MOHR SAW
INSTALLING INSTRUCTIONS

(LINOTYPE)

EDITION C

THIS IS REGISTERED COPY

NO. 76

MOHR LINO-SAW COMPANY

CHICAGO 6, ILLINOIS

PRINTED IN U. S. A.

INSTALLING INSTRUCTIONS

Linotype Application of Model D2 Mohr Lino-Saw

FOREWORD

If a Mohr Saw is being installed on a Linotype that is not equipped with a self-quadder, follow only those operations that are marked "NON-QUADDER" to the left of the operation number. If a Mohr Saw is being installed on a Linotype that is equipped with a self-quadder, follow only those operations that are marked "QUADDER" to the right of the operation number.

If a Mohr Saw is being installed on a 42-pica or Model 9 Linotype, refer first to pages 25 and 26.

Most of the Linotype parts referred to in the instructions are shown on pages XIV, XV, and XVI, others are shown in the Figs. referred to.

Pages 27 to 37, inclusive, deal with "Accuracy." The installer should be familiar with this before proceeding with the installation so that he may be prepared to meet any question that may arise on this subject.

The following tools will be required:

DRILLS: Number 50, 41, 34, 28, 20, 18, 14, 12, 9, 6, 1/4";
Letter C; Extension drills Number 9 and 21.

TAPS: 4x48, 6x48, 8x32, 10x32, 1/4x24, 5/16x24, 3/8x16;
Extension tap 10x32.

REAMERS: Taper Pin - 6/0, 5/0, 4/0, 3/0, 2/0, 0 and 1;
Straight Hand - 3/16" and 1/4".

ELECTRIC DRILL: With a chuck that will take a 1/4" drill.

Fig. 1 is a general view (omitting vertical shaft and upper bracket units) of the 30-pica, non-quadding, Mohr Saw.

Non-Quadder

OPERATION NO. 1

Quadder

Open the box containing the Mohr Saw. The contents consist of a number of packages, each marked with an identifying number.

It is suggested that the entire contents of the case be removed and that the numbered packages be laid aside unopened. To avoid mixing or losing the parts, it is best to open the packages only as called for in the instructions.

Or, as a precaution, some installers check the contents of certain packages as soon as the shipment is opened. After checking, they re-wrap the packages to be sure that parts are not lost pending the need for them. For example:

1 - If the saw is to be applied to a non-quadding Linotype, does package 6 contain the correct left hand vise jaw block - that is, was a side- or top-fastening vise jaw block received, to correspond with the type used on the Linotype?

2 - Does the package marked "Motor" contain a motor of the correct current specifications?

3 - Does package 14 contain knife block liners of the same thickness - 36 point or 45 point - as those now in use on the Linotype?

Is the lower line the correct one? Fig. 19 shows the two types, one for 4-pocket mold machines, the other for 6-pocket mold machines.

Most other shortages or inaccuracies can be corrected on the job but the above cannot, so a check-up before the installation is begun may save time.

Non-Quadder **OPERATION NO. 2** **Quadder**

This operation covers application of the ejecting plate and slug jogger actuating unit, as shown in Fig. 2. To get more room in which to work, remove the ejector lever link BB-386. It is also advisable to disconnect, or remove, the pot pump plunger.

Make sure that the set screws holding the transfer cam and the pot pump cam of the Linotype are tight so that the locating piece can be removed without disturbing the cam spacing. (This is best done when the machine is in normal position.)

Remove the delivery and elevator transfer cam locating piece C-348 and set it aside for application later.

To bring the main cam shaft of the Linotype into position to attach cam 1500, turn the Linotype over by hand until the second elevator starts to go down. Take care to avoid overheating the mold, if heat is on the pot, while spotting, drilling and tapping for the screw at the leading edge of the cam, and while re-applying locating piece C-348.

Open package 2a which contains the cam and its attaching screws. (Although only three screws are actually needed for attaching the cam, four will be found in the package. The extra screw is a spare in case one is lost or spoiled. The same practice is followed in other instances so an assortment of screws will be left over when the installation is completed.)

Place cam 1500 on the main cam shaft, with the locating key of this cam in the key-way of the delivery and elevator transfer cam C-1565. Follow Fig. 2 as a guide. Hold cam 1500 close to the hub of cam C-1565 by wedging a block of wood about two inches long and five picas square between the cam and the driving gear. Spot the main cam shaft (using the three attaching screw holes in cam 1500 as guides) with a No. 9 extension drill, then drill 7/8" deep (from the surface of the cam) with a No. 21 extension drill, tap the holes with a 10x32 extension taper tap and finish tapping the holes with a plug tap (to avoid the possibility of breaking off a tap in the hole and causing extra work). Fasten the cam in place with the three flat head screws.

Re-apply cam locating piece C-348 about 1/8" ahead of the leading edge of the cam. Do not put the cam locating piece too far ahead of the cam as it will then prevent a full stroke of the ejector lever. Spot, drill and tap for 8x32 screws. Fasten locating piece in place.

Turn the machine forward to normal standing position.

To get room in which to work while applying bracket 1513 and lever 1507 with their associated parts (in package 2b), remove the pot balancing spring F-365. See Fig. 2. Then remove the following parts in the order given: starting and stopping lever hinge pin E-150, starting and stopping lever E-147, starting and

stopping lever connecting rod stud BB-240, vise automatic stop connecting bar E-406 and starting and stopping lever connecting rod E-152. Remove the left rear column bolt and discard it. A new bolt 1514 will be used to fasten cam roller lever bracket 1513 in place.

Following Fig. 2 as a guide, place bracket and lever in position. Put bolt 1514, washer 1513-D and lock washer 1516 into position, tightening bolt just enough to hold yet permitting the shifting of bracket 1513 when fastening it in place. Carefully align cam roller 1596 with face of cam 1500, then fully tighten bolt 1514. In fastening this unit in place, maintain the 1-1/16" dimension shown in Fig. 2, to properly synchronize the action of the Linotype with that of the ejecting plate and slug jogger actuating unit of the Mohr Saw. The adjustment is made with studs 1518 and clamping hook 1520.

Apply spring 1511.

Re-check alignment of cam roller 1596 with face of cam 1500.

Replace connecting rods E-152 and E-406, stud BB-240, lever E-147 and hinge pin E-150.

From in front of the Linotype remove and discard the upper attaching screw holding the starting and stopping lever bracket E-1112, Fig. 2. This screw hole will be used later for screw 1538.

Next, complete application of ejecting plate and slug jogger actuating unit, by applying actuating rod 1524-A and its associated parts, to be found in package 2c.

Remove cotter pin 1531 and castellated nut 1530 from actuating rod 1524-A.

With spring 1525 and washer 1526 in place (washer 1526 should be between spring 1525 and lever 1507, in the position shown in Fig. 2) on actuating rod 1524-A, make sure that the bend in rod 1524-A is in the proper position to avoid interference with ejector controller lever. Then put unit in place, inserting the end of rod 1524-A in guide plate 1528, and replacing castellated nut 1530 and cotter pin 1531.

Attach actuating rod bracket 1567 with attaching screw 1538, as shown in Insert C Fig. 2. A top view of 1567 applied to E-1112 is shown in Insert B Fig. 2. Apply the stop ring 1524-E in the rear of the two grooves in the forward end of 1524-A. (If the Linotype is equipped with a current style air mold cooler the 1567 is applied in the same position but in front of the blower nozzle extension, as shown in Insert A, Fig. 2. A longer screw (1538, Type B) is to be used in this case; and the stop ring 1524-E is to be applied in the forward of the two grooves on the forward end of 1524-A.)

Replace pot balancing spring F-365 and ejector lever link BB-386.

The ejecting plate and slug jogger actuating unit should now be completely installed. Check against Fig. 2.

NOTE: In case the Mohr Saw is being applied to a Linotype equipped for casting low slugs (.022" depth) it will be necessary to alter two parts:

1 - Remove 1533 (Fig. 2) and its lock nut 1534; shorten rod 1524-A by cutting off 1/2" from its forward end; re-drill and re-tap for 1533; re-apply 1533 and lock nut 1534.

2 - Lengthen the rod of part 1587 by 1/2", by replacing the rod with a longer one or by drilling the end and tapping for a screw (like 1533) and applying a screw and lock nut to increase the length the needed 1/2".

It will probably be better to make these alterations on the job than to order parts from the Mohr factory. If preferred to order the parts, ask for 1532-A (to replace 1524-A) and 1583-A (to replace 1587-A, the rod of 1587).

Non-Quadder **OPERATION NO. 3**

Remove and discard vise balancing spring.

Remove the knife block and set it aside - to be re-worked and re-applied later under another operation.

A Linotype column bolt and one of the attaching screws for the starting and stopping lever bracket were discarded, now the vise balancing spring. It would be well to provide a "discard box" to receive these parts, the ones listed below and others to be mentioned later - Linotype parts that will not be needed with the Mohr Saw on the machine and are to be left with the plant owner for such use as he wishes to make of them.

E-1597 Galley slug adjuster, assembled
E-2051 Galley, assembled
E-2055 Galley bracket, right hand, assembled
E- 161 Slug lever screw
B- 352 Slug lever spring
B- 773 Slug lever, assembled
E- 961 Slug lever connecting rod

(If the saw is being installed on a later or earlier model than one using the parts listed above, remove instead the corresponding parts.)

Remove the first elevator slide, first disconnecting the lower link B-271 and first elevator slide stop E-792 and removing both right hand first elevator slide gibs. The first elevator slide will be replaced later.

Remove the vise jaw left hand wedge bracket E-1880, including the vise jaw left hand wedge spring.

Remove the vise cap and all of the parts it contains. Set the vise cap and three of its four attaching screws aside to receive attention later. The attaching screw located farthest to the right hand end of the vise cap will not be needed further.

All of the wedge bracket and vise cap parts removed are to be discarded, with the following exceptions:

(1) vise jaw left hand adjusting bushing E-582; (2) vise jaw left hand wedge guide E-584; (3) vise jaw left hand wedge E-578; (4) vise jaw left hand wedge hinge pin BB-68; (5) the two vise locking screw safety pin banking screws G-126; (6) vise locking screw left hand, assembled E-1292; (7) first elevator

jaw back guard E-1854, and attaching screws, auxiliary line safety rod D-2914 and spring H-544; (8) first elevator slide filling piece (flapper) and attaching screws; (9) vise jaws, right and left hand, with their attaching screws; (10) knife wiper bar rod and associated parts (if the Linotype is equipped with the down-stroke type of knife wiper) which will be used later with the Mohr right hand first elevator slide gibs, and (11) vise jaw left hand wedge spring E-3399 if used.

Remove and discard vise automatic stop rod lever bracket E-1856, first removing therefrom vise automatic stop rod lever E-2090 which is to be applied to the Mohr bracket 1580 in package 3. This part is very much like the part it replaces. The replacing part has been modified to permit needed clearance for the waste chute. Install the new unit on the Linotype.

Chip guard 1579, shown in Fig. 34-A is provided to exclude chips from the slot for the vise automatic stop lever E-201. The guard may be applied by the plant machinist, if needed. Drill a No. 21 hole in vise automatic stop lever and tap 10x32. Apply guard with a 10x32x1/4" round head screw.

OPERATION NO. 3

Quadder

Follow Operation No. 3 (Non-Quadder) instructions above except do not dismantle or discard any parts from the wedge bracket. The vise jaw left hand adjusting bar and bracket assembled E-3548 is the only quadder part taken off the vise cap. Be extremely careful not to bump the vise jaw left hand safety detent bar E-3210 while handling or working on the vise cap.

Non-Quadder

OPERATION NO. 4

Quadder

This operation covers the alterations to be made in the vise frame. Cut out, with a hack saw, the 2-5/8" section "A-B" of the vise frame, as shown in Fig. 3. Cut along the back edge of the slot. This provides clearance for raising the saw slightly above 30 picas. It is advisable when sawing to guide the hack saw so that the bottom of surface "C" is slightly back of surface "D". Smooth the cut with a file to remove burrs.

Non-Quadder

OPERATION NO. 5

Next, the vise cap receives attention.

If no bench vise is available for holding the vise cap for this operation, the vise frame of the Linotype can be used to hold it. Turn the vise cap upside down and attach it to the vise frame in this position by means of two of its four regular attaching screws. Wedge a block of wood between the mold disk and the vise frame so that the latter will be rigid.

The tongue on the under side of the vise cap must be cut out to provide clearance for ejecting finger 1071 when the saw is raised slightly above 30 picas and a full-length, un-sawed slug is to be delivered.

Two types of vise cap may be encountered. On earlier Linotypes there was a large cavity in the right hand end of the vise cap, as illustrated in Fig. 4;

while on recent Linotypes the vise cap is solid at this point, as illustrated in Fig. 5. If the vise cap is of the "cavity" type, cut out section "D" Fig. 4; if it is of the "solid" type, cut out section "D" of the tongue, as indicated in Fig. 5. (Follow Fig. 6 instead for 42-pica installation). When the alterations have been made, clean all machined surfaces of the vise cap and the vise frame; also see that all burrs are removed.

Now the upper bracket attaching stud 1102, Fig. 7, is to be put in place. The stud is in package 5b.

Insert stud 1102 in hole in vise cap, using a sheet of paper to wedge it tightly to prevent its turning when set screw hole is drilled.

Drill hole for 1/4-24 set screw, using No. 6 drill, in position shown in Fig. 7, aiming for center of stud. Drill about 3/16" into the stud to provide a seat for the set screw.

Remove stud, discard paper wedge and tap set screw hole with 1/4-24 tap.

Replace stud so that the set screw will seat in hole in stud. Install set screw.

Being careful that the left hand end of it is flush with the vise frame, replace the vise cap then fasten it in place with the three attaching screws.

OPERATION NO. 5

Quadder

Follow Operation No. 5 (Non-Quadding) instructions above up to last paragraph. Before replacing vise cap replace vise jaw left hand adjusting rod E-4555, its cap E-4554 and vise jaw left hand adjusting bar extension E-4023, with Mohr parts 2326, 1718 and 1702 respectively, as shown in Fig. 8, to be found in package 8. Use vise jaw left hand adjusting bar tit screw E-3624, removed with E-4023, for fastening 1702 in place. Insert 1702 in the right side of the left hand vise jaw block, with the flat side up. Using a drill the same size as the tit on screw E-3624, drill part way through 1702. Replace E-3624 in its hole. Make sure that the head of the tit screw is below the top surface of the left hand vise jaw block or it will bind when the vise cap is in place. After these parts have been installed, put the vise cap back on the vise frame being careful not to injure the quadder parts. Be sure that screw 2326 turns freely and that the left hand jaw is open to approximately 30 picas. Has E-3570 been replaced in the vise cap?

Non-Quadder

OPERATION NO. 6

Apply the parts contained in package 6.

Attach the vise jaws removed from the Linotype to the vise jaw blocks in this package. (The left hand vise jaw block should be Mohr part 1735 if for use on a current model Linotype in which the vise jaw is fastened to the top of the left hand vise jaw block; or Mohr part 1731 if for use on an earlier Linotype in which the vise jaw is fastened to the side of the left hand vise jaw block.) Care must be taken that the edges of the vise jaw blocks, where they fit on the vise jaws, have not been injured or burred. Carefully smooth

these surfaces so that the vise jaw blocks fit tight. Unless the jaws and blocks do fit together properly "squirts" are likely to occur. Try the assembled parts in the vise cap to make sure that they slide freely.

Slide the vise jaw block left hand, then the vise jaw block right hand, with their respective vise jaws attached, over the horizontal screw assembly. Then slide this group of parts into the vise cap channel. See Fig. 9.

Attach the vise jaw block right hand stop assembled 1730-B, the one that came with the saw, to the vise jaw block right hand.

Non-Quadder **OPERATION NO. 7**

Next, apply the parts contained in package 7. Follow Fig. 9.

Remove collar and spring from the wedge block assembled 1807.

Install vise jaw left hand wedge adjusting bushing E-582 in end bracket 1806. Screw it in so that adjusting space will be left on both sides.

Apply the left hand wedge wiper and its bracket to the new end bracket, using the attaching screws furnished.

Apply the vise jaw left hand wedge guide E-584 to the vise jaw left hand wedge E-578, being sure that the word "TOP" on the wedge guide is uppermost.

Hold the wedge and wedge guide assembly in their proper positions in the end bracket and insert the rod 1807-B of the wedge block 1807 through wedge, wedge guide and adjusting bushing.

Replace the spring and collar on the wedge block rod, seating the set screw for the collar in the indentation on the under side of the wedge block rod. This spring presses the wedge block into contact with the wedge and, in doing this, releases the left hand vise jaw after the line is cast, preventing the matrices from "dragging" as the first elevator slide takes them from the vise jaws.

Next, apply the end bracket to the vise cap, making sure that the head of the horizontal screw 1700, in the vise cap, is properly engaged in the slot of the wedge block. The end bracket is fastened to the left hand end of the vise cap by means of four screws. The heads of three of these are alike. The head of the fourth is larger than the others, and there is a groove around the head. This odd screw is to be applied in the hole in the lower, right hand corner of bracket 1806 (referring to Fig. 10). Its groove is to be used for anchoring the upper end of the wedge spring.

Does the wedge block work freely? If not, shift the end bracket slightly until the wedge block and its associated parts do work freely.

Two dowels 1804 for bracket 1806 will be found with the dial bracket and are to be applied later after dial bracket has been fastened in place. See Fig. 10.

Package 7 contains Mohr vise jaw left hand wedge spring 1814. If Linotype was

equipped with wedge spring E-692 (diameter of wire .105") discard this and apply spring 1814 in its place. However, if Linotype was equipped with wedge spring E-3399 (diameter of wire .125") re-apply E-3399 and discard 1814.

Wedge springs 1814 and E-3399 are stronger than spring E-692. The added tension assures the movement of the wedge to its full upward limit on every justification. This upward limit is the stop at the top of the end bracket just applied. The effect here is to have the wedge and the wedge block in exactly the same relative positions with every justification, thus narrowing the variation that formerly occurred with variations in tightness of line, number of spacebands used, etc. The combination of the stronger spring and the stop for the wedge helps reduce this variable factor. (This point is more fully covered in the chapter entitled "Accuracy" beginning on page 27 of these instructions.)

OPERATION NO. 7 — **Quadder**

Most of this operation refers to changes in the wedge bracket. Because this unit is not changed on quadders, skip all except the last two paragraphs of Operation No. 7 (Non-Quadder) and apply the wedge bracket to the machine.

Non-Quadder — **OPERATION NO. 8** — **Quadder**

Reapply the vise locking screw LEFT HAND assembled.

Open package 9. Use the long-handled vise locking screw, as in Fig. 11, for the RIGHT HAND vise locking screw. Part 1740 is used on non-quadders, part 1738 on quadders.

Close the vise. Replace the two vise locking screw safety pin banking screws G-126.

Non-Quadder — **OPERATION NO. 9**

Remove and discard left hand galley bracket E-1796. Replace with bracket 1408 from package 11. See Fig. 18.

The waste chute 2210, in package 12, can now be installed. If the vise automatic stop rod guide studs E-185 are too long to permit mounting of the waste chute, run more threads on the studs.

Slide the waste chute back of the left hand galley bracket. The front surface of the waste chute should fit close against the first elevator slide when applied. Fasten waste chute in place with the special 1/4-24 flat head screw in the bag attached to the waste chute. Apply the screw in hole "E", Fig. 3.

Hole "E" in the vise frame should be countersunk so that the head of the fastening screw is flush with the tongue of the waste chute. This is important as any projection of this tongue or screw is likely to catch on the ejecting plate of the Mohr Saw and thus interfere with the free vertical travel of the ejecting plate 1068.

OPERATION NO. 9 — Quadder

This is the best place to make changes in quadder parts to provide room for the waste chute of the Mohr Saw. Fig. 16 will be found generally helpful in identifying the various parts referred to in this operation. With the quadder set at "non-quad", remove and discard lever E-4718. Save stud E-2641, washer H-2595 and nut J-1228 as they will be needed to install the replacing lever. With the vise open, remove the two screws that hold the vise jaw control rod latch rack slide bracket E-4163 on the vise frame, being careful that it does not fall to the floor as the last screw is removed. Take this bracket to the bench. Remove E-3379 from the bracket and counterbore or countersink the two screw holes so that heads of screws will be flush with surface. File right hand corner to approximately 1/8" radius as shown in Fig. 12. Breaking this corner will give room to put in the lower half of the waste chute. Now remove E-2633, Fig. 13, from the bracket, being careful not to lose the 3/16" ball C-471 and its spring D-1747. Cut off one inch from the right hand end of E-2633 as this part interferes with the waste chute.

Remove gear rack E-2634, Fig. 14, from E-2633, Fig. 13. Counterbore or countersink the two fastening screw holes so that the heads of the screws will be flush with surface.

Drive out pin that holds gear E-2637, Fig. 15, on shaft E-2636, remove from the bracket and re-assemble gear and shaft. It will be necessary to cut off the hub of this gear to get room for the Mohr Saw waste chute but before doing so drill a hole through the gear itself and the shaft with a No. 50 drill, ream with a 6/0 taper pin reamer until the new taper pin furnished fits nicely and does not interfere with the gear teeth. The new pin is installed before removing the hub to avoid disturbing the gear timing and also to maintain the 1-5/32" dimension shown in Fig. 15.

Now cut off the protruding hub and shaft and file to get a neat surface. See Fig. 15. Now re-assemble the re-worked parts on bracket E-4163. First install E-2633 and fasten in place with E-3379. Are the ball C-471 and its spring D-1747 still in the bracket? Be sure. Install the re-worked shaft E-2636 and its gear E-2637 in the bracket. Check to see that taper pin does not interfere with gear teeth.

Drive out pins holding knob E-2624 and collar E-2623 on shaft E-2622. Remove these parts from machine. Take out the 8x32x1/4" headless screw E-25 which holds spring D-3219 against the 1/8" steel ball D-3507. Depress control rod latch E-3711, hold up justification bar and remove stud E-2622 from lever E-2614. Replace with Mohr Saw part 2225. Re-install detent ball, spring and screw. Make sure unit operates smoothly.

Re-apply bracket E-4163 with its altered parts on the machine. Fasten in place with the two screws and be sure that they are tight. Install the Mohr Saw lever 2226 (Lever 2226, Type B, is used on quadding Linotypes carrying the serial number 55498 or higher; lever 2226, Type A, is used instead on quadding Linotypes carrying the serial number 55497 or lower. Lever 2226, Type B, is shown in place in Fig. 16; lever 2226, Type A, is shown in insert in Fig. 16.). Install it with the same stud, washer and nut used for the discarded E-4718. Operate quadder with foot with left hand jaw connected to see that 2225 tracks in the groove of this new lever without binding at any part

of its travel. Was washer H-2595 replaced on the stud?

Install the toggle-lock chip guard. There are two types of this unit: 2218 (shown in place in Fig. 16) for use on quadding Linotypes carrying a serial number 61505 or lower; and 2227 (shown in the insert in Fig. 16) for use on quadding Linotypes carrying a serial number 61506 or higher.

In applying 2218, use the Linotype screw for attaching the lower end of guard. Spot hole for top screw, drill with No. 34 drill and tap for 6x48 screw. In drilling the hole for this screw in the control rod bracket E-2589, be careful not to drill deep enough to make a burr that would interfere with the action of the vise jaw control rod locking toggle sleeve E-3272. A burr that interferes will necessitate partially dismantling the quadder to remove bracket E-2589 so as to get at the burr. The method of applying 2227 is readily apparent when the unit is held in place.

Check to see that all quadder parts are back on the machine.

Remove and discard left hand galley bracket E-1796. Replace with Mohr Saw bracket 1408, from package 11. See Fig. 18.

Install the waste chute, which is made in two parts for use on the quadding Linotype. The lower part of the waste chute is easily removable to obtain access to the quadder parts. Countersink hole "E", Fig. 3, with an 82° countersink so that the head of the 1/4x24 fastening screw is flush with the tongue. Fasten top part of waste chute in position with this one screw. Place lower half of waste chute in position and spot, drill and tap hole for 1/4x24 fastening screw 2216, shown in Fig. 16. (On later machines a hole that can be used for this purpose will be found in the machine.) After the lower part of the waste chute is fastened with this screw, spot, drill, tap and countersink the hole for the 4x48x1/4" flat head screw 2217, shown in Fig. 16. This screw holds the top part of the waste chute in position when the lower part is removed for access to the quadder.

It is usually necessary to place a washer between the top part of the waste chute and the vise frame, with the screw 2217 passing through the washer. The washer should be just thick enough to place the right hand part of the waste chute in position to receive the left hand part of the waste chute.

Non-Quadder **OPERATION NO. 10** **Quadder**

Replace the first elevator slide, re-connect the lower link, replace first elevator slide stop and get the Linotype again in casting position. It is important to keep the first elevator slide in its original alignment, with due allowance for wear. To restore this original alignment, time will be saved by temporarily re-attaching the Mergenthaler right hand gibs, which have locating dowels. These original, dowelled, right hand gibs furnish a base line for proper alignment of the first elevator slide. Apply the first elevator slide and move the left hand gibs snugly against the first elevator slide to hold the first elevator alignment while replacing the Mergenthaler right hand gibs with the Mohr gibs.

Package 10 contains Mohr Saw right hand gibs that are to be applied now. Fig. 17 shows three pairs of right hand Mohr gibs that are available. Gibs

1090 and 1091 are for use on Linotypes equipped with the up-stroke type of knife wiper. Gibs 1072 and 1089 are to be used on Linotypes equipped with the earlier style down-stroke type of knife wiper. Gibs 2289 and 1072 are used with the current style of down-stroke knife wiper.

Specification sheets are required with all orders for Mohr Saws for field installation. This should insure that the correct gibs for a given application are supplied. In an emergency, however, 2289 can be modified to serve as 1089, 1072 to serve as 1091 and 1089 to serve as 1090.

If the Linotype is equipped with the down-stroke type of knife wiper, replace the Linotype gibs on this unit with the two Mohr gibs supplied, making sure that the gib with the extra hole above the main hole is in the lower position in order to avoid interference with the first elevator slide re-casting block screw.

Apply the assembled down-stroke knife wiper unit and Mohr right hand gibs (using, instead of the discarded right hand gib attaching screws, the two 5/16x24 hexagon head screws 1096 and the washers to be found with the gibs. These screws are to be used only temporarily for this operation.) Fit the gibs snugly against the first elevator slide and tighten securely to the vise frame. This should give, with the Mohr Saw gibs, practically the original first elevator alignment.

Ease off the left hand gibs, as required, to secure necessary working freedom of the first elevator slide.

Make sure that the first elevator slide works properly and then turn the Linotype over by power two or three times to be certain that these adjustments are right.

Next, fasten the right hand gibs in place with additional screws. The reason for this is that the main bracket unit of the Mohr Saw (to be applied later) is fastened to the Linotype by means of screws which pass through the holes otherwise used for the gib attaching screws. Thus, unless the gibs are held in place by other means, should it be necessary to remove the main bracket unit at any time, the gibs would come off with it and it would be necessary to re-align the first elevator slide whenever the saw was taken off the machine.

There is an extra hole in each of the new right hand gibs. Spot each of these with a No. 9 drill and then drill them 7/8" deep with a No. 21 drill.

Tap the two holes with a 10x32 tap and fasten the gibs in place with the two filister head screws found in the package with the gibs.

Now remove and discard the two 5/16x24 hexagon head screws 1096 and their washers that were used temporarily to hold the gibs in place. They are of no further use.

It is a good precaution to run a 5/16x24 tap through the holes in the vise frame, where the first elevator slide gibs and the main bracket unit are anchored, so that the anchoring screws will surely seat on the head, otherwise the screws might be tight and yet not hold the main bracket unit securely to the Linotype.

If the Linotype uses the up-stroke type of knife wiper, follow the instructions just given for applying the gibs disregarding, of course, references to the knife wiper bar. If the Linotype is equipped with an up-stroke knife wiper, there will be an interference between the knife wiper bar link screw E-1466 and screw 1533, Fig. 2, on end of actuating rod. To eliminate this interference, remove screw E-1466 and dress down head until about two points thickness of head remains. Replace screw in knife wiper bar. Then remove screw 1533 and cut off head on one side of screw until side is flush with shank of screw. Replace screw in actuating rod, making sure flat side is toward knife wiper bar. On rare occasions it may be necessary to move bracket 1567, Fig. 2, slightly to the right to obtain sufficient clearance here.

Non-Quadder **OPERATION NO. 11** **Quadder**

Apply pulley 2176 to motor shaft, then motor to base, following Fig. 18, and fasten resulting unit to left hand galley bracket.

The belt and belt guard, Fig. 18, are to be laid aside for application later.

Apply vise balancing spring 1085. This is stronger than the vise balancing spring it replaces, to compensate for the added weight of the Mohr Saw, particularly the motor. If the new vise balancing spring is not quite long enough to fit on the hooks provided for it, lengthen the spring by bowing it and inserting a slug in each of as many coils as needed to get the spring long enough to apply.

Non-Quadder **OPERATION NO. 12** **Quadder**

Apply the main bracket unit assembly to be found in package 13, fastening it by means of the two attaching screws supplied with it, through the first elevator slide gibs right hand. The upper bracket of the main bracket unit is forked at the back, to slip on the upper bracket supporting stud fitted to the vise cap earlier in the installation. With the fork astraddle of this stud, tighten the nut.

Now apply the driving belt 2183, from the motor to the lower end of the vertical shaft of the main bracket unit (See Fig. 18). Shims 2186 may be used to adjust the driving belt as well as moving the motor toward the machine or away from the machine. Vee belts should be just tight enough to make them pull. It is a common error to adjust vee belts too tight with the result that the motor burns out and the vertical shaft bearings are soon ruined. A good test for belt tightness is to pinch the belt together with the fingers when it is in place on the machine. If, when applying only moderate pressure, the sides can be squeezed together until their inner surfaces are within an inch apart, the tension should be correct. Remember, a vee-type belt does not need to bottom in the pulleys in which it travels; the pull is on the sides of the belt and the grooves of the pulley, not the bottom. If the belt bottoms, traction will be lost.

Then apply the belt guard. Note that the slotted end of this guard fits into a groove in the vertical shaft lower bearing support.

Mohr Saws are used in all parts of the world and in consequence must be

supplied with motors to suit a wide variety of current characteristics. While only one part number (2176) is used for the motor pulley assembled and one part number (2183) is used for the driving belt, each of these parts is furnished in several different sizes to meet varying conditions. It is necessary, therefore, in ordering either of these parts to specify in addition to the part number and name, the make of the motor (Marathon, Bodine, Westinghouse, General Electric), also the r.p.m. of the motor. With this information, orders can be filled correctly. The information required can be secured from the name plate of the motor. In ordering these two parts, therefore, specify as follows:

2176 Motor pulley assembled (Make of motor - r.p.m.)
2183 Driving Belt (Make of motor - r.p.m.)

Non-Quadder **OPERATION NO. 13**

The next unit, in package 8, is the dial bracket.

There are two holes to be drilled for the dial bracket attaching screws. Place the dial bracket in the position shown in Fig. 11, inserting the locating pins in the dial bracket in the vise cap slot, using them as a locating template; permitting the end of the horizontal screw 1700 to protrude through the hole for it in the dial bracket. Be sure that the locating pins are up to the top of the vise cap slot as far as they will go. This is very important as it controls the line-up of the dial shaft with the main bracket unit.

Spot the upper right hand hole with a 1/4" drill; then drill with a No. 6 drill about 3/4" deep, and tap with a 1/4x24 tap. Clean out the chips and attach the dial bracket with one of the 1/4-24 filister head attaching screws. This will hold the bracket securely while the other attaching screw hole is spotted, drilled and tapped. Be sure that all chips are cleaned out of these holes to avoid binding of screws.

Next, loosen the attaching screw used to hold the bracket in place. Without removing the dial bracket completely, slip it far enough to the right to permit slipping the horizontal screw miter gear assembled 1701 (See Fig. 11) on the end of the horizontal screw 1700 as the latter protrudes through its hole in the dial bracket.

Push the dial bracket back against the vise cap and fasten it in place with the two 1/4x24 filister head attaching screws. To make sure that all the vise cap parts work freely, press in on the wedge block rod 1807-B, Fig. 9, and release pressure alternately. If parts work freely, dowel dial bracket in place (two dowels). Use a No. 14 drill to drill the two dowel holes to a depth of 1/8" more than the length of the dowel pins. Ream both of these holes with a 3/16" straight reamer. Remove dial bracket from machine and use a No. 12 drill to enlarge the dowel holes in the vise cap to about .001" oversize. Do not use power on the electric drill as it will make the dowel holes entirely too large.

Install the two dowel pins in the dial bracket. They should fit quite snug in the dial bracket but slide freely in the dowel holes in the vise cap.

With all vise cap parts working freely, now dowel the end bracket 1806

(Fig. 10) in place. Use a letter "C" drill and drill 1/8" deeper than length of dowel pin, ream with 1/4" reamer and then apply dowel pins 1804.

OPERATION NO. 13 — Quadder

The method of locating a dial bracket on a quadder machine is different from the method used on a non-quadder machine. See Fig. 8.

Open package 8 and assemble dial bracket parts contained in this package. To do so, remove assembler slide control bracket 1705-D from vise jaw left hand adjusting bar screw 1705-A and turn the screw into vise jaw left hand adjusting bar spur gear 1705-G until it protrudes about one inch through the right side of the gear. Then put 1705-D back into place so that the pin is at a 90° angle with the flat side of 1705-A (in other words, the pin must point away from you).

A pin 1717 holds the gear 1716 and plug 2335-B to one end of the brass tube 2335. Remove this pin and put the gear, plug and tube in place in the hole at the back of the dial bracket. Pin 1717 is a taper pin so be careful to keep the parts in the same relation they were. Tube 2335 extends to the left, the same as 1705-A. See that the gears turn freely after re-pinning the parts.

The important thing in applying the dial bracket is to get the brass tube 2335 centered in the rear hole of the right hand vise jaw block so that there will be no interference with the movement of this jaw in quadding and centering. Every thousandth of an inch is important.

With the machine standing in normal position, open the vise, fit the dial bracket against the vise cap, and line the dial shaft joint with the main saw frame. One way of lining the dial shaft joint with the main saw frame is to lay a slug of the right thickness (usually 14 points) on top of the right hand vise locking screw and tie it there so the dial shaft joint will rest on it while spotting the hole for top fastening screw.

If necessary, turn brass tube 2335 slightly to make it slip over flat-sided screw 2326 that was installed in the left hand vise jaw block in Operation No. 5 (See Fig. 8). It may also be necessary to turn screw 1705-A to the right several turns to get the dial bracket to fit against the vise cap. When the brass tube is centered in the rear hole of the vise jaw block, the dial shaft joint lined up with the main saw frame, and the dial bracket held against the vise cap, spot the hole for the top fastening screw with a 1/4" drill.

Remove the dial bracket from the machine and drill a hole for the top fastening screw with a No. 6 drill to a depth of 3/4".

Tap the hole with a 1/4x24 tap. Enlarge the top fastening hole in the dial bracket about 1/16", using a round file or a 6/0 taper pin reamer. If such a reamer is used, ream from each side of the hole.

Now apply the dial bracket so that screw 1705-A will slip on the bar 1702 (which was installed in the left hand vise jaw block in Operation No. 5) by about 1/4".

With the vise closed and the left hand jaw as far to the left as it will go, hold the dial bracket against the vise cap with one hand while turning screw 1705-A to the left until it makes contact with 1702. Then move dial bracket 1/4" away from vise cap and move screw 1705-A to the left until it again makes contact with 1702. Press dial bracket to left and turn screw 1705-A a fraction of a turn until it slips on 1702.

After checking the location of the dial shaft joint to see that it is neither too high nor too low, put the dial bracket in position loosely with the top fastening screw.

Close the vise.

With the quadder set at "center" and the top fastening screw still loose, operate the quadder lever with the foot while tightening the screw. This procedure generally locates the dial bracket and quadder parts correctly. When the screw is tight and the quadder works perfectly in all positions, try moving the dial a few points back and forth. If it feels free, try the quadder again. When sure that everything is free, open the vise, spot, drill and tap for the lower 1/4x24 fastening screw.

Close the vise.

Put the lower fastening screw in tight. If a bind has occurred in the dial or the quadder, it will be necessary to remove the dial bracket and enlarge the lower fastening screw hole. Put the dial bracket back on and position it by working the quadder lever with the foot in the same manner described above, tightening the holding screws while operating the quadder.

If successful in applying the dial bracket properly the jaws and dial will work freely. But as a further check, turn the Linotype by hand until the first elevator rests on the vise cap (do not use the flapper). Step on quadder lever to test action of jaws in all positions to be sure they are working properly. It may be necessary to tap the dial bracket slightly in one direction or another to get the jaws to work freely. If the jaws and the dial work freely, return the machine to normal.

Open the vise.

Dowel the dial bracket in position, using the same method given in Operation No. 13, NON-QUADDER.

Non-Quadder **OPERATION NO. 14** **Quadder**

Install the knife block, following Fig. 19.

Before proceeding with the knife block alterations, it will probably be well to discuss them in general and explain the minor variations required to adapt the Mohr Saw to the various types of knife blocks and other requirements.

The Linotype knife block liners, both upper and lower, are to be replaced with Mohr Saw knife block liners. The latter are made in two thicknesses, 36-point and 45-point. Be sure to use the same thickness of Mohr Saw liners as those replaced.

The addition of a Mohr Saw to a Linotype presents a new condition that must be met. Every slug must be presented to the saw blade on a uniform base, otherwise accurate sawing would not result. The Mohr Saw depends upon the slug resting firmly on the top surface of the knife block liner lower as the saw blade starts to cut the slug.

The replacing Mohr Saw knife block liner lower is much like the one that it replaces except that its surface is higher and slopes upward toward the front of the machine.

Also, the knife block liner lower is adjustable. In installation, the upper section is to be adjusted to the individual machine. The reason: Chips, especially on machines equipped with mold-cooling blowers, pile up on the upper surface of the knife block liner lower. When a slug is ejected from the mold it drops down upon these chips, as shown in Fig. 20. The chips raise the slug and cause the saw to saw the slug short by the thickness of the chips under the slug. The remedy for this condition is to adjust the upper section of the knife block liner lower so that its rear end is only a few thousandths of an inch lower than the upper edge of the right hand liner when the mold is in ejecting position. The slugs, when ejected from the mold, will then push the chips ahead, as shown in Fig. 21.

Adjust the knife block liner lower as just explained. A cross-sectional view of the liner is shown in Figs. 20 and 21. Loosen the set screw B and adjust the liner with set screws A. When the setting is correct, tighten set screw B to hold upper part of liner rigidly in place.

Also, there is interference between the Mohr Saw knife block liner lower and the lower edge of the right hand knife of the Linotype knife block at point "A", Fig. 22. It will be necessary to grind clearance on the knife at the point indicated. Do not grind off any more than necessary to clear knife block liner.

The Mohr Saw knife block liner upper 1664-A is similar to the liner it replaces but is equipped, on its under side, with down-pressure springs, which press each slug firmly from the top so that the slug is continually in contact with the knife block liner lower and is always presented to the saw blade in a uniform position vertically.

The spring plate of the Linotype is replaced by spring plate 1620. The latter, again, is much like the one it replaces but is wider in order to support the slug beyond the point necessary without a Mohr Saw.

Combination text-display, head-letter and some job machines require different spring plates from those ordinarily supplied with Mohr Saws. For example: A combination text-display machine may set long runs of 12-pica, column-width, slugs and it may be preferred to cast such text slugs 12 picas long instead of 30 picas long and saw each slug down to the 12 picas. Yet when used for display matter, all slugs will be cast the full 30 picas and be sawed to any measure required by the Mohr Saw. Under such conditions a 1619 (12 pica) spring plate is used instead of the standard 1620 spring plate (reference here is to a Linotype equipped to cast 30-pica slugs). The 1619 (12-pica) spring plate is shown in Fig. 23.

As shown, the 1619 spring plate is fitted with a spring designed to press

down on a slug cast 12 picas, serving the same purpose on a 12-pica slug that the springs on the knife block liner upper serve on 30-pica slugs. Yet, when a 30-pica slug is cast it automatically presses the 12-pica spring through the spring plate and out of the way and the springs on the upper knife block liner function in its stead, pressing the 30-pica slug downward as it passes through the knife block. When the machine again produces 12-pica slugs, the 12-pica spring again serves its purpose automatically.

A 12-pica slug was used in this explanation but 1619 spring plates can be prepared, on special order, for almost any other measure, 13-picas, 15-picas, 24-picas, 24-picas plus 3 points, and so on. In some few cases, as for headletter machines particularly, it is desired to use a 1619 spring plate with springs at both 12-picas and 24-picas plus 3 points. Such spring plates can be provided on special order to permit the casting to length, without sawing, of both single- and double-column slugs as well as the full 30-pica.

The spring plate tension spring is also replaced with a Mohr tension spring. The latter is stronger than the spring replaced, controlling the slug more firmly as it passes through the knife block.

A new part is added to the knife block, the knife block slug guide. The forward extension of this part is used to guide the type end of the slug into the channel which leads to the galley and prevents it from jumping out on the floor. This finger should be set as close to the slug as possible and yet allow the slug to drop into the slug channel. Setting it for one thickness of slug sets it for all thicknesses as this finger moves with the right hand knife. If for any reason this finger gets bent to the right and long slugs hop out on the floor, it will be necessary to re-set this finger.

Fig. 19 shows in sketch form the various Mohr Saw knife block parts required to suit different Linotype adaptations. The table below gives the part numbers for the various parts shown in Fig. 19.

	30-PICA 4-mold	30-PICA 6-mold	25½-PICA 6-mold	24½-PICA 6-mold
KNIFE BLOCK LINER UPPER	1664-A	1664-A	1655 (See Note C)	1655 & 1655-D (See Note C)
KNIFE BLOCK LINER UPPER DOWN-PRESSURE SPRINGS	1665	1665	1657	1657
KNIFE BLOCK LINER LOWER	1644 (36-Pt) 1645 (45-Pt)	1649 (45-Pt)	1649 (45-Pt)	1649 (45-Pt)
SPRING PLATE ASS'D (See Note "A")	1620	1620	1650	1650
SPRING PLATE ATTACHING SCREWS	1621	1621	1621	1621
SPRING PLATE TENSION SPRING	1622	1622	1651	1651
KNIFE BLOCK SLUG GUIDE ASS'D (See Note "B")	1609	1609	1609	1609

NOTE A - Spring plate 1619 (-- picas) can be furnished where required in place of the standard shown in the above table. In ordering, specify the measure, in picas, at which the spring is desired. If a spring is desired in the 1650 spring plate, order "1650 spring plate with spring at --- picas".

NOTE B - The 1609 knife block slug guide is furnished in two types, Type A and Type B as shown in Fig. 24. Type A is regularly supplied. For use with the advertising figure knife block the Type B should be used and should be ordered specifically.

NOTE C - When knife block liner 1655 is used, it is necessary to alter knife block casting E-1103 as shown in Fig. 25.

Now that the knife block alterations have been explained the actual changes can be made. First, remove and discard the following parts:

E-1630 knife block liner lower
E-1631 knife block liner upper
E-1526 spring plate
E-1043 spring plate spring
E-2149 knife block slug plate, attaching screws and dowels

Also, if the knife block has its cam and roll action operated by handle E-1985 remove and discard the following:

E-1985 knife right hand slide handle
E-1984 knife right hand slide handle shaft
E-1983 knife right hand block cam
E- 84 knife right hand block slide handle pin
E-1977 knife right hand block cam roll
E-1978 knife right hand block cam roll stud

It is not necessary to remove parts corresponding to the last six parts listed from any other type of knife block.

Install knife block slug guide 1609.

Install knife block liners upper and lower.

Install the spring plate which is to be attached with the two 8x32 headless screws. To locate the holes for these screws, place the spring plate in its usual position, with a two-point rule between it and the lower liner and a one-point hair-space or rule between the spring plate and the right hand knife next to the lower ear of the spring plate (as shown in Fig. 26) and slugs wedged between the upper edge of the spring plate and knife block liner upper, holding the spring plate against the knife at the same time. Now spot the lower hole with a No. 18 drill, remove spring plate, drill about 1/2" into the casting with a No. 28 drill being careful not to drill into the case-hardened right hand knife fastening screw and tap hole with an 8x32 tap.

Replace plate in position and fasten with one of the 8x32 headless screws. Replace the two-point rule and one-point hair-space, placing the one-point hair-space this time up against the upper ear of the spring plate. Spot with

a No. 18 drill, as before, remove spring plate, complete drilling and tapping as before.

Install the Mohr Saw spring plate tension spring in place of the one removed. Set the tension of this spring so that two thirds of it is against the lower part of the plate and the balance against the upper part. Desirable as it is to have considerable tension on the spring plate, the total pressure must not be great enough to bend overhanging figures or initial letters as slugs carrying them pass through the knife block.

Apply the spring plate.

If heads of spring plate screws protrude far enough to injure slugs as they pass through the knife block they should be filed down to remove the interference. This condition is caused by the knife being adjusted close to its extreme right hand limit. If shorter screws were furnished there might not be enough length to hold spring plate securely if knife were set at its extreme left hand limit.

Before replacing the knife block on the Linotype, turn the Linotype over by hand to see that all parts work properly. If they do, test the Linotype under power. Also, check the advance of the ejector blade of the Linotype. It should advance, at the forward limit of its stroke, at least 1/8" beyond the vise frame in order to transfer the slug properly from the ejector blade of the Linotype to the ejecting plate of the Mohr Saw. If the advance is not enough, adjustment should now be made.

(a) - Use the adjusting screw in the ejector lever adjustable pawl of the Linotype, taking care not to advance the ejector blade so far that the lever will bank against the shaft and possibly break the pawl; (b) If the pawl does not provide enough adjustment, lower the vise frame to the second position, pull out the mold disk slide and examine the ejector slide for dirt and chip accumulations that may be preventing a full stroke of the ejector blade. Fig. 27 shows where these chips may be found; (c) - If there is still insufficient adjustment it may be necessary to replace the Mergenthaler ejector blade controller F-2688 with a Mohr Saw ejector blade controller (which will have to be ordered as it is not furnished unless specified). The Mohr Saw controller (Part 212 for 30-pica machines, part 3549 for 42-pica machines), is made with a 1/8" offset which gives the ejector blade that much additional advance, which has proved to be all that is needed.

Another point in connection with the transfer of the slug from the ejector blade of the Linotype to the ejecting plate of the Mohr Saw: Occasionally, because of unavoidable variations between Linotype and Mohr Saw, the ejecting plate of a Mohr Saw does not align properly with the edge of the vise frame. Section A, Fig. 28 shows the correct relationship between the right hand edge of the ejecting plate, at the time of transfer, and the vise frame. As will be seen, the spring plate can press the slug to the left in transferring it to the ejecting plate without interference from the ejecting plate; also, there is sufficient surface of the ejecting plate upon which to load the slug. In Section B, Fig. 28, the edge of the ejecting plate extends so far to the right that it interferes with the transfer of the slug. When such a condition is encountered, the edge of the ejecting plate should be filed to produce the relationship shown in Section A, Fig. 28. Unless this is done slugs will not be transferred properly and the main bracket unit will be subjected to strains that are likely to result in faulty performance.
In Section C, Fig. 28, the ejecting plate does not extend far enough to the

right to provide sufficient loading surface for the slug. This condition occurs only rarely but when it does the remedy is to replace the regular ejecting plate with a 1068 ejecting plate special (1/16" wider than standard). This will have to be ordered unless the installer carries such a piece with him for use in emergencies. Proper transfer of slug to ejecting plate is very important. Correction of any misfit that may occur, as outlined here, should be made at this time.

Replace the knife block in its usual position. Be sure to avoid ruining the knife block liner upper down-pressure springs by catching them in the spring plate when applying the knife block.

Non-Quadder **OPERATION NO. 15** **Quadder**

Put the galley, package 15, in place.

In order to position the galley to prevent it from interfering with the travel of the slug jogger, push the slug jogger all the way to the left, then move galley to the right to meet the slug jogger. To maintain the galley in that position, the loose pin that came with the galley is to be placed in the position shown at 1408-B, Fig. 18, and the galley is to be notched to fit snugly against the pin. With the galley in place as just described spot the hole in the left hand galley bracket, through the galley about 1/16" from the edge of the galley. Remove galley and drill the hole in left hand galley bracket with a No. 14 (.182") drill 11/32" deep and ream for a press fit of the pin. Apply pin. Replace galley and file notch to fit snugly around pin. Check to see that slug jogger can travel freely.

Put galley slide, also in package 15, in place on galley.

Non-Quadder **OPERATION NO. 16** **Quadder**

The chip guard 1128 will be found in package 16. The operator may use this guard or quickly remove and set it aside, as he chooses. Application of the chip guard is shown in Fig. 29. (Follow Fig. 30 instead for 42-pica installation).

Non-Quadder **OPERATION NO. 17** **Quadder**

Attach the assembler slide parts contained in package 17. Follow Fig. 9. (Follow Fig. 31 instead for 42-pica installation).

Remove the pica scale and assembler slide clamp D-1659. Remove assembler cover screw D-1344 and substitute assembler rod support left hand stud 2044. Assembler rod support right hand 2020 is interchangeable with assembler slide bracket D-3075. All of these removed parts are to be discarded.

The assembler arm 2078 is attached to the assembler slide with two 8x32 filister head screws for which holes must be drilled and tapped. Fig. 9 gives the location. Be sure that the assembler slide is clean and slides freely and that roller D-3073 and screw D-3074 are in place.

(Two assembler rod supports left hand are supplied with each Mohr Saw for attachment to a Linotype already in use in the field. These are shown inset in Fig. 9. Only one is to be used on an installation, the other can be kept as a spare in the installer's kit. Use the 2040 on Linotypes without the swinging keyboard; the 2043 on Linotypes with the swinging keyboard. A third type support may rarely be needed when a saw is being applied to an old Linotype, to drop the assembler rod and assembler rod indicator lower than with 2040 or 2043. If this support is needed, order part 2045.)

Put the assembler rod 2000 in place as shown. Check fit of connection between assembler rod 2000 and pin on connecting rod 1720. If the pin is not fully engaged adjustment can be made by adding a washer to stud 2044. The assembler rod support right hand 2020 is made of brass and can be bent slightly, if necessary, to bring the assembler rod level and parallel with the assembler slide. Make sure that the assembler slide unit slides freely.

Apply pot pump lever extension 2229, as shown in Fig. 32.

Non-Quadder **OPERATION NO. 18** **Quadder**

Make a temporary connection between the motor of the Mohr Saw and the current supply. Leave with the customer the contents of package 18, conduit and fittings for making a permanent connection between Mohr Saw motor and Linotype switch. The customer must arrange for his own electrician to make this permanent connection.

Fig. 33 should be called to the attention of the customer for his use in instructing his electrician for the permanent wiring. These points should be watched: (1) Linotype and Mohr Saw motors must be designed for use on the same kind of current, alternating or direct, the same voltage, and if A. C. the same frequency and number of phases; (2) Linotype and Mohr Saw motors are to be wired in parallel and controlled by the one Linotype switch so that the turning of one Linotype switch starts or stops both Linotype and Mohr Saw in unison, thus eliminating the possibility of damage caused by ejecting a slug into an idle saw; (3) with the vise frame closed apply the conduit with the slack shown.

Watch out with temporary wiring to see that the saw is running when the Linotype is running. When leaving the job remove the temporary wiring connection, to avoid incurring liability for possible damage resulting from use of incomplete electrical connections. The customer can re-connect temporarily if he wishes.

It is recommended, if it is necessary to purchase a new switch, that the customer consider the advantages of the thermal cut-out type of switch which provides protection for his motors. Customer's electrician can furnish details.

Non-Quadder **OPERATION NO. 19** **Quadder**

Open package 19. It contains (1) a 15-pica gauge, which will be needed now; (2) a 9-inch socket wrench for adjusting the left hand knife (when saw is set at 15 picas); (3) a saw shaft sleeve spanner wrench to fit in the hole just

below the upper bracket ball bearing, in the saw shaft sleeve, to hold it steady while tightening or loosening the left hand nut on top of the fly wheel; (4) an assortment of spare parts; and (5) an instruction book; all of which are to be left with the customer.

Now, adjust the vise jaw, assembler and saw to operate in accurate unison. Three steps are necessary:

(a) Set the saw blade to saw a slug 15 picas long. Disregarding the figures on the dial, turn the latter until pointer on pica scale on main saw frame indicates 15 picas.

Now, saw a blank slug and try it in the 15-pica gauge. If the slug does not fit, move the saw up or down as the case may require, by means of the dial, and continue to cast, try and adjust until one fits the gauge properly.

Permit the slugs to cool before testing in the gauge, as slugs shrink considerably in cooling.

(b) Set the vise jaws at 15 picas. Raise the vertical screw pinion engaging pin 1036, thus disengaging the saw from the left hand vise jaw block stop and the assembler slide. Now, still disregarding the figures on the dial, hold the 15-pica slug just tested between the vise jaws and turn the dial until the jaws just close on the slug.

(c) Set the indicator on the left hand scale on the assembler rod at 15. The indicator is threaded to permit this adjustment. When this setting has been made, replace vertical screw pinion engaging pin in the operative slot, moving the dial slightly to the right or left so that the engaging pin will slip into the slot in the vertical screw and again connect saw, assembler slide and left hand vise jaw block stop. Then loosen the nut on the face of the dial, turn the latter so that the indicator engages "0" and re-tighten nut.

The rough setting of the vise jaw, within approximately 3 points of being accurate, has now been completed.

Now proceed with the finishing adjustment, to eliminate the 3 points or less of inaccuracy:

(a) - To set the saw to trim the type line properly: Assemble a line of matrices, preferably the smallest face and the thinnest slug, because finer adjustments are required on the smaller faces and when the adjustments are correct for the smaller faces they must also be correct for the larger ones. A suggested trial line for this purpose consists of a lower case "o" at each end of the line with "pi" (including 4 or 5 space bands) between.

Lock the "transfer" lever of the Linotype so that the line will not be distributed. Cast and saw a slug, then adjust the left hand vise jaw by means of bushing E-582 so that the type face is cast flush with the end of the slug.

Care must be taken that the locking screw 1240 (which locks the saw housing) is not left loose while sawing, re-casting and changing the adjustments.

Do not force any adjustments.

(b) - Loosen the locking screw $\frac{1}{4}$ turn and turn the dial forward for a few revolutions and then turn it in the other direction a few turns, finally returning to a setting of 15 picas. In setting to the 15-pica measure, be sure that the last movement of the dial is in a right hand or clockwise direction, to take up the backlash. Set, cast, saw and test a line. It should be correct.

See that the indicator on the left hand scale of the assembler rod is set at "15" and, using the last slug tested and found correct, set the star wheel with reference to the assembler stop on the assembler rod.

To set the star wheel, set a line of matrices about 6 picas long, with a lower case "o" at each end and only one spaceband about the middle. Send the line into the first elevator and lock the transfer. Move the dial to increase or decrease the drive of the spaceband until it is about one inch. Re-cast the line, making sure that the left hand wedge rises to the upper limit of its stroke just before the second drive of the justification lever. If it does, turn the dial until less than $\frac{1}{2}$" of drive occurs. Open the vise, remove the line from the jaws, close the vise, place the matrices and spaceband in the assembler. Turn the assembler arm adjusting screw 2075-B until the star wheel is stopped, then lock it with its nut. By using this method to set the star wheel there is always at least $\frac{1}{2}$" of justification if the star is turning. No line that stops the star should ever be sent into the first elevator.

While making final adjustments on the saw, it is advisable to see that the quadder (if saw is attached to a Linotype with quadder) is functioning properly. This is a very important step in testing.

Non-Quadder **OPERATION NO. 20** Quadder

Now that the saw is on, adjusted and tested, instruct those who are going to use and maintain the machine.

This is highly important for the success of the machine in the office depends upon the manner in which these individuals start out with the machine. If the machinist and operators find the saw easy to understand and operate, know how to set it if they accidentally disturb the adjustments, how to care for it, and how to get the most out of its use, the saw will most likely be successful in the office from the start.

Use of the 15-pica gauge, saw shaft sleeve spanner wrench, left hand side-trimming knife screw adjusting wrench and spare parts (all of which were packed in package 19) should be explained to the machinist. Explain the saw sharpening service that is available to the user. Give the customer the extra saw blade, saw blade box and two coupons, from package 19.

At this point, too, two other points should be checked:

1 - Is this machine expected to handle 48-pt slugs?

The Mohr Saw, as regularly furnished, will saw and deliver slugs up to and including the following sizes:

Quadder Linotype — Non-Quadder Linotype

36-Pt — 45-Pt

36-Pt is the largest size slug that can be accommodated on a quadder Linotype Mohr Saw as the narrow waste chute used on this type of Mohr Saw cannot carry away a larger waste end. The salesman should have explained this point at time of sale, and probably did, but just in case it would be well to check.

The non-quadder Linotype Mohr Saw can be fitted to cast and deliver 48-Pt slugs, if needed. The fitting requires the replacement of the waste channel, assembled with a waste channel, assembled 1343-A-B-C-D (48-Pt). The replacing waste channel is wider than the one it replaces, to permit passage of the wider slugs.

Check to see if the 48-Pt parts are needed. If they are, order them and instruct the user how to apply them when they are received.

2 - Will this saw need the waste ejector 1266 (36-Pt) or 1266 (45-Pt), the small saw-blade-like piece that is needed on Individual Mohr Saws that handle slugs 45-Pts and larger and occasionally on individual Mohr Saws handling a large volume of the larger display slugs up to 36-Pts. The use of 1266 is explained in the booklet "How the Mohr Saw Works," Page 19, under the heading "The Waste Ejector."

Order the part if necessary and show the customer how to apply it when it arrives.

Non-Quadder — **OPERATION NO. 21** — **Quadder**

At this point it is understood that the men who are to use and care for the Mohr Saw have been fully instructed, that they have operated the machine satisfactorily and the machine can safely be left in their care.

If nothing is left over and nothing is missing from the saw, arrange with the customer for disposing of the packing box and packing material and explain to him that he is to keep the discarded parts which were removed from this machine.

This should complete the job.

42-PICA LINOTYPE

Mohr Saws for application to 42-pica Linotypes are so similar to Mohr Saws for 30-pica Linotypes, with the exception that many of the vertical and horizontal parts are longer, that the general instructions are to be followed, taking into account the special comment below for the operations indicated:

Non-Quadder — **OPERATION NO. 2** — **Quadder**

Instead of actuating rod front support 1567, use part 3537 for the same purpose. The latter is to be attached through the lower hole of the starting and stopping lever bracket, as shown in Fig. 39.

Non-Quadder — **OPERATION NO. 4** — **Quadder**

The ejecting plate of the Mohr Saw, part 3068 on 42-pica saws, extends farther downward than its 30-pica counterpart. To provide needed room, replace vise automatic stop lever E-1713 with Mohr Saw part 3075; also, following Fig. 34, remove enough material from surfaces "B" and "B1" to bring these surfaces even with the front edge of lever 3075 when installed and in normal position. This will do for the present but after the main saw frame is on the machine, run the saw down to its minimum measure of 6 picas and remove any interference there may be at this point with ejecting plate 3068 just as it is about to receive a slug from the ejector blade of the Linotype.

Re-locate vise automatic stop rod lever E-2090 to provide room for waste chute, by applying parts 3593 and 3594 as shown in Fig. 34. Drill and tap an 8x32 hole in lever E-2090 directly below stop rod E-1705 when it is in normal position, for screw 3594.

Also, drill and tap an 8x32 hole in front of the vise frame at the left side and use stud E-3751 and lock nut E-3265 to fasten spring E-3753, which operates vise jaw locking toggle release lever E-3767.

Lever E-2090 having been lowered quite a bit, it may be necessary to extend the track on the first elevator slide on which its roller operates. On current machines the track on the left hand (In Fig. 35) side of the first elevator slide extends to the bottom of the slide and filler piece 3076 is, therefore, not needed. On earlier machines, upon which the track stops short of the bottom of the slide, install filler piece 3076 on the first elevator slide as shown in Fig. 35 being careful that 3076 is flush with the first elevator slide or a few thousandths of an inch lower, so it will not interfere with the travel of the first elevator slide.

MODEL 9 LINOTYPE

If the Mohr Saw is to be installed on a Model 9 Linotype, follow the basic instructions noting the exceptions below:

The Model D2 Mohr Saw cannot be applied to a Model 9 Linotype equipped with the up-stroke type of knife wiper.

Non-Quadder — **OPERATION NO. 2** — **Quadder**

Follow Operation No. 2 in basic instructions with these exceptions (See Figs.2 and 36):

(a) Use shorter lever 1502 instead of 1507; (b) Use bracket 1506 instead of 1513; (c) Anchor bracket 1506 by means of clamp 1512, stud 1515, washer 1517 and nut 1523 instead of using studs 1518 and clamping hook 1520; (d) Replace stud BB-240 with stud 1539. Stud 1539 has a thinner head to avoid interference with the actuating rod of the Mohr Saw.

Non-Quadder — **OPERATION NO. 11** — **Quadder**

Follow Operation No. 11 in basic instructions with this exception:

Use vise balancing spring 1087, Fig. 37, instead of 1085.

Non-Quadder — **OPERATION NO. 17** — **Quadder**

The same principles covered in Operation No. 17 of the basic instructions apply in this case although there are some variations because of the movable front of the Model 9 Linotype. Instead of following Fig. 9, follow Fig. 38.

ACCURACY

The Mohr Saw is a precision machine and, as such, it is expected to and will saw slugs accurately.

Fig. 40 illustrates what is meant by an accurately sawed slug. The copy called for, let us say, a 15-pica column width. The slug, when delivered, is found to measure exactly 15 picas in length and the type face fits perfectly on the slug without shoulder or overhang on the right-hand end and without shoulder or bleed at the left-hand end. Slugs like the one shown in Fig. 40, accurate in the particulars mentioned, are the kind that the Mohr Saw is designed to produce and will produce.

Nevertheless, occasionally slugs sawed by Mohr Saws are not accurate according to these specifications. It is the purpose of this discussion to (1) classify the various types of inaccuracy that may be encountered; (2) explain why the variations in each classification occur, and (3) in explaining why the variations take place, point the way to removal of the causes for the inaccuracies, toward the end that every Mohr Saw will always produce accurate slugs.

It will be noted, as the discussion proceeds, that the end result sought is more dependent upon accurate adjustment and use of the typesetting machine to which the Mohr Saw is attached than upon the Mohr Saw itself. When precision sawing is desired the typesetting machine must first be adjusted to produce a precision slug, then the Mohr Saw will be enabled to saw the precision slug precisely. For this reason the present discussion will be specific in dealing with both typesetting machine operations and Mohr Saw operations that affect accurate sawing.

The inaccuracies will be grouped under three main headings: First, "Variations in Length of Sawed Slug for a Given Measure"; second, "Variations in Position of the Type Face on the Slug"; and third, "Variations in Length of Type Face for a Given Measure".

VARIATIONS IN LENGTH OF SAWED SLUG FOR A GIVEN MEASURE

Fig. 41 shows two slugs. The slug identified by the letter A is the same accurate slug shown in Fig. 40. The slug identified by the letter B is a correction of slug A but, as shown, the slug is shorter than the 15 picas it was supposed to be. It might have been longer. The point to be emphasized is that the slug was not sawed to the exact length at which the dial was set. There are five factors involved in this condition:

1 - The Saw, Left-Hand Vise Jaw and Assembler Slide Must be Set in Unison

First, it is necessary that the dial, saw, left-hand vise jaw and assembler slide be set exactly in unison so that when the dial is set at 15 picas a slug will be sawed to that length and will fit snugly, when cool, in the 15-pica gauge. For some reason the adjustment of these units may have been disturbed and may require re-setting. For convenience, the instructions for setting dial, saw, left-hand vise jaw and assembler slide in unison are reprinted here:

A - Set the Saw Blade to Saw a Slug 15 picas Long — Disregarding the graduations on the dial, turn the dial so as to bring the pointer on the vertical scale (to the left of the saw housing) to "15", as at A, Fig. 42.

Cut a blank slug and try it in the 15-pica gauge. If the first slug does not fit the gauge properly, adjust the saw up or down, as the case may require, and continue to cast, try and adjust until a slug is obtained which does fit the gauge properly. All tests should be made when the slug is cold. Unless this instruction is followed, a variation can develop here for the slug varies in length at different temperatures.

B - Set the Left-Hand Vise Jaw at 15 Picas — Remove pin B, Fig. 42, thus disconnecting the saw from control by the dial; but leaving the left-hand vise jaw and assembler slide under control of the dial. Place the cold, 15-pica slug just tested between the vise jaws and, disregarding the graduations on the dial, turn the dial until the jaws close on the slug.

C - Set Assembler Rod Scale Indicator at "15" and Dial Indicator at "0" — Assembler rod scale indicator (C, Fig. 42) is threaded to permit adjustment. Set it to indicate "15" on the assembler rod scale; then lock it in place by means of the lock nuts.

Replace pin B in the operative slot (to restore saw to the control of the dial), moving the dial slightly (but not more than 1½ points) to the right or left as needed, to "feel" the pin into the deeper, or "operative", slot in the vertical screw.

Loosen the dial nut E and re-tighten it with the dial indicator at "0", as at D, Fig. 42.

CAUTION: Before setting the dial indicator at "0", be sure that the locking screw G, Fig. 42, is tight. Then, to take up backlash in setting the dial at "0", follow this procedure: Loosen the dial and turn it to indicate "11". Tighten the dial nut with your thumb and one finger. Then move the dial from "11" to "0", against the light resistance that you created when you tightened the dial nut with your thumb and one finger. Now hold the dial firmly while you tighten the dial nut securely with a wrench. Because of the backlash in the gears, you should now be able to move the dial from "0" toward "11" without changing the setting but should not be able to move the dial from "0" toward "1" unless you thereby change the measure of saw, left-hand vise jaw and assembler by the amount you move the dial.

This completes the coarse setting.

D - Set the Saw to Trim the Type Line Properly - Assemble a line of matrices with a lower case "o" at either end, preferably in the smallest face and on the thinnest slug mold on the machine. Lock the transfer lever of the typesetting machines so that the line can be re-cast and will not be distributed. Correct the line-up of the type face on the sawed end

of the slug in the usual manner, by means of part E-582 (F, Fig. 42).

CAUTION: When making these settings, be sure that locking screw G (Fig. 42) is tight while the slugs are being sawed. It is important that the operator acquire the habit of loosening locking screw G with his left hand, by about a quarter-turn, as he reaches for the dial handle with his right hand to change measure. With the locking screw loose he then turns the dial to the measure desired. When he has the dial set at the measure he wants he re-tightens the locking screw with his left hand. The locking screw will, then, always be tight when the slug is being sawed and this, in turn, means that the saw housing and saw blade are held firmly in fixed positions when the slug is being sawed. This practice becomes a matter of habit with the operator and he gives it no conscious thought after the habit is established. Do not force the dial. Perhaps the locking screw has not been loosened.

E - Final Check Loosen the locking screw and turn the dial forward a few turns, then backward a few turns and come to a setting at 15 picas again, making the last movement in a clock-wise direction, to take up backlash. Then cast, saw and test a line in the 15-pica gauge.

F - Set Star Wheel Using the last slug tested and found correct, set the star wheel with reference to the assembler stop on the assembler rod.

To set the star wheel, set a line of matrices about 6 picas long, with a lower case "o" at each end and only one spaceband about the middle. Send the line into the first elevator and lock the transfer. Move the dial to increase or decrease the drive of the spaceband until it is about one inch. Re-cast the line, making sure that the left hand wedge rises to the upper limit of its stroke just before the second drive of the justification lever. If it does, turn the dial until less than 1/2" of drive occurs. Open the vise, remove the line from the jaws, close the vise, place the matrices and spaceband in the assembler. Turn the assembler arm adjusting screw 2075-B until the star wheel is stopped, then lock it with its nut. By using this method to set the star wheel there is always at least 1/2" of justification if the star is turning. No line that stops the star should ever be sent into the first elevator.

2 - Backlash Must be Accounted For The second most likely cause of slugs being sawed incorrectly to length is failure to take up backlash. Are all operators who use the Mohr Saws careful to observe the rule regarding this?

In setting the dial of the Mohr Saw to any measure, the last movement of the dial should be in a clock-wise direction. The reason for this rule is to take up whatever backlash there may be in one, clock-wise, direction. If this rule is disregarded, the length to which the type ends will be sawed will not be dependably uniform.

To explain this point more clearly: Suppose that the saw is set at 13 picas and that the next slug is to be 16 picas. Turn the dial, in a clock-wise direction, directly from 13 picas to 16 picas. Now, suppose that the saw is set at 16 picas and that the next slug is to be 13 picas. Turn the dial, in a counter-clock-wise direction, from 16 picas down to 12 picas

and 10 points (about 2 points under the desired measure, 13 picas); then turn the dial in a clock-wise direction to 13 picas. The last movement of the dial would thus be in a clock-wise direction. This same rule should be followed in making all measure settings from a longer to a shorter measure.

3 - Saw Housing Ball Bearing Knurled Locking Screw Must Be Set Correctly

The setting of the saw housing ball bearing knurled locking screw (J, Fig. 42) may not be holding the bearing in position. The purpose of this part, as more clearly shown in Fig. 43, is to hold down the ball bearing at the lower end of the saw shaft so that it will be in a fixed position with relation to the saw housing. If such a position is not held, the bearing, and with it the saw shaft, will float along its axis as the saw is moved from longer to shorter measures, resulting in inaccurate sawing to length. The tip of this screw presses down lightly on the upper rim of the ball bearing. Use the fingers of the hand only for adjusting this screw and never with enough strength to squeeze or distort the bearing. Tighten the screw just enough to prevent the bearing from floating vertically.

The same effect as just described is brought about if the saw housing ball bearing (See Fig. 43) is worn to the extent that there is end play when the saw shaft, grasped between the thumb and two fingers, can be moved up and down although the outer race of the bearing is held firmly by screw #1220. Such a worn bearing should, of course, be replaced with a new one.

4 - A Buckled Saw Blade Will Cause Variations

Although it happens only rarely, once in a while a saw blade will become buckled, or wavy. When such a condition exists, one slug may be long and another short and still another be the correct measure although the saw remains at the same setting. The variation depends upon the segment of the wave in the saw blade that first starts the cut. If such a condition is suspected, try another blade to make sure.

5 - Side-Knife Trimmings Cause Variations in Length

Occasionally, but more frequently when mold-cooling blowers are used, trimmings from the side trimming knives fall upon the knife block liner, lower, as shown in Fig. 20. If the slug, when ejected from the mold of the machine, drops down upon one of these trimmings it is raised as it passes through the knife block across the knife block liner, lower, and is sawed short by the thickness of the trimming underneath. To prevent this condition, the knife block liner, lower, should be so set that the slug, instead of dropping down upon the trimmings, pushes them ahead of it as it passes through the knife block, as shown in Fig. 21. All molds in the disk should, of course, be made to line up with the right-hand jaw so they will all be uniform, in ejecting position, with respect to the knife block liner, lower.

If all of the points just covered above have been checked and found in order the Mohr Saw should produce a slug sawed accurately to any measure within its range.

VARIATION IN POSITION OF TYPE FACE ON THE SLUG

Now that the necessity has been emphasized for making sure that the slug itself is being sawed to the exact length desired and it is assumed that the saw is sawing to the correct length, let us consider the problems raised by slugs A and B in Fig. 44.

The root cause of the difficulties exemplified by the slugs in Fig. 44 is that the right-hand end of the type face is not aligned flush with the right-hand end of the slug. Perhaps Fig. 45 will help to clarify this point.

The sketches in Fig. 45 show the full slug, before sawing. Let us suppose that the dial of the Mohr Saw is set at 15 picas in all three instances, X, A and B. Let us further suppose that the type face in each case is exactly 15 picas long. In the case of slug X the type face is aligned flush with the right-hand end of the slug as it should be. It will be noted that the saw blade, waiting to meet the slug as it is ejected, will saw the slug flush with the left-hand end of the type face. In the case of slug A, however, the type face is not flush with the right-hand end of the slug; and the left-hand end of the type face is correspondingly as far to the left of the line at which the saw will saw the slug as the type face missed being flush with the right-hand end of the slug. The end character of the type face of slug A will, accordingly, be bled and a shoulder will be left on the right-hand end of the slug, as shown in slug A, Fig. 44. In the case of slug B, Fig. 45, the type face again is not aligned flush with the right-hand end of the slug but in this instance the type face overhangs the right-hand end. The left-hand end of the type face is, correspondingly, too far to the right of the line across the slug the saw blade is waiting to saw. When delivered, this slug will have a type face shoulder at the sawed end and an overhanging (probably mashed) type face on the right-hand end. The sawed slug is shown at B, Fig. 44.

Worn or Loose Mold Disk Studs and Blocks Cause Variations

To properly position the type face on the slug, the mold itself must be rigid; that is, there must be no play or looseness which would permit movement of the mold to right and left in front of the line of matrices. To prevent such looseness, the mold disk locking studs must fit snugly into the mold disk locking stud blocks. If either of these parts is worn some play is bound to occur and dependable positioning of the type face on the slug cannot be expected.

A simple test will serve to show if wear exists in these parts. Cast one 5-pica slug, from each mold. Use the same line of matrices, containing three spacebands, for these samples. Have line so adjusted that spacebands will drive from $\frac{1}{2}$" to 1". Then cast one 29-pica slug from each mold. Use a line of matrices containing three spacebands for these samples. Have line adjusted so that spacebands will drive from $\frac{1}{2}$" to 1" and use the same line on all four molds.

Now examine the type face at the right-hand end of each slug. If the type face has the same relation to the right-hand end of the slug body on all of the test slugs, the locking studs and the right-hand block are in good shape.

If, however, the type face overhangs the right-hand ends of the four short slugs, and all the long slugs have a slight indentation, or shoulder, at the right-hand end, the locking stud block is worn or loose.

If the slugs from only one mold show (1) an overhang of the type face on the right-hand end of the short slug, and (2) a slight indentation, or shoulder, on the right-hand end of the long slug, then the mold locking stud on the next mold to the right (in a clock-wise direction) is worn or loose. Sometimes more than one mold will show worn or loose studs.

If there is any variation in the position of the type face at the right-hand end of the slug, there is a corresponding variation in its position at the left-hand end of the type face. If the type face extends farther to the left than the set measure, the end character will be bled.

When worn studs or blocks are discovered, they should be replaced with new ones. The new studs must fit snugly in the mold disk.

Importance of Aligning Right-Hand Vise Jaw With Right-Hand Mold Liners — The controlling factor in preventing the conditions shown in slugs A and B in Figs. 44, is the flush alignment of the right-hand mold liner of each mold with the right-hand vise jaw, on all length slugs.

To determine if the molds are properly adjusted in this respect, set and cast a line, and re-cast that line on all four or six molds. Check the slugs from each mold to see if the type face is flush with the right-hand end of the slug in every case. If not, it may be necessary to replace one or more worn right-hand mold liners. If this does not correct the trouble, it will probably be necessary to shift one or more molds to make all line up properly with the right-hand vise jaw.

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With mold disk locking studs and mold disk locking stud blocks firmly seated and without play and with the right-hand mold liner in each mold flush aligned with the right-hand vise jaw the type face should be positioned properly on all slugs without bleeding of end characters or the formation of shoulders, with one exception which will be discussed next.

VARIATION IN LENGTH OF TYPE FACE FOR GIVEN MEASURE

So far in this discussion we have discussed variations in sawed slug length and variations in the position of the type face line on the slug body. In dealing with the position of the type face line on the slug body we have assumed that the type face line, in each case, was exactly the same length as the measure to which the slug was to be sawed. There is another condition to consider: variation in length of type face, uncontrolled expansion beyond the measure at which the slug is to be sawed.

To illustrate the condition: Let us suppose that an operator is setting short measure matter on a 5-point slug. He sets the dial at the measure desired, and sets and casts his lines. When the proof comes through, most of the lines in this take are found to be sawed properly to length but the end characters on one or possibly two of the lines have been bled. It is immaterial whether the sawing was done on a Mohr Saw or a floor saw - the cause lies in the adjustment of the typesetting machine, not in the saw.

What happened in this case was that the left-hand vise jaw of the typesetting

machine did not hold uniformly on the bled lines to the exact measure at which the Mohr Saw was set. The left-hand vise jaw was forced to the left beyond the set measure, by the width of the bleed.

When a Mohr Saw is applied to a typesetting machine the dial controls the setting of the saw, the assembler slide and the left-hand vise jaw. These three settings are in unison.

If, however, independently of this setting of the three units, the matrix line is permitted to be expanded beyond the set measure at the instant of casting, the saw will bleed the end character. Such expansion is caused by sending in matrix lines that are "overfull" and cannot be compressed to the set measure, or matrix lines with only one or a few spacebands that expand the matrix line more than ordinary lines with many spacebands.

"Safety" Position of Left-Hand Vise Jaw

To adjust the Linotype to reject all matrix lines that are "overfull", the use of a "safety" position of the left-hand vise jaw is needed. Used as instructed, matrix lines will be held rigidly to the set measure at the instant of casting and type lines will not be bled from this cause, regardless of the number of spacebands used and how many lines are cast.

Thus, if bleeding of lines from this cause is objectionable and the plant machinist wishes to prevent it, it can be done and this discussion will point out the remedy.

First, the table below lists the actions that pertain to a line of matrices between the vise jaws. The actions that have to do with the movement of the left-hand vise jaw, and which are indicated by boxed numerals, are the ones in which we are particularly interested in this connection. Then, following the table will be found instructions for securing the "safety" position on the Linotype.

CYCLE OF ACTION

1 - A line of matrices is set up and sent into the first elevator jaws.

[2] - The first elevator descends until it rests upon the vise cap. While the first elevator is descending, the mold wheel makes a quarter-turn, from ejecting to casting position. The left-hand vise jaw should be in "safety" position, as shown at A, Fig. 46, as the line of matrices is entering between the vise jaws.

3 - The mold slide, carrying the mold disk, advances until the mold is over the toes of the matrices.

[4] - The left-hand vise jaw moves to "closed" position (See B, Fig. 46) making the distances between the vise jaws the exact measure at which the Mohr Saw dial was set.

5 - The justification lever rises, causing the justification bar to rise in an inclined plane and push the spacebands upward through the line, spreading the line until the friction of the spacebands stops the action of the justification spring. This is the first justification.

6 - The justification and vise closing levers descend and the left-hand vise jaw moves to "wide open" position (See C, Fig. 46). This movement of the left-hand vise jaw relieves the line of matrices from end pressure and allows them freedom for the vertical and front-to-back alignment which follows immediately.

7 - The first elevator rises approximately .010", lifting the matrices so that their toes bear against the aligning shoulders in the mold for vertical alignment.

8 - The metal pot advances and pushes the mold forward against the line of matrices, pressing them forward against the first elevator front jaw, to complete the alignment face-wise or the front-to-back alignment of the matrices.

9 - The metal pot recedes somewhat, relieving the matrix line from the forward pressure of the mold, preparatory to final justification.

10 - The vise closing lever rises and the left-hand vise jaw is moved inward to the exact length of the line. See D, Fig. 46.

11 - The justification and vise closing levers rise simultaneously, causing the justification block to rise horizontally and push the spacebands upward through the line of matrices, to complete the second justification.

12 - The metal pot closes against the mold, forcing the mold against the aligned and justified matrices, making the "lockup".

13 - The plunger descends and thereby forces metal through the mouthpiece into the mold to form the slug, after which the plunger rises to normal position.

14 - The metal pot moves back, followed very soon by the mold disk. As soon as the slug is completely clear of the line of matrices the left-hand vise jaw reaches this "wide open" position and the first elevator starts to lift the line of matrices from between the vise jaws. See E, Fig. 46.

Fitting the Linotype for "Safety" Position The Linotype as designed and built provides for but two positions of the left-hand vise jaw, "fully open" position and "fully closed" position, and the vise closing cam, which actuates the vise closing wedge, which controls the action of the left-hand vise jaw, was designed for only these two positions.

The "wide open" position should not be used for Action 2 when a Mohr Saw is applied to a Linotype as it permits matrix lines that are too full to be held to the set measure to settle between the vise jaws, with the result that the Mohr Saw will cut off the "overfull" portion of the type-face line, usually bleeding the end character.

So, instead of the "wide open" position in Action 2, a so-called "safety" position is used to meet the needs of accuracy set up by the application of a Mohr Saw to a Linotype. As will be seen at A, Fig. 46, the left-hand vise jaw is to the left of the set measure. The distance is about half a point.

This position allows room for the opening of the left-hand vise jaw half a point (about .008") beyond the set measure. A line of matrices a half-point longer than the set measure will thus be permitted to settle between the vise jaws, while all lines longer than that will be rejected.

Any matrix line can be squeezed at least .008" and lines containing many thin matrices can be compressed considerably more than .008". Advantage is taken of this fact in providing the "safety" position which accepts, in Action 2, matrix lines ½-point longer than the set measure, that will squeeze, in Actions 4 and 10, to the set measure. This extra half-point is very welcome to operators setting short measure ad and catalog composition and to operators of head machines. Thus, no "overfull" line will settle between the vise jaws yet the maximum length matrix line that can safely (to avoid bleeding) be taken is allowed to enter between the vise jaws.

To obtain this third, or "safety" position, for Action 2, it is necessary to alter the vise closing cam, which actuates the vise closing wedge, which controls the position of the left-hand vise jaw, at two points. If the cam were not modified at these two points the wedge would be moved down to the "safety" position at points in the cycle when it should stop in the "wide open" position.

The first modification is of that part of the vise closing cam that controls the position of the wedge during Actions 7 and 8 (See Fig. 47). This is a high point in the cam less than two inches long. It is important that the wedge remain in "wide open" position at this time. If it is permitted to go down to "safety" position it partially locks the line of matrices and the first elevator does not have sufficient upward pressure for vertical alignment of the matrices in this partially-locked line, especially if using the "flapper". File this high point in the cam to a depth of about one thirty-second of an inch, being careful to hold a uniform radius and to keep the file level so the cam roll will track the center of the cam where filed. Having finished, stop the machine with the cam roll at the point just filed and the wedge should stop and remain in the position shown at C, Fig. 46, the "wide open" position.

The second modification has to do with that part of the vise closing cam which causes the first elevator to lift the line of matrices from between the vise jaws. Stop the machine just as the first elevator starts to rise and make a mark on the vise closing cam where the cam roll rests, then turn the machine forward by hand until the line of matrices is just clear of the vise jaws and make another mark where the cam roll rests on the cam. File the vise closing cam between these two marks to a depth of about one thirty-second of an inch.

Finish both of these filed surfaces with a fine file and when sure that the cam roll is tracking near the center of the cam, finish with a fine emery cloth. Tracking only one side of the cam will not do, as it will result in rapid wear of the cam at this point. Considerable skill is required to file to a uniform depth, hold the radius, and keep the file level so that the cam roll will track the center of the cam. Be careful. When finished, check to see that the wedge remains in the "wide open" position shown at E, Fig. 46, until the line of matrices is entirely clear of the vise jaws.

It is realized that the wedge actions recommended here are contrary to the instructions given by Mergenthaler Linotype Company on page 131 of the book "Linotype Machine Principles". The Linotype was designed to permit an operator to get all he possibly could into a line regardless of whether some lines were "overfull" or not. In fact, "overfull" lines were helpful in many cases such as setting "want ads" and "heads" in newspapers in the days of six-point column rules. Now that many papers are using thinner column rules, the "overfull" lines with their overhanging typematter often times mash down the column rules. As explained in these present instructions the application of a Mohr Saw to a Linotype requires that "overfull" matrix lines be prevented from entering between the vise jaws, in order to avoid the bleeding of end characters. Therefore, these instructions are offered for the guidance of the machinist in making the modifications needed to get the precision results he requires from his Mohr Saw-equipped Linotype.

If all adjustments, referred to herein have been made exact measure lines should now be set, cast and sawed without leaving type-face shoulders or bleeding end characters, regardless of the number of spacebands used in a line and regardless of whether the line is long or short.

On the other hand, you may still find that the end character is bled on some slugs. If so, the "fully closed" position of the left-hand vise jaw, as explained below, may require attention.

"Fully Closed" Position of Left-Hand Vise Jaw

The task now is to make sure that the left-hand vise jaw is moved to the "fully closed" position in Actions 4 and 10. If the left-hand vise jaw is not moved to the exact measure at which the slug is to be sawed the end character on the slug will still be bled. Let us look into the reason why, in some instances, the "fully closed" position will not be rigidly held.

The main justification spring of the Linotype exerts an upward pressure on the spacebands in the line of between 40 and 50 pounds, regardless of how many spacebands there are in the line, whether one or many. When there is only one spaceband in a line all this pressure of the main justification spring is exerted on the one band, with the result that it is driven up farther than would be the case if more spacebands were in the line and the pressure was off-set by the combined friction of all the bands in the line.

When "fully closed" position is attained in Action 4 but cannot be reached in Action 10, it will usually be found that a one-spaceband line of matrices is between the vise jaws. Tension on the vise jaw wedge spring must be strong enough to move the left-hand vise jaw to "fully closed" position in Action 10 when justifying a line with only one spaceband. If the vise jaw wedge spring is adjusted to exert its maximum tension and "fully closed" position in Action 10 cannot be attained, reduce the pressure of the main justification spring. This will allow the vise jaw wedge spring to raise the wedge to its uppermost position, banking against the stop, which is necessary to get the "fully closed" position. This "fully closed" position is important on all lines but is especially so on lines with only one spaceband.

To check this point: set a line of matrices, about six picas long, with a lower case "o" at each end of the line and use only one spaceband about the middle of the line. Send the line into the first elevator, lock the transfer and re-cast this line until all of the following adjustments have been completed. Check the amount of drive of the spaceband and move the dial slightly to increase or decrease the drive of the spaceband until it is about one inch. Now adjust the right-hand jaw until the type face is even with the right-hand end of the slug. Adjust the left-hand vise jaw by means of bushing E-582 until it is even with the left-hand end of the slug. Now re-cast and check to see if the vise jaw wedge rises to the full upper limit of its stroke and banks against the stop just before the second drive of the justification levers. If it does not, it will then be necessary to either increase the tension of the vise jaw wedge spring or decrease the pressure of the main justification spring until the desired result is obtained.

If the spaceband now in this test line is a thick or extra-thick spaceband and there is a possibility that at some future time you may wish to use thin spacebands on this machine, it is suggested that the band in the line be replaced with a thin spaceband. The reason for this is that spacebands with a smaller taper per inch require more tension on the vise closing spring than spacebands with a greater taper per inch, even though the pressure of the justification spring is the same for both spacebands.

Lower End of Vise Jaw Wedge Should be Centered in Fork of Main Justification Lever

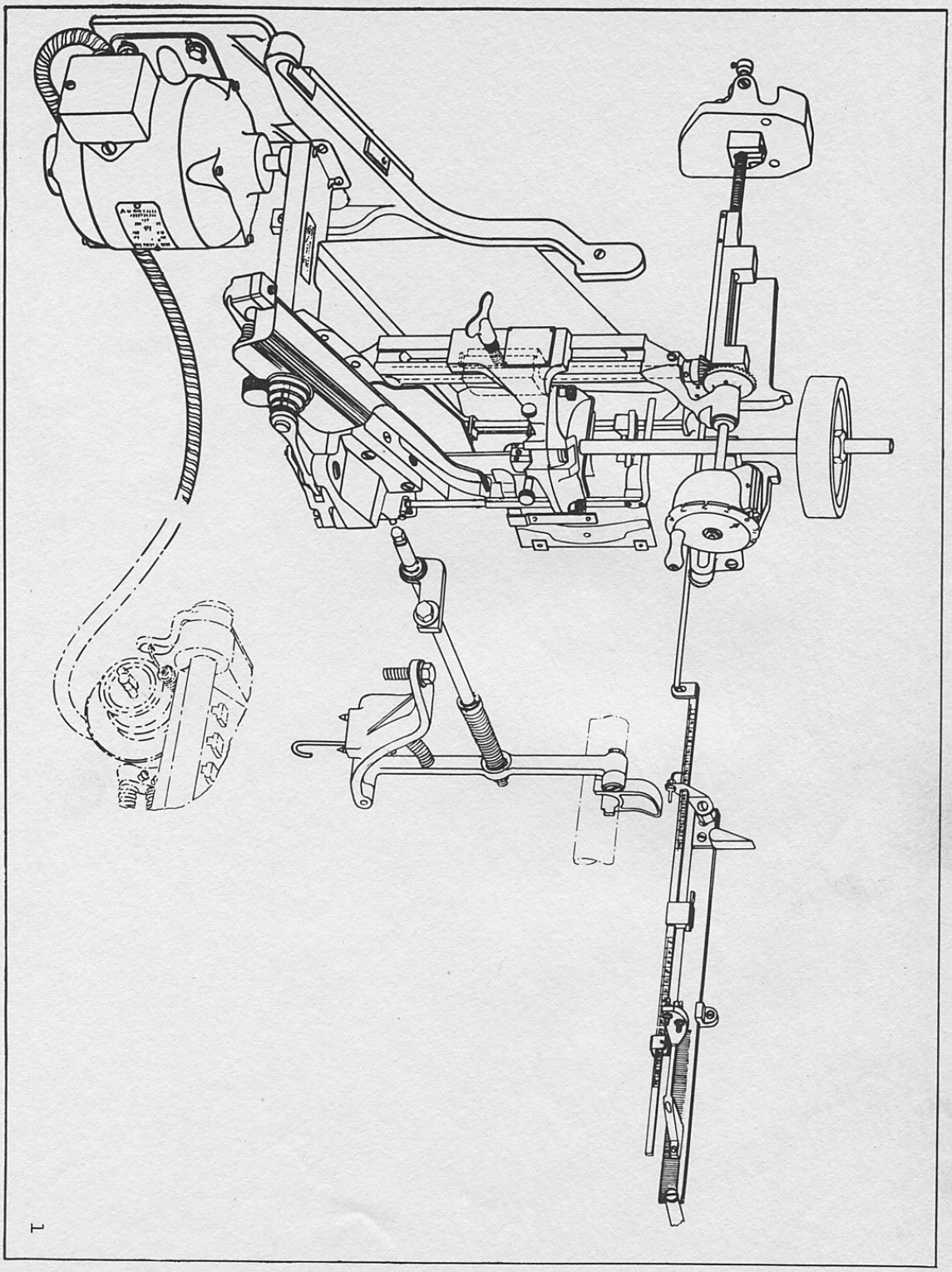
Another source of bled lines that must be considered here results from the lower end of the vise jaw wedge not being properly centered in the fork of the main justification lever. Using the same line just used, stop the machine as the wedge is fully closed and the spaceband driven up. Examine the fork on the lower end of the wedge rod to see if any binding occurs here. The arm should be so adjusted that no binding or rubbing occurs on either side. The ideal condition is to have the lower end of the wedge centered in the fork. If binding or rubbing occurs it will be necessary to bend the lower part of the wedge rod, which is malleable.

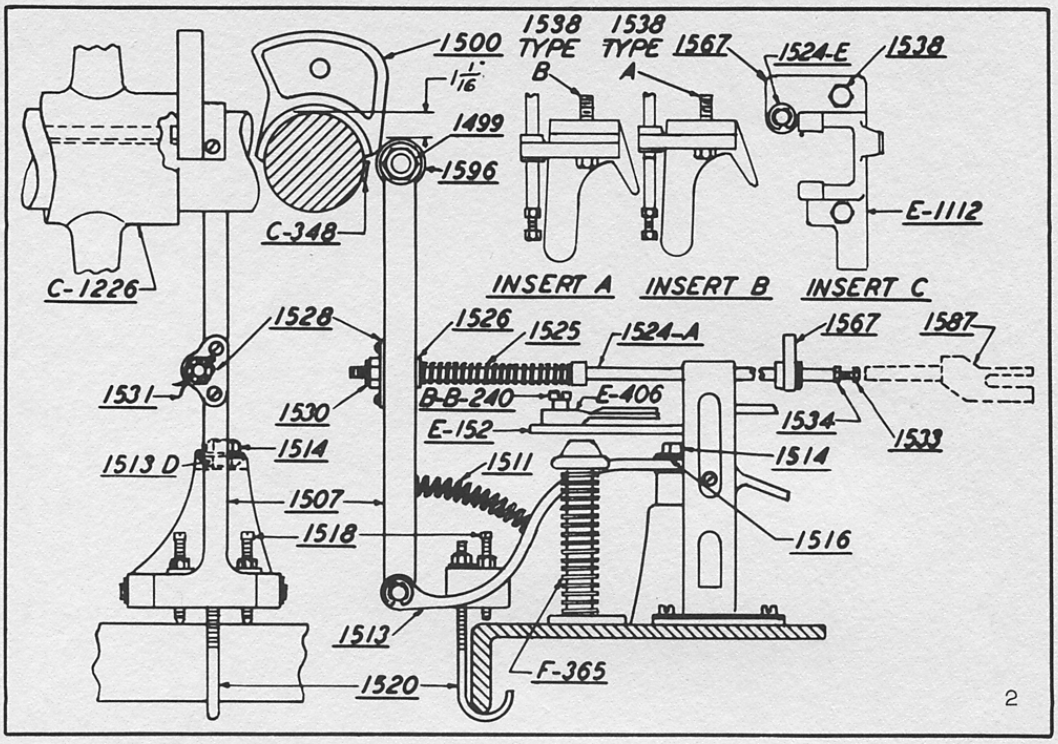
The vise jaw wedge must be kept well lubricated at all times. Keep the wedge clean and see that dirt does not accumulate in the wedge slot.

- - - - - -

If the above explanations are clearly understood and the adjustments recommended have been made, there should be no difficulty from bled end characters on slugs sawed by a Mohr Saw irrespective of the number of spacebands in the line or the length of the line or how many lines are produced.

This may seem like a lengthy article but the subject has been treated rather fully to meet the needs of Mohr Saw users who are always striving for better results in the product they turn out. As has been shown, Mohr Saws can produce as high quality work as is needed provided that the typesetting machine, as well as the Mohr Saw, is properly adjusted and operated for the purpose.




1500
1 1/16"
1499
1596
C-348
C-1226
1538 TYPE B
1538 TYPE A
1567
1524-E
1538
E-1112
INSERT A
INSERT B
INSERT C
1528
1526
1525
1524-A
1567
1587
1531
1530
B-B-240
E-406
E-152
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1533
1513 D
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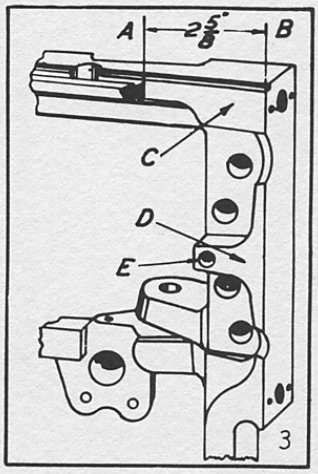
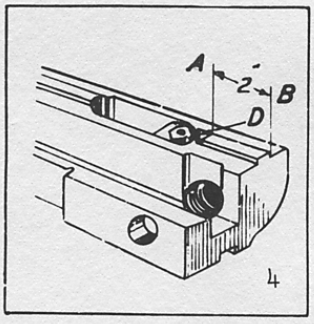
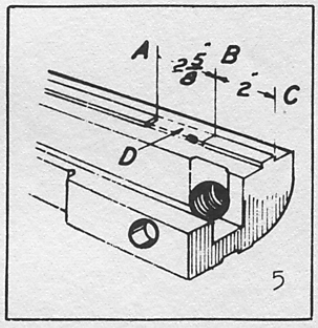
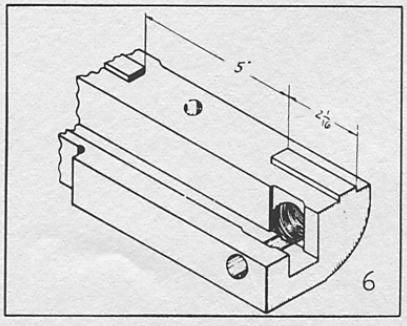
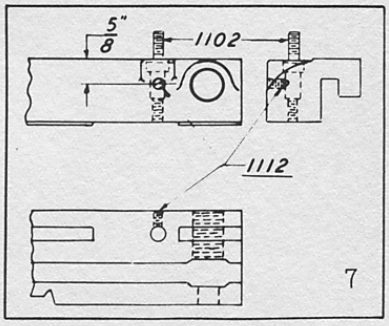
1514
1507
1518
1516
1513
F-365
1520
2

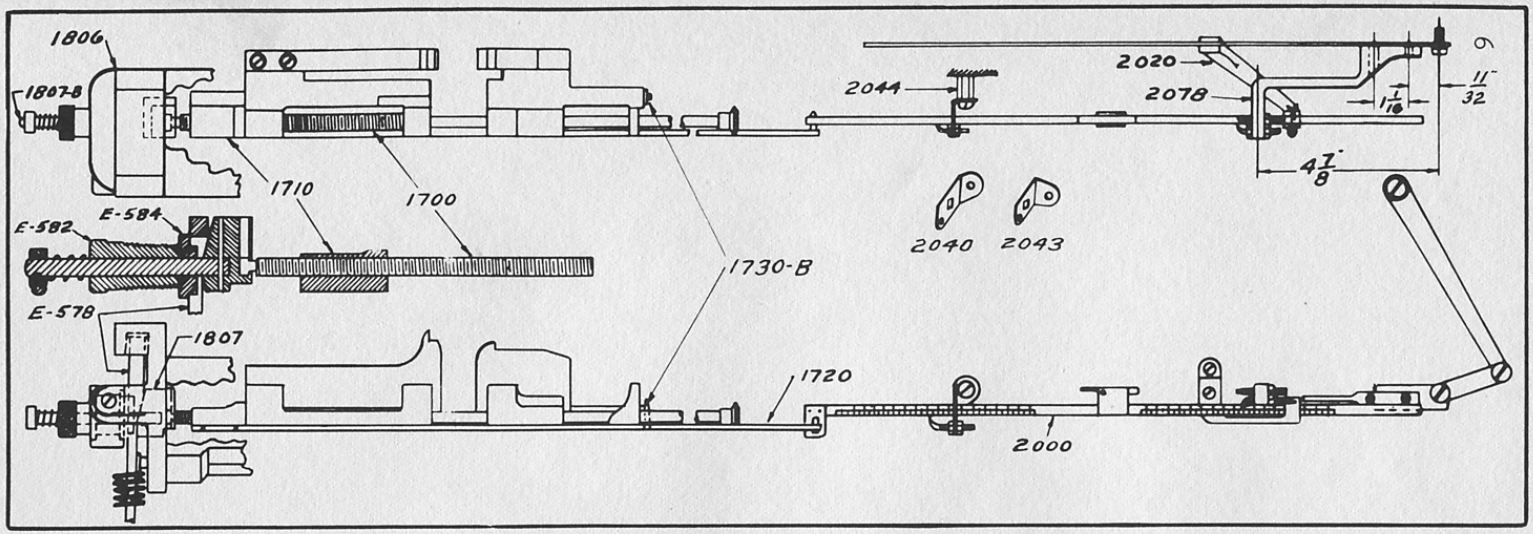

A
2 5/8"
B
C
D
E
3


A
2"
B
D
4

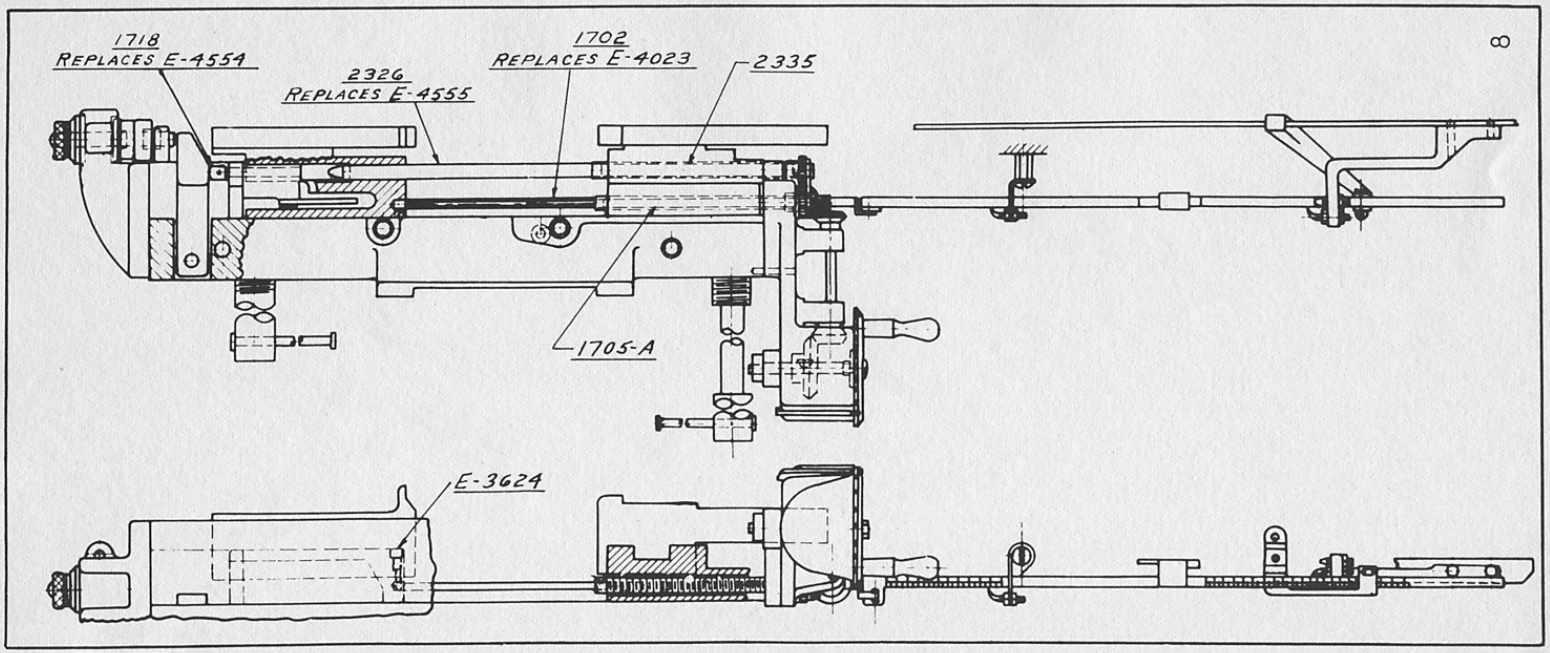

A
2 5/8"
B
2"
C
D
5


5"
2 1/16"
6


5/8"
1102
1112
7


1806
1807B
1710
1700
E-582
E-584
E-578
1807
1730-B
1720
2000
2044
2020
2078
2040
2043
1 1/16
11/32
4 7/8"

9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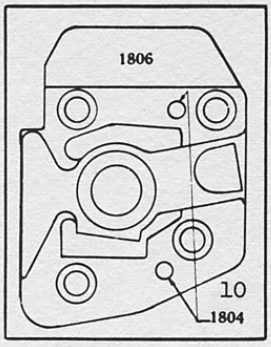
REPLACES E-4554
2326
REPLACES E-4555
1702
REPLACES E-4023
2335
1705-A
E-3624

8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1804
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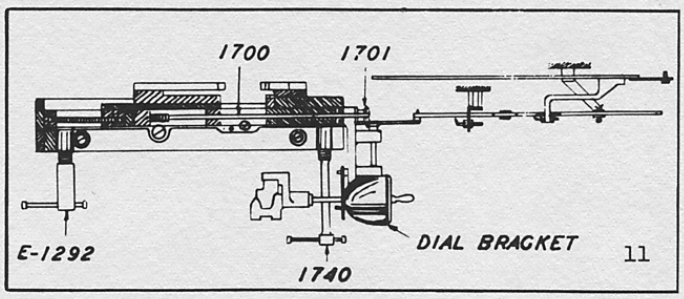
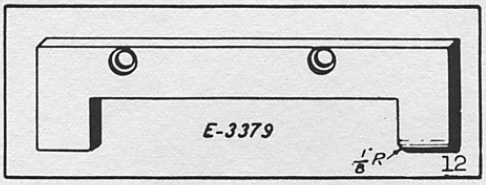
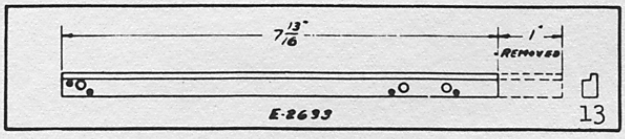
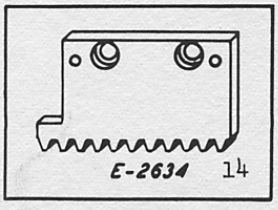

1700
1701
E-1292
1740
DIAL BRACKET
11


E-3379
1/8 R
12


7 13/16"
1"
REMOVED
E-2693
13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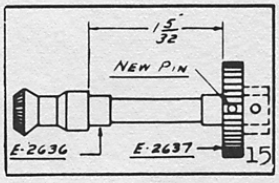
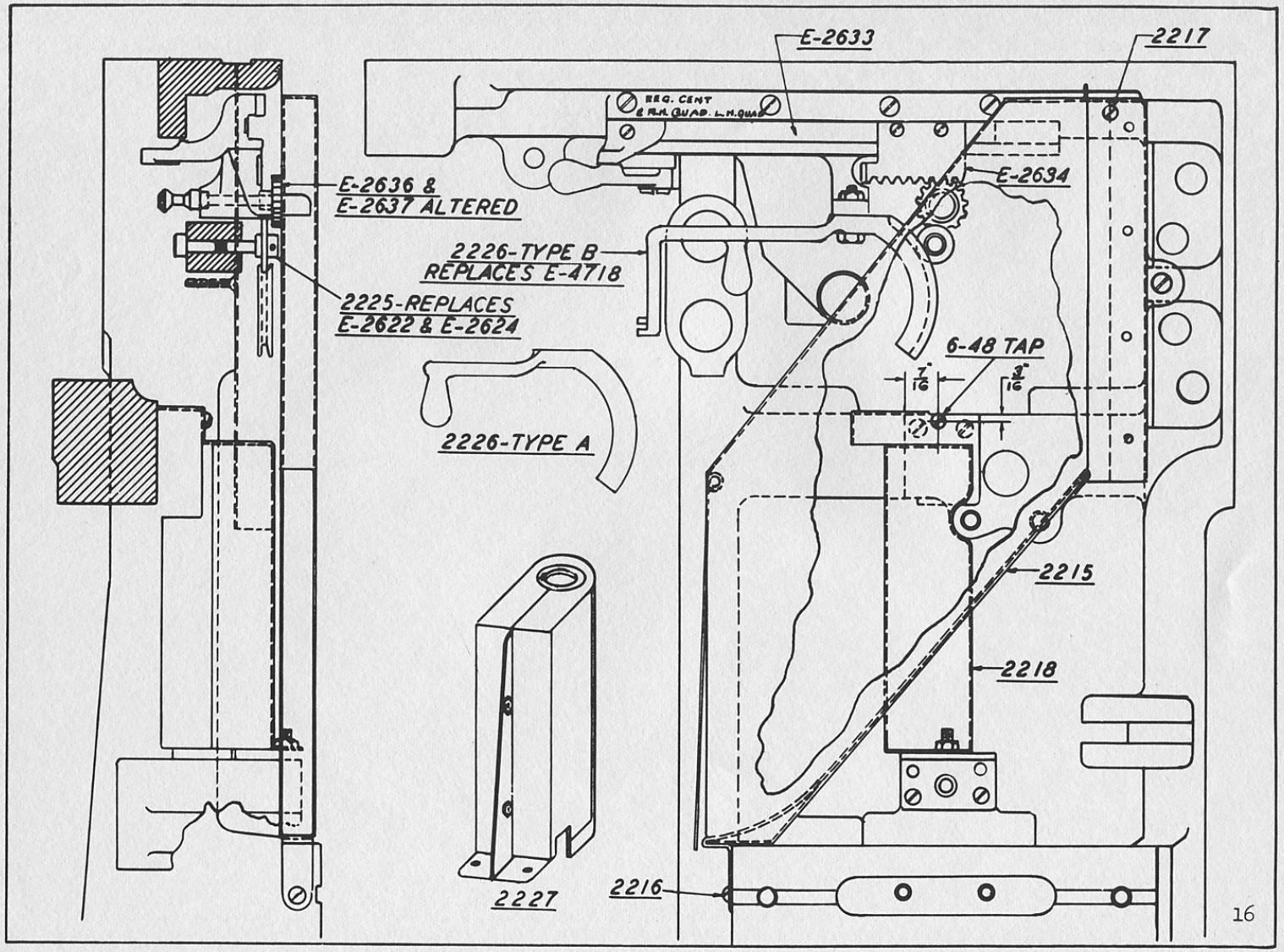
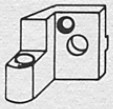
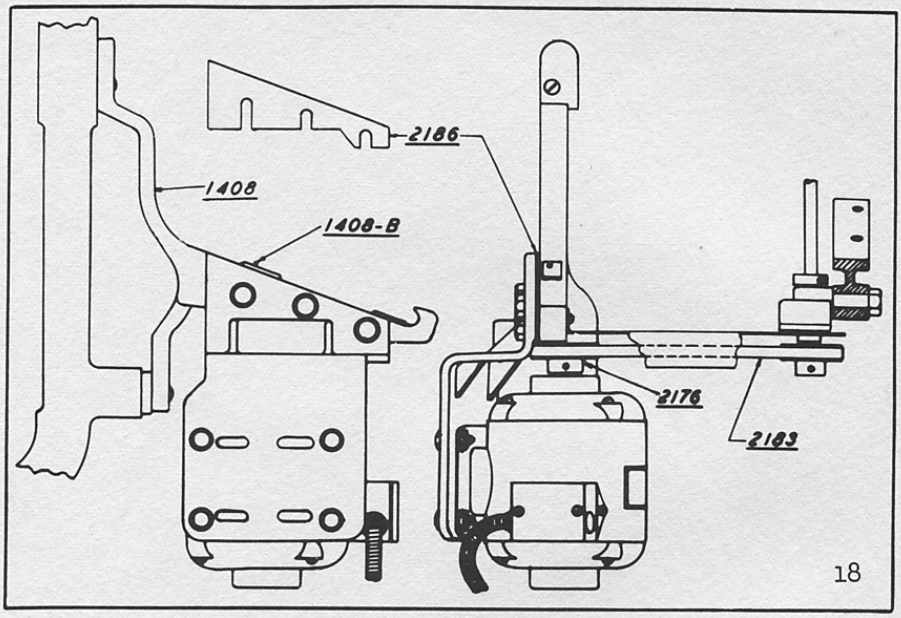

1 5/32"
NEW PIN
E-2636
E-2637
15


E-2633
2217
REG. CENT
& R.H. QUAD. L.H. QUAD
E-2634
E-2636 &
E-2637 ALTERED
2226-TYPE B
REPLACES E-4718
2225-REPLACES
E-2622 & E-2624
6-48 TAP
2226-TYPE A
2215
2218
2227
2216

RIGHT HAND FIRST ELEVATOR SLIDE GIBS - LINOTYPE		
UP STROKE KNIFE WIPER	DOWN STROKE KNIFE WIPER	
	EARLIER TYPE	CURRENT TYPE
 1090 RIGHT HAND-UPPER	 1089 RIGHT HAND-UPPER	 2289 RIGHT HAND-UPPER
 1091 RIGHT HAND-LOWER	 1072 RIGHT HAND-LOWER	 1072 RIGHT HAND-LOWER

17



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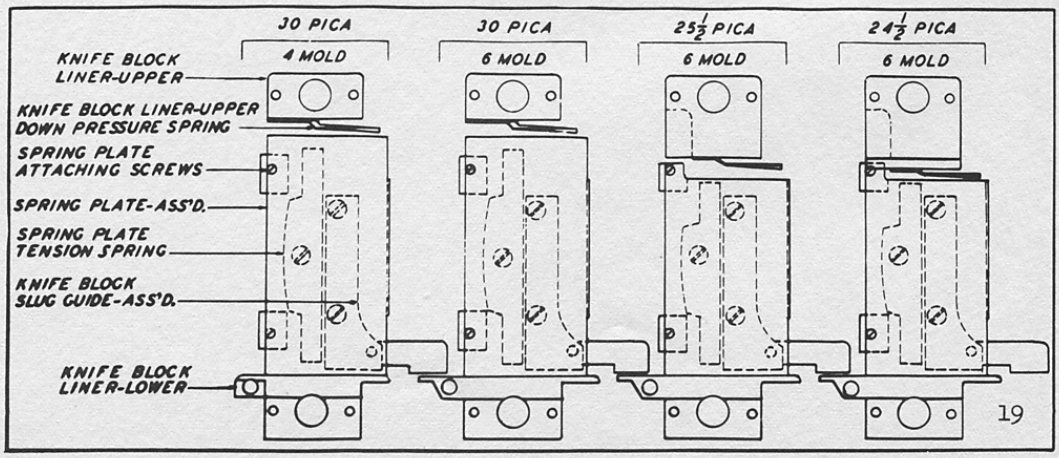

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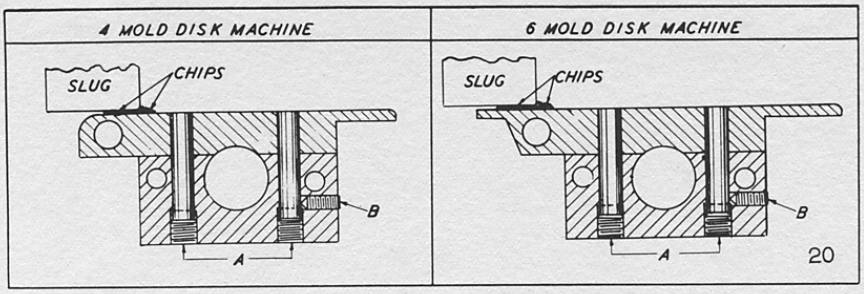
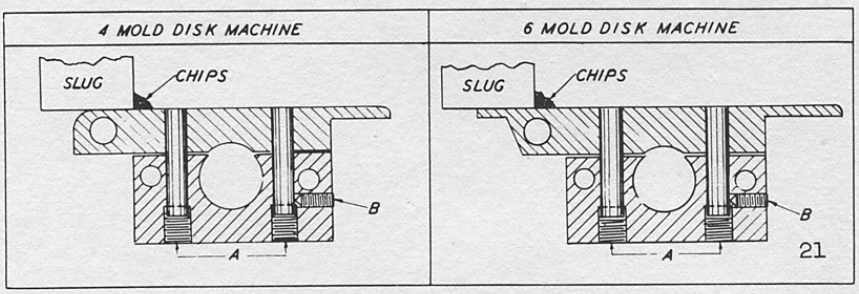

4 MOLD DISK MACHINE
6 MOLD DISK MACHINE
SLUG
CHIPS
B
A
20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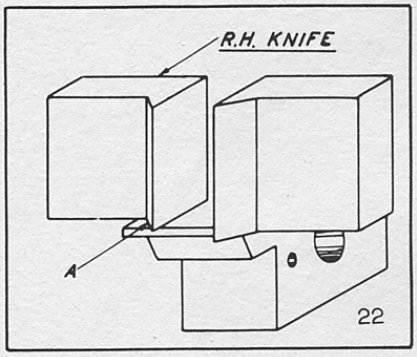
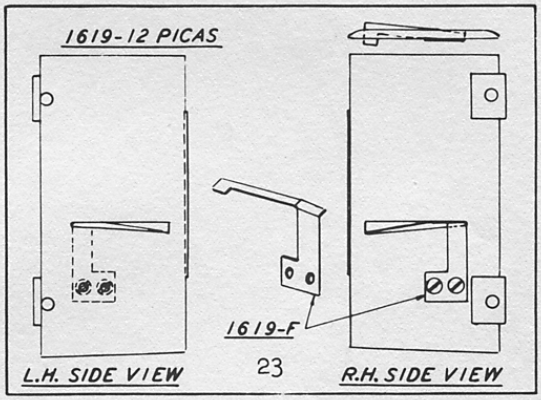
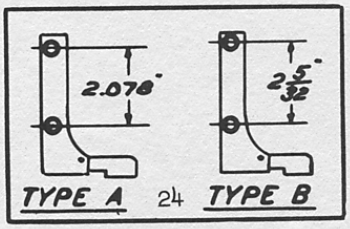
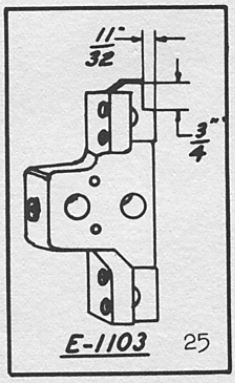
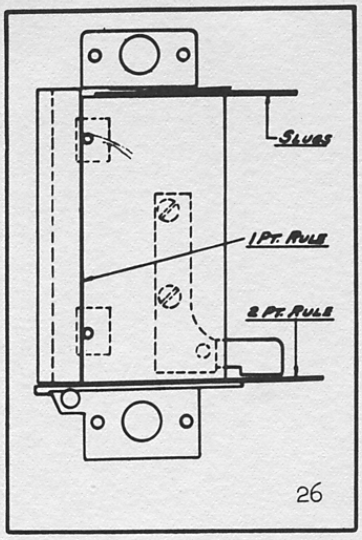
6 MOLD DISK MACHINE
SLUG
CHIPS
B
A
21

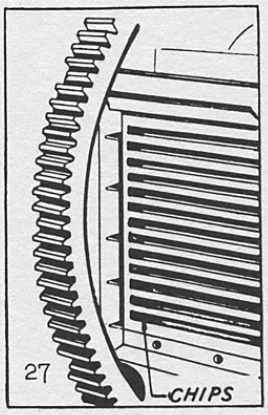

R.H. KNIFE
A
22


1619-12 PICAS
1619-F
L.H. SIDE VIEW
23
R.H. SIDE VIEW


2.078"
2 5/32"
TYPE A
24
TYPE B


11/32"
3/4"
E-1103
25


SLUGS
1 PT. RULE
2 PT. RULE
26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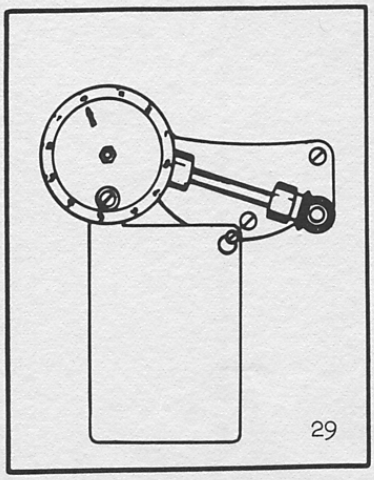
CHIPS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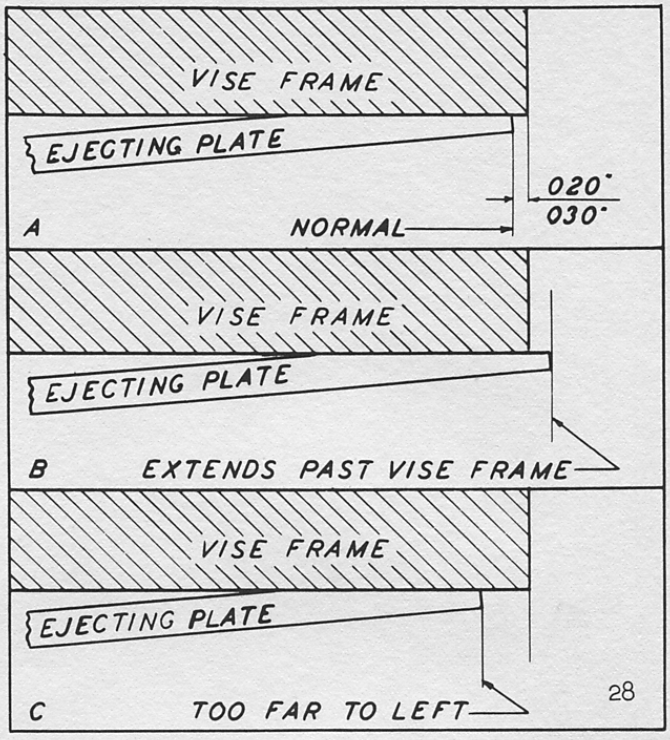
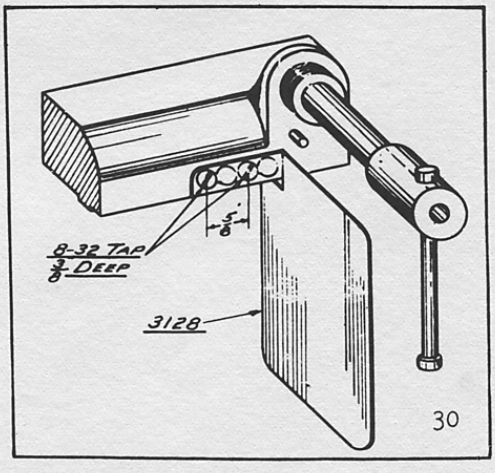
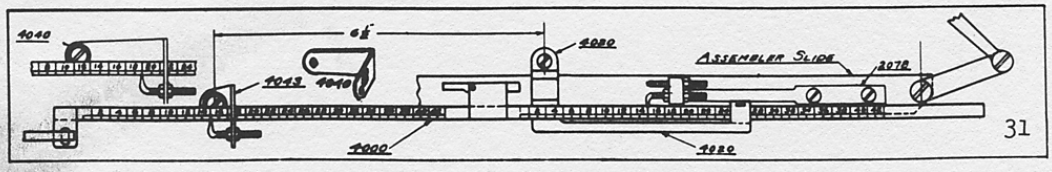
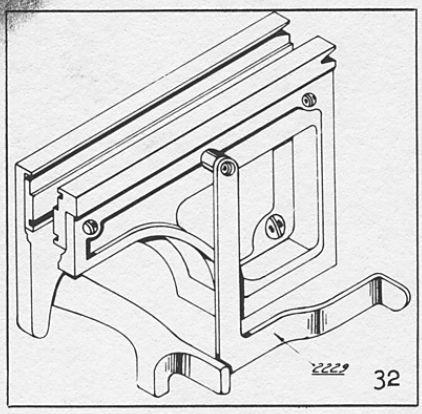

VISE FRAME
EJECTING PLATE
.020"
.030"
A
NORMAL
VISE FRAME
EJECTING PLATE
B
EXTENDS PAST VISE FRAME
VISE FRAME
EJECTING PLATE
C
TOO FAR TO LEFT
28


8-32 TAP
3/8 DEEP
5/8
3128
30


4040
6"
4020
ASSEMBLER SLIDE
2078
4043
4040
4000
4020
31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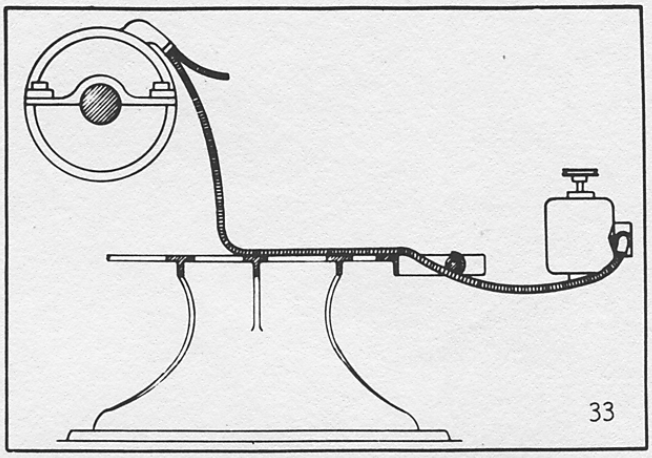
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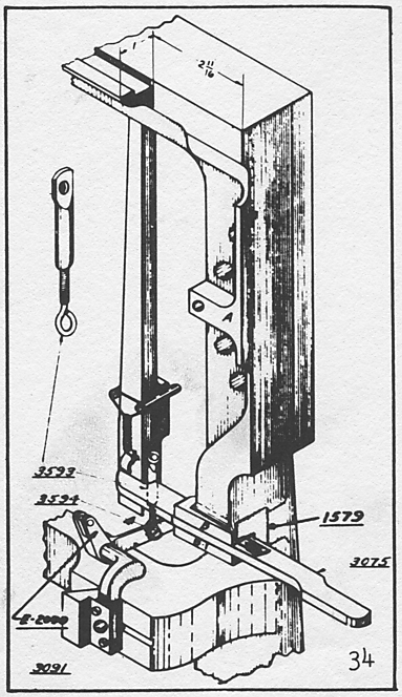
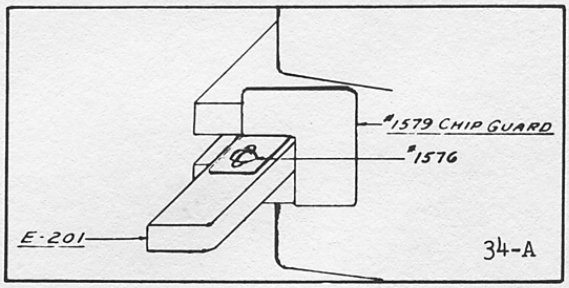
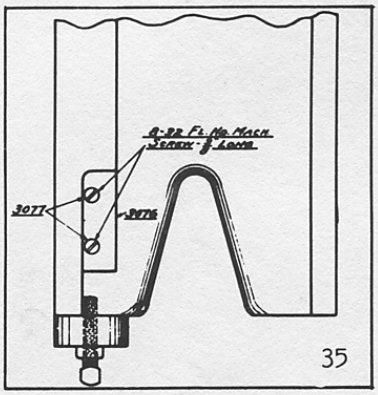

3593
3594
1579
3075
E-2000
3091
34


#1579 CHIP GUARD
#1576
E-201
34-A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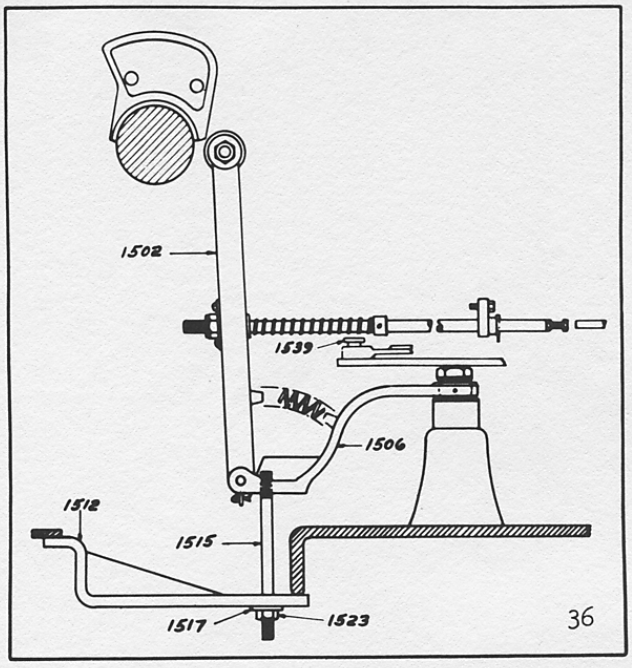
3076
35



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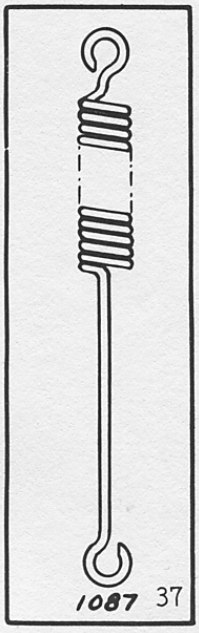

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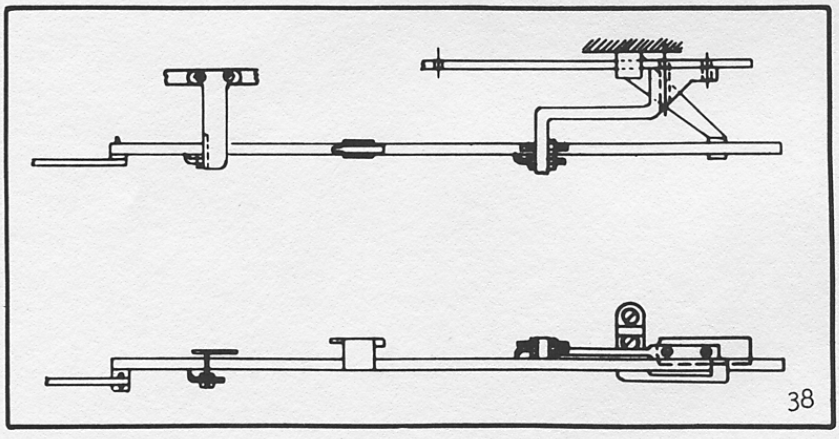
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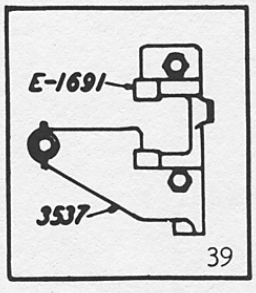

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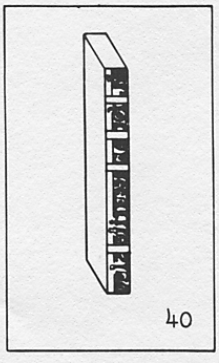
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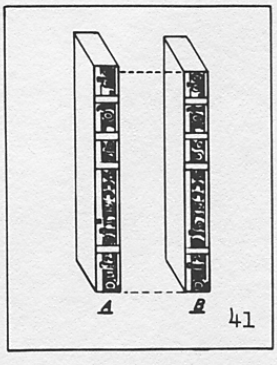
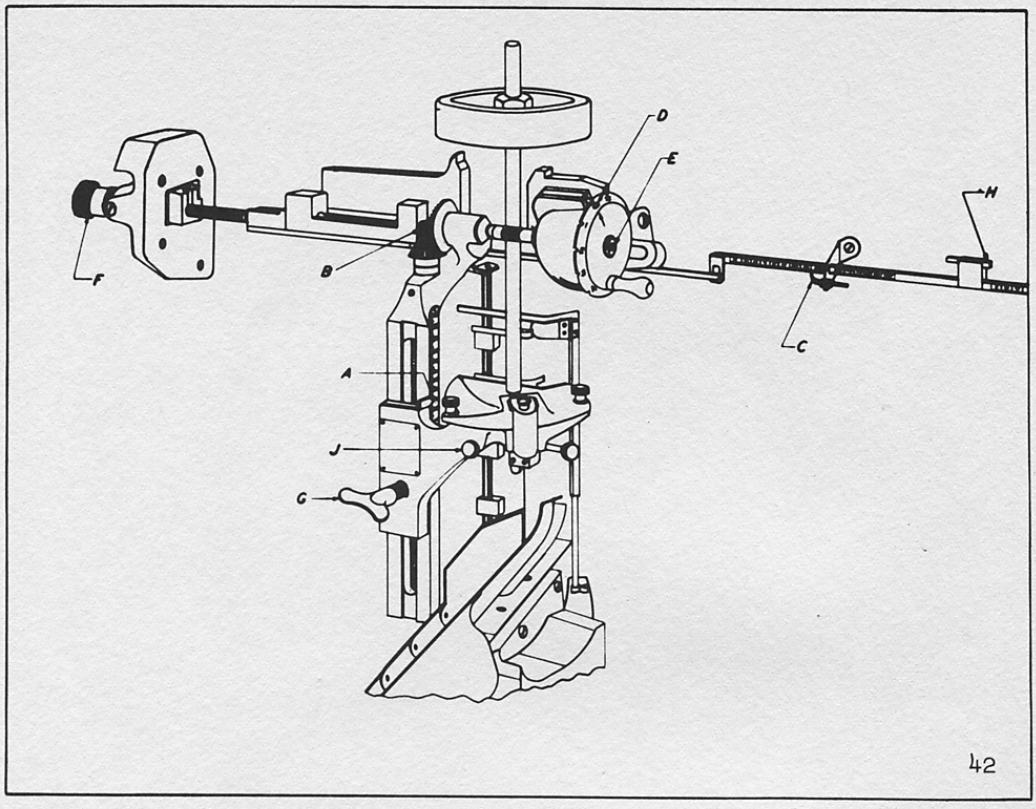
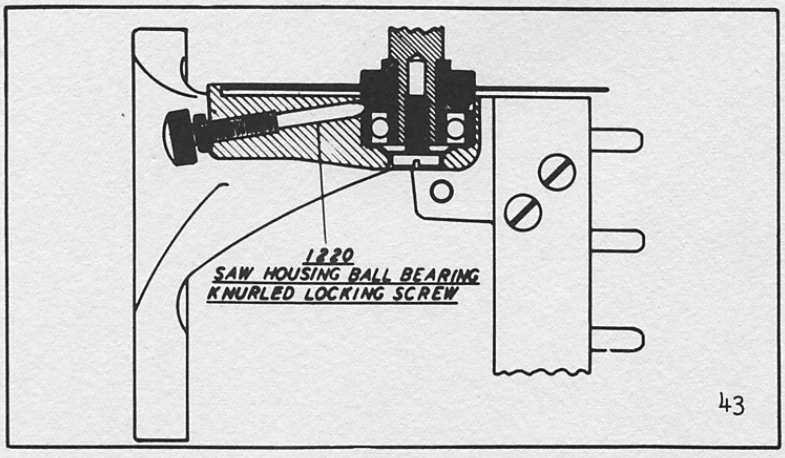


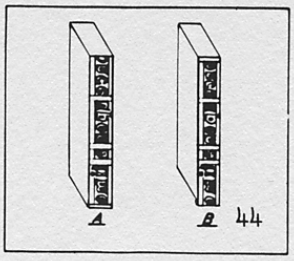
41

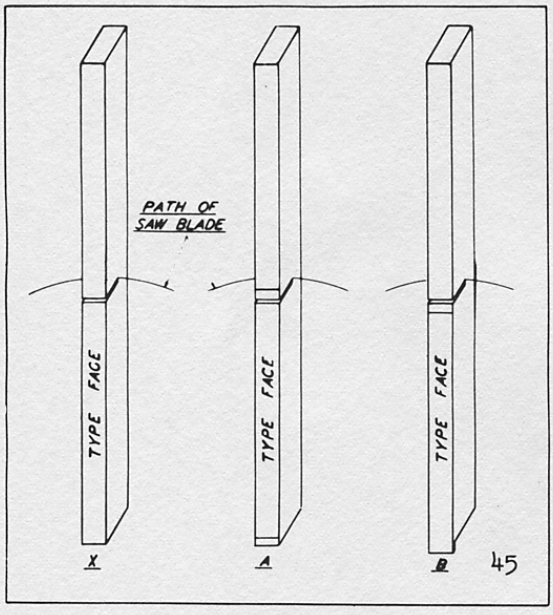

D
E
H
F
B
C
A
J
G

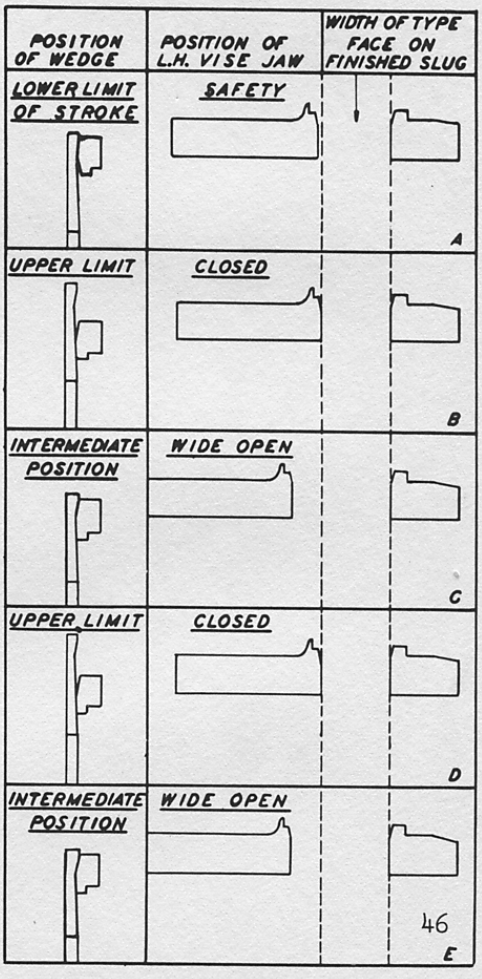
42

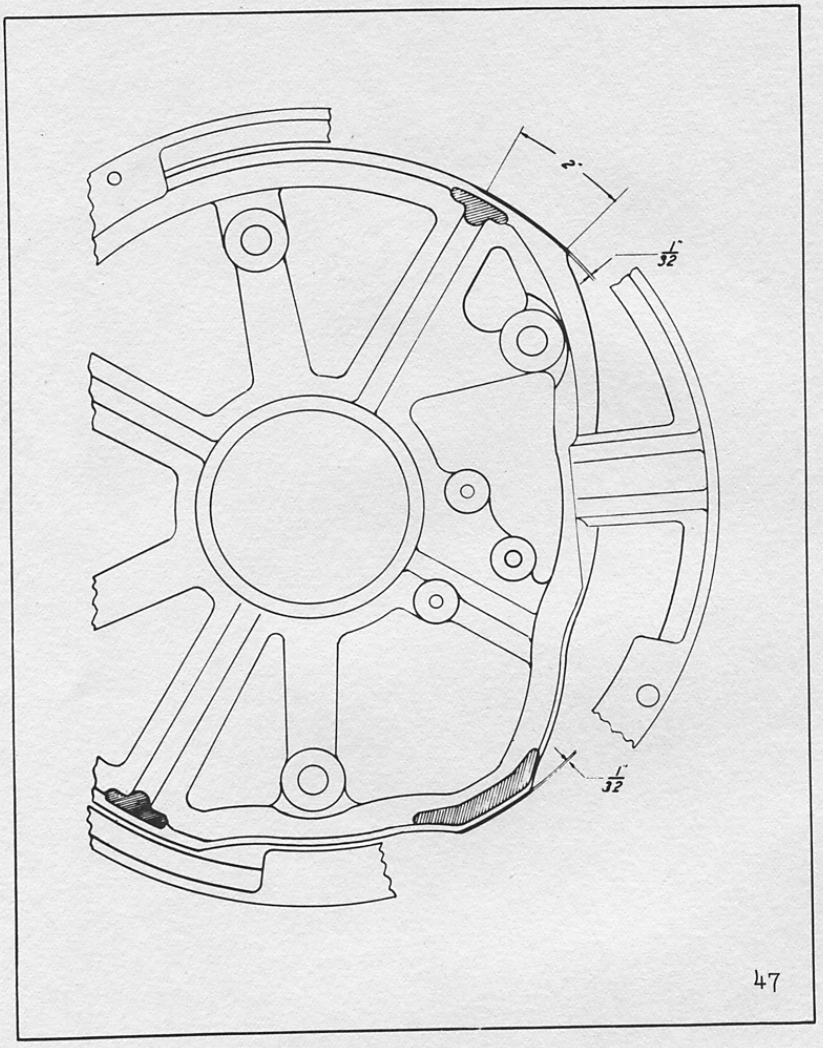

1220
SAW HOUSING BALL BEARING
KNURLED LOCKING SCREW

43


A
B
44

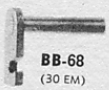

PATH OF SAW BLADE
TYPE FACE
TYPE FACE
TYPE FACE
X
A
B
45


POSITION OF WEDGE
POSITION OF L.H. VISE JAW
WIDTH OF TYPE FACE ON FINISHED SLUG
LOWER LIMIT OF STROKE
SAFETY
A
UPPER LIMIT
CLOSED
B
INTERMEDIATE POSITION
WIDE OPEN
C
UPPER LIMIT
CLOSED
D
INTERMEDIATE POSITION
WIDE OPEN
E
46

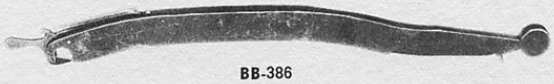

2"
1/32"
1/32"
47

B-352

B-271



BB-68
(30 EM)

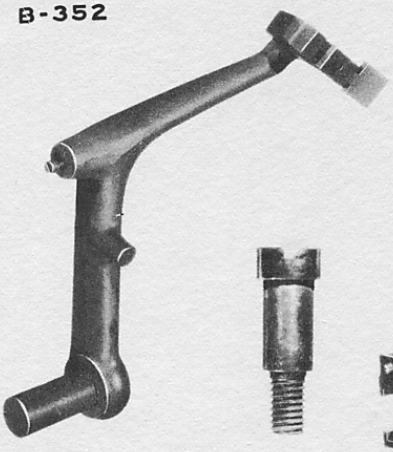


BB-386

C-348
(30 EM)

C-471

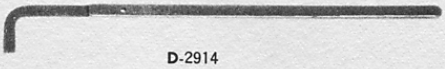
D-1344



B-773 (30 EM)

BB-240

D-1659 (30 EM)



D-2914

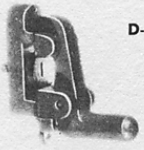
D-1747

D-3074

D-3507

E-147

D-3073



D-3075

E-25

E-84

E-152

E-150

E-161

E-185

E-692
E-3399

E-584

E-582

E-201 (30 EM)

E-578

E-406

E-792

E-961

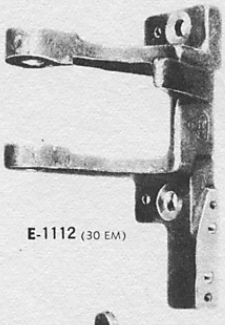
E-1043

E-1466

E-1705
(42 EM)

E-1526

E-1597
(30 EM)



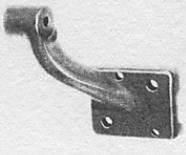
E-1112 (30 EM)

E-1630

E-1631 (30 EM)

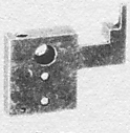
E-1713 (42 EM)

E-1796 (30 EM)
E-1863 (42 EM)



E-1856

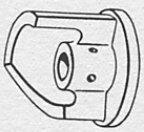
E-1977



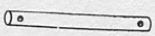
E-1854
E-4149 (42-45 PT.)

E-1880

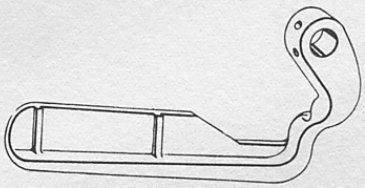
E-1978



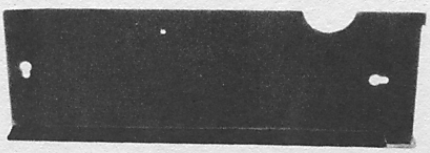
E-1983



E-1984

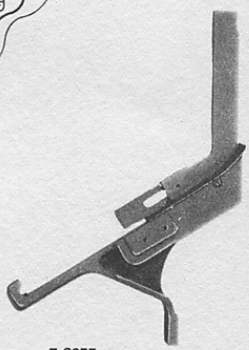


E-1985

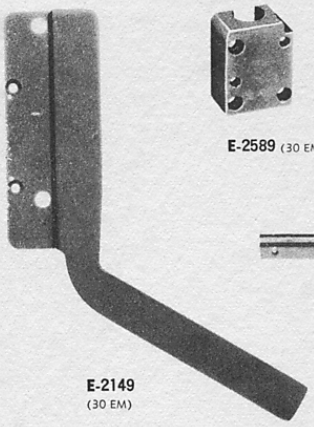


E-2051 (30 EM)

E-2090



E-2055 (30 EM)



E-2149
(30 EM)

E-2589 (30 EM)

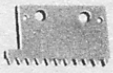
E-2614 (30 EM)

E-2622 (30 EM)

E-2623

E-2624

E-2633 (30 EM)
E-2973 (42 EM)



E-2634

E-2636

E-3210 (30 EM)
E-3212 (42 EM)

E-3379

E-2637

E-2641

E-3265

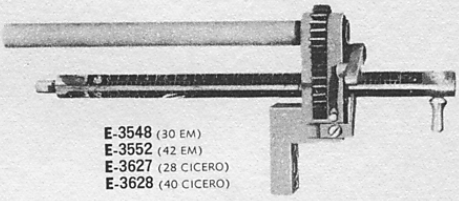
E-3570

E-3624

E-3711

E-3753 (42 EM)

E-3272 (30 EM)
E-3276 (42 EM)

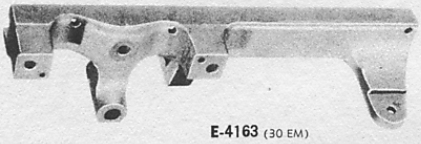


E-3548 (30 EM)
E-3552 (42 EM)
E-3627 (28 CICERO)
E-3628 (40 CICERO)

E-3751
(42 EM)

E-3767
(42 EM)

E-4023 (30 EM)
E-4026 (42 EM)



E-4163 (30 EM)

E-4554

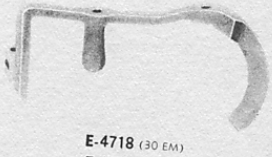
G-126

E-4555 (30 EM)
E-4556 (42 EM)
E-4557 (28 CICERO)
E-4558 (40 CICERO)

H-544

H-2595

J-1228
(42 EM)



E-4718 (30 EM)
E-4721 (42 EM)

I N D E X

MOHR SAW PARTS

LINOTYPE PARTS