

CHAPTER 36

The All-Purpose Linotype

THE ALL-PURPOSE LINOTYPE (A-P-L) is a complete, self-contained unit for the casting of type in the form of slugs, in faces ranging from 6 point to 144 point; for casting of furniture, rules, borders, decorative and spacing material from 6- to 72-point body, and 42 picas in length. Universal A-P-L matrices, standard Linotype matrices and other hand-set matrices may be used.

The compositor sets lines of matrices by hand in special sticks, and the A-P-L quickly casts and delivers the finished slug ready for use.

The capacity of the A-P-L, both in point of quantity and range of product, is largely governed by the skill of the operator. The machine is in reality a tool capable of translating into metal the craftsmanship of the most skilled printer, or the simple forms of composing and spacing material with equal ease. Its uses are many and varied, and its quality is on a parity with Linotype products.

The simplicity of the principle and design of the All-Purpose Linotype permits its operation by persons with a reasonable degree of training, but the best results are obtained when it becomes the tool of an intelligent and skilled printer.

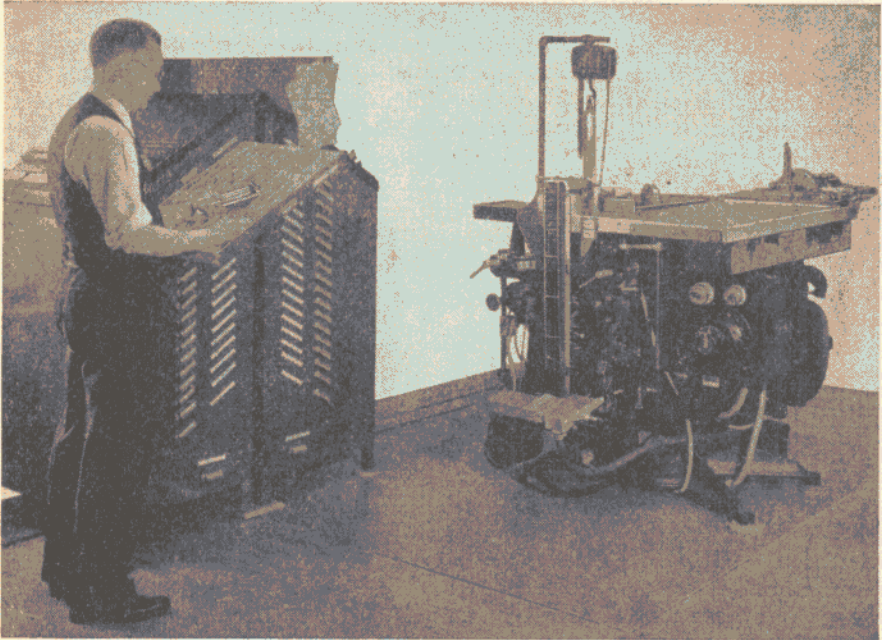


FIG. 1-36. An All-Purpose Linotype Installation.

The A-P-L produces in slugs the lines which have been composed by the compositor, his skill and understanding being thus reflected in the finished product.

The following pages are devoted to technical descriptions of the methods of operation and care of the A-P-L. Careful observance of the fundamentals and their application, coupled with an interest on the part of the compositor to improve his technical ability through experience in the use of the A-P-L, will insure satisfactory results.

THE EQUIPMENT

The All-Purpose Linotype is the basic machine, the main feature of which is the casting unit. To this are added several features, some of which are necessary to all installations and others that are desirable, depending upon the use to which the machine is to be put and the nature of the product required. This permits purchasers to equip each installation to meet particular conditions.

For example, the A-P-L may be used as supplementary equipment to Linotype installations, to cast only faces above certain sizes produced regularly by standard Linotypes. In other cases, the A-P-L may be used to cover a complete range of type sizes, also many sizes of furniture and spacing material.

Equipment is also provided for casting from regular Linotype matrices on the A-P-L as well as other hand-set matrices in all point sizes.

All-Purpose Matrix Cabinet

For the convenient and proper storage of matrices, matrix cabinets have been especially designed of steel construction. These cabinets are built with either right-hand or left-hand cases to permit advantageous layout of equipment. It is frequently found desirable to place right- and left-hand cabinets back to back to save space and permit cases to open toward the machine.

Three types of cases are available. The No. 1 case is intended for the storage of 6- to 72-point fonts, casting side up. The case is divided in two sections, and provides ample space for caps, lower case, figures, points and special characters. The No. 2 case is double-depth, taking the place of two No. 1 cases, and provides for the storage of 84- to 144-point fonts and for other hand-set matrices above 48 point. The large matrices stand on end with reference character showing for identification. The No. 3 case is single-depth and is divided into two sections, each having movable wooden partitions to provide adjustable rows for the storage of slug or individual type in 84- to 144-point sizes. The large matrices can also be placed in this case, due to the flexibility of layout provided by the movable partition feature.

A small drawer conveniently partitioned to provide storage space for sticks, tools, etc., is constructed in the base of the cabinet.

The floor space occupied by a cabinet is 24" x 31" closed, 24" x 56" when cases are opened. The sloping bank provides a surface 28" x 29". The cabinet is 46" high in front, 60" in back.

Two types of copy holders are available. The "adjustable position" type is fastened by means of a slidable bracket to the top rail of the cabinet, directly above the cases. It is ample in size to hold any piece of copy which can be retained by one clip and is generally preferred because of its adjustable feature. The "telescoping" type slides in back of the top of the cabinet when not in use and is intended for those offices where large sheets of copy, requiring two supports, are frequently used.

While there is ample room in the cases for spaces, it is suggested that a space tray be placed on top of the cabinet as a more convenient means for storing and using spaces. An Assembler Stick Rack and a Filling Piece Rack are two other items designed to fit on top of the cabinet. The former provides a convenient holder for the assembler sticks, while the latter is for a complete set of filling pieces from 6 to 30 ems long. These filling pieces are used for quick justification of short lines, and may also be supplied doubled up in the smaller lengths so as to simplify centering. As all lines cast are 42 picas in length, the use of these filling pieces greatly facilitates handling.

Matrices

A-P-L Matrices are made in sizes ranging from 6 point to 144 point inclusive. Sizes below 18 point are supplied in regular Linotype matrices and are also made, on order, in A-P-L matrices to provide Universal alignment in the full range of type families.

The development of the All-Purpose machine has brought about an entirely new feature in matrix design. The new matrix, having a perfectly flat banking surface which is presented to the equally flat surface of the mold, performs its function in the machine without being subject to friction or wear. This feature insures long life for the matrix. Another exclusive feature of the A-P-L matrix is the development of Universal alignment. The matrices align at the bottom or base of the letter, which presents unlimited possibilities in producing various combinations, intricate department-store advertising effects and type lines now difficult to obtain by other methods.

The type families have been divided into two classifications, namely, High alignment and Low alignment. A type family will fall into either of these classifications because of its own characteristics. For example, a type family having long descenders would fall into the high aligning classification, while another series having short descenders would fall into the low aligning classification. All sizes of faces of High alignment will align perfectly with each other and all faces of Low alignment will also align perfectly with each other. This feature permits combinations of type families and sizes casting in perfect alignment.

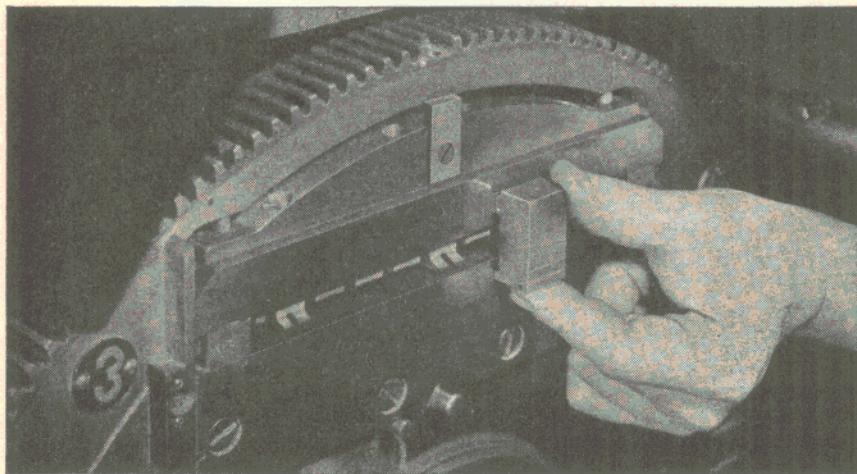


FIG. 2-36. An A-P-L matrix held in relation to recessed mold in mold disk.

In order to produce a true Italic letter it has been necessary to manufacture the Italic matrices on three different angle blanks: 12°, 15° and 22°. By so doing, the true characteristics of all the Italic families are produced without the slightest distortion. Many faces and sizes are now available. Other faces are in the process of manufacture.

The number of matrices required by a user of the A-P-L depends entirely upon the extent to which the machine is to be used. An installation may be modestly begun and additional matrices purchased as needed.

Standard Linotype matrices in a great variety of faces may be used for casting slugs on the A-P-L using the proper equipment for that purpose.

Other hand-set matrices may also be used for casting slugs on the A-P-L by the use of a special stick.

Standard Linotype matrices, not being made on the Universal alignment, cannot be mixed in the same line with A-P-L matrices, and, by the same token, other hand-set matrices, being on a centered alignment, cannot be mixed with either A-P-L or standard Linotype matrices.

Sticks

Special sticks are provided for composing the matrices to be cast on the A-P-L according to the type of matrices to be used. The number required by a plant will depend on the number of compositors working and the range of casting desired.

The stick shown in Fig. 8-36 is the regular A-P-L composing stick used for matrices up to and including 72 point. Other sticks are made for use with A-P-L matrices over 72 point as well as Italic sticks covering different angles to accommodate matrix design. To justify long measures easily and quickly, there are long line assembler sticks of 126 picas. When the proper measure is obtained the matrices are then transferred to the 42-pica sticks which are used to make the cast. Sticks are also provided for the casting of regular Linotype matrices or other hand-set matrices on the All-Purpose machine. All sticks are light, durable and accurate, and are designed to facilitate the proper spacing and handling of matrices from the case.

Molds and Liners

When ordering molds for the All-Purpose machine, a survey of the requirements of the particular office should be made so as to select body sizes that will adequately cover the range of work with a minimum of underpinning. Since any size face may be cast on any mold body, because of the overhanging feature, it is not necessary to change liners to accommodate particular sizes of type. Lines are cast on the nearest body size in machine and the overhung section is underpinned.

The Molds are made to cast the standard furniture height of .765 (Didot .775). Wherever necessary, they may also be obtained .002 or .004 higher than standard to meet the requirements of the customer. Point sizes are 6 to 18 point, the adjustable type, and recessed molds (Fig. 2-36) in 18 point, 20 point, 24 point, 30 point, 36 point, 42 point, 48 point, 60 and 72 point.

The adjustable mold is recommended for casting faces 14 point and smaller, and for spacing material. The 20-24-point mold is also available in the adjustable type, since 18-point faces have been made to cast on a 20-point body.

Where an office uses standard Linotype matrices on the A-P-L, special molds may be procured to accommodate either one-letter display or two-letter matrices from 5 to 14 point.

All molds are equipped with a new type mold cap guide, holding the cap, liners,

and body firmly together. Care should be taken when applying these guides, as they are close fitting. The body, cap and liners should be held squarely together while tapping the guides into position.

Slug Face Surfacer

While the A-P-L casts in slug form a wide range of faces of good printing quality, no pains have been spared to insure as fine a printing surface as is possible to produce. To this end the Slug Face Surfacer is provided. It is designed for the greatest precision and, when attached, becomes an integral part of the machine. Very large faces can be produced to print perfectly with light impression on the smoothest finish papers.

The A-P-L Slug Face Surfacer, Fig. 3-36, is constructed on the principle of a high-speed rotary cutter and is mounted at the left and in front of the mold disk and the back knife. This permits the trimming of the base and face of the slug at the same time, thus insuring uniform height to paper.

By means of a micrometer screw very close adjustments may be made. This convenient adjusting screw allows the compositor to adjust the depth of the cut according to the size and weight of the face being cast. The expansion and contraction of slugs vary according to body size, and for this reason a compositor soon becomes accustomed to changing the adjustment whenever necessary to prevent distortion of fine hair lines by excess surfacing.

This unit is equipped with an automatic switch, so that the power is turned on

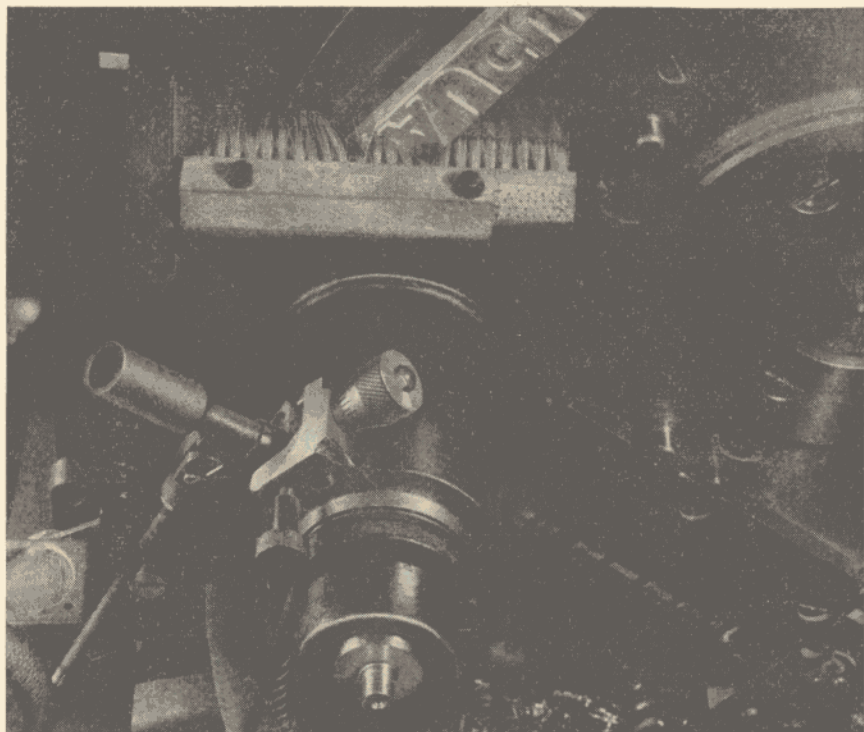


FIG. 3-36. The A-P-L slug face surfacer.

only when the machine is operating. When the machine has completed its cycle, the power is automatically shut off.

The cutter will retain its keen edge for several months' normal service. Because of the precision of these cutters it is important that they be sent to the Linotype factory when regrinding becomes necessary.

Slug Saw-Trimmer

In order that the A-P-L equipment may be self-contained, a slug saw has been perfected for cutting type slugs, furniture and all material cast on the machine. The A-P-L Slug Saw-Trimmer, Fig. 4-36, is attached to the table of the machine and is completely equipped with the latest approved safety devices, guides and attachments for both straight and angle cutting and trimming. It is a valuable

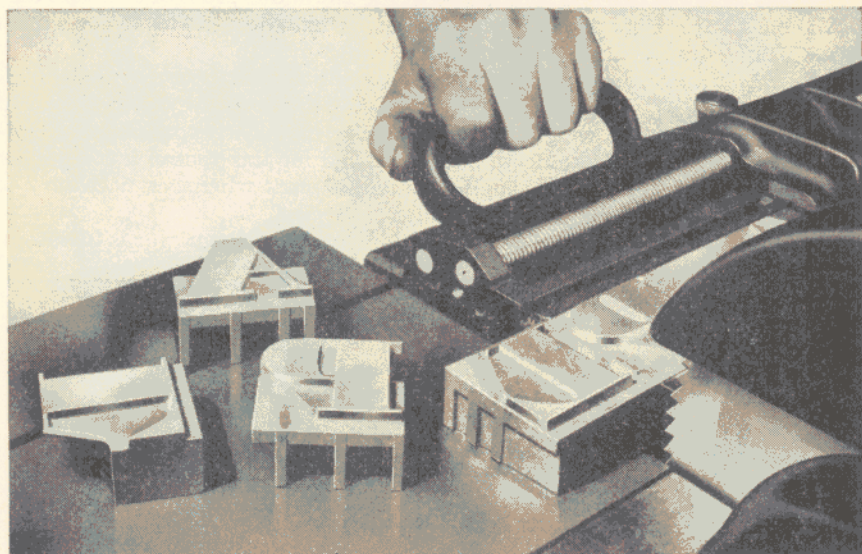


FIG. 4-36. Operation of the A-P-L slug saw-trimmer to cut slugs into individual type

adjunct to the machine, because of its proximity to the work-table and by reason of the unique "type-foundry" feature, which offers inexhaustible quantities of new, type-high individual characters, cast at minimum investment.

The saw is equipped with a right-hand gauge used to quickly align type matter with the saw blade when cutting two or more slugs to fit a given measure, as in newspaper banner lines. The gauge is located at the right side of the saw and can be thrown out of position when not required.

Individual Type

In arranging matrices in the stick for casting characters which are to be cut up into individual type, particularly in faces 84 point and larger, it is important to have one or more ribs on the individual type character. To facilitate quick and accurate location of the matrix in the stick, the stick has indicating marks which correspond to the location of the ribs on the slug. When the slug is cast, it is placed against the left-hand gauge and the shoulder brought to a bearing against the right-hand swinging gauge to locate the character in relation to the saw

blade. When the blank portion is cut off, the position of the slug is reversed and the right-hand gauge brought to bear on the other side for the final cutting of the finished character. This operation is repeated for as many characters as are cast on the slug.

Furniture Rack

To have the underpinning for overhanging slugs, as well as other spacing material, within easy reach of the compositor, a Furniture Rack is provided for attachment to the under side of the table. It may be seen in Fig. 1-36. The compartments are arranged to meet all time-saving requirements, and are divided so as to provide ample space for the large display slugs.

Slug Cooling Attachment

Large slugs as delivered on the galley are too hot for immediate handling, therefore a quick and efficient cooling device is provided. As the slug is delivered it is immersed in a spray of cold water and is instantly cooled. The water automatically returns to a tank in the base of the machine and is used over again. Running water connection is not required, and replacement for normal evaporation only is necessary.

The phantom diagram, Fig. 5-36, illustrates the location and action of the Slug Cooling Attachment. The water reservoir is placed at the rear of the base of the machine where it is out of the way, protected from dirt and metal chip accumulations, yet accessible when it becomes necessary to replenish the water supply. With a revolution of the machine, the mechanical action, in brief, is as follows:

As the high part of the cam comes into play the lever is naturally driven downward. This lever ends in a piston which drives the water out of the well and up

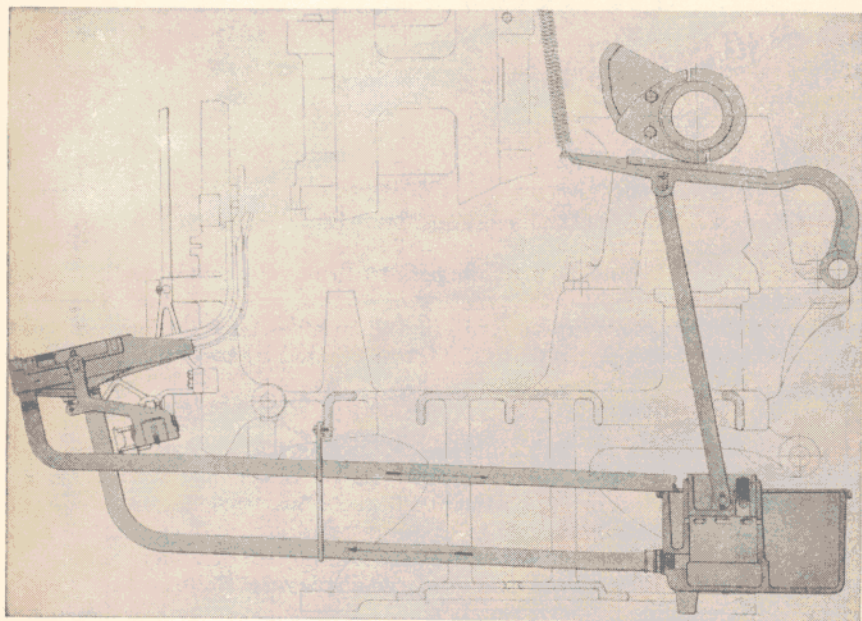


FIG. 5-36. Phantom view of location and action of A-P-L slug cooling attachment.

through the outlet hose. This action is synchronized with the ejection of the slug, the resulting meeting of slug and water spray giving the desired cooling effect. Thus, the slug, regardless of its size and weight and the fact that it has just emerged from molten metal of 550° temperature, is quickly cooled for handling. The water then returns by gravity through the drain hose to the reservoir. The entire action is simple, automatic, economical and fool-proof.

Aligning Dial and Wedges

Through the use of the aligning dial and wedges illustrated in Fig. 6-36, controlled alignment is made possible. The dial, which is laid out in one-point graduations and numbered at every third point, is extremely simple to operate. One facing is graduated for the alignment of A-P-L and standard Linotype matrices, the reverse facing is graduated to align other hand-set matrices. To change from one to the other, the operator merely flips over the dial.

The dial is used to operate the controlling wedges. These wedges, in turn, form the banking surface for the elevator when it descends to present a line of matrices to the mold. It is by means of this controlling wedge that type matter may be brought either above or below the constant line of the mold.

This feature, together with the reduction of base alignments of all A-P-L faces to two standards, high and low, and the resolving of all sizes in a series to one or

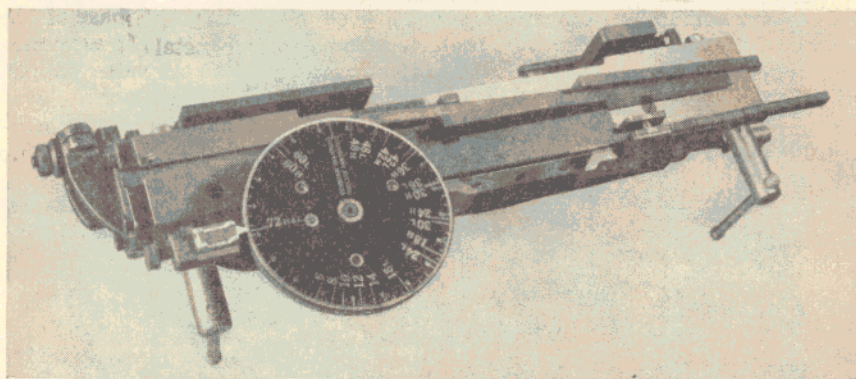


FIG. 6-36. Aligning dial and wedges used to control alignment of matrices.

the other of these alignments, presents possibilities never before available. New opportunities are opened for the creation of original effects in the use of type. The compositor and make-up man will find themselves far less hindered in setting, casting and arranging type to the forms created by modern lay-out men.

Automatic Casting Interval Regulator

Fig. 7-36 shows a device for regulating the casting speed of the A-P-L when casting furniture, base material, or continuous repeat casting of any kind, to prevent overheating the mold. It is a unit attached to the driving mechanism at the rear of the machine and can be thrown in or out of operation by a convenient lever at the front. The casting speed of the machine can be regulated according to the size of the slug cast. For example, in the large display sizes, the casting speed of the machine should be proportionately slower than when casting in the smaller point sizes. This unit may be set from a maximum of 6½ lines per minute to as

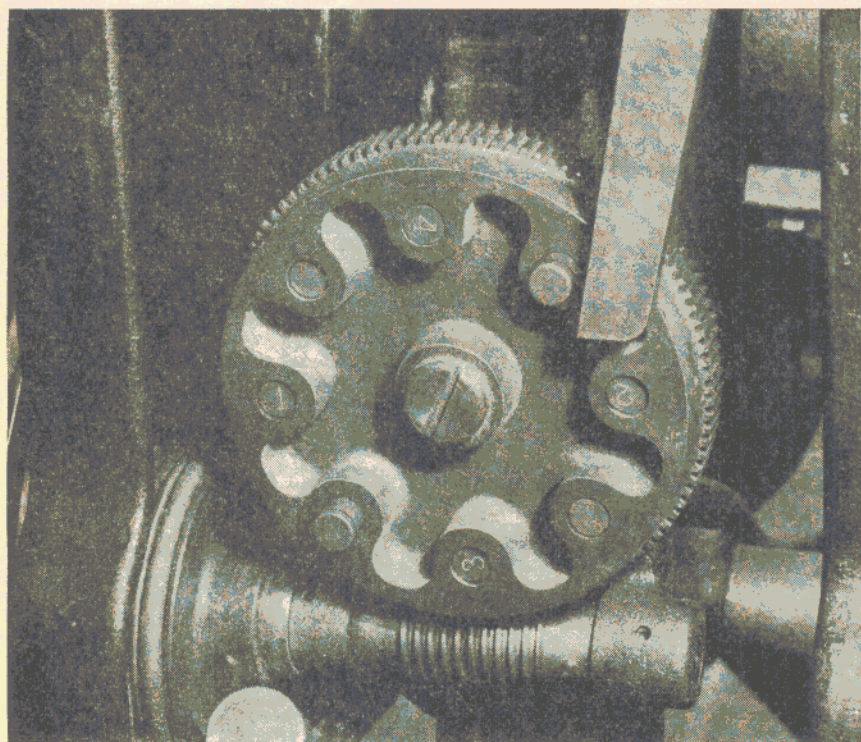


FIG. 7-36. The automatic casting interval regulator.

low as one slug cast every two minutes. On a recasting job the machine will continue to operate automatically, unattended, until stopped by control lever. A block for casting high furniture on one side and low on the other can be supplied.

Table Top

The table top is made of highly finished heavy cast iron, which has been rust-proofed and measures 33 inches in length and 21 inches in width.

Because of its proximity to both the A-P-L slug saw-trimmer and the A-P-L furniture rack, the table top furnishes an ideal small make-up table, at a comfortable working height.

Metal Feeder

An automatic metal feeder should be used on the A-P-L in order to adequately replace the large consumption of metal and maintain uniform temperature. This is readily understood when it is realized that a 72-point 42-em slug contains slightly more than a pound of metal.

A special "fast-feeder" engineered by the makers of the well known Margach Feeder is available to meet the requirements demanded of the A-P-L metal pot.

Motor

The A-P-L is driven by the standard Emerson Motor used on Linotype machines. It is one-third H. P., operates at 850 R.P.M. and is supplied for either A.C. or D.C.

In ordering a d.c. motor it is necessary to specify only the voltage. In ordering an a.c. motor it is necessary to give the voltage, frequency and phase of the current which is to be used.

OPERATION

In this section the working range of the machine and the many varied uses which it has in the field of type composition will be discussed.

This machine has been appropriately named the All-Purpose Linotype because it will serve the printer in all purposes and can be very easily fitted into the scheme of operation for the newspaper and magazine composing rooms, the commercial printing establishments, the trade composition plant and advertising typographer.

As each printing establishment presents individual problems in composition, the following pages deal with the general subject of composing different forms of type lines, both the standard and the unusual combinations made possible by the use of A-P-L features.

Composing the Line

Matrices to be cast on the All-Purpose Linotype are assembled into a composing stick held in the left hand, in a manner similar to the composition of hand type; see Fig. 8-36. The lower side of the stick is toward the compositor; the locking screw to his right. The matrices are set face up.

The ease of this method will appeal to the compositor since every letter is visible exactly as it will print, thus affording the opportunity to read lines carefully to check possible errors, and also adjust spacing as needed for balance.



FIG. 8-36. Illustration of the method of composing a line of A-P-L matrices.

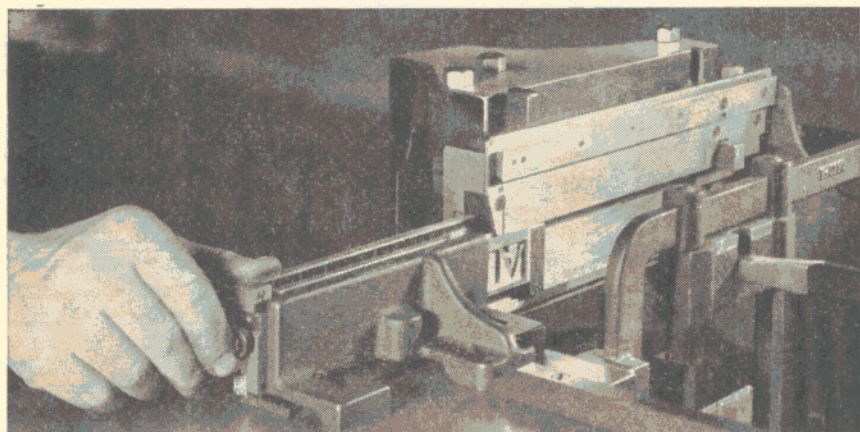


FIG. 9-36. The method of inserting the stick, carrying a composed line of matrices ready to be cast, into the elevator jaws.

Complete spacing material may be found, either in the case or, as previously explained, with the filling pieces, conveniently located in the space tray on top of the cabinet. The line is completed before the compositor leaves the cabinet.

The line is set and properly spaced to a given measure. In the case of a short measure a filling piece is used to quad the line out to a full 42 picas. Each line must be fully justified in the stick before being placed in the machine. The slug saw-trimmer is provided with a gauge which facilitates cutting this type of slug.

Having set the line fully justified in the stick the compositor should then give the knurled locking-screw about a half turn.

The compositor is now ready to cast his line. He places the stick on the assembler-stick rail of the machine which provides the elevator aligning base for the

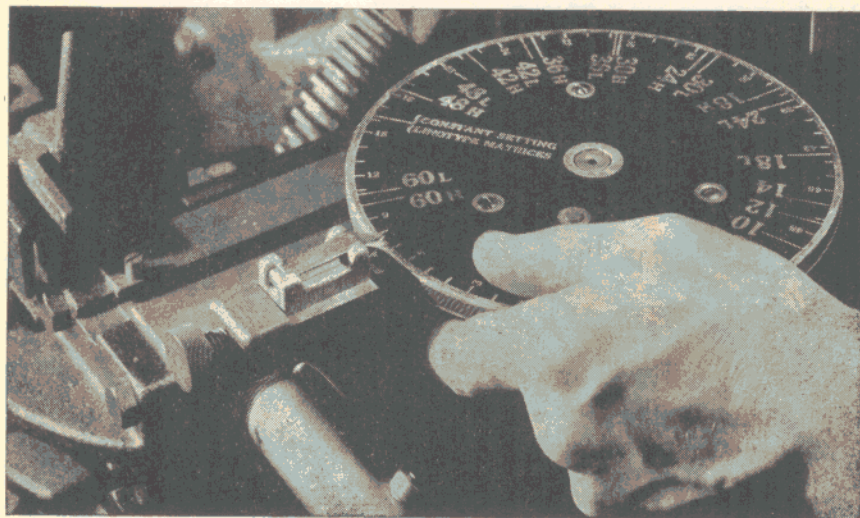


FIG. 10-36. The aligning dial.

composing stick carrying matrices as high as 72 point. With the knurled locking-screw to the right and the face of the matrices flat against the elevator-aligning bracket, as shown in Fig. 9-36, the stick is pushed to the left into the elevator jaw to a positive stop.

The stick containing the line of matrices is now in the elevator jaw and the next step is to set the aligning dial, Fig. 10-36. This is determined by the point size of the face to be cast. For example, we have just composed a line of 48-point Bodoni and the dial would be set on 48-H. The letter H refers to High alignment, which should be indicated on the matrix case. If this line were mixed, containing both 48 and 24 point, to be cast without overhang, the 48-point mold would be used and the dial setting would remain at 48-H. In the event that the 48-point mold is not available, the line may be cast on a mold of a size corresponding to the point size of the smaller matrix. In this case the mold would be 24 point and the dial setting would be 24-H. The large size characters will overhang and be supported by underpinning.

The dial being set, the compositor must place the desired mold in position. The mold pockets are marked with the numerals 1, 2, 3, and 4, and placed at the front of the machine are small cards showing the mold sizes these pockets carry. This enables the compositor to set the mold without opening the vise, thereby saving considerable time.

As already stated, we have composed a 48-point line and have set our dial accordingly. It is always advisable to use the same size mold when possible, thus eliminating underpinning. However, this is not at all necessary nor does it affect the product. For example, let us assume we are not carrying a 48-point mold in our machine, but we do carry a 36-point. This would simply mean we will place the 36-point mold in position, by use of the mold-turning pinion, as illustrated by Fig. 1-12.

Pull the starting lever and allow the machine to cast. We have cast the line on the 36-point mold, twelve points of which overhung on the cap of the mold. When the slug is ejected it will require a 12-point piece of underpinning. By the same method this line could have been cast on a 24-point or even a 12-point mold, had it been necessary to do so. This, of course, decreases the size of body and increases the overhung section, which necessarily requires more underpinning. It might be well at this point, to remind the operator that this use of different molds does not change his original dial setting of 48-H.

The steps taken thus far cover what might be called the normal type of casting. We have cast a short measure line as justified in the 42-pica stick.

In composing lines longer than 42 picas, the matrices are set in the long assembling stick for justification to line length, Fig. 11-36. After setting and spacing the line, the compositor transfers the matrices into two or three 42-pica composing sticks, depending on the length of line. In transferring these matrices he places

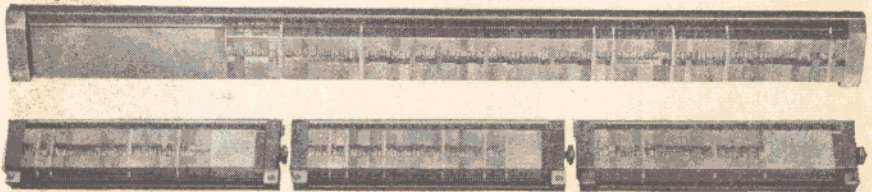


FIG. 11-36. Views showing how extra-length lines are composed for casting on the A-P-L.

as many as will conveniently fit into the stick, and quads out the remaining space on the right-hand end, as shown in the lower half of Fig. 11-36.

When the slugs are cast the blank end is cut off on the saw by using the right-hand gauge, as previously explained under the Slug Saw-Trimmed.

Overhanging Work

Having taken the compositor step by step through the casting of simple lines and long lines, it is now shown how overhanging work is made possible through the proper use of molds and the aligning wedge.

The aligning dial and wedges were fully described earlier in this chapter. They provide the means for locating any size type face on any size body in any desired position on that body.

Let us consider that a 30-point type face is being cast. It may be cast on any size body up to 72 point, and in any position on that body. Fig. 12-36 shows cross sections of a 30-point face cast in various positions on 30-point slugs or bodies, and serves as an indication of the flexibility attainable. The same 30-point type face

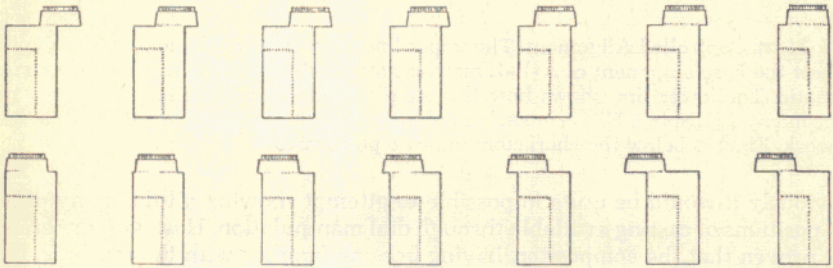


FIG. 12-36. Control of Position on Body. Cross sections of several 30-point slugs with 30-point type face cast in various high, low and normal positions. This control requires no machine adjustments other than an instantaneous setting of a dial.

could be cast just as easily and effectively on any other A-P-L mold available in the machine, whether it be 12, 72 point or any size between, and the face could be positioned wherever desirable on the body.

Fig. 13-36 shows a large initial overhanging up from various body sizes. This type of casting, as will be explained later, is invaluable for two- or three-line initials and for effects used in modern advertising display.

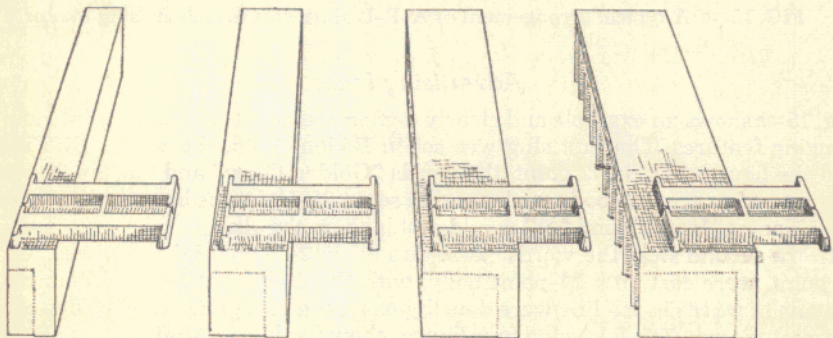


FIG. 13-36. Overhang Casting. 144-point initial at edge of 30-, 48-, 60-, and 72-point slugs.

The following examples further indicate the versatility of the All-Purpose Linotype, the advantage of Controlled Alignment, and the unique feature of controlling its position on the slug body.



FIG. 14-36. Controlled Alignment. The upper line is an extreme demonstration showing how the base alignment of A-P-L matrices makes display combinations quite automatic. The lower line shows how this simple combination of sizes provides a new economy in display. Hitherto such combined types had to be aligned by slow hand work. Figures below the characters indicate point sizes.

Obviously it would be quite impossible to attempt showing all the many different positions of casting available through dial manipulation. However, experience has proven that the compositor, having become familiar with the machine, finds no difficulty in producing many different combinations.

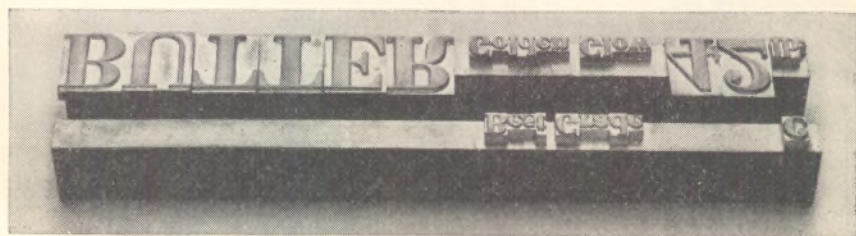


FIG. 15-36. A typical arrangement of A-P-L slugs cast for advertising matter.

Advertising Lines

Fig. 15-36 shows an example and clearly demonstrates the advantage of the overhanging features. The first slug was set in Bodoni Bold, the word "BUTTER" and the figures "42" in 72 point, the words "Golden Glow" and "lb." in 24 point, and cast on a 30-point body with the dial set at 36-H. It was brought that low so the 72-point "Butter" and "42" would cast high on the slug.

In the second slug, the words "Best Grade" in 24 point and the letter, "C" in 42 point, were cast on a 24-point body, with the dial set at 29. Positioning and spacing of words in the line were done by using the pica gauge on the edge of the composing stick. The following four figures show further possibilities in advertising composition:

CASUAL . . . comfortably

FIG. 16-36. Six sizes of Memphis Bold in one word. What a fussy job to align loose type thus! A-P-L cast the line just as you see it.

REALLY Better to

FIG. 17-36. One A-P-L slug in Pabst Extra Bold Italic. Base alignment permits these four or more sizes, if desired, and varieties of matrices to be combined at maximum speed of production. Sizes used here are (left to right), 42-, 36-, 30- and 24-point caps, with 36-point lower case.

Sale price 16.75 - New Tailored Suits!

FIG. 18-36. Three sizes of Poster Bodoni within the first line arrive at just the desired build-up in the copy -- a whole advertisement in the two headlines -- good test of both copy and display.

**We had placed orders
for these woolens long
before the market rise
A bargain for \$ 19**

FIG. 19-36. Here, 18- and 30-point Metroblack No. 2 are combined with 144-point Gothic No. 40 figures -- the figures and the 36-point Metroblack No. 2 dollar mark are on the lower slug, projecting up.

Two- or Three-Line Initials

When casting large initials, to align with smaller type, and to overhang two or three lines deep with smaller text, it is advisable to cast the line carrying the large initial on the body of the small size. The compositor places the mold of the small

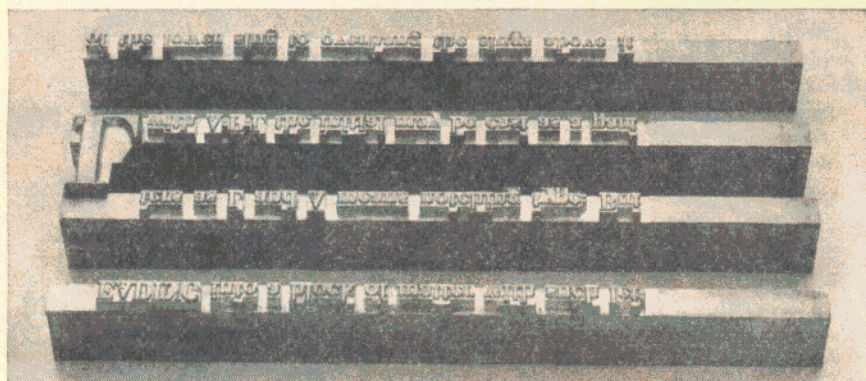


FIG. 20-36. An arrangement of initial slugs cast on the A-P-L.

size in position, sets the dial on the small type point size and opens the left-hand knife. By so doing, the overhanging sections of the large initial will cast on the body of the mold, and will rest on the space allowed on the lines above.

If the small size type happens to be all caps and the shoulder is to be eliminated, it may be cast on a mold a size smaller, the dial-setting remaining the same. The overhanging section in this type of work is cast up on the slug when the dial is set for the small size type, because of the alignment being at the bottom or base of the letters.



FIG. 21-36. Another typical arrangement of A-P-L initial slugs.

Raised Initials

Because of the universal alignment face, the raised initial is practically standard casting. When the large initial is to be above the type line, on the body of the large size, the dial is set on the highest point size in the line. Where the large initial is over 72 point, the dial setting is determined by the molds available, and the point size of the type with which it is cast. The best results are obtained by casting 144 point on bodies not smaller than 30 point and 120 point not smaller than 24 point.



FIG. 22-36. Raised initial arrangement cast on A-P-L.

Matrix Blocks

Various styles of Matrix Blocks, Fig. 23-36, are available for casting high and low furniture, base for mounting plates, rules, borders and decorative material. These blocks may be used on both sides: for example, a decorative border might be available on one side of the block, while the reverse side might be cut for casting high furniture. The point size and the height desired must be specified.

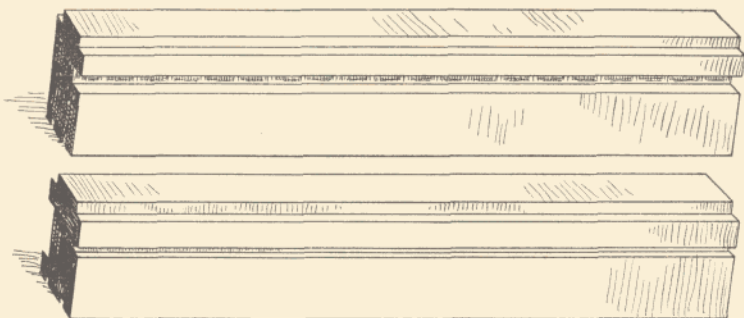


FIG. 23-36. A-P-L matrix blocks.

Elevator Adaptor and Stick-Aligning Rail

In casting sizes above 72 point, it is necessary for the compositor to use the composing stick designed for 84- to 144-point matrices.

The compositor removes the adaptor, which has been in the elevator jaw while casting from all the A-P-L matrices up to 72 point and all other hand-set mat-

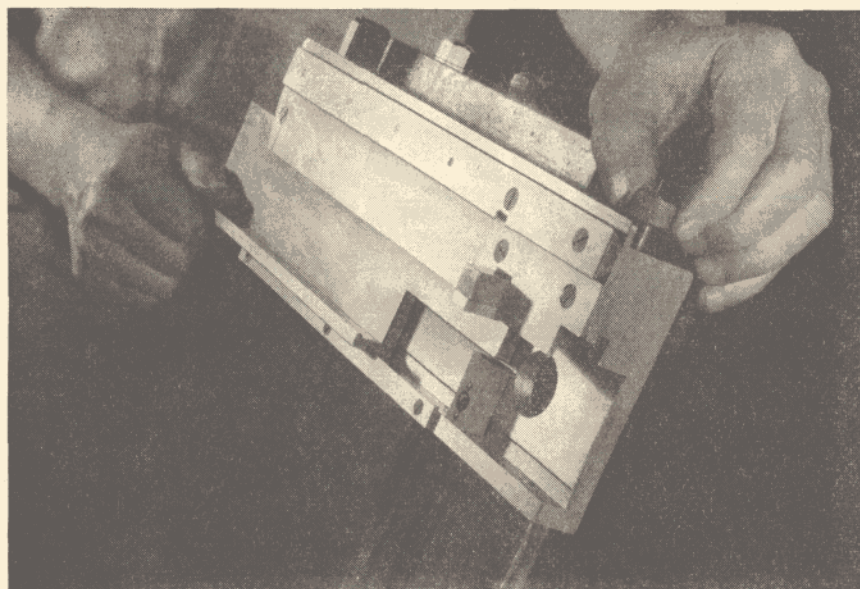


FIG. 24-36. Illustration of the method of adapting elevator jaws for casting A-P-L matrices larger than 72 point.

rices. This adaptor is removed to allow clearance for the larger stick, which is used for composing matrices up to and including 144 point.

The operation, shown in Fig. 24-36, is simple; the compositor raises the knurled detent-pin at the left of the elevator jaw, and slides the adaptor out to the right. At this same time he slides back the movable stick-aligning rail, thus forming the proper alignment of the larger stick with the elevator jaw.

The compositor has now gone through many different types of work and has set the machine to accommodate all of it.

Casting From Linotype Matrices

As previously mentioned (under Equipment), molds and composing sticks are provided for the office using regular standard Linotype matrices.

In preparing a machine which has been casting from A-P-L or other hand-set matrices, the elevator jaw adaptor and the stick-aligning rail changes mentioned in a preceding paragraph must be made.

Since such a change brings us back to the standard Linotype-height mold, auxiliary jaws such as that shown in Fig. 25-36 are provided to slide over the

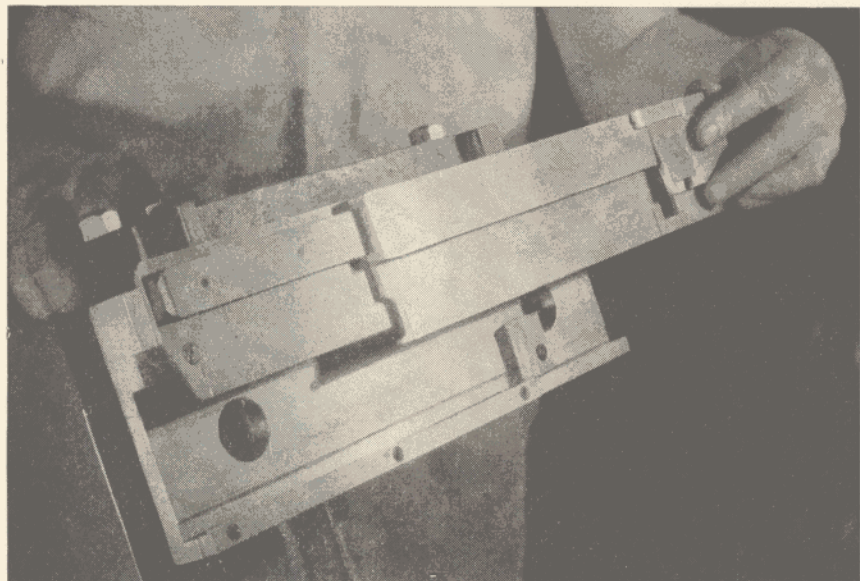


FIG. 25-36. View showing the means of adapting elevator jaws for casting from Linotype matrices.

dovetail bearing on the back of the regular A-P-L elevator jaw. One auxiliary jaw is used when display matrices are cast, the other where one- and two-letter matrices are to be cast. The jaws are marked for identification.

In applying either of the auxiliary jaws, the compositor depresses the small safety stop at the left of the elevator jaw. This allows the auxiliary jaw to slide over the bearing provided. The compositor then sets his dial on the graduation marked regular Linotype matrices, places the regular Linotype mold in position and the machine is ready to cast.

Casting From Other Hand-Set Matrices

Casting from other hand-set matrices is also a very simple matter on the A-P-L. In making the machine ready the compositor has but to reverse the face of the aligning dial, Fig. 26-36, and change the composing stick.

Aligning points are graduated on the reverse side of the aligning dial so that the compositor will not be confused. The adaptor that has been in the elevator jaw for all A-P-L matrices up to 72 point, remains in the jaw for all other hand-set matrices. No additional changes are necessary.

When full-bodied slugs are desired, these matrices are cast on the regular A-P-L molds. These matrices may also be cast as a "T" slug, on the 12-point body Universal mold and underpinned.

An offset stick is provided for casting cap and small cap combinations up to 48 point. In casting this type of slug, it is necessary to select any mold size smaller than the largest character. This reduces the amount of white space and requires only a minimum of underpinning. The dial setting is determined by the point size of the largest character in the line.

A third stick is provided for casting matrices over 48 point. These matrices may be cast as a "T" slug on a 12-point mold, or as a full-bodied slug to eliminate

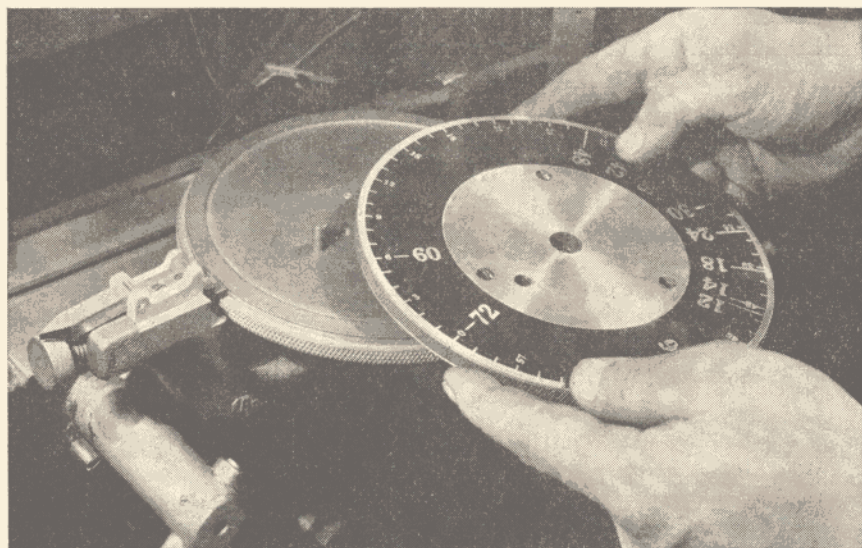


FIG. 26-36. Reversing the aligning dial for use in casting from other hand-set matrices.

underpinning. However, when casting cap and small cap effects, using sizes 60 or 72 point with any small cap, cast as a "T" slug on a 12-point mold. The dial must be set at 30, which setting will cover the entire range. This setting has been determined as the common point which will adequately provide for the approximate centering of all large-size matrices. When casting "T" slugs using the narrow stick, taking all matrices up to and including 48 point, the dial must be set at 12. This setting will cover any combination of matrices that might be cast as a "T" slug on a 12-point body.

On all offset work, lines are set and spaced exactly as they are under your present system, and hair spaces are inserted wherever necessary.

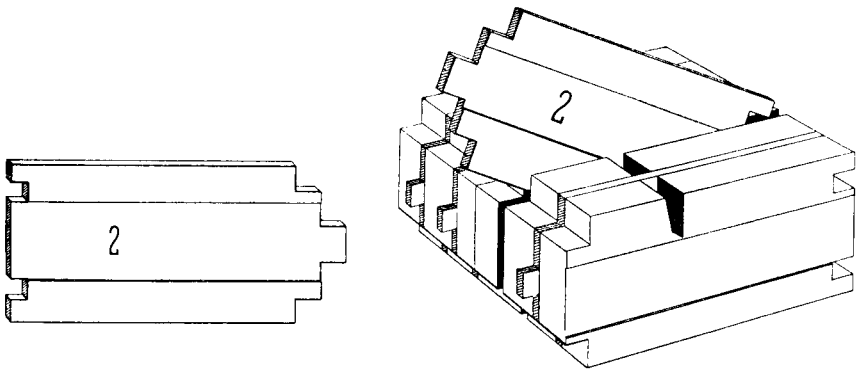


FIG. 28-36. This is an illustration of the slot matrix which casts the slot in the slug for receiving the vertical brass rule. It has the numeral 2 stamped on the side to distinguish it from the ordinary two-point thin space. Either edge of the matrix can be used in the casting position. This matrix is accurately cut to two points in thickness. The right-hand view shows the slot matrix assembled in the line.

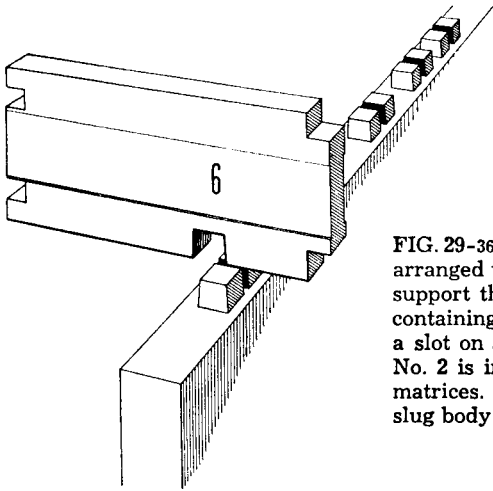


FIG. 29-36. This is a space matrix 6 points thick, arranged to cast a high shoulder on the slug to support the vertical brass rule in open forms containing vertical brass rule lines only. To cast a slot on an otherwise blank slug Slot Matrix No. 2 is inserted between two of these No. 6 matrices. This matrix can be cast on any size slug body with equal facility.

How It Is Used

The first step in the composition of a table is to determine the width of each column in points or ems after an allowance of two points has been made for the vertical brass rule. The matrices for casting the horizontal lines are then assembled in the regular A-P-L way. Where the vertical brass rule is to appear in the form, a slot matrix 2, Fig. 28-36, is inserted in the line of dashes, and when the slug is cast the slot matrix will form a slot in the slug into which the brass rule, which is 11 points high, is to be inserted. The required number of duplicate slugs are then automatically recast from the same line of matrices. The slots in the slugs will be in perfect alignment to receive the brass rule for the vertical lines in the form.

The matrices are made on various setwidths, 2, 3, 6, 12, 18 and 24 points, permitting the justification of any width of box heading or column. The slot matrices for casting the slot to receive the brass rule are 2 points in thickness.

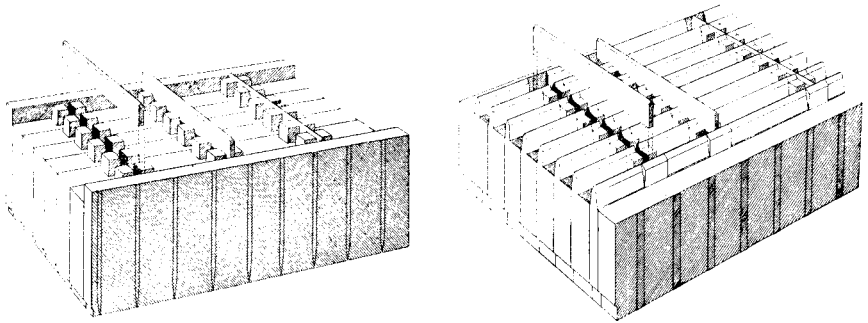


FIG. 30-36. The left-hand view further illustrates the use of Matrix No. 6, mentioned above. It shows how a series of continuous slots are made up when the printing form consists of vertical lines only. Note the operations of inserting the brass rule and the high blank slug top and bottom to butt the rule ends to prevent shifting.

In the right-hand view it will be noted that the horizontal rule character on each side of the rule slot has a high shoulder covering the full body of the 12-point slug. Character No. 106a is used in the example. This high shoulder on each side of the slot provides additional side support for the vertical brass rule. It is supplied in 6-point set-width only, and in a complete variety of printing faces under Nos. 106a, 206a, 306a, and 406a. These characters are used only in casting horizontal lines on slug bodies of 12-point size and larger, and are not to be used on 6-point slug body.

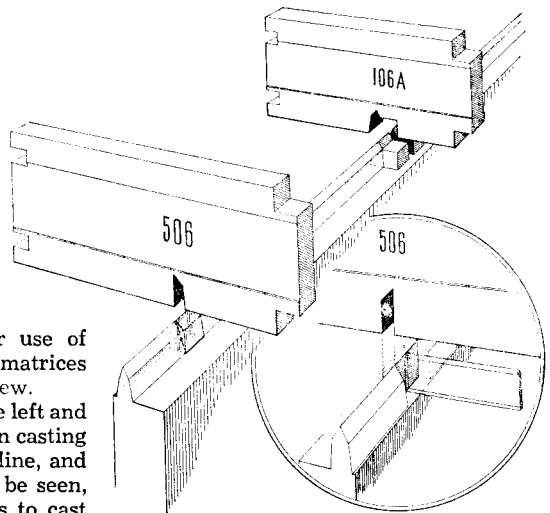


FIG. 31-36. Illustrating further use of characters of the "a" series of matrices used in Fig. 30-36, right-hand view.

The character 506 shown at the left and enlarged in the circle is for use in casting horizontal hairline, double hairline, and one-point face. As will readily be seen, the purpose of this character is to cast the printing face of the horizontal line on

a direct right angle (90°) from the slug to the face, forming a perfect joint with the end of the vertical brass rule and the horizontal line. This is further illustrated in the specimen form, Fig. 27-36, where the vertical brass rule joins the horizontal under the heading "Amount." The face of the ordinary horizontal character requires an angular support for the printing face of the rule. This angle would prevent a perfect joint between the horizontal and vertical lines, for which reason the special character in question should be used as indicated.

All matrices for casting the horizontal lines are on universal alignment and may be cast on any slug body. It is recommended, however, that either 6-point or 12-point bodies be used. The Alignment Dial should be set at the small numeral 48 on the edge of the dial, which is located between large alignment numbers 10 and 12. This setting will cast the horizontal rule line on the edge of the slug. However, this setting may be varied to meet specific or unusual requirements.

A special folder is available which describes in further detail the A-P-L Rule Form System.

Safeties

The All-Purpose Linotype is fully protected so that no one need be timid about handling it. The safeties are designed so that the machine will stop automatically before any damage is done.

To begin with, an elevator slide safety stop is applied with each mold at the left side of the pocket. One safety stop is for the A-P-L molds, a second for the regular Linotype display mold and a third for the regular Linotype two-letter mold. Whenever a mold is changed the stop must also be changed with it. These stops are designed so that they may be applied only with the mold for which they are intended.

If, for example, the mold disk is equipped with A-P-L and Linotype molds, and in casting A-P-L matrices the compositor neglects to put the A-P-L mold in casting position, the elevator jaw, front, safety block will descend and bank on the elevator slide safety stop as shown in Fig. 32-36, preventing the elevator jaw from banking on the aligning wedges. This action allows the mold disk dog to come forward, striking the vise automatic stop rod, which throws the clutch out of action, thereby stopping the machine.

If the compositor wishing to cast a line of regular Linotype matrices places the proper mold in position and applies the correct auxiliary jaw, but fails to set the aligning dial properly, the elevator jaw safety block will bank on a small block on the vise cap

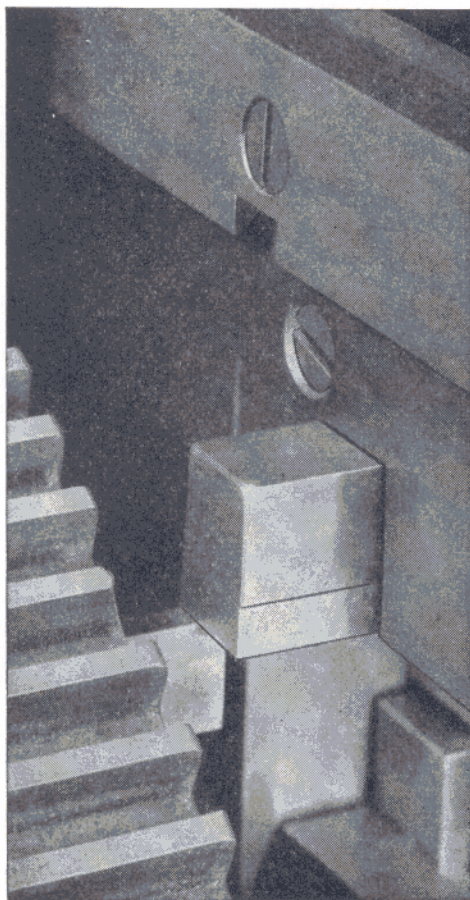


FIG. 32-36. View showing operation of the elevator slide safety stop on mold disk and the elevator jaw, front, safety block.

as shown in Fig. 33-36, causing the same action to take place and stopping the machine. When the dial is set properly, the elevator safety block rests between the vise cap banking blocks, allowing the elevator jaw to bank properly on the wedges, and the cast to be made.

Or an attempt may be made to cast regular Linotype matrices either one- or two-letter, without first placing the proper mold in position. In this case, the elevator jaw, back, safety stop will rest on the elevator slide safety stop, again stopping the machine. When the proper mold is in position its safety stop will clear the elevator jaw, back, safety stop, and allow the machine to cast. By the same token regular Linotype display matrices cannot be cast without first placing the proper mold in position. The proper mold safeties are made to work in combination with the elevator jaw, back, safeties and must be used together to allow the machine to cast.

When either of these situations occurs, the compositor should throw in the starting handle and look very closely before proceeding, and *under no circumstances* try to force the machine. Upon careful investigation, he will no doubt find the cause of the stop. Since the stop takes place before the elevator reaches casting position, the machine can be backed up by opening the clutch guard and turning it back to normal position by hand.

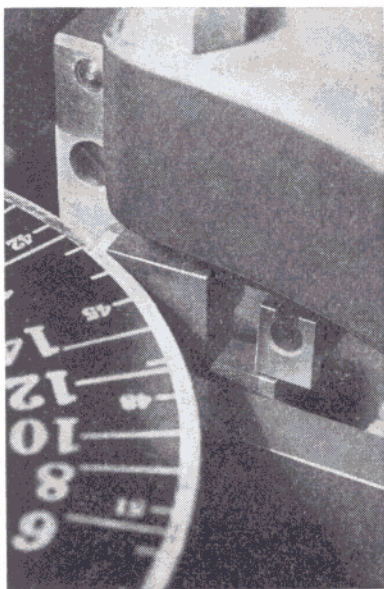


FIG. 33-36. Illustration of the action of safeties when aligning dial is improperly set.

As previously mentioned, each line is justified to 42 picas in the stick, before being placed in the machine. However, if for some reason a short line is placed in the machine to be cast, the machine will make a complete revolution but the plungers will not go down. The stick may then be taken out and the line properly justified. Short lines can do absolutely no damage, because of the setting on the pot-pump lever stop lever, which does not allow the plungers to descend until a line has been properly justified to full length.

Because of this safety feature it is also quite safe to allow the machine to make a complete revolution, if through error an empty stick has been inserted. In fact it is also quite safe to allow the machine to complete the cycle without inserting a stick in the elevator jaw.

Machine Actions

In previous pages of this chapter, the compositor had reached the point where the stick had been placed in the elevator jaw. From that point we continue, showing the action which takes place when the compositor pulls the starting lever, setting the machine in motion:

1. The elevator descends, presenting the line of matrices in front of the mold which has been brought into casting position by the one-quarter turn of the mold disk from normal position.

2. The mold disk moves forward horizontally, where the surface of the mold banks flat against the matrices.

3. The vise closing lever forces the left-hand wedge up, which action drives the matrices against the right-hand jaw, which in turn opens the pot pump lever stop lever. During this operation the metal pot has advanced against the back of the mold.

4. The pot pump lever descends forcing the plungers down, pumping metal through the mouthpiece of the pot crucible into the mold, and into the dies of the matrices. The plungers remain down for a few seconds to allow the metal to solidify. The plungers are then raised, the pot recedes from the mold, which in turn recedes from the line of matrices.

5. The vise closing wedge drops at this point, releasing the side pressure from the matrices.

6. The mold disk starts to revolve on its three-quarter turn, passing the slug over the back knife, trimming the bottom and, through the surfacer, trimming the face of the type. During this operation the elevator returns upward to its normal position. At this point the composing stick may be removed.

7. The mold disk having completed its three-quarter turn, again advances.

8. A steel ejector blade moves forward against the back of the slug. Horizontal to this main blade is a series of blades which move forward through the ribs of the mold. These blades assure a positively straight ejection, the slug being supported on the rib as well as the constant side.

The slug is being supported in front by an automatic slug guide buffer. It is securely held between this buffer and the blades until it is outside the mold, from which point it slides into the galley.

9. During the ejection operation the vertical mouthpiece wiper is driven downward, across the face of the mouthpiece to wipe off any surplus metal that might have remained, and to clean the vents.

10. The slug having reached the galley, it is subjected to a spray of water, cooling the slug so that it may be handled immediately.

Cams

Although the general cam design is similar to the standard Linotype machine, the contours have been changed. Standing at the rear of the machine and counting from the right we have:

First—The mold turning cam, carrying segments which operate the mold turning shaft.

Second—The vise closing cam, which action operates the left-hand wedge.

Third—The elevator slide cam, through which action the line of matrices is carried in the elevator jaws to and from casting position.

Fourth—The pump cam, which action forces metal into the mold. This also carries an auxiliary cam used to operate the pot mouthpiece wiper.

Fifth—The pot cam acting on the pot lever, locks the pot mouthpiece against the back of the mold.

Sixth—The pot return cam which action causes the pot to pull back from the mold after the cast has been made.

Seventh—The mold cam and driving gear with segment idler. This mold cam action operates the mold slide forward against the matrices, and back again

after the cast is made. It also pushes the mold slide forward again so that the slug may be ejected, after which it slides back to normal position. Through the action of the segment idler, the forward motion of the cams is delayed, permitting the pot pump plunger to take its full stroke thereby assuring a more solid slug and superior face. This segment is so designed that it can be made inoperative when this feature is not desired.

Eighth—The ejector slide cam operates with a roller on the ejector slide, which action removes the slug from the mold.

Ninth—The slug cooling cam which operates a piston forcing water through the galley to cool the slug.

Tenth—The automatic stopping pawl support cam. This cam carries the automatic stopping pawl, which, banking on the vertical lever pawl, automatically forces the lower stopping lever against the forked lever, thereby releasing the clutch. This cam also pulls the ejector blade back out of the mold.

The bearing surfaces of all cams should be kept clean and oil should not be used on those surfaces.

MAINTENANCE

The preceding section has been confined to the composition of various type lines, together with a brief description of the manner in which they are handled. It is now appropriate to explain the more important mechanical actions of the machine, describing the adjustments of its principal parts and attachments and supplying mechanical information generally useful toward its maintenance.

Vise Automatic—As explained previously under the topic of safeties, the vise automatic stops the machine if for any reason the elevator slide does not rest in the proper position on the wedges.

The adjusting stud in the center of the elevator slide is used to operate and adjust this safety. This stud is brought down until the vise automatic stop rod just clears the disk dog, when the elevator slide banks in the proper position on the wedges. If, for some reason, the elevator slide does not bank properly on the wedges, the disk dog will not clear the stop rod and the machine will stop.

Aligning Type Face on the Slug—The type face alignment with the constant line of the mold is set perfectly at the factory; it should not be necessary to re-adjust it. In the event the machine has been improperly handled, perhaps in shipping, it may become necessary to reset this alignment. The two adjusting studs found in the top of the elevator slide are for this purpose. The third stud found in the center is used to operate the vise automatic.

After casting a slug, observe the alignment. If the type face does not align properly along the constant line of the slug make the following adjustment:

First, check the elevator slide, making sure the gibs are set properly and the slide is straight. Allow the elevator banking shoes to rest on the wedges and place a thin piece of paper between the banking shoes and the wedge, one piece under each shoe. In this position, loosen the lock nut on the banking shoe and back off the set screw. Then loosen the lock nut of the studs at the top of the elevator slide. Having done this, use a small screwdriver and adjust the studs up or down as the case may require, just a little at a time, taking care to retain a pull on each side with the paper. This will insure a perfectly square alignment. Tighten both lock nuts, cast another slug and observe the alignment.

Elevator Slide—If the stick does not transfer freely into the elevator jaw, an adjusting screw will be found on the base to raise or lower the elevator slide and

thereby obtain the proper alignment. However, before touching this adjusting screw, make sure to examine the banking point of the elevator lever to be certain there is no dirt or metal preventing the proper rise. The elevator lever should bank on the above-mentioned screw with a reasonable degree of tension.

The elevator slide bearing surfaces should be lubricated frequently to insure free and easy action.

The elevator slide gibs should be checked so as not to allow any play in the slide. They should also be set so as to guide the elevator slide in maintaining a perfectly straight action, because if the slide is allowed to go out of line, it may seriously affect the type face alignment on the slug.

Pot Pump—The pot pump lever rests on the pot pump lever stop lever and is released at the point of cast only by a fully justified line. This prevents any action of the pot pump plungers when short lines are sent through the machine.

The pot pump plungers are forced down by a heavy spring attached to the base of the machine and may be adjusted by a screw on top of the pump lever which is used to increase the pressure when necessary.

These plungers should be removed from the pot and cleaned with a wire brush. It is also advisable to follow with a slight coating of a mixture of graphite and oil about once a day.

Main Driving Clutch—In caring for the machine, it is necessary to keep the clutch leathers and the clutch bearing of the driving pulley clean and free from oil. These should be cleaned thoroughly with benzine, and the leathers rubbed with sandpaper, to remove the glazed surface. This attention will keep the clutch action positive and eliminate the possibility of slipping.

After a quite lengthy service, if these leathers show signs of wear, or the clutch does not pull correctly, it may be necessary to replace them with new leathers, as the $\frac{1}{2}$ " adjustment set at the factory must be maintained between the collar of the driving shaft and the driving-shaft bearing.

To determine the necessity of new leathers, shut off the power and pull out the starting handle. If there is clearance between the lower stopping lever and the forked lever, new leathers should be applied. In changing these, see that the heads of the small brass screws are down tight and below the surface of the leather, as not to bear on the driving pulley.

Mold Slide—The mold slide moves forward by the action of the mold cam bringing the mold in contact with the line of matrices. This contact takes place when the roller is on the highest point of the cam. In this position the mold should bank against the line of matrices. This adjustment is made by means of an eccentric pin in the mold slide lever.

To insure easy action, the roller should be frequently oiled.

Ejector Cam—Slugs are ejected from the mold by the use of a cam operating against a roller on the ejector slide. When the roller is on the highest point of the cam, the ejector blades should project not more than $\frac{1}{2}$ " beyond the face of the mold. The adjusting screw, by which this adjustment is made, will be found on the ejector slide.

In order to insure smooth operation, the ejector slide and roller should be frequently lubricated.

Adjusting the Slug Face Surfacers—The Slug Face Surfacers is set at the factory and with normal care the adjustment need not be touched.

This is a high-speed cutter and the bearings should be *oiled daily* with a fine grade of oil.

When it becomes necessary to replace the cutter, the main adjustments will remain positive since they are independent of the trimmer head.

It might be well to go through the entire main adjustment to cover any extreme condition, if through error these adjusting screws may have been loosened, and the entire adjustment thrown out.

To begin with, the mold disk guide should be set so as to show a light bearing on the front of the mold disk. Opposite this guide there is an adjusting slide, used to eliminate end play between the disk and the mold slide.

Place the trimmer head in position and fasten, draw the cutter back so as to clear the slug, and start the motor.

Cast a 72-point slug centered on the 12-point body Universal mold. Just after the cast, and before the slug passes through the cutter, stop the machine. While in this position bring the cutter forward so that it just starts to cut the slug. This is done with the adjusting screw at the top of the trimmer head. Start the machine again and eject the slug. Then measure each side of any character with a micrometer, usually one at each end. The measure should be the same on each side of the character. If the measure is not the same, the horizontal adjusting screws found on the left side of the bracket are used. Adjust these screws to favor the condition until the characters on the "T" slug measure the same on each side.

This being done, the two screws found at the front of the trimmer head are used to adjust the cutter so that it will cut on its upper edge. This is done by observing the grain in the slug. When this grain runs in both directions the cutter is parallel and cutting top and bottom. In this case the lower adjusting screw must be brought in as little as possible, just enough to allow the bottom of the cutter to clear. After doing this the grain will run in only one direction, the cutting being done at the upper edge.

Having obtained this condition, recheck the horizontal adjustment on the "T" slug; this having remained parallel, the trimmer is properly set.

The adjusting screw found on top of the trimmer head is used in obtaining the proper height to paper.

The switch lever is connected with the trimmer head. Adjust the lever so when the cutter is back the switch will shut off the current. When forward, it will start the motor.

If the belt becomes loose, adjusting screws found on the base of the motor may be loosened, allowing the motor to drop down.

The belt should not be tight, as it is a V-belt and the pulling is done on the side of the pulleys.

To Remove the Cutter—Disconnect the switch-lever by removing the small cotter pin and loosen just *one* of the horizontal adjusting screws found on the left side of the bracket. Then loosen the large bolt under the bracket which holds the trimmer head. The trimmer head may now be released from the bracket. Remove the cutter with the special wrenches supplied, one for the end of the spindle, the other a spanner-wrench made to fit the cutter.

In replacing the trimmer head, the untouched horizontal adjusting screw will serve as a banking point. The loosened screw should be brought up so as to just touch the head. Using this method the horizontal adjustment should not change.

Slug Saw-Trimmer—The saw is operated by a direct motor drive, and runs at a speed exceeding 3400 R.P.M. It is a ball-bearing unit and should be *oiled every day*. The saw is easily changed, as it is necessary to loosen only three screws which fasten the saw blade to the saw hub.

To adjust the trimmer to remove more metal, remove the motor-shaft guard

and insert a pin-wrench through a hole in the shaft extension. By the use of a second pin-wrench loosen the thrust-bearing lock nut nearest the motor (right-hand thread). Tighten the saw-hub lock nut (left-hand thread). This procedure may be reversed when adjusting to remove less metal.

To remove the trimmer entirely: Remove the saw, push the table all the way in, back the cutter thrust-bearing lock nut all the way off, and remove the cutter thrust-bearing retaining plate. The cutter may now be drawn out away from the motor.

When replacing the cutter, use a piece of brass rule of a known length and place this against the left-hand gauge set to exactly the same length. The cutter should be adjusted so as to just touch the brass rule.

Metal—Imperfect slugs are largely due to the use of inferior metal. The life of good metal depends on the care it receives; therefore, metal should be tested regularly.

Under no circumstances should slugs be fed direct to the machine.

Never use rosin in the metal pot for the purpose of causing the dross and dirt to rise to the top. Rosin will cause slugs to stick in the mold when ejecting.

Reconditioning of metal, when undertaken, should be done by experienced men, in a remelting furnace, and only upon recommendation of a reputable metal manufacturer.