CHAPTER 14

The Ejector

THE UNIVERSAL EJECTOR for pushing the cast slug forward out of the mold and through the space between the knives which trim the slug accurately for body size, consists of a series of blades .054″ in thickness arranged one above another so that the lowest blade, which is generally four ems in width, may be used alone or with any number of two em width blades, up to the length of slug that the machine will cast.

Ejector blades .040″ thick are also available for ejecting 4-point slugs and any 30-em machine with the universal ejector can be equipped to cast 4-point slugs by replacing the .054″ blades with .040″ blades and making other minor changes.

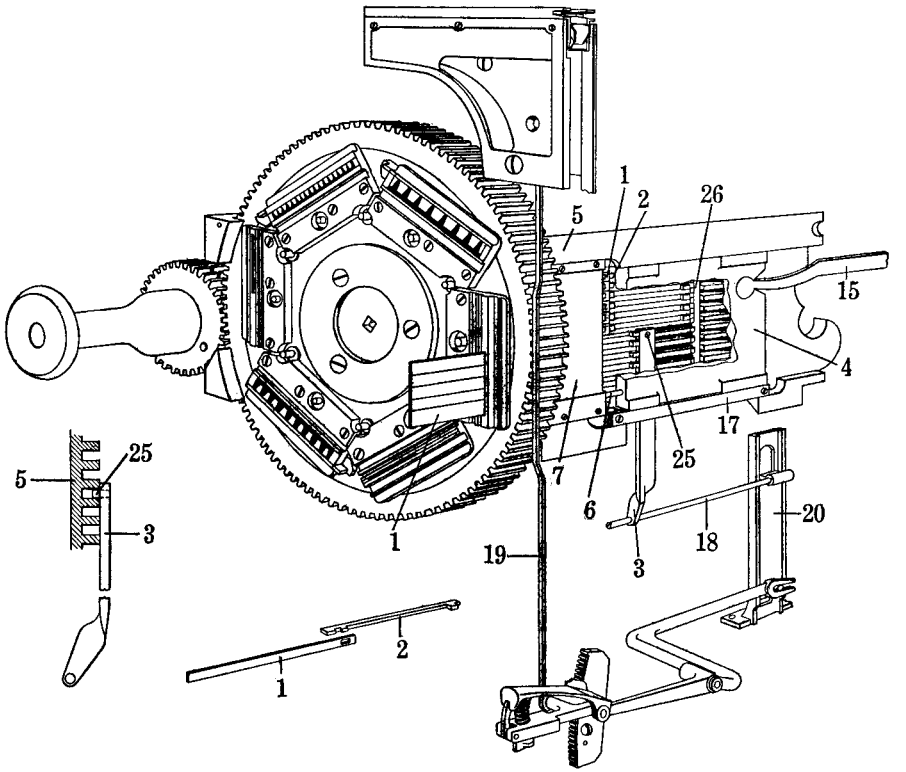

FIG. 1-14. Showing in detail the mechanism of the universal ejector blade with the 24½-em six-mold disk. The mechanism is exactly the same when used with the four-mold or the 30-em six-mold disks.

These ejector blades move between two plates which brace them so firmly that they eject slugs of all point sizes without bending. Part of Fig. 46-1 in Chapter 1 is a section (with portions broken away to show more clearly the blades and related parts) of the bearing arm of the mold slide which has in it the universal ejector elements.

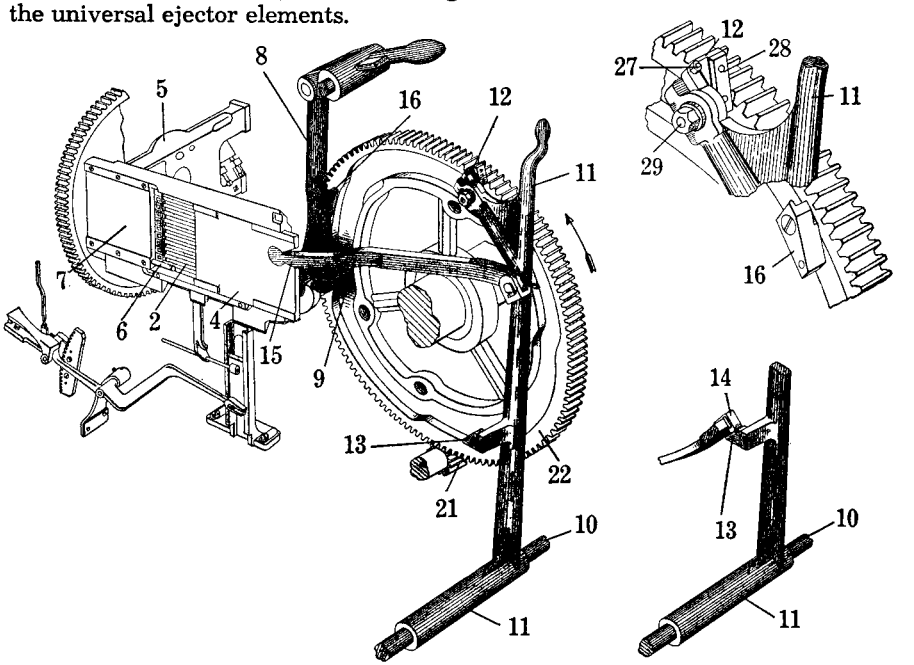

FIG. 2-14. View showing the ejector lever and the cam which operates it, together with the large gear *22* meshing with the pinion *21* on the jack shaft. This gearing causes the rotation of the cam shaft.

Near the circumference of the gear there is a groove in which runs the roller *9*. This roller on the lever *8* is caused by the mold cam to operate the mold slide.

When the cam rotates, its groove causes the mold slide to go forward, carrying the mold against the matrices at the proper time, holding it there during the casting operation and withdrawing it again to its normal position. These movements of the mold slide are repeated for ejection of the slug from the mold.

Mounted on the shaft *10*, at the rear of the machine, is the ejector lever *11*. This lever *11* has on it the pawl *12* and the shoe *13*. Mounted on the rim of the large gear *22* is the ejector cam *16* which engages the pawl *12* at the proper time and carries the lever *11* forward.

On the lever *11* there is a link *15* which connects with the ejector slide *4*. This ejector slide pushes the ejector blade or blades forward to eject the slug from the mold and past the trimming knives, and then withdraws them upon its return movement toward the rear of the machine.

When the ejector cam *16* has passed the ejector pawl *12*, the lug *14* on the line delivery cam engages the ejector lever shoe *13* and pushes the ejector lever *11* back to its normal position, at which instant the shoe *13* has been pushed out of the path of the lug *14*.

The forward movement of the ejector lever is regulated by an adjusting screw *27* in the pawl *12*. Raising the pawl shortens the stroke, and lowering the pawl lengthens the stroke of the ejector lever.

The ejector blade links are shown at *2*, the ejector blade guide at *7*, and the buffer spring rod at *6*.

In this arm of the mold slide there are grooves cut lengthwise, in which links of the shape shown at *2* in Fig. 1-14 slide. Attached to the front end of each of the sliding links *2* is a blade *1*. The ejector slide *4*, which is moved horizontally, has a groove across it. The vertical groove contains a controller *3*, which is set manually at various vertical positions so as to engage the back ends of as many of the sliding links as desired.

When the ejector lever forces the ejector slide forward against the lugs of the ejector links, the ejector blades are forced through the mold. When the ejector slide is pulled back, a lug vertically across its inner face pulls the links along with it by contacting with the front surface of the rear lugs on the links.

A controller lever, with a handle, is located below the starting and stopping lever, at the front of the machine. This lever raises and lowers a vertical slide carrying on its front side a round rod extending toward the front of the machine. This round rod connects the controller to the slide at all positions of the ejector slide and permits the controller to move forward and rearward with the slide.

When it is desired to eject a longer or shorter slug, it is only necessary to move the controlling lever handle downward to engage more blades or upward to engage fewer blades.

An em scale on the upper end of a vertical rod attached near the handle of the controller lever, operates through a groove in the delivery channel, and shows how many ems of blades are in operative setting at the time.

There is a buffer spring at the lower end of the ejector blade guide. This spring prevents the slide going forward with a sudden jerk after the ejector lever has passed its center of gravity during its forward motion and after the slug has passed the resistance of the trimming knives. The spring is in a hole in the ejector blade guide and around a rod which banks against the ejector slide. If the spring is not acting, the slug is likely to be thrown too far, possibly out onto the floor.

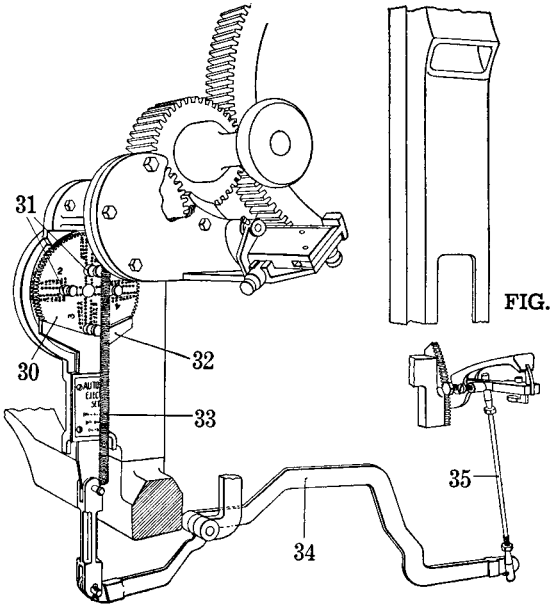

FIG. 3-14. The Automatic Ejector Set.

Automatic Ejector Set

Fig. 3-14 shows an attachment known as the "Automatic Ejector Set" which is supplied by the Linotype Company.

When the mold disk pinion is pulled forward and turned in order to bring the desired mold into operating position, this attachment automatically sets the ejector to correspond to the length of slug to be ejected from that particular mold. Any combination of four different measures is provided for when using the four-mold disk, or six different measures when using the six-mold disk.

The illustration shows the index wheel *30* in which holes are located to provide for two pica variations in slug length. To obtain the desired settings, the pins *31* are placed in the holes marked to correspond to the length of the various slugs to be cast.

The operation is very simple. When the mold disk turning pinion is pulled forward to change the mold, it is brought into mesh to operate the index wheel *30*, and as that revolves, the forked upright *32* which is held up by the spring *33* will come in contact with the pins *31* moving the cross lever *34*, and the connecting rod *35* will change the ejector control lever.

If a mold liner is changed to set a different length slug, the pin in the index wheel must be changed to correspond.

A safety latch is provided which prevents the mold disk from getting out of time when the mold slide is pulled forward.

When the automatic ejector set is used with the six-mold disk, the mold disk should be in either the first or fourth position as marked on the outer rim, when the mold slide is pulled forward.

This attachment can be installed on the Linotype in a short time, as there are no holes to drill or tap.

MAINTENANCE

Referring to Fig. 1-14, the ejector blade controller *3* is set to engage the right number of blades to eject a 12-pica slug.

At the top of the blade controller there is a pin *25*, which projects beyond the left-hand side of the controller and this projecting pin fits in the link groove when the ejector blades are carried across, as shown in view at lower left in Fig. 1-14. This pin forms a guide to positively engage the correct number of blades to correspond with the setting of the scale bar *19*.

There is a ¼" hole at the bottom of the blade controller *3* which fits over the controller link rod *18* and this rod moves the controller when the ejector blades are changed and it also acts as a support when ejecting a slug if the pin *25*, at the top of the controller should become worn or sheared off. If the hole in the controller becomes too badly worn the part should be replaced; otherwise the controller may not be held high enough to bring the pin in alignment with the groove, and the action of the ejector blades would not be smooth. It is also possible that the blade controller might drop too low to engage the proper number of blades.

To Remove Ejector Slide—If it becomes necessary to remove the ejector slide from the machine, the vise must be opened to the second position. Turn the machine until the first elevator slide head rests on the vise cap and shut off power before the mold slide advances; then open the vise to the first position and withdraw the pin against which the bottom lug on the vise rests, lowering the vise carefully. Before the mold slide can be drawn all the way out, the ejector

blade controller *3* must be released by removing the controller link rod *18,* which has a slot for a screwdriver at its end and must be loosened from the link lift *20* to allow the blade controller to drop out. This must be done with the mold slide in normal position. If the machine has a water-cooled mold disk, the hoses must be disconnected. The mold slide can now be withdrawn from the machine after it has been disconnected in the usual manner.

Replacing Damaged Ejector Blades—If a damaged ejector blade is to be replaced, remove the ejector slide keeper *17* which is fastened with a screw at each end, and also the ejector slide *4.*

The ejector blade guide *7* is held in place with three screws at the top and three at the bottom. The front screws are directly under the rim of the mold disk, but there is sufficient room to take them out without removing the mold disk from the mold slide.

Fig. 1-14 also shows the ejector blade link *2,* on which the ejector blade *1* is fastened, and it is necessary to have them fit snugly when they are connected. The blades must be of equal length, and the front ends must be square and have the full thickness (no rounded edges). If the end of the ejector blade is thin it might sink into the back of the slug when ejection is taking place, and cause the slug to stick in the mold.

The ejector blade link stop *26,* also shown in Fig. 1-14, is made of steel and its outer projections are tapered to guide the blade controller pin *25* into the slots when the ejector blades are moved forward, and if the taper on the projections becomes too badly worn, the link stop should be replaced.

When reassembling the ejector blades, every part, including the slots in the mold slide, should be thoroughly cleaned, so that when the ejector blade guide *7* is fastened in place, the ejector blades will slide freely when the screws are tightened. Also connect the ejector slide *4* and the keeper *17.* After the mold slide is replaced in the machine, connect the blade controller. To get the mold slide in position to do this, note first that the lower edge of the mold slide near the rear end has been cut out about ½″ in length and $\frac{3}{16}$″ deep, and to get the controller in the correct position to be raised, have it directly opposite the cut in the mold slide, with the pin *25* toward the left side of the machine, and have the ejector slide nearly all the way back which will bring the ejector blade links in a position where they will clear the controller when it is raised. Fasten controller in place with the rod *18.*

Adjusting Stroke of Ejector Lever—Fig. 2-14 shows the operation of the ejector lever. *12* is the ejector lever adjustable pawl, which is held in position by the adjusting screw *27.* When the slug is to be ejected the ejector cam *16* comes in contact with the pawl *12.* The travel of the ejector lever is controlled by the adjusting screw *27.* If the ejector blade does not come far enough ahead, turn out on the adjusting screw *27* which will allow the ejector lever pawl to come lower and remain in engagement longer when the slug is ejected. If the ejector blade comes too far ahead, lower the adjusting screw to raise the pawl.

On the forward travel the ejector blade should be adjusted to come slightly beyond the front end of the lower liner in the knife block. If the blade comes too far forward, the slug may strike the slug adjuster, and hesitate when dropping into the galley. On the lower part of the ejector lever there is a shoe *13* which returns the lever to normal position. In case the shoe should be lost or become loose, the blades would not be fully withdrawn from the mold and they might be damaged when the disk started to revolve.

Removing the Ejector Lever Adjustable Pawl—If it becomes necessary to remove the ejector lever adjustable pawl, there are two ways of doing it.

The first way is to turn the machine backward until the ejector lever *11* can be pushed ahead far enough to bring the head of the pawl screw *29* opposite the opening in the side of the main driving gear (where the roll *9* travels) and in this position the screw can be loosened all the way; then disconnect the spring which is fastened to the bottom of the pawl with a screw.

A second and easy method of removing the pawl is to place flatwise a hammer handle that will just fit between the main driving gear and the front end of the ejector lever near the pawl, then twist the handle sidewise, which will move the ejector lever away from the main gear far enough to give sufficient clearance to remove the screw *29* from the pawl.

If the pawl plate *28* shows wear at its lower end, replace it so it will give the proper travel to the ejector lever. The pawl spring should be connected before the pawl is replaced.

Failure of Slugs to Eject—Sometimes a slug will fail to eject, and it may be that the slug is hollow, or the trimming knives may be set wrong; for instance, if the knives are set to trim an 8-point slug and a 10-point slug is cast it would be impossible for the ejector to push it through until after the machine is backed up and the knives readjusted. To do this, push the starting lever in and turn the machine backward as far as possible by pressing against the first elevator cam, and when it comes to a stop, pull back on the ejector lever *11* and continue to turn backward until the slug is far enough away to allow the knife to spring into place when the proper setting is made.

Examine the knife wiper bar rod to see that it does not bind, and that the return spring is of sufficient strength to raise the rod to its full height. If the rod is not fully raised, it will leave the wiper in front of the slug being ejected, and cause it to stick.

An ejector blade not set the full length of the slug to be cast will interfere with proper ejection. Another cause of slugs sticking in the mold is rough mold liners. To remedy this, rub the ends of the liners with a fine oilstone, being careful not to change their taper.

Removing a Stuck Slug—If a slug sticks in the mold it may be bound at one end only, and to examine it, turn the machine back in the manner just described. When the mold disk clears the stud blocks, turn the disk to the left and loosen the right-hand mold cap screw; then turn the mold disk back to ejecting position and if the slug is not hollow it should push out when the ejector blade comes forward. Tighten the mold cap screw before casting another line.

If the slug is hollow and does not eject when the mold cap screw is loosened, turn the machine backward and lift the ejector pawl *12* to clear the cam *16;* then allow the machine to turn to normal position, and loosen the three mold cap screws to free the slug.