The Art of Cutting, Casting and Preparing of Letter for Printing, with a neat Representation of a Letter-founder's Work-house *is being sent to you as a friend of the Press. In this way we hope to express our appreciation to all such friends. This is in continuation of our plan of issuing from time to time printed pieces of typographical interest. If your address appears incorrect on this mailing we would be glad to be notified of any change.*

The Southworth-Anthoensen Press
Portland, Maine, U. S. A.

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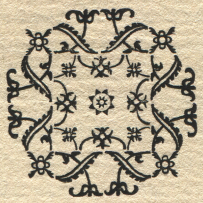
By Fred Anthoensen



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A Note on Typefounding

"THE Art of Cutting, Casting, and Preparing of Letter for Printing, with a neat Representation of a Letter-founder's Work-house," was published in "The Universal Magazine, July 1750, for F. Hinton, at the King's Corners in St. Paul's Churchyard, London." It was a condensation of the section on typefounding in Moxon's "Mechanick Exercises," of London, 1683. Even in this briefer form, Moxon speaks with authority, giving comprehensive directions for cutting punches, striking and justifying matrices, casting type and making type-metal as practised at that time. Moxon's book, published eighty-one years before Fournier wrote his "Manual Typographique," was the earliest printers' manual to find publication in any language. As the treatise in its present condensed form is rare and not unworthy of notice by the layman or the student, it is hoped it may find favour with those unable to possess a copy of the original in this or in the earlier form.

That typefounding in the eighteenth century, as now, was a fashionable subject for polite culture is proved by the appearance of this work in a popular magazine. Fournier speaking to the literary world says: "Surely those who habitually use books should not be ignorant of so useful an art: indeed, it is greatly to be wished that every literary man were able to pass a valid judgment upon the typography of his publications, for in that case the artists concerned with it would be obliged to have respect for his work and not so to disfigure it, as they often do, with marks of incompetence or want of taste."

There were a number of foundries in operation in England before Caslon's time. Their output was inferior to that of the Dutch foundries, and it is a fact recorded by Rowe Mores that "There was probably more Dutch type in England between

1700 and 1720 than there was English."* In other words those printers who could afford it bought the imported Dutch type while others had to satisfy themselves with what came from the foundries of the Andrews and James families. It was the inimitable skill of a letter-founder William Caslon (1692-1766), who brought regeneration to English printing from the depths to which it had fallen in the seventeenth century. Until William Caslon started his letter foundry in 1720 the history of typefounding in England had hardly begun.

The steel punch engraved by hand was the vital feature in all typefounding until the engraving machine was invented. In the fifteenth century most printers cut their own types, but about 1530 printers with a special talent for punch-cutting began to sell punches, or strikes from their punches to other printers. Most "typefoundries" during the sixteenth century sold very little type, but did most of their business in matrices, the printers casting their own types. During the seventeenth century, those foundries flourished most that had competent punch-cutters or that bought strikes from some well-known punch-cutter, and traded as typefounders only.

The technique of punch-cutting and typefounding did not change much between 1460 and 1860. Both were regarded as secret crafts, to be passed down from father to son. Moxon, in his "Mechanick Exercises," gives us the first explicit explanation of these crafts in considerable detail. Douglas C. McMurtrie writing on this subject today says: "The first operation was the making of a counter punch which determined the internal outline of the letter. This was hardened and driven into the end of a punch of soft steel. The external outlines of the letter were then cut on this with a graver and a file, and the punch was then hardened by tempering. The finished punch was then driven by a mallet into a block of copper, which was then accurately squared or 'justified.' This matrice, placed against the casting aperture of the mold, was used to form the types. The hand mold also changed very little in form or design. The metal was poured from a ladle and forced into the aperture and against the matrice by a deft jerk of the hand. The type came out with the jet attached which was broken

* T. B. Reed, "A History of Old English Letter Foundries."

off and the feet of the type planed smooth. The bevel on the sides of the letters were then rubbed off on an abrasive stone."

The craftsmen working in this difficult medium had to visualize the effect of each letter when printed on paper. Each letter of the alphabet had to accord well in color and to align with all the other letters. Each size was an independent design, though preserving the same general characteristics as the other sizes. A steady hand and a sure eye were his only guides.

The illustration shown herewith gives an excellent view of the interior of William Caslon's foundry. The seated figure at the right is that of Joseph Jackson (1733-1792), who later operated a distinguished foundry of his own. The four men at the left are type casters. At the extreme right (4) is a rubber, and beyond him, seated, is a dresser. The boys (2) at the center table are breaking off the jets of metal. The devices on either side of the table are almost literal reproductions of two illustrations of a mold in Moxon's "Mechanick Exercises." As reproduced in this print, they are probably ten times larger than their normal size. On the left (5) is the lower half of a mold, which almost duplicated the upper half (6). The reference letters identify the parts, and are listed in the treatise on page 4.

When we admire a beautifully printed book of the past, let us not think only of the printer, who arranged the types intelligently, and did the presswork with care, but also, the far more painstaking work of the probably unknown punch-cutter who was responsible for the perfection of the types with which the book was printed.

In our own immediate time the best types are those modelled or revived from the best designs of the past or cast from original matrices that have been preserved. The structure of type has not varied since Gutenberg first looked with delight upon a few shining punches. He brought printing into full bloom and the craftsmanship of his pages cannot be bettered today. Printers are blessed with a rich heritage covering nearly five centuries; their product has done much to draw aside the the curtain of ignorance; therefore we are proud of our calling.

Fred Anthoensen.

A true & exact *Representation* of the *Art* of *Casting & Preparing* Letters *for* Printing.



Engravd for the Universal Magazine 1750 for J. Hinton at the Kings Arms in St. Pauls Church Yard LONDON.

The Art of CUTTING, CASTING, and PREPARING OF LETTER *for* PRINTING, *with a neat Representation of a* Letter-founder's Work-house.

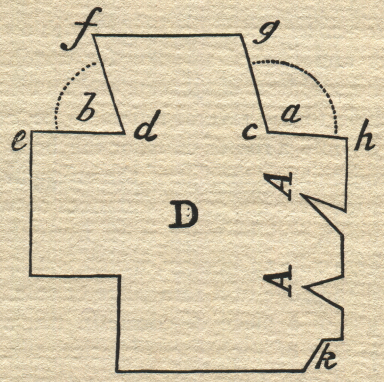
THE *Letter-cutter* must be provided with a vice, hand-vice, hammers and files of all sorts for watchmakers use; as also *gravers* and sculpters of all sorts and an oilstone, *&c.* suitable and sizeable to the several letters to be cut: a *flat* gage made of box to hold a rod of steel, or the body of a *mold*, *&c.* exactly perpendicular to the flat of the *using-file:* a *sliding gage* whose use is to measure and set off distances between the shoulder and the tooth, and to mark it off from the end, or from the edge of the work; a *face-gage*, which is a square notch cut with a file into the edge of a thin plate of steel, iron, or brass, of the thickness of a piece of common tin, whose use is to proportion the face of each sort of letter, *viz.* Long letters, ascending letters, and short letters. So there must be three gages, and the gage for the *long* letters is the length of the whole body supposed to be divided into forty two equal parts. The gage for the *ascending* letters *Roman* and *Italic* are $\frac{5}{7}$ or 30 parts of 42, and 33 parts for the *English* face. The gage for the *short* letters is $\frac{8}{7}$ or 18 parts of 42 of the whole body for the *Roman* and *Italic*, and 22 parts for the *English* face.

The *Italic* and other *standing* gages are to measure the scope of the *Italic* stems, by applying the top and bottom of the gage to the top and bottom lines of the letters, and the other side of the gage to the stem; for when the letter complies with these three sides of the gage, that letter hath its true shape.

By placing one point of a pair of steel dividers at the point *c* or *d* in the figure D, and with the other point describe a small fine arch of a circle, as *e f*, or *g h*. In this arch of the circle, must be set on the gage *a* 110 degrees, and on the gage *b* 70 degrees, and draw from the centers *c* and *d* two strait

lines through those numbers of degrees; then filing away the plate between the two lines, the gages are finished.

To find the measure of this, or any other number of degrees, describe a circle on a piece of plate brass of any radius: draw a strait line exactly through the center of this circle, and another strait line to cut this strait line at right angles in the center through the circle, so shall the circle be divided into four quadrants: Then fix one foot of the compasses in one of the points where any of the strait lines cuts the circle; and extend the moving foot of the compasses where-ever it will fall



in the circle, and make there a mark, which is 60 degrees from the fixed foot of the compasses: Then again fix the foot of the compasses in the intersection of the strait line and circle, that is, next the mark that was made before, and extend the moving foot in the same quadrant towards the strait line, where you first pitched the foot of your compasses, and with the moving foot make another mark in the circle. Which two marks will divide the quadrant into three equal parts. The other three quadrants are divided the same way, till the whole is divided into 12 equal parts: and each of these 12 parts contains an arch of 30 degrees: Then with your dividers divide each of these 30 degrees into three equal parts, and each of these three equal parts into two equal parts, and each of these two equal parts into 5 equal parts, so shall the circle be divided into 360 equal parts for use.

To use it; describe on the center of the circle an arch of almost a semicircle: which arch must be exactly of the same radius with that I have prescribed to be made on the gage *a b* from *e* to *f* and from *g* to *h*; then count in your circle of degrees from any diametrical line 110 degrees; and laying a strait rule on the center, and on the 110 degrees aforesaid, make a small mark through the small arch; and placing one foot of the compasses at the intersection of the small arch, with the diametrical line, open the other foot to the mark made on the small arch for 110 degrees, and transfer that distance to the small arch made on the gage: then, through the marks made by the two points of the compasses in the small arch on the gage, draw two strait lines from the center *c*, and, the brass between these two strait lines being filed away, that *gage* is made. And in like manner you may set off any other number of degrees for the making of any other gage.

And thus you may measure any angle in the draughts of letters, by describing a small arch on the angular point, and an arch of the same radius on the center of the divided circle: for then, placing one foot of the compasses at the intersection of the small arch with either of the strait lines proceeding from the angle in the draught, and extending the other foot to the intersection of the small arch with the other strait line that proceeds from the angle, you have, between the feet of the compasses, the width of the angle; and by placing one foot of your compasses at the intersection of any of the strait lines that proceed from the center of the divided circle, and the small arch you made on it, and making a mark where the other foot of your compasses falls in the said small arch, you may by a strait ruler laid on the center of the divided circle, and the mark on the small arch, see in the limb of the circle the the number of degrees contained between the diametrical or strait line and the mark.

If you have already a dividing plate of 360 degrees of a larger radius than the arch on your gage, you may save yourself the labour of dividing a circle as aforesaid; and work by your dividing plate, as you have been directed to do with the circle.

The next care of the *letter-cutter* is to prepare good steel *punches*, well tempered and quite free from all veins of iron; on the face of which he draws or marks the exact shape of

the letter, with pen and ink, if the letter be large; or with a smooth blunted point of a needle, if it be small; and then, with sizeable and proper shaped and pointed gravers and sculpters, digs or sculps out the steel between the strokes or marks he made on the face of the punch, and leaves the marks standing on the face. Having well shaped the inside strokes of his letter, he deepens the hollows with the same tools: for if a letter be not deep in proportion to its width, it will, when used at the press, print black, and be good for nothing. This work is generally regulated by the depth of the *counter-punch*. Then he works the outside with proper files till it be fit for the *matrice*.

But, before we proceed to the sinking and justifying of the *matrices*, we must provide a *mold* to justify them by, of which you have a draught on the copper-plate, *fig.* 5, 6.

a The Carriage.
b The Body.
c The Male Gage.
d e The Mouth-piece.
f i The Register.
g The Female Gage.
h The Hag.
a a a a The Bottom Plate.
b b b The Wood, the Bottom Plate lies on.
c c e The Mouth.
d d The Throat.
e d d The Pallat.
f The Nick.
g g The Stool.
b b The Spring or Bow.

Every mold is composed of an *upper* and an *under* part. The under part is delineated at *fig.* 5. The upper part is marked *fig.* 6, and is in all respects made like the under part, excepting the stool behind, and the bow, or spring, also behind; and excepting a small roundish wire between the body and carriage, near the break where the under part hath a small rounding groove made in the body. This wire, or rather half-wire, in the upper part makes the nick in the shank of the letter, when part of it is received into the groove in the under part. These two parts, are so exactly fitted and gaged into one another (*viz.* the male gage, marked c in *fig.* 6, into the female marked g in *fig.* 5) that when the upper part of the mold is properly placed on, and in the under part of the mold both together, makes the entire mold, and may be slid backwards for use so far, till the edge of either of the bodies on the middle of either carriage comes just to the edge of the female gages, cut in each carriage: and they may be slid forwards so far, till

the bodies on either carriage touch each other: and the sliding of these two parts of the mold backwards makes the shank of the letter thicker, because the bodies in each part stand wider asunder, and the sliding them forwards makes the shank of the letter thinner, because the bodies on each part of the mold stand closer together.

Then the *mold* must be *justified:* And first the founder justifies the *body* by casting about twenty proofs or samples of letters: which are set up in a composing stick, with all their *nicks* towards the right hand; and then by comparing these with the pattern letters, set up in the same manner, he finds the exact measure of the body to be cast. He also tries if the two sides of the body are parallel, or that the body be no bigger at the head than at the foot; by taking half the number of his proofs, and turning them with their heads to the feet of the other half; and if then the heads and the feet be found exactly even upon each other, and neither to *drive out* nor *get in*, the two sides may be pronounced parallel. He further tries whether the two sides of the thickness of the letter be parallel by first setting his proofs in the composing stick with their *nicks* upwards; and then turning one half with their heads to the feet of the other half: and if the heads and feet lie exactly upon each other, and neither drive out nor get in, the two sides of the thickness are parallel.

The *mold* thus justified: the next business is to prepare the *matrices*. A *matrice* is a piece of brass or copper of about an inch and a half long, and of a thickness in proportion to the size of the letter it is to contain. In this metal is sunk the face of the letter intended to be cast, by striking the letter punch about the deepness of an *n*. After this the sides and face of the matrice must be justified and cleared, with files, of all *bunchings* made by sinking the punch.

Every thing thus prepared, it is brought to the furnace, which is built of brick upright with four square sides and a stone on the top, in which stone is a wide round hole for the *pan* to stand in. A foundery of any consequence has several of these furnaces in it, as you see described at *fig.* 1.

The *metal*, of which printing letters are made, is lead hardened with *iron* or *stub-nails*, which are commonly made of good soft and tough iron.

To make the iron run, they mingle an equal weight of antimony, beaten, in an iron mortar, into small pieces, and stub-nails together: And preparing such a number of earthen pots as will endure the fire, and are necessary at a time, they charge these pots with the mingled iron and antimony, as full as they will hold; and melt it in an open furnace built on purpose.

When it bubbles, it is a sign of the iron's being melted: but it evaporates so much that they seldom find above one quarter of the pot full; which compost of iron and antimony melted is ladled into an iron pot of lead, fixed on another furnace close to the former, in the proportion of three pounds of melted iron to 25 pounds of lead; and they incorporate them according to art.

The founder must be now provided with a ladle, which differs nothing from other iron ladles, but in its size. And he is provided always with ladles of several sizes, which he uses according to the size of the letters he is to cast. Before the caster begins to cast, he must kindle his fire in the furnace to melt the metal in the pan. Therefore he takes the pan out of the hole in the stone, and there lays in coals and kindles them; and, when it is well kindled, he sets the pan in again and puts in metal into it to melt: if it be a small bodied letter he casts, or a thin letter of great bodies, his metal must be very hot; nay sometimes red-hot, to make the letter come. Then having chose a ladle that will hold about so much as the letter and break is, he lays it at the stoking-hole, where the flame bursts out to heat. Then he ties a thin leather, cut with its narrow end against the face to the leather groove of the matrice, by whipping a brown thread twice about the leather-groove, and fastening the thread with a knot. Then he puts both halves of the mold together, and puts the matrice into the matrice-cheek, and places the foot of the matrice on the stool of the mold, and the broad end of the leather upon the wood of the upper half of the mold, but not tight up, lest it might hinder the foot of the matrice from sinking close down upon the stool in a train of work. Then laying a little rosin on the upper wood of the mold, and having his casting-ladle hot, he with the bolling-side of it melts the rosin: and, when it is yet melted presses the broad end of the leather hard down on the wood, and so fastens it to the wood; all this is the preparation.

Now he comes to casting. Wherefore placing the under half of the mold in his left hand, with the hook or hag forward, he clutches the ends of its wood between the lower part of the ball of his thumb and his three hind fingers; then he lays the upper half of the mold upon the under half, so as the male gages may fall into the female gages, and at the same time the foot of the matrice places itself upon the stool; and, clasping his left hand thumb strong over the upper half of the mold, he nimbly catches hold of the bow or spring with his right hand fingers at the top of it, and his thumb under it, and places the point of it against the middle of the notch in the backside of the matrice, pressing it as well forwards towards the mold, as downwards, by the shoulder of the notch close upon the stool, while at the same time with his hinder fingers, as aforesaid, he draws the under half of the mold towards the ball of his thumb, and thrusts by the ball of his thumb the upper part towards his fingers, that both the registers of the mold may press against both sides of the matrice, and his thumb and fingers press both halves of the mold close together.

Then he takes the handle of his ladle in his right hand, and with the boll of it gives a stroke, two or three, outwards upon the surface of the melted metal, to scum or clear it from the film or dust that may swim upon it; then takes up the ladle full of metal, and having his mold as aforesaid in his left hand, he a little twists the left side of his body from the furnace, and brings the geat of his ladle (full of metal) to the mouth of the mold, and twists the upper part of his right hand towards him to turn the metal into it, while at the same moment of time he jilts the mold in his left hand forwards, to receive the metal with a strong shake (as it is called;) not only into the bodies of the mold, but while the metal is yet hot running, swift and strongly, into the very face of the matrice, to receive its perfect form there, as well as in the shank.

Then he takes the upper half of the mold off the under half, by placing his right hand thumb on the end of the wood next his left hand thumb, and his two middle-fingers at the other end of the wood; and finding the letter and break lie in the under half of the mold (as most commonly by reason of its weight it does) he throws or tosses the letter, break and all, upon a sheet of waste paper laid for that purpose on the

bench, just a little beyond his left hand, and is then ready to cast another letter as before; and also, the whole number that is to be cast with that matrice.

A workman will ordinarily cast about three thousand of these letters in a day.

The letters thus cast are delivered to the boys to break off the *breaks* from the *shanks*, as in *fig.* 2, and to rub them upon a stone as in *fig.* 3. And then, being brought to their just proportion in the body, they are delivered to a man, as in *fig.* 4, to cut them all of an even height: which finisheth the font for the use of the printer.

This book has been set in Caslon Old Face cast from the original matrices and three hundred and fifty copies printed by The Southworth-Anthoensen Press, Portland, Maine.