CHAPTER 12

The Mold, Mold Disk and Mold Slide

FROM THE general description of the Linotype mold in Chapter 1, it is evident that this mold is a very substantial unit composed of few separate parts, and is mounted either singly or with others, on the mold disk.

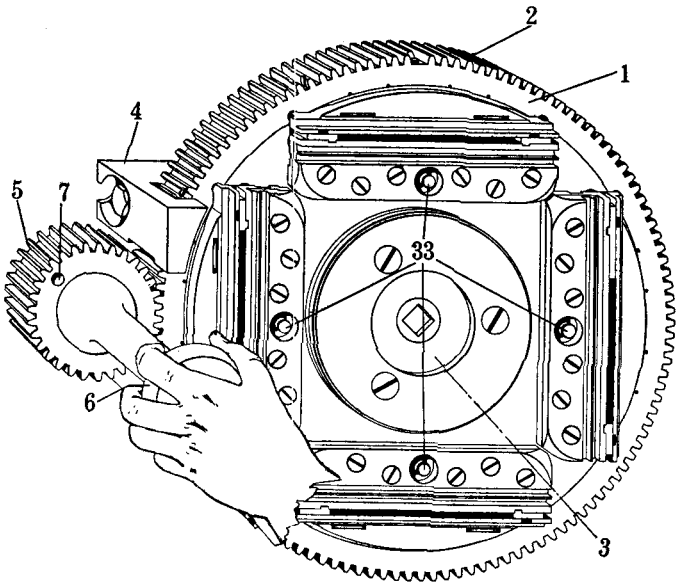


FIG. 1-12. Perspective view of the mold disk containing four molds. (See p. 146 for six-mold disk.) The mold disk, *1*, has teeth, *2*, cut on its circumference. The disk is mounted on the *hollow* stud, *3*, through which water is circulated.

On the left-hand side there are two guides, *mounted* on the mold slide, to prevent the thrust of the back knife from springing the mold disk while the bottom of the slug is being trimmed. The upper guide is shown at *4*.

The mold disk *1* is caused to rotate by the pinion *5*. This pinion is connected to a shaft running from the front to the rear of the machine, in bearings on the mold gear arm. On the front side of the pinion *5* is a handle *6*, which may be grasped by the *hand*. Through this handle *6* the mold disk pinion *5* may be disconnected from its driving shaft and the mold disk may be rotated by hand.

The mold disk has four locking studs *33* on its front surface. The two studs which are on the horizontal diameter of the disk when the mold disk is advanced to casting or ejecting position, serve to align whichever mold is in use at that time, for casting or ejection of the slug. They accomplish these alignments by registering with two mold disk locking stud blocks shown in Fig. 2-11 in Chapter 11.

THE MOLD DISK

The mold disk or "mold wheel" has a front surface which is substantially flat. The rear side is flanged all around the circumference on which gear teeth are cut, and it also has a flanged center bearing upon which the disk is rotated.

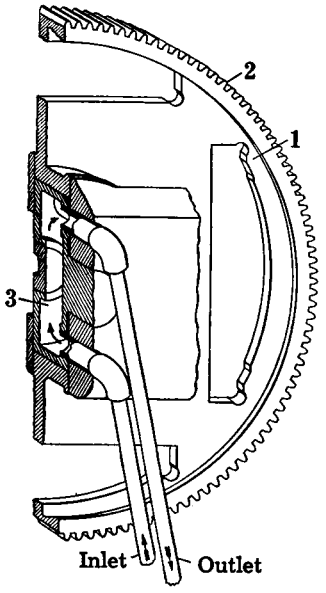


FIG. 2-12. Diagram showing the water circulation system of the water-cooled mold disk.

Generally the mold disk has four openings to receive as many molds, but on some special machines the mold disk accommodates six molds.

The rotation of the mold disk in order to bring the mold which is in use from the ejecting or normal position to the casting position, and then again to the ejecting position, is accomplished by means of the mold disk turning pinion which is in mesh with the teeth on the circumference of the mold disk. The teeth on this pinion are wider than those on the mold disk, so that they are always well in mesh as the mold disk or pinion is moved forward and back. The mold turning pinion is on the front end of a long shaft which extends from the front of the machine back toward the cam shaft, but it is not pinned or keyed to the shaft in the ordinary way. Instead, there is pinned to the long shaft just back of the pinion, an arm on which is fastened a driving pin which registers with a hole through the mold turning pinion. A spring holds the pinion back against the arm, so that normally the arm and pinion are held together and act as a single operating unit.

In front of the mold turning pinion, and part of it, is a handle by means of which the pinion can be pulled forward out of lock with the arm on the shaft. It is then possible to rotate the mold disk with the pinion by hand, so as to bring any of the four molds in the disk into operating position. The mold turning pinion is then allowed to be forced back by the spring, and when the driving pin again enters the hole through the pinion the mold disk is in proper register with the mold turning cam on the cam shaft.

On its rear end, the long shaft carries a small spur gear which engages a larger spur gear on a short jack shaft inside of the mold gear arm. At the rear end of the short shaft there is a small bevel pinion and a square steel block, the side plates of which are hardened and ground.

The mold turning cam carries on its circumference two segments of a large diameter bevel gear, a short segment, and a long segment (three times the length of the short segment).

The short segment meshes with the bevel pinion on the short jack shaft in order to rotate the mold disk from the ejecting to the casting position, and the long segment acts similarly to rotate the mold disk from the casting to the ejecting position. After each of the above noted rotations the mold disk is advanced toward the front of the machine and is positioned exactly by the mold disk locking stud blocks. In order to prevent wear on either the mold disk locking studs or locking stud blocks it is necessary to locate the disk as accurately as possible beforehand. For this purpose each of the bevel gear segments has immediately

before and after it on the mold turning cam a hardened and ground steel shoe adjustable so as to be brought close (about .002″) to the side of the square block on the end of the jack shaft. During the rotation of the jack shaft by the segments there is clearance provided for the square block when turning. During the time when the mold disk need not be so very accurately located, the play of square pinion is limited by the surface finished on the mold turning cam itself.

In order to overcome any vibration incident to the rotation of the mold disk, and to maintain a constant friction tending to hold the disk after it has backed

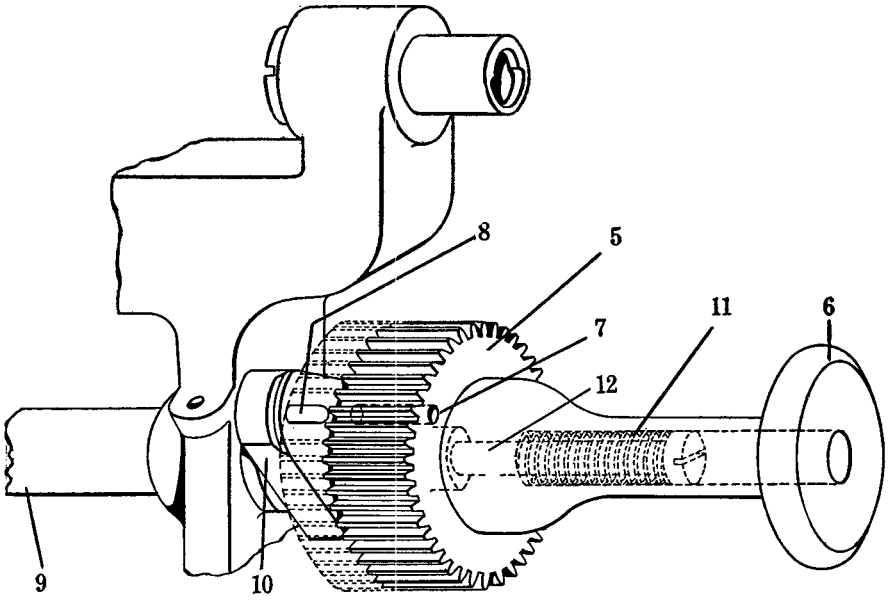


FIG. 3-12. Another view of the mold disk turning pinion 5. The driving shaft for the mold disk is shown at 9. Mounted on the shaft 9 is a sector *10* on which is fastened a pin *8*. The mold disk turning pinion has a hole 7 passing through it. The shaft 9 drives the mold disk pinion through the pin *8* in the hole 7 of the pinion. When the mold disk turning pinion 5 is pulled by hand toward the front of the machine, the pin *8* is disengaged from the pinion 5, but the teeth of the pinion remain in mesh with the teeth of the mold disk, thus allowing the disk to be turned by hand. Inside of the mold disk turning handle is a compression spring *11* around a stud *12* which is screwed into the center of the sector *10*. This spring, acting between the head of the stud *12* and a seat in the pinion handle, pushes the pinion toward the rear when the hole 7 through the pinion registers with the pin *8* on the sector, and holds the parts together on the shaft 9.

The diameter of the mold disk turning pinion is exactly one-quarter of the diameter of the mold disk gear. Therefore, one complete turn of the pinion rotates the mold disk one-quarter of a revolution, the pin *8* registering with the hole 7 through the pinion and driving the pinion.

When the vise frame has been lowered and the mold disk pulled forward so that the teeth of the pinion are no longer in mesh with the teeth on the mold disk, these teeth must always be properly remeshed so that the pinion and gear will be properly timed. For this purpose there is a spot on the edge of the pinion face, and four spots (one every quarter turn) on the edge of the mold disk face. The pinion and gear must be meshed so that the spot on the pinion always matches a spot on the mold disk.

away from its locking stud blocks, an adjustable friction brake is provided. This brake, shown in Fig. 6-12, consists of a leather-lined friction clamp on the pinion shaft and is adjustable by means of a screw and lock nuts which hold a clamp spring. Projections on the two castings which comprise the clamp, rest against the mold arm casting, preventing the clamp from turning with the shaft. When adjusting the clamp spring, it should not be made tighter than actually necessary. If adjusted too tight, the main clutch could not drive the machine, as the clamp spring would overcome the tension of the clutch spring.

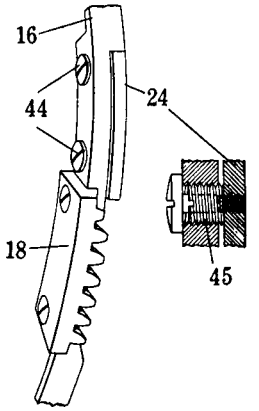


FIG. 4-12. Shows a segment of the gear rack which revolves the shaft turning the mold disk.

It also shows the steel shoe which runs alongside of the square block and holds the mold disk in position to slide freely on mold disk bushings *8* and *9*, Fig. 2-11 at casting and ejection.

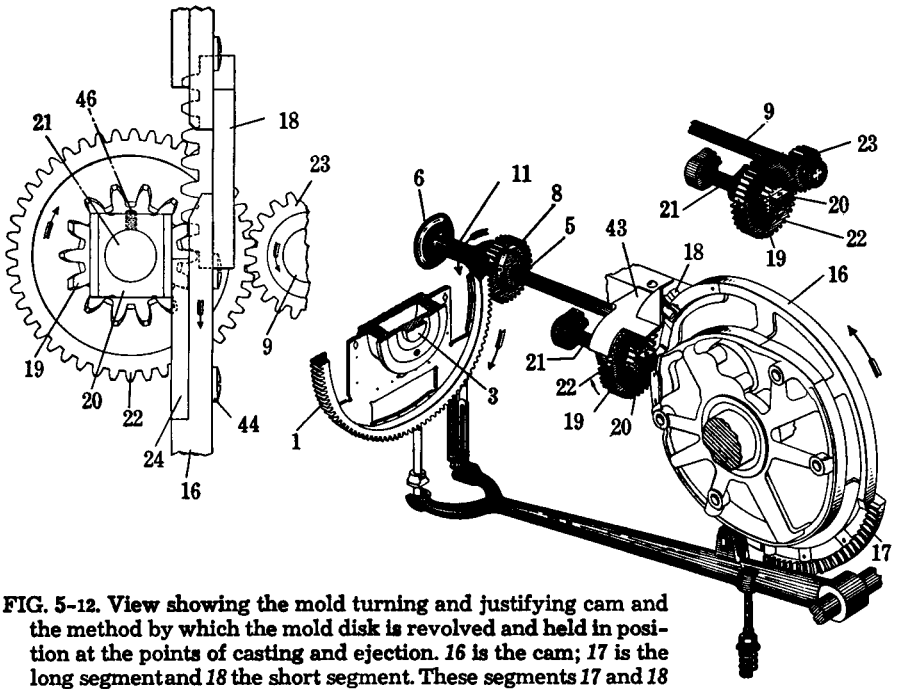


FIG. 5-12. View showing the mold turning and justifying cam and the method by which the mold disk is revolved and held in position at the points of casting and ejection. *16* is the cam; *17* is the long segment and *18* the short segment. These segments *17* and *18* are portions of a circular bevel gear fastened to the cam *16* and at the proper time engage the bevel pinion *19*.

Just back of the bevel pinion *19* is a square block *20*. This block rides on a surface of the cam *16*. The surface is cut away at certain points so as to permit the block *20* to revolve when the segment *17* or *18* is in mesh with the beveled pinion *19*.

While the block *20* is riding on the inside surface of the cam *16*, the beveled pinion

19 cannot turn; the shaft *21*, on which the bevel pinion is mounted, is also motionless.

In front of the bevel gear pinion is a spur pinion *22* mounted on the shaft and fastened to it. This pinion *22* is in constant mesh with a pinion *23* mounted on a shaft *9*. This shaft extends forward and has at the front end another pinion *5* mounted on it.

When either segment *17* or *18* is in mesh with the bevel pinion *19*, the shaft *9* is caused to revolve by the spur pinions *22* and *23*. When either segment *17* or *18* is not in mesh, the block *20* holds the shaft *9* stationary. This arrangement is what is known in mechanics as a "Geneva lock."

It will be noted that on the segments *17* and *18* the first tooth engaging the bevel pinion is partly cut away.

The pinion *5* is not fast to the shaft *9*, but is held to the shaft by a device which consists of a hand wheel *6* and a pin *8*, shown in another view. The pin *8* engages in a hole in the pinion *5*, and is held there by a spring *11* not shown because it is inside of the pinion.

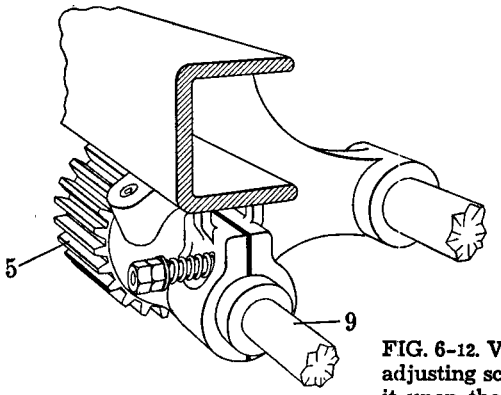


FIG. 6-12. View showing the mold disk brake with adjusting screw for holding the same for clamping it upon the shaft. The object of this brake is to prevent the momentum of the mold disk when revolving from carrying it beyond the proper position to go forward on the locking stud blocks. The clamp should be adjusted so that the mold disk stops in the proper position.

As the leathers wear, the brake must be adjusted from time to time. This will usually be at long intervals, however.

THE MOLD SLIDE

The mold slide which serves to support the mold disk and to move the disk forward to present the mold to the matrices for casting the slug, backward again while the mold disk is being rotated to the ejecting position, then forward for ejection of the slug, and finally back again ready for the mold disk to be rotated to the casting position, is supported on its right side by, and operates in, a runway on the left side of the column of the machine.

It is a casting with beveled edges on the arm which slides in corresponding bearings on the column, and has an arm at right angles extending to the left near the front of the machine. The slide portion of the casting houses the universal ejector blade, while the arm at the front carries the mold disk, also the back knife and the mold disk supports. The extreme left end of this arm is supported on the frame of the machine by a large hardened screw upon which the lower mold disk support rests. Correct adjustment of this support screw is very important, and its lock nut should always be kept tight.

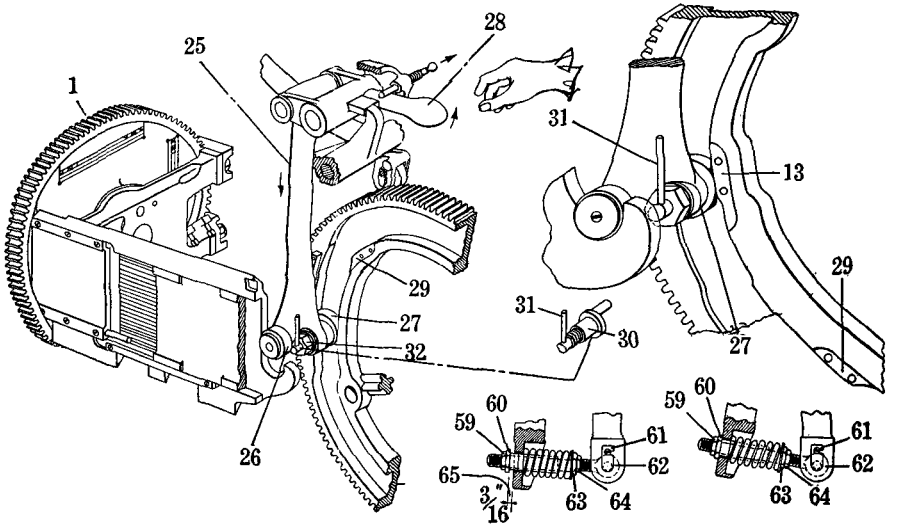


FIG. 7-12. View showing the mold mechanism and the means of connecting and disconnecting the mold slide. In the view given the rolls *26* and *27* mounted on the mold cam lever are shown lifted, the handle *28* being underneath a little spring pin which holds it in its position. By pulling this pin outward the handle *28* is allowed to rise, lowering the mold cam lever *25* into position to connect with the mold slide.

The small view at the right shows the mold slide lever in position to operate the mold slide, and also an eccentric pin and adjustment for the roll which moves the mold slide forward and back, in order to take up normal wear.

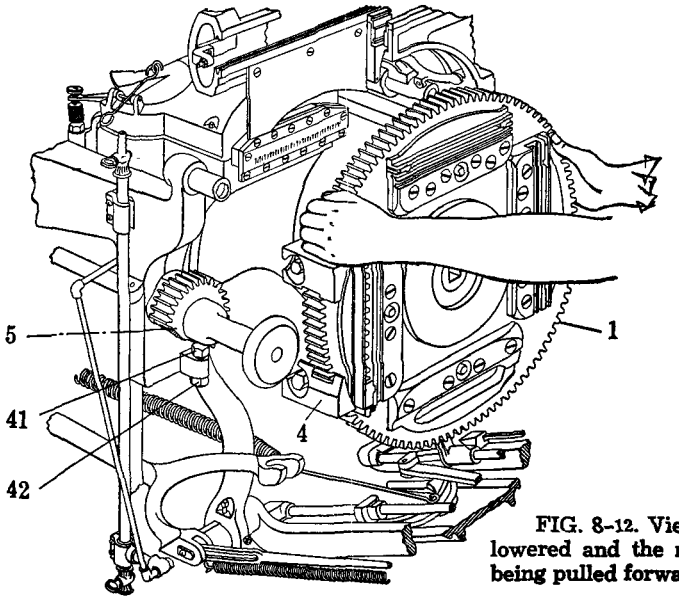


FIG. 8-12. View showing the vise lowered and the mold disk and slide being pulled forward.

At the rear end of the mold slide is a semi-circular notch into which fits a roller carried on the right side of the lower end of a hanging arm. This arm is operated by the mold slide cam and gives the mold slide its forward and backward motions.

It is called the mold cam lever, and on the lower left hand end it carries the cam roller which is adjustable for position with reference to the mold slide roller by means of an eccentric pin, as shown in Fig. 7-12.

The mold cam lever is mounted upon another arm in such a way that the roller can be lifted out of the notch in the mold slide so as to disengage the slide from the lever which operates it.

MOLDS AND LINERS

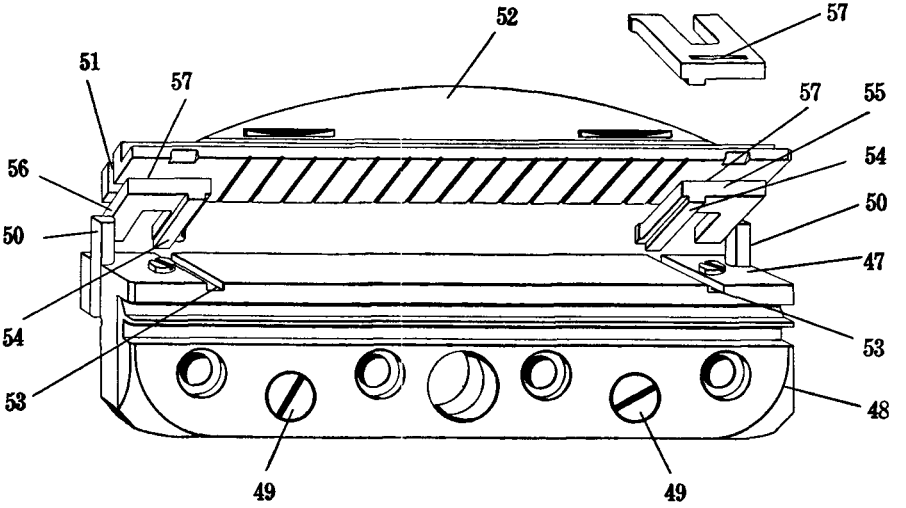


FIG. 9-12. View of the mold. *47* is the mold body. On this mold body is a separate piece *48* having a groove in it. This is called the "keeper." The keeper is fastened to the mold by screws *49*. The mold is fastened to the disk by four screws, the holes for which are shown. At each end of the mold body are two upright posts *50*. These posts fit into two notches *51* at each end of the mold cap *52*. The mold body has also in it two grooves from front to rear *53*. These grooves are for the purpose of affording a seat to a projecting rib *54* upon the liners *55* and *56*.

The right-hand liner *55* is always of the same dimension, except in the matter of thickness, which varies for different body sizes. The left-hand liner *56* not only varies in thickness but also in length. The distance between the liners *55* and *56* forms the limits of the length of the slug. In the mold cap *52* there are a number of transverse grooves. These grooves are about .015" deep, on the front side, or on the side toward the operator, and taper toward the rear. These grooves form recesses into which metal flows, and form the ribs on the slugs. These ribs form a shaving surface which is more easily and accurately trimmed than if the knife were to be subjected to the strain of cutting the whole width of the slug.

In the liners *55* and *56* there are on the upper side two small notches *57*. These notches are clearly shown in the perspective view at the right of the main view. Their purpose is to facilitate removal with the aid of a screwdriver.

Universal Adjustable Mold

The universal adjustable mold is adjustable for any measure from 4 to 30 pica ems and from 5 to 14 points in body thickness. The body portion of the mold is screwed firmly to the disk. The mold cap overlying the body is held securely at each end by upright mold cap guides insuring positive positioning, front and back, of cap and body—a necessity for accurate slugs.

The right- and left-hand liners are held firmly in position by the pressure of the mold cap screws, and by keys on the bottom of the liners, which fit in the slots in the mold body, insuring rigidity and accuracy in length.

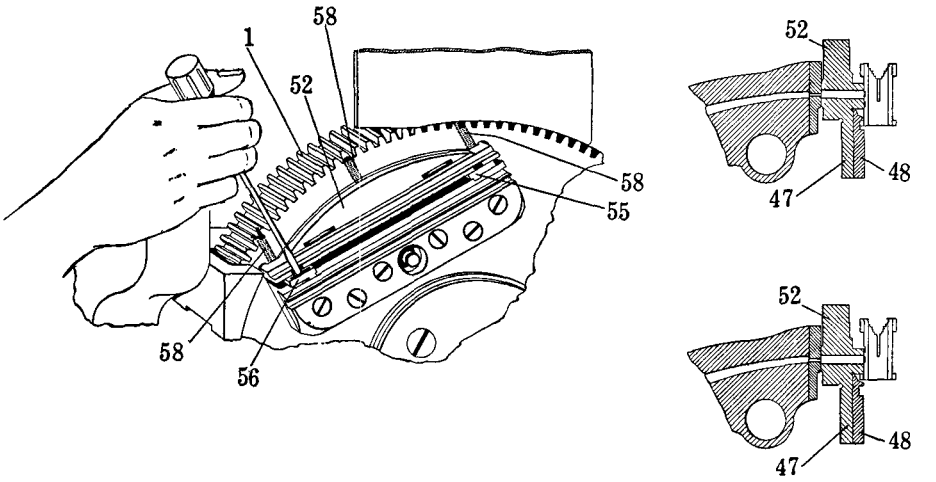


FIG. 10-12. View showing the method of removing and replacing liners in the mold. In this figure, *1* is the mold disk, *56* is the liner, which has in its upper edge a small groove in which the end of the screwdriver may be inserted when removing the liner. The screws *58* have been loosened a little so as to relieve the mold cap *52*.

The two liners *55* and *56* can then be removed and replaced. When the length of the line is to be changed, the liner *56* is the only one that is removed and replaced. When the body of the slug is to be changed, both the liners *55* and *56* are replaced.

In making this change, it is most convenient to revolve the mold disk a little to the left (by means of the handle), as shown in the illustration.

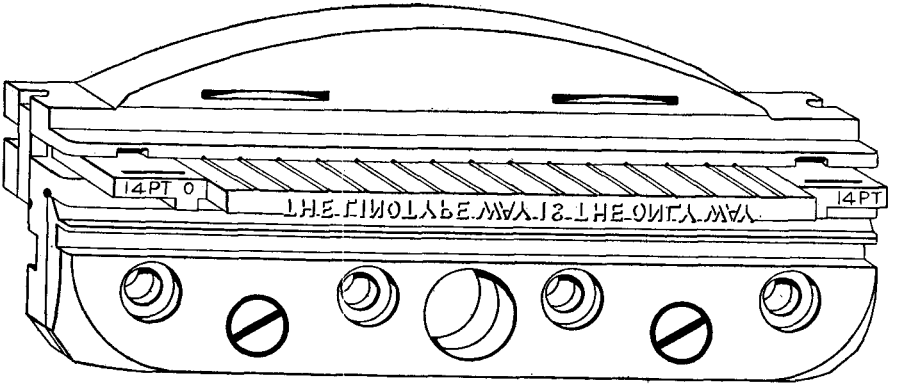


FIG. 11-12. Universal adjustable mold.

A change of measure and body does not affect the general relation of the mold to the trimming knives. Therefore, the molds and knives, when properly adjusted, will maintain their corresponding position indefinitely, thus insuring slugs of equal height and thickness. The mold disk opening or pocket is of a curved form on the outer side, with three set screws through the rim from the outside which hold the mold cap liners securely in place.

In order to change the length of the line, it is only necessary to loosen the screws so that the left-hand liner may be withdrawn easily and one of the proper length inserted. The mold cap can be raised by inserting a screwdriver in the slots which will be found in both ends of the cap. Never pry the cap open by inserting screwdriver in the mold slot. This will eventually ruin the mold.

If a change of body is required, the three mold cap screws are loosened, and both liners (right-hand and left-hand) withdrawn and the proper ones inserted. When tightening the screws, use only a moderate pressure.

Liners can be supplied for all measures in even ems or half ems up to 30 ems (30-em mold), or up to 42 ems (42-em mold), and in all bodies from 5 to 14 point, inclusive.

Recessed Mold

In order to reduce the quantity of metal in large slugs and to improve the face on characters—10 to 14 point, inclusive—this mold is provided with a cap having projecting portions forming large cavities or recesses in the slug, as shown in the illustration, thus reducing the weight about one-third.

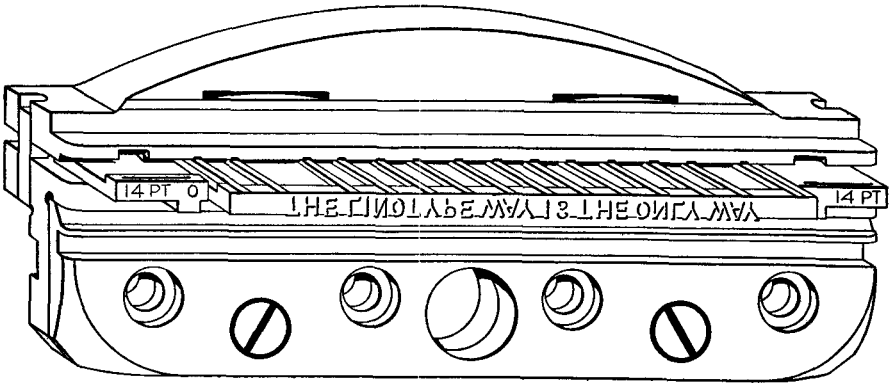


FIG. 12-12. Recessed mold.

The slug has a solid face, as usual, and ribs at the side to sustain the face, so that it will stand up solidly under the pressure of stereotyping, electrotyping, or printing from the slugs direct.

The recessed mold is, in general construction, similar to the universal adjustable mold. The right-hand liner is precisely the same as that used in the universal adjustable mold, but the left-hand liner, which is used in changing from one measure to another, *is special, and can be used only in a recessed mold.*

The mold can be applied to any machine having a universal adjustable mold disk, without altering or fitting.

The slugs being much lighter than when cast solid, the saving in metal reduces the expense of keeping matter standing. As the air to be displaced from the mold is less than that from the universal adjustable mold, more perfect slugs are secured, especially on the larger sizes.

Display or Head-Letter Mold (One-Letter)

The one-letter display mold, used to cast the larger bodies, is similar to the recessed mold, the recess being proportionately deeper to accommodate the increased size of slug. This style of mold requires a pocket or opening in the mold disk somewhat larger than that required for other styles of molds. This mold is adjustable for body size as well as length of line and is used in the same general manner as other molds.

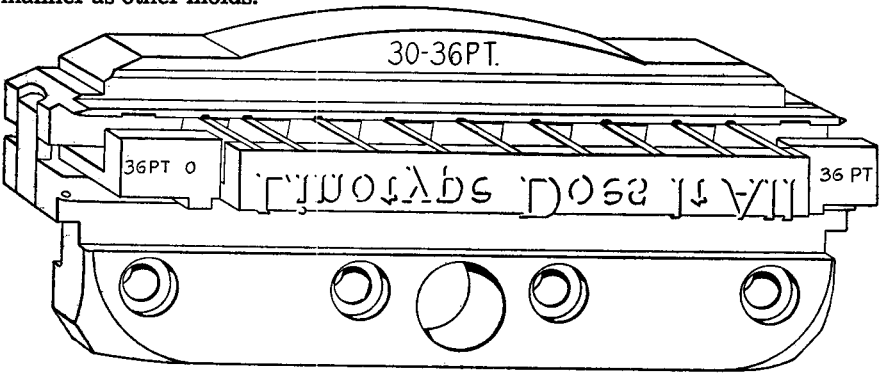


FIG. 13-12. Display or head-letter mold (one-letter).

Display or Head-Letter Mold (Two-Letter)

The two-letter display mold, such as that shown in Fig. 14-12, is used to cast Linotype 18- and 24-point two-letter display faces. It is made in three styles: 18 point, 18-24 point, and 24 point. This mold has a two-letter "keeper" and the auxiliary aligning point is raised to permit casting the auxiliary position characters.

The face in either the normal or auxiliary position is cast separately and is assembled in the regular position in the assembling elevator. When casting the auxiliary position face, the 45-point first elevator slide filling piece must be in position on the vise cap.

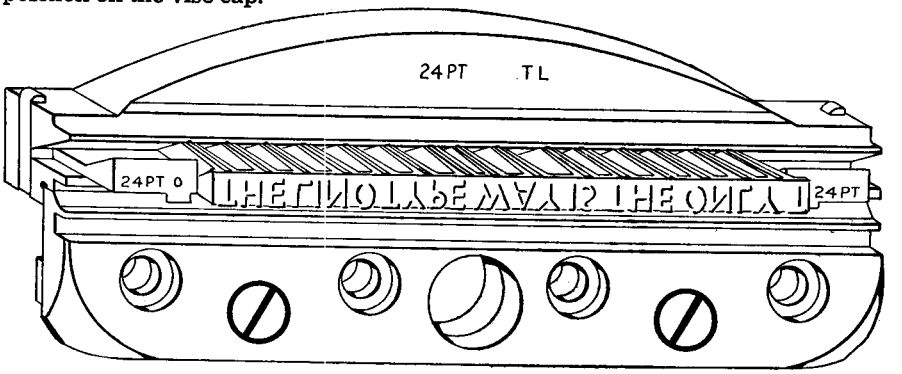


FIG. 14-12. Display or head-letter mold (two-letter).

Care should be exercised in removing and replacing liners on two-letter display molds. Also in pulling the mold disk forward by hand, it should not be pulled forward to a point where the cap of the two-letter display mold will strike the mold disk stop dog on the vise frame. Such contact may result in damage to the mold cap and cause unnecessary expense.

Advertising Figure Mold

This mold is made for the purpose of casting large figures for prices or other display characters on a slug of smaller size than the face of the type. It permits of casting a character that overhangs the slugs below. There is a wide lip on the cap, against which the overhanging portion of the character is cast, and the ribs are parallel, instead of tapered as usual. This mold will cast overhanging faces up to 24 point in face, and it is adjustable in body from 5 to 12 point.

In special cases this mold will be adapted to accommodate 14- or 15-point liners so that certain 30-point display faces can be cast overhanging. ***When 14- or 15-point liners are so used, the two-letter attachment must be used to prevent the mold cap lip from striking the first elevator back jaw.***

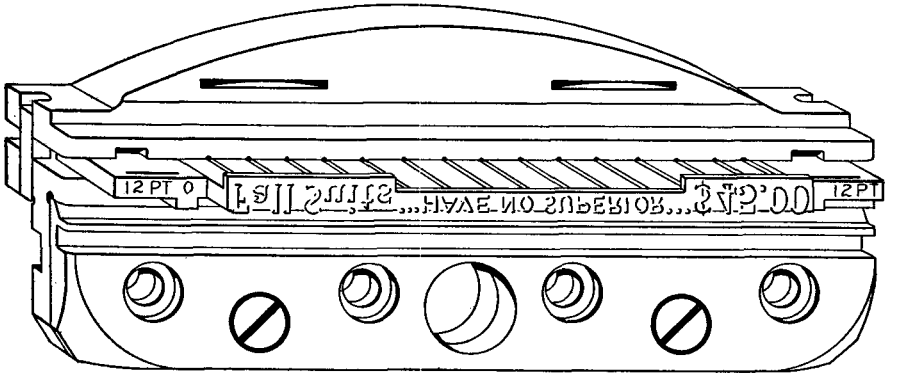


FIG. 15-12. Advertising figure mold.

Fig. 15-12 shows the advertising figure mold with slug bearing overhanging characters. This style of composition is frequently required in newspaper and job work, and is easily and quickly accomplished by the use of this type of mold.

Special Advertising Mold

For Use with Matrices in the Auxiliary Position—This mold is for use with extra large figures and display faces. It is a one-letter mold for use only with matrices punched in the auxiliary position, and will cast larger figures up to and including 42 point. Thus, its scope is much larger, due to an extra wide lip on the mold cap to provide for the overhang, than the regular advertising mold. Regular universal adjustable mold liners from 5 to 12 point, inclusive, can be used with this mold. Largest overhang that can be cast against face of mold cap is 27 points.

Mold Liners

Universal Adjustable Mold Liners—Universal adjustable mold liners are made in point sizes from 5 to 14 point, inclusive, and, in length, to produce a slug by ems or half ems from 4 to 42 ems, inclusive.

When ordering liners specify the body size and also the length of slug to be set, and on what type of mold they are to be used.

Changing Mold Liners

To change liners, lower the vise and revolve the mold disk to a convenient position where the mold will be accessible, as shown in Fig. 10-12. Be sure to change the ejector blade before changing liners for a different length of slug. The mold

must be turned to the ejecting position after the change. Do not remove the keeper from the mold for any reason, except an injury. If it is necessary to remove it, care must be taken in replacing it to see that there is no dirt on it and that its upper edge is seated properly as this controls the alignment of the matrices. Set the vise jaws by the gauge attached to the vise, close the vise, and set the trimming knives, the assembler slide and delivery slide.

In order to change the left-hand mold liner in a 36-em mold, it is necessary to take the mold from the mold disk, after which the cap can be removed and the liner taken out. The liner is held in position by the mold cap guide and cannot be changed while the mold is in the mold disk, as the universal adjustable mold liner is changed. Be sure that the mold body and cap are perfectly clean, and that there is no metal adhering to them when changing liners.

Left-hand liners made for 30-em molds cannot be used in 36-em molds, and *vice versa.*

The Back Knife

After the slug has been cast, the mold disk is caused to make three-quarters of a revolution to its stopping position for ejection of the slug. While doing this, the back of the mold passes the "back knife." This knife is mounted very close to the left-hand end of the same arm of the mold slide which supports the mold disk. It presses closely, but yet lightly, against the back of the mold, and serves to shave off any surplus metal which may adhere to the base of the slug when the pot mouthpiece is withdrawn from the mold, and so makes the bottom of the slug

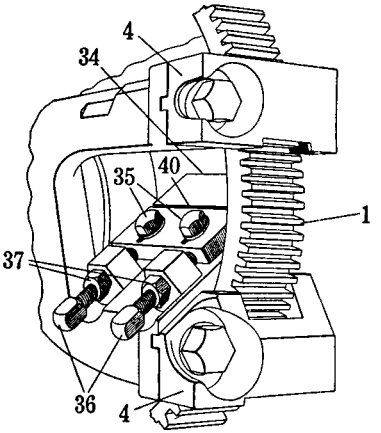


FIG. 16-12. View of the back trimming knife and the adjusting and clamping screws for bringing the edge of the knife in the correct position against the mold, so that it will trim the bottom of the slug and at the same time will not score the mold.

smooth and the slug itself "type high." It also effectively removes any metal which may adhere to the back of the mold disk locking studs. The back knife is adjusted by two square-head screws back of it, and is held in place by two hexagon-head clamping screws, as shown in Fig. 16-12.

This knife should always be kept sharp, but should not have a razor edge; nor should it be set so close as to cut or gouge the backs of the molds and mold liners.

The Back Mold Wiper

The back mold wiper shown in Fig. 17-12 keeps the back of the mold clean and polished and prevents the accumulation of metal.

By keeping the molds clean at all times, a perfect lock-up is maintained with a freedom from back squirts. A felt disk is held against the back of the mold by spring pressure, assuring constant and uniform wiping contact.

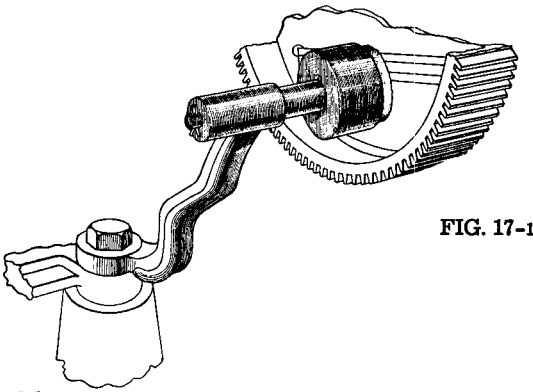


FIG. 17-12. The back mold wiper.

This very simple attachment is not mounted on the mold slide, but is held in place on the frame of the machine by one large screw, and can easily be removed for cleaning or renewing the felt wiper.

Front Mold Wiper

In order to keep the front face of the mold clean and free from metal particles, there is provided a wiper consisting of three layers of felt held at the upper end of a two-armed vertical lever which has its fulcrum on the side of the mold disk locking stud block (right-hand) and has a coil spring which keeps the edges of the layers of felt in yielding contact with the front of the mold.

This wiper is at the upper right of Fig. 48-1. It is simple and requires little care, but it is well to remember that no grease should ever be used on the felt, and that graphite is the only lubricant allowable. The graphite should be applied by rubbing it on the felts after they have been soaked with gasoline.

Molds for 24½-em Six-Mold Disk

Molds for the 24½-em six-mold disk are short and compact and cast a maximum slug length of 24½ ems. The same variety of molds is provided as for the four-mold disk, the only difference being in the length of slug cast.

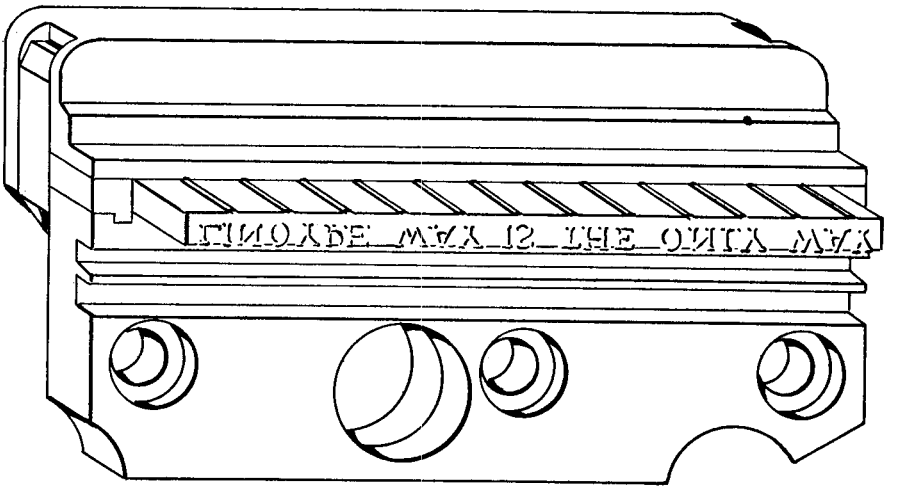


FIG. 18-12. Universal adjustable mold (24½-em).

The mold illustrated in Fig. 18-12 is the type used in the 24½-em six-mold disk. Both right- and left-hand liners are arranged to lock around the mold cap guides. To change liners in this type of mold, the mold is removed from the disk, the cap separated from the body and the liners changed. Universal adjustable, recessed and advertising figure molds are adjustable for body size as well as length of line. Display molds are adjustable only for length of line.

Molds for 30-em Six-Mold Disk

These molds, while different in shape than those used in the 30-em four-mold disk, cast full 30-em slugs. The same variety of molds is provided as described for four-mold disk machines.

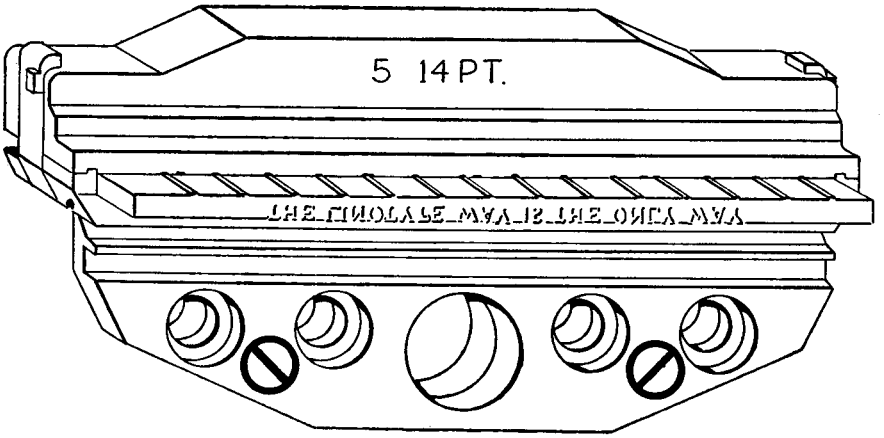


FIG. 19-12. Universal adjustable mold (30-em).

The mold illustrated in Fig. 19-12 is the type used in the 30-em six-mold disk. All molds for this type of disk are adjustable both as to body size and length of slug cast, by changing liners. To hold the liners securely in place during casting and ejection, the left-hand liners have projections on the upper surface which fit into corresponding grooves in the mold cap.

To change liners, the mold cap clamping screws are loosened and the liners tapped from the back of the mold sufficiently to permit withdrawing them from the front of the disk.

SIX-MOLD DISK

Fig. 20-12 shows a 30-em six-mold disk. The six molds provide a greater variety, and reduce the necessity for frequent liner changes. On newspaper "head" machines three molds may be equipped to set single column of various body sizes, and three with double column liners.

There are available two six-mold disks, one to cast slugs of 24½ picas maximum length and the second for casting slugs of 30 picas maximum length.

These mold disks are constructed of new special material. The mold disk guides are of hardened and ground steel and are adjusted in the factory.

Six molds are equally spaced in the disk at 60° intervals (instead of 90° as in four-mold disks). Their normal operating position differs correspondingly. The mold disk pinion carries three locating holes (rather than one as is the case of the four-mold disk). Since the mold disk moves only 60° from one mold to an adjacent

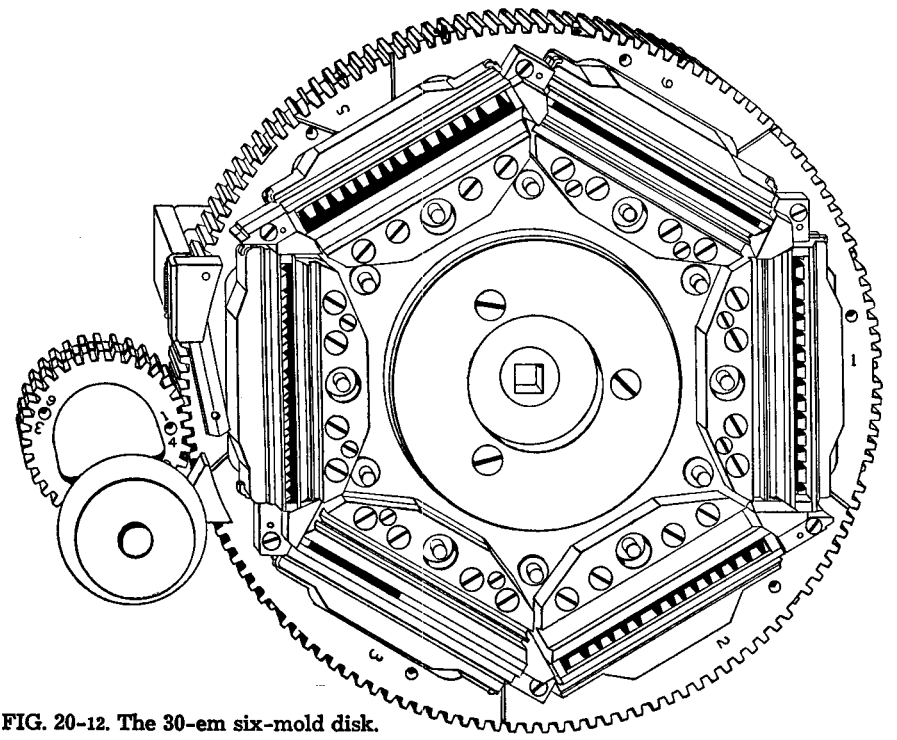


FIG. 20-12. The 30-em six-mold disk.

mold, the pinion turns 240°. Additional holes are provided at intervals of 120° to compensate for the loss of 60° on the pinion.

The pinion should be rotated only when the machine is stopped in normal position. Numbers are provided as a guide to assist in locating the mold disk in approximate position. Spots (as on the four-mold disk) are provided to align the disk, three on the pinion and one for each mold on the disk visible through the hole in the safety lever. Unless two spots align, the mold disk will be out of time.

When the mold disk is pulled forward and turned, it is well to remember what mold is being used. When relocating the disk, if the mold number has been forgotten, always relocate either the No. 1 or No. 4 mold in normal position and try the ejector blades for length of line to be certain they match. If they do not, the pinion can be rotated until the proper blades come through the mold.

MAINTENANCE

Adjustments of the Mold Turning Mechanism—The mechanism of the mold turning shaft is shown in Fig. 4-12 and 5-12. The smoothness of the operation of the mold disk depends on the proper setting of the steel shoes *24* in relation to the square block *20*. The hardened steel shoe *24* is adjustable by means of a threaded bushing as shown in Fig. 4-12.

When making this adjustment, remove the guard *43*, Fig. 5-12 which is fastened to the machine with one screw. Then start the machine and allow the first elevator slide to descend until it rests on the vise cap, and shut off the machine *before* the

mold disk has started forward to engage the mold disk locking studs. The steel shoe *24* will then be in contact with the square block *20* and in this position the amount of play between the shoe and the block can be seen when the shaft *9* is rocked backward and forward by hand, using the handle *6* to obtain this motion.

If there is excessive play between these parts, allow the machine to advance to where a screwdriver may be used for removing the screws *44*, Fig. 4-12. The screws should be removed one at a time to prevent the shoe *24* from dropping off the cam. After the screw has been removed, turn inward on the screw bushings *45*. One complete turn of the bushings will give a movement of .050", so when making the adjustment, only a fraction of a turn should be made before testing. Tighten the screws *44*, and, with a micrometer or calipers see that the distance in relation to the outer edge of the cam is the same at both ends of the shoe, then bring the machine to normal position and turn it by hand to see that the shoe does not bind excessively against the square block.

Turn the machine to the ejecting position and examine the shoe and square block at that point, and adjust if necessary in the same manner as described. Several trials may have to be made to get the exact adjustment.

This adjustment must be made properly so that when the mold disk is revolving it will be turned far enough ahead to bring the mold disk locking studs in exact line with the stud blocks so it can advance freely, without noise or bind.

See that the felt which is fastened to the side of the guard *43* is kept well oiled.

If necessary to remove the spur pinion *22* from the machine, turn the cam shaft backward until the mold disk comes ahead against the pins, remove the guard *43* and loosen the set screw *46*. The machine will now be in position so that the back end of the shaft may be pried forward slightly to start it and the opposite end will then protrude enough to allow the shaft to be wedged out with a large screwdriver or similar tool. To replace the gear, have the machine with the mold disk ahead on the pins, and this will bring the steel shoe *24* in contact with the square block *20*. In this position there will be no possibility of getting the shaft out of time. The square with the set screw *46* must remain at the top as before, and when the gears are correctly meshed, the shaft will go into place easily.

Adjusting the Back Knife--Fig. 16-12 shows the knife which trims the back of the slug as the mold disk revolves past it, and it should be sharpened frequently to keep the cutting edge in good condition.

If trouble is experienced with slugs that are more than type high (.918"), lower the vise to the first position, disconnect the mold slide in the manner illustrated in Fig 7-12, pull the slide forward to clear the small gear and then remove the back knife *34* and see if the upper and lower mold disk guides *4*, Fig. 16-12 are resting against the front surface of the mold disk. If there is any space between them, loosen the screws and tap them back until there is no lost motion; then turn the mold disk to see that it turns freely, does not bind in the guides, and is properly oiled on its bearing.

When replacing a back knife, loosen the lock nuts *37*, Fig. 16-12, and turn out slightly on the adjusting screws *36* until there is sufficient room for the knife between the set screws and the mold disk, then turn the clamping screws *35* nearly tight and have the knife very close but not quite against the mold disk. Rub red lead on the back surface of the mold and turn slowly on the adjusting screws *36* until the knife touches the base and cap of the mold evenly as it is moved past the knife. When setting, if one side of the knife has been brought too close, loosen the adjusting screw *36* on that side and place the point of an iron-handled screwdriver in the slot *40* of the knife and drive down toward the adjust-

ing screw without loosening the clamping screws. When properly adjusted, tighten the clamping screws. Hold the heads of the adjusting screws with a pair of pliers or a small wrench so that they will not move and disrupt the adjustment when the lock nuts are tightened.

The proper setting of the back knife is very important. It must be close enough to trim the slug type high, and the disk must turn freely when the operator changes molds. If the disk turns hard, the locking studs will not align properly to enter the stud blocks when the mold slide advances.

Sharpening the Back Knife—If the cutting edge of the back knife is nicked or very dull, it should be sent to the Linotype Company to be properly ground. Always have a sharpened knife on hand so that there is an extra one ready for use at all times.

If the knife is not neglected too long, it is possible to maintain a good cutting edge by removing the knife from the machine and dressing the edge in the following manner: Use the lapping block, part number F-317, which can be obtained from the Linotype Company. Sprinkle the surface with No. 120 emery powder, X-491, also available from the Linotype Company; then moisten with kerosene.

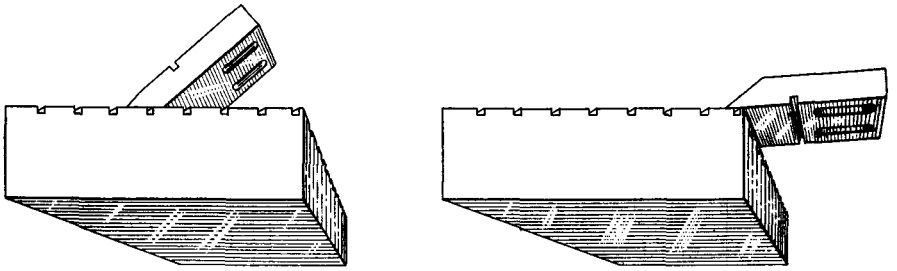


FIG. 21-12. Showing correct procedure in sharpening the back knife.

Holding the knife in the position shown to the left in Fig. 21-12, rub over the surface of the lapping block. Then holding the knife as shown to the right, rub lightly until a sharp, even edge has been obtained.

It is important that the original bevel of the cutting edge is not changed, and care must be taken to hold the knife against the lapping block in such a way that this cannot happen. The condition of the back of the slugs will indicate the necessity for the above treatment of the back knife.

Adjusting the Movement of the Mold Slide—Fig. 7-12 shows how the mold slide is disconnected to pull it forward and also where the adjustment is made to get the proper clearance between the mold and line of matrices.

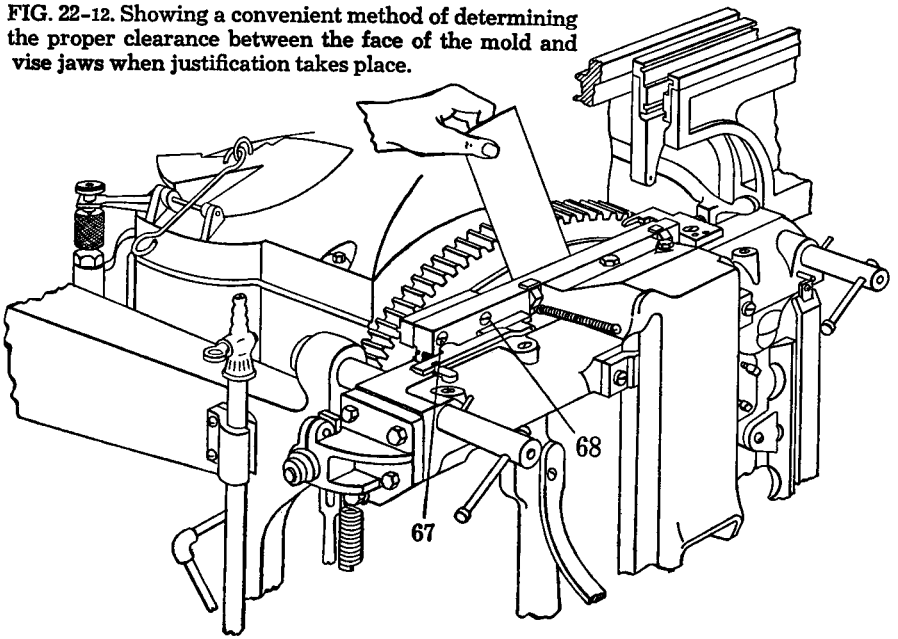
To adjust the mold slide so that there is proper clearance between the face of mold and matrices when justification takes place, the mold cam roll eccentric pin *30*, Fig. 7-12, must be adjusted when the mold cam roll *27* is on the section of the mold slide cam shown at *13* which is the highest point of the cam. When the eccentric pin is properly adjusted the space between the face of the mold and the matrices should not be less than .003″ or over .005″. Adjusting of eccentric pin handle *31* toward rear of the machine moves mold slide forward; adjusting handle toward the front of the machine moves the mold slide backward. (For this adjustment when machine is fitted with split mold cam lever see Chapter 32.)

This setting is extremely important and if improperly made will result in trouble in justification.

Before making the adjustment of the eccentric pin it will be necessary to release the pressure of the pot lever spring. This is done by removing lock nuts *59* and *60*, wing pin *61* and eyebolt *62*, as also shown in Fig. 7-12. The lock nuts *63* and *64* must not be disturbed.

As shown in Fig. 22-12, this adjustment can be made as follows: Remove the first elevator back jaw by taking out the two screws *67* and *68*, also remove the line stop. Close the left-hand vise jaw and run the machine around until the first elevator rests upon the vise cap. Place a strip of ordinary newspaper (measuring .003″ thick) between the vise jaw and the face of the mold. Then move the ma-

FIG. 22-12. Showing a convenient method of determining the proper clearance between the face of the mold and vise jaws when justification takes place.



chine ahead until the mold cam roll *27*, Fig. 7-12, is on the section of the mold cam indicated at *13* also shown in Fig. 7-12. With the machine in this position, there should be a slight resistance when the paper is pulled from between the vise jaw and the mold.

When the proper adjustment has been obtained, the lock nut *32* must then be turned very tight so that the eccentric pin will not slip, and while it is being tightened it may be necessary to hold the pin *31* with a small wrench or a piece of pipe to prevent the eccentric pin from changing its position.

After completing the setting of the mold slide, allow the machine to complete its revolution. Then replace the first elevator back jaw, being careful to put the screws *67* and *68* back in their correct positions, as the screw *67* is somewhat longer and will extend through the jaw and damage the safety plate if their position is reversed. Also replace the line stop.

When the jaw and line stop have been replaced, allow the machine to run ahead until the first elevator rests upon the vise cap. With the machine in this position, the pot lever spring can again be connected. Then run the machine ahead to the casting position and make sure the space between the pot lever and the lock nut *60* is approximately $\frac{3}{16}$″, as shown at *65* in Fig. 7-12.

When the mold slide is in normal position, it is supported on the left-hand side

by a support screw. Fig. 8-12 shows this screw *41*, which comes under the lower mold disk guide *4*, when the slide is moved back into normal position. This support screw seldom needs attention, but after considerable use it may become worn too much to support the mold slide properly. To adjust this screw, have the mold slide in normal position and remove one mold from the disk and turn the opening to the ejecting position which will expose to view the mold slide; then raise up on the mold disk guide *4* and insert a strip of paper between the lower right-hand side of the mold slide and the column of the machine. After loosening the lock nut *42*, turn the support screw *41* up until the paper can be withdrawn, and then tighten the lock nut.

Adjusting Mold Disk Locking Stud Block—Fig. 1-12 shows the locking studs *33*, and in Fig. 2-11, the stud blocks are shown at *8* and *9*. When these become too much worn it will be almost impossible to trim the slugs parallel, and it may be necessary to replace the locking studs and the stud blocks. The stud blocks are doweled to the vise frame, and when new blocks are put on, the dowels will generally bring them to the right position as they are made interchangeable. After the new locking studs and stud blocks have been fastened in place they should be tested. To do this, disconnect the mold slide and pull the disk forward on the locking studs to see that they do not bind, and also see that the ejector blade is in line with the base of the mold when the blade comes forward. If the blade does strike, or the locking studs bind in the stud block, it may be necessary to remove the dowel pins from the blocks and fasten them loosely to the vise frame; then see that the ejector blade is correct in relation to the mold. Tighten the stud blocks evenly so that the locking studs will be free in the blocks.

The locking studs are fastened to the mold disk with a screw in the back which passes through a keeper, and should be examined occasionally to see that the screws have not worked loose.

Changing Mold Liners—Fig. 10-12 shows the method of changing mold liners. If the left-hand liner only is to be changed, it is not necessary to loosen the right-hand mold cap screw, but if the size of the body is to be changed, loosen all three, and when fastening the mold cap down, tighten the two end screws first. If the center screw is tightened first it has a tendency to force the mold cap back, and may cause it to bind on the back knife. This is particularly true when changing liners on a 42-em mold. When ordering liners, it is recommended that they be purchased from the Linotype Company as they are accurately made and have the proper taper of .003″. If the taper of the right-hand liner is different from the left, it will be difficult to get the proper trim on the slug.

Care of the Back Mold Wiper—The back mold wiper as shown in Fig. 17-12 should never be oiled, but lubricated with dry graphite, rubbed well into the felt. If oil is used, it is apt to come through the mold and get on the matrices. See that the wiper is adjusted so that it will rub against the mold when the machine is in normal position.

Removing the Mold Slide—Run the machine ahead until the first elevator rests upon the vise cap, stop the machine by pushing back the starting and stopping lever and then shut off the power. Remove the pot pump plunger pin and the ejector lever link *15*, Fig. 2-14; lower the mold cam lever handle 28, Fig. 7-12; remove the ejector blade controller link rod *18*, Fig. 1-14, and the controller *3*. Open the vise to first position; raise the first elevator slide by hand, and lower the vise to a horizontal position. Detach the hose from the mold disk stud, first turning off the water, and the mold slide is then free to be removed bodily from the machine.