

PART IV

Equipment Information

THE OPERATOR or shop owner who desires to get the very best of results from a Linotype—which means wonderful results—should heed the instructions which follow to the letter. The loss of time involved is so small that it is hardly a factor in the busiest of shops, the practice applied really speeding up production in the Linotype Department, as it preserves machine equipment and assures its availability for use at a moment's notice.

Keep Sorts in Cabinet. All matrices used as sorts in the shop should be kept, when not in daily use, in the regular sorts tray cabinet. This applies also to Gothic or other small job fonts, rule and leader-work matrices, border slides, and border matrices. The sorts cabinet is made to hold eight or twelve trays and can be placed on the floor, near the operator very conveniently. The trays can be placed on the machine while in use. The operator must take care of his matrices. If he neglects to do this he will not have sufficient to work with. This will cause loss in production, especially when he is called upon to set composition of wide measure and finds himself short on some of the lower-case letters.

Care of the Matrices. At the end of each day every matrix which runs down the pi channel should be put back on its proper tray and the tray put away in the sorts cabinet. Matrices should be picked up off the floor when dropped; those that are bent, straightened, if they are not too badly damaged, and run back in the machine. Do not run dirty or oily matrices back into the magazine.

Care of the Spacebands. Particular care is also necessary with regard to the spacebands. New spacebands have their slides specially treated by a process known as Linolizing, which reduces metal adhesion on the casting surface. The spacebands must, however, be cleaned of metal accumulations at least once in every eight hours' operation by rubbing on a graphited pine board. They should not be rubbed in a circular manner as this bevels the edges, but should be moved back and forth. Do not use too much graphite. As each spaceband must drop into the assembling elevator by its own weight, it is very important that the sleeve should function freely. After cleaning each spaceband see that the sleeve moves up and down without binding, before replacing it in the spaceband box.

Spacebands should be kept in a box containing a small amount of graphite, when not in use, this being done to prevent them from accumulating rust, due to dampness, while the machine is idle. The proper polishing of

spacebands on soft pine board should not be neglected, however, before replacing them in the machine.

Cleaning the Matrices. Do not clean matrices with gasoline, benzine, acid, or steel-wire brush. A good way to clean them is to use the matrix reference cleaner, placing a row of matrices upon a galley so that they may be handled to good advantage. This rubber will produce a high polish or luster that will enable the operator to read the reference side of the matrices distinctly. Remember to clean only the ears and the toes; do not touch the sides of the matrices.

A faster and perhaps better way to clean matrices is with the Perfect Matrix-Cleaning Holder and Brush. The holder will accommodate 18½ inches of matrices clamped in by tightening a thumb screw at one end. The soft wire brush is made with either of two diameter center holes to fit saw arbor sizes most commonly used. In the holder, the characters and side-walls are safeguarded during the cleaning by a protecting rail, while the front and back lugs and reference sides are exposed to the buffing and cleaning action of the brush.

The foreign substance removed from the lugs will insure freedom from sticking when the matrices are run into the magazine and various parts of the machine.

Tight Lines. This has the most harmful effect on both machine and matrices, and with very little effort can be easily avoided by the operator simply setting his slide stop at little less than the measure to be set and not crowding the lines too tight.

In some few cases where an inexperienced person has moved the position of the various machine scales for cleaning, and has replaced them improperly, proper replacement can be made by using a slug between the vise jaws, and also between the assembler slide finger and the star wheel, the left vise jaw being set the proper slug length, while the assembler slide is set slightly under the measure, just so the slug fits tight between the assembler slide finger and the star wheel.

The setting of the scales or measures accurately, together with the knowledge that four medium-size spacebands will justify one pica, will do much to eliminate abuse of the machine and its matrix equipment.

Watch for Bent or Cut Matrices. If at any time while operating the machine the operator notices a bright mark, either on the face of the matrix or on the ear or toe, and this shows up frequently, he should either call the machinist, or, in the event that he is caring for the machine himself, look at the vertical alignment and parts of the machine that might be causing the damage. If the line does not seat itself properly in the vise jaws, the mold will shear the toes of the matrices. Any noticeable damage that is being done should be remedied immediately, before the font is badly damaged or destroyed. Whenever a hair-line matrix shows up in a proof, remove it im-

mediately from the magazine. A matrix proof of the fonts should be taken regularly, and all doubtful letters or characters removed.

Matrix Combinations. The word "combination" used in connection with a Linotype matrix refers to the sawlike teeth which are found on the sides of the triangular opening at the top of the matrix. There are seven of these teeth on each side, and for convenience in referring to them they are numbered from 1 to 7. The teeth on both sides are numbered alike, and in cutting combinations both sides are treated alike.

A matrix with all its teeth is called a "pi" matrix because it will not drop in any of the character channels, but run clear across the distributor bar and drop through the chute into the sorts stacker.

In order to cause the matrices to drop in their respective channels, certain of the combination teeth must be removed. This is called "cutting the combination."

There are ninety channels in a Linotype magazine for body matter, and to drop matrices in all these it is necessary that each character shall have a tooth combination different from any other. This means that there are in an ordinary font of English matrices ninety different combinations. Including the combination for the extra "e" and the full combination for sorts matrices, the total reaches ninety-two. Magazines for larger type sizes carry either ninety or seventy-two channels.

Destruction of Matrix Combinations. The matrix combination, a very important part of the matrix, is sufficient under ordinary conditions to last for years. It is possible, however, to ruin a set of matrices in a very short time by cutting or wearing out the combinations. The cause of the combination becoming injured is invariably due to bad alignment at one or possibly all of the various transfers.

Care of the Molds. The highly polished surfaces of molds require that they always be handled carefully in order to avoid damage. Such care is particularly important on new molds which have their surfaces specially treated by a process known as Linolizing in order to reduce metal adhesion.

At least once in every eight hours molds should have their front and back surfaces wiped with a clean rag in order to clean them of any metal accumulation. This should be done while the mold is hot, and no abrasives of any kind should ever be used.

Front and Back Mold Wipers on the machine should be checked occasionally for proper contact with the mold surfaces, and when this is done a very small amount of graphite can be applied to the mold wiper felts.

Molds should never be left in contact with a hot mouthpiece for any prolonged length of time, since this will result in overheating the mold and may either draw the mold temper or cause it to warp. The face of the mouthpiece should likewise be wiped with a clean rag once during each eight-hour period.

Care of Liners. The task of keeping the corners on the liners square should receive special attention. The proper square ends or corners help considerably in making easier the task of setting any kind of multiple slug printing.

The liners, when removed from the mold, should be assembled on a cross stick in a wooden box or board, where there will be no possible chance of injury to the ends. The verification of measures before starting to work on the machine will also do much to prevent the ejector blade from injuring the liners, due to an improper setting. A point to be remembered in this connection is that the ejector setting must coincide with the space left in the mold after the liners are inserted.

Transfers at Three Points. There are three transfers involved in the automatic actions of the Linotype where matrices may be injured if the adjustments are not accurately made; that is to say, the matrices are transferred at three distinct points where the combinations are involved.

Location Where Damage May Occur. The first transfer is from the first elevator jaws to the second elevator bar, at the intermediate channels. A matrix when in position in the first elevator jaws at this transfer point should line up with the bar, so that you will have a perfect transfer on to the bar without binding. There is a set screw at the bottom of the first elevator slide on the right-hand side for raising or lowering the slide. The alignment should be made as nearly perfect as possible, and if the second elevator head, for any reason, does not seat properly on the intermediate channel rails or if these rails are out of true, the trouble should be remedied. The second elevator bar should be perfectly smooth and free from burrs. This same rule applies to the distributor box bar and the distributor bar.

The *second transfer* is from the second elevator bar to the distributor box bar. The second elevator, when in its normal position, should be so adjusted that the second elevator bar will line up with the distributor box bar. Any condition or obstruction preventing these bars from aligning properly should be removed.

The *third transfer* is from the distributor box rails to the combination bar. The distributor box rails should be perfectly square with one another. Place a matrix on the distributor box rails and raise the outside distributor screw; then turn the distributor slowly by hand and see that the matrix when supported on the distributor box rails will transfer freely to the combination bar. There must be perfect alignment at all these points, otherwise undue wear on the matrix combinations will result. (Use a sorts matrix with full combinations when making these tests.)

Matrix Bridges for Model 9. Matrices on the Model 9 are separated in the primary distributor for the various magazines by means of small bridges having different combinations of projections. In addition to the four on the machine, extra bridges, with still different combinations can be supplied.

All matrices used in the Model 9 must have the beveled notch, in addition to the bridge notches for separating fonts for the various magazines. For machines with the four deck pi stacker, sorts matrices are bridge notched. For other Model 9 machines, sorts matrices are supplied without notches. These pass to sorts stacker through the pi tube at the end of the primary distributor.

Matrix Bridge and Notches for Models 25, 26, 29, 30, 35 and 36 with Fixed Bridge. Bridge-cutting of matrices for these machines consist of from one to three bridge notches. This cutting refers to the upper magazine only. Matrices for the lower main and auxiliary magazines are unnotched unless otherwise ordered. Matrices for the upper auxiliary magazine are cut with all notches, in order to drop on any bridge in use. A matrix with a combination which does not correspond with the bridge projections in use (also an unnotched matrix) will ride across the bridge, to the upper distributor box and into the lower magazine.

Matrix Bridge and Notches for Models 29, 30, 35 and 36 with Movable Bridge. The separation of matrices in these models is controlled by a single bridge projection which is positioned by an indicator dial. Since only two adjacent magazines can be in operating position at one time, it is merely necessary to position the single bridge projection to correspond to a notch in the matrices in the upper position, which notch does not appear in the matrices in the lower position. The matrices from the upper magazine will then drop on the bridge and pass to the upper magazine while the matrices from the lower magazine will ride across the bridge and pass to the lower magazine.

The location and size of the bridge notches for matrices to run in these models are the same as for those used on Models 25 and 26. Only one notch is needed for separation.

Commercial Fractions. When commercial fractions are run in the magazine (Figure 104) they displace other characters. The table below indicates the channel in which they run, as well as the tooth combination and the thickness of the matrix lugs.

¼	.....ffl.....	16.....	.080	¾	.....Z.....	247.....	.060
½	.....ffi.....	6.....	.080	¼	.....@.....	2457.....	.080
¾	.....P.....	1236.....	.050	¾	.....&.....	12457.....	.050
½	.....°.....	256.....	.046				

FIGURE 104

Alignment of Matrices. Standard alignment is always adhered to unless special conditions require a deviation from standard.

High and Low Alignment. Some 8-point faces are also made on 7 point as well as on standard 8-point alignment. The low alignment is standard. In 8-point faces where two alignments are made, standard alignment will be furnished on all orders unless otherwise specified.

Any deviation from standard alignment is clearly indicated on specimen sheets.

Figures

IT IS IMPORTANT that the operator become familiar with the design of the three styles of figures available with old-style faces: *modern*, *old style*, and *modernized*.

Modern figures have a common alignment; that is, are all of the same height, and have the characteristics of modern faces—square serifs, contrasting thick and thin strokes, and, in most cases, larger body per point size. They are not ordinarily used with old-style faces. Typical modern figures:

1 2 3 4 5 6 7 8 9 0

Old-style figures have ascenders and descenders, and have the modeled serifs and tapering thick and thin strokes characteristic of old-style type faces:

1 2 3 4 5 6 7 8 9 0

Modernized figures are old-style figures brought to a common alignment, with the shapes of the 1, 2, and 0 changed accordingly:

1 2 3 4 5 6 7 8 9 0

The style desired should always be specified on supply orders and machine specifications.

The largest figure which will run in regular figure channel of the standard 90-channel magazine is .1107 wide. The information always appears on specimen sheets of all faces.

Sizes of Linotype Faces

IN REFERRING to the sizes of faces it is essential to employ the term “point,” such as 6 point, or 7 point, etc. Every matrix is clearly marked on the side with the point size of the face and the triangle number, as a means of identifying point size and name of face.

Decimal Measurement of Bodies. The table below (Figure 105) gives the decimal measurement of bodies from 1 to 72 points:

1	.....	.01383	6%	.....	.0934	12	.....	.166	28	.....	.3874
2	.....	.0277	7	.....	.0968	14	.....	.1936	30	.....	.415
3	.....	.0415	8	.....	.1107	15	.....	.2075	34	.....	.4704
4	.....	.0553	8½	.....	.1176	16	.....	.2213	36	.....	.498
4%	.....	.0657	9	.....	.1245	18	.....	.249	42	.....	.581
5	.....	.0692	10	.....	.1383	20	.....	.2767	48	.....	.664
5½	.....	.0761	10%	.....	.1452	21	.....	.2906	54	.....	.7471
6	.....	.083	11	.....	.1522	24	.....	.332	60	.....	.8301
6%	.....	.0899	11½	.....	.1591	27	.....	.3736	72	.....	.996

FIGURE 105

Thickness of Leads and Slugs. Of importance also, is a familiarity with the thickness of leads and slugs, expressed decimally in Figure 106.

12 to Pica.....	.01383"	6 to Pica.....	.0277"
10 to Pica.....	.0166"	4 to Pica.....	.0415"
8 to Pica.....	.0207"	2 to Pica.....	.083"

FIGURE 106

Systems of Measurement

Point System. Until the latter part of the nineteenth century each type founder was a law unto himself in the matter of type standards. Brevier, for example, made by one foundry would not justify with brevier from another foundry. The pica "em" in use up to that time had been obtained by dividing an inch into six parts, equalling, decimally, .166⅔". When the present point system of the American Type Founders Association was decided upon in 1886, the fraction was eliminated and a standard "pica" em adopted, measuring .166". This standard of matrix measurement is used by the Mergenthaler Linotype Company, and one-twelfth of the pica, .166", equals one point, .01383".

Didot System. The Didot point measures .01483 of an inch. The Didot unit is the Cicero, which equals 12 points, or .178 of an inch. The American (Linotype) unit is the pica em, measuring 12 points, or .166 of an inch. The Didot system of measurement is used in France and in most of the countries of continental Europe, and commonly known as the French system.

Mediaan System. The Mediaan point measures .01369 of an inch, and the Mediaan em or Cicero .1643 of an inch. This point system is used in Belgium. Mediaan height to paper is .934".