

J. C. FOWLER.

METHOD OF PRODUCING TYPE CASTING MOLDS AND MATRICES.

(Application filed Aug. 21, 1899. Renewed July 9, 1900.)

(No Model.)

Fig. 1.

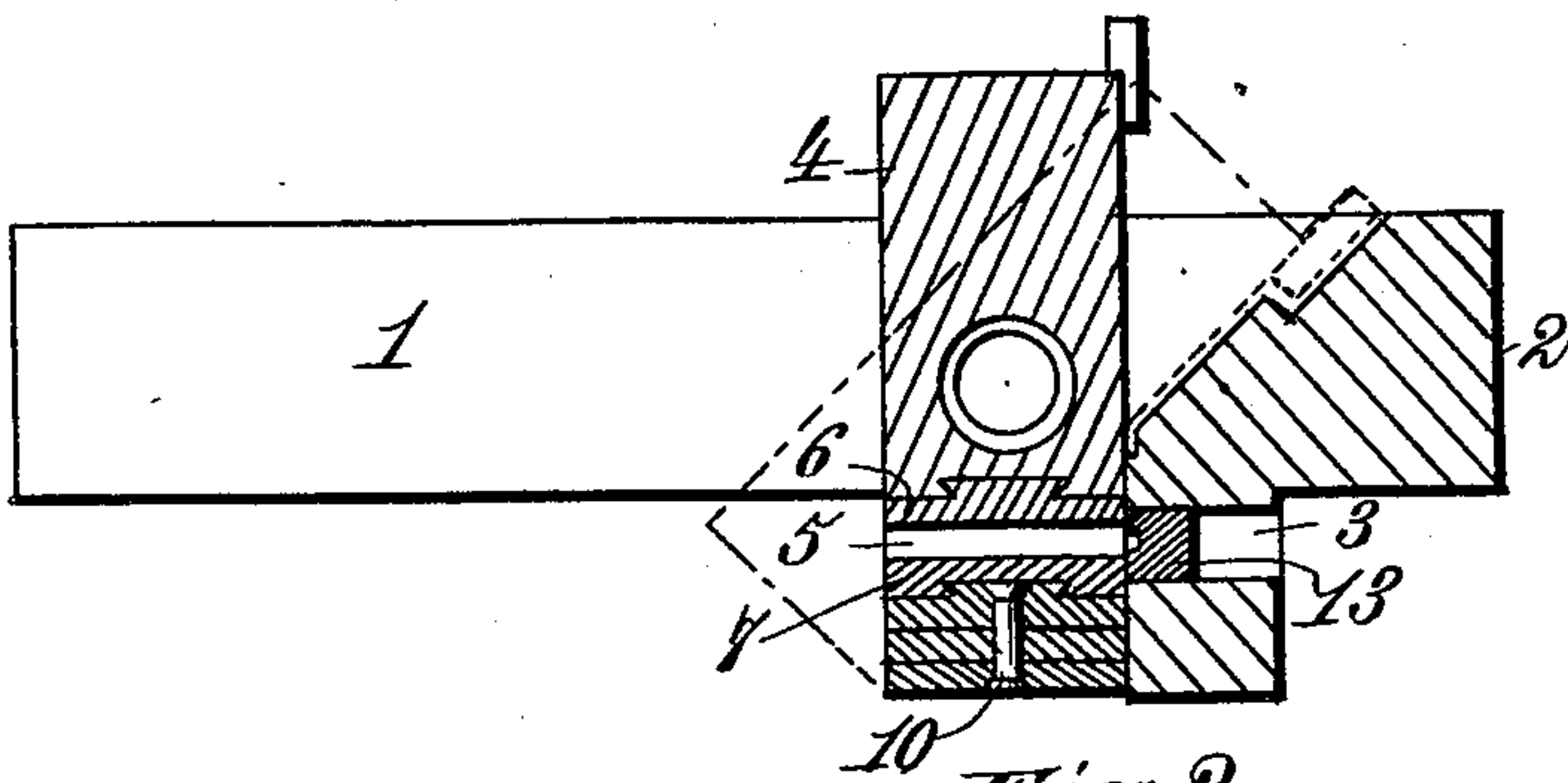


Fig. 2.

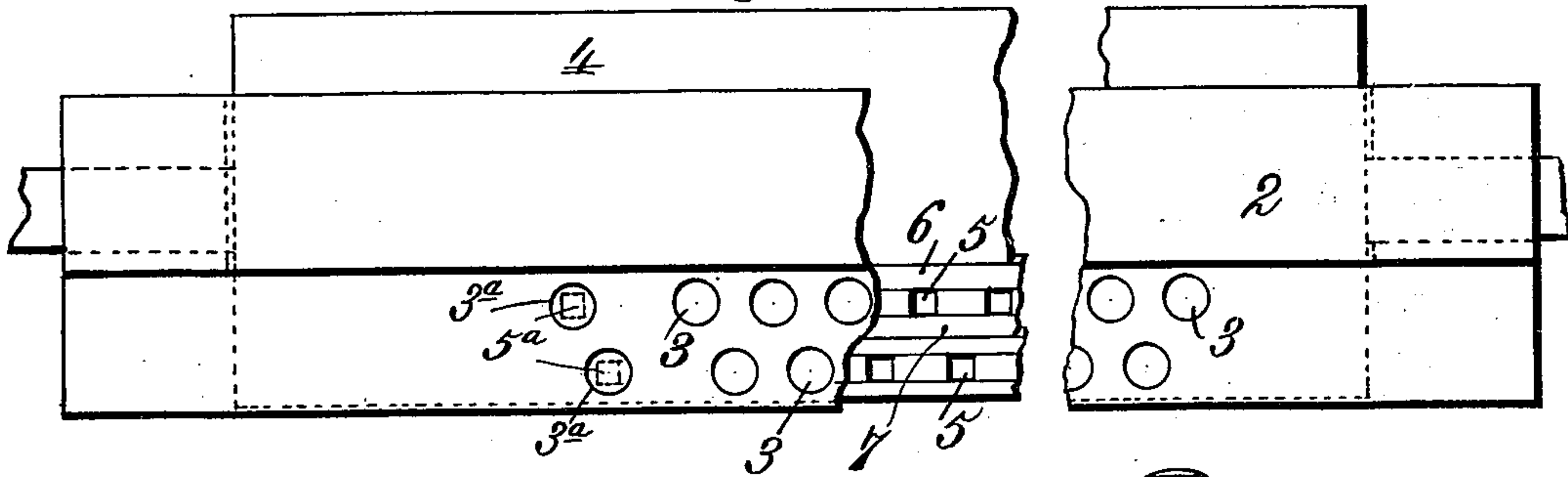


Fig. 3.

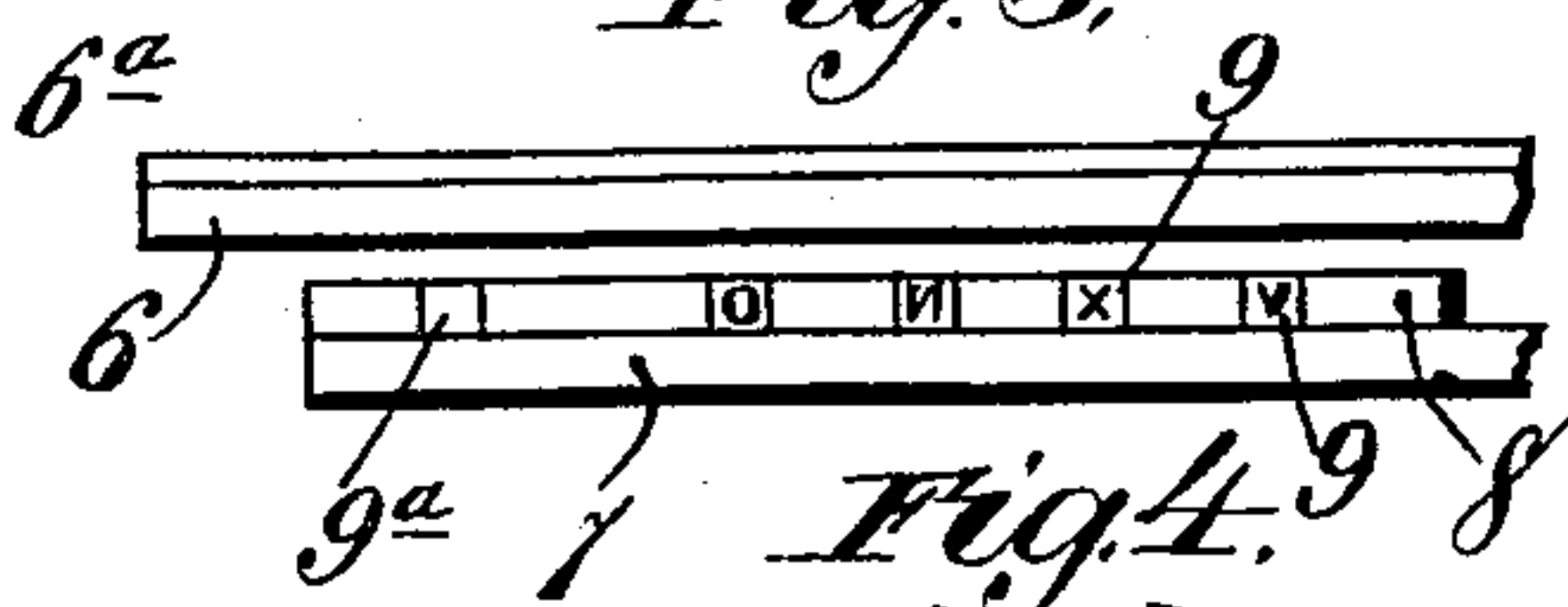


Fig. 4.

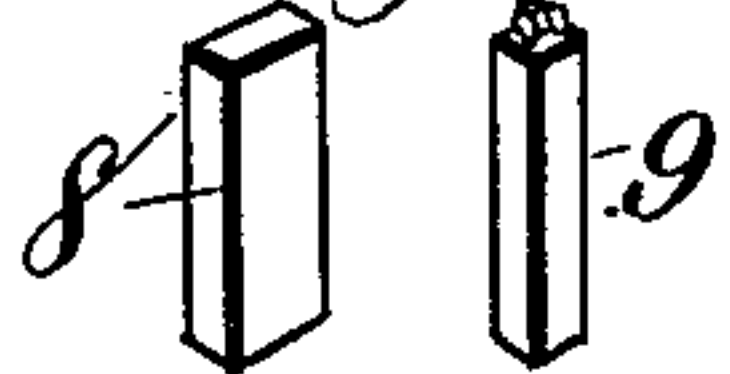
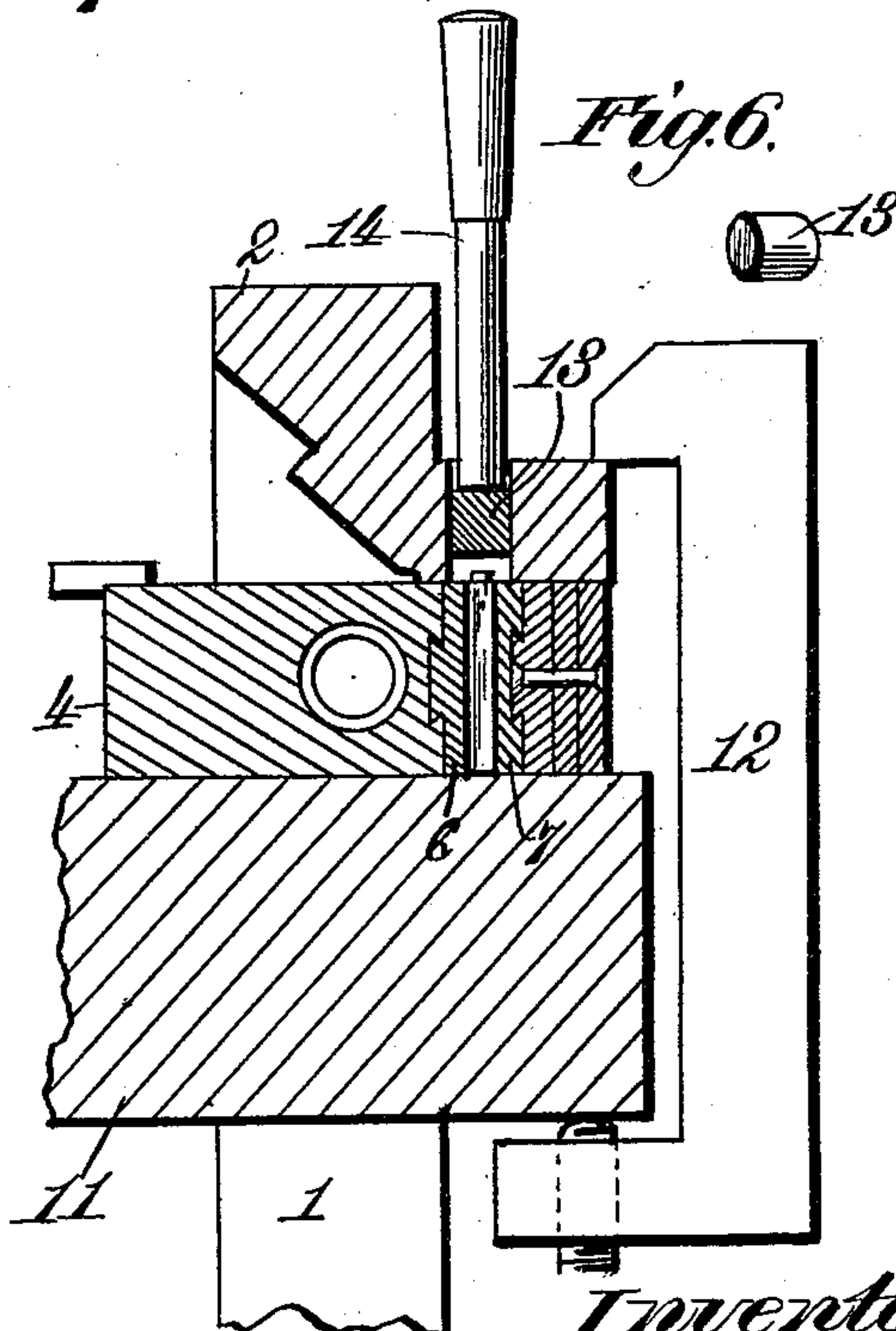


Fig. 5.



Fig. 6.



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UNITED STATES PATENT OFFICE.

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METHOD OF PRODUCING TYPE-CASTING MOLDS AND MATRICES.

SPECIFICATION forming part of Letters Patent No. 667,211, dated February 5, 1901.

Application filed August 21, 1899. Renewed July 9, 1900. Serial No. 23,045. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. FOWLER, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have
5 invented new and useful Improvements in Methods of Producing Type-Casting Molds and Matrices, of which the following is a specification.

This invention relates to a novel method of
10 producing a type-casting mold and matrix for use in that class of machines for casting and setting types wherein provision is made for the simultaneous casting of a group or set of types bearing different characters and for the
15 accumulation of the cast types in assorted columns or piles in the magazine of a type-setting mechanism.

It is the purpose of my invention to produce a type-casting mold with a plurality of
20 mold-cavities arranged in one or more series, according to the variety of types to be cast simultaneously, and wherein the mold-cavities shall be accurately formed with walls composed of suitably-hardened surfaces and
25 also to produce a plurality of accurately-formed matrices for use in conjunction with the mold-cavities of the type-casting mold.

In the annexed drawings, illustrating my invention, Figure 1 is a vertical transverse
30 section of a type-casting mold and its matrix produced in accordance with my improved method and shown as mounted in condition to be placed in a machine for casting and setting types. Fig. 2 is a partly-broken-away
35 front elevation of the type-casting mold and matrix-supporting bar. Fig. 3 is a detail view, in side elevation, of parts that may be employed in constructing the type-casting mold. Fig. 4 shows in perspective a pattern-type
40 and a spacer-block to be employed in constructing the mold and in producing a matrix. Fig. 5 is a part sectional elevation of parts of a type-casting mold with pattern-types therein. Fig. 6 is a transverse sectional elevation of the type-casting mold with
45 pattern-types therein and the matrix-supporting-bar, illustrating the method of forming a matrix.

It is important that the matrices and mold-
50 cavities to be used in a type casting and setting machine for simultaneously casting a

group or set of types bearing different characters should be in all instances accurately formed and properly arranged with relation to each other in order to secure the best results in type-casting. Ordinarily the matrices and the mold-cavities can be accurately produced only at great expense for skilled labor. The method of construction that I have devised enables the mold-cavities and
60 matrices to be properly produced with great accuracy and with the expenditure of but little time and labor.

In practicing my improved method of constructing a type-casting mold and matrices
65 I provide a mold-body with a plurality of mold-cavities that may be arranged in one or more series, preferably with the cavities in one series alternating with the cavities in the adjoining series and with a pattern-type located
70 in each mold-cavity, and I further provide the matrix-supporting bar with a plurality of cavities corresponding with and arranged opposite to the character-bearing ends of said pattern-types, and I then press or punch into
75 each of said cavities in the matrix-supporting bar a matrix-block of suitable soft metal or composition to take the impression of a character on the opposing pattern-type, and subsequently I remove the pattern-types, leaving the mold-cavities clear for use in casting
80 types in conjunction with the matrices.

Referring to Figs. 1 and 2, the reference-numeral 1 designates a frame comprising a matrix-supporting bar 2, having a plurality
85 of cavities 3 formed therein and extended through said bar, as shown. A mold-body 4 is so constructed as to be trunnioned at its ends in the said frame 1 immediately in rear of the matrix-supporting bar. In this mold-
90 body 4 I form a plurality of mold-cavities 5, coinciding with the cavities 3 of the matrix-supporting bar for the casting of types bearing characters and with other mold-cavities (designated by 5^a) in Fig. 2, which need not
95 coincide with any cavity of the matrix-supporting bar. These latter mold-cavities 5^a are for the casting of slugs, blanks, or spaces bearing no character or letter, and consequently requiring no matrix. There may be
100 more than one series of mold-cavities in the type-casting mold and more than one series of

cavities in the matrix-supporting bar, and in this event the cavities in one series will alternate with the cavities in the adjoining series, as shown in Fig. 2. For the purpose of securing the greatest accuracy in the formation of the mold-cavities 5 and 5^a it is preferable to provide these mold-cavities with hardened walls that may be produced by bars 6 and 7, of steel or other hardened metal, and by interposed spacer-blocks 8, also of steel or hardened metal, alternating with steel pattern-types 9 and 9^a, the said pattern-types and spacer-blocks being interposed between the hardened bars 6 and 7, as shown in Figs. 3 and 5.

In assembling the bars 6 and 7, spacer-blocks 8, and pattern-types 9 and 9^a the lowermost bar will be placed level on any suitable support and the spacer-blocks 8 and pattern-types 9 will be laid transversely thereon, alternating with each other and in close contact, and with the blank patterns 9^a at or toward one end. The upper bar 6 will then be brought down onto the spacer-blocks 8 and patterns 9 and 9^a, and all these said parts may then be firmly secured together by means of rivets 10, passed through certain spacer-blocks at proper points, as shown in Fig. 5. The upper side of the upper bar 6 is provided with a longitudinally-arranged tongue 6^a, preferably dovetailed or undercut along its opposite edges to be securely engaged in a correspondingly-dovetailed groove formed in the bottom of the mold-body 4, as indicated in Fig. 1. The under side of the lower bar 7 may be constructed with a longitudinally-arranged dovetailed groove to receive a tongue on the upper side of another group of bars and interposed spacer-blocks and patterns, as shown in Figs. 1 and 6. Several groups of these bars 6 and 7, interposed spacer-blocks 8, and patterns 9 and 9^a may be connected together in a type-casting mold where it is desired to employ several series of mold-cavities. The cavities 3 in the matrix-supporting bar 2 are preferably cylindrical in form, as shown in Fig. 2, and are bored or drilled through the matrix-supporting bar at such points as to coincide with the character-bearing pattern-types 9, as shown in Figs. 1 and 2. There need be no cavities 3 corresponding with the patterns 9^a, which bear no characters, except as hereinafter provided. The mold-body 4 having been trunnioned to the frame 1 of the matrix-supporting bar 2 these parts are next placed in the position shown in Fig. 6 on a suitable firm support 11 and are secured thereon by a clamp 12 or other suitable means. A matrix-block 13, Figs. 1 and 6, is then inserted in each cavity 3 of the matrix-supporting bar and is driven down therein by means of a punch 14 or other suitable instrument, so as to cause the formation of a matrix in said block by the raised type character on the end of the pattern-type.

The matrix-block 13 may be made from lead, copper, or any metal composition that will be suitable for the formation of a matrix. By

forcing this matrix-block into a cavity 3 under a suitable pressure it will be made to completely fill and accurately fit the inner end of said cavity flush with the face of the type-casting mold, so as to produce an accurately-formed matrix and without leaving any spaces outside the matrices, into which molten metal could enter when the matrix and mold are subsequently employed in the casting of types in a type casting and setting machine. After the matrix-blocks have been forced accurately and properly into the cavities 3 the matrix-supporting bar, with its frame and the mold-body trunnioned thereto, will be removed from the bed 11, and the mold-body will then be swung on its trunnions to disengage the pattern-types from the matrices, and then these pattern-types 9 and 9^a will be ejected by suitable pressure applied to their butt-ends, thus leaving the type-casting mold provided with a plurality of accurately-formed mold-cavities 5 and 5^a, the mold-cavities 5 each coinciding with a matrix formed in a matrix-block and the mold-cavities 5^a being adapted to fit against a plane or unperforated portion of the matrix-supporting bar. It will be seen that each matrix is accurately formed to correspond to the character on an opposite pattern-type and that all the mold-cavities 5 and 5^a are provided with perfectly accurate and hardened walls formed by the bars 6 and 7 and interposed spacer-blocks 8, with which the pattern-types will alternate.

This method of forming the type-casting mold and matrices for use in machines for casting and setting types is more economical and effective than those methods of construction wherein it is necessary to bore or tap out the required mold-cavities or wherein it is necessary to form the matrices by means of expensive machinery.

By forming the matrices in the manner described in matrix-blocks 13, forced into cavities 3 in the matrix-supporting bar opposite the character-bearing pattern-types 9, there will be secured a fluid-tight joint with each mold-cavity 5 when the mold and matrices are mounted in operative position in a type-casting mechanism. For the purpose of obtaining a similar fluid-tight joint at each mold-cavity 5^a for casting slugs and spaces it is preferable to provide the bar 2 with additional cavities 3^a, Fig. 2, one opposite each mold-cavity 5^a, and to force suitable plugs into each of these cavities 3^a flush with the inner face of the bar 2, thereby securing a fluid-tight joint with each mold-cavity 5^a, so that the ends of the slugs, blanks, or spaces to be cast therein will be free from burs or irregularities due to leaking or spreading of the molten metal.

What I claim as my invention is—

1. The method of producing a type-casting mold and matrices for a type casting and setting machine to simultaneously cast a group or set of types bearing different characters, which consists in forming in a mold-body a

plurality of mold-cavities, locating pattern-types in said cavities, providing a matrix-supporting bar with a plurality of cavities coinciding with the character-bearing pattern-types of the mold, pressing matrix-blocks into said cavities of the matrix-supporting bar into close contact with the characters on said pattern-types to take impressions therefrom, and ejecting the pattern-types, substantially as described.

2. The method of producing a type-casting mold and matrices for a type casting and setting machine to simultaneously cast a group or set of types bearing different characters, which consists in attaching to the body of a type-casting mold, upper and lower horizontally-arranged hardened metal bars, interposing pattern-types transversely between said bars, alternating with metal spacer-blocks, and securing said bars and spacer-blocks together, forming a plurality of cavities in a matrix-supporting bar coinciding with the character-bearing pattern-types of the mold, forcing a matrix-block into each of said cavities of the matrix-supporting bar coincident with the character-bearing types of the mold so as to take an impression therefrom, and

ejecting the pattern-types from said mold, substantially as described.

3. The method of producing a type-casting mold and matrices for a type casting and setting machine to simultaneously cast a group or set of types bearing different characters, which consists in forming in a mold-body a plurality of mold-cavities, locating pattern types and slugs in said cavities providing a matrix-supporting bar with a plurality of cavities coinciding with the pattern types and slugs of the mold, pressing matrix-blocks into some of said cavities of the matrix-supporting bar into close contact with the characters on said pattern-types to take impressions therefrom and forcing plugs into other cavities of the matrix-supporting bar to form close joints with the pattern-slugs, and subsequently ejecting the pattern types and slugs, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH C. FOWLER.

Witnesses:

JAMES L. NORRIS,
F. B. KEEFER.