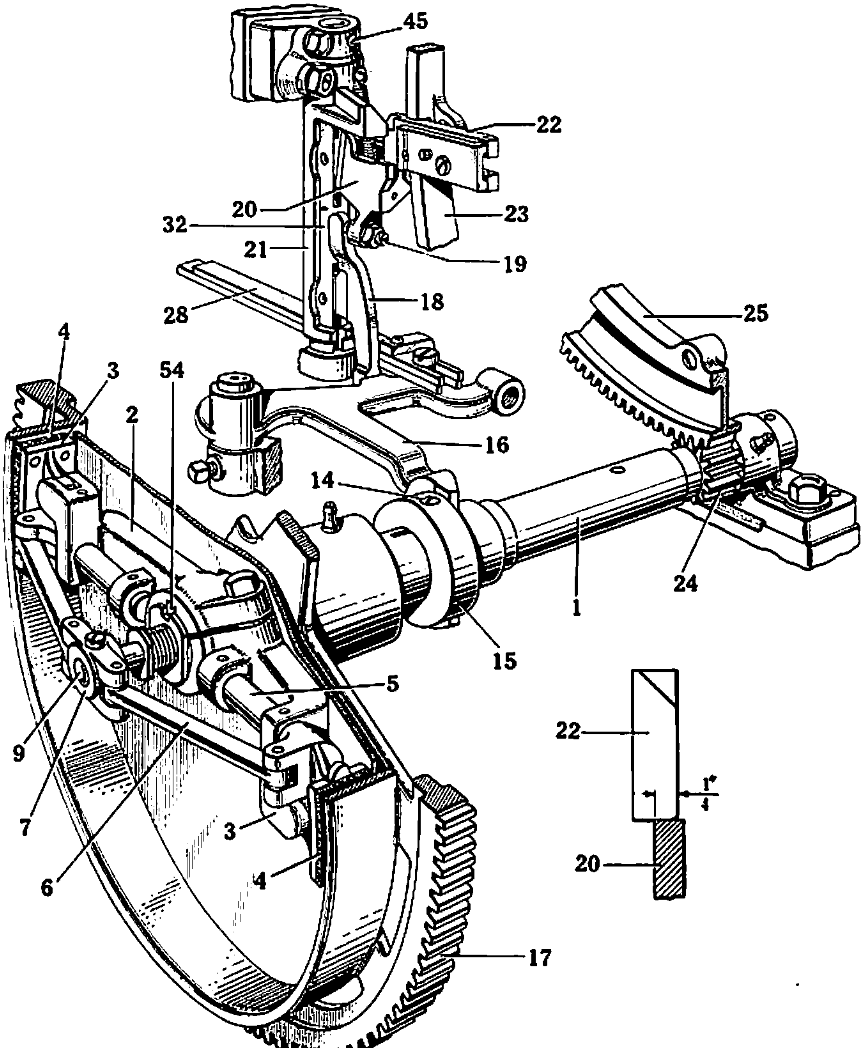

Fig. 182. Driving Shaft Friction Clutch and Vertical Starting Lever in Assembly. The main drawing indicates how the automatic stopping pawl *22* in the delivery and elevator transfer cam *23* disengages the clutch by banking on the upper stopping lever *20*. Pressure on the upper stopping lever causes the lower lever *18* to move the forked lever *16* against clutch flange *15*. The flange moves the clutch rod 9 to the left and draws buffers *4* away from the driving pulley *17*, thereby stopping the cams in normal position.

The detail drawing indicates how much engagement the automatic stopping pawl *22* should have with the upper stopping lever *20* when the machine is in normal position.

delivery and elevator transfer cam *23*. As the cam shaft completes its revolution and is almost in normal position, pawl *22* banks on the upper stopping lever *20*, which is pivoted on shaft *32* in the vertical lever *21*. Downward movement of the upper stopping lever *20* causes the lower end of lever *18* to bear against the pivoted forked lever *16*. The forked lever moves the clutch flange *15* to the left, and from the connections outlined previously, it is apparent that clutch rod *9* is moved in the same direction. Links *6* then draw shoes *3* and buffers *4* away from pulley *17* and the assembled cam shaft is thereby stopped in normal position.

When a matrix line is sent in to the casting mechanism, the driving mechanism is started automatically by disengaging pawl *22*, Fig. 182, from the upper stopping lever *20*. In the description of the delivery slide mechanism, which was presented at the beginning of the section on the casting mechanism, it was pointed out that when a matrix line is sent in to be cast, a cam roll arm on the delivery lever shaft strikes pawl *22* and moves it clear of the upper stopping lever *20*. This releases the pressure of lever *16* from flange *15* and the clutch rod spring inside the driving shaft is then permitted to move rod *9* to the right. Links *6* then press the friction buffers *4* against the revolving driving pulley *17* and the driving shaft *1* is rotated. On the end of the driving shaft is pinned a pinion *24* which meshes with the mold cam and driving gear *25* on the cam shaft. Rotation of shaft *1* is thereby transmitted to the assembled cam shaft and the cams are rotated one complete revolution, during which the slug is cast and ejected and the matrices and spacebands are transferred and returned to position. The stopping of the cams and the release of the friction clutch occur when stopping pawl *22* comes to rest again on the upper stopping lever *20*.

Auxiliary Automatic Stopping Devices. The preceding outline of clutch operation indicated how the driving mechanism is started and stopped during normal machine operation, that is, when lines of matrices and spacebands are being sent in to the casting mechanism and are being transferred and distributed in subsequent operations. In addition to the mechanism described in this connection, there are three auxiliary devices which may disengage the driving clutch and cause the cams to stop in an intermediate position. These devices are the vise automatic, the mold disk slide safety device and the automatic safety pawl.

The vise automatic stops the machine if an obstruction prevents the first elevator from making its full downstroke to the vise cap. The mold disk slide safety device disengages the clutch if the mold is prevented from advancing to within .010″ of the matrix line. The automatic safety pawl stops the machine at transfer position if recasting work is being done or if the second-elevator lever is held up at the distributor by a matrix stop. The vise automatic and the mold disk slide safety device were described previously under those headings. The automatic safety pawl was described in connection with transfer lever adjustments. For complete descriptions of how these three auxiliary devices operate the friction clutch, see the outlines of operation under the three headings indicated.

Manual Operation of Driving Mechanism. The parts provided for manual control of the driving mechanism are shown in Fig. 183. The engagement of the friction clutch was described previously in terms of the automatic stopping pawl *22* and the upper stopping lever *20*. It was pointed out that when pawl *22* is moved to the right and clears lever *20*, the lower stopping lever *18* releases the forked lever and permits the friction clutch to engage. The connection between the forked lever and the lower stopping lever is shown clearly in Fig. 182.

From the standpoint of manual operation, pawl *22*, Fig. 183, is released by a lug *26* on the vertical starting lever *21*. The starting lever is mounted on shaft *32* and is free to be turned on the shaft. At the lower end of the vertical lever *21* there is a lug *33* located in front of a pin *27* in connecting rod *28*. The connecting rod is engaged with the starting and stopping lever *30* by link *29*. The starting and stopping lever is pivoted on a pin in bracket *31* and when the lever is pulled forward all the way, pin *27* banks against lug *33*. This causes vertical lever *21* to turn on shaft *32* and lug *26* pushes pawl *22* clear of upper stopping lever *20*. The friction clutch then engages the driving pulley and turns the cam shaft as outlined previously.

The starting and stopping lever at the front of the machine is also used to stop the driving mechanism at any point during the rotation of the cams. The back end of connecting rod *28*, Fig. 182, engages a stud in the forked lever *16*. Whenever the starting and stopping lever is pushed in, therefore, lever *16* moves

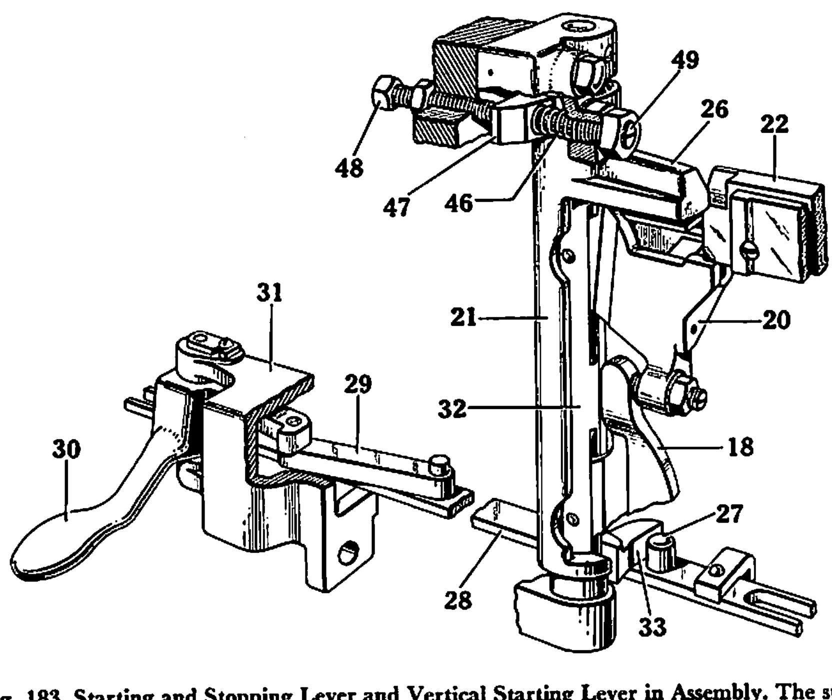

Fig. 183. Starting and Stopping Lever and Vertical Starting Lever in Assembly. The starting and stopping lever *30* provides instant control of the driving clutch mechanism and may be used to start or to stop the cams at any point. To start the cams manually, such as when casting blank slugs or when recasting lines, it is necessary only to pull the starting and stopping lever *30* forward all the way. This causes the pin *27* in rod *28* to turn the vertical starting lever *21*. Lug *26* thereby pushes pawl *22* clear of the upper stopping lever and permits the clutch to engage and to turn the cams. When lever *30* is pushed in all the way, the clutch is disengaged and the cams are stopped.

flange *15* and clutch rod *9* to the left. This causes links *6* to draw buffers *4* away from pulley *17* and to stop the cams instantly.

Mold Disk Slide Safety Lock. In connection with the manual operation of the driving mechanism, a safety device attached to the mold cam lever is provided to lock the starting and stopping lever whenever the mold disk slide is disengaged from the mold cam. Part of the mold cam lever is shown at *34,* Fig. 184. This lever, as described previously in connection with the mold disk slide, connects the slide with the cam groove in the mold cam and driving gear. Attached to the lower end of the lever is a link *35,* which raises safety lock *36* as the mold cam lever is raised to disengage the mold disk slide from its cam. When the safety lock is raised, it comes to position in front of a block *37* on the starting and stopping lever connecting rod *28,* as illustrated. This locks the starting and stopping lever *30* in its inoperative position and makes it impossible to start the driving mechanism while the mold disk slide is disengaged from its cam. When the mold slide is returned to position and the mold cam lever *34* is lowered, lock *36* will be lowered under block *37* and will make it possible to move lever *30* out.

From the standpoint of withdrawing the mold disk slide, it should be apparent from the preceding description that the starting and stopping lever must be pushed in. As shown in Fig. 184, lock *36* clears block *37* only when lever *30* and rod *28* are in their inoperative positions. When lever *30* is let out, block *37* comes to position directly above the lug on lock *36* and it will be impossible during this position to raise the mold cam lever *34* in preparation for withdrawing the mold disk slide.

Adjustments of Driving Mechanism

Proper operation of the driving mechanism depends, to a great extent, upon the correct adjustment of several related parts. All of the settings of the friction clutch and the vertical starting lever are outlined below in the sequence in which they are made when assembling the machine.

Clutch Flange Clearances. Two important clutch flange clearances are illustrated in Fig. 185. As shown in the drawing, there should be 15/32″ space between the clutch flange *15* and the clutch shaft bearing and there should also be 1/32″ play between the forked lever *16* and flange *15* *when the leather friction buffers are pressing against the driving pulley.* The purpose of these clearances is to insure positive starting and stopping of the friction clutch. The 15/32″ space insures sufficient movement for flange *15* to disengage the clutch leathers from the pulley when lever *16* moves the flange to the left. The 1/32″ play between lever *16* and flange *15* permits the clutch spring to press the friction buffers tightly against the driving pulley when the clutch is in operation. The 1/32″ clearance is adjustable, as described below, but *the 15/32″ clearance depends entirely upon the thickness of the driving shaft friction buffers.* Since the buffers are subject to wear, the clearance should be checked from time to time and if the required space is not present, it will be necessary to replace the buffers in order to restore the original setting.

The relationship between the 15/32″ clearance and the thickness of the friction buffers will be understood more easily by referring to Fig. 184. When the clutch is engaged, as indicated previously, the clutch rod spring inside the driving

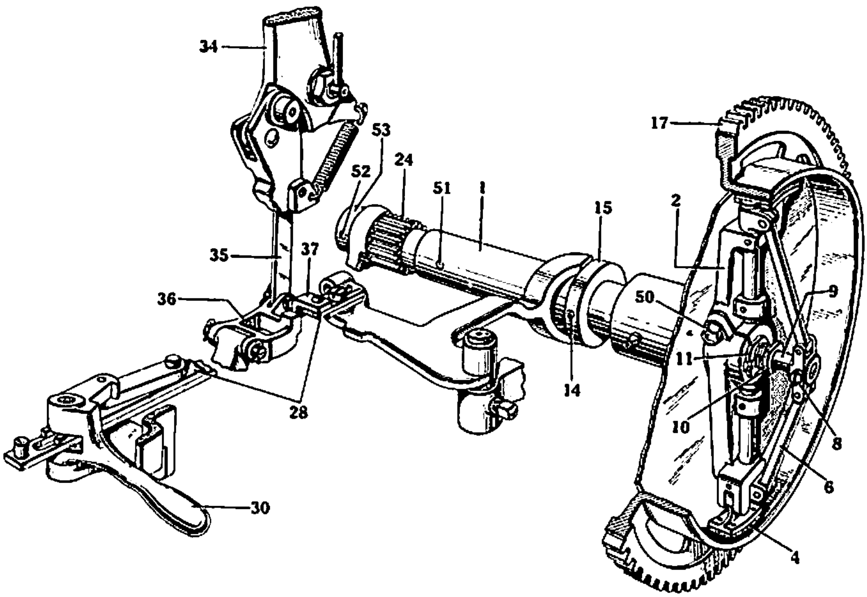

Fig. 184. Starting and Stopping Mechanism and Mold Disk Slide Safety Lock. **The safety lock *36* prevents operation of the machine when the mold disk slide is disengaged from its cam. When the mold cam lever is raised, lock *36* is automatically raised in front of block *37* on rod *28*. This makes it impossible to pull the starting lever *30* forward. When the mold cam lever is lowered to reconnect the mold disk slide with its cam, lock *36* is lowered and the starting mechanism is free to be operated.**

shaft moves clutch rod *9* to the left (viewed from the front of the machine). This causes links *6* to press the friction buffers *4* against the driving pulley *17*. The maximum movement of the clutch rod to the left, therefore, depends upon how far buffers *4* move until they contact the pulley. Since the clutch flange *15* is connected with the clutch rod *9* by screw *14*, the movement of the flange to the left likewise depends upon the thickness of the leather friction buffers.

When the friction buffers are new, the 15/32″ clearance shown in Fig. 185 is automatically established in the process of assembling the clutch shaft. The 1/32″ play between the forked lever *16* and flange *15* is then set by means of an adjusting screw in the upper stopping lever. As the friction buffers wear, however, the clutch flange *15* is permitted to move further away from the clutch shaft bearing. This causes the original 15/32″ clearance to increase and the 1/32″ clearance to decrease. If the friction buffers are permitted to wear excessively, therefore, flange *15* will bear against the forked lever *16* while the clutch is engaged and the buffers will not be permitted to grip the driving pulley with the full pressure imparted by the clutch spring. The clutch may slip under these conditions and the cams may stall during casting or ejecting position.

To maintain efficient clutch operation, therefore, the 15/32″ clutch flange clearance should be checked periodically and the friction buffers should be replaced if they are worn. If the old leather buffers are not greasy, they may be used

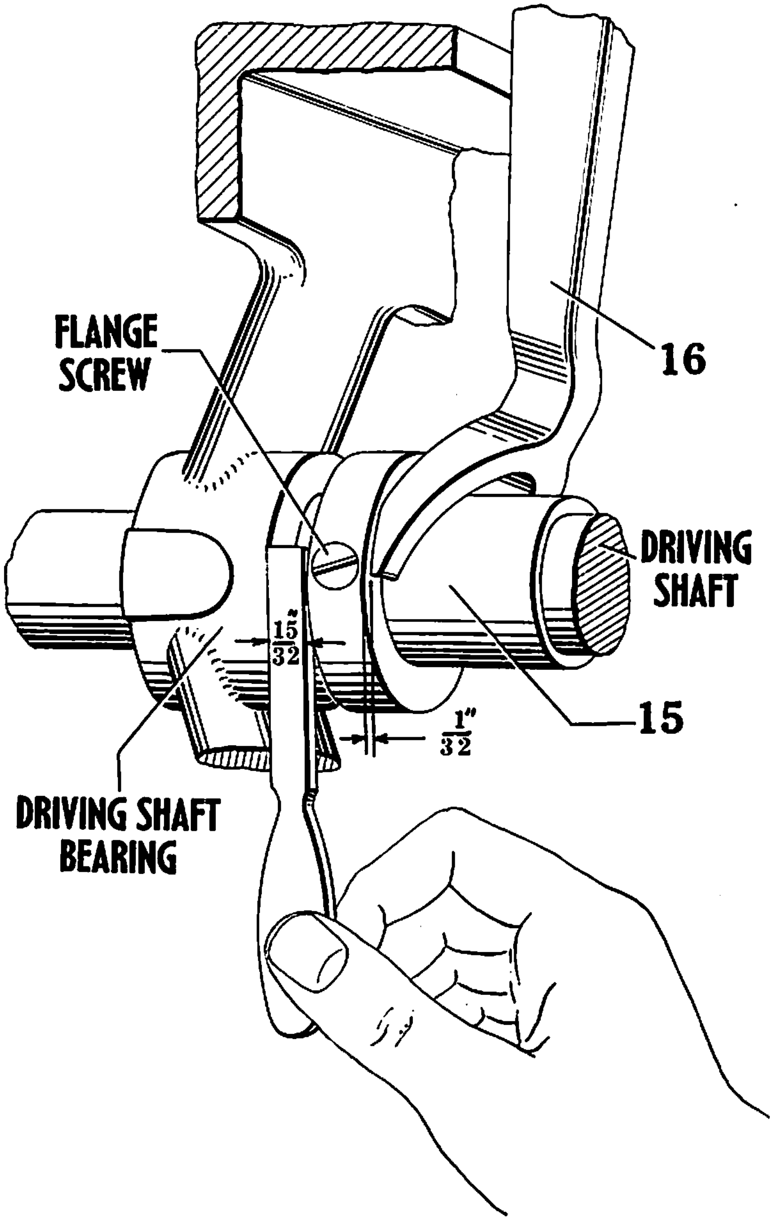

Fig. 185. Clutch Flange Clearances. Both of the clearances illustrated are obtained *when the driving shaft friction buffers are engaged with the driving gear pulley.* The motor should be shut off, of course, when measuring the clearances. The 15/32" space between the driving shaft bearing and flange *15* depends upon the thickness of the friction shoe buffers. If the leathers are worn, it will be necessary to apply new ones to restore the original setting. The 1/32" play between the forked lever *16* and flange *15* is obtained by adjusting screw *19*, Fig. 182.

again by placing thin cardboard under them to compensate for the wear. If the leather is oily or badly worn, however, it is advisable to apply new buffers to the clutch arm.

Having established the correct clearance between the clutch flange and the clutch shaft bearing, the next step is to provide 1/32″ play between the forked lever *16*, Fig. 185, and the clutch flange *15 when the driving shaft friction buffers are engaged with the driving pulley.* This adjustment is made by means of adjusting screw *19*, Fig. 182, in the upper stopping lever *20*. To test the clearance between the forked lever and the clutch flange, turn off the motor and pull the starting and stopping lever out all the way so that buffers *4* will grip the driving pulley *17*. Grasp the forked lever *16* and move it to the right and to the left to determine how much play there is between the lever and flange *15*. It will be noted that when the forked lever is moved to the right, it banks against the lower stopping lever *18*. The desired clearance between the forked lever *16* and flange *15*, therefore, is established by providing the same clearance between the forked lever and the lower stopping lever *18*. Adjust screw *19* until there is 1/32″ play between the parts and tighten the lock nut securely.

Automatic Stopping Pawl and Automatic Safety Pawl. These pawls, mounted in the delivery and elevator transfer cam, are shown in Fig. 186. In order to provide sufficient sidewise movement for the pawls to start the driving mechanism, it is necessary to set each pawl 15/16″ from the edge of the cam, as illustrated. The stopping pawl *22* is set by means of screw *38*. The screw is held against a lug on the delivery and elevator transfer cam *23* by spring *39* and limits the position of the pawl to the left. Set the adjusting screw until the right side of the pawl is 15/16″ away from the edge of the cam and tighten the lock nut securely. It will be necessary to back the cams in order to make the pawl accessible for adjustment. The adjustment of the stopping pawl plate *40* was described previously in connection with the delivery slide.

The automatic safety pawl *41*, Fig. 186, is adjusted in a similar manner by means of screw *42*. The right side of the pawl should be set 15/16″ from the edge of the cam, as illustrated. Spring *43* holds the pawl adjusting screw to the left against the cam. The adjustment of the safety pawl buffer *44* was described previously in connection with transfer lever adjustments.

Upper Automatic Stopping Lever. When the automatic stopping pawl *22*, Fig. 182, comes to rest on the upper stopping lever *20*, the pawl should have ¼″ engagement with the lever, as shown in the detail drawing. This relationship was adjustable on earlier machines but is now fixed in the process of assembling the vertical starting lever. As shown in the main drawing, the vertical starting lever shaft *32* on which is mounted the upper stopping lever *20* is fixed in position by pin *45*. The ¼″ engagement of pawl *22* with respect to the stopping lever *20* is therefore fixed on present machines.

In the case of earlier machines, a square-head set screw was provided instead of pin *45*, Fig. 182. The set screw made it possible to locate the upper stopping lever *20* in relation to the stopping pawl *22*. If the set screw is provided, therefore, lever *20* should be located to provide ¼″ engagement with pawl *22*, as shown in the detail drawing. Tighten the set screw securely when the adjustment is correct.

Vertical Starting Lever Stop Screw. When the vertical starting lever is inoperative, spring *46,* Fig. 183, causes a lug *47* on the lever to bank against stop screw *48* on the inside of the machine column. The stop screw governs the clearance between the stopping pawl *22* and the lug *26* on the vertical lever. When the pawl is resting on the upper stopping lever *20,* there should be 1/64″ clearance between lug *26* and the pawl. The purpose of this clearance is to permit pawl *22* to come to its full rest on lever *20* without being pushed to the right by lug *26.* Set screw *48,* therefore, until there is 1/64″ play between lug *26* and pawl *22,* then tighten the lock nut. When testing the clearance, hold pawl *22* to the left so that it will not move away from its normal resting position. Note also that the 15/16″ setting of the pawl, which was described above, must be correct before setting the stop screw.

Vertical Starting Lever Spring Adjusting Screw. Screw *49,* Fig. 183, limits the distance to which lug *26* of the vertical starting lever *21* can be moved in relation to the stopping pawl *22* and the automatic safety pawl. It was indicated previously that when the starting and stopping lever *30* is pulled forward, pin *27* banks against lug *33* of the vertical starting lever *21.* This causes the lever to be turned on shaft *32* and lug *26* pushes pawl *22* off the upper stopping lever *20,* thereby engaging the clutch. When lug *26* moves pawl *22* to the right, the pawl should be moved 1/16″ clear of the stopping lever *20.*

To verify this adjustment, turn off the motor and back the cams slightly so that the pressure of pawl *22,* Fig. 183, will be relieved from lever *20.* Move lug *26* by hand as far as it will go to the right, then observe the clearance between pawl *22* and lever *20.* If there is more or less than the specified 1/16″, reset adjusting screw *49* and tighten the lock nut.

Clutch Rod Spring Adjusting Bushing. Threaded in the end of the driving shaft, as shown in Fig. 184, is an adjusting bushing *10* which banks against the clutch rod spring inside the driving shaft. The bushing can be turned in to pro-

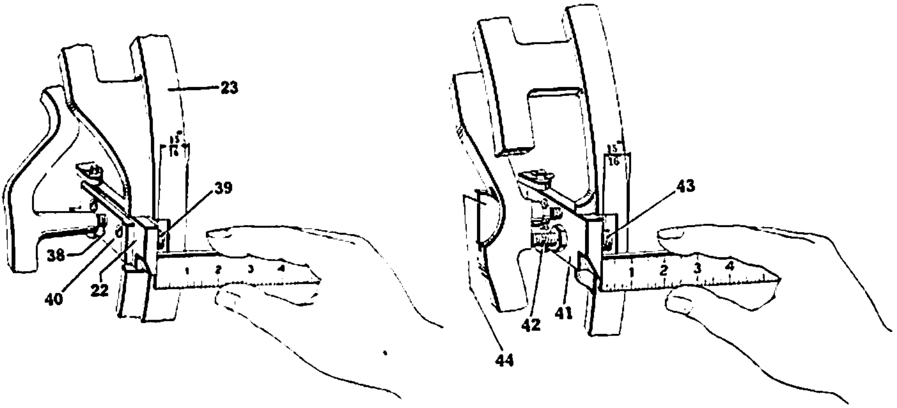

Fig. 186. Stopping Pawl and Safety Pawl Adjustments. The automatic stopping pawl *22* and the safety pawl *41* should be set 15/16″ from the edge of the delivery and elevator transfer cam, as illustrated. Pawl *22* is set by means of screw *38;* pawl *41* is adjusted by means of a similar screw *42.*

vide more compression on the spring and thereby to cause the friction buffers *4* to engage the driving pulley *17* with greater pressure. This is usually necessary only after the machine has been in use for a long period of time and if the spring has lost some of its original tension. When the spring is new, it is approximately 4¾" long and supports a weight of 22 pounds when compressed to 3⅛". The clutch spring should cause the buffers to engage the driving pulley with enough pressure to prevent slippage during normal operation.

If the clutch shows a tendency to slip when under stress, such as when the pot is locked against the mold or when the ejecting mechanism starts to function, it is permissible to turn in the spring adjusting bushing to eliminate the slippage. It should be noted, however, that *the spring adjusting bushing should not be used to compensate for worn friction buffers or for an incorrectly adjusted part.* This will defeat the most important advantage of the clutch, namely, its ability to slip when obstructions are present and thereby to prevent damage to the machine. Before resetting the spring adjusting bushing, therefore, check all of the basic clutch adjustments and make sure that they are correct.

Removal of Parts. It may be necessary at long intervals to remove the clutch arm *2*, Fig. 184, to roughen the leather buffers *4* or to apply new ones. The assembled clutch arm is removed simply by taking out screw *8* and loosening screw *50*. It will be necessary to drive a screwdriver or similar tool a slight distance into the split part of the clutch arm in order to free it from the clutch shaft. When the assembled arm *2* is removed, the buffers may be roughened with sandpaper or new buffers may be applied if necessary.

If it is necessary to remove the clutch rod spring from the driving shaft *1*, Fig. 184, the clutch arm *2* should be removed first as just described. Slide the driving pulley *17* off the shaft, turn out the spring adjusting bushing *10* and remove the driving shaft bushing *11*. The spring will then be accessible for removal. If it is necessary to remove the clutch rod *9*, take out screw *14* and pull the clutch rod out of the shaft.

If it is necessary to replace the driving pinion *24*, Fig. 184, or to remove the assembled driving shaft *1*, first remove screw *8*, loosen screw *50* and remove the clutch arm *2*. Slide the driving pulley *17* off the shaft. Remove screw *14*, drive out taper pin *51*, then slide the assembled driving shaft *1* away from pinion *24*. Sometimes the shaft of which pinion *24* is a part will bind in the driving shaft. If this is the case, apply some kerosene oil to the joint and tap the joint with a lead hammer until the parts separate. When the parts are freed, drive out taper pin *52*, remove collar *53*, then slide pinion *24* out of its bearing.

When replacing the driving shaft and its parts, two important points should be borne in mind. First, note in Fig. 182 that when the machine is in normal position with stopping pawl *22* resting on lever *20*, the clutch arm *2* should be parallel with respect to the floor. The reason for this is that the friction buffers *4* are held an equal distance away from pulley *17* when the clutch is disengaged. Note also that when the clutch does engage, both buffers will grip the pulley simultaneously and will rotate the cams with a uniform starting movement. In order to locate the clutch arm *2* in the position shown, note that key *54* is located at the top of the driving shaft *1*. When replacing the shaft and when remeshing