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CASTER

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MANUAL

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THE 'MONOTYPE'
SUPER CASTER MANUAL

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Published by
THE NATIONAL COMMITTEE OF MONOTYPE USERS' ASSOCIATIONS
11 BEDFORD ROW LONDON WC1
IN ASSOCIATION WITH THE MONOTYPE CORPORATION LIMITED

Published 1953

Printed by
SIMSON SHAND LTD, THE SHENVAL PRESS
LONDON AND HERTFORD

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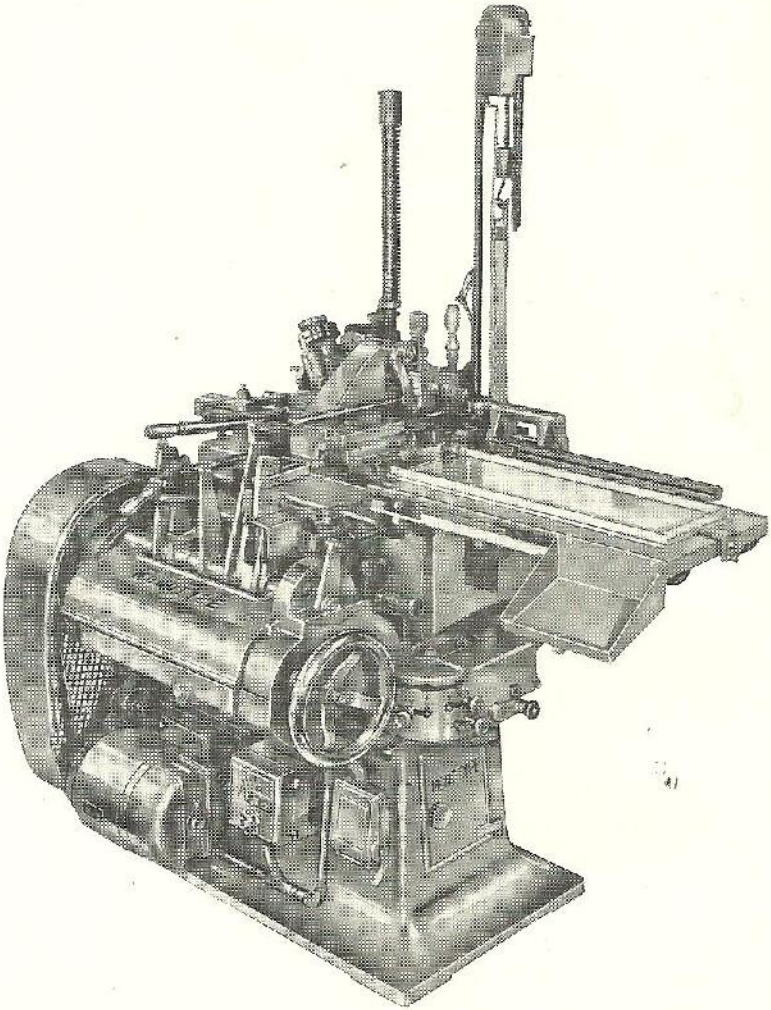
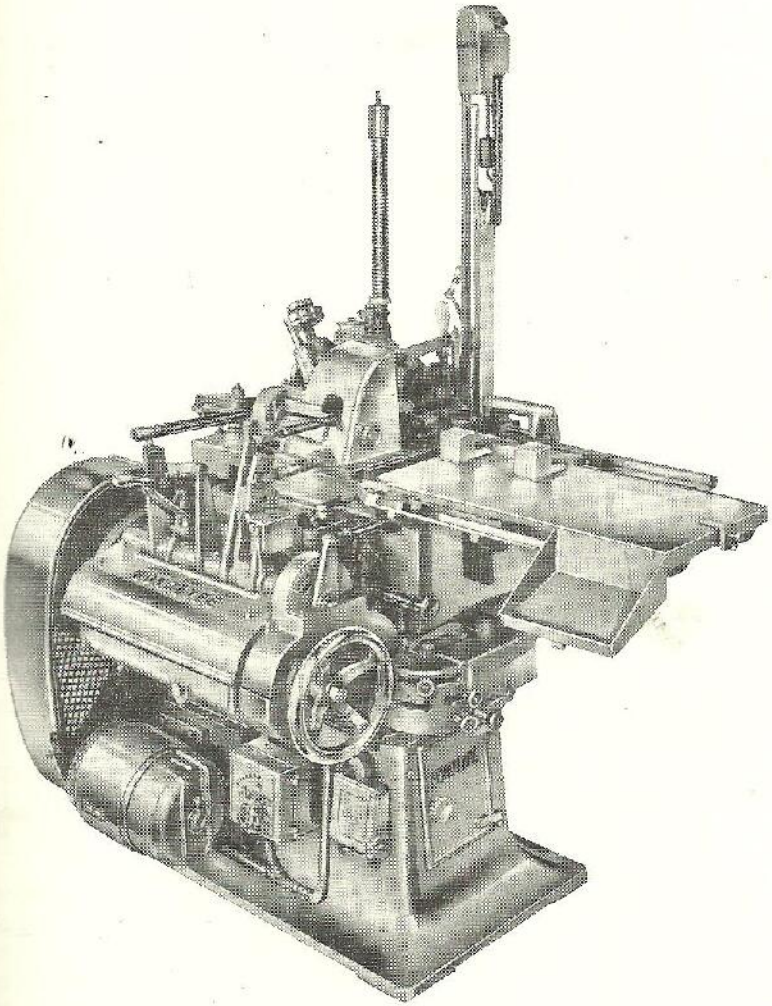


THE SUPER CASTER

This illustration shows machine equipped for casting small type, with electric heater in use.



THE SUPER CASTER

This illustration shows machine equipped for casting strip material.

FOREWORD

THIS MANUAL is not meant to cover every possible instruction concerning the running of a 'Monotype' Super Caster, but it will be found that, if the instructions given herein are closely followed, there will be little left which could be learnt by other means than practical experience.

The best training is actual daily contact with the machine, but the operative will add to his efficiency by consulting this manual on details of adjustment and other problems which are not clear to him.

The manual will be found useful for reference, enabling the operative to refresh his memory on adjustments and practices designed to maintain the efficiency of the machine. A thorough understanding and careful application of the instructions given will establish his reputation as an intelligent and painstaking operative. It will also serve to remind him that there are many things which should be strictly avoided.

Ordinarily an operative's duties are confined to the changing of the matrices and moulds, and to seeing that the quality of type produced is satisfactory. In doing this he should satisfy himself that all adjustments in connection with changing a matrix are scrupulously exact to the standard laid down in this manual; that his metal is kept clean, of standard quality, and maintained at the correct temperature; that his pump connections are working correctly; that the metal channels are clean; and that the type is cast and delivered to the galley without hitch of any kind. Beyond this, all he has to do is to keep his machine clean and oiled, and to see that no screws or nuts work loose.

The operative should draw a line between calling on the Monotype Corporation's inspectors for advice regarding trivial details, and the obstinate attempt to do for himself work (whether repairs or adjustments) which he must know he is not qualified to undertake.

This manual is issued with the idea of giving an operative an opportunity of studying every motion on the machine, tracing such motions from their starting points, and guiding him as to how such parts should be adjusted. Although it explains the methods of detaching various parts, it does not follow that any group or part should be frequently or even occasionally disconnected without a reasonable purpose.

For general illustrations of parts, refer to Book of Parts of 'Monotype' Super Caster.

Acknowledgment is due to Messrs. Fry's Metal Foundries Ltd. for kindly supplying the material for article on METALS FOR USE ON 'MONOTYPE' MACHINES on pp. 118–134.

INSTALLATION

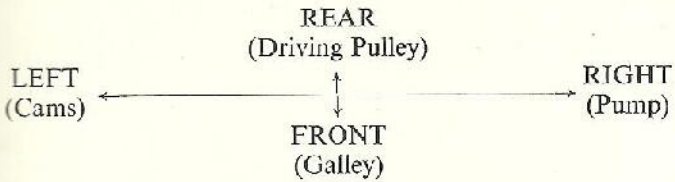
A 'MONOTYPE' SUPER CASTER should be installed in a room or section of a room that is light and free from dirt or dust. A strong bench should be provided, as well as a suitable cupboard for storing accessories and spare parts.

Sufficient space should be allowed around the machine to permit free access by the operative to any part of the mechanism.

When installing a first 'Monotype' Super Caster, the possibility of increasing the plant should not be overlooked.

NOTE

In all the instructions, 'right', 'left', 'front' and 'rear' are understood to be taken when the operative is stationed with the pump mechanism on his right, and the cams on his left. When referring to a part removed from the machine, right, left, front or rear are assumed from the position such part occupies on the machine with the operative stationed as stated.



For verification of symbols, refer to Book of Parts of 'Monotype' Super Caster.

VARIETY OF PRODUCT

The machine is constructed to cast the following material:

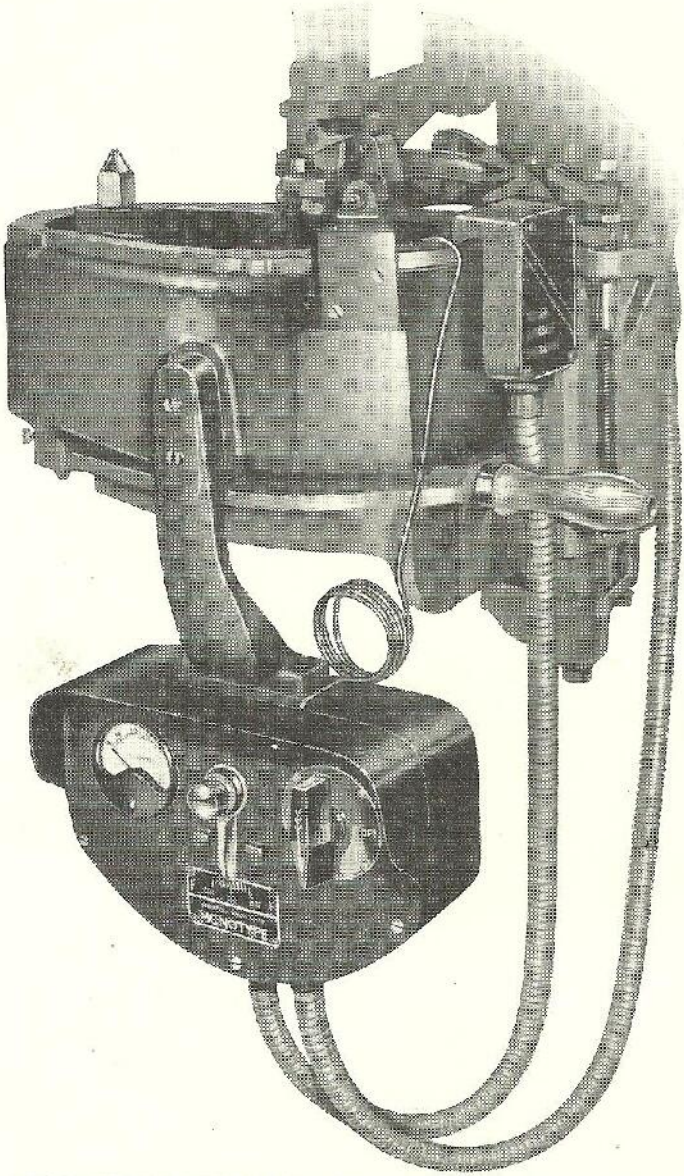
TYPES, SPACES, BORDERS AND ORNAMENTS, in any size from 5 to 72 point.

LEADS AND RULES in any of the usual thicknesses from 1 to 18 point.

12- and 18-point TIE-UP SLUGS.

CONTINUOUS STRIP BORDERS in 6, 8, 10, 12 and 18 point.

FULL-FACED RULES from 1 to 18 point.



AUTOMATIC REGULATION OF TEMPERATURE OF METAL

The melting pot may be heated by gas or electric current. This illustration shows electric heating equipment, which includes a regulator for maintaining the metal at the required temperature. The action of this regulator causes the electric current to be automatically put in or out of action by the control box.

CLUMPS AND DASHES in any length from 9 to 16 12-point ems.
CONTINUOUS FURNITURE in 24, 36, 48, 60 and 72 point.
STEREO AND ELECTRO MOUNTS in 24, 36 and 48 point.
TWO-PIECE TYPE-HIGH FOUNDRY FURNITURE in 36, 48, 60 and 72 point.
QUOTATIONS in the following sizes:

12-POINT EMS:				
6×6	6×5	6×4	6×3	6×2
	5×5	5×4	5×3	5×2
		4×4	4×3	4×2

WOODEN-CORED QUOTATIONS in sizes 6×6 and 6×3 12-point ems.

PIPING

The machine must be provided with water- and drainpipes, and the necessary piping equipment to which these pipe services must be attached is built into the machine.

HEATING (for plate see p. 2)

Electric heaters are recommended, but gas piping connections can be fitted for customers not provided with electric current supply.

A gas service pipe should be $\frac{3}{4}$" galvanized iron. The connection on the machine is $\frac{1}{2}$" gas thread.

If gas is used to heat the metal, the consumption is about 22 cubic feet per hour; if electric heaters, the consumption is about $1\frac{1}{2}$ units per hour.

WATER SUPPLY

This pipe should be $\frac{1}{2}$" galvanized iron. The connection on the machine is $\frac{1}{2}$" gas thread. The amount of water passing through the moulds averages less than 3 gallons per hour.

WATER DRAIN

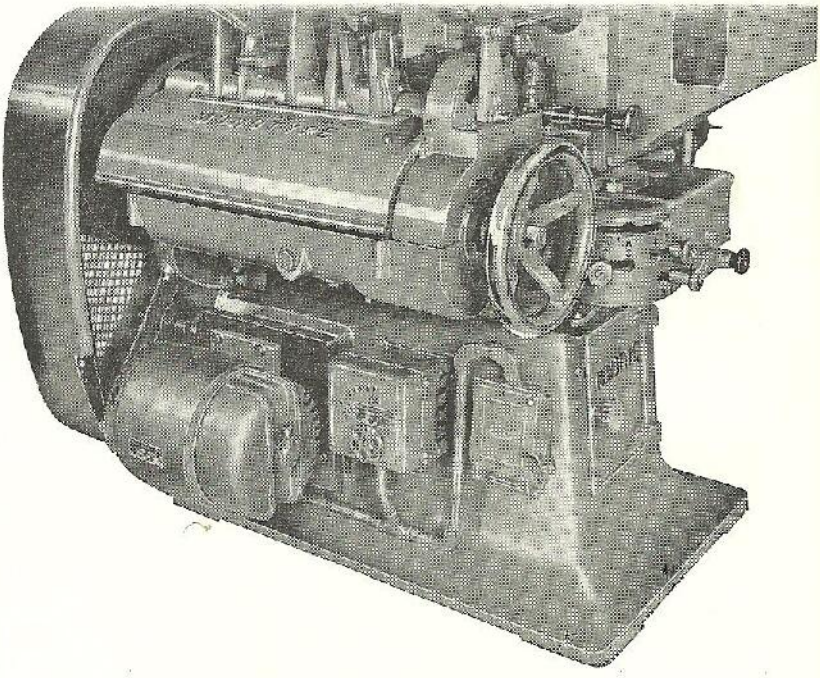
This pipe should be $\frac{3}{4}$" galvanized iron. The connection on the machine is $\frac{1}{2}$" gas thread.

AIR

An air blast is very beneficial in keeping the matrices and quotation coring blocks cool during the casting process.

Where the Super Caster is placed near a 'Monotype' composing machine, the compressed air pipe of the composing machine equipment should be carried to the Super Caster. This pipe should be $\frac{3}{4}$" galvanized iron. The connection on the machine is $\frac{1}{2}$" gas thread.

In cases where no 'Monotype' composing machine is installed and no independent air supply is available, a special rotary blower is provided for use on the Super Caster. This is driven from a toothed wheel



MOTOR AND STARTER

The Super Caster is equipped with a ¾ horse-power motor. A spring-controlled jockey pulley maintains an even belt tension upon the motor driving pulley.

attached to the machine pulley. The necessary piping is supplied with each blower.

DRIVE (for plate see p. 4)

The machine may be driven by belt from shafting or direct by motor. It is started by pulling the starting rod to the front, to cause the belt to be drawn to the fixed pulley, and the starting rod to become latched. Should any of the gear-positioning levers not be taken to their correct locating positions, the starting rod will remain locked, and it will not be possible to start the machine. The machine is stopped by depressing the starting rod latch trip which causes the belt to return to the loose pulley.

The machine is equipped with a $\frac{3}{4}$ horse-power motor (a maximum of $\frac{1}{2}$ horse-power is absorbed in driving).

The belt should be kept fairly tight in running, otherwise the machine will run irregularly.

TOOLS

THE SUPER CASTER operative should maintain his tools in good condition. A bad habit is to use screwdrivers for stirring the metal or for testing it to see if it has commenced to melt. This softens the point of a screwdriver, causing it when used on hardened screws to become blunted and burred. The point of a screwdriver should be kept correctly tempered, and should be so ground that it has no tendency to slip out of the screw slot. In tightening or loosening a screw, the driver should be held firmly down in the slot of the screw head, as frequent slipping out will ruin the edges of the screw slot, rendering it impossible to tighten the screw thoroughly, or to loosen it when required. The handles should never be battered upon with a hammer.

The pump body and nozzle should always be drilled when cold, otherwise the drill will become softened and useless.

The operative should be provided with the following tools:

TOOLS PROVIDED WITH MACHINE

Screwdrivers: 11ST2, 11ST3, 11ST4, 11ST5, 11ST6, 11ST7, 11ST8; Wrenches: two each of 9ST1, 9ST2, 13ST2, 13ST3, 13ST4, 13ST5, 13ST6; one each of 13ST1, 13ST7, a13ST8, 13ST10; Nozzle Squaring Posts: 7ST1, 7ST2; Pump Nozzle Setting Gauge x10ST; Well Arm Drills 14ST1, 14ST2 for $\frac{7}{8}$" and $1\frac{1}{4}$" Pump; Cleaning Tools 2ST1, xb3ST, xa18ST, x20ST; Ingot Mould 4ST1; Iron Ladle 5ST1; Skimming Spoon 12ST1; three Oil Cans 8ST1.

The following parts are supplied with new installations only, unless specially ordered:

1″ Micrometer 27ST1; Type Alignment Gauges a15s1, a15s12; Eye Glass 26ST1; Tweezers 28ST1; Centring Pin Gauge 25ST1; Border Length Gauge 1s11.

EXTRA MATERIAL WHICH SHOULD BE PURCHASED

Storage boxes for loose matrices. Cupboard for tools. A strong vice, with 3″ or 3½″ jaws. A suitable bench. Nozzle drills: 16ST1, 16ST2, 16ST4, 16ST5, 16ST6, 16ST7, 16ST8, 16ST9, 16ST10; Nozzle taps: 17ST1, 17ST2; Piston Extractor X24ST.

NOZZLE DRILLING

One drill for each size nozzle should be reserved specially for clearing the nozzle point, when required, without removing nozzles from the machine. All other drills and taps should only be used on nozzles or pump body when cold. On no account should drills or screwdrivers be dipped in molten metal, as this softens them and renders them unfit for general use.

TYPE METAL

A reasonable reserve of type metal must be provided, in order to avoid too frequent smelting. This metal is an alloy of tin, antimony and lead. A good all-round standard mixture suitable for all kinds of products cast on a Super Caster is 10% tin, 16% antimony and 74% lead, see METALS FOR USE ON 'MONOTYPE' MACHINES, pp. 118–134.

RE-MELTING FURNACE

A suitable re-melting furnace should be provided and the metal cast into ingots of suitable size.

In re-melting, an efficient non-corrosive cleansing flux should be used in moderation, and an excessive temperature should be avoided.

OIL

Only good machine oil should be used for lubricating the Super Caster. It is therefore recommended that Vacuum Oil Company's product be used generally, and Duckham's Mould Oil for type moulds. For strip moulds, use a reliable quality of castor oil. Recommended suppliers of oils for gear box and cam bath are detailed on p. 51.

HANDWHEEL

The handwheel must always be moved anti-clockwise.

SPEED REGULATING MECHANISM

This provides for 18 different speeds, in addition to the top speed obtained when the gears are placed out of action.

A speed table is provided, based on a maximum direct pulley drive speed of 144 revolutions per minute. The gear box controls should be moved in the sequence shown on the CHANGE SPEED TABLE on pp. 150, 151.

MAIN SECTIONS OF MACHINE

THE MAIN SECTIONS of the machine and equipment are dealt with in the following pages:

1. MICROMETER ADJUSTMENT HEAD; p. 7.
2. MATRIX HEADS BASE; p. 17.
3. MATRIX HEADS; pp. 21, 23.
4. COUNTER MECHANISM; p. 27.
5. STRIP CUTTING AND STACKING MECHANISM; p. 37.
6. PUMP MECHANISM; p. 39.
7. SPEED REGULATING MECHANISM; p. 45.
8. AUTOMATIC INGOT FEEDER; p. 52.
9. AIR BLOWER; p. 52.
10. ELECTRIC MELTING POT ATTACHMENT; p. 52.
11. TYPE STACKER; p. 53.
12. MOULDS; p. 53.
13. MATRIX HOLDERS; p. 109.
14. MATRICES; p. 112.

MICROMETER ADJUSTMENT HEAD

(FOR PLATES SEE PP. 8, 10; FOR TABLES SEE PP. 140–149)

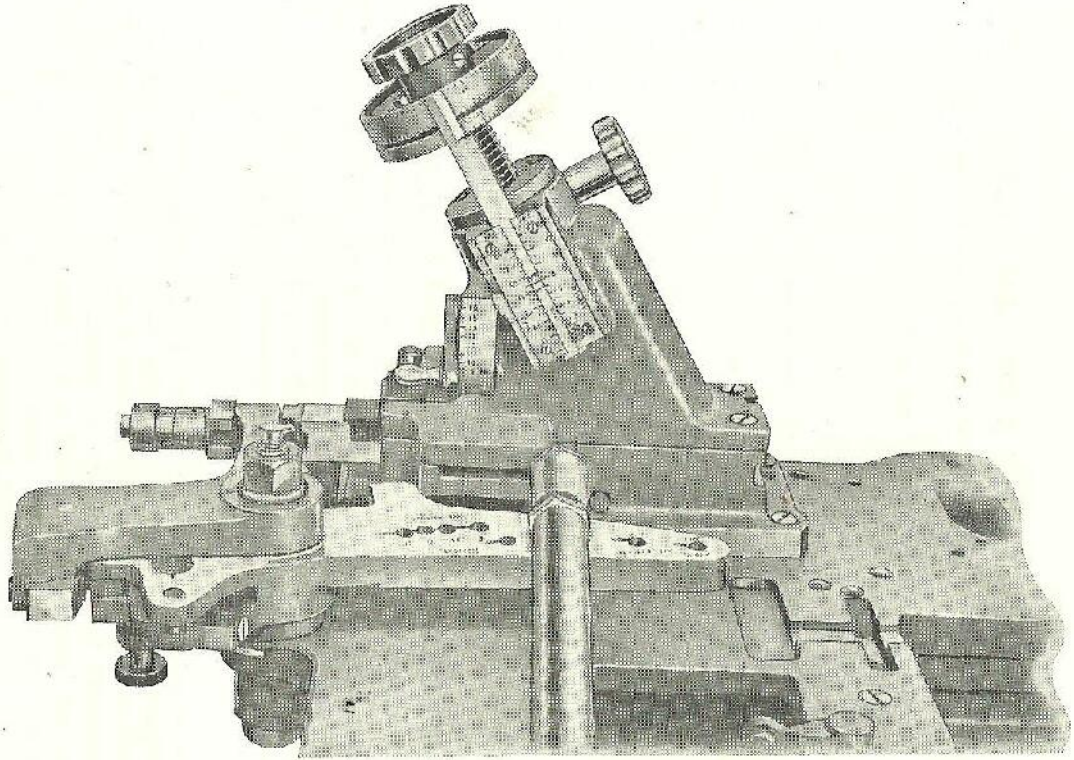
THIS MECHANISM determines the set size adjustment for mould blades when casting type, the length of dashes and clumps, and (in conjunction with the counter mechanism) the lengths of leads, rules, strip borders and furniture. A screw-and-wedge combination allows for very fine adjustments.

CONSTRUCTION AND FUNCTION OF MICROMETER WEDGE 8SEF

The micrometer wedge screw has six threads of twelve points each to one inch, and the wedge (8SEF which abuts against the two support pins 13SF2 and 13SF1) is so designed that a complete revolution of the screw makes a difference of 6 points (.083″) to the opening of the mould blade.

The screw is turned by the wedge screw handwheel a10SF1 at its upper end, and just beneath the handwheel are two wedge screw scales a10SF10 and 10SF4.

The upper wedge screw scale a10SF10 is marked around the upper edge of its circumference with divisions, representing thousandths of an inch, and around the lower edge with divisions representing points



MICROMETER ADJUSTMENT HEAD

Shows the screw for adjusting the micrometer wedge, the scale wheels to indicate the amount of fractional adjusument given to the micrometer wedge, and scale plates to indicate the position of the micrometer wedge in points and ems.

and sixteenths of a point. This scale is locked by means of the lock screw 10SF12 and clamp 10SF11 at the side of handwheel marked 'type'.

The lower wedge screw scale 10SF4 is marked around the lower edge of its circumference with divisions representing points and sixteenths of a point. This scale is locked by means of nut 10SF6 and washer 10SF7 at side of handwheel marked 'leads'.

Keyed between the two scales is a wedge indicator b9SFF which moves up and down with the micrometer wedge screw 10SF as the latter is turned.

The lower end of the wedge indicator runs in a slot in the micrometer head casting. On one side of the slot is a scale 9SF4 marked 'points' and on the other side is a scale 9SF5 marked 'ems'. The wedge indicator pin 9SF1 serves to show the opening of the mould in ems or points, and the wedge screw handwheel scales indicate fine adjustments in thousandths of an inch or fractions of a point.

One revolution of the micrometer wedge screw handwheel moves the wedge indicator 6 points, or .083". Therefore, when the micrometer wedge handwheel is at zero the wedge indicator should be in alignment with an 'em' line or half-way between two em lines.

The micrometer head also carries a stepped mould blade stop a1SF against which abuts the mould blade slide abutment plate 4SF4; this controls the distance to which the lead mould blade is pushed when ejecting the product. The stop is positioned by the handle 2SF5 on the scale on the wedge screw housing 12SFF.

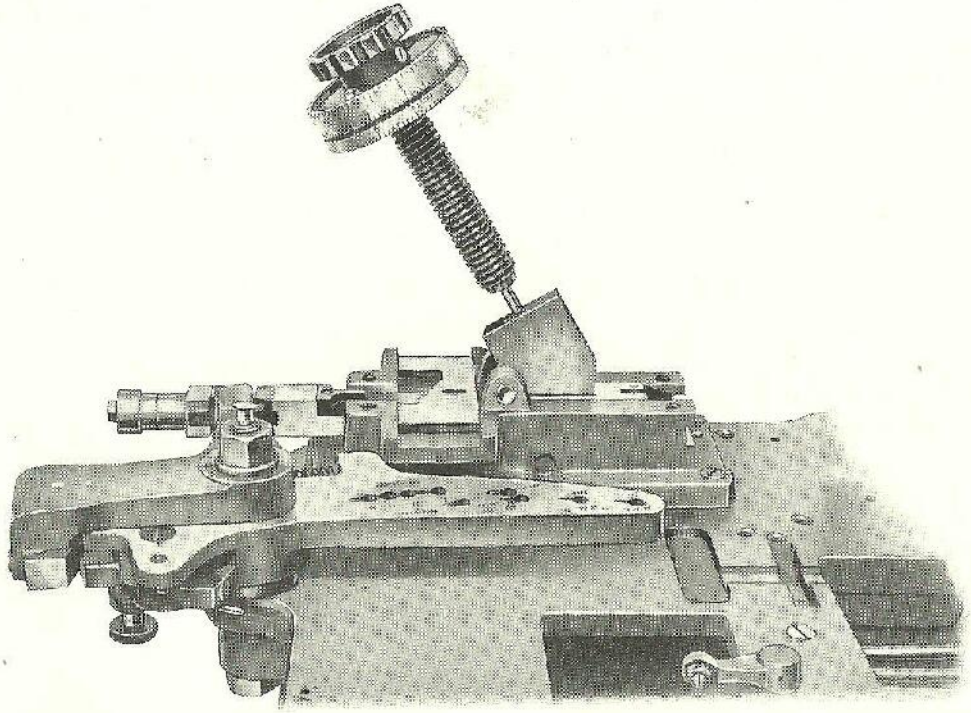
ADJUSTMENTS WHEN PREPARING TO CAST TYPE

At the rear end of the mould blade slide 4SF, a reversible abutment 4SF8 is provided. When type of 12-point width or less is to be cast, the large diameter end of the driving block cap abutment 4SF8 should be positioned at the front; that is, with the spring in action. For all widths above 12 point, this cap abutment should be reversed; that is, with the spring out of action. To reverse the abutment, remove screw b4SF3.

With type mould fixed to machine, and a blank matrix in matrix holder, turn machine to ejecting position (150°). This will bring the mould blade close to the crossblock. This is the starting position for sizing the mould blade opening.

Loosen the clamp nut 11SF2 and screw the micrometer wedge down to its lowest position. Loosen the two screws 9SF6 and set the 'points' wedge indicator scale 9SF4 on side of micrometer head so that 'zero' mark is in line with mark on wedge indicator pin 9SF1.

Loosen the scale lock screw 10SF12 on top of wedge screw handwheel, and turn the upper handwheel till the zero mark is in line with knife edge of wedge indicator b9SFF; tighten the scale lock screw 10SF12



MICROMETER WEDGE, MOULD BLADE SLIDE, AND MOULD BLADE SLIDE DRIVE LEVER

Shows how the mould blade slide is drawn, by mould blade slide drive lever, against the micrometer wedge. This wedge limits the position to which the mould blade opens. Also shown is the stepped distance piece which decides the distance to which the mould blade shall be pushed when ejecting leads, rules and dashes. On the mould blade slide drive lever intermediate lever a5SE1 are shown the various holes to which the connecting rod may be attached, so that different stroke-lengths may be applied by the lever.

As the mould blade is now completely closed, one revolution of the wedge screw handwheel (bringing the 'zero' mark on handwheel again in line with the knife edge on the indicator) will open the mould 6 points, and bring the mark on wedge indicator pin 9SF1 in line with the 6-point mark on wedge indicator scale 9SF4.

This scale has divisions representing a difference in mould blade opening of 6 points, and any smaller differences may be obtained by turning the wedge screw handwheel as required.

For example: if the set size required is 39 points, make six complete turns of the wedge screw handwheel to give a mould opening of 36 points. Continue to turn the handwheel until the line marked '3' on the upper handwheel scale coincides with the knife edge on the wedge screw indicator; this gives the extra 3 points required to make up the 39 points.

As the micrometer wedge will usually be screwed to its lowest point when the mould is comparatively cold, it will be found in practice that the wedge screw scale requires a little extra adjustment when sizing the type. For instance, although the wedge indicator and wedge screw scale may have been adjusted to 6 points when the mould was cold, when types are cast and the mould becomes heated it may be necessary to move the wedge screw scale to correct the type size by a few thousandths of an inch. When the product has been sized correctly, the scale lock screw 10SF12 should be loosened and the upper wedge screw scale finally adjusted to indicate the size obtained.

After this the micrometer screw may be moved in either direction to produce any other required size.

After having adjusted the micrometer wedge to cause correctly-sized type bodies to be cast, insert the required 'star' matrix in matrix holder, bring the micrometer wedge and speed gear to positions indicated by the matrix marking, and make a cast.

The centring pin must be adjusted to cause the crossbar of the 'set' matrix to be exactly central bodywise on the type, with the two ends exactly level with the sides of the correctly-sized type. To ensure accuracy in getting the crossbar of the 'star' central bodywise on the type, cast two types, and place them on a gauge with the nicks reversed. This doubles any visual error. For composition matrices it is recommended that the special steel flat type alignment gauges be used for testing the alignment. These are produced for composition matrices in increments of .0005".

ADJUSTMENTS FOR CASTING STRIP MATERIAL

Move the lead mould blade stop lever handle 2SF5 to position marked 'Leads'.

Place the border length gauge 1ST1 between mould blade slide abutment plate 4SF4 and lead mould blade stop a1SF; screw down the micrometer wedge screw until the gauge fits accurately (without binding) between the two stops. Turn wedge screw scale 10SF4 to zero and lock.

Tighten wedge screw clamp nut 11SF2 and check to see that the gauge is still a good fit.

ADJUSTMENTS FOR CASTING DASHES OR CLUMPS

Move the lead mould blade stop lever handle 2SF5 to scale mark corresponding with lengths in ems of clump or dash required to be cast.

Turn micrometer wedge screw until the wedge indicator pin 9SF1 indicates on scale 9SF5 the length in ems of dash or clump required to be cast.

NOTE

The minimum length of a dash must be greater than the distance from end of a dash matrix to opposite end of character in the matrix. *Any attempt to cast dashes in shorter lengths will result in the matrix seating on the character of the previous cast.*

ADJUSTMENTS FOR CASTING STRIP BORDERS

Having gauged the mould blade stroke (as explained in ADJUSTMENTS FOR CASTING STRIP MATERIAL, see p. 11), examine the border matrix which is to be used to see if it is marked '+' or '—'. If it should have either of these marks stamped upon it (such as ' | 3' or ' 2'), turn the micrometer wedge screw the corresponding number of divisions '+' or '—' on the top scale of the upper wedge screw scale a10SF10. These divisions represent thousandths of an inch.

ADJUSTMENTS FOR CASTING FURNITURE OR PLATE-MOUNTING MATERIAL

Set wedge indicator b9SFF at 6 ems, and check that front of mould blade is level with distance piece 11208.

Place the lead mould blade stop lever handle 2SF5 in the 13-em position.

DISMANTLING THE MOULD BLADE SIZING MECHANISM

Remove the mould blade slide driving block screw b4SF3 and take off block b4SF2, cap a4SF7, abutment 4SF8 and spring 4SF9.

Remove screw a14SF1 and wedge screw housing cover 14SF.

Remove three screws 12SF2 from wedge screw housing 12SFF and lift off housing and lead mould blade stop a1SF; the mould blade slide 4SF can then be removed.

Unscrew wedge rod nut 8SF2. Remove washer 8SF4 and wedge screw spring 10SF3, and wedge 8SFF can then be taken out ; the wedge screw 10SF complete with handwheel a10SF1 and wedge indicator b9SFF can also be screwed out.

To dismantle the handwheel, loosen handwheel lock screw a10SF2 and remove wedge screw 10SF.

Take off nut 10SF6 and remove washer 10SF7 and bolt 10SF5.

Remove screw 10SF12 and clamp 10SF11.

Remove the six screws 10SF9, when plates and scales will come apart.

To remove blade stop lever 2SF3, knock out taper pin 2SF8.

To remove wedge screw nut a15SF, take off clamp nut 11SF2 and take out bolt a11SF1 and wedge screw clamp a11SF.

Remove three screws 15SF1 and, using a piece of wood, drive out wedge screw nut a15SF from beneath, taking care not to damage the inside threads.

Remove scales 9SF4 and 9SF5 by taking out screws 9SF6 and 9SF7.

ASSEMBLING THE MOULD BLADE SIZING MECHANISM

Replace wedge screw nut a15SF; take care that it is in the right position, otherwise the screws cannot be assembled. Once the nut is driven home it is very difficult to turn.

Replace three screws 15SF1, bolt a11SF1, wedge screw clamp a11SF and clamp nut 11SF2.

Replace blade stop lever 2SF3, making sure that the handle spring 2SF6 and handle spring plunger 2SF7 are in position; lock up by means of taper pin 2SF8.

To assemble handwheel, replace two scales, making sure that the type scale a10SF10 is on the top and that the figures read correctly.

Replace washer 10SF7, bolt 10SF5, and nut 10SF6, the cut-away portion of the washer facing outward.

Replace clamp 10SF11 and screw 10SF12.

Replace plates with the word 'type' on plate 10SF13 against the clamp 10SF11 and secure with six screws.

Assemble wedge screw 10SF to handwheel and lock with handwheel lock screw a10SF2.

Screw wedge screw into nut and assemble wedge indicator b9SFF and indicator scales 9SF4 and 9SF5.

Replace wedge, spring, washers and nut, and lock tight in position.

Replace mould blade slide 4SF and lead mould blade stop a1SF, ensuring that the narrowed portion of the stop is to the right-hand side of machine.

Replace wedge screw housing 12SFF, ensuring that the lead mould blade stop lever 2SF is located correctly in the lead mould blade stop a1SF; secure with three screws 12SF2.

Replace wedge screw housing cover 14SF and screw a14SF1 and lock in position.

Assemble abutment 4SF8, spring 4SF9, cap a4SF7, and block b4SF2, and screw to mould blade slide 4SF by means of screw b4SF3.

MOULD BLADE SLIDE DRIVE LEVER 5SFF

This lever is for imparting the necessary traverse to the mould blade. It is operated by mould blade cams X17SC through the mould blade cam lever 18SC and the connecting tube X6SF. This connection may be attached to the lever 5SFF in various positions to give the varying movements required when casting different classes of product.

To provide against damage caused by any obstruction to the movement of the mould blade, this lever is constructed in two sections, each working upon the same axis. The two parts are held together by a clutch in the form of a friction plunger b5SF4 supported by a spring b5SF11. Should any obstruction occur, it overcomes the pressure of the spring, causing the plunger to recede and to become locked in an inoperative position. All pressure is thus released from the mould blade.

When the obstruction to the mould blade has been removed, the plunger is restored to its operative position by withdrawing the lock pin knob 5SF7. The lock pin should be withdrawn only when the machine is at rest, and when the plunger b5SF4 is opposite its recess in the plate 5SF2.

POSITION OF PLUNGER SPRING ADJUSTING NUT 5SF23 AND FULCRUM PIN ECCENTRIC a5SF18F

When casting cored type, 42 to 72 point, and furniture, there is greater resistance to the mould blade when ejecting the type, and greater spring pressure is therefore necessary on the plunger. This extra spring pressure is obtained by turning the plunger lever fulcrum pin eccentric a5SF18F until the line marked 'type 42-72 point' corresponds with the line on the intermediate lever a5SF1, and by locking the adjusting nut 5SF23 right forward against the stop collar 5SF24.

For 14 to 36 point display moulds, and lead and rule moulds, the adjusting nut should be against the stop as for 42-72 point but the eccentric should be in the 'small type' position.

To obtain the reduced spring pressure necessary when casting from composition moulds, set the eccentric in the 'small type' position and the adjusting nut right back against the head of the guide rod a5SF12F.

DISMANTLING MOULD BLADE SLIDE DRIVE LEVER 5SFF

When wishing to separate the two levers 5SFF and a5SF1, see that the plunger lever fulcrum pin eccentric a5SF18F is in the 'small type' position, as this reduces the spring pressure on the plunger. Place the

lever 5SFF in a vice, letting the vice jaws grip the slide drive lever plate 5SF2 with the lever 5SFF to the left. Give the end of the lever a5SF1 a sharp blow; this will cause the plunger to be depressed and the safety catch to lock in its inoperative position.

REMOVING SPRING b5SF11

Hold the lever a5SF1 firmly by hand, and press the plunger against the edge of a bench until the plunger spring is compressed; then release the lock pin a5SF5 and remove the bush a5SF6. The plunger can then be removed. Hold the lever in a vice with the spring b5SF11 facing upward. Take out the split pin 5SF15, push out pin 5SF14 and remove the plunger lever 5SF16.

REPLACING SPRING b5SF11

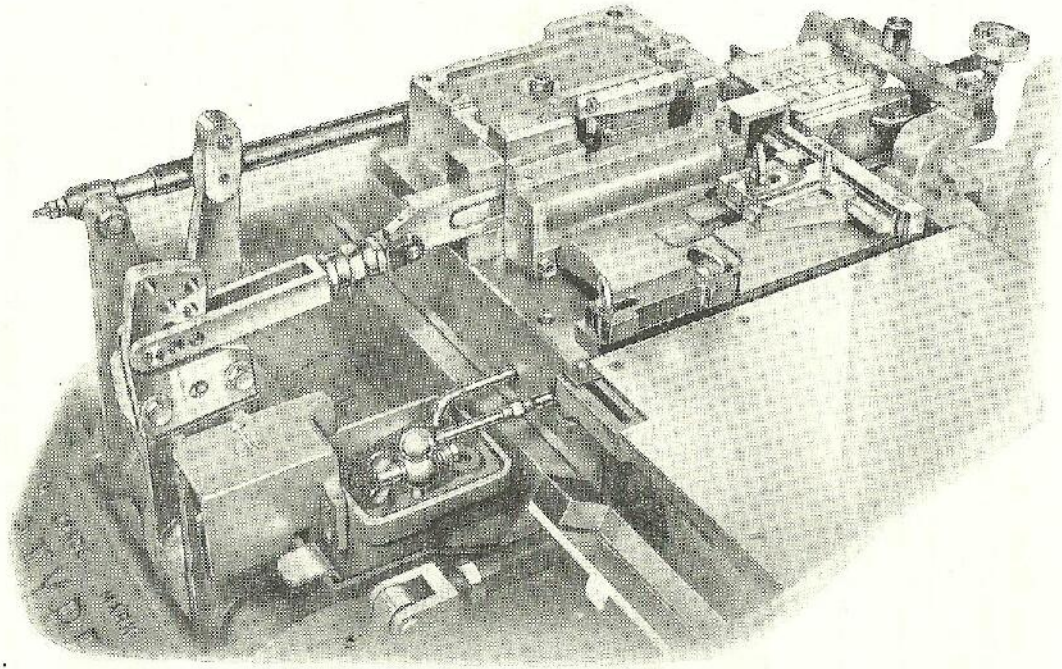
Place the end of lever a5SF1 in a vice with the spring abutment facing upward. Place the spring b5SF11 over the rod a5SF12F and have the plunger spring abutment collar 5SF13 at the end of the spring. See that the eccentric is in the 'small type' position, and then partly insert the plunger lever 5SF16 from underneath with the semi-circular end and recess facing the pin 5SF17. Press against the eye on end of rod a5SF12F, insert the spring guide rod pin 5SF14. Fit the split pin 5SF15 in position and open out. Insert the plunger b5SF4 with groove facing downwards. Replace lock pin a5SF5 and bush complete, and press plunger back so that lock pin engages the hole in the plunger. Place the lever a5SF1 over the boss of lever 5SFF and release the lock pin a5SF5 so that the plunger engages the recess in the plate 5SF2.

PREPARING MOULD BLADE SLIDE DRIVE LEVER FOR CASTING FURNITURE

Make sure that plunger b5SF4 is held back by lock pin a5SF5. Remove mould blade slide drive lever plate 5SF2 and fit the special plate a5SF2 supplied for furniture. Take care that it is assembled with the word 'Furniture' uppermost. This special plate must be used when casting furniture or supporting material, in order to absorb excess movement of intermediate lever when making a fusing cast. For predetermined lengths of furniture, see instructions under SUPER CASTER FURNITURE MOULD, p. 103.

ADJUSTING MOULD BLADE SLIDE DRIVE LEVER CONNECTING TUBE X6SF

With a type mould on machine, turn machine to 150° and adjust the connecting tube so that the plunger b5SF4 has moved $\frac{1}{64}$" away from its normal seating position.



MATRIX HEADS BASE AND TYPE CARRIER

Matrix heads base, type carrier attached to a mould crossblock, and type carrier cover plate. To the latter are attached the type channel blocks, between which the type is pushed after ejection from the type carrier.

MATRIX HEADS BASE

(FOR PLATE SEE P. 16)

THIS IS USED when type is required to be cast, and is secured to main stand by three screws 4SD12. This base carries permanently:

1. TYPE PUSHER. 2. TYPE CARRIER. 3. TYPE CHANNEL BLOCKS. 4. GALLEY LOCATING BLOCK.

It also carries a stop b8SE11 for locating the position of the heads base, according to whether a mould under or above 42 point is in use and either the composition or sorts matrix head.

TYPE PUSHER

This is for pushing the type into the type channel, and functions during the period that the next type is being cast. It is operated by type pusher cams X27SC through the connecting rod 36SE and type pusher lever 35SEE. The latter engages a slot in the type pusher 34SE.

REMOVING TYPE PUSHER

Detach cover 34SE1 by taking out six screws 34SE2 and remove pusher from its slot.

REMOVING TYPE PUSHER LEVER 35SEE

With the matrix heads base removed from the machine, slacken the lock nut 36SE3 and unscrew the connecting rod from the ball socket 36SE1 until the socket can be removed from the lever ball stud 35SE1. Remove the nut 35SE3, knock out the pin 35SE2, and remove the lever from the under side of the matrix heads base.

ADJUSTING TYPE PUSHER

Turn machine to 310°. Release type pusher connecting rod nut 36SE9 and lock nut 36SE10. Adjust type pusher lever connecting rod nut 36SE9 until end of type pusher 34SE stands .010″ in front of fixed type channel block latch 29SE4 and tighten the lock nut 36SE10. Press on end of type pusher to take out play, and turn machine round again to see if the adjustment has been correctly made.

TYPE CARRIER

This slides in the matrix heads base and is driven by the type carrier cams X25SC. The carrier connects to the crossblock of the type moulds. During the casting period of the machine, the carrier is in its left-hand position; in this position the type pusher can pass through carrier for moving the type to the type channel.

After a type has been cast and the matrix has been lifted from the mould, the carrier advances to the right. In doing this, the jet cast on the lower end of the type becomes sheared, and a cam in the mould

base causes the jet to be ejected into the melting pot. The type clamp 32SEE is held back as the mould crossblock advances so that, when the crossblock reaches the end of its movement to the right, the type may be ejected from the mould into the carrier.

The type is prevented from being overthrown, or from falling on its side, by the type support spring 37SE being brought into the path of the type.

Immediately the type has been ejected into the carrier, the carrier proceeds to return, and on its way to its extreme left-hand position, the type is gripped by the type clamp, and the support spring is drawn away from the type, so that when the type carrier is brought to rest, the type pusher may enter and eject the type into the type channel. The mould crossblock is then in position to permit the next type to be cast.

REMOVING TYPE CARRIER

To remove type carrier without taking off mould or matrix head, turn machine to 30°; remove type carrier guard 26SE; take out the two screws 23SE2 and two screws 23SE3 and then remove the type carrier cover a23SEE. Remove type carrier connecting rod yoke pin a24SE7 and mould coupling hook 39SE1.

TYPE CARRIER CAM LEVER PLUNGER

The cam lever is so constructed that, if there is any obstruction in the path of the type carrier when travelling from right to left, a plunger a26SE12 in the upper end of the lever will be depressed and held down by a lock pin b26SC13 so that the type carrier drive and pump mechanism will become disengaged, and the machine will stop.

As an additional safeguard against breakage, the type carrier connecting rod yoke pin a24SE7 is made so that it will shear if any undue obstruction occurs in the path of the type carrier.

After the obstruction to the type carrier has been removed, the locking pin knob must be pulled outward to permit the plunger to re-engage the latch 26SC25. The pin is easily withdrawn at a point just before the plunger reaches the slot in latch. It should not be released whilst the machine is in motion.

ADJUSTING STROKE AND PAUSING POSITIONS OF TYPE CARRIER

Remove the type support spring cam bracket 27SE1. Place the connecting rod yoke pin a24SE7 in the 72-point hole in cam lever extension, loosen the extension bolts and adjust the extension by means of eccentric 26SC11 to give type carrier $2\frac{11}{16}$" travel between the type casting position 220° and the type ejecting position 150°. Tighten extension bolts and check setting.

Move yoke pin a24SE7 to 12-point hole and turn machine to 220°. With 5–13 point channel block (fixed) x29SE in position, loosen connecting rod lock nuts, and adjust the length of connecting rod to bring the inside face of type carrier (against which the type is pressed by the type clamp) level with face of type channel block (fixed). Test after tightening lock nuts. Care should be taken to see that yoke pin a24SE7 is free after tightening nuts.

ADJUSTING MACHINE STOPPING MECHANISM

Turn machine to 355°. Set the trip plate 30SC6 in centre of adjustment slots, and adjust the latch trip adjusting rod 31SC1 until contact of cam face of trip plate is made with the smaller diameter of locking pin knob. Tighten adjusting rod lock nuts.

TYPE SUPPORT SPRING

The type support spring 37SE is operated by a small lever 22SE2 fitted to the type carrier body. This lever is operated by a cam 27SE attached to a bracket 27SE1 on the matrix heads base.

TYPE SUPPORT SPRING CAM

No adjustments are necessary, but care must be taken to ensure that the cam 27SE and packing plate 27SE5 are used as under:

Bracket without packing.—For all type up to 36 point body size and not more than 12 points set size.

Bracket with packing.—For all type over 36 point body size and not more than 12 points set size.

Bracket to be removed.—For all type over 12 points set size.

TYPE CHANNEL BLOCKS (for plate see p. 20)

These blocks support the type and guide it from the type carrier to the galley. One adjustable and three fixed blocks are supplied. The adjustable block x28SE is used when casting all sizes of type, but the fixed blocks are used as follows:

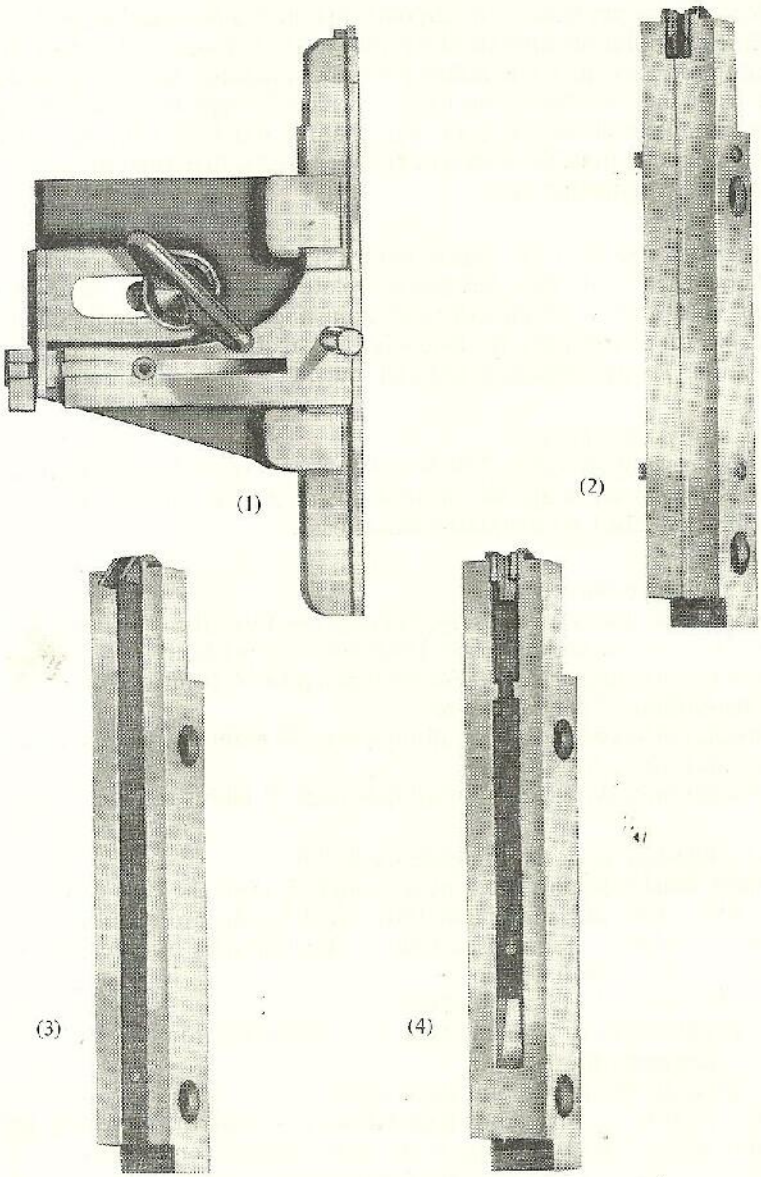
x29SE for 5- to 13-point type.

x30SE for 14- to 72-point type and quotations from 4×2 to 6×6 12-point ems.

x31SE for 40- to 72-point cored type.

The position of the adjustable block is altered by loosening the thumb screw 28SE10, placing in the type channel some types of the point size about to be cast, and pushing the adjustable block against this type, making sure that the channel is parallel before locking it in position with thumb screw 28SE10.

The three fixed type channel blocks are secured to the matrix heads base by the two screws 29SE7.



TYPE CHANNEL BLOCKS

(1) Adjustable channel block for use with all moulds; (2) Fixed channel block for use when casting small type; (3) Fixed channel block for use when casting cored types; (4) Fixed channel block for use when casting quotations and spaces.

When casting thin spaces from the 42- to 72-point type mould, it is advisable to place in front of the spaces in the type channel a quad of the type size that is being cast. This prevents the spaces falling over.

COMPOSITION MATRIX HEAD

(FOR PLATES SEE PP. 22, 24)

THIS HEAD is for lowering and raising the composition matrix holder and the centring pin. The centring pin clamps the matrix to the mould, ensuring a metal-tight fit during casting.

The centring pin is operated by the matrix cams x15SC through the connecting rod b18SEE. The latter operates matrix lifter lever a16SE, one end of which engages with coupling head a2SE6, at top of centring pin a2SE. As the matrix lifter lever is operated, the centring pin moves up and down, carrying with it the matrix lifter c12SE. The centring pin is not pressed down by the matrix lifter lever but by the action of centring pin loading spring 4SE at the upper end of centring pin. As the matrix lifter lever descends, the spring 4SE presses upon the yoke, and beneath this yoke is another spring 2SE2 terminating upon the matrix lifter. The centring pin, the yoke and the matrix lifter all move down as one piece, under the pressure of the upper spring, until the matrix holder guide is stopped by stop collar 12SE8. The matrix holder is depressed in this manner to within .005″ of the mould surface. Although the matrix holder movement is arrested, as explained, the pressure of the spring 4SF causes the centring pin to proceed, and to clamp the matrix firmly upon the mould. After casting has taken place, the matrix lifter lever is returned. In returning, it presses upon the yoke bolted to the centring pin, and overcomes the pressure upon the spring 4SE, thus raising the centring pin until a shoulder on its lower end meets the matrix lifter. This causes the matrix lifter to lift the matrix clear of the type in the mould.

The matrix head is provided with two adjusting micrometer screws 15SE positioned at right angles to each other; these are for adjusting the matrix holder relative to the mould blade opening, so that the matrix may be correctly aligned over the mould before casting.

To remove the matrix lifter guide a12SE1E, a plunger withdrawal sleeve 3SE7 should be attached to the sleeve at side of head to relieve the spring pressure.

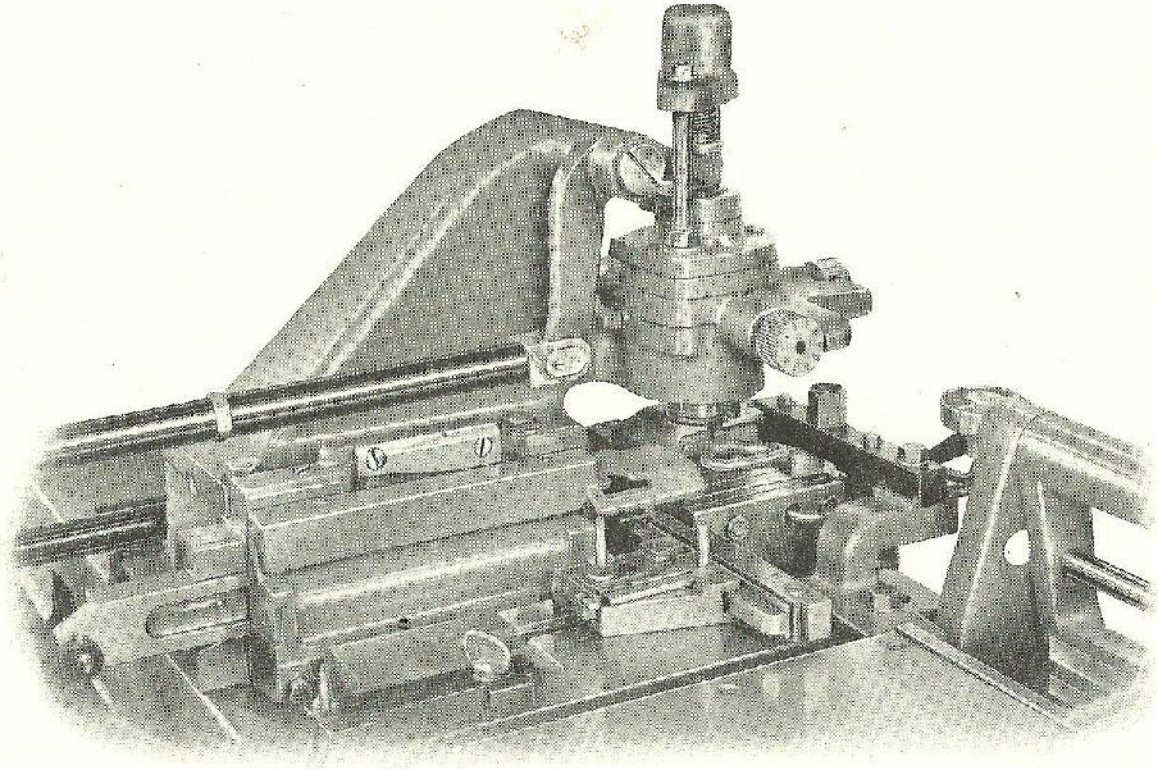
ADJUSTING COMPOSITION MATRIX HEAD

Attach mould to machine.

Place on matrix head and attach connecting rod to matrix cam lever.

Turn machine to 180°.

Place matrix in matrix holder and insert holder in lifter.



HEAD FOR USING SMALL TYPE COMPOSITION MATRICES

Mould must be on machine or matrix holder will be damaged.

Turn machine to 220° taking care that matrix lifter lever a16SE does not foul top of matrix lifter c12SE.

Release the nuts on matrix lifter lever connecting rod and adjust the rod so that matrix lifter lever a16SE raises centring pin yoke $\frac{1}{64}$".

Place two thicknesses of paper (.005") on the mould and turn machine to 214°.

Release matrix lifter stop collar 12SE8 and adjust so that the paper is just free between matrix holder and mould. Lock the stop nut and check setting.

Remove the paper and turn machine to 220°.

Adjust the connecting rod b18SEE until one thickness of paper (.0025") can just pass between top of the matrix lifter lever and centring pin coupling head a2SE6 on both sides. Lock the rod and check setting. This adjustment should be made with upper end of cam lever pressed to right so that the cam lever roller is in contact with cam.

ADDITIONS TO COMPOSITION MATRIX HEAD FOR USING .4" MATRICES

Take off the bridge 4SE1 by removing the nuts 4SE3 and washers 4SE4. Remove the loading spring 4SE. Remove the centring pin coupling head screw a2SE7 and replace by screw b2SE7. Replace the loading spring 4SE.

Assemble the bridge 14SE2 with auxiliary loading spring 14SE1, rod 14SE3, knurled nut 14SE5, and lock nut 14SE4. Attach this bridge complete, in place of the bridge 4SE1, and replace washers 4SE4 and nuts 4SE3.

To bring this auxiliary loading spring into operation, which is necessary when casting 14- to 24-point type, the knurled nut 14SE5 must be locked at top of cut-out rod 14SE3. Check to see that, when the centring pin is seated in matrix on mould, there is a clearance between under side of nut 14SE5 and top of bridge 14SE2.

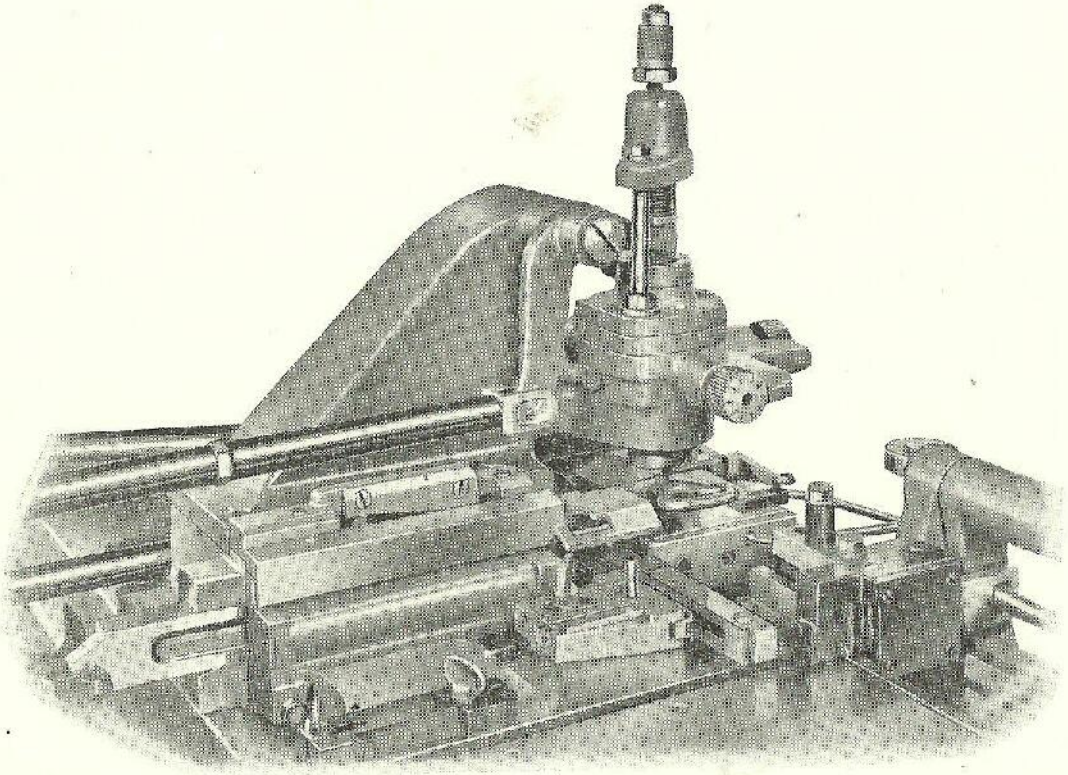
It is important to lock this auxiliary loading spring out of action when using .2" matrices, otherwise the extra pressure will cause excessive wear on matrices and moulds. To do this, screw down the knurled nut 14SE5 until the spring 14SE1 is solid. Lock with nut 14SE4.

DISPLAY MATRIX HEAD

(FOR PLATES SEE PP. 26, 28)

FOR RAISING and lowering the matrix, and for clamping the matrix on the mould while the cast is taking place; also for raising, lowering and clamping the core when casting quotations.

This head is operated by the matrix cams x15SC through matrix cam lever 16SC and locking wedge spring box x21SE. This spring box is



HEAD ADAPTED FOR USING LARGE TYPE COMPOSITION MATRICES

attached to lock wedge 20SE which in the forward stroke operates the display matrix lifter lever 17SE and compresses spring 13SE4. On the return stroke, the pressure on the lever is released; this allows the spring to come into operation to take the matrix down to the mould, where it is finally clamped by the lock wedge 20SE sliding over a projection on matrix lifter a13SEE.

When casting quotations, the matrix lifter must be given an increased movement. This is obtained by lifting the knob 19SE1 and turning shaft lever handle 17SE3 to the left, where it is locked by releasing the knob; this causes the matrix lifter lever to be brought into operation earlier and imparts an increased motion to the matrix lifter.

ADJUSTING DISPLAY MATRIX HEAD

With display matrix head fixed to machine, mould in position, and display matrix bridge a1SE fitted, turn machine to 10°.

Turn lever shaft lever handle 17SE3 to right; *i.e.*, the position it occupies when casting type.

Insert matrix holder, with a matrix in position.

Turn machine to 240°.

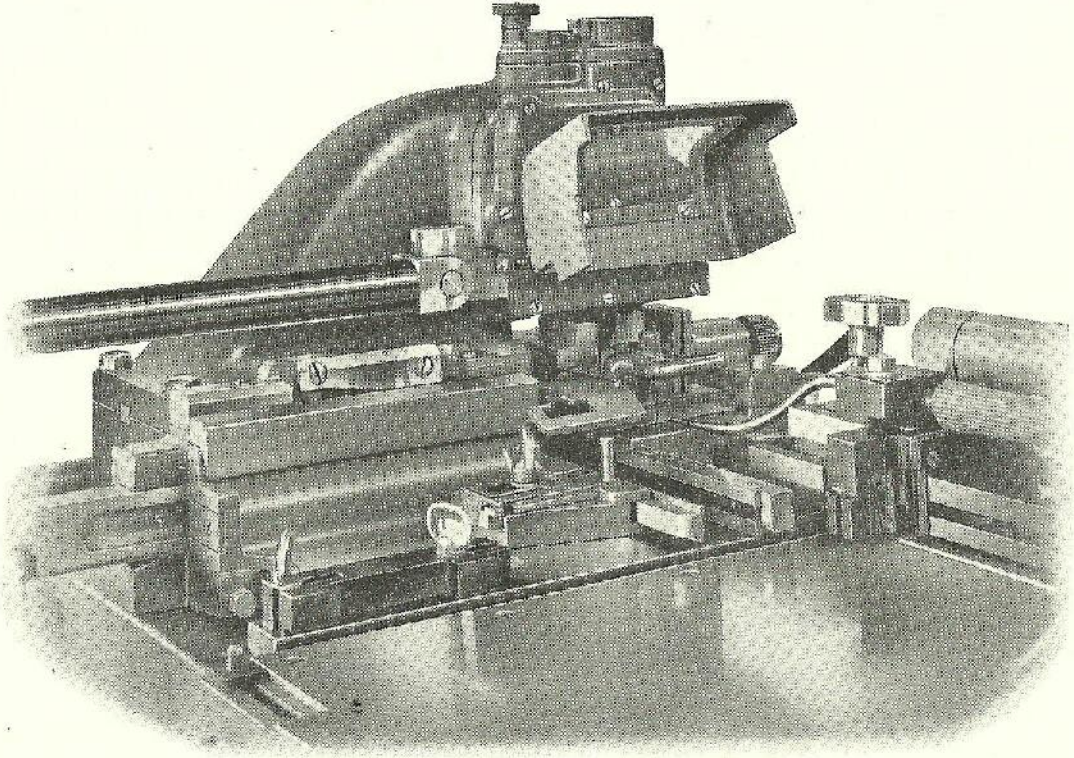
Slacken spring box rod yoke lock nut 21SE5 and then adjust the spring box rod to give $\frac{1}{8}$" to $\frac{3}{16}$" compression on spring, which can be measured by noting the distance between the lock nut 21SE5 and spring box cap 21SE1.

Turn machine to 10°.

With matrix lifter lever shaft lever handle 17SE3 positioned to the right, the distance between the lower end of matrix lifter a13SEE and top of mould should be $1\frac{1}{16}$". To obtain this dimension (if found to be incorrect), remove matrix head side cover a7SE1, spring box yoke pin 20SD, matrix lifter lever 17SE, lock wedge 20SE, matrix lifter a13SEE and spring 13SE4; then adjust matrix lifter stud nuts 13SE7 and 13SE9 to give required dimension. Replace parts and see that all screws and nuts are tight.

DISPLAY MATRIX BRIDGE a1SE (for plate see p. 30)

This bridge is secured to the mould (or adaptor base) and located in correct position by means of locating strip 1SE1. When attaching this bridge to Super Caster display type moulds 14 to 36 point and 42 to 72 point, use three screws 1SE3; when securing to the adaptor base, use two screws 1SE3 and one screw 23SL10. The object of the bridge is to position the matrix correctly over the mould; this is done by pushing the matrix holder against the pad a10SE by means of the locating key 11SEE. The position of this pad can be finely adjusted by turning the adjusting screw a10SE1. The matrix holder is inserted in the bridge by pulling back the lever 11SE1 which withdraws the locating key and allows the holder to be placed in position. When the lever is released,



HEAD FOR USING DISPLAY MATRICES AND QUOTATION CORES

Shows matrix bridge fixed on mould.

the locating key engages the slot in the holder and locates it in the correct position.

DISMANTLING DISPLAY MATRIX BRIDGE

Remove the adjusting screw a10SE1 and adjusting pad a10SE, taking care that plunger 10SE2 and spring 10SE3 do not fly out. Knock out the pin 11SE2 from under side of bridge, and remove lever 11SE1, spring 11SE3 and locating key 11SEE.

ASSEMBLING DISPLAY MATRIX BRIDGE

Place locating key and spring in position, insert the lever under the pin 11SE4 through the locating key, taking care to locate the lever correctly before driving in the pin 11SE2. Replace the adjusting pad, keeping the relieved side to the rear; but before replacing the adjusting screw place a piece of 3-point lead between the head of adjusting pad and the face of the bridge. Firmly pushing the head of pad against the 3-point lead, replace plunger 10SE2 and spring 10SE3; then screw the adjusting screw into position.

COUNTER MECHANISM

(FOR PLATES SEE PP. 32, 34; FOR TABLES SEE PP. 152–155)

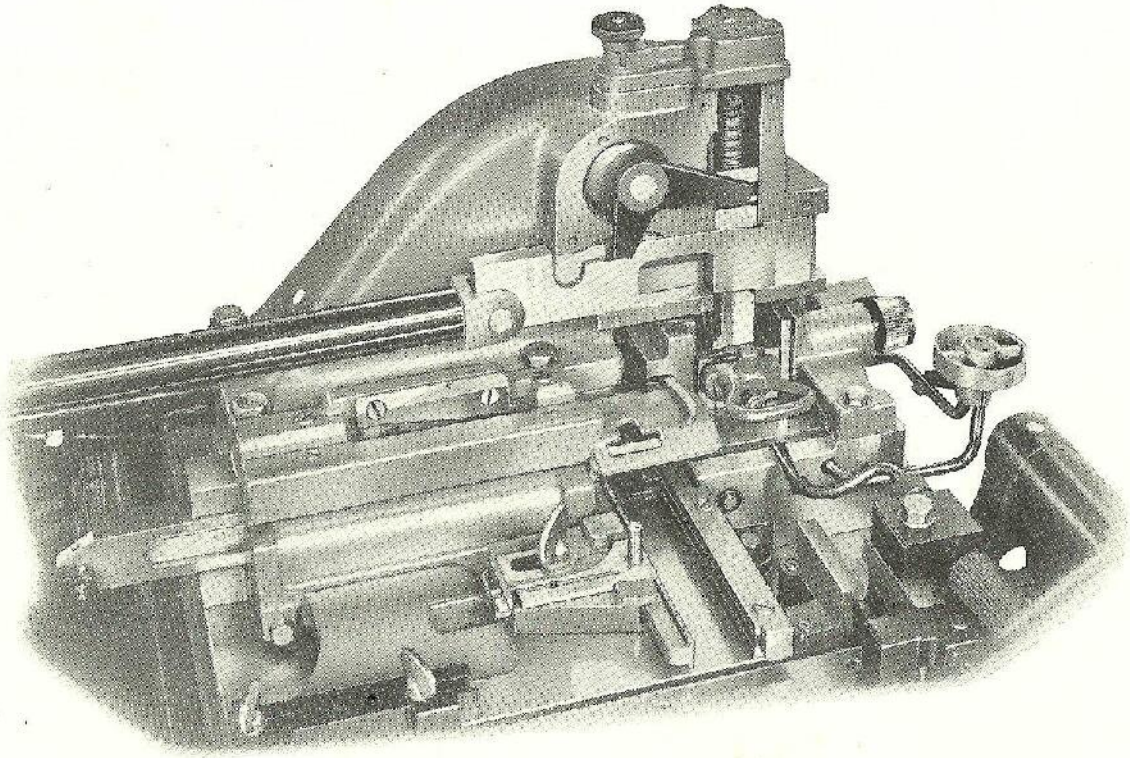
THE COUNTER MECHANISM is only for strip material and the head carries:

1. Two projections against which strip moulds are positioned.
2. A slide for operating the strip mould jet block.
3. A lever for clamping the cast strip in the mould whilst the next cast is taking place.
4. An attachment for raising and lowering strip border and dash matrices.
5. A counter mechanism for deciding length of strips.

HOW COUNTER MECHANISM FUNCTIONS FOR LEADS, RULES AND CONTINUOUS STRIP BORDERS

Fitted in the counter bracket b4SDD is a drum a5SDD containing on its circumference 25 rows of figures running in fractions and whole numbers from $\frac{1}{4}$ to 25. This drum may be locked in any position to present any row of figures to the operative.

Upon the end of the drum spindle is a disc to which is attached a ratchet wheel. The object of this ratchet wheel is to control the number of casts made before a trip mechanism is brought into action to operate the strip shear blade. On the end of the drum is a stop against which a projection on the ratchet stop disc is returned by the action of a



HEAD FOR USING DISPLAY MATRICES AND QUOTATION CORES

In this illustration a cover plate has been removed to show how the matrix during casting operation is locked upon the mould by the action of a wedge. This prevents the pressure of the molten metal lifting the matrix during casting.

weight each time a shear is made. Tooth by tooth the ratchet pawl winds the ratchet away from this stop until it is released. It will therefore be understood that the farther the drum stop is positioned from the ratchet release, the greater will be the number of casts made before the ratchet wheel is returned to its starting position and the next shear is made.

The ratchet feed pawl is operated by an actuating lever a1SD connected to the pump connecting rod, so that as each cast is made the ratchet wheel is advanced one tooth, and in doing this it winds up a weight. This weight is released when casts have been made equivalent to the number shown on the drum above 'A' on the remainder scale a5SD1. This action is repeated after each shearing of the strip. A stop lever a22SDD limits the movement of the actuating lever a1SD. The projection on the ratchet stop disc a16SD is also used for moving the stop lever a22SDD out of the path of the actuating lever a1SD, so that a longer stroke may be given to the latter. When this lengthened stroke takes place, the actuating lever a1SD strikes against the lever 8SG8 which pulls the cutter setting block a7SG into the path of the cutter actuating plunger a4SG, so that the cutter cams x11SC cause the strip to be sheared.

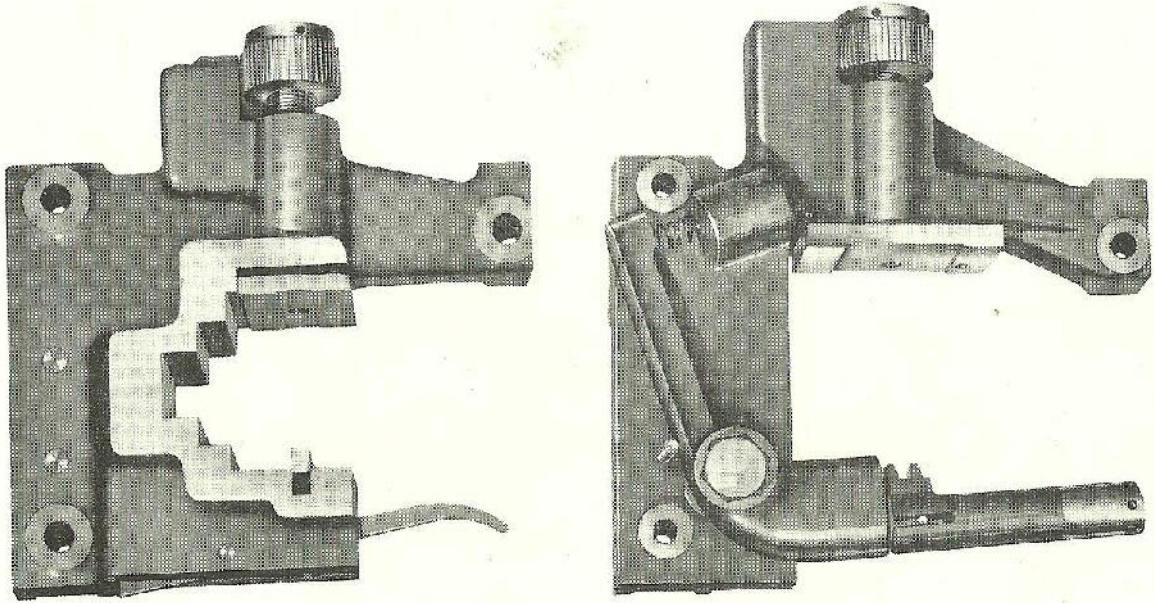
The extra motion given to the actuating lever, through stop lever a22SDD being taken out of its path, causes the actuating pawl trip pin 2SD3 to disengage the pawl 2SD from the ratchet, and allows the driving end of the pawl to release the ratchet detent 15SD1 and thus permits the weight to return the disc, and with it the ratchet wheel, to the position at which it had been set. The shear blade is thus caused to act at the end of a given number of casts decided by the setting of the drum. As the ratchet is returned by the weight to its original position, the stop lever a22SDD also returns to its operative position and limits the stroke of the actuating lever until the requisite number of casts has again been made.

An extension of the stop lever enables the operative to start the shearing mechanism by hand.

HOW COUNTER MECHANISM FUNCTIONS WHEN CASTING FURNITURE

When casting furniture, the action is the same as for leads and rules with the exception that, instead of the strip being sheared in lengths, it is pushed forward an additional 5 12-point ems to give a non-fusing cast. This action is obtained by connecting the actuating lever a1SD to the blade stop at rear of furniture mould, so that the stop can be automatically withdrawn each time the actuating lever is required to make a longer stroke.

The lead stacker a16SG must be placed out of action when casting this furniture.



DISPLAY MATRIX BRIDGES

Left, English matrix holder bridge; right, American display or electro matrix holder bridge. These bridges are located on top of mould by means of a key.

ACTION AND POSITIONING OF COUNTER DRUM

When casting plain Rules or Leads.

Attached to the counter head is a 'remainder' scale a5SD1; this is marked 'A' on the right and '5½' on the left. Above this remainder scale, any horizontal row of figures on the drum may be ranged.

The operative knows the length to which his strip material has to be cut; this we will assume to be 71 12-point ems. If we divide 71 by 6 *there will be a remainder;* we must therefore divide by 5. The reason for first dividing by 6 is because the average length of each cast should be approximately 6 12-point ems. Too great an addition to this length of 6 12-point ems would make the length of the cast excessive (the maximum length allowable being 6 12-point ems plus .015″), and a splash would occur when casting.

Dividing 71 by 6 gives 11 with a remainder of 5; this means that each of the 11 casts would have to be increased by $\frac{5}{11}$ of a 12-point em (that is, each of the casts would have a length of $6\frac{5}{11}$ 12-point ems); this length of cast would be excessive, and we must therefore divide by 5.

Dividing 71 by 5 gives an answer of 14, with a remainder of 1; this means that each of the 14 casts must be increased by $\frac{1}{14}$ of a 12-point em, or .0118″ (that is, each of the casts must have a length of $5\frac{1}{14}$ 12-point ems).

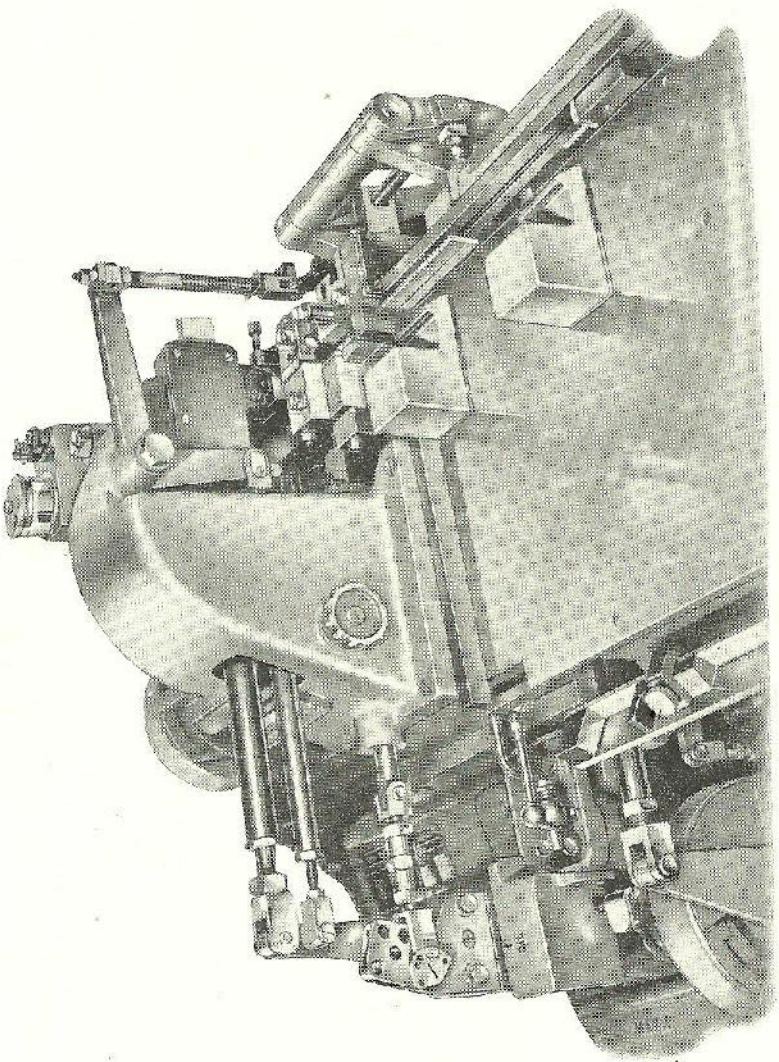
Turn the drum until the number of casts (in our example 14) comes immediately above 'A' on the remainder scale a5SD1, and lock it in this position by the latch 5SD4. As we have divided by 5, set the wedge indicator pin 9SF1, to 5 on the scale 9SF5. Then from the remainder scale a5SD1, refer to the figure on the drum a5SDD indicated by the remainder (which in our example is 1). On the drum scale 5SD6, above '1' on the remainder scale, will be seen $\frac{7}{8}$. Rotate the wedge screw handwheel until the lower scale 10SF4 has registered $\frac{7}{8}$ of 1 point (that is, 14 graduations of $\frac{1}{16}$ of a point).

The remainder scale figures are only used in the case of leads and plain rule strips.

When casting continuous borders and furniture, the number of casts for each strip is decided by positioning the drum so that the required number of casts is indicated above the letter 'A' on the remainder scale. *Any required alteration to the length of casting of strip border, governed by the design of the border, is indicated on the matrix.* (For further instructions, see: MICROMETER ADJUSTMENT HEAD—ADJUSTMENTS FOR CASTING STRIP BORDERS, P. 12.)

COUNTER DRUM SCALE AND REMAINDER SCALE, FOR USE IN CUTTING STRIP MATERIAL TO 12-POINT EMS AND HALF EMS

The bold figures of the right-hand column indicate the casts that will be made before the shearing mechanism is tripped into action. The



COUNTER MECHANISM HEAD

figures in the main section of the scale indicate the 'points' and fractions of a point that must be added to each cast in order to obtain the total correct length of strip. In no case should a length of 6 12-point ems be exceeded when casting strip material of under 6-point body.

Points to be added to each Cast — Casts

2 5/16	2 13/32	2 7/32	1 29/32	1 11/16	1 7/16	1 3/16	31/32	25/32	15/32	1/4	25
2 3/8	2 1/2	2 1/4	2	1 5/8	1 1/2	1 1/4	1	3/4	1/2	1/4	24
2 7/16	2 19/32	2 11/32	2 3/32	1 13/16	1 9/16	1 5/16	1 1/32	25/32	17/32	1/4	23
3	2 23/32	2 15/32	2 5/32	1 29/32	1 5/8	1 3/8	1 3/32	13/16	9/16	9/32	22
3 1/8	2 7/8	2 9/16	2 9/32	2	1 23/32	1 7/16	1 1/8	7/8	9/16	9/32	21
3 3/16	3	2 11/16	2 13/32	2 3/32	1 25/32	1 1/2	1 5/32	29/32	19/32	9/32	20
3 15/32	3 5/32	2 27/32	2 17/32	2 7/32	1 29/32	1 9/16	1 1/4	15/16	5/8	5/16	19
3 7/16	3 11/32	3	2 21/32	2 11/32	2	1 21/32	1 11/32	1	21/32	1/4	18
3 1/2	3 17/32	3 3/16	2 25/32	2 15/32	2 1/8	1 3/4	1 13/32	1 1/16	11/16	1/32	17
4 1/8	3 1/4	3 5/8	3	2 5/8	2 1/4	1 7/8	1 1/2	1 1/8	3/4	1/32	16
4 13/32	4	3 19/32	3 3/16	2 13/16	2 13/32	2	1 19/32	1 3/16	13/16	1/32	15
4 23/32	4 9/32	3 7/8	3 7/16	3	2 9/16	2 5/32	1 23/32	1 5/32	7/8	1/32	14
5 1/16	4 5/8	4 5/32	3 11/16	3 1/4	2 25/32	2 5/16	1 25/32	1 5/8	15/16	1/32	13
5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/32	12
6	5 7/16	4 29/32	4 3/8	3 13/16	3 9/32	2 23/32	2 3/16	1 21/32	1 3/32	1/32	11
6 19/32	6	5 13/32	4 11/16	4 1/16	3 19/32	3	2 13/32	1 13/16	1 1/16	1/32	10
7 1/32	6 21/32	6	5 11/32	4 21/32	4	3 11/32	2 27/32	2	1 11/32	1/32	9
8 1/4	7 1/2	6 3/4	6	5 1/4	4 1/2	3 3/8	3	2 1/4	1 1/2	3/4	8
9 7/16	8 9/16	7 23/32	6	6	5 1/8	4 9/32	3 7/16	2 9/16	1 23/32	7/8	7
11	10	9	8	7	6	5	4	3	2	1	6
	12	10 13/16	9 19/32	8 13/32	7 3/32	6	4 13/16	3 19/32	2 13/32	1 3/16	5
		12	10 1/2	9	7 1/2	6	4 1/2	3	2	1 1/2	4
				12	10	8	6	4	3	2	3
						12	9	6	4	3	2
											1
5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	A

REMAINDER SCALE

REMOVING COUNTER MECHANISM

Remove the counter bracket cover 4SD3, taking care that the drum latch spring 5SD5 is not lost.

Remove actuating lever a1SD by first removing the screw 5SD10 and plate 5SD9.

Disconnect from upper post the springs attached to ratchet detent 15SD1 and stop lever a22SDD; withdraw ratchet stop disc a16SD with weight and chain; remove stop lever a22SDD and drum latch 5SD4.

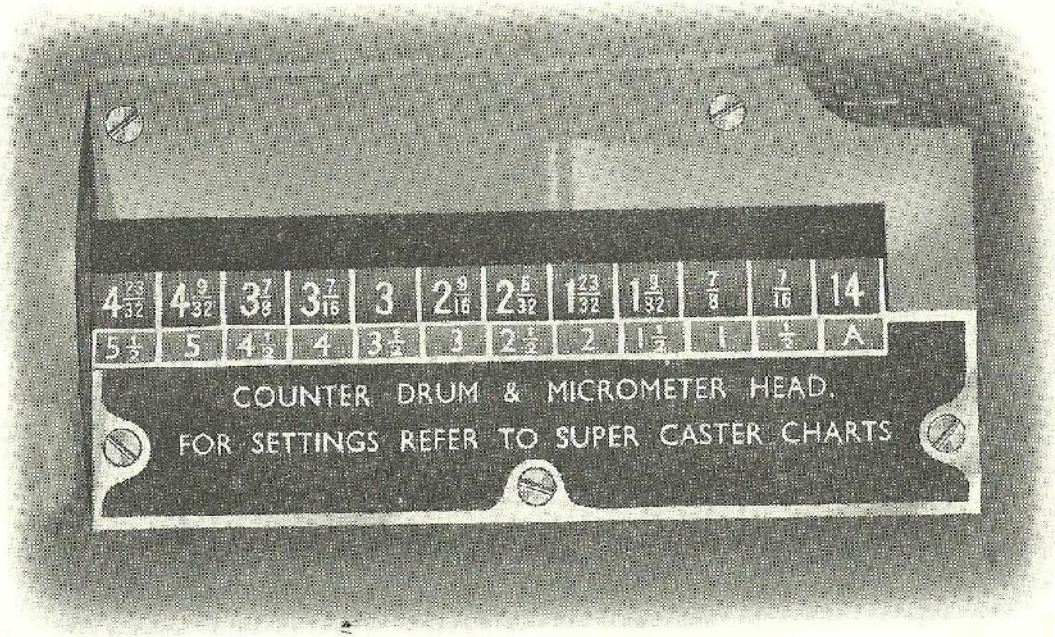
REPLACING COUNTER MECHANISM

Assemble stop lever a22SDD, drum latch 5SD4 and screw.

Turn drum to position 25 above 'A' on the remainder scale and lock.

Assemble the ratchet stop disc with chain and weight, *making certain that the stop on the ratchet stop disc is on top of the stop at the end of the drum. This is important.*

Connect ratchet detent and stop lever springs.



COUNTER BRACKET

The length to which strip material is sheared is decided by the drum figures, one row of which is seen in the upper row of figures in the illustration. Assume 71-em leads are required. Dividing 71 by 5 gives 14 with a remainder of 1. Turn drum until whole number 14 (in extreme right-hand column) comes above 'A' on remainder scale, and lock drum in position. As the divisor was 5, set the wedge indicator pin 9SF1 at 5 on 'leads' indicator scale 9SF5, and place micrometer scale wheel at zero. Then refer to remainder scale (1); above it will be seen $\frac{7}{8}$. Advance the micrometer scale wheel to $\frac{7}{8}$ (which is the same as 14/16ths), and adjustment will be complete.

Replace actuating lever a1SD and secure by plate 5SD9 and screw 5SD10.

Replace cover 4SD3 and drum latch spring 5SD5.

ADJUSTING THE COUNTER MECHANISM

When adjusting this part, the machine has to be turned with the pump handle engaged; it is therefore advisable to see that the metal pot is swung back so that there is no movement of the pump piston.

See that the pump driving rod 29SH is correctly adjusted. Refer to instructions under PUMP MECHANISM, p. 39.

Engage the drum latch 5SD4 with one of the higher numbers on drum.

Engage the pump handle; turn machine one complete revolution, and then advance it to 110°.

Slacken off the actuating rod eye lock nut a3SD9 and adjust the actuating rod 3SDD to give actuating pawl 2SD approximately .010" clearance of tooth of ratchet 15SDD, setting to the fourth tooth up from ratchet detent 15SD1. Lock the nut a3SD9 and turn machine to see that adjustment holds good.

Turn machine to 260°, slacken off actuating pawl trip pin lock nut 2SD4. Rotate the actuating pawl trip pin 2SD3 to give approximately .005" clearance between actuating pawl 2SD and actuating pawl trip pin 2SD3.

CONTINUOUS BORDER MATRIX LIFTER

The border matrix lifter 11SD consists of a slide having an inclined bearing, acting as a wedge. When moved in one direction, this raises the border matrix; when moved in the other direction, it clamps the matrix to the mould. When the matrix is clamped to the mould surface, any overthrow motion from the driving cam is absorbed by a spring box 14SD.

ADJUSTING STRIP MOULD JET BLOCK DRIVING ROD

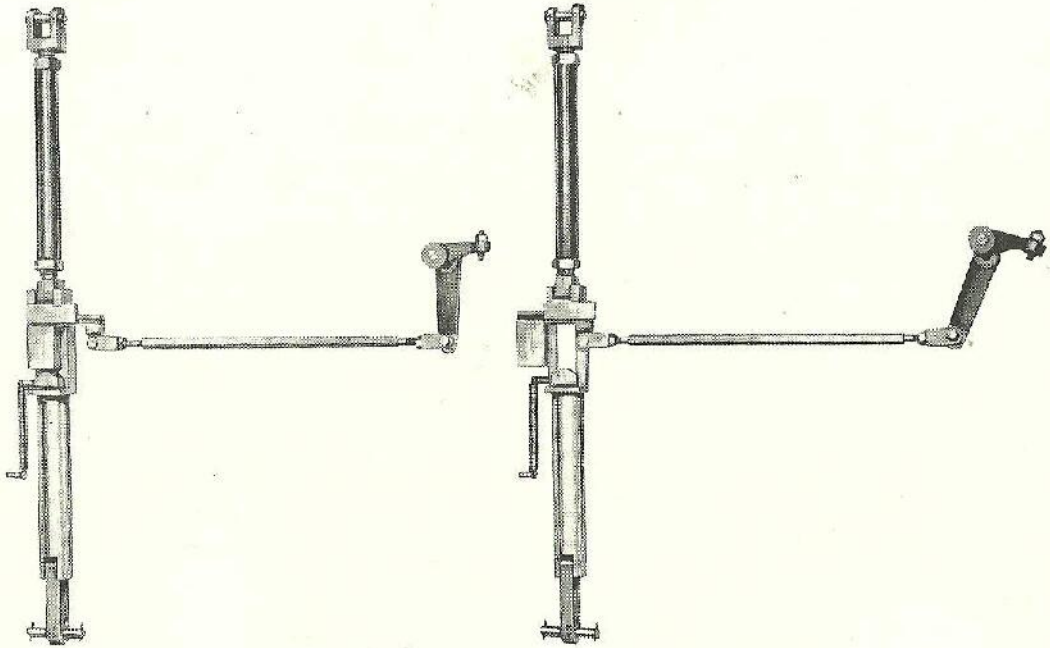
The position of the jet opening is very important when casting the smaller sizes of strip material.

For further information see: ADJUSTING THE JET POSITION, under SUPER CASTER LEAD AND RULE MOULDS, 1 to 3 POINT, p. 87, or under SUPER CASTER LEAD AND RULE MOULDS, 4 TO 18 POINT, p. 99.

Gauges for checking the jet position will be found in all lead and rule mould boxes.

ADJUSTING STRIP CLAMPING LEVER AND SPRING BOX

Information regarding the adjustments of these parts will be found in the instructions for strip moulds, see pp. 87, 99, 107. When adjusted



STRIP SHEARING MECHANISM

This is brought into action by the counter mechanism. When shearing is not required, the cutter cams reciprocate the actuating block link 1sG1, and the end of this moves without obstruction in a slot at end of cutter actuating plunger a4sG. When shearing is required, the counter lever a1sD makes a longer stroke, and presses against the cutter setting lever 8sG8, causing the rod a8sG5 to pull the cutter setting block a7sG in the path of the actuating block link 1sG1, so that as the latter advances it pushes the cutter actuating plunger a4sG, causing the cutter blade to move forward and make a shear. In the illustration the right-hand section shows cutter actuating plunger a4sG out of action, and the left-hand section shows plunger in action.

for 1 to 3 point, they will also be correct for 4 to 18 point, and for furniture casting.

STRIP CUTTING AND STACKING MECHANISM

(FOR PLATE SEE P. 36)

THIS MECHANISM is for shearing strip material to required lengths and stacking it on the galley.

It is operated by the cutter cams x11SC through cutter cam lever 12SC and cutter actuating block link 1SG1, and is controlled by the counter mechanism.

The cutter actuating block 1SG moves in the slot in cutter actuating plunger a4SG until the cutter setting block a7SG is brought between cutter actuating plunger abutment a4SG1 on cutter actuating plunger and the projection on cutter actuating block. This cutter setting block is brought into engagement by actuating lever a1SD which, when the required number of casts has been made, makes a longer stroke and operates the upper end of cutter setting lever 8SG8. The lower end of this lever 8SG is connected through cutter setting lever rod yoke 8SG2 and cutter setting lever rod a8SG5 to cutter setting block.

It will thus be understood that the lengthened stroke of the actuating lever a1SD moves cutter setting block a7SG into an operative position.

When the cutter setting block a7SG is in engagement, the cutter actuating block 1SG and cutter actuating plunger a4SG move as one piece, and being connected by the cutter actuating plunger link a4SG3 to the cutter actuating lever a2SG, they move the cutter blade forward and shear the strip against the shear blade 24SG.

THE LEAD STACKER LEVER

The lead stacker lever a19SG is fixed to the same shaft as the cutter actuating lever, therefore when a shear takes place the lead stacker a16SG is carried forward and pushes the product against the stacker support blocks x20SG clear of the next strip.

After a shear has been made, the pressure is released from the cutter setting block causing it to be pulled out of engagement by the spring 8SG13. The cutter actuating plunger a4SG is returned to its original position by the spring 4SG5.

When casting dashes, the front of shear blade 24SG is set to the mark on the galley plate a11SG, corresponding to the length in 12-point ems of dash being cast and the cutter blade 5SG must be taken out and reversed.

When casting furniture, the following parts of the galley mechanism must be removed: cutter actuating lever pin 2SG4, lead guide bracket b15SG, cutter blade bracket b6SG and lead stacker bar 16SG7.

DISMANTLING THE STRIP CUTTING AND STACKING MECHANISM

To remove cutter blade bracket b6SG, turn machine to 360° and loosen lock screw a2SG3. Then push in cutter actuating lever until the actuating lever pin b2SG2 can be taken out through hole in bracket a3SG. Withdraw the cutter blade. Take out two screws 15SG1 from lead guide bracket b15SG and screw a6SG3 from the cutter blade bracket b6SG. The cutter blade bracket and lead guide bracket can then be taken off together.

REMOVING THE CUTTER SETTING LEVER AND STOP

Disconnect spring 8SG13 from spring post 8SG14.

Remove split pin 8SG4 and yoke pin 8SG3.

The cutter setting block a7SG complete with rod a8SG5 and yoke 8SG2 can now be removed.

Knock out pin 8SG11 from the cutter setting lever 8SG8.

The cutter setting lever group can now be removed.

REMOVING CUTTER ACTUATING BLOCK

Turn machine to 350°.

To remove cutter actuating block 1SG and plunger a4SG, complete with cutter actuating block link 1SG1 and link yoke 1SG2, remove split pin 1SG4 and take out the link yoke pin 1SG3. Remove split pin 2SG5 and take out the cutter actuating lever pin 2SG4.

Disconnect the spring 4SG5 from the spring post 4SG6. This unit complete may then be taken out through the hole in main stand.

REMOVING CUTTER ACTUATING LEVER

To remove cutter actuating lever a2SG and lead stacker lever a19SG, slacken the lock nut 17SG5 and disconnect the lead stacker connecting rod a17SG; knock out the two pins 2SG6 and 19SG5 and drive out the actuating lever fulcrum pin a2SG1.

REMOVING LEAD STACKER

To remove the lead stacker a16SG, loosen lock screw a18SG2 and pull lead stacker towards front of machine; this will carry with it the lead stacker fulcrum pin 18SG and enable the lead stacker to be withdrawn.

ASSEMBLING THE STRIP CUTTING AND STACKING MECHANISM

Replace lead stacker a16SG, push in lead stacker fulcrum pin 18SG and lock in position with screw a18SG2.

Assemble the cutter actuating lever a2SG and lead stacker lever a19SG; drive in the actuating lever fulcrum pin a2SG1 and secure with the two pins 2SG6 and 19SG5. *As the fulcrum is a tight fit, care should*

be taken to see that the pin holes are in correct alignment before driving the fulcrum in position.

Connect up lead stacker connecting rod a17SG.

Insert cutter actuating block and cutter actuating plunger (complete with link 1SG1 and link yoke 1SG2) through hole in main stand; connect to cam lever with pin 1SG3, and to cutter actuating lever a2SG with pin 2SG4. Connect spring 4SG5 to spring post 4SG6.

Place in position the cutter setting lever 8SG complete with rod yoke 8SG2, rod a8SG5 and cutter setting block a7SG.

Push cutter setting lever fulcrum pin 8SG12 up through its hole in the main stand; assemble the cutter setting lever 8SG8 and secure with pin 8SG11.

Connect the cutter setting lever spring 8SG13.

Replace the cutter blade bracket b6SG and the lead guide bracket on main stand; secure with screw a6SG3 and two screws 15SG1.

Assemble cutter blade 5SG in bracket.

Push in the actuating lever a2SG until the actuating lever pin b2SG2 can be passed through the hole in bracket a3SG; connect with blade 5SG. Lock the pin in position with screw a2SG3.

ADJUSTING POSITION OF CUTTER SETTING BLOCK a7SG AND CUTTER ACTUATING BLOCK LINK 1SG1

Engage pump handle and depress the extension of the stop lever a22SDD so that the actuating lever can make a longer movement. Turn machine to 270° (in this position the actuating rod yoke is in contact with main stand casting). Adjust the screw 8SG9 in cutter setting lever 8SG8 so that lever has $\frac{1}{16}$" of free movement before reaching its stop plate 8SG17.

With pump handle still engaged, depress the extension of the stop lever a22SDD so that actuating lever can make a larger movement. Then turn handwheel to 220°. Slacken nuts 1SG5 and 1SG6 and adjust cutter actuating block link 1SG1 to give $\frac{1}{32}$" clearance between end of cutter actuating block 1SG and the cutter setting block a7SG.

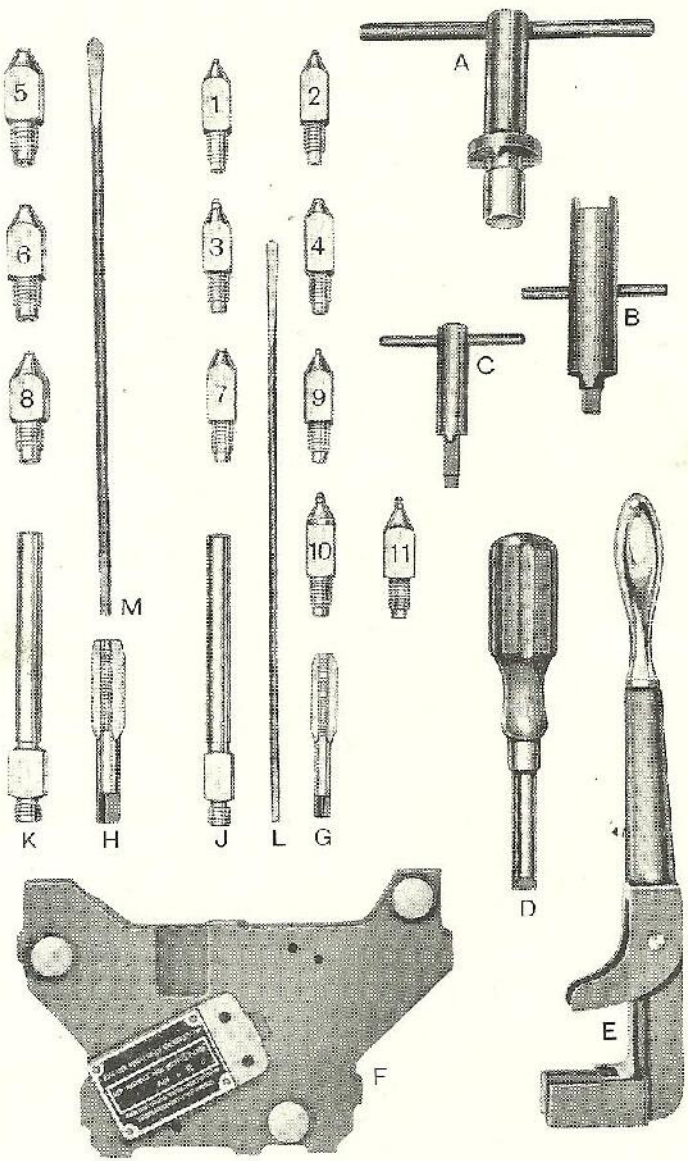
With pump handle released, return machine to 270° and adjust the rod a8SG5 until the cutter setting block a7SG can be moved $\frac{1}{32}$" toward rear of machine before contacting the side of cutter actuating block 1SG.

ADJUSTING LEAD STACKER a16SG

The connecting rod a17SG must be so adjusted that when the cutter blade 5SG is drawn into contact with lead or rule for shearing, there is a clearance of $\frac{1}{64}$" between product and face of lead stacker bar 16SG7.

PUMP MECHANISM

THE ACTION of the pump mechanism is as follows: as the pump bell crank 18SH rises, taking with it the piston operating rod 16SH, the



NOZZLES AND TOOLS

1 to 11 Nozzles; A, B, C, D Cleaning Tools; E—Pump Piston Extractor; F—Nozzle Seating Plate; G, H—Nozzle Taps; J, K—Nozzle Squaring Posts; L, M—Well Arm Drills.

lower crosshead 16SH1 compresses a spring encircling the pump body spring rod 27SH1, causing the latter to rise by the spring acting against a shoulder at the upper end of the rod. Crossheads 16SH3 and 27SH2 are attached to the upper ends of these two rods 16SH and 27SH1. Two levers xa15SH and xa21SH are connected to these crossheads, the lower lever terminating in the pump body and the upper lever operating the piston. At a given distance in the rise of the rods 16SH and 27SH1, the latter is checked in its upward motion by the nuts 27SH12 and 27SH13 coming in contact with the swing frame post b33SH, or with one or more leaves 28SH attached to the swing frame post b33SH which may be brought into use, according to the product being cast.

Although the progress of the pump body spring rod 27SH1 becomes arrested, the piston operating rod 16SH continues its upward motion, with the result that the piston lever xa15SH is rocked by the piston springs causing the piston to descend. As the piston lever is connected by a link a30SH to the pump body lever, the upward motion of the piston spring rod a17SH1 in lifting the end of the piston lever has also a tendency to lift the pump body lever. At the other end of these levers, the piston, in descending, is opposed by the pump body trying to rise; in short, the pump body and piston are working against each other. Were it not for this action, the nozzle would be forced away from the mould, because the pump body lifting spring 24SH would not be strong enough to withstand the pressure exerted by the piston. When the mould has received the full quantity of metal required to form the body of the product, the piston operating rod 16SH will not have completed its stroke; its surplus motion will be absorbed by the piston springs.

The pump body rises in a perfectly vertical direction through being supported at each end upon separate levers a23SHH and 22SHH; these levers are operated by a spring 24SH, which in turn is operated by the pump body operating rod lever 26SH terminating under the piston lever xa15SH. As the latter rises, the lever 26SH is released, and the spring 24SH elevates the pump body till the nozzle becomes seated in the mould base. As the piston lever xa15SH descends, it depresses the pump body operating rod lever 26SH, causing the pump body to recede from the mould.

All pump connections should be free and kept well oiled. The piston must slide freely in pump body, but should never be filed or cleaned with an abrasive. Before replacing piston, warm it, and see that it is clean. Use correct pump body (i.e. $\frac{7}{8}$" or $1\frac{1}{4}$") for product being cast in accordance with that shown on PRODUCT INFORMATION TABLES, pp. 156, 157.

ADJUSTING PUMP DRIVING ROD 29SH

With the piston operating rod crosshead 16SH3 resting on the stop collar a31SH, and the machine turned to 120°, adjust the pump driving rod (this has a right- and left-hand thread at the ends), so that there

is $\frac{1}{64}$" clearance between the end of slot in pump driving rod link a29SH1 and pin a24SC3. An actuating rod 3SID attached to the pump driving rod 29SII is also connected to the counter actuating lever when casting strip material. When counter head is not in use, the rod should be placed out of action by connecting the eye a3SD8 to housing 3SD3.

PUMP RELEASE

Turn machine to 120° and adjust length of release by means of the adjusting screw 29SH18 so that there is approximately $\frac{1}{64}$" clearance between the abutment faces of release and cam lever.

The screw holding the two parts together must be well slackened off to allow adjusting screw to be rotated.

When locking the parts together, see that the adjusting screw head, and one face of hexagon, are correctly positioned on lower half of release.

NOZZLE POSITION

When checking this adjustment, use nozzle 12SH3 in $1\frac{1}{4}$" pump, or nozzle 12SH2 in $\frac{7}{8}$" pump.

The metal pot must be positioned so that the nozzle is quite free to seat in mould. To test, remove piston and pump links, attach nozzle setting gauge 10ST and place machine and metal pot in casting position. Depress operating rod lever 26SH, and see that nozzle seats quite freely in the setting gauge when the operating lever is released. If the nozzle is not seating central with the setting gauge, note carefully the direction in which the metal pot requires to be moved to bring the nozzle into the desired position. Lower the metal pot and slacken the nuts 10SH7. Now raise the metal pot into position. The nozzle can now be centred by adjusting the screws 32SH1 and 32SH2 to bring the metal pot into the desired position. Tighten the nuts 10SII7 and re-check.

SQUARING NOZZLE TO MACHINE BASE

With machine and metal pot still in casting position, place between the lifting lever and the stand support sufficient packing just to fill the gap, then lower the metal pot.

Remove nozzle and nozzle setting gauge, and return metal pot to casting position with packing still in the gap. Attach nozzle squaring post 7ST1 or 7ST2, and, by means of a square, test that the post is correctly at right angles to machine base.

Remove packing and squaring post, then replace nozzle and nozzle gauge; if necessary, readjust nozzle position.

PUMP

With mould and matrix holder containing a blank matrix in position, insert piston in pump body and raise metal pot to casting position.

Engage pump release. See that the lower leaves 28SH and latch 3SH are disengaged. Loosen the nuts 27SH12 and 27SH13 at lower end of rod 27SH1 so that they are well clear of casting, and turn machine to 220°.

Loosen the pump body spring rod crosshead stop post nut 27SH9, then turn the crosshead stop post 27SH8 in a clockwise direction until the pump lever connecting link pin 30SH1 is quite free in the hole in pump lever connecting link a30SH. Now turn the crosshead stop post 27SH8 anti-clockwise until the connecting link pin commences to contact the piston lever. In that position again turn the crosshead stop clockwise half a turn and lock in position with the nut. Finally adjust the upper nut 27SH12 at lower end of rod 27SH1 until it contacts with this casting. Then turn machine to 100° so that the nuts 27SH12 and 27SH13 can be locked firmly in position.

PUMP BODY HAT VALVE 19SH13

This and its seating should always be clean, and the valve should have a clear hole in its centre. This valve checks the return of the metal from the nozzle, but *if too much metal remains in the nozzle, stop-casting is likely to result.* The small hole in the valve allows a small quantity of metal to return during the up-stroke of the piston, and this prevents stop-casting. On the other hand, if the hole is too large, insufficient metal will remain in the nozzle and metal channel, and defective types will result.

To regulate the inlet of metal beneath the piston, slacken the lock nut 13SH3 just above the piston stem end, and turn the stem end screw e13SH2 in or out as required and lock in position with nut.

LATCH 3SH, UPPER LEAVES 9SH AND LOWER LEAVES 28SH

After the pump adjustments have been made as explained, it will be understood that the piston stroke will commence immediately the pump body spring rod nuts 27SH12 and 27SH13 reach the casting of the swing frame post. This is the action when casting small type, but improved results are obtained when casting large type and other material if the piston is given a more sudden descent.

To provide for these conditions, the pumping mechanism is fitted with a latch 3SH, eight upper leaves 9SH and four lower leaves 28SH, so that the piston springs a17SH and 17SH10 may be further compressed and then suddenly released, causing a stronger and quicker pressure to be applied to the piston.

The trip latch is attached to a shaft 8SH1H, the lower end of which is fixed in an arm 8SH2, guided by a stud running from the lower end of the pump body spring rod crosshead eye 27SH3. Running on the shaft 8SH1H is an abutment 4SH, having an arm upon the upper end which rests on the piston spring rod eye 17SH2.

When the trip latch is placed in action, the piston springs a17SH and 17SH10 are prevented from operating until the latch is tripped. Therefore when the pump body spring rod is arrested by the nut 27SH12 coming in contact with the casting or the leaves 28SH, the piston operating rod continues to rise, carrying with it the piston operating rod crosshead 16SH3. This compresses the piston springs a17SH and 17SH10, but the piston will not act, as the trip latch holds up the abutment 4SH, and this in turn holds up the piston spring rod a17SH1.

As the piston crosshead continues to rise, it trips the latch, and this releases the piston springs a17SH and 17SH10, causing sudden pressure to be placed on the piston.

As both the length and strength of the piston stroke need to be varied according to the cubic content of the types to be cast, it has been found to be an advantage to position a group of eight leaves 9SH near the trip latch, so that one or more of the leaves may be inserted between the piston operating rod crosshead 16SH3 and the trip latch, thus causing the latch to trip earlier.

The leaves are hinged on a stud in the upper end of the piston operating rod 16SH, and therefore rise as the piston operating rod rises; consequently the greater the number of leaves placed in action the earlier will the piston spring rod be tripped.

Each of the lower leaves 28SH causes the piston operating rod 16SH to be acted upon earlier, and each of the upper leaves 9SH causes the latch to be tripped earlier.

A very wide range of pumping conditions is made possible by the different combinations available in connection with:

1. The lower leaves.
2. The upper leaves.
3. The adjustment of the piston spring rod nut a17SH5.

PRODUCT INFORMATION TABLES (pp. 156, 157) are included in this manual showing how to adjust the piston spring rod nut a17SH5, and the number of upper and lower leaves to be brought into use for casting various products on the Super Caster. There can be no hard and fast rule about these instructions, as the quality of type metal varies considerably, and worn pistons and pump bodies give results different from those obtained on new machines. The operative should therefore make out similar charts to suit his own conditions and experience. After a little practice at the machine, carefully studying the effects obtained by the use of different numbers of leaves and different degrees of compression of the piston springs, the operative very soon acquires experience which enables him automatically to adjust the pumping mechanism to suit the conditions of the product he is casting.

Although there are four lower leaves and eight upper leaves, it will be found in practice that not more than a total of eight should be in use at the same time.

ADJUSTING THE LATCH 3SH

The nuts 8SH3 and 8SH4 at upper end of latch stand shaft should be adjusted so that there is a slight clearance between latch and abutment plate 4SH1.

To place the latch in or out of action, move the latch pin X6SH up or down as required.

ADJUSTING THE PUMP BODY OPERATING ROD LEVER 26SH

Place in position four lower leaves 28SH and trip latch 3SH. Remove all upper leaves 9SH. Engage pump release, place operating lever under the deep groove in piston lever and turn machine to 225°. Adjust the nuts at top end of pump body operating rod 25SH to give lever a $\frac{1}{32}$" clearance in groove.

ADJUSTING THE PISTON OPERATING ROD CROSSHEAD STUD 16SH5

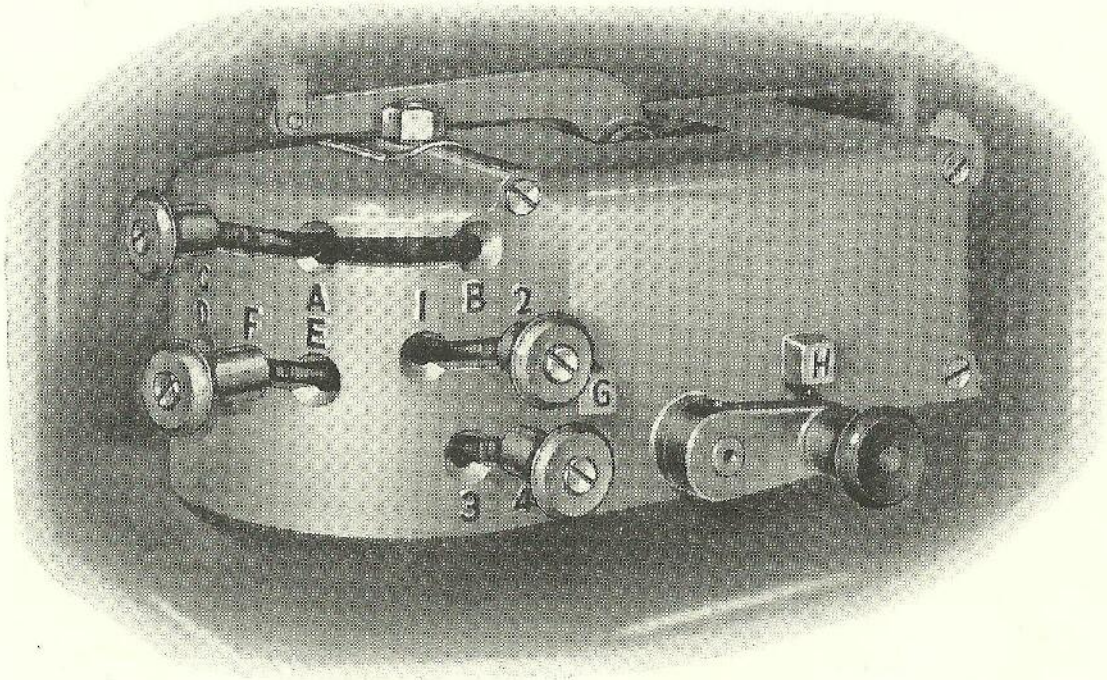
This stud allows the nozzle to seat just before the cast takes place, and takes it away just after the jet cuts off. With all leaves out of action, engage pump release, turn machine to 360°, and adjust stud just to contact pump body operating rod lever 26SH. The adjustment may be varied (according to quality and temperature of metal) to prevent stop-casting, but if the nozzle is removed from mould before the jet is cut off, splashing round the nozzle will occur.

SPEED REGULATING MECHANISM

(FOR PLATE SEE P. 46; FOR TABLE SEE PP. 150, 151)

THE OBJECT of this mechanism is to provide the speed required to suit various classes of product. The speed of casting varies in inverse proportion to the cubic content of metal pumped into the mould. Eighteen speeds are obtainable, in addition to the top speed when the gears are placed out of action. All matrices are marked with the set size of the type that will be cast from them, and a chart is provided (see pp. 150, 151) which shows the speed at which the Super Caster is to be run to produce these set sizes in any point size of body.

The maximum speed of 144 r.p.m. is obtained when the machine is driven direct from the pulley (2H4 position). The speed regulating mechanism gives a range of speeds from $4\frac{1}{2}$ to 125 r.p.m. An indicator plate is provided showing the positions of the control handles to produce the different speeds.



SPEED CONTROL HANDLES

By manipulating the five handles, eighteen speeds are obtainable in addition to the top speed when the gears are placed out of action. When not on top speed, the three right-hand handles must be in positions 3-H-1 or 2-3-G. To produce the top speed of 144 revolutions per minute, the handles should be in 2-H-4. To turn machine easily by hand, the right-hand lever should be in H.

3-H-1 control	AD	BD	CD	AE	BE	CE	AF	BF	CF	2-3-G control	AD	BD	CD	AE	BE	CE	AF	BF	CF
Speed ..	125	102	83	68	55	45	37	30	25	Speed ..	22	18	15	12	10	8	6½	5½	4½

The mechanism is fitted with safety devices to prevent the machine being started with the gears imperfectly meshed.

REMOVING CAM LEVERS

Remove camshaft nut 7sc8 and washer 7sc9. Slide off loose pulley b22sc, the driving pulley g21scc, and clutch 21sc1. Take off belt shifter ring rod end 4sc3 and allow the belt shifter ring a3sc to move down. Turn machine to 360°. Remove two screws a14sa1 and take off type carrier cam lever guard b14sa. Remove screws 5sc2 and 5sc6 and take off automatic stop mechanism complete. Disconnect all cam lever connections, the pump cam lever to be disconnected as follows: loosen lock nuts 29sh2 and 29sh3, disconnect actuating rod eye a3sd8 and unscrew pump driving rod 29sh. Turn the machine to approximately 100°. Remove front gear guard cover plate 13sc3 with three screws 13sc4. Remove front gear guard b13sc and two screws 13sc1 and 13sc2. Remove cam lever shaft screw 6sc4 and washer 6sc5 and the lever shaft retaining screw 6sc3, then the cam lever shaft can be removed. The type carrier cam lever xb26sc must be removed first and then follow on with the remainder of cam levers.

REMOVING THE CAMSHAFT STAND AND CAMSHAFTS

Turn off water.

Disconnect the water pipe drain assembly b16saa and the water pipe supply assembly b19sa2a.

Remove the water service bracket screws a17sa2 and 17sa3 and remove water service bracket a17sa. Take oil trough 7sa8 from the column by removing two screws 7sa9. Remove the oil pan b20sc by loosening the screws a20sc2 and 20sc3. Take out screws 23sh12 and remove the gear guard a26sb1b. Remove long camshaft stand screws 9sc5 from inside the main stand. Obtain help at this stage whilst taking out the short camshaft stand screws 9sc6 from the camshaft stand a9scc, taking care of the back gear safety lever stop rod 10sb when lifting off. To remove the camshafts, take off the four caps 9sc1 and the shafts complete with cams can be lifted out.

REMOVING GALLEY BRACKET

Remove the matrix box tray screws 29sg4 and 29sg5, take off matrix box tray 29sg1 from galley. Remove lead stacker connecting rod eye lock nuts 17sg5 and 17sg8 and unscrew the connecting rod a17sg. Loosen the air pipe union 5sa7 and take off air pipe. Remove galley bracket screws 9sg1 and hexagon-headed screw 9sg2, and, with help, remove galley bracket complete.

REMOVING PUMP BRACKET

Take off ingot feeder 19SU. Remove the pump body and piston from metal pot. Empty metal from metal pot and turn off the electric mains switch. Remove the mains leads to the switch box. Disconnect pump driving rod yoke 29SH15 by removing the driving rod yoke pin screw 29SH6 and removing the pump driving rod yoke pin 29SH4H. Wind the metal pot down and remove swing frame post screws 33SH1 and a33SH10. Now wind metal pot up to working position and, with help, remove the screw a33SH11. The pump bracket can now be lifted off the main stand.

REMOVING THE MAIN STAND AND SPEED BRACKET ASSEMBLY

Remove the main stand cover 12SA. Take out main stand locating screw 10SA1, the two screws 10SA2 fixing main stand to speed bracket and two screws 7SA7 fixing main stand to column. With help, lift off the main stand. Remove screws 25SB8 and then remove gear box assembly complete.

DISMANTLING THE SPEED REGULATING MECHANISM

Remove two pulley clutch lever bracket screws 16SB4, pin 17SB5, clutch lever group x16SB, and sliding gear c14SB.

Remove four handles 2SB1, a15SB1, 20SB1 and a21SB1, springs 2SB2, a15SB2, 20SB2, and a21SB2, and posts 2SB3, a15SB5, 20SB3, and a21SB3. Knock out taper pin 8SB4, remove back gear control lever 8SB. Take out three speed bracket cover screws 25SB5, remove speed bracket cover 25SB4, and back gear control lever safety spindle 8SB5. Remove sixteen speed bracket cap screws 25SB3, take off the caps. Lift out back gear 1SB and shaft 1SB1. Lift out sliding gear shaft gear (front) 24SB1, sliding gear shaft gear (rear) 24SB2, and shaft 24SBB. Lift out driving shaft (rear) b13SBB complete with gears 13SB2 and 13SB1. Lift out driving shaft front 12SBB complete with gears 12SB2 and 12SB1, back gear clutch gear 3SB, back gear clutch pinion 6SB. Remove nut 11SB1, take out the control levers fulcrum pin 11SB. To remove the four control levers, take out the four split pins and three stop rod yoke pins. Remove pulley driving clutch safety rod 18SB, complete with link 18SB1, eye 18SB5 and yoke 18SB2. Remove fulcrum pin 4SB1 and split pin 4SB3, and take out back gear clutch lever 4SBB and rod 5SB, complete with eye 5SB4 and yoke 5SB1. Remove back gear clutch safety rod 7SB, complete with link 7SB1 and yokes 7SB2 and 7SB5. To remove the two sliding gear safety rod yokes 22SB8 and 23SB8, knock out the taper pins 22SB9 and 23SB9, withdraw sliding gear (front) safety rod 22SB complete with link 22SB1, and yokes 22SB2 and 22SB3, and take out the sliding gear (rear) safety rod 23SB, complete with link 23SB1 and yokes 23SB2 and 23SB3. To remove safety rod lever 19SB, take out the fulcrum pin 19SB1.

The safety rod links 7SB1, 18SB1, 22SB1 *and* 23SB1 *have been set to the correct length and their adjustment should not be disturbed unless necessary.*

ASSEMBLING THE SPEED REGULATING MECHANISM

Replace safety rod lever 19SB and fulcrum pin 19SB1.

Reassemble the sliding gear (rear) safety rod 23SB, complete with link 23SB1, yokes 23SB2 and 23SB3, and connect sliding gear safety rod yoke 23SB8, fixing with taper pin 23SB9.

Reassemble the sliding gear (front) safety rod 22SB, complete with link 22SB1, yokes 22SB3 and 22SB2, and connect sliding gear safety rod yoke 22SB8 and taper pin 22SB9. When connecting sliding gear yokes, the concave end should be nearest the operating handle end of bracket.

Replace back gear clutch safety rod 7SB with link 7SB1 and two yokes 7SB2 and 7SB5.

Replace back gear clutch lever rod 5SB with eye 5SB4 and yoke 5SB1 and back gear clutch lever 4SBB, and secure pin in lever to eye 5SB4 and yoke 7SB5 with split pin 7SB4. Lock lever 4SBB with fulcrum pin 4SB1. Reassemble pulley driving clutch safety rod 18SB with link 18SB1, eye 18SB5 and yoke 18SB2. Replace four control levers in the following order: first 20SB, second 2SB, third 21SB, fourth 15SBB. Connect the three stop rod yoke pins and four split pins. Replace the fulcrum pin 11SB and lock with nut 11SB1. Ensure that bearings and caps are clean. Assemble driving shaft (front) 12SBB, complete with gears 12SB2 and 12SB1, back gear clutch gear 3SB and back gear clutch pinion 6SB. Assemble driving shaft (rear) b13SBB, complete with gears 13SB2 and 13SB1. Replace sliding gear shaft gear (front) 24SB1, sliding gear shaft gear (rear) 24SB2 and shaft 24SBB. Replace back gear 1SB and back gear shaft 1SB1. Replace speed bracket caps and screws 25SB3 in correct positions marked thereon. Replace the back gear safety spindle, ensuring that, with the back gear out of mesh and with the lever 8SB in the 'H' position, the safety pin 15SB6 in lever 15SBB is engaged with slot in spindle 8SB5. Replace speed bracket cover 25SB4 and the three screws 25SB5. Assemble back gear control lever 8SB and pin. Assemble four handles 2SB1, a15SB1, 20SB1, a21SB1, springs 2SB2, a15SB2, 20SB2, a21SB2, and posts 2SB3, a15SB5, 20SB3, a21SB3. Slide the gear c14SB on to shaft b13SBB.

The pulley (driving) clutch lever group x16SB *should not be assembled until the camshaft stand is in place.*

ASSEMBLING SPEED BRACKET AND MAIN STAND

With help, place the gear box on column. Assemble and tighten up the three speed bracket screws 25SB8. Locate the main stand in position on gear box and fix the locating screw 10SA1. Replace two main stand screws 10SA2 and tighten. Assemble and screw in place two

column screws 7SA7 at each end of the right-hand side of main stand and tighten. Place in position the main stand cover 12SA.

ASSEMBLING CAMSHAFT STAND, CAMSHAFTS AND CAM LEVERS

See that all bearings and caps are clean. Oil, and place the camshafts in position in the camshaft stand. Assemble all the caps and screws making sure the caps are assembled as indicated by the numbers stamped thereon. With help, place the assembly into position on main stand and secure with three short screws 9SC6. Replace two camshaft stand screws (long) 9SC5 inside main stand. Replace the cam lever shaft gear 6SC1 and lever 12SC. See that zero marks on gears coincide. Slide in cam lever shaft 6SC to engage cutter cam lever and gear 6SC1 temporarily and turn machine to approximately 100°. Replace the cam levers in the following order: the matrix cam lever, type carrier cam lever, type pusher cam lever, pump cam lever, and then the mould blade cam lever. Locate the cam lever shaft in final position and fix with retaining screw 6SC3. Replace cam lever shaft washer 6SC5 and screw 6SC4. Replace the oil trough 7SA8 with two screws 7SA9. Replace the water service bracket a17SA with two screws a17SA2 and 17SA3. Couple up the water pipe drain assembly b16SAA and water pipe supply assembly b19SA2A. Turn the machine to approximately 350°. Replace the gear guard b13SC with two screws 13SC1 and 13SC2. Replace the gear guard cover plate 13SC3 with three screws 13SC4. Replace automatic stop mechanism with two screws 5SC2 and screw 5SC6. Replace the oil pan b20SC with screws a20SC2 and 20SC3. Assemble type carrier cam lever guard b14SA. Finally, replace starting handle, loose pulley b22SC, driving pulley g21SCC, and clutch 21SC1 and tighten with nut 7SC8 and washer 7SC9.

ASSEMBLING PUMP BRACKET

Assemble pump driving rod 29SH into the yoke 29SH15 (left-hand thread) and then couple up the actuating rod 3SDD to the actuating rod housing 3SD3 with the actuating rod eye pin 3SD10D. Now screw in the pump driving rod link a29SH1 attached to the pump cam lever. With help, replace the pump bracket and melting pot on to the edge of column and fix with the screws a33SH11, a33SH10, and 33SH1. Connect up the pump driving rod yoke 29SH15 with the pump driving rod yoke pin 29SH4H into the upper hole of bell crank 18SH and fix with the screw 29SH6. Connect up mains leads to the switch box. Replace the ingot feeder 19SU, also the pump body and piston.

ASSEMBLING GALLEY BRACKET

Place the galley bracket on to the main stand and fix with screws 9SG1 and screw 9SG2. Screw in lead stacker connecting rod a17SG with lock nuts 17SG5 and 17SG8. Connect air pipe union. Replace matrix

box tray 29SG1 and screws 29SG4 and 29SG5. Connect up the cutter actuating block link yoke 1SG2 with pin 1SG3 and split pin 1SG4.

OIL BATH FOR CAMS

The oil pan b20sc is designed to give a constant supply of oil to the cams and cam rollers, camshaft gears, speed regulating gears, and to prevent overflow of oil.

There are two oil pan compartments. The larger one is for cams and rollers, and has a series of sub-compartments and an oil scraper; the smaller one is for the camshaft gears.

The cams and cam lever rollers are splash lubricated, oil being picked up by the driven cams from the sump in the larger compartment.

The camshaft gears are lubricated by oil transferred from the back gear clutch gear 3SB to the camshaft gear 7SC3. An oil scraper is fitted and excess oil is thrown off into the smaller compartment of the oil pan and led by a channel to the trough 7SA8 and sump in the column a7SA.

The column is also divided into two compartments, the larger for the main speed regulating gears and the smaller for the back gears 1SB, clutch gear 3SB, and back gear clutch pinion 6SB. These two compartments are connected by a small hole which regulates a supply of oil to the camshaft gears by means of the clutch gear 3SB. The speed regulating gears are all splash lubricated.

OILING CAMS AND CAM LEVER ROLLERS

Pour one quart of gear oil through the aperture marked 'cams'. Allow about 30 minutes for the oil to spread evenly over the oil pan, then remove plug 20sc8 and see that oil will just flow from the plug hole. This level must be maintained.

OILING CAMSHAFT GEARS AND SPEED REGULATING GEARS

Fill sump by means of the aperture marked 'gears' until oil reaches bottom of countersink in oil level gauge a13SA on rear of column. Replace cover 9sc10.

Check weekly that the oil is at correct level in oil level gauge a13SA *and, if necessary, transfer surplus oil from gauge* a13SA *to the oil pan* b20sc.

USE RELIABLE OILS

Satisfactory oils for the gear box and cam bath are:

Maker	*Description*
Dick & Co. ..	Heavy Gear Oil 'M'
Duckham & Co. ..	Gear Oil 'N'
Price & Co. ..	'Motorine' Gear Oil, Battersea 'B'
Shell	Shell Oil B.E.4
Vacuum Oil Co. ..	S/V Cylrex Oil No. 18 Mineral
Wakefield & Co. ..	Gear Oil

It is important that only best oil should be used.

AUTOMATIC INGOT FEEDER

THE AUTOMATIC INGOT FEEDER 19SU fitted to the machine enables the molten metal to be maintained at a constant level with the minimum of attention on the part of the operative. As the ingot becomes pre-heated by continued contact with the molten metal, the temperature of the metal in the pot is not subject to frequent and sudden depressions as in the case of hand-fed ingots. The mechanism consists of a sensitive escapement actuated by an iron float in the molten metal. As the metal in the pot becomes lessened, the float sinks a corresponding degree, causing the chain attached to it to release the escapement shoe and so lower the ingot into the molten metal.

ADJUSTMENTS

With the machine in casting position and the metal level approximately $\frac{1}{2}$" below the surface of the metal pot, loosen the screws 56SH4 and 57SH2 and swing round the feeder and ingot into a position free from all obstructions. Adjust the chain and float anchored to the escapement brake operating bar extension 56SH28 to maintain operating level of metal in melting pot. To do this, unhook the chain from the escapement brake operating bar extension and engage it into a suitable link until the level of metal is maintained. Tighten up screws 56SH4 and 57SH2. If the chain needs adjusting vertically, loosen the nut 56SH26 and slide the escapement brake operating bar extension along until the correct position has been found, then tighten the nut 56SH26.

An adjustment is provided for the escapement brake whereby a variation of spring pressures can be applied by means of the eccentric spring post a56SH30.

AIR BLOWER

THE BLOWER ROTOR is gear driven from the driving pulley h21SCC. This rotor eccentrically mounted in the casing is fitted with sliding blades, which, by centrifugal force, form compartments into which air is drawn and delivered. To disengage the blower, slacken the two lock screws a21SA2, swing the blower out of mesh and tighten lock screws.

ELECTRIC MELTING POT ATTACHMENT

(FOR PLATE SEE P. 2)

THIS ATTACHMENT consists of a metal pot in which two elements are attached to a connecting box, and a box containing an automatic temperature regulator, double pole switch and ammeter.

Changing the elements.—If an element gives trouble, unscrew the cover of the connecting box and detect the faulty element with the aid of a testing lamp. Having done this, switch off the current, remove the pump body and piston, empty the metal pot, remove the pump body lifting levers a23SIIII and 22SHH, disconnect the cable on connecting box, release element from connecting box and release the clips holding element in position. Then attach a new element and reassemble all parts.

If no facilities are available for quickly detecting the faulty element, it is advisable to disconnect the two wires on the connecting box, remove both elements complete with box and replace with a spare set, which it is always advisable to have in store.

Automatic Temperature Regulator.—A steel bulb containing mercury is inserted in the melting pot and connected to the automatic regulator by a metal tube of very fine bore; the other end of this tube is connected to a spiral tube. As the mercury in the bulb is expanded by the heat, the spiral tube tends to unwind and lengthen, putting pressure against a lever causing it to tilt a small glass tube containing mercury. In this glass tube there are two pockets in which the terminals are fixed. When the glass tube is horizontal, the mercury content extends from one pocket to the other and completes the circuit. When the glass tube is tilted by the movement of the spiral tube, the mercury accumulates in one pocket and breaks the circuit.

TYPE STACKER

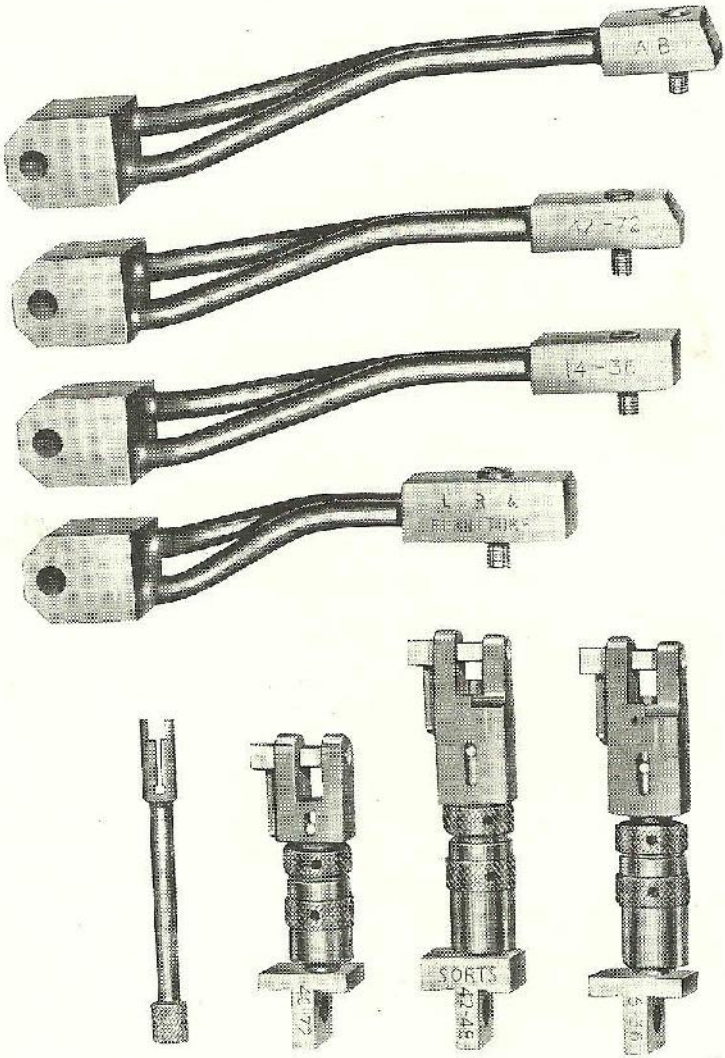
THIS ATTACHMENT enables the smaller sizes of sorts to be stacked in line for the full length of the galley. The frame 30SG6, which carries an adjustable bar 30SG1G, is clamped to the galley 2SL1. The type is pushed into a channel formed by the right-hand side of the galley 2SL1 and the bar 30SG1G. The forward end of the line of type is prevented from falling by resting against a support X31SG or X32SG.

MOULDS

THE FOLLOWING MOULDS are available for use on the Super Caster, and their use is described more fully in the following pages:

SMALL TYPE COMPOSITION MOULDS, 5 TO 14 POINT

Designed for use on a Composition Caster for casting type in any size from 5 to 14 point from .2″ matrices. A separate mould is required for casting type of each point size. The 13- and 14-point moulds produce type with a slight bevel on the upper edge; this is to give



MOULD BLADE FORKS AND MOULD WATER SUPPLY PIPING

the matrices a larger seating area on the mould. The type nick is on the right-hand mould blade block.

To enable these moulds to be used on the Super Caster, an adaptor base must be used.

QUAD AND SPACE MOULDS, 6 TO 12 POINT

Designed for use on a Composition Caster and Display Type Machine to cast spacing material up to 3 ems long in any size from 6 to 12 point. The mould is similar in construction to the small type composition moulds series 22,000, the most important variations being:

1. A mould blade is supplied for each point size required.
2. The side block springs are replaced by a clamping bar 13641 which also acts as a blade cap.
3. A distance plate 11521 is provided for use when casting 6 to 8 point material.

To enable these moulds to be used on the Super Caster, an adaptor base must be used.

LARGE TYPE COMPOSITION MOULDS, 14 TO 24 POINT

Designed for use on a Composition Caster for casting type in 14, 18 and 24 point from .4″ matrices. These consist of a base containing interchangeable mould blade insets, one for each point size. The type nick is on the right-hand mould blade block.

To enable these moulds to be used on the Super Caster, an adaptor base must be used.

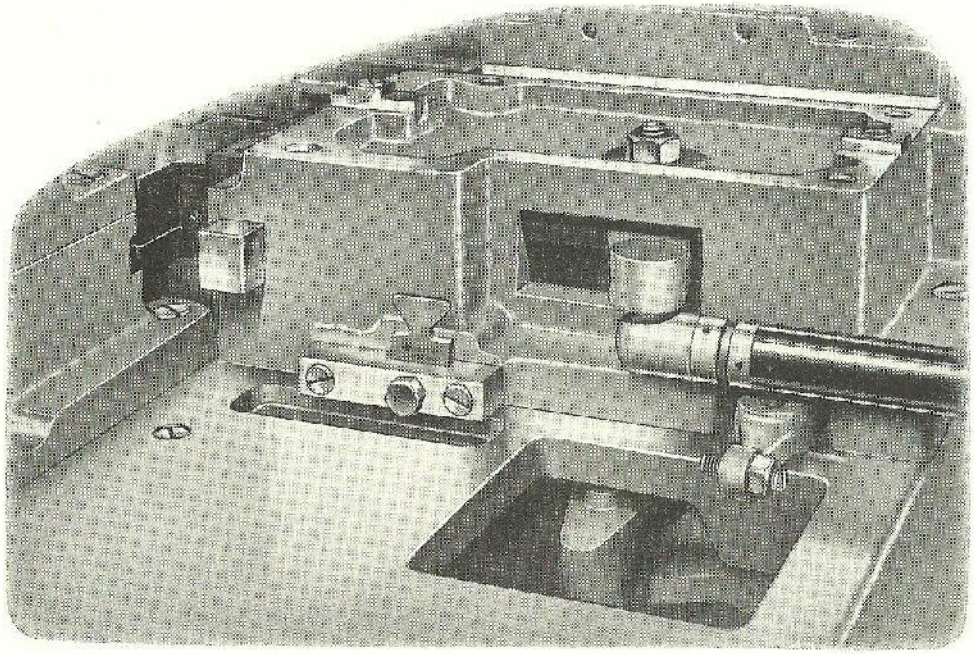
DISPLAY TYPE MACHINE MOULDS, 14 TO 36 POINT

Designed for use on a Display Type Machine for casting type in 14, 18, 24, 30 and 36 point from large display type matrices. These consist of a base containing interchangeable mould blade insets, one for each point size. The type nick is on the left-hand mould blade block, as the display matrices are positioned on the mould in a direction reverse to that of the composition matrices.

To enable these moulds to be used on the Super Caster, an adaptor base must be used.

SHORT LEAD AND RULE MOULDS, $1\frac{1}{2}$, 2 AND 3 POINT

Designed for use on a Composition Caster and Display Type Machine to cast $1\frac{1}{2}$-, 2- and 3-point leads and rules in lengths of from 2 to 36 points. The upper edge of the mould blade is shaped to fit in the matrix groove and thus forms a complete rear 'wall'. At the other end of the matrix, the mould crossblock is made high enough to act as a complete 'wall' during casting, and a stop is provided to ensure that the matrix is correctly located.



MATRIX LOCATING STOP

The matrix heads base locating distance piece 8SE6 is shown in position on matrix heads base for casting type above 36 point. This must be reversed for casting type 36 point and under.

Insets can be supplied in sizes 1½, 2 and 3 point. A separate inset is required for each point size. Rules can be cast flush-sided, central or full-faced.

In each inset, any face of that point size can be cast by providing the necessary blade and matrix.

For low leads, a special low blade and corresponding matrix is supplied.

To enable these moulds to be used on the Super Caster, an adaptor base must be used.

SUPER CASTER DISPLAY TYPE MOULD, 14 TO 36 POINT

Designed for use on a Super Caster for casting type in 14, 18, 24, 30, and 36 point from large display type matrices. These consist of a base containing interchangeable mould blade insets, one for each point size. The type nick is on the left-hand mould blade block, as the display matrices are positioned on the mould in a direction reverse to that of the composition matrices.

SUPER CASTER DISPLAY TYPE MOULD, 42 TO 72 POINT

Designed for use on a Super Caster for casting cored type in 42, 48, 60 and 72 point from large display type matrices. These consist of a base containing interchangeable mould blade insets, one for each point size.

SUPER CASTER LOW SPACE AND QUOTATION INSETS, 48, 60 AND 72 POINT

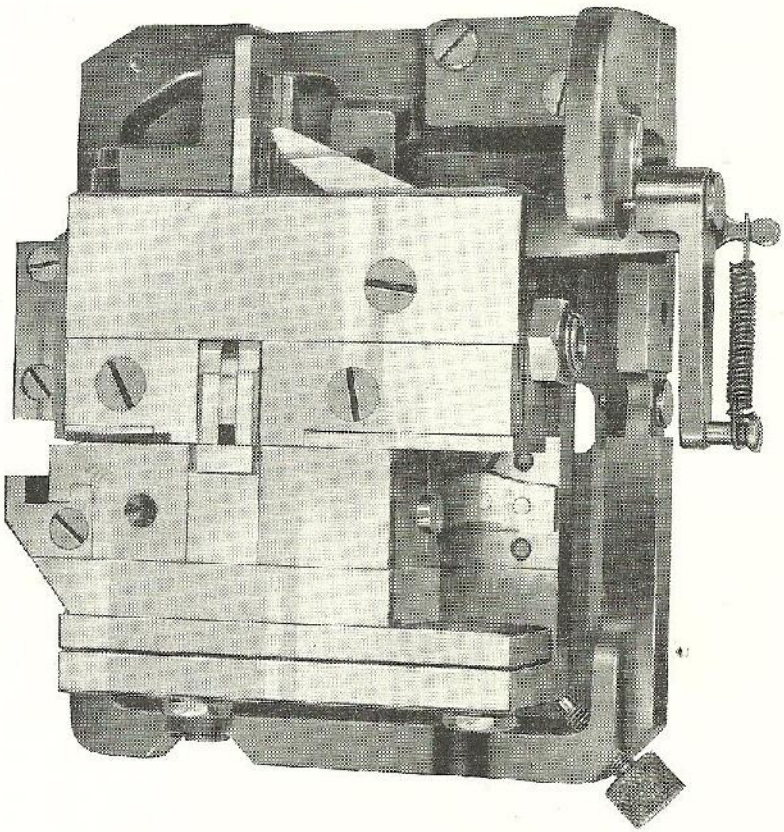
Mould blade insets are provided for use with the base of the 42- to 72-point Super Caster display type mould, for casting low spaces and cored quotations.

STRIP MOULDS

1- *to* 3-*point Lead and Rule Mould.* Designed for casting rules and high and low leads in 1, 1½, 2 and 3 point.

4- *to* 18-*point Lead and Rule Mould.* Designed for casting rules, high and low leads, borders and dashes in sizes from 4 to 18 point. This mould can be equipped with parts for casting full-faced rules and also tie-up slugs in 12 and 18 point.

Furniture Mould. Designed for casting furniture in sizes from 24 to 72 point in predetermined lengths. It can also be equipped for casting plate supporting material in 24, 36 and 48 point; two-piece type-high foundry furniture in 36, 48, 60 and 72 point, also 18-point full-faced rules.



SMALL TYPE COMPOSITION MOULD ON ADAPTOR BASE

RETURNING MOULDS FOR REPAIRS

It is not possible for operatives to repair moulds, as they have neither the special tools nor the necessary experience. The moulds should never be taken apart as long as they produce good type (or other material), neither should a mould be altered in any detail.

If in any mould any defect should develop that cannot be corrected by following the instructions in this manual, the mould or inset should be returned to The Monotype Corporation Ltd. for repair or adjustment. In returning any such mould or inset, send also a few of the defective types or a few short pieces of the defective strip, with a note giving particulars of the trouble.

SMALL TYPE COMPOSITION MOULDS, 5 TO 14 POINT

(FOR PLATES SEE PP. 58, 60)

ATTACHING MOULD TO MACHINE

Set matrix heads base to correct position (5½ to 36 point) by reversing (if necessary) the locating distance piece 8SE6 (for plate see p. 56).

Place stop lever handle 2SF5 in '15 ems' position, turn machine to 170° and disconnect ball end 6SF1F from mould blade slide drive lever intermediate lever a5SF1.

Bring mould blade slide 4SF to forward position, so that the mould blade fork 12SL can be connected by means of pin 3SF.

Screw back the micrometer wedge screw until a mould opening of approximately 60 points is obtained.

Connect the yoke pin a24SF7 to hole marked '12' in type carrier cam lever extension b26SC3.

Assemble mould on adaptor base 23SLL, and secure with screw 23SL4. Note that mould is against the locating faces of adaptor base.

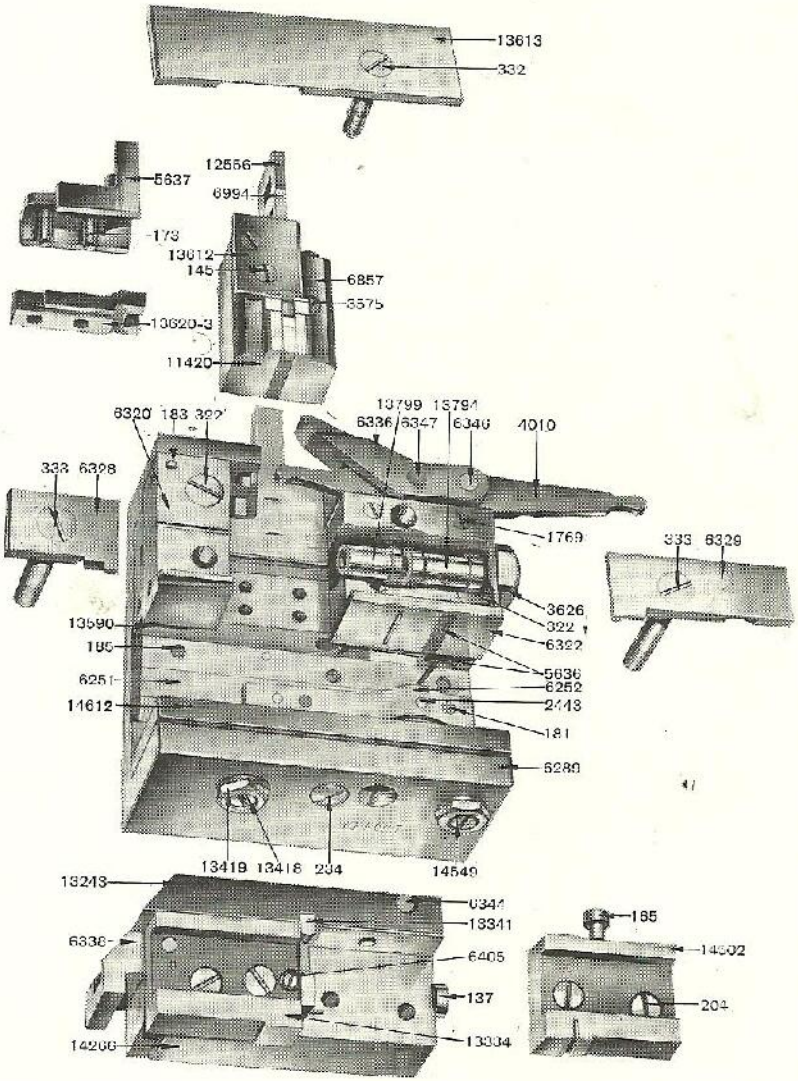
Place mould and adaptor base on machine, sliding the mould coupling hook 39SE1 into engagement with hook on type carrier. Locate the adaptor base against its two positioning faces by means of the two eccentric clamps 24SL1; secure with three screws b17SL1, b23SL2 and b23SL3.

In securing adaptor base with mould to machine, care should be taken to place the three screws in their correct holes, otherwise damage will be done to the mould.

Connect mould blade to mould blade fork 12SL by means of the pin 12SL5, using handle 12SL6; draw mould blade back to contact with pin 12SL5 by means of the nut 12SL3; lock with nut 12SL4.

Two pin wrenches should be used when locking these nuts in order to prevent damage to the mould blade by twisting of mould blade fork.

Attach water supply piping 30SLL.



PARTS OF A SMALL TYPE COMPOSITION MOULD, SERIES 22,000

Attach mould oiler and crossblock oiler.

Make certain that the cap abutment 4SF8 is in correct position for small set sizes, *i.e.*, the end with large diameter towards the front.

Connect ball end 6SF1F to hole marked 'Type to 42 Point' on mould blade slide drive lever intermediate lever a5SF1. Set the fulcrum pin a5SF18F in 'Small Type' position and the plunger spring adjusting nut 5SF23 right back against the head of the guide rod a5SF12F.

Turn machine to 150°, and screw micrometer wedge right down; set the micrometer wedge scale at zero, and see that the 5–13 point type channel block 29SEE is fitted.

REMOVING MOULD FROM MACHINE

Turn machine to 170° and disconnect the ball end 6SF1F from mould blade slide drive lever intermediate lever a5SF1.

Bring mould blade to forward position, loosen nuts 12SL3 and 12SL4, and remove the pin 12SL5.

Screw back the micrometer wedge until approximately 60 points opening is indicated on the wedge indicator scale 9SF4, and pull slide back until the connection is clear of mould blade.

Remove water connection and oilers.

Remove the three screws and two eccentric clamps that secure the mould, removing the clamp nearest the front of machine first.

Slide the mould and adaptor base squarely forward until coupling hook is clear of mould and can be withdrawn from type carrier; mould can now be removed.

Remove mould from adaptor base and blow out water. Oil the mould and place it in box.

TAKING MOULD APART FOR CLEANING

Never take a mould apart so long as it continues to cast satisfactory type. Should it become necessary to take a mould apart for cleaning, prepare a suitable place, cover it with clean paper and proceed in the following manner:

1. Remove the crossblock.
2. Remove spring block adjusting screw lock nut 3626, and loosen hollow adjusting screw 3627.
3. Remove blade stop 13620–3 and support 5637.
4. Remove cover plate 13613 (22,000 series mould).
5. Remove blade holding-down plate 13612.
6. Take off cover springs 6328, 6329.
7. Withdraw the blades, keeping them down on the intermediate plate while doing so in order not to damage the nick or nick recess.
8. Insert a few thicknesses of paper between the side blocks 6857, 11420 in place of the mould blades and remove the side blocks by canting them towards the blade opening.

This is as far as it is safe for a mould to be taken apart by the operative. The two eccentric dowels 3575 which position the side blocks must not be interfered with in any way. If the dowels of these moulds are moved the slightest amount, the side blocks will not go back in correct adjustment.

Wash all parts thoroughly in clean benzine. Metal or burnt oil adhering to the parts can be scraped off with a piece of type metal rule, care being taken not to damage the sharp corners of the side blocks, blades, etc. On no account attempt to lap or polish the parts with oilstones or other abrasives, the effect of which would be to destroy the sharp corners which are so essential if clean, burrless type is to be cast.

REASSEMBLE THE MOULD IN THE FOLLOWING ORDER:

1. Place screw side block 11420 in position.
2. Place nick side block 6857 in position.
3. Replace blades and, whilst doing so, insert mould blade lever 4010. Exercise the same care in replacing the blades as when withdrawing them so as not to damage the nick or nick recess.

In order that blades should open to their fullest extent, it is essential that the distance pieces should be located in the rear ends of their slots in the blades. To ensure this, advance the blades to a position slightly in advance of the side blocks by a continuous forward movement. If the blades are pushed too far forward, the distance pieces will also be carried too far, so that when the blades are pulled back to a position slightly in advance of the side blocks, the distance pieces will be left somewhere in the middle of the slots and the movement of the blades will be restricted accordingly.

4. Advance the hollow screw 3627 in the end of the mould until the side blocks just nip the distance pieces.
5. Replace the blade holding-down plate.
6. Replace cover plate (22,000 series mould only) and screw down firmly.
7. Replace cover springs and screw down firmly.
8. Apply tension to the side blocks as follows for the different styles of moulds:

22,000 *series moulds with spring tension on side blocks.* Tighten up the hollow screw by screwing firmly home.

22,000 *series moulds and old pattern moulds which have been converted to square nick and have a hollow plug in place of the spring.* Tighten hollow screw, applying no more pressure than can be exerted by hand without undue strain.

Old pattern moulds, either converted or not converted to square nick, which have spring tension on the side blocks. Advance the hollow screw until it just grips, and then give it three half turns.

In those cases where the hollow screw has a lock nut, see that this is tightened.

9. Replace blade stop and support.

10. Oil the mould thoroughly and replace the crossblock.

ADJUSTING THE GIB PLATE OF MOULDS WITH NEW STYLE CROSSBLOCK

The crossblocks of these moulds are fitted with a back plate 13249 without spring pad.

After the mould has been in use some time, a slight burr may appear on the crossblock side of the type, rendering a slight adjustment of the gib plate 14612 necessary.

To adjust, proceed as follows: loosen the gib plate adjusting screw lock nuts 13419 and slide crossblock into casting position.

Tighten the left-hand screw 13418 just sufficiently to permit the crossblock to be moved freely by hand, but so that the pressure of the gib plate can be felt. Then slide the crossblock to the right, so that right-hand edge is flush with edge of mould base.

Repeat the adjustment to right-hand screw 14549.

Slide the crossblock backwards and forwards a few times to allow it to settle itself to its new adjustment.

Repeat the adjustment if not satisfied that the crossblock is free or tight enough, or if crossblock is tighter at one end than the other.

Tighten the lock nuts 13419 by using wrench 13SL3, holding the screws with a screwdriver to prevent them turning with the lock nuts. Only slight pressure is necessary in tightening the lock nuts.

When the gib plate is properly adjusted, the crossblock should work much more easily than was the case with the old style crossblock with a spring button in the back plate.

This readjustment of the gib plate on a new or overhauled mould may become necessary as a result of initial 'running in' wear. Once made, further adjustment should not be necessary for a long period, provided of course that the crossblock is kept properly lubricated.

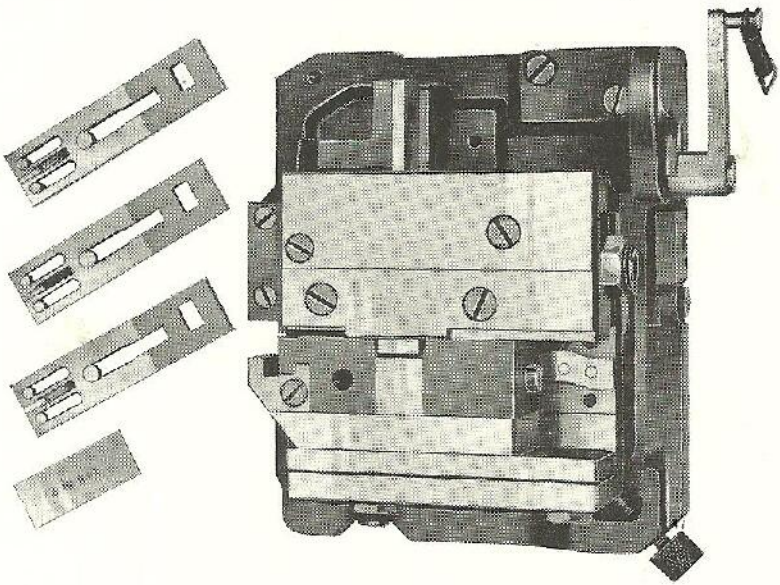
For the better working of moulds, the use of the crossblock oiler X48SL in conjunction with the mould oiler is recommended. This oiler not only ensures that neither side of the crossblock runs dry, but also wipes off excess oil, thus preventing the top of mould from becoming flooded.

QUAD AND SPACE MOULDS, 6 TO 12 POINT

(FOR PLATE SEE P. 64)

ATTACHING MOULD TO MACHINE

Place the mould in adaptor base X23SL and locate with screw 23SL5. Clamp the mould to the adaptor base with screw 23SL4.



QUAD AND SPACE MOULD (AND BLADES) ON ADAPTOR BASE

Attach type clamp operating block 31SL to adaptor base with two screws 31SL2.

Attach 5–36 point mould blade fork 12SL to mould blade slide 4SF.

Place mould and adaptor base on machine, locating the adaptor base against its two positioning faces by means of the two eccentric clamps 24SL1 and securing with three screws b17SL1, b23SL2 and b23SL3.

Connect mould blade to mould blade fork with pin 12SL5.

The type support spring cam x27SE should be used for sizes smaller than 12 points in width.

When casting above 12 points in width, reverse mould blade slide driving block cap abutment 4SF8.

Set micrometer head to approximately 12-point cast, check product and alter micrometer head to suit.

Set wedge screw scale (Type) a10SF10 to read zero and lock with wedge screw clamp nut 11SF2.

CHANGING FROM ONE POINT SIZE TO ANOTHER

1. Remove crossblock.
2. Loosen nut 1053 and hollow screw 11581 in end of mould.
3. Remove blade stop 11524 and support 11527.
4. Remove cover plate 13917 and clamping bar 13641.
5. Withdraw blade, keeping it down on the intermediate plate 13590 whilst doing so in order not to damage the nick or nick recess.
6. Insert a few thicknesses of paper between the side blocks in place of the mould blade and remove the side blocks by canting them towards the blade opening.

This is as far as it is safe for a mould to be taken apart by the operative. The eccentric dowels 3575 which position the side blocks must not be interfered with in any way. If the dowels are moved the slightest amount, the side blocks will not go back in correct alignment.

Wash all parts thoroughly in clean benzine, taking care not to damage the important corners of side blocks and blade. On no account attempt to polish the parts with oil stones or other abrasives, the effect of which would be to destroy the sharp corners which are so essential if clean, burrless product is to be cast.

REASSEMBLE THE MOULD IN THE FOLLOWING ORDER

1. Place screw side block 11516 in position (also distance plate 11521 for 8 point and under).
2. Place nick side block 11517 in position.
3. Insert mould blade of required point size, exercising the same care as when withdrawing the blade to avoid damage to the nick or nick recess.

In order that the blade shall open to its fullest extent, it is essential that the distance pieces 3580 *and* 11523 *should be located in the rear ends of their recesses in the blade. To ensure this, advance the blade to a position slightly in advance of the side blocks by a continuous forward movement. If the blade is pushed too far forward the distance pieces will also be carried too far, so that when the blade is pulled back to a position slightly in advance of the side blocks, the distance pieces will be left somewhere in the middle of the recesses and the movement of the blade will be restricted accordingly.*

4. Advance the hollow screw 11581 in end of mould until the side blocks just nip the distance pieces.

5. Secure the clamping bar in position, making sure that its front edge is located against the spring block 6322 and screw block 6320.

6. Replace cover plate and screw down firmly.

7. Tighten hollow screw, applying no more pressure than can be exerted by hand without undue strain. Tighten lock nut.

To maintain accurate body size, the spring block must be held securely in position, and all holding down screws firmly tightened.

8. Replace blade stop and support.

9. Oil the mould thoroughly and replace the crossblock.

Refer to small type composition mould instructions for adjustment of new style crossblock (see p. 63).

ADJUSTING MACHINE

1. Make certain that the stroke of the type carrier is set to standard adjustments.

2. Piston spring must be adjusted to give as little pressure as possible, consistent with good results.

3. Use nozzle (No. 1) 12SH.

4. The type carrier connecting rod yoke pin a24SE7 must be connected in the 12-point hole of the type carrier cam lever extension b26sc3.

5. Ball end 6SF1F to be in 42 point position.

6. Type channel block (fixed) 5 to 13 point x29SE must be used with this mould.

7. Speed for 3 ems approximately 50 r.p.m., other sizes in proportion. In the event of bad ejection or blistered quads, reduce speed.

LARGE TYPE COMPOSITION MOULDS, 14 TO 24 POINT

(FOR PLATE SEE P. 68)

ATTACHING MOULD TO MACHINE

The following information will indicate where the instructions for these moulds differ from instructions for small type composition moulds.

The connecting rod yoke pin a24sE7 should be in the hole marked '24' in type carrier cam lever extension b26sC3.

Use mould oiler a15sL1.

Make certain that the cap abutment 4sF8 is in correct position for 'setwise' size of type to be cast.

Use the type support spring cam bracket as instructed under heading: TYPE SUPPORT SPRING CAM, see p. 19.

Attach the 14–72 point type channel block x30sE.

REMOVING MOULD FROM MACHINE

Turn machine to 170° and disconnect ball end 6sF1F from mould blade slide drive lever intermediate lever a5sF1.

Bring mould blade to forward position, loosen nuts 12sL3 and 12sL4, and remove the pin 12sL5.

Screw back the micrometer wedge until approximately 60 points opening is indicated on the wedge indicator scale 9sF4, and pull slide back until mould blade fork 12sL is clear of mould blade.

Remove water connection and oiler.

Remove the three screws b17sL1, b23sL2, b23sL3, and two eccentric clamps 24sL1 that secure the mould, removing the clamp nearer the front of machine first.

Slide mould and adaptor base squarely forward until coupling hook is clear of mould and can be withdrawn from type carrier; mould can now be lifted off.

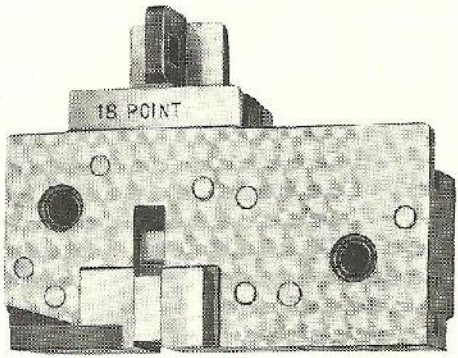
Remove mould from adaptor base and blow out water. Oil the mould and place it in box.

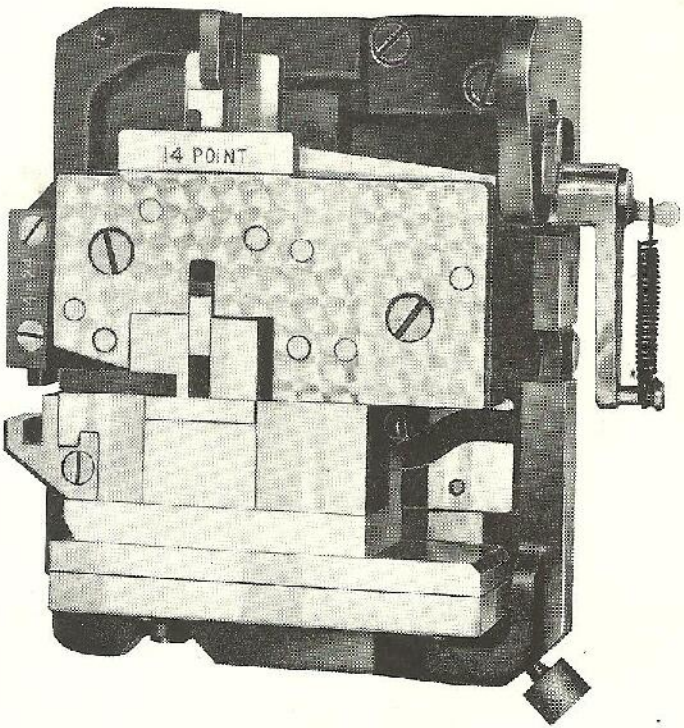
CHANGING FROM ONE POINT SIZE OF INSET TO ANOTHER

1. Prepare a place covered with clean paper, and have hands clean.
2. Remove crossblock.
3. Remove the two small screws 258 on side of base and two large ones 318 on top of inset.
4. The inset can now be removed by pushing it away from back of base in direction formerly occupied by the crossblock. To clear the aperture in base which positions the inset, push endwise to disengage the lever from the blade.

As the important sharp edges of the inset are unprotected when away from the base, extreme care must be taken that they are neither dulled nor damaged.

5. Blow waterways clear, and wipe and oil thoroughly before placing mould in its proper box.
6. The required inset and mould base must be thoroughly washed in clean benzine and dried with a clean white cloth; any small particle of type metal adhering to any part should be removed with a piece of





LARGE TYPE COMPOSITION MOULD ON ADAPTOR BASE

Shows mould blade inset section for changing the type sizes.

type metal rule. In no circumstances must abrasive material (such as emery-cloth or oilstone) be used.

Smear a light coating of clean oil on the bottom of inset and slide into position.

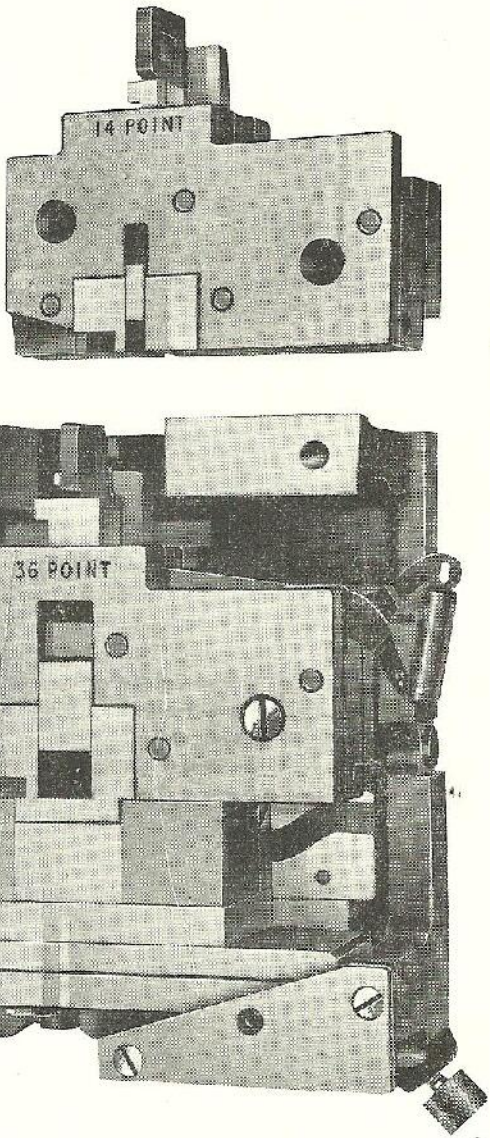
Insert the two small screws 258 for holding the inset to base and screw up firmly, then release and bring them just up to bearing. Insert the two large screws 318 and screw down firmly, then release and bring them just up to bearing. Finally, tighten the two small screws firmly, then the two large ones.

The crossblock must also be thoroughly washed before replacing, and care taken that the jet blade 3159 is in correct position, *i.e.*, the fluted end to the front. The crossblock must be oiled before inserting, and should work freely; if not, it indicates that the inset has been replaced with dirt between it and the base, in which case it must be taken out and cleaned.

DISMANTLING AND ASSEMBLING INSETS

If it is found necessary to take apart an inset, proceed in the following manner: prepare a suitable place and bear in mind that success or failure in making a satisfactory job will depend on scrupulous cleanliness and the preservation of the sharp edges of insets.

1. Drill $\frac{1}{4}$" hole in ingot of type metal.
2. Procure a steel punch of suitable size (which may be purchased from The Monotype Corporation Ltd.).
3. Plan a method whereby the tapered dowels are ensured of being replaced in the identical holes from which they are taken.
4. With the cover plate 3147–1 facing downward, place inset on the ingot of type metal, with the dowel 3197 over the $\frac{1}{4}$" hole; remove the dowels with the punch by giving the latter a sharp tap with a small hammer.
5. Remove the screws 263 and take off cover plate. Remove the blade back stop screw 325 in centre of intermediate plate 13616.
6. In removing the blades, slide them from front to rear. *Never lift the rear of the blades when passing them between the side blocks, nor try to force them over the nick pin, as this would injure the blade or nick pin.*
7. Clean carefully all parts which have been removed and insert blade. This is best done by placing the upper blade on the lower, and working backwards and forwards to make sure there is no dirt between them. Place the blades on the intermediate plate and hold them firmly down when sliding into position. These should also be worked backwards and forwards.
8. Before replacing dowels, pull a strip of clean cloth backwards and forwards through the holes.



DISPLAY TYPE MACHINE MOULD ON ADAPTOR BASE

With illustration of mould blade inset section for casting another size of type.

9. Replace the cover plate, clean the dowels and insert them lightly. Replace the cover screws 263 and bring them just up to bearing. Tap the dowels gently and tighten the screws a little. Tap the dowels home, and screw up firmly.

The water passages of mould must be kept clean, and whenever a mould is taken off the machine, blow water out and blow oil through them.

If any defects occur in the mould that cannot be corrected by following these directions, it is necessary only to return the particular inset which is troublesome. Return to The Monotype Corporation Ltd., with samples of the defective type and a memorandum giving particulars of trouble.

DISPLAY TYPE MACHINE MOULDS WITH 14 TO 36 POINT INSETS

(FOR PLATE SEE P. 70)

THE FOLLOWING INFORMATION describes the manner in which instructions for these moulds differ from instructions for composition moulds.

ATTACHING MOULD TO MACHINE

Use adaptor base a23SLL, bridge a1SE, mould oiler a15SLL, crossblock coupling hook 39SE1 and 14–72 point type channel block x30SE.

Connect the pin a24SE7 to type carrier cam lever extension b26SC3 in hole marked for size of type to be cast.

Make certain that the cap abutment 4SF8 is in correct position for 'setwise' size of type to be cast. *See subject headed:* ADJUSTMENTS WHEN PREPARING TO CAST TYPE, p. 9.

Set the plunger spring adjusting nut 5SF23 right forward against the stop collar 5SF24 and fulcrum pin a5SF18F in 'Small Type' position.

Use the type support spring cam bracket as instructed under subject headed: TYPE SUPPORT SPRING CAM, see p. 19.

REMOVING MOULD FROM MACHINE

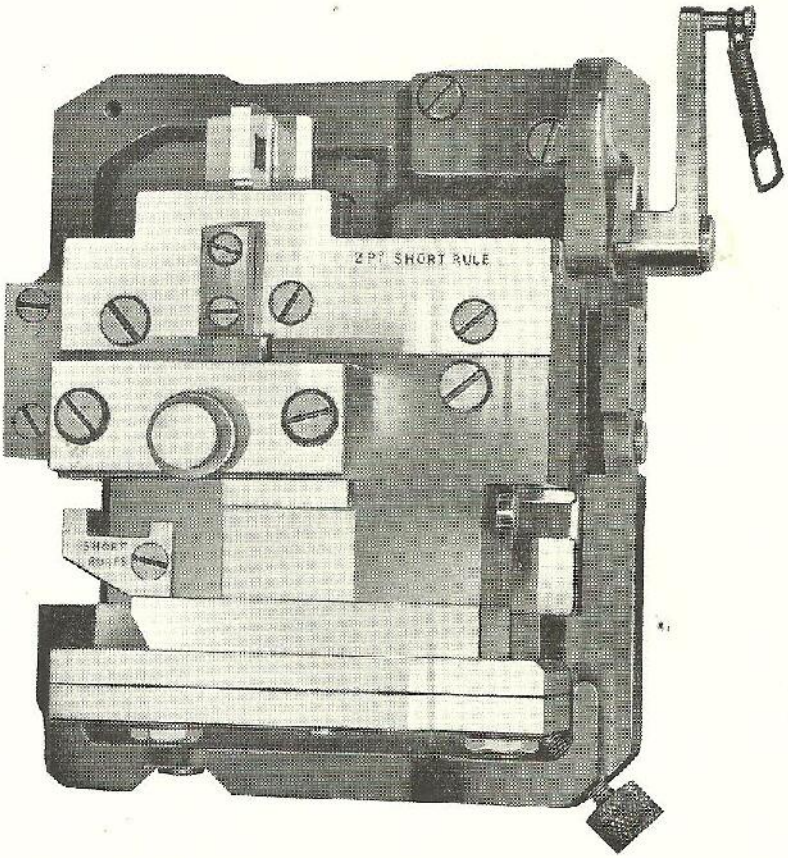
Remove bridge and proceed as for small type composition moulds, see p. 61.

CHANGING FROM ONE POINT SIZE OF INSET TO ANOTHER

Adjust blade to approximately 18 points, move blade operating lever spring box out of contact with lower blade lever and proceed as for changing insets on 14- to 24-point large type composition moulds, see p. 67.

DISMANTLING AND ASSEMBLING INSETS

Proceed as for 14- to 24-point large type composition moulds, see p. 69.



SHORT LEAD AND RULE MOULD ON ADAPTOR BASE

SHORT LEAD AND RULE MOULDS, 1½, 2 AND 3 POINT

(FOR PLATE SEE P. 72)

ATTACHING MOULD TO MACHINE

Place the mould in adaptor base x23SL and locate with screw 23SL5. Clamp the mould to the adaptor base with screw 23SL4.

Attach type clamp operating block d31SL to adaptor base with two screws 31SL2.

Attach 5–36 point mould blade fork 12SL to mould blade slide 4SF.

Place mould and adaptor base on machine, locating adaptor base against its two positioning faces by means of the two eccentric clamps 24SL1 and securing with three screws b17SL1, b23SL2 and b23SL3.

Connect mould blade to mould blade fork with pin 12SL5.

Remove the type support spring cam x27SE since the type support spring is not required for short rules.

When casting above 12 point in width, reverse mould blade slide driving block cap abutment 4SF8.

Set micrometer head to approximately 12-point cast, check product and alter micrometer head to suit.

Set wedge screw scale (Type) a10SF10 to read zero and lock with wedge screw clamp nut 11SF2.

ADJUSTING MACHINE

1. Adjust stroke of type carrier so that the line on top of the cross-block registers with the line on the inset when the carrier is in the casting position. The line for delivery position is not used.

2. Piston spring must be adjusted to give as little pressure as possible consistent with good results.

3. Use lead and rule nozzle 12SH12.

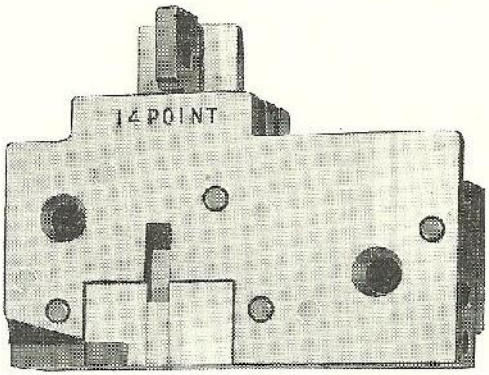
4. The type carrier connecting rod yoke pin a24SE7 must be connected in the 12-point hole of the type carrier cam lever extension b26SC3.

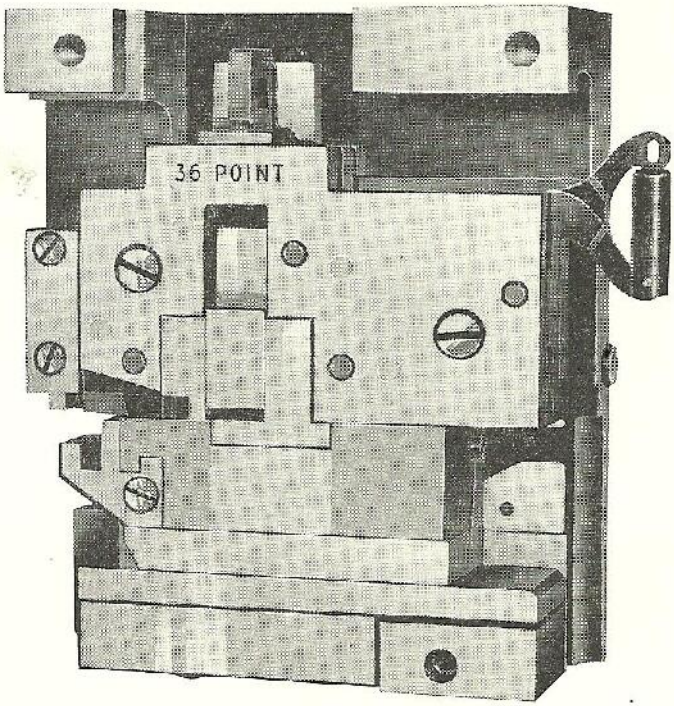
5. Ball end 6SF1F to be in 42 point position.

6. The type channel block (fixed) solid type, 14–72 point x30SE, must be used with this mould.

7. It may be necessary when using this mould on the Super Caster to remove the corners of the tenon on type channel block (adjustable) x28SE.

Speed of machine: 2–12 point opening 110 r.p.m.
13–24 point opening 90 r.p.m.
Over 24 point opening 80 r.p.m.





SUPER CASTER DISPLAY TYPE MOULD, 14 TO 36 POINT

With illustration of mould blade inset section for casting another size of type.

CHANGING FROM ONE STYLE OF PRODUCT TO ANOTHER

1. Take off the cover plate 11602 complete with matrix stop 11483.
2. Remove matrix or cap.
3. Remove the blade abutment 11058 and take out the blade.
4. Slide the required blade into position and replace blade abutment.
5. Replace cover plate complete with matrix stop and secure.
6. Carefully place matrix or cap in position using the matrix stop 11483 to keep it in contact with the crossblock. Before locking the matrix clamp screw 11066 by means of the nut 13453, move the blade backwards and forwards by hand to make sure that it is perfectly free.

The bridge spanning the side blocks prevents movement of these blocks; the safety plate stop 12665 on front of bridge should locate the matrix level with side blocks and just out of contact with crossblock. The bridge must, therefore, be accurately located.

There is no reason for the operative to remove the bridge; should he do so, however, he must make sure that, on replacement, the matrix does not come in advance of the side blocks.

The tapered dowels 3197 *locating the side blocks are assembled with the larger end in the intermediate plate,* i.e., *the opposite way to the insets of Display Type Machine and Super Caster Display Moulds.*

SUPER CASTER DISPLAY TYPE MOULDS, 14 TO 36 POINT

(FOR PLATES SEE PP. 74, 76)

THE FOLLOWING INFORMATION explains where instructions for these moulds differ from the instructions for composition moulds.

ATTACHING MOULD TO MACHINE

Attach bridge a1SE, use water supply piping 19SLL, mould oiler a15SL1, and 14–72 point type channel block x30SE.

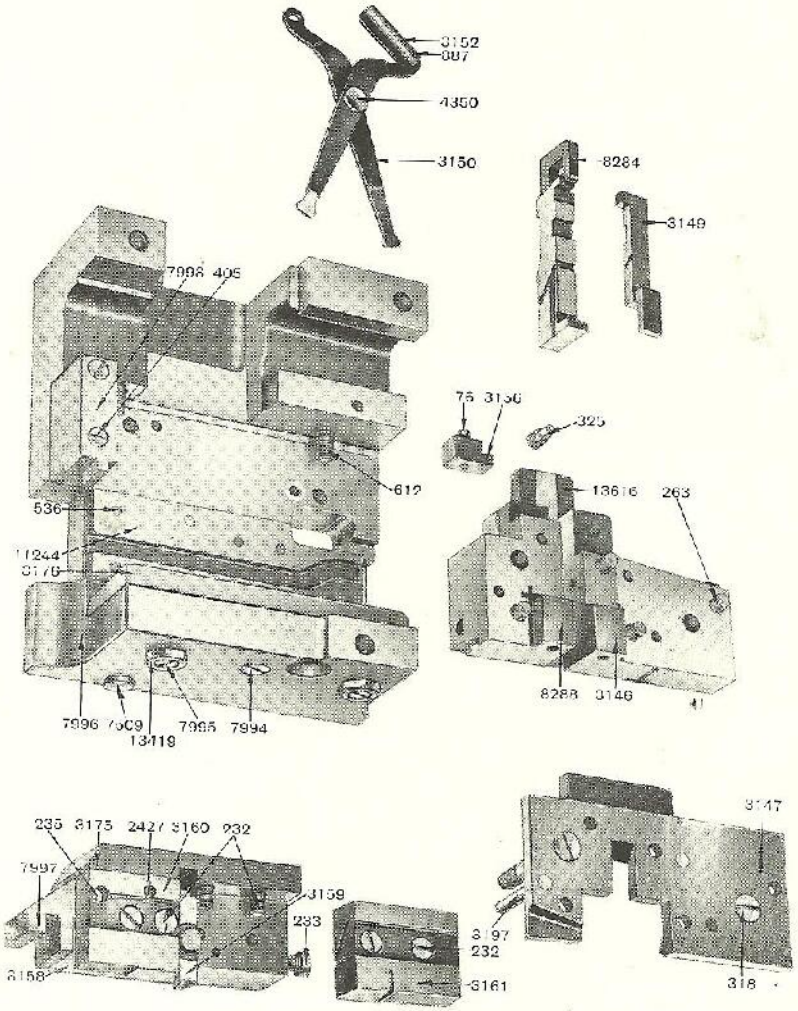
Connect the pin a24SE7 to hole in type carrier cam lever extension b26SC3 marked for size of type to be cast.

This mould does not require an adaptor base. It should be held against the locating faces by two clamps 14SL1 and secured to main stand by three screws b17SL1.

Make certain that the cap abutment 4SF8 is in correct position for 'setwise' size of type to be cast. Refer to subject headed: ADJUSTMENTS WHEN PREPARING TO CAST TYPE, see p. 9.

Set the plunger spring adjusting nut 5SF23 right forward against the stop collar 5SF24 and the fulcrum pin a5SF18F in the 'Small Type' position.

Use the type support spring cam bracket as instructed under heading: TYPE SUPPORT SPRING CAM, see p. 19.



PARTS OF A SUPER CASTER DISPLAY TYPE MOULD, 14 TO 36 POINT

REMOVING MOULD FROM MACHINE

Remove bridge and proceed as for small type composition moulds, see p. 61.

CHANGING FROM ONE POINT SIZE OF INSET TO ANOTHER

Adjust the blade to approximately 18 points, move blade operating lever spring box 3152 out of contact with lower blade lever and proceed as for changing insets on 14- to 24-point large type composition moulds, see p. 67.

DISMANTLING AND ASSEMBLING INSETS

Proceed as for 14- to 24-point large type composition moulds, see p. 69.

SUPER CASTER DISPLAY TYPE MOULDS, 42 TO 72 POINT

(FOR PLATES SEE PP. 78, 80)

THE FOLLOWING INFORMATION explains where instructions for these moulds differ from the instructions for composition moulds.

ATTACHING MOULD TO MACHINE

Attach bridge a1SE, use water supply piping 20SL, mould oiler 16SL1 and 14–72 point type channel block X30SE.

Connect the pin a24SF7 to hole in type carrier cam lever extension b26SC3 marked for size of type to be cast.

This mould does not require an adaptor base. It should be held against the locating faces by two mould clamps 14SL1 and secured to main stand by three screws b17SL1.

Make certain that the cap abutment 4SF8 is in correct position for 'setwise' size of type to be cast. Refer to subject headed: ADJUSTMENTS WHEN PREPARING TO CAST TYPE, see p. 9.

Set the plunger spring adjusting nut 5SF23 right forward against the stop collar 5SF24 and fulcrum pin a5SF18F in '42 to 72 point' position.

Use the type support spring cam bracket as instructed under subject headed: TYPE SUPPORT SPRING CAM, see p. 19.

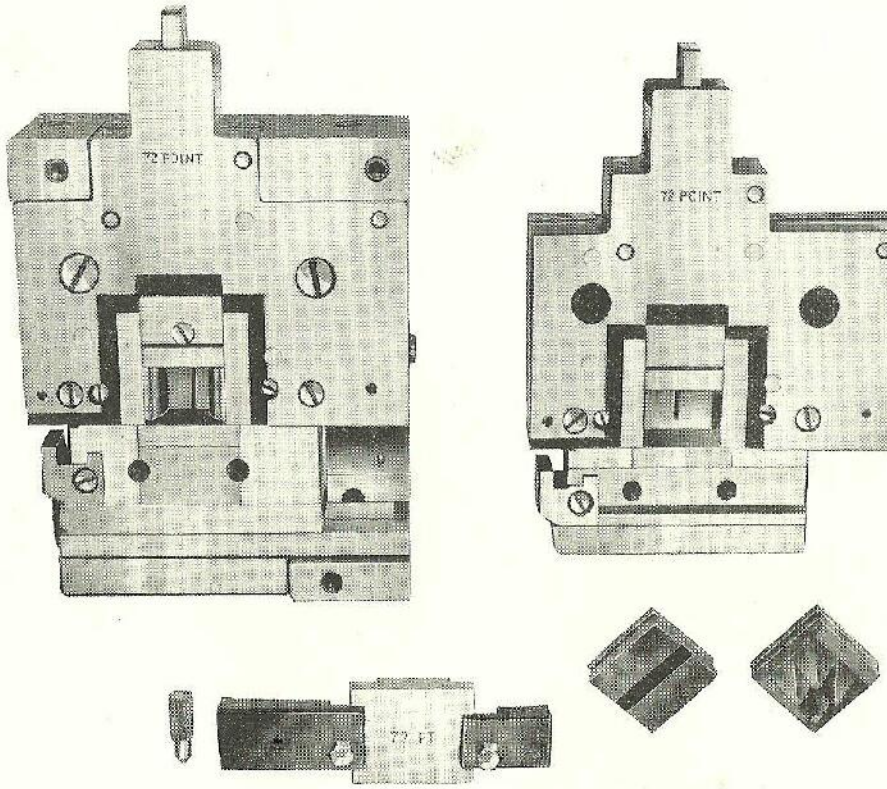
REMOVING MOULD FROM MACHINE

Remove bridge and proceed as for small type composition moulds, see p. 61.

CHANGING FROM ONE POINT SIZE OF INSET TO ANOTHER

Proceed as for 14- to 24-point large type composition moulds, see p. 67.

There are no blade operating levers in this type of mould. For casting low spaces, see under heading: CASTING LOW QUADS AND SPACES, p. 79.



SUPER CASTER DISPLAY TYPE MOULD, 42 TO 72 POINT

Shows mould blade inset section and special crossblock for casting hollow quotations, quotation core block, and cap for casting 72-point low spaces

DISMANTLING AND ASSEMBLING INSETS

Prepare a suitable place, and bear in mind that success or failure in producing a satisfactory job will depend entirely upon scrupulous cleanliness and the preservation of the sharp edges of insets.

1. Place inset on bench with the cover plate 7906 downward, and remove the three screws 613 that secure the cover plate, taking care to remove the correct screws only: *i.e.*, those which have their points flush with face of cover plate. Place these screws on the bench in such a manner that they can with certainty be replaced in the same holes. Turn inset over and remove the two screws 407 from front of cover plate. Do not remove or damage the dowel pins 7933.

Take off cover plate by inserting two screwdrivers under the plate in the slots provided, and gently prise it up.

2. Remove mould blade abutment 7907 by taking out the two small screws 131.

3. The blade can now be removed by sliding it toward the back of inset. *Never lift the rear of the blade when passing it between the side blocks, nor try to force it over the nick pin, or damage will be done to blade or nick pin.*

4. Clean carefully all parts which have been removed and insert blade. This is best done by placing the blade on the intermediate plate 7901, and holding it down while sliding it into position; do not push it straight, but work backwards and forwards until it is in position.

5. Make sure that cover plate and side blocks 8652, 8656 are clean. Replace cover plate on the pins and secure with the two screws 407 at the front; turn inset over and replace the three screws 613. Replace the mould blade abutment and the two screws 131.

The water passages of mould must be kept clean, and whenever the mould is taken off the machine, blow water out and blow oil through them.

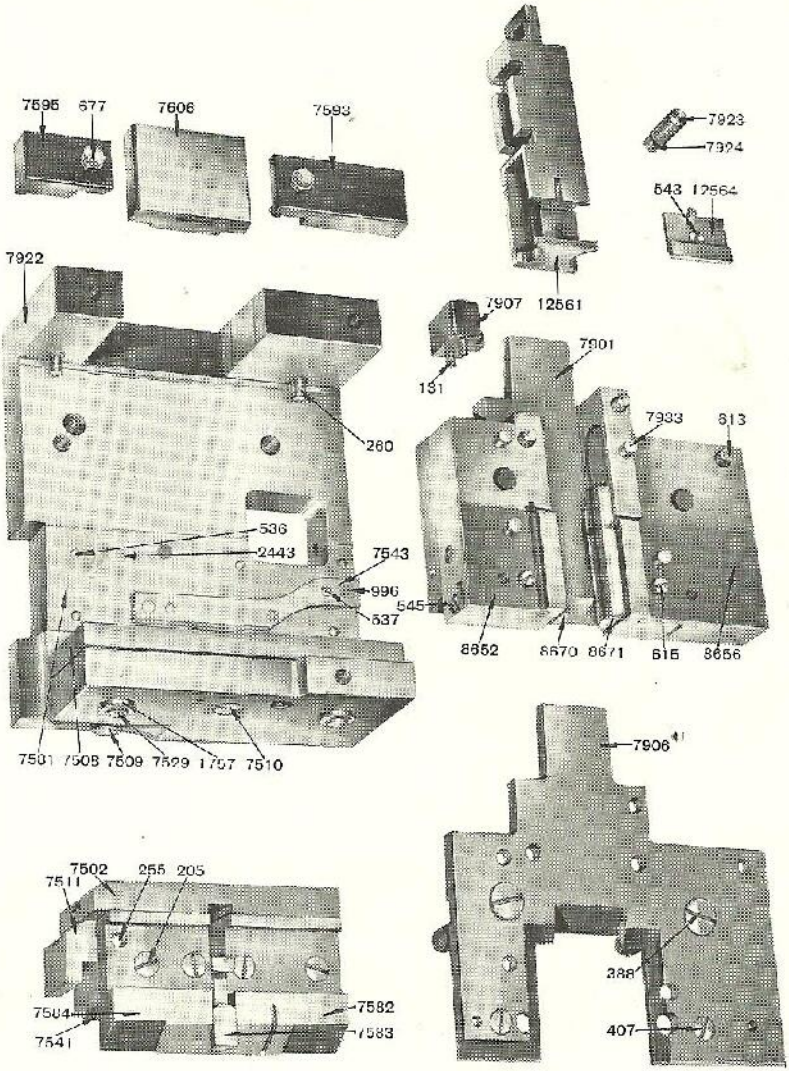
CASTING LOW QUADS AND SPACES

APPLICABLE TO SMALL TYPE COMPOSITION MOULDS WITH SQUARE NICK

The low quad lever on these moulds is operated by means of the spring 25SL attached to the lever 25SL1. To cast low quads and spaces, turn the lever 25SL1 toward the rear; to cast types or high quads, turn the lever toward the front.

APPLICABLE TO SMALL TYPE COMPOSITION MOULDS NUMBERED UNDER 20,000 FITTED WITH LOW QUAD MECHANISM—OLD STYLE

The low quad mechanism on these moulds is operated by means of the spring 28SL2 attached to the lever 28SL. To cast low quads and spaces, attach the spring to the post on left-hand side of adaptor base.



PARTS OF A SUPER CASTER DISPLAY TYPE MOULD, 42 TO 72 POINT

To cast types or high quads, attach the spring to the post on right-hand side of adaptor base. See illustration entitled: SMALL TYPE COMPOSITION MOULD ON ADAPTOR BASE, p. 58.

A special mould blade fork X26SL must be connected in place of the fork X12SL.

APPLICABLE TO SUPER CASTER, 14- TO 36-POINT DISPLAY TYPE MOULDS

Swing the blade operating lever spring box 3152 out of contact with the lower blade lever into the reverse position abutting on stop fixed to lubricator. It is not necessary to remove the bridge to make this adjustment. When casting low quads or spaces, it is important that a blank matrix be inserted in matrix-case, otherwise the pressure of the molten type metal will spring the blades apart.

APPLICABLE TO SUPER CASTER, 42- TO 72-POINT DISPLAY TYPE MOULDS

With inset of required point size in position, and crossblock fitted, remove the screw 543 from top of blade and, using mould blade cap handle 7923, remove blade cap 12564.

Make sure that the matrix seat and low space cap 7606 are clean, and assemble the cap on mould with slot toward crossblock. Assemble the two low space cap clamps 7593, 7595. In clamping with the two hexagon-headed screws 677, great care should be taken to clamp both sides of the cap evenly. This is best done by tightening both screws until they just bear, and then making them both moderately tight, finally tightening them firmly in position.

When reassembling the blade cap, make certain that blade and cap are perfectly clean.

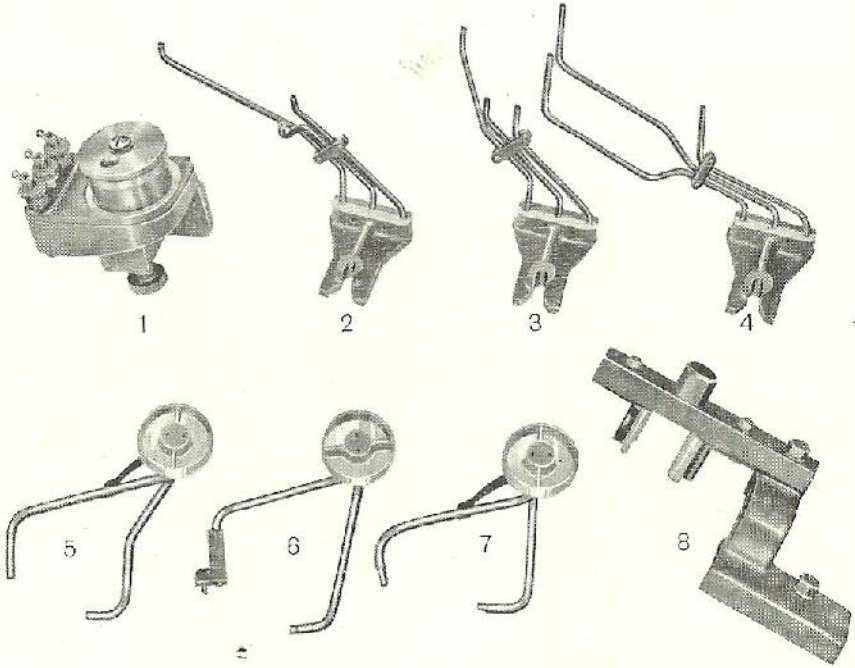
CASTING QUOTATIONS

APPLICABLE TO SUPER CASTER, 42- TO 72-POINT DISPLAY TYPE MOULDS

To cast quotations, it is necessary for the mould to be equipped with the special crossblock used for quotations only; this is additional to the inset required for each quotation point size.

The machine must be equipped with the type channel block (fixed) X30SE, and the matrix lifter lever shaft lever handle 17SE3 must be to the left. To set this handle in correct position, turn machine to 10° and lift the shaft lock pin 19SE, turn handle to left and release the lock pin 19SE, making sure that it locks the shaft 17SE1 with lever handle 17SE3 in correct position.

Open mould to correct set size required, insert the core in matrix holder 8SLL and place on machine, making sure that core is in correct



MOULD OILERS

(1 and 2) 1- to 3-point Lead and Rule Mould; (1 and 3) 4- to 18-point Lead and Rule Mould; (1 and 4) Furniture Mould; (5) Composition Mould; (6) Type Mould, 14 to 36 point; (7) Type Mould, 42 to 72 point; (8) Crossblock Oiler.

position over mould opening. Care must be taken to ensure that the quotation core, as it descends, does not foul the mould blade.

WOODEN-CORED QUOTATIONS FOR PLATE MOUNTING

Any Super Caster 72-point Display Type Mould can be equipped for casting wooden-cored quotations 72 point × 72 point and 72 point × 36 point, for mounting half-tone, electro or stereo plates.

The equipment consists of:

SPECIAL QUOTATION INSET and CROSSBLOCK for each plate thickness;
CORE PIECE for each point size and plate thickness;
CORE BLOCK HOLDER;
ASSEMBLY FIXTURE for holding wooden cores in position.

For use with this equipment, suitably prepared wooden cores are necessary.

To cast a wooden-cored quotation, a wooden core is attached to the core block holder. This enables the core to be lowered into the mould (slots downwards) and, at the casting operation, incoming metal surrounds the core, producing a lightened quotation with a flat surface into which mounting brads may be driven and securely retained.

The quotations may be assembled to suit any size of plate, and the uniformity of the flat surface reduces considerably the time usually taken in make-ready.

MOULD OILER Xb39SL

(FOR PLATE SEE P. 82)

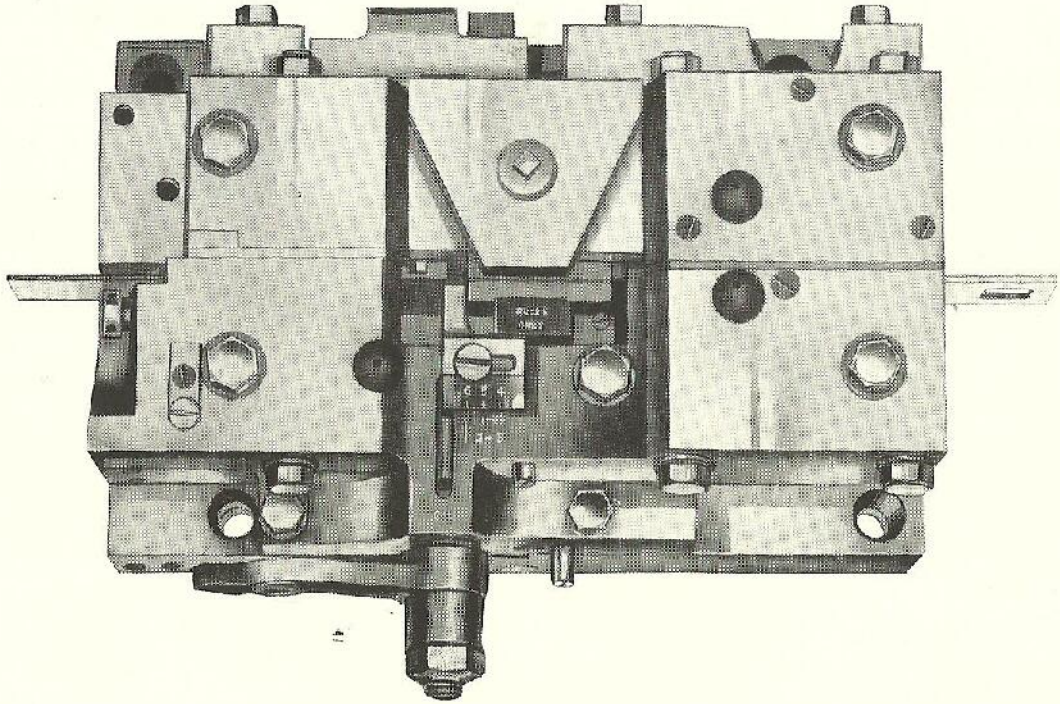
LUBRICATING THE 1- TO 3-POINT LEAD AND RULE, 4- TO 18-POINT LEAD AND RULE AND FURNITURE MOULDS

How the Oiler works.—A base attached to the counter bracket contains the oil and is provided with three valves for controlling the supply by drip feed.

A separate assembly of three pipes and support is supplied for each mould and is attached to the base by means of a knurled screw. Each pipe is arranged to carry the oil from the drip feed to an oil hole in the mould. To fill, rotate the dust cover above glass, until the hole in the cover corresponds with a hole in the cap, fill with castor oil, and return the cover to close the inlet hole.

How to adjust the Oiler.—The flow of oil is independently adjusted at each needle valve to give the correct supply, the amount being visible at the drip feed. When the valve lifters are vertical, the oil will feed. To shut off the supply, place the valve lifters in the horizontal position.

To adjust the supply.— Raise the valve lifters and rotate the adjusting screws until they are just out of contact with the lifters. In this position



SUPER CASTER LEAD AND RULE MOULD, 1 TO 3 POINT

the valve needles are on their seatings and the oil supply is shut off. Unscrew the adjusting screws a few notches to allow the oil to drip the desired amount. An excessive supply of oil will have a bad effect on the printing face of the product.

SUPER CASTER LEAD AND RULE MOULDS, 1 TO 3 POINT

(FOR PLATES SEE PP. 84, 86)

THIS MOULD is designed to cast rules and high and low leads in any point size from 1 to 3 as required.

The required point size is obtained by means of interchangeable insets, distance pieces, blades and caps.

DESCRIPTION OF MAIN PARTS OF MOULD

THE STRAIGHTENING DEVICE

This consists of a roller 8924 designed to direct the product as it leaves the mould. If the product has a tendency to rise, the knurled-head screw 8926 in end of side block should be turned anti-clockwise until straight product is produced.

THE MATRIX SETTING PLATE 10057

This is for setting the matrix in correct relation to the form on front of the mould blade. The markings on the plate are 4, 5 and 6 12-point ems, and these should be set to their zero lines in accordance with length of cast necessary to produce length of product required, *i.e.*, if the em scale on micrometer head is set at 5 12-point ems, the setting plate should also be at that position, taking care that the correct zero line is used.

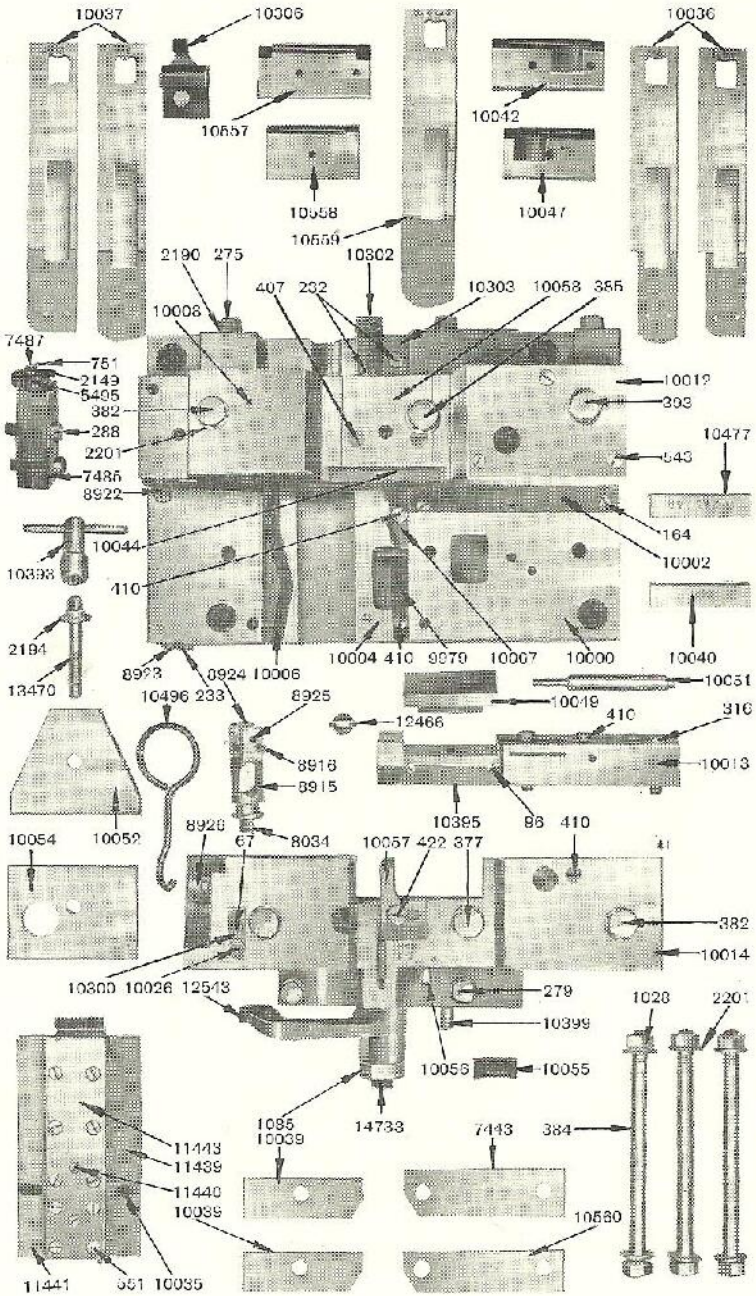
DOTTED RULE SUPPORTING PAD 8922

The dotted rule supporting pad in mould base should be raised in contact with bottom of the movable side block when making dotted rules; at all other times it should be locked in its lowest position.

SIDE BLOCK INSETS

These are of two designs: the plain ones are for 1½, 2 and 3 point, and can be supplied for matrices of .015″ or .030″ drive. The plates recessed at the back are for 1 point, and are made to suit a .015″ drive matrix only.

It is essential that the faces of this part and those to which it abuts on the side block are absolutely clean.



PARTS OF A SUPER CASTER LEAD AND RULE MOULD, 1 TO 3 POINT

THE LEAD CLAMP LEVER 12543

This is provided with an extension which acts as a safety stop. This stop must not be allowed to touch the main stand while the machine is casting. On the other hand, if the gap between the lever and the main stand is too great, the product will not be fully ejected from the mould.

Adjust the lead clamp screw 14733 so that there is a gap of approximately $\frac{3}{16}$" when the product is clamped.

ADJUSTMENTS

TO ADJUST

Release the lead clamp screw lock nut 1085 (which has a left-hand thread). Turn the machine so that the lead clamp lever is $\frac{3}{16}$" from the main stand. Firmly tighten lead clamp screw against spring block 10013. Tighten lock nut and rotate machine to check setting. Rotate machine by hand through the casting position and stop at the point where the telescopic rod is about to release the clamp screw. Attempt to release clamp screw by lifting the clamp lever upwards. If this can be easily done, it proves that the lever is touching and must be readjusted.

If any difficulty is experienced in making these adjustments, check the length of the lever rod xd9sd *as follows:*

From the top of the swivel collar 9sd15d to the top of the yoke b9sd8 should be $4\frac{11}{16}$" with spring compressed, and $5\frac{5}{8}$" free.

Frequently oil the threads and clamping end of screw by placing machine oil in the slot in movable side block where marked 'OIL'.

The setting of the lead clamp screw is of considerable importance. The aim should be to get the minimum withdrawal of the spring box rod 10sd2d from the spring box end 10sd1. Then the stop face of the lead clamp lever is approximately $\frac{3}{16}$" from the main stand.

ADJUSTING THE JET POSITION

Place the mould on machine and proceed as follows:

See that the jet block driving rod connecting rod yoke position pin a7sd7 is positioned for 1–1½ point. Turn machine to approximately 260° until the jet block 11438 rests against the jet block stop 10302. Adjust the jet block driving rod connecting rod 7sd, by loosening the lock nuts right hand and left hand, and turn the rod to right or left until there is just tension on the type carrier cam lever plunger a26sc12. Lock the nuts, taking care that the flat on the jet block driving rod b6sd remains in horizontal position. Check setting.

When the above adjustment is correct, the jet block driving rod connecting rod yoke position pin a7sd7 will be correct for all sizes cast on strip moulds, if placed in the 12-point hole in the type carrier cam lever extension b26sc3.

ASSEMBLING AND OPERATING THE MOULD

1. Select from the mould box the blade, distance pieces, cap or matrix, and piece of product to be used.

2. Smear blade with castor oil and place in position on blade connection.

3. Place the distance pieces 7443, 10039 in position.

4. Place the movable side block 10014 against the distance pieces and see that the lead clamp screw 14733 is not contacting the spring block 10013.

5. Insert and finger-tighten the five vertical screws 279 (2), 377, 382 (2), and three horizontal bolts 384. *Insert the vertical screws first.*

6. Lightly tighten the vertical screws with spanner.

7. Lightly tighten the horizontal bolts with spanner.

8. Repeat instructions in last two paragraphs in the same order, firmly tightening all eight screws and bolts.

9. See that the blade is quite free throughout its motion when the lead clamp is released.

10. Hold the straightening roller 8924 by means of roller carrier cam 10026 in top of side block 10014 and push the product in mould opening, so that the end will be covered by the matrix or cap.

11. Place matrix locator 10054 in position on fixed side block after making sure that all faces are perfectly clean.

12. Adjust the matrix setting plate 10057 to suit length of product to be cast. For leads, set at 4 ems.

13. If casting leads, place the cap on top of mould so that the projection enters mould opening, and clamp it into position.

14. If casting rules, fill the open end of matrix with soap which is sufficiently soft not to crumble.

15. Place the matrix in position against locator 10054 and setting plate 10057, taking care to put the end filled with soap toward setting plate.

16. Place the matrix clamp pad 10055 on top of spring block cover plate 10395 and lightly tighten the clamp screw 10056 in side block.

17. Place matrix clamp 10052 in position and firmly tighten the clamp screw 13470.

18. Release clamp pad screw and re-tighten, to make sure that the matrix is correctly seated on mould.

19. Connect the lead clamp intermediate lever rod b9SD to the mould.

20. See that the lead clamp screw is adjusted as previously described, see p. 87.

21. See that the micrometer head and counter head are adjusted to suit length of required product.

22. Connect mould blade slide drive lever connecting tube 6SF to intermediate lever a5SF1 by means of ball end 6SF1F, which must be placed in hole marked 'Leads'; lock ball end with nut 6SF2.

23. Attach water supply piping 21SLL.

24. Fill oiler with castor oil and connect oil pipes and place oiler valve lifters in vertical position.

25. See that correct nozzle (No. 10) 12SH11 is in position in $\frac{7}{8}$" pump.

26. See that metal is at correct temperature, see table on p. 156.

27. Turn on water supply.

28. See that gear box is set for correct speed, see table on p. 156.

29. Insert pump handle and turn machine to casting position, taking care that pump body operating rod lever 26SH is under crosshead stud 16SH5.

30. Adjust piston spring rod nut a17SH5 to suit point size to be cast.

31. Before starting to cast, rotate machine by hand with pump locked out, then engage pump and rotate machine again by hand to make first cast. This is to see that the mould and machine are working correctly before starting under power.

If the type carrier cam lever plunger a26SC12 throws out of engagement, the mould should be warmed up by swinging the pump into position for a short time before commencing to cast.

SUGGESTIONS FOR CASTING SATISFACTORY PRODUCT

1. Frequently clean both nozzle and pump.

2. Keep surface of metal clean to allow jets to melt as soon as they fall into metal pot.

3. Adjust the crosshead stud 16SH5 as low as possible for 1 to 1½ point, but loosen for 2 to 3 point.

4. When changing from one point size to another, remember to adjust the temperature regulator, so that metal is at required heat when ready to re-start.

5. When changing style of product, take a piece of product just cast and keep with the matrix. This can be used with the first cast when using the same matrix again, thus avoiding use of soap.

6. As soon as the product being cast is fusing correctly, test whether the product is straight, cast two long lengths of the product for which the machine is adjusted, lay them on the galley bracket foot to foot. If the feet do not touch throughout their length, the roller carrier actuating screw must be adjusted.

7. Marks on the side of the product usually indicate that the facing plate in the side block (fixed) against which the product is pressed by the roller is 'tinning'. Each time the mould is changed from one point size to another, it is advisable to rub both this plate and the insets with a piece of product to remove any foreign matter.

8. If the product is short, the lead clamp screw 14733 may not be correctly adjusted, or the matrix not properly located.

9. If the product is long ('blowing out'), the lead clamp screw may again not be correctly adjusted, or the screw may require oiling.

10. Always place a piece of product in the mould before applying pressure to the lead clamp lever 12543. Failure to do this may cause the spring block to be unduly strained.

11. Occasionally make sure that the oil has a clear passage through the small oil holes in side blocks and jet block.

REMOVING MOULD FROM MACHINE

1. Disconnect the mould blade slide drive lever intermediate lever a5SF1 by removing the ball end 6SF1r and move the lever so that mould blade is clear of blade slide housing.

2. Place oiler valve lifters in horizontal position.

3. Disconnect lead clamp lever.

4. Remove product from mould.

5. Disconnect water connection.

6. Remove four screws 18SL1 from mould base and the two mould clamps 14SL1 from front and right-hand side of mould. *Move front eccentric first.*

7. Pull mould towards metal pot until the blade is clear of the blade connection, and jet block is against jet block stop, then raise the 'ejection' end of mould by means of mould lifting hook 19ST1 until jet block is clear of its driving rod b6SD.

8. Blow the water out of the mould waterways and thoroughly clean mould before placing it in the mould box. If any defect should develop in the mould which cannot be corrected by following these instructions, the complete mould should be returned to The Monotype Corporation Ltd. for repair or adjustment. In returning a mould, send also a few pieces of the defective product or jets, with a note giving particulars of trouble.

If the defect is in the face of the rule, return the matrix which is giving trouble; otherwise do not return rule matrices with mould.

CLEANING INSTRUCTIONS FOR JET BLOCK 11438

Frequently remove the jet block for cleaning; it will usually be necessary to remove the jet pusher only, smear with castor oil and replace. If, however, the faces of the jet block require cleaning, proceed as follows:

Remove large plate 11439 only (the small plate 11441 must not be removed). Clean angle faces on both plates and pusher 10035 with a piece of rule (do not use abrasive material for cleaning). Thoroughly clean all other faces of the jet block including key and keyway.

To assemble, replace large plate and secure lightly with the six screws 551. Oil and replace pusher. Release locking screw 564 of eccentric pin 11440 and adjust position of the large plate by means of eccentric pin, until pusher is a good sliding fit, then lock the eccentric. Firmly tighten the screws 551 securing large plate. Smear all faces of jet block with castor oil before replacing in mould.

PREPARING MOULD FOR CASTING FULL-FACED RULES

1. Remove the insets from the mould and replace with the correct insets according to the size to be cast.
2. Assemble blade and distance pieces of the correct point size.
3. Assemble other parts of mould as for casting rules, but use blade cap 10561 in place of rule matrix.

SUPER CASTER LEAD AND RULE MOULDS, 4 TO 18 POINT

(FOR PLATES SEE PP. 92, 96, 98)

THIS MOULD is designed to cast high and low leads, continuous strip borders, rules, clumps and dashes, in any point size from 4 to 18 as ordered.

The required point size is obtained by means of interchangeable distance pieces, blades and caps.

Auxiliary parts can be supplied for casting full-faced rules and 12- and 18-point tie-up slugs.

DESCRIPTION OF MAIN PARTS OF MOULD

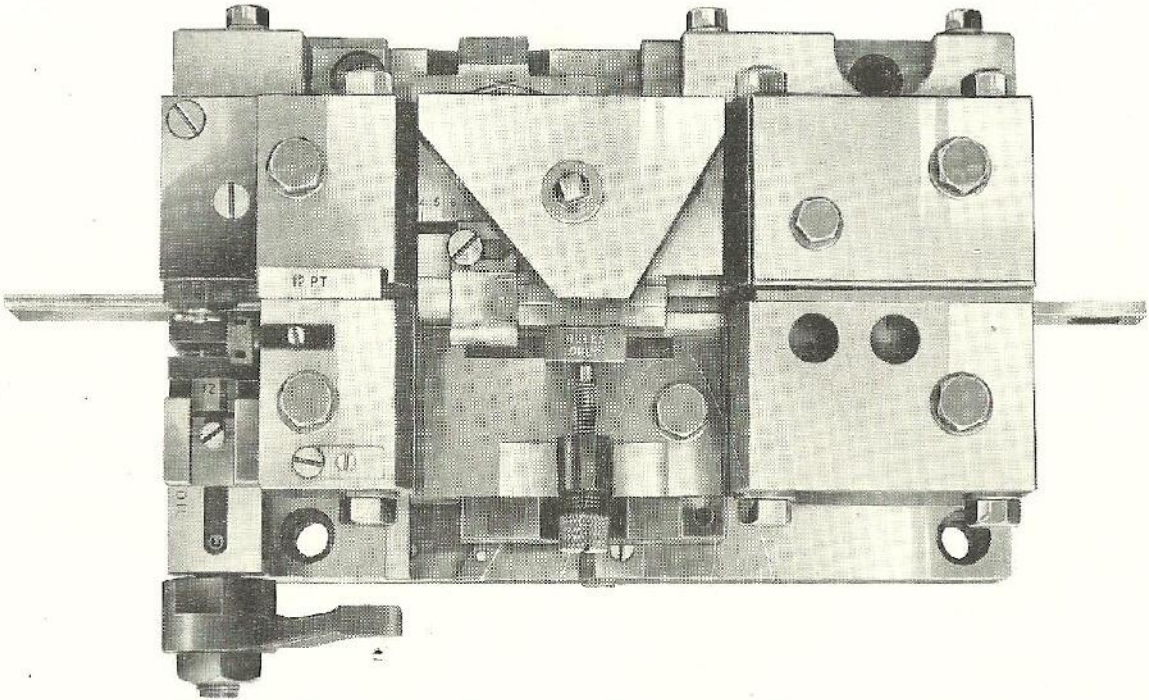
1. *The Mould Base* 10400 carries the nozzle seating plate 8824, jet cam 7418, base facing strip 10402 (on which the mould blade travels) and the supporting pad, etc., for use when casting dotted rules.

2. *The Jet Block* 12325 carries a jet pusher 7458 which is operated by the cam 7418. As the jet block travels from the casting to the ejecting position, the jet is pushed out of the block and contacts the jet stop which deflects it clear of the jet block through the base into the melting pot.

3. *The Side Block* (fixed) 10408 carries the left-hand inset and the matrix locator, etc. The locator for the dotted rule attachment is at the end of this block.

4. *The Side Block* (adjustable) 10416 carries the straightening device, the oil channel block 10460, the friction plunger 8913 and the right-hand inset.

5. *The Straightening Device* consists of a roller 8924 which is designed to direct the product as it leaves the mould. If the product has



SUPER CASTER LEAD AND RULE MOULD, 4 TO 18 POINT

Shows a patterned roller fitted, for impressing the strip printing surface with a continuous border pattern.

a tendency to rise, the knurled head screw 10426 in end of side block should be turned in an anti-clockwise direction until a straight product is produced.

6. *The Lead Clamp* 10403 and *Lead Clamp Screw* 10406 are located in the lead clamp screw block 10407 which is secured to the mould base at the end of the side block (adjustable). Distance pieces 10404 of varying width are provided for insertion between the lead clamp 10403 and lead clamp screw 10406. Once the lead clamp is set to clamp any particular size of product, any other size can be clamped without adjusting the lead clamp lever 12136, merely by using the appropriate distance piece.

The correct way to assemble this distance piece is with the marking indicating the point size upward, and reading the same way as the marking on the distance piece (front) 10427.

Frequently oil threads and clamping end of screw by placing machine oil in the slot marked 'Oil' on the lead clamp screw block.

7. *The Matrix Locator* (side) 10432 is placed on the side block (fixed). It carries the matrix locator (end), locates the rule matrix, and has a projection on it which acts as a splash guard. *It is essential that the faces of this part and those to which it abuts on the side block must be absolutely clean.*

8. *The Matrix Locator* (end) 10433 is secured to matrix locator (side) 10432, and is for setting the matrix in correct relation to the front of the mould blade. The marking on the matrix locator (side) is 4, 5, and 6 ems, and the locator (end) should be set to the appropriate mark to suit the length of cast necessary to produce the length of product required, *e.g.*, if the scale on the micrometer head is set at 5 ems, the matrix locator (end) should also be set in that position.

9. *The Matrix Sealing Slide* 10435 is located in the matrix locator (end) and is used for sealing the end of rule matrices when making the first cast, thus obviating the necessity for using soap.

The machine must always be turned by hand when making this first cast. Great care must be taken to lift the sealing slide clear of the face before attempting to eject the product from the mould.

10. *The Matrix Clamp Pad* 10055 is used with rule matrices only; it rests on the side block (adjustable), and presses the matrix against the locator when the clamp screw 7410 is tightened. This screw must be in the lower hole in the post when using this pad. *This part must not be used in conjunction with low blade caps.*

11. *The Matrix Locator Packing Piece* 10434 is used in conjunction with the matrix locator (side) when casting 18-point multiple-line rules only.

12. *The Dotted Rule Supporting Pad* 8922 in mould base should be raised in contact with the bottom of the side block (adjustable) when

making dotted rules; at all other times it should be locked in its lowest position.

13. *The Side Block Insets* 10421, 10423 or 10529, 10531 are located in the side blocks with the oil grooves nearest the blade.

14. *The Matrix Guide* 7035 is secured to the side block (fixed) and is used to position the border matrix holder and the dash matrix, and for locating high and low blade caps. It should be used for low leads up to and including 18 point, and for high leads, borders and dashes up to and including 12 point.

15. *The Matrix Guide* 10431 takes the place of matrix guide 7035 when casting 18-point high leads, borders, and dashes.

16. *The Matrix Guide Cover* 7400 is used in conjunction with either of the above matrix guides when casting borders or dashes. It is held in contact with the guides by the clamp screw 7410 placed in the upper hole of matrix cover clamp screw post 7409.

17. *The Matrix Guide Cover Clamp Screw* 7410 and *Post* 7409 are located in the hole at centre of side block (adjustable). The screw should be in upper hole in post when clamping matrix guide cover, and in lower hole when clamping the rule matrix clamp pad.

18. *The Matrix Clamp* 10429 is screwed to the side block (fixed) and is used for securing the blade cap when casting high or low leads, and the rule matrix when casting rules.

19. *The Friction Plunger* 8913 in the side block (adjustable) is designed to prevent the product moving back with blade.

CHANGING THE MOULD TO ANOTHER SIZE

DISMANTLING THE MOULD

Prepare a suitable place, and bear in mind that success or failure in producing a satisfactory job will depend entirely upon scrupulous cleanliness and the preservation of the sharp edges of insets.

1. Remove the side block (adjustable) 10416 by taking out the three horizontal bolts and three holding down screws. Disconnect the mould blade slide drive lever intermediate lever a5sf1 from its connecting tube x6sf by removing the nut 6sf2 and lifting the ball end 6sf1f clear of lever. Raise the lead mould blade stop lever (outer) 2sf3f to 15-em position, and move slide clear of slide housing.

2. Take off the blade and distance pieces.

3. Loosen screw 200, take off retainer 10405, and remove lead clamp distance piece 10404.

ASSEMBLING THE MOULD

4. Make sure all parts are perfectly clean.

5. Smear blade and distance pieces of required size with castor oil, and place them in position.

6. Select a piece of product of the size to be cast, and place it against the side block (fixed).

7. Place side block (adjustable) in position against the distance pieces.

8. Replace the three vertical screws 382 (2), 385, and then the three horizontal bolts 384 with side block spring 8083, washers 2201, and nuts 1028, tightening them with the fingers.

9. Lightly tighten vertical screws 382 (2), 385 with spanner.

10. Lightly tighten horizontal bolts 384 with spanner.

11. Repeat instructions given in last two paragraphs in the same order, firmly tightening all six screws and bolts. When casting up to and including 8 point, release front bolt nut $\frac{1}{2}$ turn to allow the necessary side block movement.

12. Place the lead clamp distance piece 10404 of the required size in position, and secure with the retainer 10405 and screw 200.

13. See that the blade is quite free throughout its travel when the lead clamp 10403 is released by lever 12136.

14. Connect blade to blade slide. It should be understood that, as the purpose of the connecting pin 3SF is to prevent slackness between blade and slide, there is no necessity to use it to lock the blade to the slide.

15. Return the lead mould blade stop lever (outer) 2SF3F to the 'leads' position.

16. Check that blade and slide are quite free when operated by lever.

17. Replace connecting tube ball end in correct hole in the mould blade slide drive lever intermediate lever.

18. Connect lead clamp lever 12136 to its connecting rod.

19. Place the matrix locator (side) 10432 in position on the side block (fixed) 10408, making sure that all faces are clean.

20. Slacken the screw 422 on matrix locator (side) and set matrix locator (end) 10433 to correct position to suit product to be cast.

21. If casting low leads, place the cap 7491 on top of mould, so that projection enters mould opening, and clamp it in position. For high leads, use cap 7649 which has no projection.

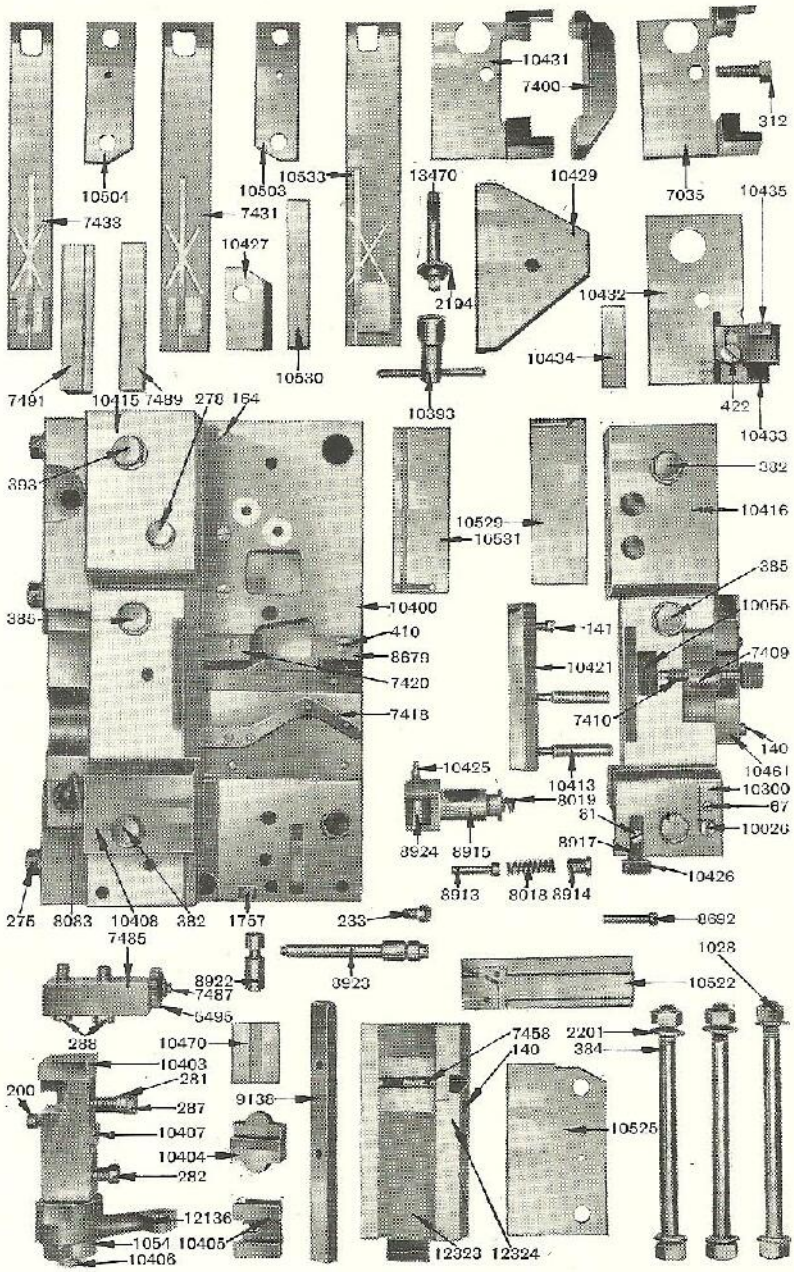
22. If casting rules, place the rule matrix in position against the locator, taking care that the open end of matrix is against the sealing slide 10435.

23. Place the rule matrix clamp pad 10055 on top of the side block (adjustable) 10416 and secure by lightly tightening the clamp pad screw 7410.

24. Place matrix clamp 10429 in position and firmly tighten the clamp screw 13470.

25. Release clamp pad screw 7410 and re-tighten to make certain that the matrix is correctly seated on mould.

26. Push down the matrix sealing slide 10435 until it contacts with side block insets, thus sealing end of matrix for first cast.



PARTS OF A SUPER CASTER LEAD AND RULE MOULD, 4 TO 18 POINT

INSTRUCTIONS FOR REMOVING INSETS WHEN NECESSARY FOR CLEANING PURPOSES

27. Remove the side block (adjustable) 10416 by taking out the three horizontal bolts 384 and three holding down screws 382 (2), 385.

28. Take off the blade 7431 and distance pieces 10427, 10503.

REMOVING RIGHT-HAND INSET 10421 FROM SIDE BLOCK (ADJUSTABLE) 10416

29. Take off oil channel block 10460 by removing two screws 140.

30. Remove inset screw (short) 141.

31. Remove inset screw (long) 10413 from centre of inset and place it in the hole from which the inset screw (short) 141 was removed.

32. Loosen the other inset screw (long) 10413 and push on both screws to eject inset.

REPLACING RIGHT-HAND INSET 10421 IN SIDE BLOCK (ADJUSTABLE) 10416

33. Make sure that the inset and its locating faces on the side block are perfectly clean and place inset in position.

34. Replace the three screws, putting the short one at end of inset nearest the blade.

35. Lightly tighten all screws.

36. Firmly tighten all screws.

37. Replace oil channel block.

REMOVING LEFT-HAND INSET 10423 FROM SIDE BLOCK (FIXED) 10408

38. Remove the side block holding down screw ($1\frac{1}{2}$" long) 385.

39. Take out inset screw (short) 141.

40. Remove inset screw (long) 10413 from centre of inset and place in the hole from which inset screw (short) was removed.

41. Loosen the other inset screw (long) and push on both screws to eject the inset.

REPLACING LEFT-HAND INSET 10423 IN SIDE BLOCK (FIXED) 10408

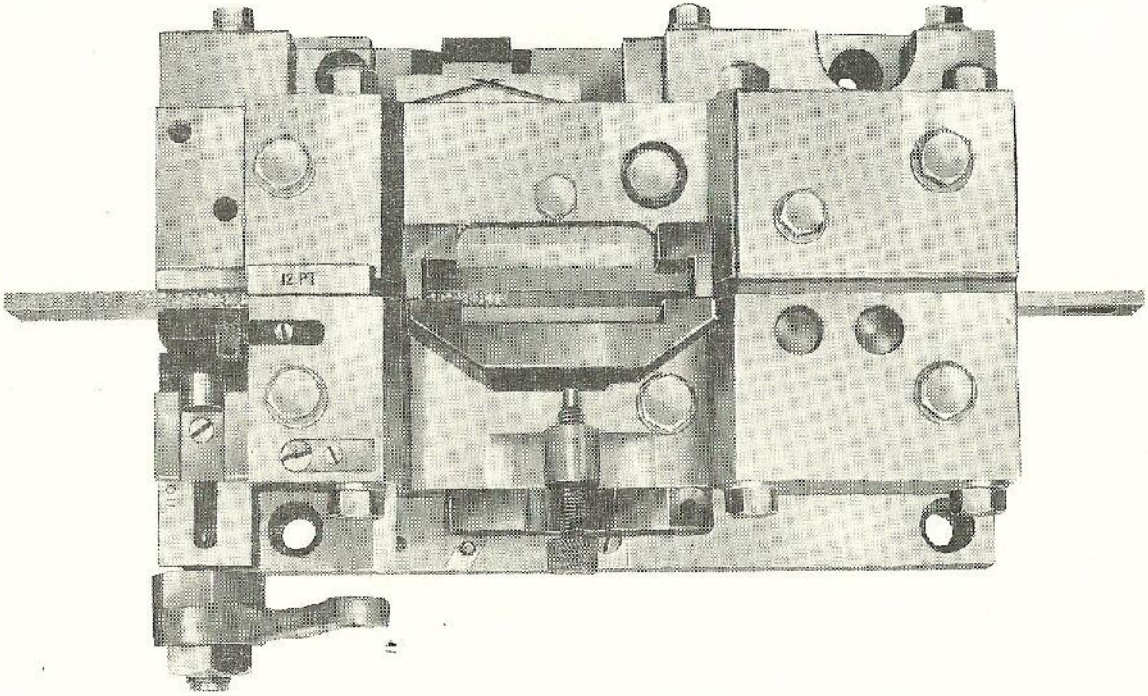
42. Make sure that the inset and its locating face on the side block are perfectly clean, and place inset in position.

43. Replace the three screws, putting the short one at end of inset nearest the blade.

44. Lightly tighten all screws.

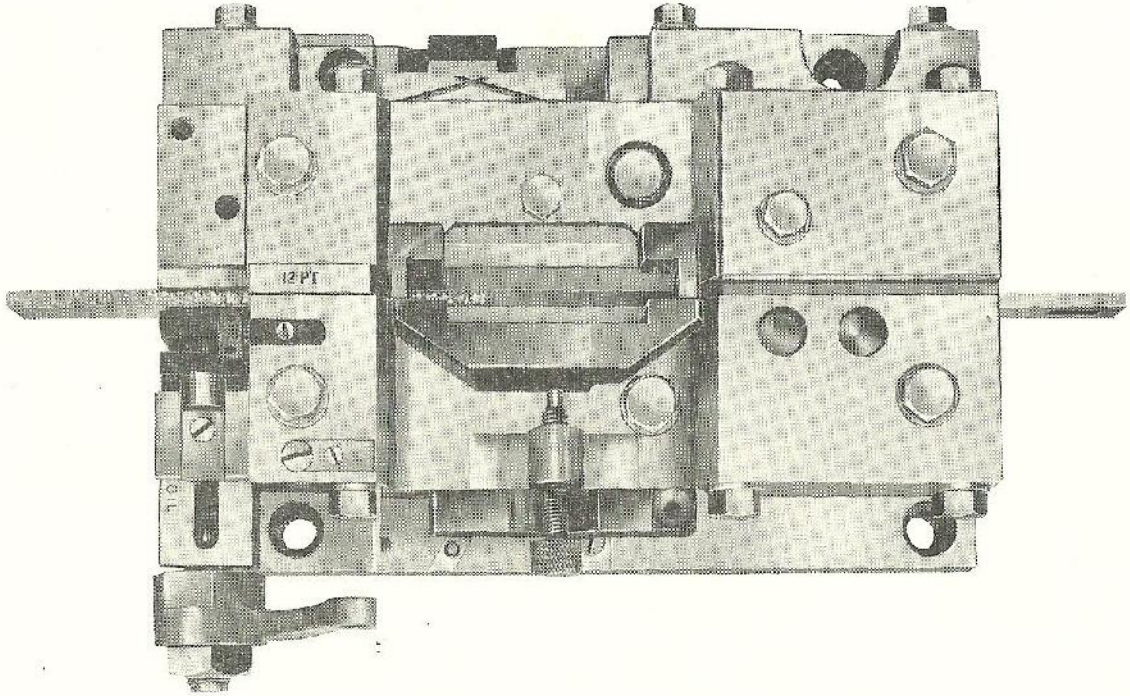
45. Firmly tighten all screws.

46. Replace the holding down screw.



SUPER CASTER LEAD AND RULE MOULD, 4 TO 18 POINT

Shows continuous strip border material being cast.



SUPER CASTER LEAD AND RULE MOULD, 4 TO 18 POINT

Shov continuous strip border material being cast.

REPLACING THE SIDE BLOCK (FIXED) 10408 WHEN IT HAS BEEN REMOVED FOR CLEANING PURPOSES

47. See that all parts are perfectly clean.

48. Firmly hold side block in position and assemble the three vertical screws 382, 385, 393 and three horizontal bolts 384 finger tight.

49. Lightly tighten all horizontal bolts with spanner.

50. Lightly tighten all vertical screws with spanner.

51. Repeat instructions in the last two paragraphs in the same order, firmly tightening all six screws and bolts.

ADJUSTING LEAD CLAMP 10403

Should it become necessary to adjust the lead clamp, proceed as follows:

1. Make sure that the correct lead clamp distance piece 10404 is in position, and that it is assembled correctly, see DESCRIPTION OF MAIN PARTS OF MOULD, paragraph 6, p. 93.

2. Adjust lead clamp screw 10406 so that, when the lever 12136 is in its lowest position, the rod 10SD2D withdraws $\frac{1}{4}$" from the spring box 10SD. In this position there should be about $\frac{3}{8}$" between underside of lever and main stand, and $\frac{3}{32}$" between inside boss of lever and mould.

ADJUSTING THE JET POSITION

1. See that jet block driving rod yoke position pin a7SD7 is positioned for 4 point.

2. Place the jet block setting piece 6ST3 so that the flat side (with clearance for nick) is against the side block (fixed).

3. Turn machine to casting position (220°).

4. Release the nuts 7SD1 and 7SD2 on jet block driving rod connecting rod 7SD, and turn the rod to right or left until the right-hand side of jet opening is exactly level with side of gauge.

5. Lock the nuts, taking care that the flat on driving rod b6SD remains in the horizontal position, and check setting.

When the above adjustment is correct, the jet block driving rod yoke position pin will be correct for all sizes cast on this mould, if placed in the 12-point hole in type carrier cam lever extension.

INSTRUCTIONS FOR CASTING VARIOUS KINDS OF PRODUCT

LOW LEADS

When casting low leads, the mould must be equipped with low lead blade, cap and distance pieces of the required point size.

HIGH LEADS

When casting high leads, the mould must be equipped with high blade, cap and distance pieces of the required point size, and the matrix clamp 10429. For high leads up to and including 12 point, use matrix guide 7035, but for 18 point use the matrix guide 10431.

DASHES

When casting dashes, the mould must be equipped with high blade, distance pieces of the required point size, matrix guide 7035 or 10431, guide cover 7400, and a dash matrix and holder. *When using dash matrices, always put the side on which the size is marked toward the matrix guide.*

RULES

When casting rules, the mould must be equipped with high blade and distance pieces of correct point size, matrix locator (side) 10432 complete with locator (end) and sealing slide, and rule matrix clamp pad 10055. For 18-point multiple-line rules, the matrix locator packing piece 10434 must be placed between the rule matrix and matrix locator (side). For instructions on assembling and operating these parts, see DESCRIPTION OF MAIN PARTS OF MOULD, paragraphs 7 to 11 inclusive, p. 93, and CHANGING THE MOULD TO ANOTHER SIZE, p. 94.

DOTTED RULES

When casting dotted rules, the mould must be equipped as for casting rules. The dotted rule attachment 9su must be secured to the side block (fixed) and the dotted rule supporting pad must be raised into contact with the bottom of the side block.

It is advisable to use this method for production of dotted rules only when the face of the rule is 3 point or less in width; for wider faces, cast as a border, using a suitable matrix. See DESCRIPTION OF MAIN PARTS OF MOULD, paragraph 12, p. 93.

CONTINUOUS STRIP BORDERS

When casting continuous strip borders, the mould must be assembled as for casting dashes, but the dash matrix and holder are replaced by border matrix and holder.

The border matrix holder is provided with a matrix sealing plunger which obviates the necessity for using soap when making the first cast. After taking first cast, remove matrix holder, raise the sealing plunger, and see that the border has not lifted with the matrix. The plunger can be lifted by means of the knurled knob on top of the holder, and is retained in this position by placing the projection at the bottom of

the knob in the shallow slot in the holder. See DESCRIPTION OF MAIN PARTS OF MOULD, paragraph 9, p. 93, for instructions on matrix sealing slide, which are applicable to this matrix sealing plunger.

When placing the matrix in the holder, insert the open end towards the sealing plunger.

The matrix lifter must be in its upper position in order to attach matrix holder.

Very carefully set the micrometer head for the length of border (the standard length is 6 12-point ems or .996″; any variation is stamped on the side of matrix).

Before taking a cast, turn the machine by hand to see that the matrix cam seats on the mould, and that, when the matrix is in its lowest position, the rod 14SD2D withdraws $\frac{1}{8}$″ from spring box 14SD.

Make the first cast by turning the machine by hand.

SUGGESTIONS FOR CASTING SATISFACTORY PRODUCT

1. Frequently clean both nozzle and pump.
2. Keep surface of metal clean to allow jets to melt as soon as they fall in metal pot.
3. Make sure that the jet opening is set correctly as explained under heading, ADJUSTING THE JET POSITION, see p. 99.
4. When changing from one point size to another, adjust the temperature regulator so that the metal is at the correct temperature when ready to re-start.
5. When changing style of product, take a piece of product just cast and keep with the matrix. This can be used for the first cast, when again using the same matrix.
6. As soon as the product being cast is fusing correctly, test whether the product is straight. Cast two long lengths of the product for which the machine is adjusted, lay them on the galley bracket foot to foot. If the feet do not touch throughout their length, the roller carrier actuating screw must be adjusted.
7. Occasionally make sure that the oil has a clear passage through the oil hole and oil channels.
8. See that speeds, temperature and trip are set in accordance with PRODUCT INFORMATION TABLE on p. 156.
9. When casting 18-point material, make sure that the pin 2SG4 is connected in the *outer* hole of the cutter actuating plunger link a4SG3, otherwise the product as it leaves the mould will strike the lead stacker.
10. Secure the cutter blade bracket with the screw a6SG3 and the washer 6SG15, in addition to those used for the smaller sizes.
11. For 4-point material, water should be half turned on; for 6 point and upwards, fully turned on.
12. Make sure that the oiler is kept full with castor oil, and that the lead clamp screw is oiled with machine oil.

AUXILIARY PARTS FOR CASTING 12-POINT TIE-UP SLUGS

To enable 12-point tie-up slugs to be cast in this mould, the following parts are required:

1. Inset (right-hand) 10522, complete with facing plate.
2. Distance plate 10525.
3. *Blade (low lead) (6 point) 7433.
4. *Blade distance piece (rear, low leads) (6 point) 10504.
5. †Blade distance piece (front) (12 point) 10427.
6. †Blade cap (low leads) (12 point) 7491 standard height or 7489 special height.
7. Friction plunger 8692.

PREPARING THE MOULD FOR CASTING 12-POINT TIE-UP SLUGS

1. Remove the inset (right-hand) from the side block (adjustable) and replace with the inset (right-hand) 10522, as explained on p. 97.

2. Remove the friction plunger spring abutment 8914 and take out the spring 8018 and plunger 8913, place the plunger 8692 in position and replace the spring and abutment. Remove cam retaining pin 10300 and cam 10026 and take out the roller carrier, complete, and spring 8019.

3. Assemble blade (6 point), blade distance piece (rear), low leads (6 point) and blade distance piece (front) (12 point). Place distance plate 10525 in position against the distance piece (rear), replace side block (adjustable) and secure with the three bolts, as explained on p. 95.

4. Assemble other parts of the mould as for casting 12-point low leads.

AUXILIARY PARTS FOR CASTING FULL-FACED RULES

To enable full-faced rules to be cast in the mould, the following parts are required:

1. Inset (right-hand) 10529.
2. Inset (left-hand) 10531.
3. Blade 10533 (one per point size).
4. Blade distance piece (rear) 10535 (one per point size).
5. Blade cap 10530.
6. Blade distance piece (front) 10427 (one per point size).

This distance piece is part of the standard equipment of the mould for 4- to 18-point material, so that only one (per point) of this part is required if casting 4- to 18-point material and 4- to 18-point full-faced rules of the same point size.

* These pieces are part of the standard equipment of the mould for casting 6-point material, so that only one of each of these parts is required if casting both 6-point material and 12-point tie-up slugs.

† These pieces are part of the standard equipment of the mould for casting 12-point material, so that only one each of these parts is required if casting both 12-point material and 12-point tie-up slugs.

PREPARING THE MOULD FOR CASTING FULL-FACED RULES

1. Remove the side block insets from the mould and replace with the insets 10529 and 10531, as explained on p. 97.

2. Assemble the blade 10533 and distance pieces 10535 and 10427 of the correct point size.

3. Assemble other parts of the mould as for casting rules, but use blade cap 10530 in place of rule matrix.

SUPER CASTER FURNITURE MOULD

(CASTING TO PREDETERMINED LENGTHS)

(FOR PLATES SEE PP. 104, 106)

THE FURNITURE MOULD is normally equipped for 24-, 36-, 48-, 60- and 72-point furniture, but its range can be extended to include 24-, 36- and 48-point mounting material, two-way mounting material, 36-, 48-, 60- and 72-point type-high foundry furniture, 18-point full-faced rules and numerous other shapes of product to individual requirements.

Predetermined lengths are obtained by a pre-set rear wall (blade guide) and an external length control that adjusts the position of the ejection stop for completed lengths.

REAR WALL AND BLADE

These parts are adjustable so that the length of each fusing cast can be from 3 to 6 ems inclusive.

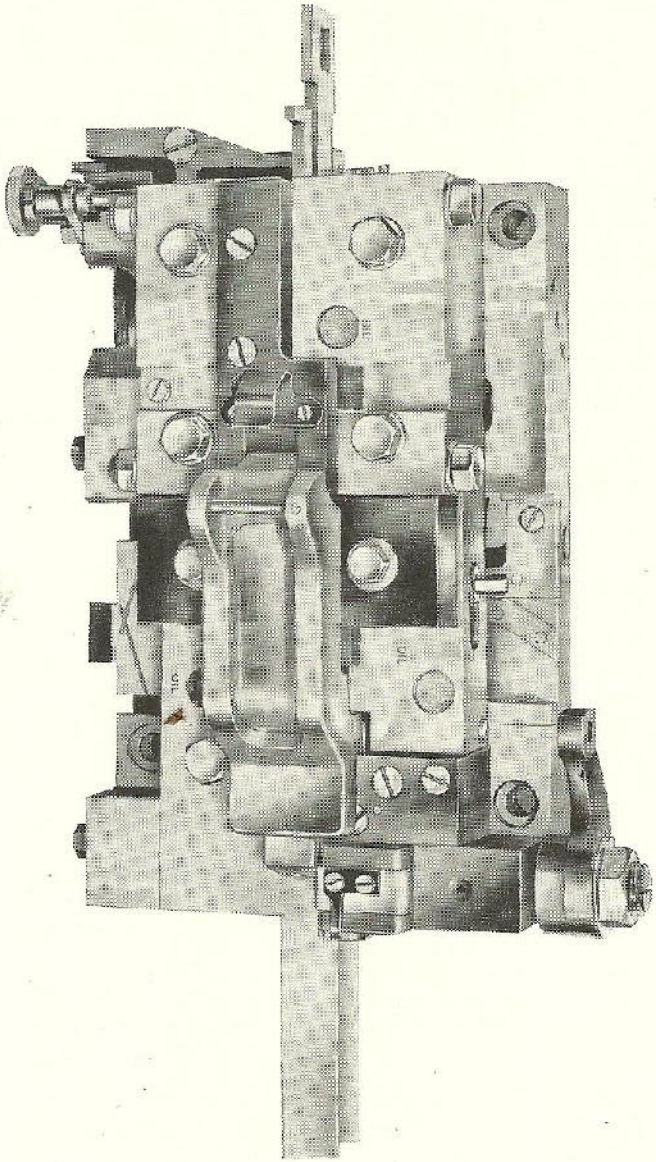
Fusing casts must not exceed 6 ems in length.

EJECTION STOPS

The ejection stop for fusing casts is controlled by the counter mechanism and is withdrawn when the required number of fusing casts has been made; the completed length is then ejected a further amount to the non-fusing stop. This additional amount is a minimum of 5 ems, but a conveniently placed external adjustment permits the 5 ems to be increased by an amount equal to the total contraction of the lengths of type metal. The external adjustment consists of a graduated wedge and screw indicating each .001″ and .010″ of variation from the 5 em addition. By this means, the completed lengths are consistently cast to the required measure.

The various core pieces, caps, blades, distance pieces, etc., are clearly marked to indicate the purpose for which they are to be used.

The clamping shoe lever pivot 9974 regulates the level at which pressure is applied to the clamping shoe 10291. Set the pivot 9974 in the 60- to 72-point position when casting mounting material and full-faced rules.



SUPER CASTER FURNITURE MOULD

Friction applied by the plate 9947 and clamping shoe 10291 ensures that the product remains in the position to which it is ejected whilst clamp is released.

The jet block 12530 is designed with two jet cavities so that metal from the nozzle is divided to ensure a satisfactory fusing of the product.

CHANGING FROM ONE PRODUCT TO ANOTHER

The packing plates 11206 and 11207 should be between mould base and side block (large) 15712 when casting furniture .697" in height. Take them out when preparing mould for mounting material or the upper half of foundry furniture (jet on face). Use plates 11561 and 11562 when casting 18-point full-faced rules. Use plates marked 'foundry furniture' when casting the upper half of foundry furniture, with jet on side.

When mould is equipped for product other than furniture, the side block (large) is machined for the attachment of facing strips of various thicknesses to suit the width of product. The mould must also be equipped with the appropriate clamping shoe, friction plate, blade, distance piece, and adjustable rear wall.

PREPARING MACHINE

Mould Blade Slide Drive Lever xa5SF. Make sure that the plunger b5SF4 is held back by the lock pin a5SF5.

Remove the existing mould blade slide drive lever plate 5SF2 and fit the new plate b5SF2 marked '15739 and Furniture'. This special plate must be used for predetermined lengths of furniture to absorb excess movement of the intermediate lever a5SF1 when making the shorter fusing casts.

Set the eccentric pin a5SF18F at the 40- to 72-point position. Make sure that the nut 5SF23 is screwed into contact with its stop collar 5SF24, thus causing the spring b5SF11 to exert maximum pressure.

Galley Mechanism. Remove the lead guide bracket b15SG and the cutter blade bracket b6SG.

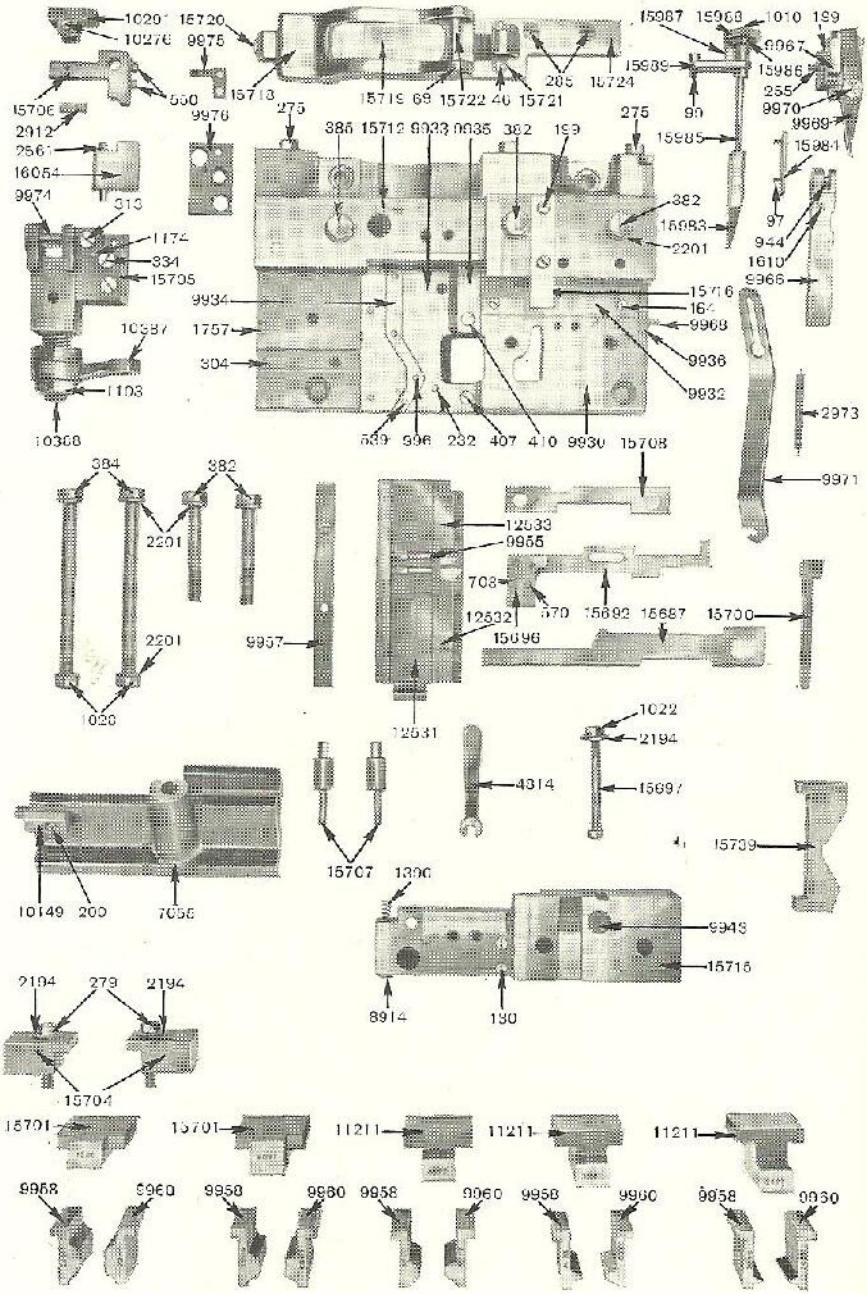
Place the lead stacker out of action by removing the pin 2SG4. Remove lead stacker bar 16SG7.

Attach mould to machine, making sure that the eccentric pin 3SF holds blade in contact with its slide 4SF.

Attach furniture guide.

Connect the mould blade connecting tube ball end 6SF1F to the hole marked 'Furniture'.

Micrometer Head. Remove the existing wedge indicator scale (leads) 9SF5 and fit the new scale a9SF5 with additional graduations for 3 and 3½ ems. (Machines numbered 71090 and onwards incorporate this new scale).



PARTS OF A SUPER CASTER FURNITURE MOULD

Raise lead mould blade stop lever handle 2SF5 to its uppermost position instead of the position marked 'Furniture', as on machines numbered prior to 71090.

Jet Block Driving Rod Connecting Rod 7SD. Connect the jet block driving rod connecting rod yoke position pin a7SD7 in the 12-point position on intermediate lever a5SF1.

Pump. Use $1\frac{1}{4}$" pump and No. 5 nozzle 12SH3.

ADJUSTING AND OPERATING MOULD

1. Move cap and core pieces to front end of mould.
2. Release adjustable wall clamping nut at rear of side block (large).
3. Place the 3-em setting gauge 15700 between the 'fusing' stop and lower edge of blade. Adjust the micrometer wedge so that gauge is lightly held in position, and set the scales 10SF4 and a10SF10 in wedge screw handwheel to zero. Make sure the new wedge indicator scale a9SF5 is correctly positioned at 3 ems.

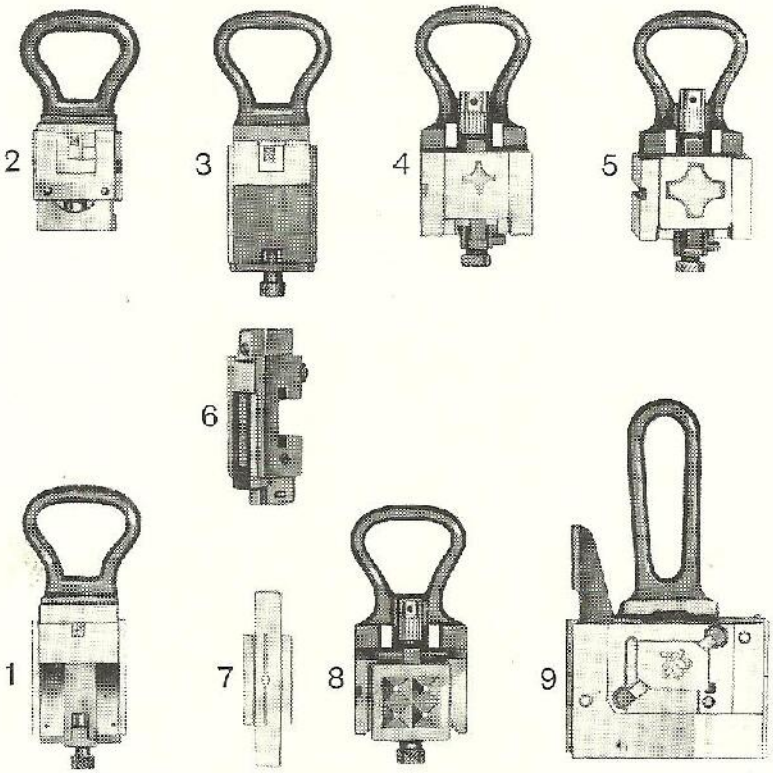
SETTING THE COUNTER HEAD AND MICROMETER HEAD

As there must always be a 5 em addition to the total length of the fusing casts, it is obvious that this amount must be subtracted from the required length before referring to the counter head drum for the number of casts and lengths of each cast. If, however, the information is obtained from the furniture lengths table (see pp. 152, 153), do not subtract 5 as this is already allowed for in the table.

4. Adjust counter head and micrometer head as indicated by drum or table.
5. Rotate machine so that mould blade is in its extreme backward position as dictated by position of micrometer wedge.
6. Move the adjustable rear wall into contact with the stop face on blade and lock in position. The wall is now correctly set for the required length of cast.
7. Apply castor oil to the core pieces and assemble them in contact with the rear wall so that the bevelled edge of each core piece is toward open end of mould.
8. Place cap between core pieces and in contact with wall. Clamp in position.
9. Insert a piece of product in open end of mould after raising upper end of clamping shoe lever 15706 to withdraw clamping shoe.
10. Make sure that clamping screw 10388 is adjusted so that there is approximately $\frac{1}{32}$" compression in spring box x10SD.

All components required specially for supporting material are marked 'S' in addition to the point size or sizes.

See PRODUCT INFORMATION TABLE on p. 156 for speeds, temperature, pump pressure, etc. 48-point supporting material should be cast at one



MATRIX HOLDERS

1. For Standard (Small Type) Composition Matrices .2″×.2″.
2. For Extended (Small Type) Composition Matrices .2″×.4″ or .4″×.2″ or .4″×.4″.
3. For Large Type Composition Matrices .4″×.2″ or .4″×.4″.
4. For 1″ (Pointwise) Display Matrices.
5. For 1⅛″ (Pointwise) Display Matrices.
6. For Border Matrices.
7. For Dash Matrices.
8. For Quotation Cores.
9. For Electro (U.S.A.) Matrices.

speed lower than indicated on table; 18-point full-faced rules should be cast at 18 r.p.m.

18-point full-faced rules may be cast to predetermined lengths or sheared to length as for leads and rules. For the latter, make sure that the pin 2SG4 is connected in the outer hole of cutter actuating plunger link a4SG3, otherwise the product will foul the cutter blade.

Remove the link 1SD4 so that 'fusing' stop is permanently in position.

FURNITURE TRIMMING ATTACHMENT

As the non-fusing cast does not always produce a perfectly clean end to the completed lengths, it is advisable to fit the trimming attachment to the end of galley bracket so that the rim of detachable box just clears the sorts tray.

The knurled nut on attachment should be set so that the front of shear blade is level with the clean portion of end to be trimmed.

Super Casters numbered prior to 70639 are equipped with a length gauge that must be removed whilst this attachment is in position.

MATRIX HOLDERS

(FOR PLATE SEE P. 108; FOR TABLE SEE P. 159)

HOLDERS are supplied for carrying the various styles of matrices in correct positions over the mould. The various holders and their uses are described in the following paragraphs.

.2″ × .2″ MATRIX HOLDER Xa3SL

This holder is used only for the .2″ × .2″ matrix. The matrix must be placed in the holder with the designation number to the right when holder is in position on machine. Squaring plungers a3SL12 and a3SL13 are provided in the holder to ensure that any matrix that has become badly worn shall still be held quite squarely.

DISMANTLING THE .2″ × .2″ MATRIX HOLDER

Remove the handle a3SL1 complete with plate 3SL26 and spring washers 3SL3 by removing the two screws 3SL2.

Remove six screws 3SL15 and slide off matrix holder guide plate a3SL14L together with matrix retainer a3SL11.

The squaring plungers a3SL12 and a3SL13, plunger levers 3SL16, plunger lever spring a3SL18 and support wire a3SL19 can now be removed.

ASSEMBLING THE .2″ × .2″ MATRIX HOLDER

Replace plunger levers 3SL16, plunger lever spring, support wire and squaring plungers a3SL12 and a3SL13.

Slide into position the matrix holder guide plate a3SL14L, together with matrix retainer a3SL11, and secure with six screws 3SL15.

Replace handle a3SL1, plate 3SL26 and secure with spring washers 3SL3 and screws 3SL2.

.2″ EXTENDED MATRIX HOLDER Xa4SL

This holder is used for the .2″ extended matrices, and is provided with a matrix locating block 4SL6 to enable any of these matrices to be used (whether extended above or below the line). This locating block is secured by means of the screw 4SL7.

When inserting a .2″ extended matrix in the holder, another matrix or blank matrix must be used, to make up an over-all size of .4″×.4″.

Before placing holder in machine, make certain that the cone hole is in correct position to engage with the centring pin.

DISMANTLING THE .2″ EXTENDED MATRIX HOLDER

Remove the wires and plate 4SL9L. Slacken the screw 4SL7 and remove the matrix locating block 4SL6.

Take out the four screws 4SL2 and remove cover a4SL1, when the plungers 4SL10 and springs 4SL11 can be removed.

Remove handle a4SL3, insulating packing pieces 4SL12 by removing the two screws a4SL4.

ASSEMBLING THE .2″ EXTENDED MATRIX HOLDER

Assemble the handle a4SL3 together with insulating packing pieces 4SL12 and secure with screws a4SL4. Replace plungers 4SL10, springs 4SL11, cover a4SL1 and secure with four screws 4SL2. Place in position the matrix locating block 4SL6 and tighten the screw 4SL7.

Replace the wires and plate 4SL9L.

.4″×.4″ MATRIX HOLDER Xa5SL

This holder is used for the .4″×.4″ and the .4″×.2″ matrix; when the .4″×.2″ is being used, another matrix of the same size must be located in the holder to retain the matrix in the correct position.

The matrix must be placed in the holder with the designation number to the right when holder is in position on machine.

DISMANTLING THE .4″×.4″ MATRIX HOLDER

Remove the handle a5SL3 with plate 5SL12 and insulating packing pieces 5SL11 by taking out screws 5SL4.

Remove six screws 5SL2 and slide off guide plate a5SL1L together with matrix retainer a5SL6.

ASSEMBLING THE .4″×.4″ MATRIX HOLDER

Slide into position guide plate a5SL1L together with matrix retainer a5SL6 and secure with six screws 5SL2. Replace handle a5SL3, plate 5SL12 and insulating packing pieces 5SL11, and secure with two screws 5SL4.

1″×1″ MATRIX HOLDER Xa6SL

This holder can be used for 1″×1″, 1″×1⅛″ and 1″×1.35″ matrices. The matrix is inserted in the holder by pulling back the rear clamp 6SL6 until it can be given a quarter turn to permit the matrix to be inserted. The matrix must be placed in the holder with the designation number toward the handle. Secure the matrix by reversing the rear clamp until the projection abuts on the matrix. When clamping the 1″×1″ or 1″×1⅛″ matrix, the rear clamp is turned so that the right-angled projection clamps the matrix, but when a 1″×1.35″ matrix is in the holder, the straight projection must be used.

A knurled-head screw 6SL3 is provided in the holder to move the matrix locator 6SL10 and thus alter the alignment of the matrix (set-wise) on the mould.

DISMANTLING THE 1″×1″ MATRIX HOLDER

Remove the handle a6SL1 complete with plunger 6SL4, spring 6SL5 and insulating washers 6SL15 by taking out two screws a6SL2. Knock out the pin 6SL7 and remove the rear clamp 6SL6, when the shaft 6SL8 together with the spring a6SL9 can be taken out. Unscrew the knurled-head screw 6SL3 and remove the matrix locator 6SL10 and spring 6SL11.

ASSEMBLING THE 1″×1″ MATRIX HOLDER

Replace the matrix locator and spring, securing by means of knurled-head screw 6SL3.

Reassemble the spring a6SL9, shaft 6SL8, clamp 6SL6 and insert the pin 6SL7.

Place spring and plunger in handle a6SL1 and secure the handle and insulating washers 6SL15 to matrix holder body with two screws a6SL2.

1⅛″×1⅛″ MATRIX HOLDER Xa7SL

This holder can be used for 1⅛″×1⅛″ and 1⅛″×1.35″ matrices.

Its construction is similar to that of the 1″×1″ matrix holder, the instructions for which apply to this holder.

LOW SPACE AND QUOTATION MATRIX HOLDER 8SLL

This holder is for locating the low space blanks and the quotation cores on the mould.

The construction of the low space and quotation matrix holders is very similar to that of the 1″×1″ matrix holder, and the paragraphs on operating apply to both holders.

CONTINUOUS BORDER MATRIX HOLDER Xa9SL

In this holder, the matrix is pushed to position against an abutment a9SL1 and held there by a spring operated clamp 9SL3.

It is advisable not to remove the clamp and spring as they are difficult to reassemble.

DASH MATRIX HOLDER 10SL1

This holder consists of a block to which the dash matrix is fitted; it is used in conjunction with the 4- to 18-point lead and rule mould.

MATRICES

COMPOSITION TYPE MATRICES

Composition type matrices are made in four forms:

1. .2″ pointwise×.2″ setwise
2. .2″ pointwise×.4″ setwise
3. .4″ pointwise×.2″ setwise
4. .4″ pointwise×.4″ setwise

When referring to .4″×.2″ or .2″×.4″ matrices, always mention the 'point' direction dimension first and the 'set' direction dimension last. Thus, a .2″×.4″ matrix is a small type composition matrix extended setwise, whereas a .4″×.2″ matrix is a large type composition matrix limited setwise to .2″.

Type from these matrices is cast to units, a unit being the 18th part of the body em (see tables on pp. 140–147).

DEPTH OF DRIVE—COMPOSITION

Composition matrices, .050″.

SIDE WALL MEASUREMENTS OF COMPOSITION MATRICES

Composition matrices are punched a certain distance from one side of matrix body. With a few exceptions the following measurements apply:

From 5 to 11 point inclusive, the standard side wall measurement on composition matrices is .035″; in 12 point it is .025″. In some large type composition matrices, the side wall is reduced to .015″.

'LINE'

The 'Line' is the position on type bodies or matrices taken by the lower serifs of caps. and lower case (descenders excepted).

In 'Monotype' specimen books, the 'line' of composition matrices is given thus: 'Line .1295'. This means that the 'line' of the character comes .1295″ from the rear edge of *matrix*. In type above 14 point, the 'line' given indicates the measurement from the 'line' of the *character* to the rear edge of type body.

DISPLAY TYPE MATRICES

Display type matrices are made in various sizes:

1″ pointwise × 1″ (or more) setwise

$1\frac{1}{8}$″ pointwise × $1\frac{1}{8}$″ (or more) setwise

These matrices are for casting display type from 14 to 72 point. They are marked with the face series number and the point size of type to be cast from them; also with the set measurement in points. Thus, 199 18 toward one edge of the matrix means that the face series is No. 199, and the body size is 18. At the other end of the same edge of the matrix is a number indicating the point size of the 'set' to which type must be cast from that matrix; thus, $16\frac{3}{4}$ indicates that the micrometer wedge must be adjusted to $16\frac{3}{4}$ points.

The 'set' number, taken into consideration with the point body size of the type, is an indication of the speed at which the type must be cast. A chart is provided (see table on pp. 150, 151) from which the speed of casting may be obtained from any matrix marking.

DEPTH OF DRIVE—DISPLAY

Display matrices up to 36 point, .050″; display matrices 42 point and over, .065″.

SIDE WALL MEASUREMENT OF DISPLAY TYPE MATRICES

From 14 to 60 point, the side wall measurement is .150″; 60 point Didot and 72 point, .1025″.

ELECTRO DISPLAY TYPE MATRICES

Many electro matrices are in circulation for casting display type from 14 to 36 point. A special holder is provided for casting from these.

These are marked with the face series number, the point size and the set size. Thus, 159–24–*9–6 or 159–24 9 6 indicates 159 series of face, 24 point; with the asterisk it means $9\frac{3}{4}$ points in set, and without the asterisk $26\frac{3}{4}$ points. The asterisk implies a difference of 17 points. On these matrices, the final 2 indicates $\frac{1}{4}$ point, 4 indicates $\frac{1}{2}$ point, and 6 indicates $\frac{3}{4}$ point.

A sizing card is provided (see table on pp. 148, 149) to indicate the micrometer head adjustment when using these matrices.

A limited number of electro matrices are in use from 42 to 48 point. These have special markings, such as asterisks or diamonds, the significance of which is indicated on the sizing card.

RULE MATRICES

For use on strip moulds for casting plain rules in different strengths of line, either single or multiple. The matrices remain fixed to the mould.

CONTINUOUS STRIP BORDER MATRICES

For casting strip material with a continuous border design. A special holder is provided for these matrices. The matrix is lifted from the mould whilst the strip is advanced, and when the matrix is again lowered to the mould, another section of strip is cast.

QUOTATION CORES

These take the place of matrices, and a special holder is provided. The core block is lowered to the mould, projections on the block entering the mould, so that a cored body is cast. Quotation moulds are provided with a special inset and crossblock to correspond with the height of the quotations.

CARE OF MATRICES

Properly treated, these will last for years.

Matrices should be thoroughly brushed before being inserted in the machine, and cleaned every morning when in continual use, otherwise grit may accumulate between them and cause excessive wear. Examine the cone holes in composition matrices to see that no metal or other foreign matter is deposited there, as this will affect the alignment of the type cast from such matrices.

The best method of cleaning matrices is to wash them in clean paraffin, and then to blow out from the cone holes and faces the loosened dirt by compressed air.

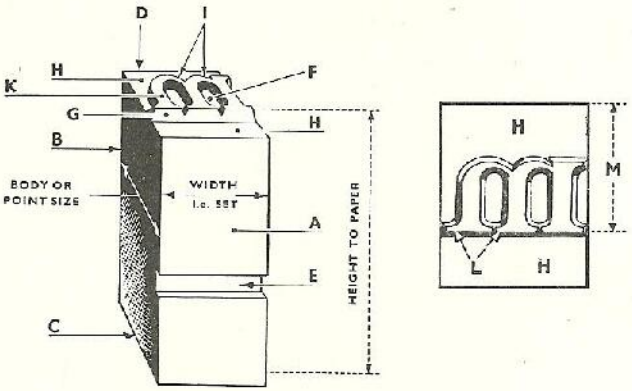
Oil should be kept from the face of matrices as much as possible while the machine is running, as it causes burrs to be cast on the type between matrix and mould.

If by chance a character breaks off in its matrix, the matrix should not be dipped in the metal pot, as this softens the matrix. The following procedure should be adopted: set mould blade to quad position and give machine a few revolutions with the pump mechanism in action. This generally clears the matrix.

On no account should the matrix be struck against anything hard. Should a matrix become damaged in a manner likely to affect the precision of the type to be cast from it, it should at once be discarded and replaced. The use of a scriber for cleaning damaged matrices should not be permitted.

When not in use, the matrices should be stored in a dust-free cabinet.

NAMES OF TYPE FEATURES



(A) front (of body), (B) back (of body), (C) foot, (D) head, (E) nick, (F) counter, (G) beard (shows depth of drive), (H) shoulder, (I) hair line, (K) main stroke, (L) serif, (M) type line.

TYPE HEIGHT

THE STANDARD height for English 'Monotype' type, from foot to face of character, is .918", and when moulds are producing type more than .002" less than this, they should be returned for repair.

The height of type depends upon the height of the mould blade and the depth of matrix punchings. These are fixed quantities, and will only alter through wear which should be very slight over a prolonged period.

Before commencing to cast a fount of display type, always measure the height of the type. This will prevent the use of matrices possessing a drive inconsistent with the height of mould.

ALLOWANCE FOR SHRINKAGE

Where precision is required, type should be measured when cold. The shrinkage in cooling in the height of a type is .003"; the same applies to the body of a 72-point type.

Typecasting should be carried out with as few stoppages as possible, so as to maintain a regular mould temperature and uniform type shrinkage. Types cast in a cold mould contract less than those cast in a hot mould.

QUAD AND QUOTATION HEIGHT

MOULD lower blades are made to produce quads and spaces to a height of .750". Non-cored quotations can also be cast to this height. This permits the use of quads and quotations as base material for mounting stereos and electros, machined to a thickness of 12 points. It allows .002" for the thickness of the adhesive employed in attaching the plates to the quad or quotation bases.

TYPE BODY SIZES

THE STANDARD UNIT for English type body measurements is termed a 'point', and this measures .01383".

The old English terms, such as nonpareil, minion, brevier, etc., are obsolete, and types based on these sizes are now seldom used. Maintenance of these old-fashioned sizes is to be discouraged.

English 'Monotype' moulds can be made to any body size required, but printers are recommended to encourage the use of moulds made to 'point' sizes only.

Names	Point	Inch	Lines to 6 ems (App'x.1")	Names	Point	Inch	Lines to 6 ems (App'x.1")
	1	.013833	72.00	Pica	—	.1667	5.97
	2	.0276	36.00		13	.1798	5.54
Minikin ..	3	.0415	24.00	English ..	—	.1880	5.29
Brilliant ..	3½	.0484	20.57		14	.1936	5.14
Gem	4	.0553	18.00	2-line Brevier	—	.2166	4.59
Diamond ..	4½	.0622	16.01		16	.2213	4.50
Pearl	5	.0691	14.40	Great Primer	—	.2350	4.23
Ruby or Agate	5½	.0760	13.08		18	.2490	4.00
	6	.0830	12.00	Paragon ..		.2626	3.79
Nonpareil ..	—	.0833	11.95		20	.2766	3.60
Emerald ..	6½	.0899	11.07	Double Pica		.2890	3.44
	7	.0968	10.28		22	.3043	3.27
Minion ..	—	.0972	10.24		24	.3320	3.00
Brevier ..	—	.1083	9.19	2-line Pica ..	—	.3362	2.96
	8	.1106	9.00	2-line English		.3750	2.65
Bourgeois ..	—	.1180	8.44		30	.4150	2.40
	9	.1244	8.00		36	.4980	2.00
Long Primer ..	—	.1350	7.37		42	.5810	1.71
	10	.1383	7.20		48	.6640	1.50
Small Pica ..	—	.1450	6.86		54	.7470	1.33
	11	.1521	6.54		60	.8301	1.19
	12	.1660	6.00		72	.9960	1.00

The American 'em' of 12 points is based on 35 centimetres divided into 83 parts, and therefore measures .166".

The above table shows the measurements of standard 'point' sizes, as well as sizes of old-fashioned English types. With regard to the latter, definite standard measurements do not exist; the 'authorities' simply state that they measure (for example) 'about 19' or 'about 20'

lines to the inch. The measurements of types with obsolete names are based on average measurements of type produced by leading type-founders of the past, and the smaller sizes are shown as some definite fraction of the point.

PRODUCTION OF GOOD TYPE

TO BE CONSIDERED PERFECT, a type must possess the following attributes:

1. It must be quite solid, have sharp corners, a solid and flat foot, the face sharp and well defined, and be cast from metal neither too soft nor too brittle.

2. It must be *square* in all directions, exact to size pointwise and setwise, and of correct height from foot to face of character.

Principal causes of imperfect type are: (1) poor quality metal; (2) foul nozzle or pump body channel; (3) worn piston or pump body bearing; (4) insufficient piston pressure to overcome air resistance in mould; (5) some part of pump mechanism not working freely; (6) water leakage below mould blade side blocks.

In the case of imperfect type, make sure of the following points: that a suitable quantity of metal enters below the pump body piston, and that no dross has accumulated in the piston inlet, piston base, valve face and seating, pump body channel, or nozzle channel. The pump body should be cleaned regularly, and a drill run up the main channel till it can be seen at the nozzle end. The nozzle should be drilled every day whether it appears to require it or not. If dross is allowed to accumulate unduly in the nozzle, it may become difficult to drill.

CARE OF METAL

The metal in the pot should be kept clean and completely molten when the Super Caster is in use. In molten printing metal, the tin and antimony are completely dissolved, and do not tend to separate. However, the metal may get chilled, for example, by the addition of fresh ingots, or by a current of cold air passing over the surface. It may then happen that some parts of the metal cool below the temperature at which freezing commences, with the result that crystals of tin-antimony form. These crystals, being light, float upwards and collect as a scum on the surface. Severe separation not only leads to loss of the hard tin-antimony constituent but interferes with the proper working of the pump and leads to the production of hollow type. The important points, therefore, are to maintain the temperature, to avoid chilling by the sudden addition of a lot of cold metal and to puddle the metal occasionally to help dissolve any tin-antimony

crystals which may form. Do not attempt to clean the metal in the Super Caster melting pot; any skimmings should be re-melted with type. Be careful of nostrums advocated for cleansing the metal. If they contain acids or salts, the pump body valve may become corroded, and the small hole in the latter will become enlarged. The main point is to keep the antimony well mixed with the lead. Being lighter, it has a tendency to rise and oxidize. Occasional puddling maintains the mixture, and assists the dirt in the metal to rise to the surface. The practice of dipping the piston in vaseline and other lubricants is much overdone, as the oil carbonizes on the piston and in the pump body channel, in time causing the latter to become choked. Simply brush the piston end with a brush, and before inserting the piston, skim away any dross above the pump body boring so that the piston may enter clean metal and not carry dross down with it.

Regulate the metal passing through the piston so that the type is solid and too much metal does not remain in nozzle. In the latter event, stop-casting may result. When casting small type, the piston should have a short, sharp stroke which should be slightly longer when casting larger type. As it is impossible to see the metal entering beneath the piston, any idea of the action that takes place must be based on theory, and this gives the operative scope for reflection and deduction.

Never attempt to run the pot up or down without making sure that the metal is completely molten and that the nozzle end of pump body is seated correctly. The nozzle should be a perfectly vertical fit in mould base. The dross which accumulates on the surface of the metal near the nozzle should be cleared away so as to allow the jet pieces from the mould to melt quickly. In the case of metal squirting over the nozzle, or the jets not being melted, the latter may accumulate so that it is not possible to eject any more, and the crossblock will in consequence become wedged. In this event do not force the machine round, as this might break the type carrier lever; run the pot down and clear away all the jet pieces from the opening in the mould through which they fall.

METALS FOR USE ON 'MONOTYPE' MACHINES

SINCE THE VERY early days of printing, alloys of lead, tin and antimony have been used as type metals. Over the years, the compositions appropriate for specific purposes have been more closely defined and the standards of purity have been raised.

Scientific study of the alloys has lagged behind their practical application but in recent times there has been a good deal of research on the constitution of the alloys and on those properties of importance in

printing. Such work not only offers a valuable supplement to experience in the investigation of practical problems; it also provides a picture of the behaviour of the alloys on melting and casting which can be of great assistance to anyone engaged in their handling.

REQUIREMENTS OF A TYPE METAL

1. A type metal should give sharp and true castings.
   It should reproduce faithfully every minute detail of the matrix and give a casting correct in form and dimension when cold.
2. It should give strong and sound castings.
   Cast type should be as sound as possible and stand up well to printing wear and pressure.
3. It should be easy to cast.
   The melting temperature of the metal should not attack the iron and steel from which type-casting machinery is made, nor clog the small apertures in mouthpieces or nozzles.
4. It should be clean to melt.
   When molten, it should give as little dross as possible and losses on remelting should be low.

CONSTITUENTS OF TYPE METALS

Long experience has shown that alloys based on lead with additions of tin and antimony meet these requirements better than any other metal or alloy.

Lead. Lead, which forms the basis of all printing metals, melts at 621°F., and is exceptionally malleable and ductile. It is comparatively cheap, so that it is a suitable metal economically as well as metallurgically, but by itself it is very soft and does not give sharp castings.

Antimony. Antimony melts at 1166°F. It is a hard, brittle and highly crystalline metal, which supplies hardness to the alloy and promotes sharp reproduction of the mould.

Tin. Tin, which has a melting point of 450°F., is not much harder than lead but much tougher. In a printing metal, it adds toughness and wear-resistance to the alloy, in addition to making it more fluid and easy-flowing.

MELTING PROPERTIES OF PURE LEAD

Pure lead has a sharp melting point at 621°F. This means that at temperatures above 621°F. it is always completely molten forming a homogeneous liquid, and that below 621°F. it is always completely solid.

A pot full of molten lead, cooled down slowly from say 700°F., will stay molten until the temperature has dropped to 621°F. At this point, the metal will solidify and the temperature remain constant until the

whole contents of the pot are solid (which will take some time). Once the metal has completely solidified, the temperature will again fall steadily.

EFFECT OF ANTIMONY

Thus pure metal melts and solidifies in a simple manner at a single temperature. The solidification of alloys is not so simple. Only in special cases does an alloy solidify at a single temperature; most compositions solidify over a range of temperatures.

Consider an alloy containing 5 per cent of antimony, 95 per cent of lead. At a temperature of 700°F., the antimony will be completely dissolved in the molten lead, forming a homogeneous liquid, although the melting point of pure antimony is 1166°F.

When this alloy is cooled, nothing happens at 621°F. (the temperature at which pure lead solidifies) and the contents of the pot remain

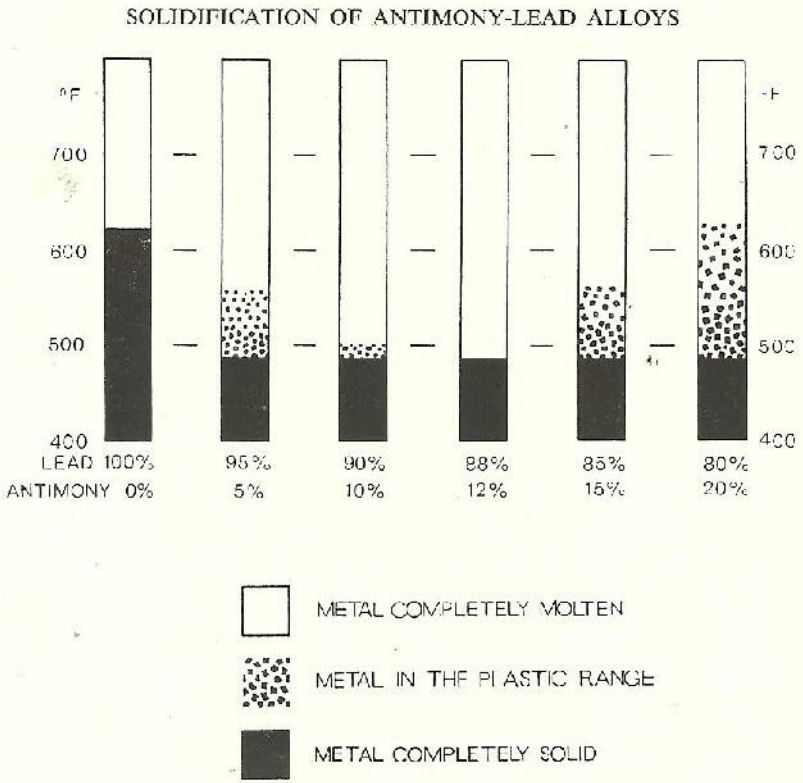


FIG. 1.—Diagram comparing the melting behaviour of various antimony-lead alloys.

fully molten until the temperature has dropped to 555°F. Here small particles like 'grit' appear in the metal, showing that solidification has commenced, but the metal continues to cool, and becomes more pasty, until the temperature drops to 486°F.

Then, while the temperature remains constant, the remainder of the metal sets solid (which again takes some time). As soon as all the metal has solidified, cooling continues once again.

If the test is repeated with an alloy of 10 per cent antimony, 90 per cent lead, it will be found that the temperature falls to 500°F. before the grittiness which indicates the commencement of solidification appears. Again cooling continues to 486°F. and again the metal remains at that temperature until solidification is complete.

Thus, when antimony is alloyed with lead, the temperature of final solidification (which is called the 'solidus') is lowered to 486°F.; all alloys containing only antimony and lead finally solidify at this temperature. A second effect of initial antimony additions is to *lower* the temperature at which solidification commences (the 'liquidus'); 621° with no antimony; 555° with 5 per cent antimony; 500° with 10 per cent antimony (Figure 1, p. 120). The alloy 12 per cent antimony, 88 per cent lead begins to solidify at 486°F. and remains at this temperature until it is a solid. In other words, this one composition behaves like a pure metal in having a single melting point or solidification temperature.

With alloys containing more than 12 per cent of antimony—and these are of the greatest interest to a 'Monotype' user—the liquidus temperature rises again. Thus, in an alloy containing 15 per cent antimony 85 per cent lead, gritty crystals appear on cooling at 558°F. Cooling continues and the metal becomes more pasty until the solidus of 486°F. is reached.

For the 20 per cent antimony, 80 per cent lead alloy, the liquidus temperature is still higher—626°F., though the solidus remains at 486°F.

When the alloy contains over 12 per cent antimony, then, the liquidus temperature rises as the antimony content of the alloy is increased. Since the solidus is constant, it follows that increasing the antimony content over 12 per cent increases the length of the solidification or pasty range. This fact has an important bearing on the choice of an alloy for casting type, since alloys with a long solidification range are more difficult to handle.

MICROSTRUCTURE OF ALLOYS

All metals are composed of crystals, which can be clearly seen if a piece of metal is sectioned, ground flat, polished and examined under a microscope.

Solidification of metals can be regarded as a process of crystallization. Thus, in pure lead, the crystals form at 621°F. to combine into an assembly of close-fitting grains.

PHOTOMICROGRAPHS OF PRINTING METALS

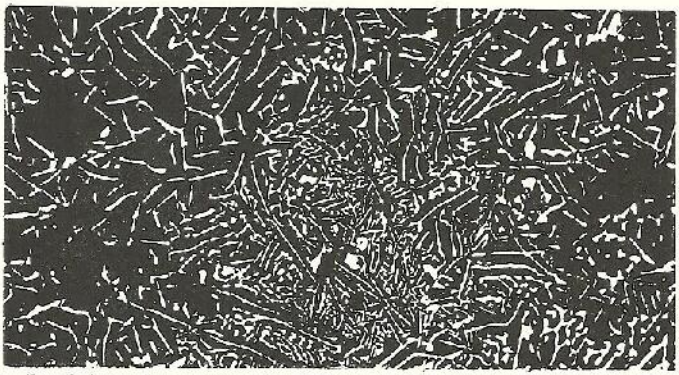


FIG. 2.—Lead-tin-antimony eutectic: 4 per cent tin, 12 per cent antimony, 84 per cent lead. Melts sharply at 464°F. Note characteristic laminated structure.

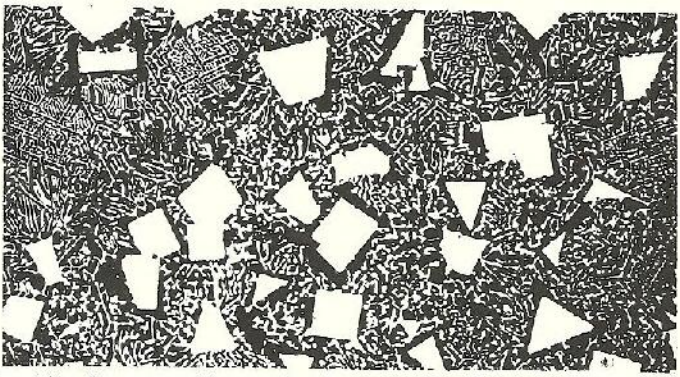


FIG. 3.—Alloy for composition work: 10 per cent tin, 16 per cent antimony, 74 per cent lead. White cubic tin-antimony crystals set in a groundmass of eutectic.

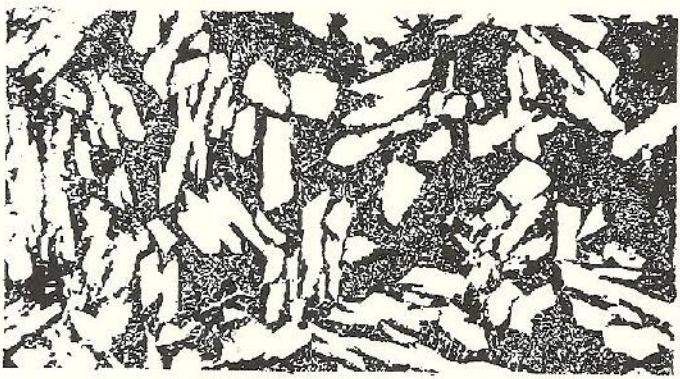


FIG. 4.—Alloy for display type: 12 per cent tin, 24 per cent antimony, 64 per cent lead. Note higher proportion of the hard crystals in comparison with Fig. 3.

Consider again the alloy containing 5 per cent antimony, 95 per cent lead. The first sign of solidification as the alloy cools was described above as the appearance of small particles like 'grit' in the molten metal. These particles consist of crystals of lead which, at the commencement of solidification, are very small, but grow as cooling proceeds. The crystals are, in effect, extracting lead from the liquid metal which therefore gets progressively richer in antimony. Crystal growth continues until the metal which still remains liquid contains 12 per cent of antimony, 88 per cent of lead, by which time the temperature has fallen to 486°F.

Similarly, when the alloy containing 15 per cent antimony, 85 per cent lead cools, the crystals which appear are of pure antimony. These crystals grow until the metal, still liquid, contains only 12 per cent of antimony.

It is possible now to see the significance of the special composition 12 per cent of antimony, 88 per cent of lead. When an alloy cools, it sheds whichever metal is in excess as solid crystals. Ultimately, the liquid remaining always contains 12 per cent antimony and, as we have seen, this always solidifies at 486°F.

This composition is called the 'eutectic' which means 'easy melting'. The name is given:

1. to the alloy itself containing 12 per cent antimony, 88 per cent lead and solidifying at the single fixed temperature of 486°F.,

2. to the constituent in other lead-antimony alloys which remains after the crystals, either lead or antimony (whichever is in excess), have formed and which likewise solidifies at 486°F.

Thus, an alloy of 15 per cent antimony, 85 per cent lead is seen, under the microscope, to contain isolated crystals of pure antimony surrounded by the eutectic constituent. The latter is in fact a very fine network of interlaced lead and antimony.

EFFECT OF TIN

Tin in printing metals can be considered as modifying, but not altering in principle, the features observed in lead-antimony alloys.

The two changes which are of importance in consideration of 'Monotype' metal are as follows:

1. Some tin enters the eutectic, which in type metals has the composition 4 per cent tin, 12 per cent antimony, 84 per cent lead. This melts at the single definite temperature of 464°F.

2. Excess tin and antimony over and above the eutectic composition form tin-antimony crystals, instead of the antimony crystals which are present in plain lead-antimony alloys.

MICROSTRUCTURE OF TYPE METALS

Figures 2–4 (p. 122), are photomicrographs of some type metals. Figure 2 shows the eutectic alloy. The dark material is lead, the fine white lines are tin-antimony. The constituents are very intimately mixed.

This alloy, which incidentally is very close to the composition of slug casting metal, is rather soft and lacking in wear resistance for direct printing. A dual purpose 'Monotype' metal is shown in figure 3. The white cubic crystals are tin-antimony which, being hard themselves, confer on the alloy improved resistance to wear. Surrounding these crystals is the eutectic constituent.

In the display metal (Figure 4), there are many more of the hard tin-antimony crystals.

The size of the crystals in the metal depends on the rate of solidification. If this is very slow, the crystals have time to grow large. Rapid solidification on the other hand produces a very fine structure. It is very desirable that the crystals in metal fed into the machine pot should have a fine structure, so that they dissolve rapidly when the metal is added.

In type, the tin-antimony crystals may be only one ten-thousandth of an inch across.

The tin-antimony crystals are very hard in comparison with the lead-rich eutectic and it is desirable to have a high proportion present in the alloy for good wear resistance. But as the proportion of tin-antimony crystals is increased to secure greater hardness, so the melting temperature goes up.

The same effect was observed in lead-antimony alloys containing more than 12 per cent of antimony. If we consider the addition of tin alone, we may find that it lowers the melting point; thus an alloy containing 6 per cent tin, 15 per cent antimony, 79 per cent lead not only has a lower melting point than the plain 15 per cent antimony, 85 per cent lead alloy, but it is also much harder. There is, however, a limit to the amount of tin which can usefully be added in this way, apart from economic considerations. Broadly speaking, the best results are obtained by increasing both tin and antimony together, and—to repeat —when this is done, the hardness is increased but the final melting temperature rises also.

PRACTICAL DISADVANTAGES OF HIGH-MELTING-POINT ALLOYS

The speed of casting normally demanded limits the range of alloys which can be used. It may be assumed that the metal enters the mould when it is only just completely liquid and that the type is ejected very soon after it has solidified. Consider two rather extreme alloys: 6 per cent tin, 15 per cent antimony, 79 per cent lead for composition work, and 18 per cent tin, 27 per cent antimony, 55 per cent lead, a very hard metal for display type.

	6/15	*18/27*
Completely liquid at ..	502°F.	646°F.
Completely solid at ..	464°F.	464°F.
Solidification range ..	38°F.	182°F.

The 'solidification range' for the hard metal is vastly greater. In comparable conditions of casting, therefore, the hard metal takes a much longer time to solidify. The cooling could, of course, be accelerated by extra water cooling, but even so, reduction in the speed of casting would be necessary to maintain satisfactory production of sound type.

The comparison is an extreme one but, even within the range of alloys normally used, there are alloys having widely different melting points. Since there is a maximum casting temperature above which the metal would not solidify rapidly enough to maintain the speed of the machine, it is clear that the margin between this working temperature and the first freezing point of the alloy is much narrower with hard metals. There is a narrower permissible range of temperature with hard metal, and closer attention to temperature control is necessary.

A further disadvantage of hard metals is their greater erosive effect on matrices.

CHOICE OF METAL COMPOSITION

To some extent, therefore, the composition of the alloy must represent a compromise between hardness and ease of casting. The final choice is dictated by the service to which the type will be put.

There is, however, one most important point which must be borne in mind. The resistance of type to wear depends not only on its hardness but also on its soundness and, particularly, the solidity of the printing surface. With the harder alloys, more care and preferably a slower rate of casting are necessary to secure solidity. If high speeds of casting are to be maintained, then it is unwise to aim for hardness at the expense of solidity. A somewhat softer alloy which will in routine casting yield solid type will in the end be more reliable.

The foregoing may explain why metal compositions are not more rigidly standardized. Conditions of casting and use vary and it is for the individual user to select the composition which best meets his requirements.

COMPOSITIONS AND PROPERTIES OF ALLOYS

6 per cent tin, 15 per cent antimony, 79 per cent lead

Completely liquid at	502°F.
Completely solid at	464°F.
Brinell Hardness Number	23.0

The alloy containing 6 or 7 per cent of tin with 15 per cent of antimony is most widely used for composition work. It has the lowest melting point of the alloys normally cast on a 'Monotype' machine and

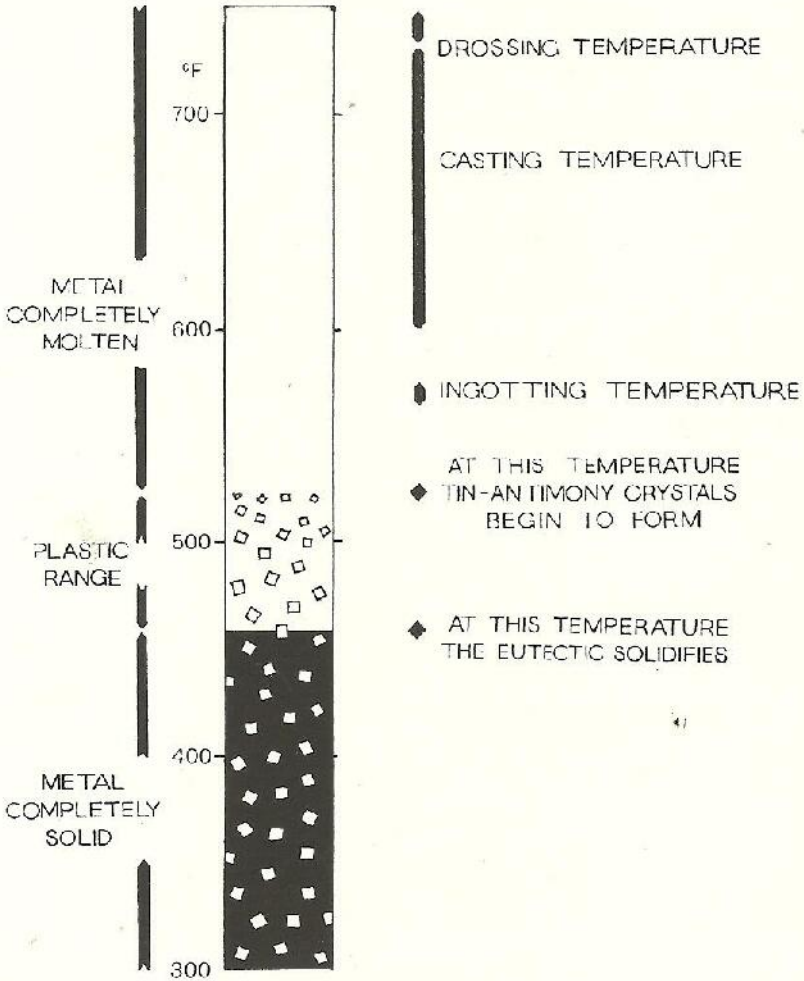


FIG. 5.—Solidification and treatment temperatures for the alloy containing 10 per cent tin, 16 per cent antimony, 74 per cent lead.

is easy to handle, giving sound type at high casting speeds. The type is naturally softer than that produced from the higher melting point alloys but has adequate wear resistance for the general run of composition work.

10 per cent tin, 16 per cent antimony, 74 per cent lead

Completely liquid at	524°F.
Completely solid at	464°F.
Brinell Hardness Number	27.0

Containing a higher proportion of tin-antimony crystals, this is considerably harder than the preceding alloy, although the liquidus temperature is not very much higher. It has excellent fluidity, owing to the relatively high tin content. This is the recommended alloy for the dual purposes of composition and case type, for which it is well suited by reason of its good combination of wear resistance and ease of handling.

9 per cent tin, 19 per cent antimony, 72 per cent lead

Completely liquid at	546°F.
Completely solid at	464°F.
Brinell Hardness Number	28.5

This formula was once very popular but it has lost ground as a dual purpose metal to the 10/16 alloy. The reason lies in the higher liquidus temperature, for although it is slightly harder intrinsically than 10/16, and in favourable conditions gives excellent results, there is greater difficulty in maintaining output of solid type in routine production.

The difference shows up sharply in the casting of rule. Particular care is required with the 9/19 alloy to secure a clean face and good welds. By contrast, the 10/16 alloy, with its high ratio of tin to antimony, flows and welds more easily.

13 per cent tin, 17 per cent antimony, 70 per cent lead

Completely liquid at	542°F.
Completely solid at	464°F.
Brinell Hardness Number	29.5

This alloy illustrates the virtues of a high tin content. It is particularly tough as well as free flowing. Easy to cast, it yields beautifully clean, hard-wearing type.

12 per cent tin, 24 per cent antimony, 64 per cent lead

Completely liquid at	626°F.
Completely solid at	464°F.
Brinell Hardness Number	33.0

This is the composition occasionally used for display type. The hardest metal normally cast on a Super Caster, it contains, as Figure 4 shows, a very high proportion of the hard tin-antimony crystals.

The liquidus temperature is a good deal higher than any considered above; this means that special care is required in casting to maintain a homogeneous metal in the pot and to prevent blockage of nozzles.

HANDLING OF MOLTEN PRINTING METALS

FROM THE EXAMINATION of metals under the microscope, it is possible to deduce a good deal about their behaviour on melting and casting.

We have seen that a normal metal for 'Monotype' composition, properly melted and maintained throughout at a temperature of say 700°F., is a completely uniform and homogeneous liquid. The tin and antimony are dissolved in the lead, and so long as the temperature is maintained, they will stay dissolved. No separation will occur, for even though tin and antimony are lighter than lead, they cannot separate because they are in solution.

The temperature of 700°F. is well above the temperature at which the alloy commences to solidify. The superheat is necessary to allow for the cooling which occurs on the passage of the metal through the pump and nozzle, so that when it enters the mould it is still sufficiently fluid to fill out all the detail.

Unfortunately, practical factors tend to disturb the uniformity. The temperature in a Super Caster pot is not absolutely the same at all points. Conduction away of heat by pump parts lowers the temperature of surrounding metal. Fresh metal added has a cooling effect. A current of cold air passing over the pot will tend to chill the metal on the surface. The ejected jet pieces both chill and aerate the metal where they fall. Thus the temperature generally may remain satisfactory but the metal may be chilled locally to such an extent that the temperature falls below its upper melting point. It is this condition which gives rise to separation in the pot.

SEPARATION OF CRYSTALS

The alloy 10 per cent tin, 16 per cent antimony, 74 per cent lead, as an example, commences to solidify at 524°F. When the temperature drops below this, tin-antimony crystals form. If cooling continues, more and more tin-antimony crystallizes out. If, however, the temperature remains constant at a few degrees below the liquidus, say at 515°, crystal formation is arrested: the crystals which have formed remain suspended in metal still molten.

The tin-antimony crystals are, however, much lighter than the remainder of the metal and hence they tend to float to the surface where they form a scum. If the pot is skimmed in this condition, a proportion of the valuable hardening constituents will be removed and the quality of the metal will fall.

If separation of the rich constituents does take place, as evidenced by the presence on the surface of the metal of a thick scum, do not skim this material off. Steps must be taken to redissolve the crystals as soon as possible, for if they become oxidized on the surface, they may be drawn into the dross and lost. The temperature should be raised well above normal for a brief period and the metal thoroughly stirred.

If the metal is always raised to 730°F. before skimming, loss of hard crystals will be kept to a minimum.

The metal should always be stirred well after it has been melted from cold in the mornings and at frequent intervals during the day, particularly after the addition of cold metal. This helps to even out the temperature and to redissolve crystals which may have formed.

FEEDING THE POT

It is advisable to add metal to the pot regularly as required, one ingot at a time. If a lot of metal is added at once, the pot is chilled, separation is likely to occur, and the temperature will fluctuate widely. A single nugget melts quickly and produces less disturbance of the general temperature.

The ideal method of supplying make-up metal is by the use of the Ingot Feeder Attachment. The level in the pot remains constant and steady feeding of small quantities of pre-heated metal provides the best conditions for precise control of the temperature.

SPEED OF MELTING

Printing metals should always be melted quickly, and there should always be adequate input of heat for this purpose. With a slow rate of heating between the first melting of the eutectic and the final melting of the tin-antimony crystals, the latter will be free to separate to the surface into a concentrated crust which is only redissolved with difficulty. Similarly, when the Super Caster is working, the reduced heat supply may be inadequate to give the required quick response after the pot has been chilled by the addition of fresh metal. Reductions in the supply voltage are a frequent cause of slow heating, and furthermore, they are most likely to occur in cold weather, at just the time when extra heat is needed in the metal pot to make up for losses due to the colder machine and atmosphere.

EFFECT OF SEPARATION ON THE CASTING OPERATION

Possible loss of hardening constituents is not the only consequence of separation. The operation of the Super Caster may be affected.

If separation has occurred, there will be solid grit-like crystals floating around in the metal. They will tend to settle out on cooler surfaces. As the metal flows from the pump to the mould, it loses heat.

The crystals may settle out in the metal channels and in particular, in the nozzle. A build-up occurs, which gradually reduces the effective area of the nozzle, thus contributing towards hollow type. Ultimately, the nozzle becomes so blocked that casting is stopped.

This hazard is clearly more serious with the higher melting point metals and it can readily be seen that these require greater care to keep the metal channels free and thus to maintain production of solid type.

MELTING LOSS AND DEPRECIATION

Printing metals, when molten, form dross which contains slightly higher proportions of tin and antimony than the molten metal. If the same metal is used over and over again, the result is a gradual depreciation which ultimately throws the composition out of balance and results in type of inferior quality.

The depreciation can be ascribed to two separate causes.

Firstly, when type metal is molten and in contact with air, oxidation takes place. All three constituents of the alloy suffer, but tin, and to a lesser degree antimony, oxidize rather more rapidly than lead.

The second cause of depreciation arises from the separation of the tin-antimony crystals which occurs when the metal is chilled.

REDUCING THE MELTING LOSS

The formation of dross by oxidation of the metal is inescapable: little can be done to reduce the amount apart from the exercise of reasonable precautions in the re-melting of type. Oxidation takes place more rapidly at high temperatures; if metal is overheated and then vigorously stirred for a long time so that a fresh surface is continually exposed to the air, then a heavy dross will be formed. Losses of this kind are avoided by working at the correct temperature.

Losses due to the separation of tin-antimony crystals, while they can be much more serious, are kept low if care is taken in the handling of metal whenever it is molten or melting.

The greater part of the loss is likely to occur during re-melting but loss in the machines *can* be considerable in unfavourable conditions. The precautions necessary to limit the loss from this cause have already been described: melt the metal quickly; maintain it at the correct temperature; do not skim when it is cold.

DEPRECIATION AND HOW IT IS MADE GOOD

However carefully type metals are handled, some depreciation will occur. The joint effects of oxidation and separation produce a gradual reduction in the tin and antimony contents of the metal which, if not corrected, will soon be evident in the quality of the type.

The regular addition of new metal to the old stock helps partially to maintain the quality but it is rarely easy to ensure uniformity in this

way. Since some of the metal in printing works is locked up for long periods, while other metal is used again and again, the quality of the stock is liable to become irregular.

Satisfactory results in the composing room depend on a uniform supply of metal. Perfect uniformity can only be achieved if every potful of type, as it is re-melted, is brought up to the standard of new metal.

This ideal can be approached very closely by the regular use of reviving alloy.

Experience has shown the average loss of tin and antimony occurring each time an alloy is used, *i.e.*, cast into type and subsequently re-melted. On the basis of these figures, reviving alloys have been designed containing high proportions of tin and antimony so adjusted that the addition of the correct proportion of the alloy at each re-melting will restore the tin and antimony wastage. Since most of the wastage occurs in re-melting, the effect is to correct the loss as soon as it has occurred.

This procedure is recommended in preference to the occasional addition of a substantial quantity of reviving alloy, which costs just as much but only improves part of the stock.

RE-MELTING TYPE

The importance of careful re-melting of type can hardly be over-stressed. Poor metal, which has become contaminated or impoverished, produces bad type, wastes time in all departments and does a poor job in the end. Careful re-melting—which does not mean expensive re-melting saves money at every stage of production.

EQUIPMENT FOR RE-MELTING

The melting pot should hold at least 3 cwt. and preferably 5 cwt., so that the metal is melted in batches of reasonable size and is thus kept uniform. The pot can be efficiently heated by gas or electricity. Gas is cheaper both in first cost and in operation; electricity is cleaner and simpler to control; but, whereas electrical heating of typecasting machines has enormous advantages, there is not the same need for it when re-melting.

The pot should preferably have a bottom pouring valve. This saves labour and ensures that only the clean metal below is poured.

The pot should be hooded and the outlet conveyed out of doors, in order to take away fumes and the products of combustion, if gas heating is used. The fumes from the pot arise mostly from the ink and from floor sweepings and also from the use of flux, which cannot be avoided. All these fumes are harmless but unpleasant. No fumes are given off by the metal but a certain amount of dusting from the dross is inevitable and such dust is, of course, obnoxious.

The best position for the re-melting pot is near a wall for simplicity of providing gas or electricity supply and as near the flue as possible.

Other equipment required is: ingot moulds—for large outputs, water-cooled moulds are desirable, but for normal work, heavy cast iron moulds are satisfactory—at least six should be available (if Automatic Ingot Feeder Attachment is fitted, two special ingot moulds will also be required); a ladle, which can be used for stirring; a perforated ladle for removing the dross; dross container to keep the dross under cover; mould skimmer to remove the 'froth' from the ingots after they are poured, and thermometer to test the temperature of the metal.

KEEPING GRADES OF METAL SEPARATE

Type should be kept apart from slugs or stereos since a few pounds of these in a melting pot may affect the composition appreciably.

Founders' leads and furniture should be kept out of the pot for the same reason.

Founders' type should not be re-melted with 'Monotype' metal since it is likely to contain quite a high percentage of copper which will lead to trouble in casting.

Any 'foreign' metals should therefore be carefully picked out before type is put into the melting pot.

MELTING AND CLEANING THE METAL

Metal should be melted quickly because, as already described, slow melting leads to separation of the tin-antimony crystals with probable loss of some of these valuable hardening constituents in the dross.

The correct temperature to which the metal should be raised for cleaning is 700-750°F., the higher temperature being necessary for harder metals.

Regular use of a thermometer will avoid under- or over-heating, both possible sources of loss through extra dross formation.

When the metal has been raised to the cleaning temperature and thoroughly stirred, the dross on the surface will be rather thick and contain a high proportion of metal in addition to metal oxides and dirt.

A flux should then be used to clean the metal from oxides and non-metallic matter and to produce a dross which contains as little valuable metal as possible. The flux should not have any corrosive action which might affect pot or machine parts. The flux is added to the molten metal, well stirred into the dross and, if it is of the burning type, the fumes should be ignited and allowed to burn out. The dross should then be fine and powdery, showing that the bulk of the metal has been released into the pot.

This dross is then taken off in a perforated ladle. The ladle is shaken each time to allow the good metal to drain away.

Dross should be immediately dumped into a suitable container so that it is kept under cover.

REVIVING OR REJUVENATING THE METAL

It has already been pointed out that the best way to maintain the standard of the metal is to add reviving alloy to every potful of metal re-melted.

The recommended quantity of reviver is $\frac{1}{2}$ lb. to every 1 cwt. After the metal has been skimmed free from dross, the reviver should be added and well mixed in for several minutes.

INGOTTING THE METAL

The temperature required for cleaning the metal is comparatively high to provide the right conditions for separating metal from dross. It is advisable to lower the temperature for pouring the ingots. A high pouring temperature results in slow cooling of the ingots; this is undesirable as it produces a coarse-grained structure which may lead to trouble in the machine.

Ingots should be skimmed as they are poured to remove any froth and scum from the surface.

IMPURITIES IN TYPE METALS

Molten printing alloys will attack and dissolve many other metals. The resulting contamination nearly always has a detrimental effect on the working properties, hence the need for care in handling of type to keep out any 'foreign' metals which might give rise to trouble.

Zinc is the most harmful impurity. In the form of zincos, this metal is quite readily dissolved if it remains in contact with molten printing metal for some time. Brass rule, another source of zinc, is rather more resistant, but even here the molten metal will exert a solvent action. When only a few thousandths of one per cent of zinc is present, the effect is immediately noticeable on the surface of the molten metal. The freshly-skimmed surface of properly melted metal should be bright and mirror-like. Metal contaminated with zinc, however, will not skim cleanly; there will be a strong thick film which immediately re-forms as the skimmer is drawn through the surface.

This strong film tends to enclose droplets of metal and thus greatly increase the amount of dross. Furthermore, the film retards the flow of the metal and restrains its entry into fine detail in the mould, thus spoiling the sharpness of the type.

Aluminium has rather a similar effect to zinc. Fortunately, it is not readily dissolved by the molten metal. If any aluminium is accidentally charged into the pot with type, it usually rises to the surface and is skimmed off with the dross.

Copper is not quite so harmful an impurity and a certain quantity can be tolerated in the metal without detriment to the casting properties. The exact amount depends on the composition of the alloy, being higher with the harder metals.

Copper in excess of this safe limit forms crystals with antimony which have a relatively high melting point. The crystals readily separate from the molten metal and deposit on cooler surfaces of the pump assembly. As the metal flows through the nozzle, the copper-rich crystals tend to build up in the orifice, restricting and ultimately blocking the flow.

Nickel in very small proportions has the same effect in causing blocking of nozzles. Nickel quite frequently occurs as an impurity through the accidental inclusion of plated stereos with type for re-melting; this should be carefully guarded against.

Iron. Printing metals are melted and cast in iron pots so that it might be expected that they would gradually absorb iron. Fortunately there is very little corrosive attack of the metal on iron and steel. The amount of iron absorbed in normal working is very small and has no practical influence on the behaviour of the metal.

ANALYSIS OF METAL

FROM TIME TO TIME, metal should be analysed to check the quality and the effectiveness of the reviving procedure. In the average jobbing works, a check analysis once every six months is adequate.

For the analysis to be of value, it must be reasonably representative of the metal in circulation. Samples should be selected with this point in mind. It is recommended that a few stamps should be taken from each machine on two or three separate days to form a composite sample to be sent for analysis.

FORMULA FOR FINDING NUMBER OF SORTS TO MAKE ONE POUND

MULTIPLY the body points of the sort required by the set points and divide the answer into 22,000.*

Example.—Cast 2 lb. of 36 point characters, the set width of which is $12\frac{1}{2}$ points.

Answer.—$22{,}000 \times 2 \div (36 \times 12\frac{1}{2}) = 98$ characters (approx.).

In the case of cored type, allow a percentage to correspond with the degree of coring.

* Four square inches (20,736 square points) is only approximately equivalent to one pound avoirdupois; for all-round estimates 22,000 square points is a more satisfactory basis. This applies to English type height.

FOUNT SCHEMES

IN CASTING FOUNTS, it is desirable that an approximately correct number of the various characters should be cast, otherwise much time and metal will be wasted in casting characters that will not be needed.

Founts are divided into two categories: those that are intended for bookwork and those intended for jobbing work.

The proportions of the various characters necessary for ordinary English book composition are fairly accurately defined, but this is not the case in jobbing composition, where certain subjects often cause a heavy demand on certain characters. In jobbing work, the demand upon capitals is much greater than in straightforward news or bookwork, and this demand varies according to the class of work that is being composed. In book and news work, the six most frequently-used characters, arranged in order, are e, t, a, i, o, n, whereas in a large directory a count of the initials of the surnames gave the following as the order for the six most frequently-used capitals: B, S, C, H, M, W. As the latter were based on the initials of names of English persons, their order cannot be accepted as a standard of average frequency of use of capitals.

Therefore, whereas it is a simple matter to give the proportions for founts to be used for English bookwork, it is not so easy to arrive at the quantities of capitals required for jobbing work. In subscription lists, the capital M naturally predominates.

A table of average quantities required of each character to make a fount of 1,000 lower-case characters in English book and jobbing founts is shown in table on p. 158.

A TO Z MEASUREMENTS

The 'a to z' measurements for determining the relative space-covering qualities of a fount are useless when estimating how many lines or pages certain copy will make. The 'a to z' measurements of two founts may be identical but, if the frequently-used characters in one fount are more condensed than those of the other fount, and the infrequently-used characters of the former fount are wider than the similar characters in the latter fount, the former fount would cover considerably less space than the latter.

CHECK THE CHARACTERS WHEN FOUNT CASTING

When casting a fount, check on a slip of paper each character as it is cast. This will avoid some characters being overlooked, and may avoid unnecessary mould changes.

ARRANGE MATRICES BEFORE STARTING TO CAST TYPE

Before starting to cast a fount, arrange the matrices in the order of the progressive thickness of the characters, from thinnest to thickest. This will save considerable gear changing.

OUTPUTS

OWING to so many intervening factors which qualify the calculations, it is only possible to give estimates of approximate non-stop hourly outputs of the various products of a Super Caster.

For type above 14 point, the speeds given in this manual in the CHANGE SPEED TABLE (see table on pp. 150, 151), and the PRODUCT INFORMATION TABLE (see table on p. 157), are based on a non-stop production of about 40 lb. per hour. Cored type is cast to the same weight per hour, but shows more in *quantity*.

The weight of hourly output must primarily depend upon the cubic content of the material cast, multiplied by the speed of casting. These are definite factors, but are qualified by other influences, such as temperature of metal, area of surface exposed (during casting) to the cooling influence of the mould, the condition of wear of pump body and piston, and other considerations.

It will thus be understood that it is impossible to estimate hourly outputs with anything like mathematical precision, even on non-stop runs over a given period.

At the same time, printers and machine operatives should have a reasonable idea of the output of the various products obtainable from a Super Caster on non-stop runs, and should know how to arrive at estimates of production. As there must be an area basis for the calculations, the usual basis of four square inches of solid type as being equivalent to one pound avoirdupois is used. This formula has been tested rather extensively, and it is found that, in 'body' types, rather less than one pound avoirdupois is contained in four square inches, whereas in display type there is often rather more than one pound. Strip rules are slightly heavier than type, as the drive of the rule matrix is less than that of type matrices.

Four square inches of type contain approximately 22,000 square points, and this weighs approximately one pound. Therefore, if the square points of output per hour are divided by this sum, the approximate weight of output in pounds per hour is arrived at. To estimate the square-point output per hour, multiply the body in points by the set in points of the product to be cast, and multiply the answer by the number of casts per hour.

Cored type bodies are cast at slightly higher speeds, so that although a greater *number* of cored types are cast per hour, the approximate *weight* cast per hour remains the same. This applies also to casting quotations.

Leads may be cast faster than rules, being approximately 20 per cent less in height.

Type below 12 point can only be cast on a Super Caster at 144 revolutions per minute; therefore, the smaller the type below 12 point, the less the weight produced per hour.

In the case of very large types, where the speed demanded is less than that provided by the lowest gear, the pump must be disengaged during every alternate revolution. This applies only to a few characters of the largest sizes.

In actual running practice, the weights obtainable per hour depend largely on the size of founts cast, as it will be understood that in founts of small weight the time taken to change the matrices and gears will, in proportion to actual casting time, be considerably more than in the case of founts of greater weight.

Super Caster users are advised not to run their machines at speeds higher than those indicated in the CHANGE SPEED TABLE on pp. 150, 151.

Solid type may in some cases be more consistently obtained at speeds lower than those given in the table, owing mainly to extra time given for the newly cast types to cool before the return stroke of the pump piston commences.

Where a machine is kept constantly employed, the quantity and quality of output are governed by the ability of the Super Caster operative and the organization of his department.

NOZZLE SEATING TIMING MECHANISM

A consistently high output of good quality solid display type can be accomplished by the use of the nozzle seating timing mechanism which is applicable to type bodies requiring casting speeds of 22 r.p.m., or less.

The mechanism provides an independent adjustment for the seating of the nozzle as distinct from the usual method where the seating is subjected to a relatively small variation by the use of the pump body spring rod stop plates.

The adjustment of a trip screw in conjunction with the latch trip plates permits the seating of the nozzle to be delayed until the descending stroke of the pump pistons is about to commence. The delaying action enables the nozzle to be kept in close proximity to the molten metal and reduces heat losses to a minimum. The sudden release of the nozzle into the mould ensures a more accurate seating.

TABLES

MICROMETER HEAD SETTINGS

FOR COMPOSITION MATRICES

5 Set to 7¼ Set

Units	5 Set	5¼ Set	5½ Set	5¾ Set	6 Set	6¼ Set	6½ Set	6¾ Set	7 Set	7¼ Set
3	27/32	7/8	29/32	31/32	1	1 1/32	1 3/32	1 1/8	1 3/16	1 7/32
	.0115	.0121	.0127	.0133	.0138	.0144	.0150	.0156	.0161	.0167
4	1 1/8	1 5/32	1 7/32	1 9/32	1 11/32	1 3/8	1 7/16	1 1/2	1 9/16	1 5/8
	.0154	.0161	.0169	.0177	.0184	.0192	.0200	.0207	.0215	.0223
5	1 13/32	1 15/32	1 17/32	1 19/32	1 11/16	1 3/4	1 13/16	1 7/8	1 15/16	2 1/32
	.0192	.0202	.0211	.0221	.0231	.0240	.0250	.0259	.0269	.0279
6	1 11/16	1 3/4	1 27/32	1 29/32	2	2 3/32	2 3/16	2 1/4	2 11/32	2 15/32
	.0231	.0242	.0254	.0265	.0277	.0288	.0300	.0311	.0323	.0334
7	1 15/16	2 1/32	2 3/32	2 1/4	2 11/32	2 7/16	2 17/32	2 5/8	2 23/32	2 13/16
	.0269	.0282	.0296	.0309	.0323	.0336	.0350	.0363	.0377	.0390
8	2 7/32	2 11/32	2 7/16	2 9/16	2 11/16	2 25/32	2 29/32	3	3 1/8	3 7/32
	.0307	.0323	.0338	.0354	.0369	.0384	.0400	.0415	.0430	.0446
9	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8	3 1/4	3 3/8	3 1/2	3 5/8
	.0346	.0363	.0380	.0398	.0415	.0432	.0450	.0467	.0484	.0501
10	2 25/32	2 29/32	3 1/16	3 3/16	3 11/32	3 15/32	3 5/8	3 3/4	3 7/8	4 1/32
	.0384	.0403	.0423	.0442	.0461	.0480	.0500	.0519	.0538	.0557
11	3 1/16	3 7/32	3 3/8	3 1/2	3 21/32	3 13/16	3 31/32	4 1/8	4 9/32	4 7/16
	.0423	.0444	.0465	.0486	.0507	.0528	.0549	.0571	.0592	.0613
12	3 11/32	3 1/2	3 21/32	3 27/32	4	4 5/32	4 11/32	4 1/2	4 11/16	4 27/32
	.0461	.0484	.0507	.0530	.0553	.0576	.0599	.0622	.0646	.0669
13	3 5/8	3 15/16	3 31/32	4 5/32	4 11/32	4 1/2	4 11/16	4 7/8	5 1/16	5 1/4
	.0500	.0525	.0549	.0574	.0598	.0624	.0649	.0674	.0699	.0724
14	3 7/8	4 3/32	4 9/32	4 15/32	4 11/16	4 7/8	5 1/16	5 1/4	5 7/16	5 31/32
	.0538	.0565	.0592	.0619	.0646	.0672	.0699	.0726	.0753	.0780
15	4 5/32	4 3/8	4 19/32	4 15/16	5	5 7/32	5 13/32	5 5/8	5 27/32	6 1/32
	.0576	.0605	.0634	.0663	.0692	.0720	.0749	.0778	.0807	.0836
16	4 7/16	4 11/16	4 7/8	5 1/8	5 11/32	5 9/16	5 25/32	6	6 7/32	6 7/16
	.0615	.0646	.0676	.0707	.0738	.0769	.0799	.0830	.0861	.0892
17	4 23/32	4 31/32	5 3/16	5 7/16	5 11/16	5 29/32	6 1/8	6 3/8	6 5/8	6 27/32
	.0653	.0686	.0719	.0751	.0784	.0817	.0849	.0882	.0915	.0947
18	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4	7	7 1/4
	.0692	.0726	.0761	.0795	.0830	.0865	.0899	.0934	.0968	.1003
19	5 9/32	5 9/16	5 15/16	6 1/16	6 11/32	6 19/32	6 7/8	7 1/8	7 13/32	7 21/32
	.0730	.0767	.0803	.0840	.0876	.0913	.0949	.0986	.1022	.1059
20	5 9/16	5 27/32	6 1/8	6 15/32	6 31/32	6 15/16	7 7/32	7 1/2	7 25/32	8 1/16
	.0769	.0807	.0845	.0884	.0922	.0961	.0999	.1037	.1076	.1114
21	5 27/32	6 1/8	6 13/32	6 23/32	7	7 5/16	7 19/32	7 7/8	8 5/32	8 15/32
	.0807	.0847	.0888	.0928	.0968	.1009	.1049	.1089	.1130	.1170
22	6 1/8	6 13/32	6 25/32	7 1/32	7 11/32	7 21/32	7 15/16	8 1/4	8 9/16	8 7/8
	.0845	.0888	.0930	.0972	.1014	.1057	.1099	.1141	.1184	.1226
23	6 5/8	6 25/32	7 1/32	7 11/32	7 21/32	8	8 5/16	8 5/8	8 15/16	9 1/4
	.0884	.0928	.0972	.1016	.1061	.1105	.1149	.1193	.1237	.1281
24	6 21/32	7	7 11/32	7 21/32	8	8 11/32	8 21/32	9	9 11/32	9 21/32
	.0922	.0968	.1014	.1060	.1106	.1152	.1198	.1244	.1291	.1337
25	6 15/16	7 9/32	7 21/32	8	8 11/32	8 11/16	9 1/32	9 3/8	9 23/32	10 1/16
	.0961	.1009	.1057	.1105	.1153	.1201	.1249	.1297	.1345	.1393
26	7 7/32	7 19/32	7 15/16	8 5/16	8 11/16	9 1/32	9 3/8	9 3/4	10 1/8	10 15/32
	.0999	.1049	.1099	.1149	.1199	.1249	.1299	.1349	.1399	.1449

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS

FOR COMPOSITION MATRICES

$7\frac{1}{2}$ Set to $9\frac{3}{4}$ Set

$7\frac{1}{2}$ Set	$7\frac{3}{4}$ Set	8 Set	$8\frac{1}{4}$ Set	$8\frac{1}{2}$ Set.	$8\frac{3}{4}$ Set	9 Set	$9\frac{1}{4}$ Set	$9\frac{1}{2}$ Set	$9\frac{3}{4}$ Set	Units
$1\ 1_4$	$1\ 9_{32}$	$1\ 11_{32}$	$1\ 3_8$	$1\ 13_{32}$	$1\ 15_{32}$	$1\ 1_2$	$1\ 17_{32}$	$1\ 19_{32}$	$1\ 5_8$	3
.0173	.0179	.0184	.0190	.0196	.0202	.0207	.0213	.0219	.0225	
$1\ 11_{16}$	$1\ 23_{32}$	$1\ 25_{32}$	$1\ 27_{32}$	$1\ 7_8$	$1\ 15_{16}$	2	$2\ 1_{16}$	$2\ 1_8$	$2\ 3_{16}$	4
.0231	.0238	.0246	.0254	.0261	.0269	.0277	.0284	.0292	.0300	
$2\ 3_{32}$	$2\ 5_{32}$	$2\ 7_{32}$	$2\ 5_{16}$	$2\ 3_8$	$2\ 7_{16}$	$2\ 1_2$	$2\ 9_{16}$	$2\ 21_{32}$	$2\ 23_{32}$	5
.0288	.0298	.0307	.0317	.0327	.0336	.0346	.0355	.0365	.0375	
$2\ 1_2$	$2\ 19_{32}$	$2\ 11_{16}$	$2\ 3_4$	$2\ 27_{32}$	$2\ 29_{32}$	3	$3\ 3_{32}$	$3\ 5_{32}$	$3\ 1_4$	6
.0346	.0357	.0369	.0380	.0392	.0403	.0415	.0427	.0438	.0450	
$2\ 29_{32}$	3	$3\ 1_8$	$3\ 7_{32}$	$3\ 5_{16}$	$3\ 13_{32}$	$3\ 1_2$	$3\ 19_{32}$	$3\ 11_{16}$	$3\ 15_{16}$	7
.0403	.0417	.0430	.0444	.0457	.0471	.0484	.0498	.0511	.0525	
$3\ 11_{32}$	$3\ 7_{16}$	$3\ 9_{16}$	$3\ 21_{32}$	$3\ 25_{32}$	$3\ 7_8$	4	$4\ 1_8$	$4\ 7_{32}$	$4\ 11_{32}$	8
.0461	.0476	.0492	.0507	.0523	.0538	.0553	.0569	.0584	.0599	
$3\ 3_4$	$3\ 7_8$	4	$4\ 1_8$	$4\ 1_4$	$4\ 3_8$	$4\ 1_2$	$4\ 5_8$	$4\ 3_4$	$4\ 7_8$	9
.0519	.0536	.0553	.0571	.0588	.0605	.0622	.0640	.0657	.0674	
$4\ 5_{32}$	$4\ 5_{16}$	$4\ 7_{16}$	$4\ 19_{32}$	$4\ 23_{32}$	$4\ 7_8$	5	$5\ 5_{32}$	$5\ 9_{32}$	$5\ 13_{32}$	10
.0576	.0595	.0615	.0634	.0653	.0672	.0692	.0711	.0730	.0749	
$4\ 19_{32}$	$4\ 3_4$	$4\ 7_8$	$5\ 1_{32}$	$5\ 3_{16}$	$5\ 11_{32}$	$5\ 1_2$	$5\ 21_{32}$	$5\ 13_{16}$	$5\ 31_{32}$	11
.0634	.0655	.0676	.0697	.0719	.0740	.0761	.0782	.0803	.0824	
5	$5\ 5_{16}$	$5\ 11_{32}$	$5\ 1_2$	$5\ 11_{16}$	$5\ 27_{32}$	6	$6\ 5_{32}$	$6\ 11_{32}$	$6\ 1_2$	12
.0692	.0715	.0738	.0761	.0784	.0807	.0830	.0853	.0876	.0899	
$5\ 13_{32}$	$5\ 19_{32}$	$5\ 25_{32}$	$5\ 31_{32}$	$6\ 1_8$	$6\ 3_{16}$	$6\ 1_2$	$6\ 11_{16}$	$6\ 7_8$	$7\ 1_{32}$	13
.0749	.0774	.0799	.0824	.0849	.0874	.0899	.0924	.0949	.0974	
$5\ 27_{32}$	$6\ 1_{32}$	$6\ 7_{32}$	$6\ 13_{32}$	$6\ 5_8$	$6\ 13_{16}$	7	$7\ 3_{16}$	$7\ 13_{32}$	$7\ 19_{32}$	14
.0807	.0834	.0861	.0888	.0915	.0941	.0968	.0995	.1022	.1049	
$6\ 1_4$	$6\ 15_{32}$	$6\ 21_{32}$	$6\ 7_8$	$7\ 3_{32}$	$7\ 5_{16}$	$7\ 1_2$	$7\ 23_{32}$	$7\ 29_{32}$	$8\ 1_8$	15
.0865	.0893	.0922	.0951	.0980	.1009	.1037	.1066	.1095	.1124	
$6\ 21_{32}$	$6\ 7_8$	$7\ 1_8$	$7\ 11_{32}$	$7\ 9_{16}$	$7\ 25_{32}$	8	$8\ 7_{32}$	$8\ 7_{16}$	$8\ 21_{32}$	16
.0922	.0953	.0984	.1014	.1045	.1076	.1107	.1137	.1168	.1199	
$7\ 5_{32}$	$7\ 5_{16}$	$7\ 9_{16}$	$7\ 13_{16}$	$8\ 1_{32}$	$8\ 1_4$	$8\ 1_2$	$8\ 3_4$	$8\ 31_{32}$	$9\ 7_{32}$	17
.0980	.1013	.1045	.1078	.1111	.1143	.1176	.1208	.1241	.1274	
$7\ 1_2$	$7\ 3_4$	8	$8\ 1_4$	$8\ 1_2$	$8\ 3_4$	9	$9\ 1_4$	$9\ 1_2$	$9\ 3_4$	18
.1038	.1072	.1107	.1141	.1176	.1210	.1245	.1280	.1314	.1349	
$7\ 29_{32}$	$8\ 3_{16}$	$8\ 7_{16}$	$8\ 23_{32}$	$8\ 31_{32}$	$9\ 1_4$	$9\ 1_2$	$9\ 25_{32}$	$10\ 1_{32}$	$10\ 5_{16}$	19
.1095	.1132	.1168	.1205	.1241	.1278	.1314	.1351	.1387	.1424	
$8\ 11_{32}$	$8\ 5_8$	$8\ 7_8$	$9\ 5_{32}$	$9\ 7_{16}$	$9\ 23_{32}$	10	$10\ 9_{32}$	$10\ 9_{16}$	$10\ 27_{32}$	20
.1153	.1191	.1230	.1268	.1307	.1345	.1383	.1422	.1460	.1499	
$8\ 3_4$	$9\ 1_{32}$	$9\ 11_{32}$	$9\ 5_8$	$9\ 29_{32}$	$10\ 7_{32}$	$10\ 1_2$	$10\ 15_{16}$	$11\ 3_{32}$	$11\ 3_8$	21
.1210	.1251	.1291	.1331	.1372	.1412	.1452	.1493	.1533	.1574	
$9\ 5_{32}$	$9\ 15_{32}$	$9\ 25_{32}$	$10\ 5_{32}$	$10\ 15_{32}$	$10\ 11_{16}$	11	$11\ 5_{16}$	$11\ 3_8$	$11\ 29_{32}$	22
.1268	.1310	.1353	.1395	.1437	.1479	.1522	.1564	.1606	.1648	
$9\ 19_{32}$	$9\ 29_{32}$	$10\ 7_{32}$	$10\ 17_{32}$	$10\ 7_8$	$11\ 5_{16}$	$11\ 1_2$	$11\ 13_{16}$	$12\ 1_8$	$12\ 15_{32}$	23
.1325	.1369	.1414	.1458	.1502	.1546	.1591	.1635	.1679	.1723	
10	$10\ 11_{32}$	$10\ 21_{32}$	11	$11\ 11_{32}$	$11\ 21_{32}$	12	$12\ 11_{32}$	$12\ 21_{32}$	13	24
.1383	.1429	.1475	.1521	.1567	.1613	.1660	.1706	.1752	.1798	
$10\ 15_{32}$	$10\ 3_4$	$11\ 1_8$	$11\ 15_{32}$	$11\ 15_{16}$	$12\ 5_{32}$	$12\ 1_2$	$12\ 27_{32}$	$13\ 3_{16}$	$13\ 17_{32}$	25
.1441	.1489	.1537	.1585	.1633	.1681	.1729	.1777	.1825	.1873	
$10\ 27_{32}$	$11\ 3_{16}$	$11\ 9_{16}$	$11\ 29_{32}$	$12\ 9_{32}$	$12\ 5_8$	13	$13\ 3_8$	$13\ 23_{32}$	$14\ 3_{32}$	26
.1499	.1549	.1599	.1648	.1698	.1748	.1798	.1848	.1898	.1948	

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS

FOR COMPOSITION MATRICES

10 Set to 11¾ Set

Units	10 Set	10¼ Set	10½ Set	10¾ Set	11 Set	11¼ Set	11½ Set	11¾ Set
3	1 11/16	1 23/32	1 3/4	1 15/16	1 27/32	1 7/8	1 29/32	1 31/32
	.0231	.0236	.0242	.0248	.0254	.0259	.0265	.0271
4	2 7/32	2 9/32	2 11/32	2 13/32	2 7/16	2 1/2	2 9/16	2 5/8
	.0307	.0315	.0323	.0330	.0338	.0346	.0354	.0361
5	2 25/32	2 27/32	2 29/32	3	3 1/16	3 1/8	3 3/16	3 1/4
	.0384	.0394	.0403	.0413	.0423	.0432	.0442	.0452
6	3 11/32	3 13/32	3 1/2	3 19/32	3 21/32	3 3/4	3 27/32	3 29/32
	.0461	.0473	.0484	.0496	.0507	.0519	.0530	.0542
7	3 7/8	4	4 1/32	4 1/16	4 3/32	4 1/8	4 5/32	4 3/16
	.0538	.0551	.0565	.0578	.0592	.0605	.0619	.0632
8	4 7/16	4 9/16	4 11/16	4 25/32	4 7/8	5	5 1/8	5 7/32
	.0615	.0630	.0646	.0661	.0676	.0692	.0707	.0722
9	5	5 1/8	5 1/4	5 3/8	5 1/2	5 5/8	5 3/4	5 7/8
	.0692	.0709	.0726	.0744	.0761	.0778	.0795	.0813
10	5 9/16	5 25/32	5 27/32	5 31/32	6 1/8	6 1/4	6 13/32	6 17/32
	.0769	.0788	.0807	.0826	.0845	.0865	.0884	.0903
11	6 1/8	6 9/32	6 13/32	6 9/16	6 25/32	6 7/8	7 1/32	7 5/16
	.0845	.0867	.0888	.0909	.0930	.0951	.0972	.0993
12	6 21/32	6 27/32	7	7 5/32	7 11/32	7 1/2	7 11/16	7 27/32
	.0922	.0945	.0968	.0991	.1014	.1037	.1061	.1084
13	7 7/32	7 13/32	7 13/32	7 25/32	7 15/16	8 1/8	8 5/16	8 1/2
	.0999	.1024	.1049	.1074	.1099	.1124	.1149	.1174
14	7 25/32	7 31/32	8 5/32	8 3/8	8 9/16	8 3/4	8 15/16	9 1/8
	.1076	.1103	.1130	.1157	.1184	.1210	.1237	.1264
15	8 11/32	8 17/32	8 3/4	8 31/32	9 5/32	9 3/8	9 19/32	9 13/16
	.1153	.1182	.1210	.1239	.1268	.1297	.1326	.1355
16	8 7/8	9 1/8	9 11/32	9 9/16	9 25/32	10	10 7/32	10 7/16
	.1230	.1260	.1291	.1322	.1353	.1383	.1414	.1445
17	9 7/16	9 11/16	9 29/32	10 5/32	10 13/32	10 5/8	10 7/8	11 3/32
	.1306	.1339	.1372	.1404	.1437	.1470	.1502	.1535
18	10	10 1/4	10 1/2	10 3/4	11	11 1/4	11 1/2	11 3/4
	.1383	.1418	.1453	.1487	.1522	.1556	.1591	.1625
19	10 9/16	10 15/16	11 5/32	11 11/32	11 5/8	11 7/8	12 1/8	12 13/32
	.1460	.1497	.1533	.1570	.1606	.1643	.1679	.1716
20	11 1/8	11 13/32	11 21/32	11 15/16	12 7/32	12 1/2	12 25/32	13 1/16
	.1537	.1576	.1614	.1652	.1691	.1729	.1768	.1806
21	11 25/32	11 31/32	12 1/4	12 17/32	12 27/32	13 1/8	13 13/32	13 23/32
	.1614	.1654	.1695	.1735	.1775	.1816	.1856	.1896
22	12 7/32	12 17/32	12 27/32	13 5/32	13 7/16	13 3/4	14 1/16	14 3/8
	.1691	.1733	.1775	.1818	.1860	.1902	.1944	.1987
23	12 25/32	13 3/32	13 13/32	13 3/4	14 1/16	14 3/8	14 11/16	15 1/32
	.1767	.1811	.1855	.1899	.1944	.1988	.2032	.2076
24	13 11/32	13 21/32	14	14 11/32	14 21/32	15	15 11/32	15 21/32
	.1844	.1890	.1936	.1982	.2029	.2075	.2121	.2167
25	13 7/8	14 1/4	14 1/2	14 15/16	15 9/32	15 5/8	15 31/32	16 5/16
	.1921	.1969	.2017	.2065	.2113	.2161	.2209	.2257
26	14 7/16	14 13/16	15 5/32	15 17/32	15 7/8	16 1/4	16 5/8	16 31/32
	.1998	.2048	.2098	.2148	.2198	.2248	.2298	.2348

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS
FOR COMPOSITION MATRICES
12 Set to 14 Set

12 Set	12¼ Set	12½ Set	12¾ Set	13 Set	13¼ Set	13½ Set	13¾ Set	14 Set	Units
2	2 1/32	2 2/32	2 3/32	2 5/32	2 7/32	2 1/4	2 9/32	2 11/32	3
.0277	.0282	.0288	.0294	.0300	.0305	.0311	.0317	.0323	
2 11/16	2 23/32	2 25/32	2 27/32	2 7/8	2 15/16	3	3 1/16	3 3/32	4
.0369	.0377	.0384	.0392	.0400	.0407	.0415	.0423	.0430	
3 11/32	3 13/32	3 15/32	3 17/32	3 3/8	3 11/16	3 3/4	3 15/16	3 7/8	5
.0461	.0471	.0480	.0490	.0500	.0509	.0519	.0528	.0538	
4	4 3/32	4 5/32	4 1/4	4 11/32	4 15/32	4 1/2	4 19/32	4 21/32	6
.0553	.0565	.0576	.0587	.0599	.0610	.0622	.0633	.0645	
4 11/16	4 25/32	4 7/8	4 31/32	5 1/16	5 5/32	5 1/4	5 11/32	5 7/16	7
.0646	.0659	.0672	.0685	.0699	.0712	.0726	.0739	.0753	
5 11/32	5 7/16	5 9/16	5 21/32	5 25/32	5 7/8	6	6 3/32	6 7/32	8
.0738	.0753	.0769	.0784	.0799	.0815	.0830	.0845	.0861	
6	6 1/8	6 1/4	6 3/8	6 1/2	6 5/8	6 3/4	6 7/8	7	9
.0830	.0847	.0865	.0882	.0899	.0916	.0934	.0951	.0968	
6 21/32	6 15/16	6 15/16	7 3/32	7 7/32	7 3/8	7 1/2	7 21/32	7 25/32	10
.0922	.0941	.0961	.0980	.0999	.1018	.1037	.1057	.1076	
7 11/32	7 1/2	7 21/32	7 25/32	7 15/16	8 3/32	8 1/4	8 13/32	8 9/16	11
.1014	.1036	.1057	.1078	.1099	.1120	.1141	.1162	.1184	
8	8 3/32	8 11/32	8 1/2	8 21/32	8 27/32	9	9 3/32	9 11/32	12
.1107	.1130	.1153	.1176	.1199	.1222	.1245	.1268	.1291	
8 25/32	8 27/32	9 1/32	9 7/32	9 3/8	9 9/16	9 3/4	9 15/16	10 1/8	13
.1199	.1224	.1249	.1274	.1299	.1324	.1349	.1374	.1399	
9 11/32	9 17/32	9 23/32	9 29/32	10 1/8	10 5/16	10 1/2	10 11/16	10 7/8	14
.1291	.1318	.1345	.1372	.1399	.1426	.1453	.1479	.1506	
10	10 7/32	10 13/32	10 5/8	10 27/32	11 1/32	11 1/4	11 15/32	11 21/32	15
.1383	.1412	.1441	.1470	.1499	.1528	.1556	.1585	.1614	
10 11/16	10 7/8	11 1/8	11 11/32	11 9/16	11 25/32	12	12 7/32	12 7/16	16
.1476	.1506	.1537	.1568	.1599	.1629	.1660	.1691	.1722	
11 11/32	11 9/16	11 13/16	12 1/32	12 9/32	12 1/2	12 3/4	13	13 7/32	17
.1568	.1600	.1633	.1666	.1698	.1731	.1764	.1796	.1829	
12	12 1/4	12 1/2	12 3/4	13	13 1/4	13 1/2	13 3/4	14	18
.1660	.1695	.1729	.1764	.1798	.1833	.1868	.1902	.1937	
12 21/32	12 13/16	13 3/16	13 13/32	13 25/32	14	14 1/4	14 1/2	14 25/32	19
.1752	.1789	.1825	.1862	.1898	.1935	.1971	.2008	.2044	
13 11/32	13 5/8	13 7/8	14 5/32	14 7/16	14 23/32	15	15 9/32	15 9/16	20
.1844	.1883	.1921	.1960	.1998	.2037	.2075	.2113	.2152	
14	14 9/16	14 19/32	14 7/8	15 5/32	15 15/32	15 3/4	16 1/32	16 11/32	21
.1937	.1977	.2017	.2058	.2098	.2138	.2179	.2219	.2258	
14 11/16	14 31/32	15 9/32	15 19/32	15 7/8	16 3/16	16 1/2	16 13/16	17 1/8	22
.2029	.2071	.2113	.2156	.2193	.2240	.2282	.2325	.2367	
15 11/32	15 21/32	15 31/32	16 9/32	16 5/8	16 15/16	17 1/4	17 9/16	17 7/8	23
.2121	.2165	.2209	.2253	.2293	.2342	.2386	.2430	.2474	
16	16 1/32	16 11/16	17	17 11/32	17 21/32	18	18 11/32	18 21/32	24
.2213	.2259	.2305	.2351	.2398	.2444	.2490	.2536	.2582	
16 11/16	17	17 3/8	17 25/32	18 1/16	18 15/32	18 3/4	19 3/32	19 7/10	25
.2306	.2354	.2402	.2450	.2498	.2546	.2594	.2642	.2690	
17 11/32	17 11/16	18 1/16	18 13/32	18 25/32	19 1/8	19 1/2	19 7/8	20 7/32	26
.2398	.2448	.2498	.2548	.2598	.2647	.2697	.2747	.2797	

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS

FOR LARGE COMPOSITION MATRICES

14 Set to 16¼ Set

Units	14 Set	14¼ Set	14½ Set	14¾ Set	15 Set	15¼ Set	15½ Set	15¾ Set	16 Set	16¼ Set
3	2 11/32	2 3/8	2 13/32	2 15/32	2 1/2	2 17/32	2 19/32	2 5/8	2 21/32	2 23/32
	.0323	.0328	.0334	.0340	.0346	.0351	.0357	.0363	.0369	.0374
4	3 3/32	3 5/32	3 7/32	3 9/32	3 11/32	3 3/8	3 7/16	3 1/2	3 9/16	3 19/32
	.0430	.0438	.0446	.0453	.0461	.0469	.0476	.0484	.0492	.0499
5	3 7/8	3 31/32	4 1/32	4 3/32	4 5/32	4 1/4	4 5/16	4 3/8	4 7/16	4 1/2
	.0538	.0547	.0557	.0567	.0576	.0586	.0596	.0605	.0615	.0624
6	4 21/32	4 3/4	4 27/32	4 29/32	5	5 3/32	5 5/32	5 1/4	5 11/32	5 13/32
	.0645	.0657	.0668	.0680	.0692	.0703	.0715	.0726	.0738	.0749
7	5 7/16	5 17/32	5 5/8	5 23/32	5 27/32	5 15/16	6 1/32	6 1/8	6 1/4	6 5/16
	.0753	.0766	.0780	.0793	.0807	.0820	.0834	.0847	.0861	.0874
8	6 7/32	6 11/32	6 7/16	6 9/16	6 21/32	6 25/32	6 7/8	7	7 1/8	7 7/32
	.0861	.0876	.0891	.0907	.0922	.0938	.0953	.0968	.0984	.0999
9	7	7 1/8	7 1/4	7 3/8	7 1/2	7 5/8	7 3/4	7 7/8	8	8 1/8
	.0988	.0985	.1003	.1020	.1037	.1055	.1072	.1089	.1107	.1124
10	7 25/32	7 29/32	8 1/16	8 5/16	8 11/32	8 15/32	8 19/32	8 3/4	8 7/8	9 1/32
	.1076	.1095	.1114	.1133	.1153	.1172	.1191	.1210	.1230	.1249
11	8 9/16	8 11/16	8 7/8	9	9 5/32	9 5/16	9 15/32	9 5/8	9 25/32	9 15/16
	.1184	.1204	.1226	.1247	.1268	.1289	.1310	.1331	.1352	.1374
12	9 11/32	9 1/2	9 31/32	9 27/32	10	10 5/32	10 11/32	10 1/2	10 21/32	10 27/32
	.1291	.1314	.1337	.1360	.1383	.1406	.1429	.1452	.1475	.1498
13	10 1/8	10 9/32	10 15/32	10 21/32	10 27/32	11	11 5/16	11 3/8	11 7/16	11 3/4
	.1399	.1423	.1449	.1473	.1499	.1523	.1548	.1573	.1598	.1623
14	10 7/8	11 3/32	11 9/32	11 15/32	11 21/32	11 7/8	12 1/16	12 1/4	12 7/16	12 21/32
	.1506	.1533	.1560	.1587	.1614	.1641	.1668	.1694	.1721	.1748
15	11 21/32	11 7/8	12 3/32	12 9/32	12 1/2	12 23/32	12 29/32	13 1/8	13 11/32	13 17/32
	.1614	.1642	.1671	.1700	.1729	.1758	.1787	.1816	.1844	.1873
16	12 7/16	12 21/32	12 7/8	13 3/32	13 11/32	13 9/16	13 25/32	14	14 7/32	14 7/16
	.1722	.1752	.1783	.1813	.1841	.1875	.1906	.1937	.1967	.1998
17	13 7/32	13 7/16	13 11/16	13 15/16	14 5/32	14 13/32	14 5/8	14 7/8	15 3/32	15 11/32
	.1829	.1861	.1894	.1927	.1960	.1992	.2025	.2058	.2090	.2123
18	14	14 1/4	14 1/2	14 3/4	15	15 1/4	15 1/2	15 3/4	16	16 1/4
	.1937	.1971	.2006	.2040	.2075	.2110	.2144	.2179	.2213	.2248
19	14 25/32	15 1/32	15 5/16	15 9/16	15 27/32	16 3/32	16 3/8	16 5/8	16 7/8	17 5/32
	.2044	.2080	.2117	.2154	.2190	.2227	.2263	.2300	.2336	.2373
20	15 9/16	15 27/32	16 3/32	16 15/32	16 21/32	16 15/16	17 7/32	17 1/2	17 25/32	18 1/16
	.2152	.2190	.2228	.2267	.2305	.2344	.2382	.2421	.2459	.2498
21	16 11/32	16 5/8	16 29/32	17 7/32	17 1/2	17 25/32	18 3/32	18 3/8	18 21/32	18 31/32
	.2259	.2299	.2340	.2380	.2421	.2461	.2501	.2542	.2582	.2622
22	17 1/8	17 13/32	17 25/32	18 1/32	18 11/32	18 5/8	18 15/16	19 1/4	19 9/16	19 7/8
	.2367	.2409	.2451	.2494	.2536	.2578	.2621	.2663	.2705	.2747
23	17 7/8	18 3/16	18 17/32	18 27/32	19 5/32	19 15/32	19 13/16	20 1/8	20 7/16	20 3/4
	.2474	.2518	.2563	.2607	.2651	.2695	.2740	.2784	.2828	.2872
24	18 21/32	19	19 11/32	19 21/32	20	20 5/16	20 21/32	21	21 11/32	21 21/32
	.2582	.2628	.2674	.2720	.2767	.2813	.2859	.2905	.2951	.2997
25	19 7/16	19 29/32	20 1/8	20 15/32	20 27/32	21 5/16	21 17/32	21 7/8	22 7/32	22 9/16
	.2890	.2787	.2786	.2834	.2882	.2930	.2978	.3026	.3074	.3122
26	20 7/32	20 13/32	20 15/16	21 5/16	21 21/32	22 1/32	22 13/32	22 3/4	23 3/32	23 15/32
	.2797	.2847	.2897	.2947	.2997	.3047	.3097	.3147	.3197	.3247

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS

FOR LARGE COMPOSITION MATRICES

$16\frac{1}{2}$ Set to $18\frac{3}{4}$ Set

$16\frac{1}{2}$ Set	$16\frac{3}{4}$ Set	17 Set	$17\frac{1}{4}$ Set	$17\frac{1}{2}$ Set	$17\frac{3}{4}$ Set	18 Set	$18\frac{1}{4}$ Set	$18\frac{1}{2}$ Set	$18\frac{3}{4}$ Set	Units
2 3/1	2 25/32	2 27/32	2 7/8	2 29/32	2 31/32	3	3 1/32	3 3/32	3 1/8	3
.0380	.0386	.0392	.0398	.0403	.0409	.0415	.0421	.0426	.0432	
3 21/32	3 25/32	3 25/32	3 27/32	3 7/8	3 15/16	4	4 1/16	4 3/32	4 5/32	4
.0507	.0515	.0522	.0530	.0538	.0546	.0553	.0561	.0569	.0576	
4 9/32	4 21/32	4 23/32	4 25/32	4 7/8	4 15/16	5	5 1/16	5 1/8	5 3/16	5
.0634	.0644	.0653	.0663	.0672	.0682	.0692	.0701	.0711	.0720	
5 1/2	5 9/16	5 21/32	5 3/4	5 27/32	5 29/32	6	6 3/32	6 5/32	6 1/4	6
.0761	.0772	.0784	.0795	.0807	.0818	.0830	.0841	.0853	.0865	
6 5/32	6 1/2	6 19/32	6 23/32	6 13/16	6 29/32	7	7 5/32	7 5/16	7 9/32	7
.0888	.0901	.0914	.0928	.0941	.0955	.0968	.0982	.0995	.1009	
7 11/32	7 7/16	7 9/16	7 21/32	7 25/32	7 7/8	8	8 1/8	8 7/32	8 11/32	8
.1014	.1030	.1045	.1060	.1076	.1091	.1107	.1122	.1137	.1153	
8 1/4	8 3/8	8 1/2	8 5/8	8 3/4	8 7/8	9	9 1/8	9 1/4	9 3/8	9
.1141	.1158	.1176	.1193	.1210	.1228	.1245	.1262	.1280	.1297	
9 5/32	9 5/16	9 7/16	9 15/32	9 25/32	9 27/32	10	10 1/8	10 9/32	10 13/32	10
.1268	.1287	.1306	.1326	.1345	.1364	.1383	.1402	.1422	.1441	
10 3/32	10 1/4	10 3/8	10 17/32	10 11/16	10 27/32	11	11 5/32	11 5/16	11 15/32	11
.1395	.1416	.1437	.1458	.1479	.1500	.1522	.1543	.1564	.1585	
11	11 5/32	11 11/32	11 1/2	11 21/32	11 27/32	12	12 5/32	12 11/32	12 1/2	12
.1522	.1545	.1568	.1591	.1614	.1637	.1660	.1683	.1708	.1729	
11 29/32	12 3/32	12 9/32	12 15/32	12 5/8	12 13/16	13	13 3/16	13 3/8	13 17/32	13
.1648	.1673	.1689	.1723	.1748	.1773	.1798	1823	.1848	.1873	
12 27/32	13 1/32	13 7/32	13 13/32	13 5/8	13 13/16	14	14 3/16	14 3/8	14 19/32	14
.1775	.1802	.1829	.1856	.1883	.1910	.1937	.1963	.1990	.2017	
13 3/4	13 31/32	14 5/32	14 3/8	14 19/32	14 13/16	15	15 7/32	15 13/32	15 5/8	15
.1902	.1931	.1960	.1988	.2017	.2046	.2075	.2104	.2133	.2161	
14 21/32	14 7/8	15 1/8	15 11/32	15 9/16	15 25/32	16	16 7/32	16 7/16	11 11/16	16
.2029	.2060	.2090	.2121	.2152	.2182	.2213	.2244	.2275	.2306	
15 19/32	15 23/16	16 1/16	16 9/32	16 17/32	16 25/32	17	17 1/4	17 15/32	17 25/32	17
.2156	.2188	.2221	.2254	.2286	.2319	.2352	.2384	.2417	.2450	
16 1/2	16 3/4	17	17 1/4	17 1/2	17 3/4	18	18 1/4	18 1/2	18 3/4	18
.2282	.2317	.2351	.2386	.2421	.2455	.2490	.2524	.2559	.2594	
17 13/32	17 11/16	17 15/16	18 7/32	18 15/32	18 3/4	19	19 9/32	19 17/32	19 13/16	19
.2409	.2446	.2482	.2519	.2555	.2592	.2628	.2665	.2701	.2738	
18 11/32	18 19/32	18 29/32	19 5/32	19 7/16	19 25/32	20	20 9/32	20 9/16	20 27/32	20
.2536	.2574	.2613	.2651	.2690	.2728	.2767	.2805	.2843	.2882	
19 1/4	19 17/32	19 27/32	20 1/8	20 13/32	20 25/32	21	21 9/32	21 19/32	21 7/8	21
.2663	.2703	.2744	.2784	.2824	.2865	.2905	.2945	.2986	.3026	
20 5/32	20 15/32	20 25/32	21 5/32	21 3/8	22 11/16	22	22 5/16	22 3/8	22 29/32	22
.2790	.2832	.2874	.2916	.2959	.3001	.3043	.3086	.3128	.3170	
21 3/32	21 13/32	21 23/32	22 1/32	22 5/8	22 11/16	23	23 5/16	23 21/32	23 31/32	23
.2916	.2961	.3005	.3049	.3093	.3137	.3182	.3226	.3270	.3314	
22	22 5/16	22 11/16	23	23 11/32	23 21/32	24	24 11/32	24 21/32	25	24
.3043	.3089	.3136	.3182	.3228	.3274	.3320	.3366	.3412	.3458	
22 29/32	23 1/4	23 5/8	23 31/32	24 5/16	24 21/32	25	25 11/32	25 1/16	26 1/32	25
.3170	.3218	.3266	.3314	.3362	.3410	.3458	.3506	.3554	.3602	
23 27/32	24 5/16	24 9/16	24 23/32	25 9/32	25 21/32	26	26 9/32	26 23/32	27 3/32	26
.3297	.3347	.3397	.3447	.3497	.3547	.3598	.3647	.3697	.3746	

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS

FOR LARGE COMPOSITION MATRICES

19 Set to 21¼ Set

Units	19 Set	19¼ Set	19½ Set	19¾ Set	20 Set	20¼ Set	20½ Set	20¾ Set	21 Set	21¼ Set
3	3 5/32	3 7/32	3 1/4	3 9/32	3 11/32	3 3/8	3 13/32	3 15/32	3 1/2	3 17/32
	.0438	.0444	.0450	.0455	.0461	.0467	.0473	.0478	.0484	.0490
4	4 7/32	4 9/32	4 11/32	4 3/8	4 7/16	4 1/2	4 9/16	4 5/8	4 21/32	4 23/32
	.0584	.0592	.0599	.0607	.0615	.0622	.0630	.0638	.0646	.0653
5	5 9/32	5 11/32	5 13/32	5 15/32	5 9/16	5 5/8	5 11/16	5 3/4	5 27/32	5 29/32
	.0730	.0740	.0749	.0759	.0769	.0778	.0788	.0797	.0807	.0817
6	6 11/32	6 13/32	6 1/2	6 19/32	6 21/32	6 3/4	6 27/32	6 29/32	7	7 3/32
	.0876	.0888	.0899	.0911	.0922	.0934	.0945	.0957	.0968	.0980
7	7 3/8	7 15/32	7 19/32	7 11/16	7 25/32	7 7/8	7 31/32	8 1/16	8 5/32	8 1/4
	.1022	.1036	.1049	.1062	.1076	.1089	.1103	.1116	.1130	.1143
8	8 7/16	8 9/16	8 21/32	8 25/32	8 7/8	9	9 3/32	9 7/32	9 11/32	9 7/16
	.1168	.1184	.1199	.1214	.1230	.1245	.1260	.1276	.1291	.1306
9	9 1/2	9 5/8	9 3/4	9 7/8	10	10 1/8	10 1/4	10 3/8	10 1/2	10 5/8
	.1314	.1331	.1349	.1366	.1383	.1401	.1418	.1435	.1452	.1470
10	10 9/16	10 11/16	10 27/32	10 31/32	11 5/32	11 1/4	11 3/8	11 17/32	11 21/32	11 15/16
	.1460	.1479	.1499	.1518	.1537	.1556	.1575	.1595	.1614	.1633
11	11 19/32	11 3/4	11 29/32	12 1/16	12 7/32	12 3/8	12 17/32	12 11/16	12 27/32	13
	.1608	.1627	.1648	.1670	.1691	.1712	.1733	.1754	.1775	.1796
12	12 21/32	12 27/32	13	13 5/32	13 11/32	13 1/2	13 21/32	13 27/32	14	14 3/16
	.1752	.1775	.1798	.1821	.1844	.1867	.1891	.1914	.1937	.1960
13	13 23/32	13 29/32	14 5/32	14 1/4	14 7/16	14 5/8	14 13/16	15	15 5/32	15 11/32
	.1898	.1923	.1948	.1973	.1998	.2023	.2048	.2073	.2098	.2123
14	14 25/32	14 31/32	15 5/32	15 3/8	15 9/16	15 3/4	15 15/16	16 5/32	16 11/32	16 17/32
	.2044	.2071	.2098	.2125	.2152	.2179	.2206	.2233	.2259	.2286
15	15 27/32	16 1/32	16 1/4	16 15/32	16 11/16	16 7/8	17 3/32	17 9/32	17 1/2	17 23/32
	.2190	.2219	.2248	.2277	.2306	.2334	.2363	.2392	.2421	.2450
16	16 7/8	17 3/32	17 11/32	17 9/16	17 25/32	18	18 7/32	18 7/16	18 21/32	18 29/32
	.2336	.2367	.2398	.2429	.2459	.2490	.2521	.2551	.2582	.2613
17	17 15/16	18 3/16	18 13/32	18 21/32	18 29/32	19 1/8	19 3/8	19 19/32	19 27/32	20 1/16
	.2462	.2515	.2548	.2580	.2613	.2646	.2678	.2711	.2744	.2776
18	19	19 1/4	19 1/2	19 3/4	20	20 1/4	20 1/2	20 3/4	21	21 1/4
	.2628	.2663	.2697	.2732	.2767	.2801	.2836	.2870	.2905	.2940
19	20 1/16	20 5/16	20 19/32	20 27/32	21 1/8	21 3/8	21 21/32	21 29/32	22 5/32	22 7/16
	.2774	.2811	.2847	.2884	.2920	.2957	.2993	.3030	.3066	.3103
20	21 3/32	21 5/8	21 21/32	21 15/16	22 7/32	22 1/2	22 25/32	23 1/16	23 11/32	23 5/8
	.2920	.2959	.2997	.3036	.3074	.3112	.3151	.3189	.3228	.3266
21	22 5/32	22 15/32	22 3/4	23 1/32	23 11/32	23 5/8	23 29/32	24 7/32	24 1/2	24 25/32
	.3066	.3107	.3147	.3187	.3228	.3268	.3308	.3349	.3389	.3430
22	23 7/32	23 17/32	23 27/32	24 5/32	24 7/16	24 3/4	25 1/16	25 3/8	25 21/32	25 31/32
	.3212	.3255	.3297	.3339	.3381	.3424	.3466	.3509	.3551	.3593
23	24 9/32	24 19/32	24 29/32	25 1/4	25 9/16	25 7/8	26 3/16	26 1/2	26 27/32	27 5/32
	.3358	.3403	.3447	.3491	.3535	.3579	.3624	.3668	.3712	.3756
24	25 11/32	25 21/32	26	26 11/32	26 21/32	27	27 11/32	27 21/32	28	
	.3504	.3551	.3597	.3643	.3689	.3735	.3781	.3827	.3873	
25	26 3/8	26 3/4	27 5/32	27 7/16	27 25/32	28 1/8				
	.3650	.3700	.3747	.3795	.3843	.3891				
26	27 7/16	27 15/16	28 5/32							
	.3798	.3866	.3896							

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS
FOR LARGE COMPOSITION MATRICES
$21\frac{1}{2}$ Set to $23\frac{3}{4}$ Set

$21\frac{1}{4}$ Set	$21\frac{1}{4}$ Set	22 Set	$22\frac{1}{4}$ Set	$22\frac{1}{2}$ Set	$22\frac{3}{4}$ Set	23 Set	$23\frac{1}{4}$ Set	$23\frac{1}{2}$ Set	$23\frac{3}{4}$ Set	Units
3 19_{32}	3 5_{8}	3 21_{32}	3 23_{32}	3 3_{4}	3 25_{32}	3 27_{32}	3 7_{8}	3 29_{32}	3 31_{32}	3
.0496	.0501	.0507	.0513	.0519	.0524	.0530	.0536	.0542	.0548	
4 25_{32}	4 27_{32}	4 7_{8}	4 15_{16}	5	4 1_{16}	5 5_{32}	5 5_{32}	5 7_{32}	5 9_{32}	4
.0661	.0669	.0676	.0684	.0692	.0699	.0707	.0715	.0722	.0730	
5 31_{32}	6 1_{32}	6 3_{32}	6 3_{16}	6 1_{4}	6 5_{16}	6 3_{8}	6 15_{32}	6 17_{32}	6 19_{32}	5
.0826	.0838	.0845	.0855	.0865	.0874	.0884	.0893	.0903	.0913	
7 5_{32}	7 1_{4}	7 11_{32}	7 13_{32}	7 1_{2}	7 19_{32}	7 21_{32}	7 3_{4}	7 27_{32}	7 29_{32}	6
.0991	.1003	.1014	.1026	.1038	.1049	.1061	.1072	.1084	.1096	
8 3_{8}	8 15_{32}	8 9_{16}	8 21_{32}	8 3_{4}	8 27_{32}	8 15_{16}	9 1_{32}	9 1_{8}	9 1_{4}	7
.1157	.1170	.1183	.1197	.1210	.1224	.1237	.1251	.1264	.1278	
9 9_{16}	9 21_{32}	9 25_{32}	9 7_{8}	10	10 1_{8}	10 7_{32}	10 11_{32}	10 7_{16}	10 9_{16}	8
.1322	.1337	.1353	.1368	.1383	.1399	.1414	.1429	.1445	.1460	
10 5_{4}	10 7_{8}	11	11 1_{8}	11 1_{4}	11 3_{8}	11 1_{2}	11 5_{8}	11 3_{4}	11 7_{8}	9
.1487	.1504	.1522	.1539	.1556	.1574	.1591	.1608	.1625	.1643	
11 15_{16}	12 3_{32}	12 7_{32}	12 3_{8}	12 1_{2}	12 21_{32}	12 25_{32}	12 29_{32}	13 1_{16}	13 5_{16}	10
.1652	.1672	.1691	.1710	.1728	.1748	.1768	.1787	.1806	.1825	
13 5_{32}	13 9_{32}	13 7_{16}	13 19_{32}	13 3_{4}	13 29_{32}	14 1_{16}	14 7_{32}	14 3_{8}	14 1_{2}	11
.1818	.1839	.1860	.1881	.1902	.1923	.1944	.1965	.1987	.2008	
14 11_{32}	14 1_{2}	14 21_{32}	14 27_{32}	15	15 5_{32}	15 11_{32}	15 1_{2}	15 21_{32}	15 27_{32}	12
.1983	.2006	.2029	.2052	.2075	.2098	.2121	.2144	.2167	.2190	
15 17_{32}	15 25_{32}	15 7_{8}	16 1_{16}	16 1_{4}	16 7_{16}	16 3_{8}	16 25_{32}	16 31_{32}	17 5_{32}	13
.2148	.2173	.2198	.2223	.2248	.2273	.2298	.2323	.2348	.2373	
16 23_{32}	16 29_{32}	17 3_{32}	17 5_{16}	17 1_{2}	17 11_{16}	17 29_{32}	18 3_{32}	18 9_{32}	18 15_{32}	14
.2313	.2340	.2367	.2394	.2421	.2448	.2475	.2502	.2528	.2555	
17 29_{32}	18 1_{8}	18 11_{32}	18 17_{32}	18 3_{4}	18 31_{32}	19 5_{32}	19 3_{8}	19 19_{32}	19 25_{32}	15
.2478	.2507	.2536	.2565	.2594	.2662	.2651	.2680	.2709	.2738	
19 1_{8}	19 11_{32}	19 9_{16}	19 25_{32}	20	20 7_{32}	20 7_{16}	20 21_{32}	20 7_{8}	21 3_{32}	16
.2644	.2674	.2705	.2736	.2767	.2797	.2828	.2859	.2890	.2920	
20 5_{16}	20 17_{32}	20 25_{32}	21	21 1_{4}	21 15_{32}	21 23_{32}	21 31_{32}	22 3_{16}	22 7_{16}	17
.2809	.2842	.2874	.2907	.2940	.2972	.3005	.3038	.3070	.3103	
21 1_{2}	21 3_{4}	22	22 1_{4}	22 1_{2}	22 3_{4}	23	23 1_{4}	23 1_{2}	23 3_{4}	18
.2974	.3009	.3043	.3078	.3112	.3147	.3182	.3216	.3251	.3285	
22 11_{16}	22 31_{32}	23 7_{32}	23 15_{32}	23 1_{4}	24	24 9_{32}	24 17_{32}	24 13_{16}	25 1_{16}	19
.3139	.3176	.3212	.3249	.3285	.3322	.3358	.3395	.3431	.3468	
23 7_{8}	24 5_{32}	24 7_{16}	24 23_{32}	25	25 9_{32}	25 9_{16}	25 27_{32}	26 3_{32}	26 3_{8}	20
.3305	.3343	.3381	.3420	.3458	.3497	.3535	.3574	.3612	.3650	
25 5_{32}	25 3_{8}	25 21_{32}	25 31_{32}	26 1_{4}	26 17_{32}	26 27_{32}	27 1_{8}	27 13_{32}	27 25_{32}	21
.3470	.3510	.3550	.3591	.3631	.3672	.3712	.3752	.3793	.3833	
28 9_{32}	26 19_{32}	26 7_{8}	27 3_{16}	27 1_{2}	27 15_{16}	28 1_{8}				22
.3635	.3677	.3720	.3762	.3804	.3846	.3889				
27 15_{32}	27 25_{32}									23
.3800	.3845									
										24
										25
										26

Upper figures show adjustment in points and fractions of a point of wedge screw handwheel scale ; lower figures show resultant sizes in thousandths of an inch.

MICROMETER HEAD SETTINGS

FOR DISPLAY MATRICES

Width in Points denotes the Micrometer Head Setting

Matrix Marking		Width in Inches	Matrix Marking		Width in Inches	Matrix Marking		Width in Inches	Matrix Marking		Width in Inches
Width in Points	Old Style		Width in Points	Old Style		Width in Points	Old Style		Width in Points	Old Style	
2		.0277	12	* 11 8	.1660	22	4 8	.3043	32	14 8	.4427
1/4	* 2 2	.0311	1/4	* 12 2	.1695	1/4	5 2	.3078	1/4	15 2	.4461
1/2	* 2 4	.0346	1/2	* 12 4	.1729	1/2	5 4	.3113	1/2	15 4	.4496
3/4	* 2 6	.0380	3/4	* 12 6	.1764	3/4	5 6	.3147	3/4	15 6	.4530
3	* 2 8	.0415	13	* 12 8	.1798	23	5 8	.3182	33	15 8	.4565
1/4	* 3 2	.0450	1/4	* 13 2	.1833	1/4	6 2	.3216	1/4	16 2	.4600
1/2	* 3 4	.0484	1/2	* 13 4	.1868	1/2	6 4	.3251	1/2	16 4	.4634
3/4	* 3 6	.0519	3/4	* 13 6	.1902	3/4	6 6	.3285	3/4	16 6	.4669
4	* 3 8	.0553	14	* 13 8	.1937	24	6 8	.3320	34	16 8	.4703
1/4	* 4 2	.0588	1/4	* 14 2	.1971	1/4	7 2	.3355	1/4	17 2	.4738
1/2	* 4 4	.0623	1/2	* 14 4	.2006	1/2	7 4	.3389	1/2	17 4	.4773
3/4	* 4 6	.0657	3/4	* 14 6	.2040	3/4	7 6	.3424	3/4	17 6	.4807
5	* 4 8	.0692	15	* 14 8	.2075	25	7 8	.3458	35	17 8	.4842
1/4	* 5 2	.0726	1/4	* 15 2	.2110	1/4	8 2	.3493	1/4	18 2	.4876
1/2	* 5 4	.0761	1/2	* 15 4	.2144	1/2	8 4	.3528	1/2	18 4	.4911
3/4	* 5 6	.0795	3/4	* 15 6	.2179	3/4	8 6	.3562	3/4	18 6	.4945
6	* 5 8	.0830	16	* 15 8	.2213	26	8 8	.3597	36	18 8	.4980
1/4	* 6 2	.0865	1/4	* 16 2	.2248	1/4	9 2	.3631	1/4	** 2 2	.5014
1/2	* 6 4	.0899	1/2	* 16 4	.2283	1/2	9 4	.3666	1/2	** 2 4	.5049
3/4	* 6 6	.0934	3/4	* 16 6	.2317	3/4	9 6	.3700	3/4	** 2 6	.5083
7	* 6 8	.0968	17	* 16 8	.2352	27	9 8	.3735	37	** 2 8	.5118
1/4	* 7 2	.1003	1/4	* 17 2	.2386	1/4	10 2	.3770	1/4	** 3 2	.5153
1/2	* 7 4	.1038	1/2	* 17 4	.2421	1/2	10 4	.3804	1/2	** 3 4	.5187
3/4	* 7 6	.1072	3/4	* 17 6	.2455	3/4	10 6	.3839	3/4	** 3 6	.5222
8	* 7 8	.1107	18	* 17 8	.2490	28	10 8	.3873	38	** 3 8	.5256
1/4	* 8 2	.1141	1/4	* 18 2	.2525	1/4	11 2	.3908	1/4	** 4 2	.5291
1/2	* 8 4	.1176	1/2	* 18 4	.2559	1/2	11 4	.3943	1/2	** 4 4	.5326
3/4	* 8 6	.1210	3/4	* 18 6	.2594	3/4	11 6	.3977	3/4	** 4 6	.5360
9	* 8 8	.1245	19	* 18 8	.2628	29	11 8	.4012	39	** 4 8	.5395
1/4	* 9 2	.1280	1/4	2 2	.2663	1/4	12 2	.4046	1/4	** 5 2	.5429
1/2	* 9 4	.1314	1/2	2 4	.2698	1/2	12 4	.4081	1/2	** 5 4	.5464
3/4	* 9 6	.1349	3/4	2 6	.2732	3/4	12 6	.4115	3/4	** 5 6	.5498
10	* 9 8	.1383	20	2 8	.2767	30	12 8	.4150	40	** 5 8	.5533
1/4	*10 2	.1418	1/4	3 2	.2801	1/4	13 2	.4185	1/4	** 6 2	.5568
1/2	*10 4	.1453	1/2	3 4	.2836	1/2	13 4	.4219	1/2	** 6 4	.5602
3/4	*10 6	.1487	3/4	3 6	.2870	3/4	13 6	.4254	3/4	** 6 6	.5637
11	*10 8	.1522	21	3 8	.2905	31	13 8	.4288	41	** 6 8	.5671
1/4	*11 2	.1556	1/4	4 2	.2940	1/4	14 2	.4323	1/4	** 7 2	.5706
1/2	*11 4	.1591	1/2	4 4	.2974	1/2	14 4	.4358	1/2	** 7 4	.5741
3/4	*11 6	.1625	3/4	4 6	.3009	3/4	14 6	.4392	3/4	** 7 6	.5775

MICROMETER HEAD SETTINGS

FOR DISPLAY MATRICES

Width in Points denotes the Micrometer Head Setting

Matrix Marking		Width in Inches	Width in Points	Width in Inches	Width in Points	Width in Inches	Width in Points	Width in Inches	Width in Points	Width in Inches
Width in Points	Old Style									
42	** 7 8	.5810	**52**	.7194	**62**	.8576	**72**	.9960	**82**	1.1343
1/4	** 8 2	.5844	1/4	.7228	1/4	.8611	1/4	.9994	1/4	1.1378
1/2	** 8 4	.5879	1/2	.7263	1/2	.8646	1/2	1.0029	1/2	1.1412
3/4	** 8 6	.5913	3/4	.7297	3/4	.8680	3/4	1.0064	3/4	1.1447
43	** 8 8	.5948	**53**	.7332	**63**	.8715	**73**	1.0098	**83**	1.1481
1/4	** 9 2	.5983	1/4	.7366	1/4	.8749	1/4	1.0133	1/4	1.1516
1/2	** 9 4	.6017	1/2	.7401	1/2	.8784	1/2	1.0167	1/2	1.1551
3/4	** 9 6	.6052	3/4	.7435	3/4	.8819	3/4	1.0202	3/4	1.1585
44	** 9 8	.6086	**54**	.7470	**64**	.8853	**74**	1.0236	**84**	1.1620
1/4	**10 2	.6121	1/4	.7505	1/4	.8888	1/4	1.0271	1/4	1.1655
1/2	** 10 4	.6156	1/2	.7539	1/2	.8922	1/2	1.0306	1/2	1.1689
3/4	** 10 6	.6190	3/4	.7574	3/4	.8957	3/4	1.0340	3/4	1.1724
45	** 10 8	.6225	**55**	.7608	**65**	.8991	**75**	1.0375	**85**	1.1758
1/4	** 11 2	.6259	1/4	.7643	1/4	.9026	1/4	1.0409	1/4	1.1793
1/2	** 11 4	.6294	1/2	.7677	1/2	.9061	1/2	1.0444	1/2	1.1827
3/4	** 11 6	.6328	3/4	.7712	3/4	.9095	3/4	1.0479	3/4	1.1862
46	** 11 8	.6363	**56**	.7746	**66**	.9130	**76**	1.0513	**86**	1.1896
1/4	** 12 2	.6398	1/4	.7781	1/4	.9164	1/4	1.0548	1/4	1.1931
1/2	** 12 4	.6432	1/2	.7816	1/2	.9199	1/2	1.0582	1/2	1.1966
3/4	** 12 6	.6467	3/4	.7850	3/4	.9234	3/4	1.0617	3/4	1.2000
47	** 12 8	.6501	**57**	.7885	**67**	.9268	**77**	1.0651	**87**	1.2035
1/4	** 13 2	.6536	1/4	.7919	1/4	.9303	1/4	1.0686	1/4	1.2069
1/2	** 13 4	.6571	1/2	.7954	1/2	.9337	1/2	1.0721	1/2	1.2104
3/4	** 13 6	.6605	3/4	.7989	3/4	.9372	3/4	1.0755	3/4	1.2139
48	** 13 8	.6640	**58**	.8023	**68**	.9406	**78**	1.0790	**88**	1.2173
1/4		.6674	1/4	.8058	1/4	.9441	1/4	1.0824	1/4	1.2208
1/2		.6709	1/2	.8092	1/2	.9476	1/2	1.0859	1/2	1.2242
3/4		.6743	3/4	.8127	3/4	.9510	3/4	1.0894	3/4	1.2277
49		.6778	**59**	.8161	**69**	.9545	**79**	1.0928	**89**	1.2311
1/4		.6813	1/4	.8196	1/4	.9579	1/4	1.0963	1/4	1.2346
1/2		.6847	1/2	.8231	1/2	.9614	1/2	1.0997	1/2	1.2381
3/4		.6882	3/4	.8265	3/4	.9649	3/4	1.1032	3/4	1.2415
50		.6916	**60**	.8300	**70**	.9683	**80**	1.1066	**90**	1.2450
1/4		.6952	1/4	.8335	1/4	.9718	1/4	1.1101	1/4	1.2484
1/2		.6988	1/2	.8369	1/2	.9752	1/2	1.1136	1/2	1.2519
3/4		.7021	3/4	.8404	3/4	.9787	3/4	1.1170	3/4	1.2554
51		.7055	**61**	.8438	**71**	.9821	**81**	1.1205		
1/4		.7090	1/4	.8473	1/4	.9856	1/4	1.1240		
1/2		.7125	1/2	.8507	1/2	.9891	1/2	1.1274		
3/4		.7159	3/4	.8542	3/4	.9925	3/4	1.1309		

CHANGE SPEED TABLE

Based upon direct drive speed of 144 Revolutions per minute

42 Point to 72 Point (Cored)					Present Matrix Marking	Old Matrix Marking	36 Point and Below					
72	60	54	48	42			36	30	24	18	14	12
†AD 125	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2	△ 6 8	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†BD 102	†AD 125	†AD 125	2-H-4 144	2-H-4 144	2½	△ 7 4 * 2 4	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†CD 83	†BD 102	†BD 102	†AD 125	2-H-4 144	3	△ 7 8 * 2 8	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†AE 68	†CD 83	†BD 102	†BD 102	†AD 125	3½	△ 8 4 * 3 4	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†BE 55	†AE 68	†CD 83	†CD 83	†BD 102	4	△ 8 8 * 3 8	†AD 125	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†BE 55	†AE 68	†AE 68	†CD 83	†CD 83	4½	△ 9 4 * 4 4	†BD 102	†AD 125	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†CE 45	†AE 68	†AE 68	†AE 68	†CD 83	5	△ 9 8 * 4 8	†BD 102	†AD 125	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†CE 45	†BE 55	†BE 55	†AE 68	†AE 68	5½	△ 10 4 * 5 4	†CD 83	†BD 102	2-H-4 144	2-H-4 144	2-H-4 144	2-H-4 144
†AF 37	†CE 45	†BE 55	†BE 55	†AE 68	6	△ 10 8 * 5 8	†CD 83	†CD 83	†AD 125	2-H-4 144	2-H-4 144	2-H-4 144
†AF 37	†CE 45	†CE 45	†BE 55	†BE 55	6½	△ 11 4 * 6 4	†CD 83	†CD 83	†AD 125	2-H-4 144	2-H-4 144	2-H-4 144
†AF 37	†CE 45	†CE 45	†BE 55	†BE 55	7	△ 11 8 * 6 8	†AE 68	†CD 83	†CD 83	2-H-4 144	2-H-4 144	2-H-4 144
†BF 30	†AF 37	†CE 45	†CE 45	†BE 55	7½	△ 12 4 * 7 4	†AE 68	†CD 83	†CD 83	2-H-4 144	2-H-4 144	2-H-4 144
†BF 30	†AF 37	†AF 37	†CE 45	†BE 55	8	△ 12 8 * 7 8	†BE 55	†AE 68	†CD 83	†BD 102	2-H-4 144	2-H-4 144
†BF 30	†AF 37	†AF 37	†CE 45	†CE 45	8½	△ 13 4 * 8 4	†BE 55	†AE 68	†CD 83	†BD 102	2-H-4 144	2-H-4 144
†CF 25	†BF 30	†AF 37	†CE 45	†CE 45	9	△ 13 4 * 8 8	†BE 55	†AE 68	†CD 83	†BD 102	2-H-4 144	2-H-4 144
†CF 25	†BF 30	†BF 30	†AF 37	†CE 45	9½	△ 14 4 * 9 4	†CE 45	†BE 55	†AE 68	†CD 83	†AD 125	2-H-4 144
†CF 25	†BF 30	†BF 30	†AF 37	†AF 37	10	△ 14 8 * 9 8	†CE 45	†BE 55	†AE 68	†CD 83	†AD 125	2-H-4 144
†CF 25	†CF 25	†BF 30	†BF 30	†AF 37	10½	△ 15 4 * 10 4	†CE 45	†CE 45	†AE 68	†CD 83	†BD 102	†AD 125
‡AD 22	†CF 25	†BF 30	†BF 30	†AF 37	11	△ 15 8 * 10 8	†CE 45	†CE 45	†AE 68	†CD 83	†BD 102	†AD 125
‡AD 22	†CF 25	†BF 30	†BF 30	†AF 37	11½	△ 16 4 * 11 4	†CE 45	†CE 45	†AE 68	†CD 83	†BD 102	†AD 125
‡AD 22	†CF 25	†CF 25	†BF 30	†AF 37	12	△ 16 8 * 11 8	†AF 37	†CE 45	†BE 55	†CD 83	†CD 83	†BD 102
‡BD 18	‡AD 22	†CF 25	†BF 30	†BF 30	13	△ 17 8 * 12 8	†AF 37	†CE 45	†BE 55	†CD 83	†CD 83	†BD 102
‡BD 18	‡AD 22	‡AD 22	†CF 25	†BF 30	14	△ 18 8 * 13 8	†BF 30	†AF 37	†CE 45	†AE 68	†CD 83	†CD 83
‡CD 15	‡BD 18	‡AD 22	†CF 25	†CF 25	15	* 2 8 * 14 8	†BF 30	†AF 37	†CE 45	†AE 68	†CD 83	†CD 83

† These have speed control 3-H-1 in operation.
‡ These have speed control 2-3-G in operation.
§ Pump to be stopped every alternate revolution.

CHANGE SPEED TABLE

Based upon direct drive speed of 144 Revolutions per minute

42 Point to 72 Point (Cored)					Present Matrix Marking	Old Matrix Marking	36 Point and Below					
72	60	54	48	42			36	30	24	18	14	12
‡CD 15	‡BD 18	‡AD 22	‡AD 22	†CF 25	16	* 3 8 * 15 8	†CF 25	†BF 30	†CE 45	†BE 55	†CD 83	†CD 83
†CD 15	†BD 18	†BD 18	†AD 22	†CF 25	17	* 4 8 * 16 8	†CF 25	†BF 30	†CE 45	†BE 55	†CD 83	†CD 83
‡AE 12	‡CD 15	‡BD 18	‡AD 22	‡AD 22	18	* 5 8 * 17 8	‡AD 22	†CF 25	†AF 37	†CE 45	‡AE 68	†CD 83
‡AE 12	‡CD 15	‡CD 15	‡BD 18	‡AD 22	19	* 6 0 * 18 8	‡AD 22	†CF 25	†AF 37	†CE 45	†AE 68	†CD 83
‡AE 12	‡CD 15	‡CD 15	‡BD 18	‡AD 22	20	* 7 8 2 8	‡BD 18	‡AD 22	‡BF 30	†CE 45	†BE 55	†AE 68
‡AE 12	‡AE 12	‡CD 15	‡CD 15	‡BD 18	21	* 8 8 3 8	‡BD 18	‡AD 22	‡BF 30	†CE 45	†BE 55	†AE 68
‡BE 10	‡AE 12	‡CD 15	‡CD 15	‡BD 18	22	* 9 8 4 8	‡BD 18	‡BD 18	†CF 25	†AF 37	‡CE 45	‡BE 55
‡BE 10	‡AE 12	‡CD 15	‡CD 15	‡BD 18	23	* 10 8 5 8	†BD 18	†BD 18	†CF 25	†AF 37	†CE 45	†BE 55
‡BE 10	‡AE 12	‡AE 12	‡CD 15	‡BD 18	24	* 11 0 6 0	‡BD 18	‡BD 18	†CF 25	†AF 37	†CE 45	†BE 55
†BE 10	†BE 10	‡BE 10	‡CD 15	‡CD 15	25	* 12 8 7 8	‡CD 15	‡BD 18	‡AD 22	†BF 30	†CE 45	
‡BE 10	‡BE 10	‡BE 10	‡CD 15	‡CD 15	26	* 13 8 8 8	‡CD 15	‡BD 18	‡AD 22	‡BF 30	†CE 45	
‡CE 8	‡BE 10	‡BE 10	‡AE 12	‡CD 15	27	* 14 8 9 8	‡CD 15	†BD 18	‡AD 22	†BF 30	‡CE 45	
‡CE 8	‡BE 10	‡BE 10	‡AE 12	‡CD 15	28	* 15 8 10 8	‡AE 12	†CD 15	†BD 18	†CF 25	†AF 37	
†CF 8	‡BE 10	‡BE 10	‡AE 12	‡CD 15	30	* 17 8 12 8	‡AE 12	‡CD 15	†BD 18	†CF 25	†AF 37	
‡AF 6½	‡CE 8	‡BE 10	†BE 10	†AE 12	33	3 8 15 8	‡BE 10	‡AE 12	‡BD 18			
‡AF 6½	‡CE 8	‡BE 10	‡BE 10	†BE 10	36	6 8 18 8	‡CE 8	‡AE 12	‡CD 15			
‡BF 5½	‡AF 6½	‡CE 8	‡CE 8	‡CE 8	42	12 8 ** 7 8	†BE 5½	†BF 10				
†CF 4½	†BF 5½	†AF 6½	‡AF 6½	‡CE 8	48	18 8 ** 13 8	‡CF 4½					
§‡CE 8	‡CF 4½	†BF 5½	†BF 5½	‡AF 6½	54							
§‡CE 8	‡CF 4½	‡CF 4½	‡BF 5½	‡AF 6½	60							
§†AF 6½	§‡CE 8	‡CF 4½	‡CF 4½	‡BF 5½	66							
§‡BF 5½	§†CE 8				72							
§‡BF 5½	§‡AF 6½				84							
§†CF 4½	§‡CF 4½				90							

† These have speed control 3-H-1 in operation.
‡ These have speed control 2-3-G in operation.
§ Pump to be stopped every alternate revolution.

TABLE FOR SETTING COUNTER FOR 12-POINT EMS

FOR FURNITURE MOULD EQUIPPED FOR

12 pt. Ems	ADJUSTMENTS			12 Pt. Ems	ADJUSTMENTS			12 Pt. Ems	ADJUSTMENTS		
	Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge −
8	1	3	—	33	5	5½	·0166	58	9	5½	·0645
8½	1	3½	—	33½	5	5½	·0332	58½	9	5½	·0737
9	1	4	—	34	5	5½	·0498	59	9	6	—
9½	1	4½	—	34½	5	5½	·0664	59½	10	5	·0747
10	1	5	—	35	5	6	—	60	11	5	—
10½	1	5½	—	35½	6	5	·0138	60½	10	5½	·0083
11	1	6	—	36	6	5	·0276	61	10	5½	·0166
11½	2	3	·0415	36½	6	5	·0414	61½	10	5½	·0249
12	2	3½	—	37	6	5	·0552	62	10	5½	·0332
12½	2	3½	·0415	37½	6	5	·0691	62½	10	5½	·0415
13	2	4	—	38	6	5½	—	63	10	5½	·0498
13½	2	4	·0415	38½	6	5½	·0138	63½	10	5½	·0581
14	2	4½	—	39	6	5½	·0276	64	10	5½	·0664
14½	2	4½	·0415	39½	6	5½	·0415	64½	10	5½	·0747
15	2	5	—	40	7	5	—	65	10	6	—
15½	2	5	·0415	40½	6	5½	·0691	65½	11	5½	
16	2	5½	—	41	6	6	—	66	11	5½	·0075
16½	2	5½	·0415	41½	7	5	·0355	66½	11	5½	·0151
17	2	6	—	42	7	5	·0474	67	11	5½	·0226
17½	3	4	·0276	42½	7	5	·0592	67½	11	5½	·0301
18	3	4	·0553	43	7	5	·0711	68	11	5½	·0377
18½	3	4½	—	43½	7	5½	—	68½	11	5½	·0453
19	3	4½	·0276	44	7	5½	·0118	69	11	5½	·0528
19½	3	4½	·0553	44½	7	5½	·0237	69½	11	5½	·0604
20	3	5	—	45	8	5	—	70	13	5	
20½	3	5	·0276	45½	7	5½	·0474	70½	11	5½	·0754
21	3	5	·0553	46	7	5½	·0592	71	11	6	—
21½	3	5½	—	46½	7	5½	·0711	71½	12	5½	·0069
22	3	5½	·0276	47	7	6	—	72	12	5½	·0138
22½	3	5½	·0553	47½	8	5	·0519	72½	12	5½	·0208
23	3	6	—	48	8	5	·0622	73	12	5½	·0276
23½	4	4½	·0207	48½	8	5	·0726	73½	12	5½	·0345
24	4	4½	·0415	49	8	5½	—	74	12	5½	·0415
24½	4	4½	·0622	49½	8	5½	·0103	74½	12	5½	·0484
25	4	5	—	50	9	5	—	75	14	5	—
25½	4	5	·0207	50½	8	5½	·0311	75½	12	5½	0622
26	4	5	·0415	51	8	5½	·0415	76	12	5½	0691
26½	4	5	0622	51½	8	5½	·0518	76½	13	5½	—
27	4	5½	—	52	8	5½	·0622	77	12	6	—
27½	4	5½	·0207	52½	8	5½	·0727	77½	13	5½	·0127
28	4	5½	·0415	53	8	6	—	78	13	5½	·0191
28½	4	5½	0622	53½	9	5	·0645	78½	13	5½	·0255
29	4	6	—	54	9	5	·0715	79	13	5½	·0319
29½	5	4½	·0664	54½	9	5½	—	79½	13	5½	0383
30	5	5	—	55	10	5	—	80	15	5	—
30½	5	5	·0166	55½	10	5	·0083	80½	13	5½	·0511
31	5	5	·0332	56	10	5	·0166	81	13	5½	·0575
31½	5	5	·0498	56½	10	5	·0249	81½	13	5½	·0638
32	5	5	0664	57	9	5½	·0461	82	14	5½	—
32½	5	5½	—	57½	9	5½	·0553	82½	13	5½	·0766

DRUM AND MICROMETER HEAD AND HALF-EMS

CASTING PREDETERMINED LENGTHS

12 pt. Ems	ADJUSTMENTS			12 pt. Ems	ADJUSTMENTS			12 pt. Ems	ADJUSTMENTS		
	Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge −
83	13	6	—	108	18	5½	·0369	133	22	5½	·0528
83½	14	5½	·0178	108½	18	5½	·0415	133½	22	5½	·0566
84	14	5½	·0237	109	18	5½	·0461	134	22	5½	·0603
84½	14	5½	·0296	109½	19	5½	—	134½	22	5½	·0641
85	16	5	—	110	21	5	—	135	22	5½	·0679
85½	14	5½	·0415	110½	18	5½	·0599	135½	22	5½	·0716
86	14	5½	·0474	111	18	5½	·0646	136	22	5½	·0754
86½	14	5½	·0534	111½	18	5½	·0692	136½	22	5½	·0792
87	14	5½	·0593	112	18	5½	·0738	137	22	6	—
87½	15	5½	—	112½	18	5½	·0784	137½	23	5½	·0433
88	14	5½	·0711	113	18	6	—	138	23	5½	·0469
88½	14	5½	·0771	113½	19	5½	·0349	138½	23	5½	·0505
89	14	6	—	114	19	5½	·0393	139	23	5½	·0541
89½	15	5½	·0221	114½	19	5½	·0437	139½	23	5½	·0577
90	17	5	—	115	22	5	—	140	23	5½	·0613
90½	15	5½	·0332	115½	19	5½	·0524	140½	23	5½	·0650
91	15	5½	·0387	116	19	5½	·0568	141	23	5½	·0686
91½	15	5½	·0443	116½	19	5½	·0612	141½	23	5½	·0722
92	15	5½	·0498	117	19	5½	·0655	142	23	5½	·0758
92½	15	5½	·0553	117½	19	5½	·0699	142½	25	5½	—
93	16	5½	—	118	19	5½	·0743	143	23	6	—
93½	15	5½	·0664	118½	19	5½	·0786	143½	24	5½	·0450
94	15	5½	·0719	119	19	6	—	144	24	5½	·0484
94½	15	5½	·0774	119½	20	5½	·0374	144½	24	5½	·0519
95	15	6	—	120	23	5	—	145	24	5½	·0554
95½	16	5½	·0259	120½	21	5½	—	145½	24	5½	·0588
96	16	5½	·0311	121	20	5½	·0498	146	24	5½	·0623
96½	16	5½	·0363	121½	20	5½	·0540	146½	24	5½	0657
97	16	5½	·0415	122	20	5½	·0581	147	24	5½	·0692
97½	16	5½	·0467	122½	20	5½	·0623	147½	24	5½	·0726
98	16	5½	·0519	123	20	5½	·0664	148	24	5½	·0761
98½	17	5½	—	123½	20	5½	·0705	148½	24	5½	·0795
99	16	5½	·0623	124	20	5½	·0747	149	24	6	—
99½	16	5½	·0675	124½	20	5½	·0788	149½	25	5½	·0465
100	19	5	—	125	20	6	—	150	25	5½	·0498
100½	16	5½	·0778	125½	21	5½	·0395	150½	25	5½	·0531
101	16	6	—	126	22	5½	—	151	25	5½	·0564
101½	17	5½	·0293	126½	21	5½	·0474	151½	25	5½	·0598
102	17	5½	·0342	127	21	5½	·0514	152	25	5½	·0631
102½	17	5½	·0391	127½	21	5½	·0553	152½	25	5½	·0664
103	17	5½	·0439	128	21	5½	·0593	153	25	5½	·0697
103½	17	5½	·0488	128½	21	5½	·0632	153½	25	5½	·0730
104	18	5½	—	129	21	5½	·0672	154	25	5½	·0763
104½	17	5½	·0586	129½	21	5½	·0711	154½	25	5½	·0796
105	20	5	—	130	25	5	—	155	25	5½	·0830
105½	17	5½	·0683	130½	21	5½	0790				
106	17	5½	·0732	131	21	6	—				
106½	17	5½	·0781	131½	23	5½	—				
107	17	6	—	132	22	5½	·0453				
107½	18	5½	·0323	132½	22	5½	·0490				

TABLE FOR CUTTING STRIP MATERIAL

The following table shows the position of the counter drum and the adjustment of the micrometer casting in multiples of 5, 5½ or 6 12-point ems per cast, plus any necessary addition in row of the drum which must be brought to 'A' on the remainder scale on the counter Indicator Scale ; and the third shows the addition in ' thousandths ' of an inch to be added on the upper edge of the upper section of the handwheel on the micrometer wedge). The total is equivalent to the measure given in the first column.

12 pt. Ems	ADJUSTMENTS			12 Pt. Ems	ADJUSTMENTS			12 Pt. Ems	ADJUSTMENTS		
	Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +
5	1	5	—	29	5	5½	·0498	53	9	5½	·0645
5½	1	5½	—	29½	5	5½	·0664	53½	9	5½	·0737
6	1	6	—	30	5	6	—	54	9	6	—
6½	2	3	·0415	30½	6	5	·0138	54½	10	5	·0747
7	2	3½	—	31	6	5	·0276	55	11	5	—
7½	2	3½	·0415	31½	6	5	·0414	55½	10	5½	·0083
8	2	4	—	32	6	5	·0552	56	10	5½	·0166
8½	2	4	·0415	32½	6	5	·0691	56½	10	5½	·0249
9	2	4½	—	33	6	5½	—	57	10	5½	·0332
9½	2	4½	·0415	33½	6	5½	·0138	57½	10	5½	·0415
10	2	5	—	34	6	5½	·0276	58	10	5½	·0498
10½	2	5	·0415	34½	6	5½	·0415	58½	10	5½	·0581
11	2	5½	—	35	7	5	—	59	10	5½	·0664
11½	2	5½	·0415	35½	6	5½	·0691	59½	10	5½	·0747
12	2	6	—	36	6	6	—	60	10	6	—
12½	3	4	·0276	36½	7	5	·0355	60½	11	5½	—
13	3	4	·0553	37	7	5	·0474	61	11	5½	·0075
13½	3	4½	—	37½	7	5	·0592	61½	11	5½	·0151
14	3	4½	·0276	38	7	5	·0711	62	11	5½	·0226
14½	3	4½	·0553	38½	7	5½	—	62½	11	5½	·0301
15	3	5	—	39	7	5½	·0118	63	11	5½	·0377
15½	3	5	·0276	39½	7	5½	·0237	63½	11	5½	·0453
16	3	5	·0553	40	8	5	—	64	11	5½	·0528
16½	3	5½	—	40½	7	5½	·0474	64½	11	5½	·0604
17	3	5½	·0276	41	7	5½	·0592	65	13	5	—
17½	3	5½	·0553	41½	7	5½	·0711	65½	11	5½	·0754
18	3	6	—	42	7	6	—	66	11	6	—
18½	4	4½	·0207	42½	8	5	·0519	66½	12	5½	·0069
19	4	4½	·0415	43	8	5	·0622	67	12	5½	·0138
19½	4	4½	·0622	43½	8	5	·0726	67½	12	5½	·0208
20	4	5	—	44	8	5½	—	68	12	5½	·0276
20½	4	5	·0207	44½	8	5½	·0103	68½	12	5½	·0345
21	4	5	·0415	45	9	5	—	69	12	5½	·0415
21½	4	5	·0622	45½	8	5½	·0311	69½	12	5½	·0484
22	4	5½	—	46	8	5½	·0415	70	14	5	—
22½	4	5½	·0207	46½	8	5½	·0518	70½	12	5½	·0622
23	4	5½	·0415	47	8	5½	·0622	71	12	5½	·0691
23½	4	5½	·0622	47½	8	5½	·0727	71½	13	5½	—
24	4	6	—	48	8	6	—	72	12	6	—
24½	5	4½	·0664	48½	9	5	·0645	72½	13	5½	·0127
25	5	5	—	49	9	5	·0715	73	13	5½	·0191
25½	5	5	·0166	49½	9	5½	—	73½	13	5½	·0255
26	5	5	·0332	50	10	5	—	74	13	5½	·0319
26½	5	5	·0498	50½	10	5	·0083	74½	13	5½	·0383
27	5	5	·0664	51	10	5	·0166	75	15	5	—
27½	5	5½	—	51½	10	5	·0249	75½	13	5½	·0511
28	5	5½	·0166	52	9	5½	·0461	76	13	5½	·0575
28½	5	5½	·0332	52½	9	5½	·0553	76½	13	5½	·0638

TO 12-POINT EMS AND HALF-EMS

wedge to shear strip material to 12-point ems and half-ems. The calculations are based upon 'thousandths' of an inch. In the column under 'Adjustments' the first column shows the mechanism head ; the second column shows the position of the pointer on the Micrometer by the micrometer wedge (this is indicated, as the micrometer wedge is adjusted by the figures amount in the third and fourth columns multiplied by the number of casts in the second column,

12 pt. Ems	ADJUSTMENTS			12 pt. Ems	ADJUSTMENTS			12 pt. Ems	ADJUSTMENTS		
	Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge −		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +		Drum (Casts)	Indicator Scale (Ems)	Micrometer Wedge +
77	14	5½	—	101	17	5½	·0732	125	25	5	—
77½	13	5½	·0766	101½	17	5½	·0781	125½	21	5½	·0790
78	13	6	—	102	17	6	—	126	21	6	—
78½	14	5½	·0178	102½	18	5½	·0323	126½	23	5½	—
79	14	5½	·0237	103	18	5½	·0369	127	22	5½	·0453
79½	14	5½	·0296	103½	18	5½	·0415	127½	22	5½	·0490
80	16	5	—	104	18	5½	·0461	128	22	5½	·0528
80½	14	5½	·0415	104½	19	5½	—	128½	22	5½	·0566
81	14	5½	·0474	105	21	5	—	129	22	5½	·0603
81½	14	5½	·0534	105½	18	5½	·0599	129½	22	5½	·0641
82	14	5½	·0593	106	18	5½	·0646	130	23	5½	·0252
82½	15	5½	—	106½	18	5½	·0692	130½	22	5½	·0716
83	14	5½	·0711	107	18	5½	·0738	131	22	5½	·0754
83½	14	5½	·0771	107½	18	5½	·0784	131½	22	5½	·0792
84	14	6	—	108	18	6	—	132	22	6	—
84½	15	5½	·0221	108½	19	5½	·0349	132½	23	5½	·0433
85	17	5	—	109	19	5½	·0393	133	23	5½	·0469
85½	15	5½	·0332	109½	19	5½	·0437	133½	23	5½	·0505
86	15	5½	·0387	110	22	5	—	134	23	5½	·0541
86½	15	5½	·0443	110½	19	5½	·0524	134½	23	5½	·0577
87	15	5½	·0498	111	19	5½	·0568	135	24	5½	·0208
87½	15	5½	·0553	111½	19	5½	·0612	135½	23	5½	·0650
88	16	5½	—	112	19	5½	·0655	136	23	5½	·0686
88½	15	5½	·0664	112½	19	5½	·0699	136½	23	5½	·0722
89	15	5½	·0719	113	19	5½	·0743	137	23	5½	·0758
89½	15	5½	·0774	113½	19	5½	·0786	137½	25	5½	—
90	15	6	—	114	19	6	—	138	23	6	—
90½	16	5½	·0259	114½	20	5½	·0374	138½	24	5½	·0450
91	16	5½	·0311	115	23	5	—	139	24	5½	·0484
91½	16	5½	·0363	115½	21	5½	—	139½	24	5½	·0519
92	16	5½	·0415	116	20	5½	·0498	140	25	5½	·0166
92½	16	5½	·0467	116½	20	5½	·0540	140½	24	5½	·0583
93	16	5½	·0519	117	20	5½	·0581	141	24	5½	·0623
93½	17	5½	—	117½	20	5½	·0623	141½	24	5½	·0657
94	16	5½	·0623	118	20	5½	·0664	142	24	5½	·0692
94½	16	5½	·0675	118½	20	5½	·0705	142½	24	5½	·0726
95	19	5	—	119	20	5½	·0747	143	25	5½	·0365
95½	16	5½	·0778	119½	20	5½	·0788	143½	24	5½	·0795
96	16	6	—	120	20	6	—	144	24	6	—
96½	17	5½	·0293	120½	21	5½	·0395				
97	17	5½	·0342	121	22	5½	—				
97½	17	5½	·0391	121½	21	5½	·0474				
98	17	5½	·0439	122	21	5½	·0514				
98½	17	5½	·0488	122½	21	5½	·0553				
99	18	5½	—	123	21	5½	·0593				
99½	17	5½	·0586	123½	21	5½	·0632				
100	20	5	—	124	21	5½	·0672				
100½	17	5½	·0683	124½	21	5½	·0711				

PRODUCT INFORMATION TABLE

1- TO 3-POINT LEAD AND RULE MOULD (77,000 SERIES) 4- TO 18-POINT LEAD AND RULE MOULD (76,300 SERIES) FURNITURE MOULD (78,000 SERIES)

Product	Gears	Revolutions per Minute	Temperature Fahr.	Temperature Cent.	Pump Body to Use	Nozzles Number	Nozzles Diameter of Drilling Top	Nozzles Diameter of Drilling Bottom	SINGLE Piston Spring Compression (From Top of Spring Rod to Top of Nut)	DUPLEX** Piston Spring Compression (From Top of Spring Rod to Top of Nut)	Number of Leaves to Use Upper	Number of Leaves to Use Lower	†† Piston Required (Short or Long end)
Rules : 1 point	†AD	125	720°	385°	3/8"	10	1/16	·180	5 1/2"	2 3/8"	—	—	Long
Rules : 1½ point	†AD	125	700°	371°	3/8"	10	1/16	·180	5"	2 1/8"	—	—	Long
Rules : 2 point	†BD	102	675°	357°	3/8"	10	1/16	·180	3"	1 1/8"	—	—	Long
Rules : 3 point	†CD	83	625°	329°	3/8"	10	1/16	·180	3"	1 1/8"	—	—	Long
Leads : 1 point	†AD	125	720°	385°	3/8"	10	1/16	·180	5 1/2"	2 3/8"	—	—	Long
Leads : 1½ point	†AD	125	700°	371°	3/8"	10	1/16	·180	5"	2 1/8"	—	—	Long
Leads : 2 point	†BD	102	675°	357°	3/8"	10	1/16	·180	3"	1 1/8"	—	—	Long
Leads : 3 point	†CD	83	625°	329°	3/8"	10	1/16	·180	3"	1 1/8"	—	—	Long
Strip Borders : 6 point ...	†BE	55	650°	343°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	4	2	Short
Strip Borders : 8 point ...	†CE	45	650°	343°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	4	2	Short
Strip Borders : 12 point ...	†CF	25	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	4	3	
Strip Borders : 18 point ...	‡BD	18	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	2	4	—
Rules : 4 point	†AE	68	700°	371°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	6	1	Long
Rules : 6 point	†BE	55	650°	343°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	4	2	Short
Rules : 8 point	†CE	45	650°	343°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	4	2	Short
Rules : 12 point	†CF	25	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	4	3	
Rules : 18 point	‡BD	18	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	2	4	—
Leads : 4 point	†AE	68	700°	371°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	6	1	Long
Leads : 6 point	†BE	55	650°	343°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	4	2	Short
Leads : 8 point	†CE	45	650°	343°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	4	2	Short
Leads : 12 point	†CF	25	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	4	3	
Leads : 18 point	‡BD	18	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	2	4	—
§16-em Dashes : 4 point ...	†CE	45	700°	371°	3/8"	11	·082	·152	3"–4"	1 1/8"–2"	6	1	Short
§16-em Dashes : 6 point ...	†CF	25	650°	343°	3/8"	11	·082	·152	3" 4"	1 1/8"–2"	4	2	Short
§16-em Dashes : 12 point ...	‡CD	15	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8" 2"	4	3	—
§16-em Dashes : 18 point ...	‡CE	8	625°	329°	1 1/4"	8	·125	·125	3"–4"	1 1/8"–2"	2	4	—
Furniture : 24 point ...	‡AE	12	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	4	3	—
Furniture : 36 point ...	‡BE	10	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	4	3	—
Furniture : 48 point ...	‡BE	10	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	3	4	—
Furniture : 60 point ...	‡BE	10	650°	343°	1 1/4"	5	·213	·302	4"–5"	2" 2 1/4"	3	4	—
Furniture : 72 point ...	‡CE	8	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	2	4	—
Furniture : 72 point × ·800 high	‡AF	6½	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	2	4	—
Foundry Furniture–36 point : Two-piece – Bottom section	‡BE	10	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	4	3	—
Top section ...	‡AE	12	650°	343°	1 1/4"	5	·213	·302	4"–5"	2"–2 1/4"	2	4	—

† These have speed control 3–H–1 in operation.
‡ These have speed control 2–3–C in operation.

** Special attention must be given to these spring pressures.
†† This column applies only to ⅝" pistons.

§ For didot machines these particulars apply to 15 cicero ems.

PRODUCT INFORMATION TABLE

TYPE MOULDS

Product	Gears	Revolutions per Minute	Temperature		Pump Body to Use	Nozzles			SINGLE Piston Spring Compression (From Top of Spring Rod to Top of Nut)	DUPLEX** Piston Spring Compression (From Top of Spring Rod to Top of Nut)	Number of Leaves to Use		†† Piston Required (Short or Long End)
			Fahr.	Cent.		Number	Diameter of Drilling						
							Top	Bottom			Upper	Lower	
*Type : 6, 7, 8 point ...	2-H-4	144	730°	387°		1	·062	·125	—	—	—	—	Long
*Type : 9, 10, 11 point	2-H-4	144	700°	371°		1	·062	·125			—	—	Long
*Type : 12 point ...	2-H-4	144	675°	357°		1	·062	·125			—	—	Long
*Type : 14 point ...	†AD	125	650°	343°		2	·125	·125			6	1	Short
*Type : 18 × 9 point ...	†BD	102	645°	340°		2	·125	·125			6	1	Short
*Type : 24 × 12 point...	†BE	55	640°	337°		2	·125	·125			6	1	Short
*Type : 30 × 15 point...	†AF	37	635°	335°		2	·125	·125			6	1	Short
*Type : 36 × 18 point...	‡AD	22	630°	332°		2	·125	·125			5	2	Short
*Type : 42 × 21 point...	‡BD	18	620°	326°		5§	·213	·302			6	2	—
*Type : 48 × 24 point...	‡CD	15	615°	323°		5§	·213	·302			4	2	—
*Type : 60 × 30 point...	‡BF	10	610°	321°		5§	·213	·302			3	3	—
*Type : 72 × 36 point...	‡AF	6½	610°	321°		5§	·213	·302			3	4	—
Quotations : 6 × 6 ems	‡CF	4½	600°	315°		5	·213	·302			3	4	—
Quotations : 6 × 5 ems	‡BF	5½	600°	315°		5	·213	·302			4	4	—
Quotations : 6 × 4 ems	‡AF	6½	605°	318°		6	·125	·125			3	3	—
Quotations : 6 × 3 ems	‡CE	8	605°	318°		6	·125	·125			4	3	—
Quotations : 6 × 2 ems	‡CE	8	605°	318°		6	·125	·125			4	2	—
Quotations : 5 × 5 ems	‡BF	5½	600°	315°		6	·125	·125			3	4	—
Quotations : 5 × 4 ems	‡AF	6½	600°	315°		6	·125	·125			4	3	—
Quotations : 5 × 3 ems	‡CE	8	600°	315°		6	·125	·125			4	2	—
Quotations : 5 × 2 ems	‡BE	10	600°	315°		6	·125	·125			4	2	—
Quotations : 4 × 4 ems	‡CE	8	600°	315°		4	·213	·213			4	1	Short
Quotations : 4 × 3 ems	‡BE	10	600°	315°		4	·213	·213			5	1	Short
Quotations : 4 × 2 ems	‡AE	12	600°	315°		4	·213	·213			6	—	Short

* Output of type based upon the half-em body.

† These have speed control 3–H–1 in operation.

‡ These have speed control 2–3–G in operation.

¶ For casting thin spaces on Super Caster Moulds use No. 6 nozzle.

** Special attention must be given to these spring pressures.

†† This column applies only to ⅞" pistons.

§ When using 42–48 point Display Moulds use No. 8 nozzle.

STANDARD FOUNT SCHEMES

Based on lower-case founts of 1,000, 500, and 250 characters

Lower-case	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z		
1 Strength (Body)	74	18	34	42	118	24	18	50	74	6	8	42	26	66	66	20	6	58	66	84	38	12	20	6	20	4	—	1,000
1 ,, (Jobbing) ...	74	18	34	42	118	24	18	50	74	6	8	42	26	66	66	20	6	58	66	84	38	12	20	6	20	4	=	1,000
½ ,, ,, ...	36	10	16	20	58	12	10	24	36	4	6	20	14	32	32	12	4	26	32	40	18	8	10	6	10	4	■	500
¼ ,, ,, ...	18	6	8	10	28	6	6	12	16	4	4	10	6	14	14	8	4	12	14	18	8	4	6	4	6	4	=	250

Capitals	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	&	Æ	—
1 Strength (Body)	8	8	6	6	12	6	8	10	10	6	8	8	28	8	8	8	4	8	12	12	6	4	8	4	6	4	8	6	6
1 ,, (Jobbing) ...	28	10	14	16	44	10	10	20	28	6	6	16	14	24	24	10	4	22	26	32	14	6	10	4	8	4	8	12	8
½ ,, ,, ...	16	6	8	10	26	6	6	12	16	4	4	10	8	14	14	6	4	14	16	20	8	4	6	4	6	4	6	8	6
¼ ,, ,, ...	10	4	6	6	16	4	4	8	10	4	4	6	6	10	10	4	4	8	10	12	6	4	4	4	4	4	4	4	4

Figures, etc.	1	2	3	4	5	6	7	8	9	0	½	⅓	¼	⅕	⅙	⅛	⅔	⅖	¾	⅗	⅘	,	;	:	-	'	!	?	(	[
1 Strength (Body)	10	6	6	4	4	4	4	4	8	12	2	2	2	2	2	2	2	2	2	40	50	8	6	10	10	2	3	12	6
1 ,, (Jobbing) ...	20	12	12	8	8	8	8	8	18	24	4	4	4	2	2	2	2	2	2	40	40	12	6	10	20	4	6	18	8
½ ,, ,, ...	16	10	10	8	8	8	8	8	10	16	—	—	—	—	—	—	—	—	—	20	30	6	6	8	10	4	4	10	6
¼ ,, ,, ...	10	6	6	4	4	4	4	4	8	12	—	—	—	—	—	—	—	—	—	14	24	6	6	6	8	4	4	8	6

Ligatures	Æ	Œ	æ	œ	æ	œ	ff	fi	fl	ffi	ffl																	
1 Strength (Body)	4	4	4	2	2	2	3	4	3	3	3																	
1 ,, (Jobbing) ...	8	8			4	4	6	8	6	6	6																	
½ ,, ,, ...	4	4	—	—	4	4	6	8	6	6	6																	
¼ ,, ,, ...	4	4	—	—	4	4	6	6	4	4	2																	

Accents	á	à	ã	ä	é	è	ê	ë	í		î	ï	ó	ò	ô	õ	ú	ù	û	ü	Ç	ç	ñ					
	2	2	2	2	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2					

Small Caps	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
	8	3	4	5	13	3	3	6	8	2	2	5	6	8	8	3	2	7	8	10	4	2	3	2	3	2		

Signs	*	÷	½	§	‖	¶	†	...	@	₱	%	$	%	/	-	—	×	÷	=									
	6	4	2	4	2	6	4	12	2	2	2	2	4	6	2	2	2	2	2									

The proportions of the 'body' founts are based upon the average recurrence of the various characters in average English literature. The proportions of the capital letters of the 'jobbing' founts relative to the lower-case characters provide for the greater use of capital letter composition when using jobbing founts. An all-capital fount should equal the strength of a 'body' lower-case and capital fount combined. Em quads should be ordered separately: the quantity required depends upon the nature of the composition. The number of em quads given above applies to the ems used in straightforward composition.

Spaces	... Ems	Ens	Thick	Mid.	Thin	Hair
1 Strength	... 100	50	200	100	100	50
1 ,,	... 100	50	200	100	100	50
½ ,,	... 75	40	100	80	80	40
¼ ,,	... 50	30	60	40	40	20

PARTICULARS OF

MOULDS AND MATRIX HOLDERS

TO USE WHEN CASTING TYPE

Size	Moulds	Mould High Space Height	Matrix	Matrix Drive	Matrix Holder	Mould Blade Fork*	Water Block	Oiler	Head
5 pt. to 12 pt.	Composition. Use adaptor plate	·868″	Composition (·2″ × ·2″) ...	·050″	xa3SL	12SL assd.	30SLL	a29SL1	Composition
5 pt. to 12 pt.	Composition. Use adaptor plate	·868″	Composition (·2″ Extended) ...	·050″	xa4SL	12SL assd.	30SLL	a29SL1	Composition
14 pt. to 24 pt.	Composition (large type) with interchangeable insets. Use adaptor plate	·868″	Composition (large type, ·4″ × ·2″ and ·4″ × ·4″)	·050″	xa5SL	12SL assd.	30SLL	a15SL1	Display
14 pt. to 48 pt.	Display, 14 pt. to 36 pt. and 42 pt. to 48 pt. Either kind fitted with interchangeable insets. Use adaptor plate	·868″	Display (1″ × 1″, 1″ × 1⅛″, 1″ × 1·35″)	·050″	xa6SL	14 pt. to 36 pt. 12SL assd. 42 pt. to 48 pt. x32SL	30SLL	a15SL1	Display
14 pt. to 36 pt.	Display. Fitted with interchangeable insets. Use adaptor plate	·868″	Display. American Electrotype (1⅛″ × ⅞″)	·050″	x33SL	12SL assd.	30SLL	a15SL1	Display
14 pt. to 36 pt.	Super Type. Fitted with interchangeable insets	·868″	Display (1″ × 1″)	·050″	xa6SL	12SL assd.	19SLL	a15SL1	Display
42 pt. to 72 pt.	Super Type. Fitted with interchangeable insets	·853″	Display (1⅛″ × 1⅛″, 1⅛″ × 1·35″)	·065″	xa7SL	13SL assd.	20SLL	16SL1	Display

* When casting type from 5 point to 36 point with the old-style low quad arrangement, use Mould Blade Fork, x26SL.

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