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MATRICES FOR TYPE CASTING AND COMPOSING MACHINES.

APPLICATION FILED DEC. 19, 1910.

1,035,343. Patented Aug. 13, 1912.

3 SHEETS—SHEET 1.

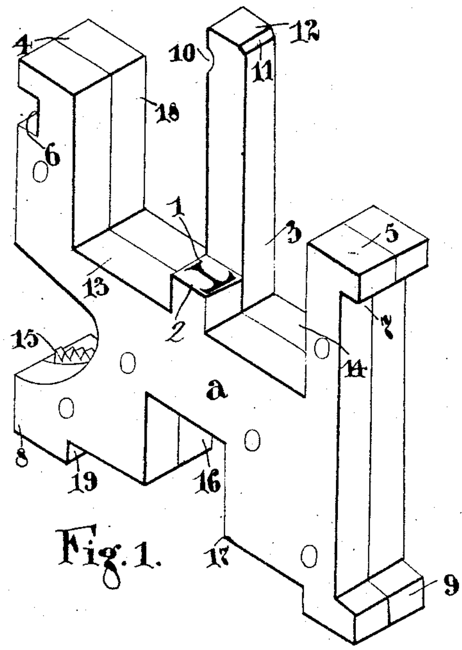

Fig. 1.

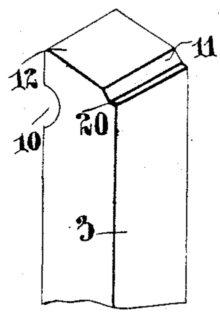

Fig. 2.

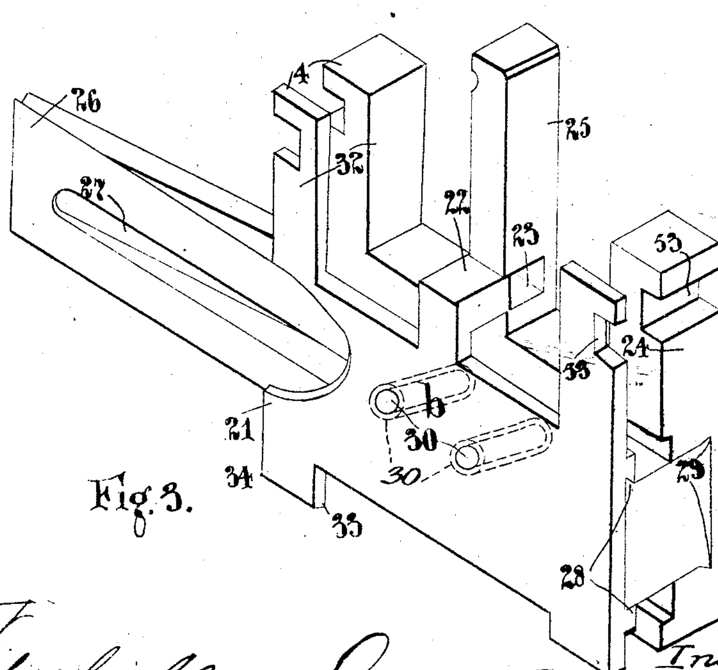

Fig. 3.

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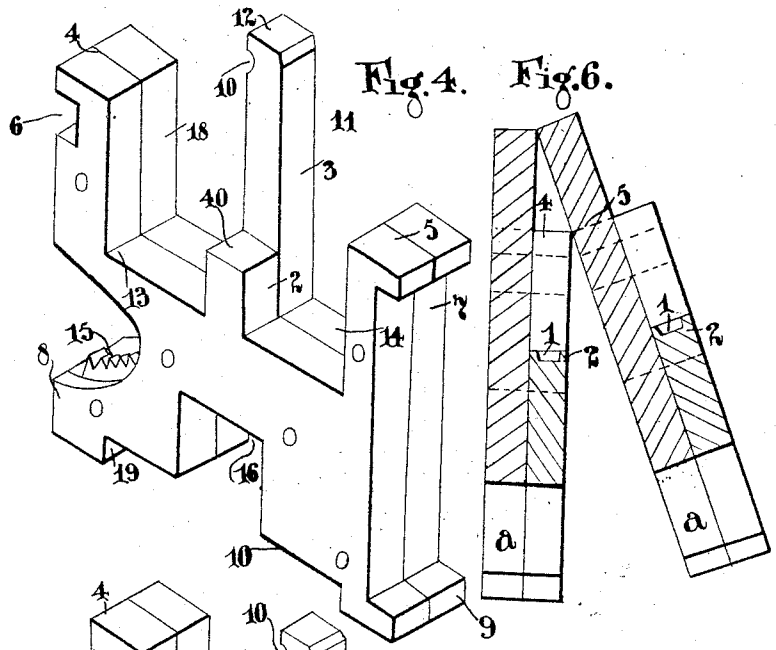

Fig. 4.

Fig. 6.

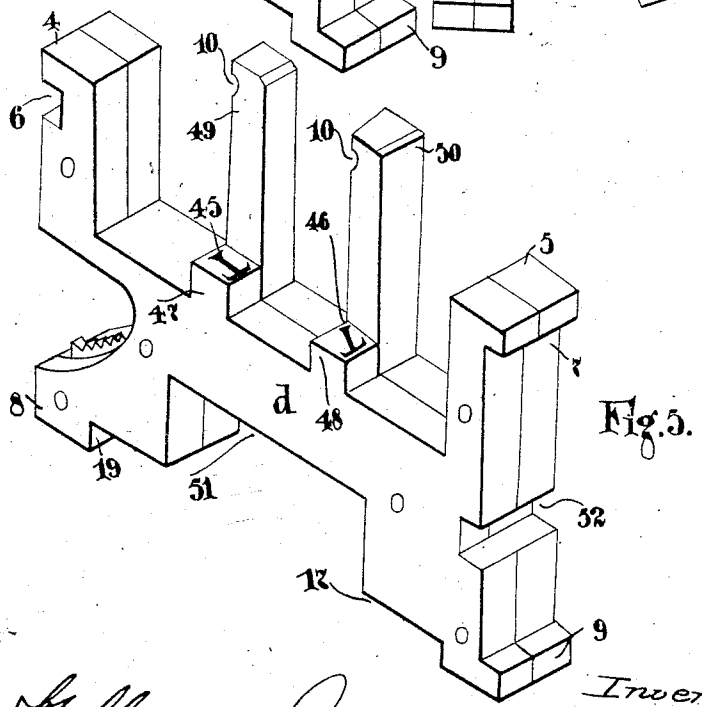

Fig. 5.

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3 SHEETS-SHEET 3.

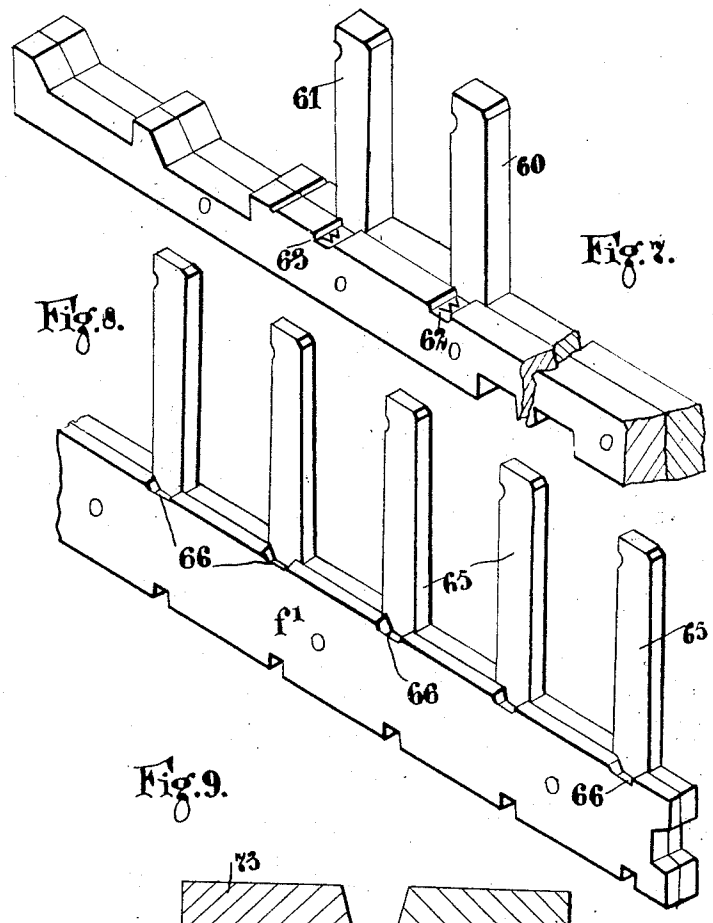
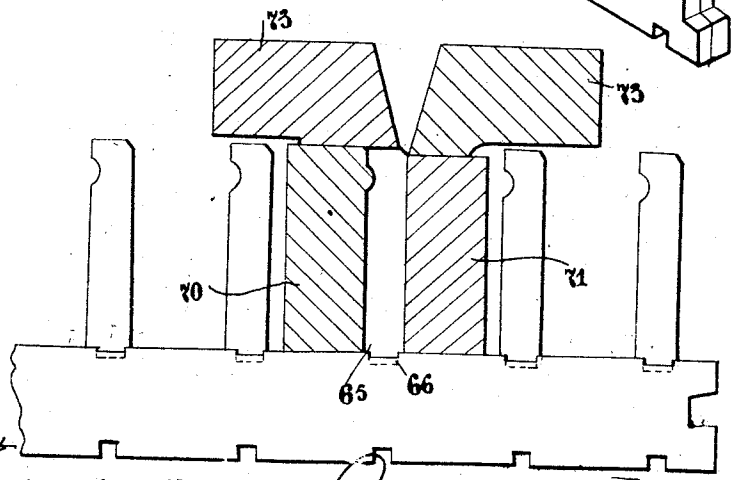


Fig. 7.

Fig. 8.

Fig. 9.



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UNITED STATES PATENT OFFICE.

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MATRICES FOR TYPE CASTING AND COMPOSING MACHINES.

1,035,343. Specification of Letters Patent. Patented Aug. 13, 1912.

Original application filed December 16, 1909, Serial No. 533,405. Divided and this application filed December 19, 1910. Serial No. 598,132.

To all whom it may concern:

Be it known that I, JOHN CAMERON GRANT, a subject of the King of Great Britain and Ireland, and residing at Albert Lodge, Albert Place, Victoria Road, Kensington, London, W., England, have invented certain new and useful Improvements in Matrices for Type Casting and Composing Machines, of which the following is a specification.

This invention relates to matrices for use in type casting and composing machines, and has for its object to provide matrices of such form that when assembled or assembled and justified in front of a single continuous mold a line of separate type may be cast from them at a single pouring of metal. Hitherto to produce the above result it has been necessary to use in addition to matrices dividing slips or mold walls between each type or logotype which was desired to be separated from the rest.

The present invention consists in matrices each having a projection or mold wall dividing successive characters in a line integral therewith the said matrices being wider than their respective set widths.

The invention also consists in the improved matrices hereinafter described.

In carrying the invention into effect in the case of modified linotype matrices according to one modification I employ matrices somewhat similar to those hitherto used in linotype machines except for a unique and absolute difference in the fact that as the width of the type is no longer dependent upon the thickness of the matrix, each matrix is made double, or otherwise proportionately greater that the set width it would otherwise have, or carries a constant additional thickness; one part of this set width being taken up with a portion of the matrix devoted to bearing the intaglio character upon a prominence and the other part, at the point where the intaglio impression occurs, being raised or extended to form a projection equal to the height of the body of the type required, and also to form at the same time a practical portion of the mold in which the line of separate types are cast, as will hereafter be more plainly made evident. In addition to ordinary non-distensible space matrices and quad matrices, I employ space matrices also similar in form to the character matrices, for the purpose of line justification; these space matrices, or, as they are sometimes called, "wedge spaces," are provided with sliding wedges.

In a convenient form the projections on the character matrices and non-distensible space matrices are equal in thickness to the set width of the character or space so that each matrix is double the width of the character or space which it casts, but unlike the character matrices and ordinary quad and space matrices, the width of the distensible space matrices is not always one half or otherwise proportionately narrower than the entire width. If the projection and prominence of the distensible wedge spaces could both be proportionately increased so as to bear to each other the same ratio for any required amount of distension, as the projection and prominence of the character and quad matrices bear to each other, it would be merely necessary to distend the distensible wedge spaces so as to fill a definite measure. It is difficult, if not impracticable, to distend both of these parts, and for constructional reasons it is preferable to make the projection of the distensible space matrix of considerable thickness and to make the prominence of such form as to slide out of the projection, more or less, according to the amount of distension required.

Referring to the accompanying drawings, Figure 1 is a perspective view of a character matrix; Fig. 2 is an enlarged perspective view of the upper part of the projection 3 shown in Fig. 1; Fig. 3 is a perspective view of a distensible space matrix; Fig. 4 is a perspective view of a quad matrix; Fig. 5 is a perspective view of a two-letter character matrix; Fig. 6 is a section through two matrices one of which is tilted against the other; Fig. 7 is a perspective view of a matrix suited for the "typograph" machine; Fig. 8 is a perspective view of a portion of a matrix for the "monoline" machine, while Fig. 9 is a sectional view showing a multiple strike matrix.

Referring to Figs. 1 to 6 of the accompanying drawings, (*a*) Fig. 1 is a perspective view of a character matrix in which the strike or intaglio character 1 is shown impressed upon the prominence 2 at the top of the matrix. Immediately adjacent to the intaglio prominence 2 is the projection 3 which is of such length that the distance from the end of the deepest portion

of the intaglio measured parallel to the side of the projection is equal to the height of the type required. On either side of the intaglio prominence 2 and of the projection 3 are two lugs 4 and 5 rising from the body of the matrix *a* and having their inner sides parallel to each other and to the sides of the intaglio prominence 2 and of the projection 3 and produced to a height sufficient to act as a shield to the edges of the intaglio prominence 2 in any position or angle into which the matrix can be tilted when in use with other matrices as shown in Fig. 6. The lug 4 is provided with a slot or groove 6; the opposite side of the matrix 7 being generally cut away for purposes of delivery from the magazine. The opposite end of the matrix is also provided with lugs or feet 8 and 9, but these feet usually have no slots or grooves cut in them. At a suitable height upon projection 3 may be cut a groove or nick 10, or two or more grooves or nicks, upon the opposite side to which the top of the projection is beveled off at an angle 11 leaving a flat surface 12 on the top of the projection parallel to the lowest portion of the intaglio 1. The object of beveling off the end of the projection at an angle 11 is to allow a space for the casting of a continuous tang which can be broken off from the several type when cast without leaving any uneven projections above the base of the separate type, so that the type, when cast and separated from the tang, may be transferred to the galley and will stand at the correct height without any necessity for trimming. For convenience of manufacture, the matrix may be built up to two separate thicknesses of metal, the intaglio prominence 2 being produced in the one and the projection 3 formed upon the other, and the matrix so constructed may be made of two different materials to facilitate the production upon the prominence 2 of the intaglio character itself, and at the same time to provide sufficient strength and wearing capacity in the projection 3. Considering a matrix as built up of two parts, the one part 13 carrying the intaglio, and the other part 14 carrying the projection, then these portions are subsequently fixed together by rivets or other suitable means so as to form one homogeneous matrix, adapted to the various guides on which the matrices are received, measured for length of line, justified and used as portion of the mold in casting. The teeth 15 are formed in one of the parts 13 or 14 and are used as in the linotype machine in connection with the elevation of the type matrices for delivery to the distributing mechanism and afterward for purposes of distribution. To facilitate the arrangement of these matrices in the magazine, they are cut away as shown by the notch 16, so that each matrix clears the projection of the preceding matrix in the magazines, and this clearance may be made sufficiently wide to prevent the contact of the projection 3 with the succeeding matrix when leaving the magazine. Between the lugs or feet 8 and 9 is a shallow slot 17 for retaining the matrix in place when the assembly box is opened.

Fig. 2 is a perspective view of part of the projection 3 showing a modification of the beveled portion 11 in which a step 20 is formed at the lower part of the bevel.

(*b*) Fig. 3 is a perspective view of a distensible space matrix in which the one part 21 carries a short prominence 22 formed to enter a recess 23 on the other part 24; this recess being so formed that the short prominence 22 can be withdrawn from the part 24 to a variable extent. The part 24 carries a projection 25 which serves the same purpose as the projections previously shown on the character matrix *a*. The two parts 21 and 24 of the space matrix can be separated to a variable extent by the action of the wedge 26 which connects the two pieces 21 and 24 by means of the dove tailed grooves 28 and 29, and the two pieces 21 and 24 are constrained to occupy the proper relative positions to each other by means of the pins 30 fixed to part 21 which slide in the tubular guides 31 fixed to the part 24. These guides pass through a slot 27 in the sliding wedge 26 and limit the travel of the wedge when at one point in the cycle of operations, the matrices are lifted by the surfaces 32 and 33. The foot 34 is made longer than the other feet for retaining the adjustable space matrix when the character matrices are lifted to the distributer by the elevator arm.

(*c*) Fig. 4 is a perspective view of a quad matrix which, like the ordinary or thinner space matrix resembles the character matrix in all particulars except that the prominence 40 which would carry the intaglio character is a plain flat surface and this is nearer the end 12 of the projection 3 than is the case with the character matrix. The distance of this plain face from the end of the projection 3 is such as to give the proper body height to the quad or ordinary space cast.

Fig. 5 is a perspective view of a two-letter character matrix *d* in which two strikes or intaglio characters 45 and 46 are shown impressed upon the prominences 47 and 48 at the top of the matrix. Immediately adjacent to the intaglio prominences 47 and 48 are the projections 49 and 50, which are of such length that the distance from the end to the deepest portions of the intaglios measured parallel to the sides of the projections 49 and 50 are each equal to the height of the type required. The notch 51 (which corresponds to the notch 16 of the

simple character matrix *a*, Fig. 1) is made wider so as to clear the two projections 49 and 50 of the succeeding two-letter matrix when leaving the magazine. The side 7 of the two-letter matrix *d* may be provided with a notch 52 for discriminating between two fonts of matrices when a double magazine is employed. The same device may be employed in the single letter matrix when used with multiple magazines carrying different fonts. In other respects the two-letter matrix resembles the simple matrix *a* shown in Fig. 1.

Methods for the justification of matrices constructed as above are described in my copending application for Letters Patent Serial No. 533405. According to another modification I make the thickness of the complete matrix greater than the thickness of the part of the matrix on which the intaglio letter is formed by a constant thickness which is equal to the thickness of the projection on the space matrices above mentioned. With this form of matrix justification is somewhat simplified, but necessitates allowing for an abnormal length of mold, as also described in my above mentioned application.

Referring to Figs. 7, 8 and 9 the invention may equally well be applied to matrices used in other forms of type casting and composing machines. A perspective view of a portion of a two-letter "typograph" matrix modified in accordance with this invention is shown in Fig. 7, the projections 60 and 61 being placed adjacent to the strike 62 and 63 or their equivalents, which, in this modification, I may form as in the ordinary "typograph" matrix instead of upon a prominence, as shown in the matrices in Figs. 1 and 3 and 4 and 5.

Fig. 8 is a perspective view of a portion of a "monoline" matrix modified in accordance with this invention showing the projections 65 adjacent to the strike 66 or their equivalents, which, as in the case of the modified "typograph" matrix shown in Fig. 7, I may also form, as in the ordinary "monoline" matrix, instead of upon a prominence.

Fig. 9 is a sectional view showing one modification of a multiple strike matrix with a projection 65 inclosed between mold walls 70 and 71 and with tang pieces 72 and 73 forming part of the mold also in position for casting.

In the drawings the matrices are shown as formed in two pieces joined together by pins, but the two parts are firmly fixed together and may, if desired, be made in one piece, the essential feature of the invention being that the part of the matrix carrying the tongue 3 should not be separable when finished from the part of the matrix which carries the intaglio character, and throughout the specification, therefore, the tongue 3 has been referred to as integral with the matrix.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:—

1. Matrices for type-casting and composing machines each comprising in an integral whole a plate having a prominence thereon upon one edge, said prominence having a type-producing surface, a second plate contiguous to and of identical contour with said first plate, and a projection upon said second plate, said projection having oppositely disposed type-defining walls, the transverse walls of said prominence and said projection being in the same plane.

2. Matrices for type-casting and composing machines each comprising in an integral whole a plate having a prominence thereon upon one edge, said prominence having a type-producing surface, a second plate contiguous to and of identical contour with said first plate, and a projection upon said second plate, said projection having oppositely disposed type-defining walls, said projection being beveled off at the end.

3. Matrices for type-casting and composing machines each comprising in an integral whole a plate having a prominence thereon upon one edge, said prominence having a type-producing surface, a second plate contiguous to and of identical contour with said first plate, a projection upon said second plate, said projection having oppositely disposed type-defining walls, and a groove or nick in said projection near its end.

4. Matrices for type-casting and composing machines each comprising in an integral whole a plate having a prominence thereon upon one edge, said prominence having a type-producing surface, a second plate contiguous to and of identical contour with said first plate, a projection upon said second plate, said projection having oppositely disposed type-defining walls, said projection being beveled off at its end in the transverse direction, and a groove or nick parallel to and on the opposite side of the said projection from said beveled edge.

In testimony whereof, I affix my signature in presence of two witnesses.

JOHN CAMERON GRANT.

Witnesses:
THOMAS H. BRISTOW,
P. A. OUTHWAITE.