CHAPTER 35

Miscellaneous

Mohr Lino-Saw

THE MOHR LINO-SAW saws each slug as it is ejected and delivers the slug to the galley as a finished product. It saws the slugs automatically. The slug is fed to the saw—is sawed—the waste end is carried away through a chute—the type end is delivered to its proper place in the galley.

The liners in the mold are set for full measure and are not changed except for body size. The movement of the left-hand vise jaw is controlled by a dial on the Mohr Lino-Saw. Turning this dial sets the vise jaw and assembler slide to the measure desired, and places the saw blade in cutting position. A full-measure slug is cast with the characters within the measure set by the dial and the remaining portion blank. This blank end is cut off by the saw automatically leaving the type matter within the limits determined, just as though the liners in the mold had been changed to cast the proper measure. Setting the dial on the Mohr Lino-Saw makes the three adjustments of setting the saw, the left-hand vise jaw and the assembler slide, automatically. The operator does not have to change liners since the ejector blades are always set for full measure. The dial control of the

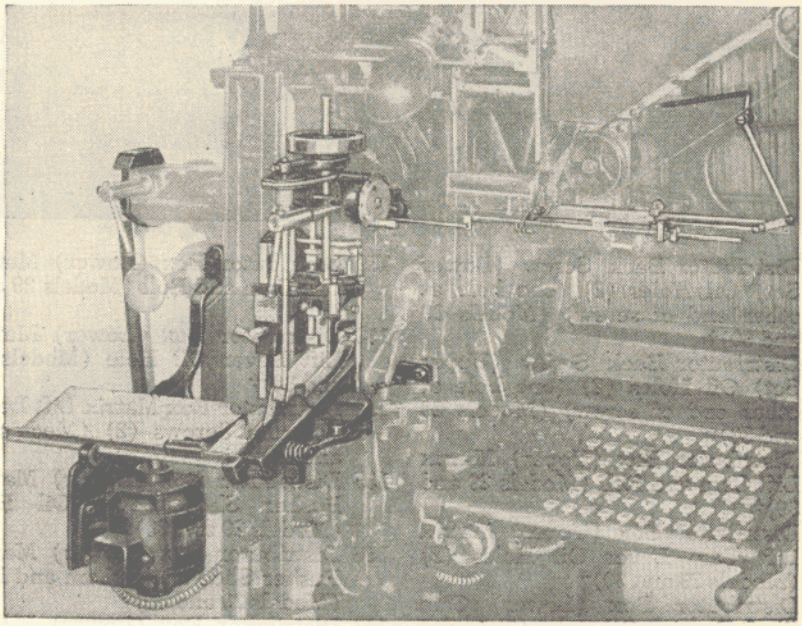

FIG. 1-35. View of Mohr Lino-Saw installed on Linotype.

Mohr Lino-Saw is graduated by points, enabling the operator to secure 312 different measures between four and thirty picas. This generous graduation is most useful in the preparation of department store, chain store and similar ads where triangular and odd-shaped boxes and run-arounds are specified.

The Mohr Lino-Saw is sturdily built and is quiet in operation. The power is derived from an individual ⅛-H.P. motor mounted below the galley. The same switch starts and stops both the Linotype and the Mohr Lino-Saw.

Linotype Motors

The individual electric motor provides the most convenient and efficient drive for a Linotype. Simply turning a snap switch, which is located within easy reach of the operator's working position, starts or stops the machine, and there is no power consumed except when the machine is running.

We have adopted as standard product an electric motor specially designed and built to our order by a prominent and successful manufacturer of small motors. This motor has given universal satisfaction for many years. It is mounted on the frame of the Linotype and becomes an integral part of the machine. This locates the motor within the lines of the Linotype where it is free from floor dirt and within easy reach for oiling. These motors are wound for any desired commercial electric light or power circuit, both direct and alternating current. They show exceptional electrical efficiency which tends toward low operating cost, and their slow speed insures long life and low maintenance cost.

The driving pinion is of the spiral type, which insures absolutely noiseless operation, maximum efficiency and economy in power transmission.

Every motor is tested at the factory, under full load and overload, with accurate instruments. The rating assigned to each motor is not a nominal rating based on the performance of a few motors, but is the actual brake load successfully carried by the individual motor during a test. They have a large overload capacity and a liberal factor of safety.

These motors are carried in stock for immediate shipment wound for 115 volt and 230 volt direct current, and 110 volt and 220 volt, single phase, two phase and three phase, 25, 40, 50 and 60 cycles, alternating current. The direct current motors will operate satisfactorily on a circuit within 10 per cent of these voltages. The alternating current motors will operate satisfactorily on a circuit within 10 per cent of these voltages and frequencies. Single-phase motors will operate entirely satisfactorily on a two-phase or a three-phase circuit.

An electric motor equipment for the Linotype consists of the motor and the pinion, a gear wheel which is to replace the tight and loose belt drive pulleys, gear guard, snap switch, cable and attaching screws. The motor is shipped with a suitable pinion to drive the Linotype at about 70 R.P.M. when motor is operated at its rated voltage. This speed permits of casting approximately 6⅓ lines per minute. If it is desired to increase or decrease this speed, the motor pinion may be changed. Substituting a pinion with one having one more tooth will increase the casting speed about ⅓ line per minute.

The direct current motors are compound wound so the speed will remain almost constant unless the voltage of the supply current changes to a considerable extent. An increase or decrease of 10 per cent in the line voltage will occasion an increase or decrease in speed of approximately 10 per cent.

The alternating current motors are of the induction type so that speed will remain almost constant regardless of normal fluctuations of supply line voltage, but if the frequency of the supply line increases or decreases there will be a corresponding increase or decrease in the motor speed.

The direct current and the 60 cycle alternating current motors are designed to run at 850 R.P.M. when operated at the voltage and frequency stamped on the name plate. The speed is not adjustable, and if a faster or slower casting speed is desired the pinion may be easily changed to one having more or less teeth.

Motors for various frequencies operate at different speeds, but all are shipped from factory with correct pinion to give a casting speed of 6⅓ lines per minute.

The bearings are of the self-aligning sleeve type, turned from a special grade of phosphor bronze, and are equipped with oiling devices of the best type. They are of liberal size with efficient thrust supports and oil retainers.

All external wiring should be carefully installed in accordance with the National Electrical Code and local requirements, and should be of ample capacity based on a maximum drop of 2 per cent of line voltage at full load.

A motor must always be connected to an electric current within 10 per cent of the same voltage and frequency as that stamped on its name plate.

Operation—In every case before starting up a Linotype motor, care should be taken to see that the bearings are properly supplied with a good quality, clean, light mineral oil, that the pinion is properly meshed with the gear wheel, and that the armature is free to turn.

Care—A Linotype motor requires very little attention, but satisfactory results should not be expected from any motor if it is not properly cared for, and it should be borne in mind that its life is increased in direct proportion to the attention it receives. A systematic inspection should be made at least once a week and the interior blown out with compressed air or a small bellows. No dirt, dust or moisture should be permitted to collect on the motor. Lubricate at regular intervals, but do not flood the whole motor with oil.

Linotype motors are well designed and cool running, and there is little danger of burning out if operated under normal conditions. They are guaranteed not to increase their temperature beyond 40 degrees Centigrade above room temperature, and also that they will operate satisfactorily continuously at this temperature. (Fahrenheit equals 9/5 centigrade plus 32 degrees.)

Guards are provided on the motor frame to protect the armature and revolving parts from mechanical and electrical injury. These guards partially surround the drive gear, forming thorough protection from this gear, and they meet all the requirements of the National Safety Council.

Direct Current Motors

The Direct Current Motors are of the constant speed, compound wound type, running at 850 R.P.M., rated at ⅓ H.P.

The frame is a generously proportioned iron casting designed to give absolute protection to the windings and rigidity to the rotating parts. It is of the semi-enclosed type, giving full protection and yet easy access to the parts occasionally requiring attention.

The field structure is proportioned to give a correct magnetic circuit. It has four poles cast integral with the field ring, producing quiet, smooth running operation. The field coils are form wound, carefully taped, impregnated with insulating compound and thoroughly baked. After the field coils are assembled into the field structure they become practically impervious to moisture.

The armature core is built up of laminated, annealed sheet steel, permanently bolted to the armature spider and keyed to the accurately-ground machine steel shaft. The partially closed coil slots are punched before assembling and are carefully insulated. The armature coils are form wound and are held in the slots

by wedges, without binding wires. The armature is impregnated with insulating compound and thoroughly baked.

The commutator is built from selected hard drawn bar copper and the best grade of mica, liberally designed to give long wear, cool running and effective insulation. Rectangular carbon brushes are carried in radial type cast-brass brush holders which do not require readjustment. The brush holder springs do not carry current and are fully adjustable.

The motor equipment includes motor and pinion, a snap switch, cable, main driving gear, gear guard and sundry screws and washers for attaching the motor to the frame of the Linotype.

When ordering give model and serial number of Linotype and the voltage of the supply circuit. When ordering supplies for motor, give type of motor and serial number on nameplate.

Alternating Current Motors

These Alternating Current Motors are of the true induction type. They are, both electrically and mechanically, the most rugged and simplest motors made. There are no brushes, no commutator nor insulated armature windings. Carried in stock for immediate shipment wound for all commercial light and power circuits. The field structure or stator consists of laminations of annealed steel slotted and well insulated. The coils are form wound, impregnated and thoroughly baked.

The armature or rotor is also built of steel laminations rigidly bolted to the spider and keyed to the armature shaft. Heavy copper conductors, riveted and soldered to correctly designed end rings, form the secondary circuit. As these rotors carry no insulated windings they are practically indestructible.

Both field structure and armature are ground accurately to size, insuring a uniform air gap.

The bearings are of the self-aligning sleeve type, turned from a special grade of phosphor bronze, and are equipped with oiling devices of the best type. They are of liberal size with efficient thrust supports and oil retainers.

A single-phase motor operates entirely satisfactorily on either a single-phase, a two-phase or a three-phase circuit. It should be connected directly to the two wires of a single-phase circuit. They may be connected to either a pair of wires of a two-phase circuit, or to any two of the three wires of a three-phase circuit. However, when a two- or three-phase circuit is available, we recommend the use of poly-phase motors.

When connecting more than one single-phase motor to a two-phase or a three-phase circuit, care should be taken to connect them to alternate phases, so that the phases will be balanced. It is customary to use 110 volt current for lighting purposes and 220 volt for power, and it should be remembered that wherever both light and power circuits are available, the motor should be connected to the power circuit. A lower rate is usually charged for the power service, and many Public Service Companies object to connecting a motor to the lighting circuit.

Pot Mouthpiece Wiper

A pot mouthpiece wiper for 30-em Linotypes is similar to the mouthpiece wiper supplied as standard equipment on 42-em machines, which is shown in detail in Fig. 6-30, and described in the footnote accompanying that view.

Kendall Metal Feeder

This one-pig feeder is very simply constructed, has few moving parts, is positive in action and requires no additional power to operate. It can be easily and quickly

applied to any Linotype, equipped with either gas or electric pot. It is attached to the upper rib of the column. For Models 1, 2, 3, 4, 5, K and L, which do not have this rib, a cross-member will be furnished.

The mechanism consists of a friction drum for holding the weight of the ingot (about 35 pounds), a ratchet to control the feed of the ingot, a pawl for operating the ratchet and a lever to actuate the pawl. The feed of the ingot into the metal pot is controlled by the forward and backward movement of the pot. As the pot moves forward, a lever follows the movement causing a pawl to engage a ratchet tooth and as the pot moves backward, the ratchet is turned, thereby feeding the ingot downward into the metal. A float in the metal pot allows the ingot to be fed only when the level of metal is low enough to require it.

Margach Automatic Metal Feeder

This two-pig feeder can be attached to any model Linotype within thirty minutes. It operates perfectly whether gas or electric pots are used. The automatic feed of the ingot is controlled by a chain attached to the first elevator lever. Every time the Linotype completes one cycle of operation, the chain operates the overhead mechanism allowing the ingot to sink slightly into the metal in the pot, provided the metal level in the pot is low enough to require it. This level is regulated to a predetermined point by a float which allows the mechanism to operate if necessary and prevents it from operating if the level of metal in the pot is correct.

This feeder is substantially built and will last indefinitely. It is a practical automatic feeding device, requiring no adjustment whether casting 5 point or 60 point. The ingots weigh 30 pounds each and can be replaced quickly and easily by hanging them on hooks provided on the feeder.

Thermo-Blo Mold Cooler

When large slug sizes, high speed production or certain other casting conditions have a tendency to cause overheating, the need for air cooling by the Thermo-Blo system is indicated. Designed by Linotype engineers to introduce several new advantages in addition to overcoming previous objections to air-cooling systems, Thermo-Blo is an important aid to constant and speedy production of display slugs of the highest quality.

Quick-Opening Advertising Figure Knife Block

Designed especially to speed up advertising and food-store composition, and being identical with the *Universal Knife Block* described in Chapter 15 except for the quick-opening feature, this knife block is equipped with a lever to open the right-hand knife instantly to clear the first or overhanging slug of advertising composition.

The lever is pushed downward to open the right-hand knife, and pulled upward to return the knife to its correct position for accurate trimming of the second or supporting slugs. Thus, the necessity of using the regular knob to open the knife and then after the overhanging slug is cast, to return the knife to trim the second slug, is eliminated.

Supplemental Keyboard

Use of this keyboard obviates the necessity of changing keybuttons to do composition in a language other than the one for which the keyboard is equipped. It consists of a keyboard with keybuttons the same as the machine keyboard, but so arranged that it may be placed on top of the regular keyboard of the Linotype, acting on the regular keybuttons beneath in the same manner as if the operator

touched them direct. Placing this keyboard in position requires no tools and takes but a few seconds. Arranged according to any desired keyboard layout.

Linotype Practice Keyboard

This practice keyboard is designed primarily for use in schools of instruction, but may also be used by individuals who desire to attain speed in Linotype operating.

Substantially constructed the same as the standard Linotype keyboard, this keyboard is exactly the same size and is equipped with standard parts. Keybars are weighted so as to give the same sense of touch as the regular keyboard on the Linotype.

Linotype Keyboard Operation Book

This book is prepared especially to follow the regular sequence of training an operator. It progresses from the first fingering exercises through a complete method which has been approved by the foremost schools and teachers. Straight matter exercises are followed by more complex problems in the various kinds of matter that come off the hook in commercial, book and publication plants.

The accepted standards for all the details of typographic treatment are set forth in terms of matrices, spaces and molds. Examples and specimens make each point clear.

It was compiled by experienced Linotype teachers and checked and double checked by experts in producing plants.

Newspaper Makeup

This book, written by John E. Allen, editor of The Linotype News, discusses and illustrates all phases of newspaper makeup from the top of a front page to the bottom of the last.

The volume, intended for active newspaper workers as well as for teachers and students of journalism, presents enough history of the physical evolution of newspapers to explain (and with showings of old-time papers) what caused newspapers to look as they did many years ago, and what prompted them to change in appearance from time to time. But the book is concerned chiefly with the improvement of appearance and effectiveness of the newspaper of today.

Among the more than 400 examples of newspaper pages, parts of pages, heads, picture treatments and so on, included, are many showing an ordinary way contrasted with a much better way of handling such units.

The Modern Newspaper

A sequel to *Newspaper Makeup,* this book, also by Mr. Allen, picks up where the earlier volume left off and attempts to point out significant changes for the better that have been made, typographically and in methods of news presentation, by newspapers in recent years, and particularly since the appearance of *Newspaper Makeup.*

It does not attempt to repeat all of the fundamentals, nor to illustrate and discuss all of the possibilities, of all of the pages of a modern newspaper. It does show that many influences have been at work, and how some of those influences have brought about many improvements more important and farther reaching than any merely typographic betterments.

Special Tools and Supplies

Other miscellaneous supplies such as magazine racks, matrix storage trays and cabinets, special tools, etc., are available from the Linotype Company. Due to

space limitations, it is not deemed advisable to include here descriptions of these supplies, all of which are recommended as useful adjuncts to Linotype operation and maintenance. Detailed information concerning these items is contained in the Special Supplies Catalogue issued by the Linotype Company.

Ordering Matrices

The Mergenthaler Linotype Company carries in stock a great supply of matrices to meet the exacting demands of printers throughout the world. Matrices can be supplied for composition in about eighty different languages. With the large number of different characters to be supplied, the importance of giving careful attention to accuracy of detail in preparing orders will be appreciated.

Every possible facility is provided for the selection and ordering of matrices according to the style of face and the characters desired. Orders should be typewritten and should show the name of the face and the reference mark, or △ number. One copy should be retained for reference.

Matrix Order Forms—Linotype matrix order forms are supplied in any quantity, free upon request. They should always be used in ordering matrices. This enables us to fill orders correctly and promptly.

Order forms can be supplied for regular characters, accents, fractions, logotypes and other special characters, border matrices and matrix slides, as well as for all foreign characters. Always use the correct type of order form. Use one sheet for each face and point size thereof.

It is important to know the Linotype model for which the matrices are intended, as well as the particular style of magazine used. This is necessary because various Linotype models differ in so far as milling of matrix lugs and magazine limitations are concerned.

Full Name of Face—The full name of the face should always be entered at the top of each order, thus:

10 point Excelsior with Italic and Small Caps; or
10 point Excelsior with Bold Face No. 2; or
10 point Excelsior with Memphis Bold

We frequently receive orders, for example, 10 point Excelsior. As shown above, this face is made in various combinations, and in such cases it is difficult to fill the order correctly without asking for further information.

Ordering Parts and Supplies

To facilitate the ordering of parts, catalogues are furnished to purchasers of Linotypes and new catalogues are published from time to time. Customers should state plainly the letter, number and full name of the part desired as shown in the catalogues. Always give the model and serial number of the Linotype for which the parts are required. These numbers appear on the patent plate upon the machine.

Use the printed supply order blanks, which are furnished free upon request.

Point System

Prior to about 1886, each typefounder 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, equaling, decimally, .166⅔". When the present 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 measurement is used by the Mergenthaler Linotype Company, and one-twelfth of the pica, .166, equals one point, .01383. One-quarter of a point is the unit used in the manufacture of our matrices on the point-set system.

Sizes of Type

Excelsior	3 point
Brilliant	4 point
Diamond	4½point
Pearl	5 point
Agate	5½point
Nonpareil	6 point
Minion	7 point
Brevier	8 point
Bourgeois	9 point
Long Primer	10 point
Small Pica	11 point
Pica	12 point
English	14 point

Thickness of Leads and Slugs

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

Decimal Measurements of Bodies From 1 to 72 Point

1	.01383	18	.249
2	.0277	20	.2766
3	.0415	22	.3044
4	.0553	24	.332
4½	.0622	26	.3596
5	.0692	28	.3874
5½	.0761	30	.415
6	.083	32	.4428
7	.0968	34	.4703
8	.1107	36	.498
9	.1245	40	.5532
10	.1383	42	.581
11	.1522	48	.664
12	.166	54	.747
13	.1798	60	.830
14	.1937	66	.913
15	.2075	72	.996
16	.2214		

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

Table of Type Measurements

The following table shows the number of ems in running inch in columns from 10 to 30 picas wide:

Width of Columns in Picas

	10	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
6 point	240	264	288	312	336	360	384	408	432	456	480
7 point	177	194	212	229	247	265	282	300	318	335	353
8 point	135	148	162	175	189	202	216	229	243	256	270
9 point	107	117	128	139	149	160	171	181	192	203	213
10 point	86	95	104	112	121	129	138	147	155	164	173
11 point	71	79	86	93	100	107	114	121	128	136	143
12 point	60	66	72	78	84	90	96	102	108	114	120

Width of Columns in Picas

	21	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
6 point	504	528	552	576	600	624	648	672	696	720
7 point	371	388	406	424	441	459	477	494	512	529
8 point	283	297	310	324	337	351	364	378	391	405
9 point	224	235	246	256	267	277	288	299	309	320
10 point	181	190	199	207	216	225	233	242	250	259
11 point	150	157	164	171	178	185	192	200	207	214
12 point	126	132	138	144	150	156	162	168	174	180

Weight of Linotype Slugs

Size of Slug	*Slugs in 1 lb.*	*Slugs in 100 lbs.*
6 point 13 ems solid	19½	1950
6 point 13 ems on 7 point	17	1700
6 point 13 ems on 8 point	15	1500
8 point 13 ems solid	15	1500
8 point 13 ems on 9 point	13	1300
8 point 13 ems on 10 point	12	1200
10 point 13 ems	12	1200
10 point 22 ems	7¼	725
10 point 30 ems	5½	550
11 point 13 ems	11½	1150
11 point 22 ems	6½	650
11 point 30 ems	5	500
12 point 13 ems	10	1000
12 point 22 ems	6	600
12 point 30 ems	4¼	425
14 point 30 ems	3⅗	372
18 point 30 ems	4½	444
24 point 30 ems	3⅗	363
30 point 30 ems	3⅛	313
36 point 30 ems	2⅔	229

Linotype Metal

Linotype metal contains three elements; lead, tin, antimony. Antimony gives hardness to the metal; tin adds fluidity and strength and also improves the face.

The approximate proportions are: lead, 85 per cent; antimony, 11 per cent; tin, 4 per cent. This formula may vary slightly with different manufacturers.

After continuous remelting of the metal it should be toned up so that its quality does not deteriorate. For this purpose use "Reductio," which is a special preparation for purifying the metal when remelting. When stirred in the molten metal it brings all impurities to the surface. "Reductio" is listed in the Linotype Parts Catalogue as X-105.

A poor quality of metal will not produce a solid slug nor a good face, and is apt to cause the throat of the crucible and the holes in the mouthpiece to become clogged. Samples of the metal should be analyzed occasionally. This is usually done by the manufacturer from whom the metal is purchased.

The temperature of the metal should be tested with a thermometer, and kept between 535 degrees F. and 550 degrees F. Overheated metal will produce porous slugs with a poor face, and there will also be a greater accumulation of dross which will cause the pot plunger to become fouled. If the temperature is too low it will not give a sharp clear face.

Metal level in the pot should be kept as nearly uniform as possible. If hand-fed, do not add a large quantity of metal at one time.

Instead of being fed directly back into the metal pot Linotype slugs should be melted down in a remelting furnace, and cast into ingots for hand-feeding or into bars if a metal feeder is used.

The remelting must be carefully done to thoroughly purify the metal. The temperature should never go above 600 degrees F. and the molten metal must be stirred so that any foreign substance will come to the top, so that it can be skimmed off.