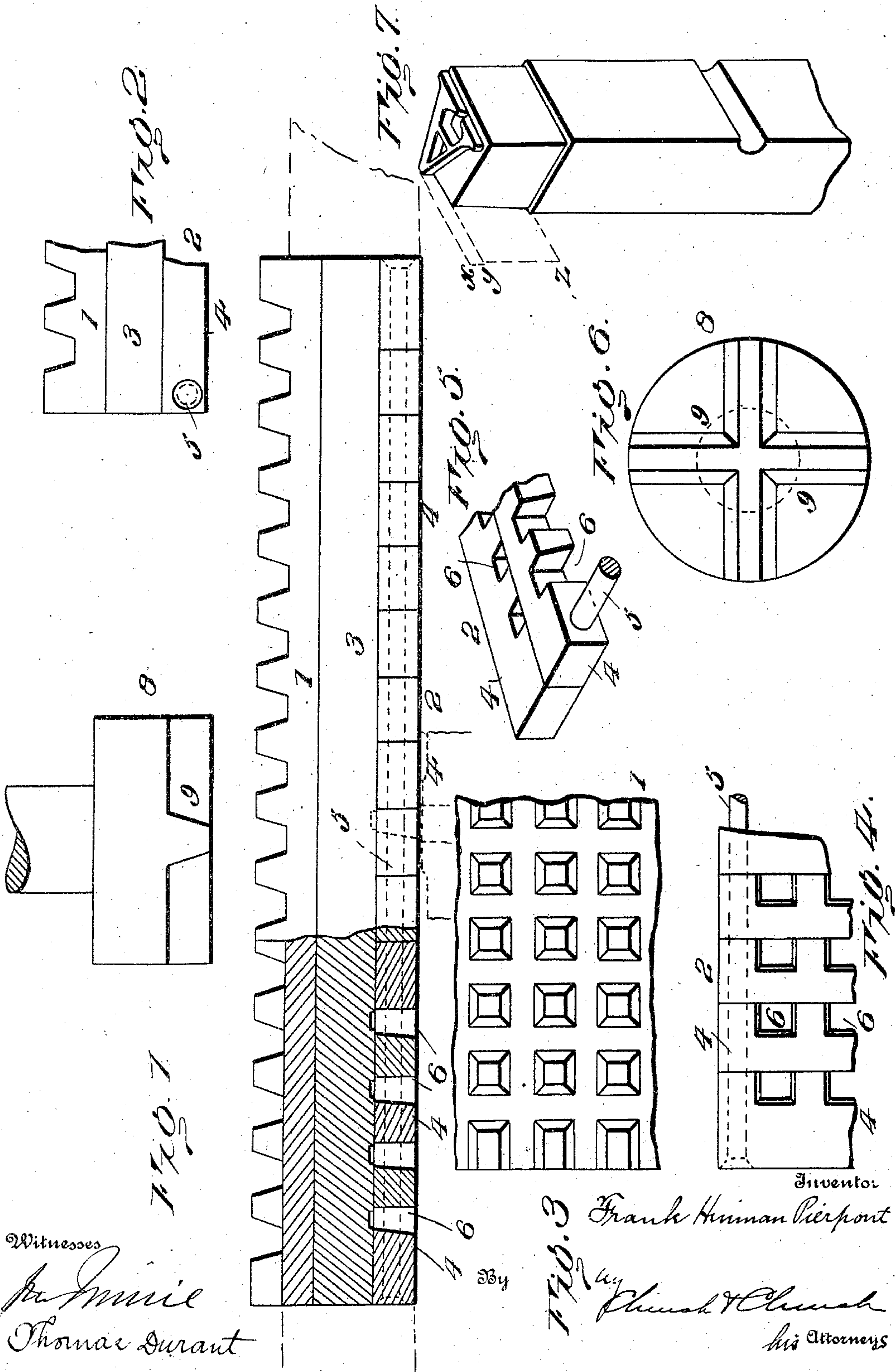


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F. H. PIERPONT.
DIE CASE EQUIPMENT FOR TYPE MACHINES.

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UNITED STATES PATENT OFFICE.

FRANK HINMAN PIERPONT, OF HORLEY, ENGLAND, ASSIGNOR TO LANSTON
MONOTYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA,
A CORPORATION OF VIRGINIA.

DIE-CASE EQUIPMENT FOR TYPE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 785,375, dated March 21, 1905.

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To all whom it may concern:

Be it known that I, FRANK HINMAN PIERPONT, a citizen of the United States, residing at Horley, England, have invented certain new and useful Improvements in Die-Case Equipment for Type-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures of reference marked thereon.

The present invention relates to the construction of die or matrix cases and the final centering mechanism therefor, and is adapted for use in connection with type-casting and analogous machines wherein a plurality of dies or matrices are associated together to be acted upon by centering or positioning devices in a manner to locate individual dies or matrices opposite a station or mold common to the series; and it is specially designed for use in connection with type casting and composing machines of the kind illustrated in Patents No. 625,998, of May 30, 1899, to J. S. Bancroft, and No. 633,088, of September 12, 1899, to Tolbert Lanston, both for improvements in type casting and composing machines.

It has been usual heretofore to provide the die-case with a frame to which the centering mechanism is connected for adjustment and in which is assembled a series of independent and separately-movable blocks bearing the characters. Usually each block has been provided at its end opposite the character with a conical cavity to receive the correspondingly-shaped end of the centering-plunger by means of which the selected block brought to position by the centering mechanism is finally centered and clamped upon the open end of the mold. Although highly satisfactory results have been obtained by the use of die-cases so constructed, their manufacture and maintenance is expensive as compared with the present system, due in part to the skill required and time consumed in justifying the characters on the separate blocks so that when

assembled in the frame they will occupy and retain the proper relative positions. Moreover, in use the separately-movable matrix-blocks, with their conical centering-recesses, have developed certain drawbacks and defects which it is one of the principal objects of this invention to avoid or remove—such, for example, as the clogging of the centering cavities, the enlargement and distortion of said cavities, due to the fact that the conical centering-pin frequently takes but a line bearing on one side of its seat, the absence of means whereby high and low quads and spaces may be produced. The depth of drive required for the matrix-cavities is such as that many recuts are necessary, and owing to the relatively small contacting-surface presented to the mold the latter soon becomes worn, necessitating frequent resurfacing and adjustment.

The invention consists in the construction, combination, and arrangement of parts hereinafter described, the novel features being specified in the claims.

In the accompanying drawings, illustrating a preferred form of embodiment of the invention, Figure 1 is a side elevation, partly in section, of the die-case or matrix-block and the centering-plunger. Fig. 2 is an end elevation of a portion of the matrix-block, showing the location of one of the clamping-bolts. Fig. 3 is a top plan view, and Fig. 4 a bottom plan view, of a section of the matrix-block. Fig. 5 is a perspective view of a section of the bottom or face plate. Fig. 6 is an end view of the centering-plunger. Fig. 7 is a perspective view of a type.

The same numerals designate like parts in the several views.

The matrix-block is preferably formed in three sections—to wit, a back or centering plate 1, a front or face plate 2, and an intermediate or matrix plate 3—said sections being secured together to form an integral structure adapted to be inserted and held within the die-case frames of the prior patents mentioned, replacing therein the series of sepa-

rate matrices and their supports heretofore employed. The die-case frame and mold are indicated by dotted lines in Fig. 1.

The matrix-plate 3 consists of a single piece 5 of metal, preferably copper or gun-metal, in one face of which the series of characters comprising the font are driven or otherwise formed. The entire series of characters may be driven in one or several operations by 10 punches suitably arranged and operated, or they may be driven in groups of a single row, or otherwise. It is not deemed necessary to enter into a detailed description of the methods of mounting and securing the punches for 15 this operation, as there are several ways in which it may be done, it being sufficient for present purposes to state that the matrix-cavities are arranged and justified in rows in two directions, being spaced uniformly in one 20 direction and differentially in the other after the plan described in the prior patents mentioned to accommodate the two adjusting or centering systems there described. It may be noted, however, that the drive for the 25 characters need not be so deep as with the separate matrix-blocks, it being sufficient if they are just deep enough for a good counter—say .023 of an inch, which is a drive that the punches will stand with safety. It is not es- 30 sential that the matrix-plate should be in one piece, although such is preferred, as it is obvious it might be formed in sections each containing one or more rows of characters, said sections or bars being rigidly united and constituting, in effect, a single plate. Owing to 35 the relatively shallow drive, only a small portion or section of the character end of the type is cast or otherwise formed in the matrix-plate 3, the end of the type-body immediately adjacent the character and upon which 40 it is sustained being formed in the face-plate 2. This face-plate 2, preferably built up of a series of bars 4, rigidly secured together, as by rivets or rods 5, or, if desired, composed of 45 a single piece of metal, is provided with an opening 6 opposite and in register with each matrix-cavity. The openings 6 are slightly less in height columnwise than the type-body to be produced and not quite so wide 50 individually as the unit of the character opposite which the opening is located, so that the cross-section of the end of the type bearing the character will be slightly less in area than the adjacent portions of the body, as 55 illustrated in Fig. 7, wherein the line xy represents the face and a small portion of the neck as formed or cast in the matrix-cavity in plate 3, while the line $y z$ designates the neck or portion formed in plate 2, the remainder of the 60 body being formed in the mold proper.

The face-plate 2 is preferably approximately one-eighth of an inch in thickness, so that by omitting the perforations 6 or forming recesses of greater or less depth therein 65 at those points brought opposite the mold

when quads or spaces are to be formed the latter can be made of any height desired, and said openings 6 may approximate in section the character or the type-body, preferably the latter, and may be formed on a taper, as 70 shown, to facilitate withdrawal after the cast.

Heretofore it has been possible in machines of this kind to cast quads or spaces but .050 inch shorter than the character-type; but with the present invention they may be .145 75 inch shorter or approximately the same length as type-founders' short quads. The danger or liability of the quads or spaces blocking up in printing is thus avoided. The face-plate 2 being flat and hard, its contact 80 with the mold will be firm and uniform, owing to the extended bearing-face presented, thereby diminishing wear and avoiding the necessity of frequent regrinding of the matrix-face of the mold, such as was incident to the use 85 of separate matrix-blocks and very objectionable where adjustable molds are employed. The block-plate 1 is equipped with a series of frusto-pyramidal projections 7, symmetrically 90 disposed at equal distances apart in two directions at right angles, thus presenting two series of parallel grooves extending in transverse planes, from which any obstruction or dirt can be readily removed by means of a 95 brush or other convenient implement.

The centering-plunger 8, which effects the final centering of the selected matrix and holds it tightly in contact with the face of the mold when the cast is being made, is equipped on its engaging surface with transverse 100 wedge-shaped projections or ribs 9, extending parallel with the two sets of grooves or recesses on the back plate 1 and adapted to enter said grooves and in so doing to not only center but to accurately position the matrix- 105 cavity. The opposing inclines on the back plate 1 and plunger 8 possess the advantages of the conical plunger and cooperating seat of the prior machines so far as the final centering of the matrix-cavity is concerned; but 110 they possess an additional advantage or function in that they operate to fix the angular position of the character in its relation to the mold, and thus preserve the proper relation 115 of the character to the sides of the body upon which it is formed. This action is due to the fact that the gaging-surfaces are located or extended on lines radial to the axis or centering-point and at two or more points in fixed angular relation thereto. Thus the plunger 120 not only accurately centers the matrix, but it corrects angular displacement of the character due to the twisting of the matrix-block. It is not essential that the projections or ribs 9 on the plunger should actually intersect at 125 the center, as shown, for the same effect would be produced if the portion within the dotted circle, Fig. 6, was omitted, in which case the four remaining ribs or projections would 130 serve equally well for positioning the matrix.

As applied to machines now in use the only change required in addition to the substituted matrix-block and plunger is a reduction in height of the mold by .095 inch in order to
 5 bring the type to standard length.

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

10 1. A matrix-block for type-machines such as described, provided with a matrix-cavity corresponding to the character and a small section of the body adjacent thereto, combined with a mold the cross-sectional area of whose cavity is greater than that of the matrix-cavity.

15 2. The combination to form a sectional matrix-block for type-machines such as described, of a matrix-section containing the drive, and a shoulder-section containing a perforation or cavity registering with the drive
 20 and of smaller cross-section than the type-body.

3. A matrix-block for type-machines such as described, comprising three plates or sections to wit; a matrix-section containing the drive,
 25 a front plate provided with an opening in register with the drive, and a centering or back plate applied to the matrix-section and provided with centering means.

30 4. A matrix-block for type-machines such as described, provided with an integral matrix-section containing the drive, and a sectional shoulder-section.

35 5. A matrix-block for type-machines such as described, provided with a matrix-plate containing the drive and a front plate or section secured thereto and containing a shoulder-perforation registering with the drive, said last-named section being divided on a line perpendicular to the face of the matrix-plate.

40 6. A matrix-block for type-machines such as described provided on its rear face with a plu-

rality of grooves in intersecting planes for co-operation with a ribbed centering-plunger.

7. A matrix-block for type-machines such as described provided with a plurality of char- 45
 acter-matrices symmetrically arranged in rows in two directions and with a corresponding series of projections forming intersecting grooves or channels for the reception of the
 50 final centering devices.

8. A die-case or matrix-block such as described, provided with a series of characters and a complementary series of projections sym-
 55 metrically arranged in rows in two directions.

9. A die-case or matrix-block such as described provided with a series of characters and a complementary series of pyramidal projec-
 60 tions symmetrically disposed in rows in two directions.

10. A die-case or matrix-block provided with a series of characters and a complementary series of pyramidal projections symmet-
 65 rically arranged in rows in two directions and adapted to move in two directions to bring any character opposite a centering-point in combi-
 nation with a centering-plunger provided with two or more ribs or projections disposed on in-
 70 tersecting lines and adapted to enter between the projections on the die-case or matrix-block, to position the selected character.

11. In combination with a multiple-character die-case or matrix-block provided with a series of pyramidal projections symmetrically
 75 arranged in rows in two directions, of a centering-plunger provided with a plurality of gaging surfaces or ribs registering with the projections in two directions.

FRANK HINMAN PIERPONT.

Witnesses:

LESLIE G. WHEELER,
 WALTER E. ROCHE.