

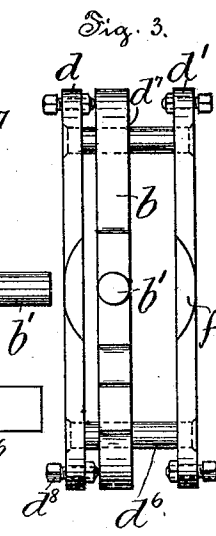
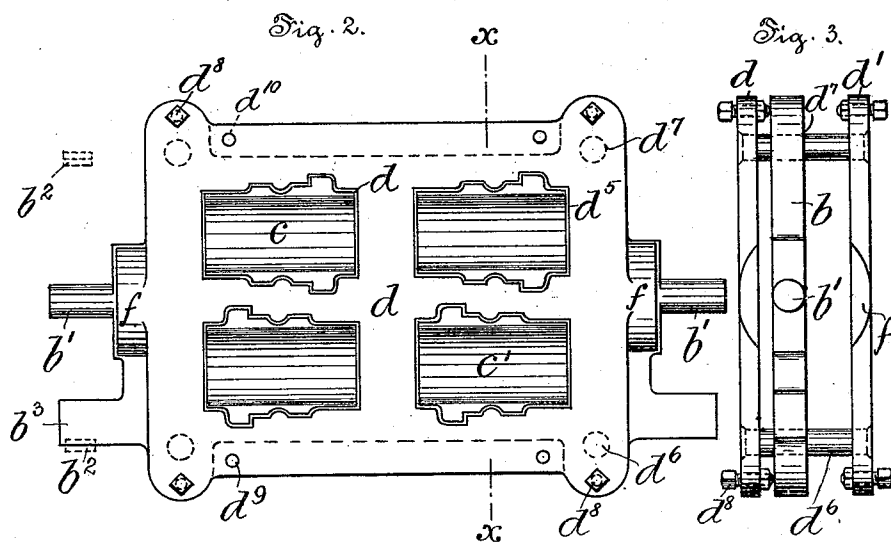
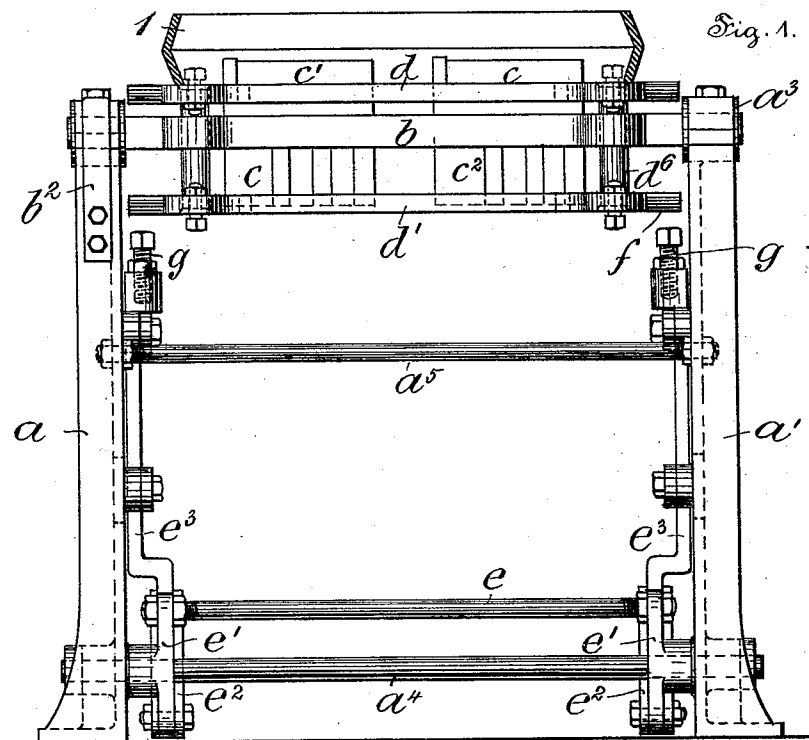
(No Model.)

2 Sheets—Sheet 1.

W. EVANS.
MOLDING MACHINE.

No. 479,755.

Patented July 26, 1892.



Witnesses:
Kamman Borman
Thomas M. Smith.

Inventor:
William Evans.
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att'y.

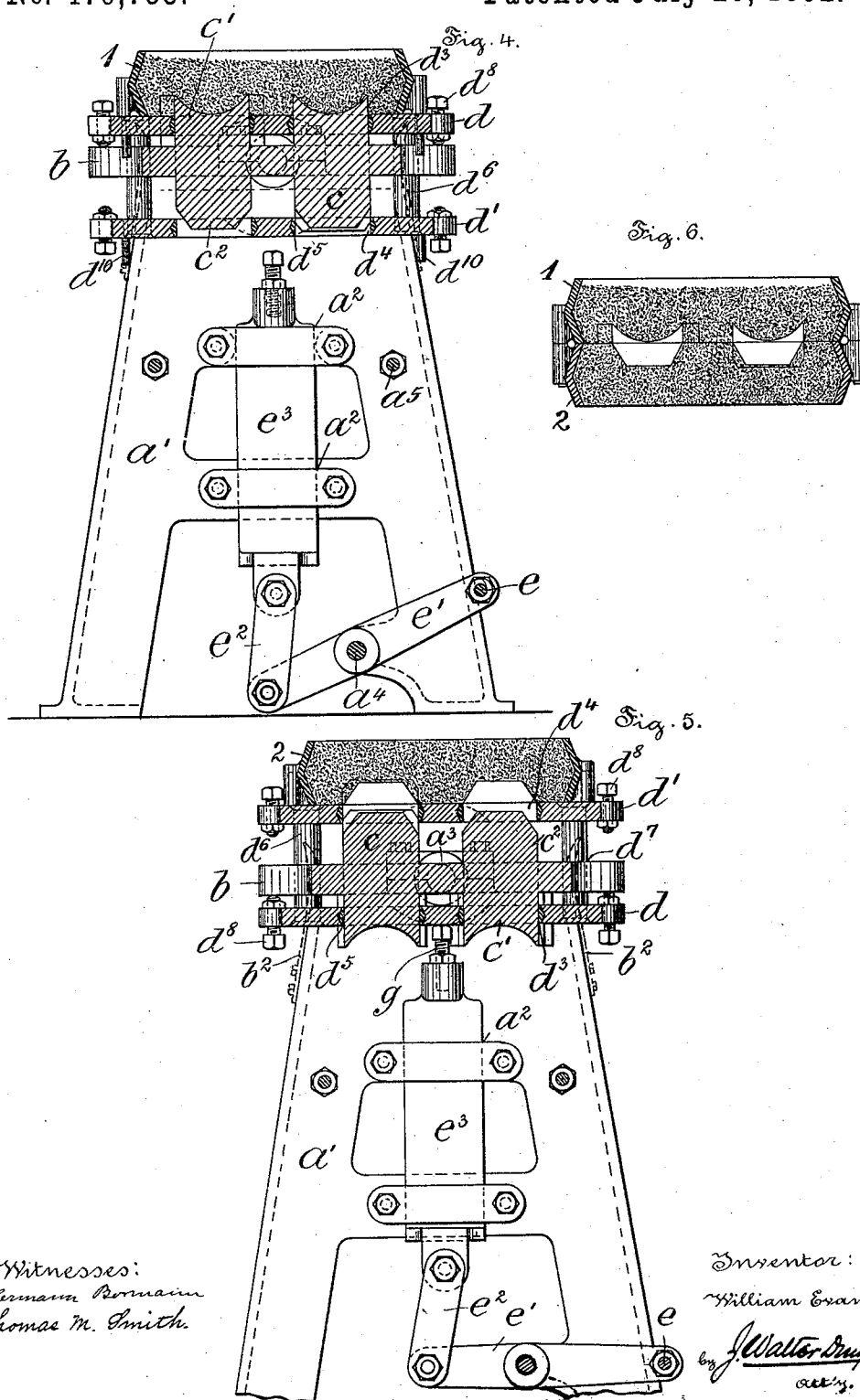
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2 Sheets—Sheet 2.

W. EVANS.
MOLDING MACHINE.

No. 479,755.

Patented July 26, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM EVANS, OF PHILADELPHIA, PENNSYLVANIA.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,755, dated July 26, 1892.

Application filed October 29, 1891. Serial No. 410,171. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EVANS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

My invention relates to a machine for forming molds in sand or other similar material for casting metallic articles.

The principal objects of my present invention are, first, to provide a simple, efficient, compact, and comparatively inexpensive machine for facilitating and hastening the operation of making molds in sand or other preferred material for the formation of castings, and, second, to so construct and arrange the pattern-plate and its accessories as that the alignment of the side walls of a mold formed by means of a machine embodying features of my invention will be more perfect than has heretofore been possible in machine-formed molds.

The nature and characteristic features of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a front elevation, partly in section, of a molding-machine embodying features of my invention and showing a rotatable pattern-carrying plate provided upon its respective faces with a section of one or more patterns, also templets rigidly connected together and located, respectively, upon opposite faces of the pattern-carrying plate, and also showing means for shifting said templets with reference to the pattern-plate. Fig. 2 is a top or plan view of the pattern-carrying plate and templets, showing certain of the sections of one or more patterns projecting through corresponding openings in one of the templets. Fig. 3 is an end view of Fig. 2, showing the two templets located on opposite sides of the respective faces of the pattern-carrying plate and connected together by distance-pins working in suitable apertures in the pattern-carrying plate, and also showing the sections of the pattern omitted in order to simplify the drawings. Fig. 4 is a vertical section taken on the line $x x$ of Fig. 2, show-

ing the position of the templets and of certain sections of the patterns during the formation of one-half of the mold in the sand or like material contained in one of the frames of a two-part flask or molding-box. Fig. 5 is a view similar in all respects to Fig. 4 and illustrating the position of the templets and the other sections of the patterns during the operation of drawing the latter out of the sand or like material contained in the other frame of the two-part flask or molding-box; and Fig. 6 is a sectional view of a complete mold formed by the ordinary operation of the machine embodying features of my invention.

In the drawings the main frame of the machine comprises two stanchions a and a' , provided, respectively, with vertically-ranging ways a^2 and with bearings a^3 .

a^4 and a^5 are braces or tie-bars connected at their respective extremities with the stanchions a and a' in order to impart rigidity and stability to the main frame.

b is a pattern-carrying plate provided with trunnions b' , adapted to be supported by the bearings a^3 in such manner that the pattern-carrying plate may be rotated with reference to the main frame of the machine in order to present either of its respective faces at the top thereof.

b^2 are spring-catches connected with the stanchion a and adapted to permit of the rotation of the pattern-carrying plate b and also to lock the same in position for use. One or more patterns may be employed in connection with the pattern-carrying plate b , and each of these patterns is preferably formed in one piece and securely fitted into a recess cut or otherwise formed in the pattern-carrying plate b in such manner that the two portions of the pattern which are imprinted or molded in the sand contained in the respective frames of a two-part flask project from opposite faces of the pattern-plate. In the present instance four similar patterns c , adapted for the production of soft-metal axle-bearings, are employed, and consequently four similar molds for axle-bearings are formed in the said two-part flask at each operation of the machine. Each of these patterns c is preferably formed of one piece and is securely fitted into an opening in the pattern-carrying plate b in such manner that the two portions

c' and c'' of the pattern which are imprinted or molded in the sand or similar material contained in the respective frames 1 and 2, Fig. 6, of a two-part flask project from opposite faces of the pattern-plate. By forming each of the patterns c in one piece and then securing it in a corresponding opening in the pattern-carrying plate a perfect alignment of the two working portions c' and c'' of the pattern is obtained, so that when the pattern-carrying plate b is rotated in the manner herein-after described the respective portions c and c' of each of the patterns c are brought into proper position for use and cannot be accidentally displaced or shifted therefrom.

d and d' are templets provided, respectively, with openings d^3 and d^4 , corresponding accurately in outline with the perimeters of the portions c' and c'' of each of the patterns c . These openings d^3 and d^4 should conform accurately with the contour of the patterns in order to afford a support for the side walls of the mold during the operation of "drawing" the patterns, so that the side walls are in alignment when the two frames of a two-part mold are joined together. This result may be readily attained by casting the openings in the plates somewhat larger than the contours of the corresponding patterns and then inserting the patterns into the openings and filling up the space between the pattern and opening with soft metal, as shown at d^5 in Figs. 2, 4, and 5. These two templets d and d' are located opposite the respective faces of the pattern-carrying plate b and are rigidly connected together by distance-pieces d^6 , adapted to work in apertures d^7 , extending through the pattern-carrying plate b , so that either of the templets may be shifted into contact with the adjacent face of the pattern-carrying plate b , and in such case the working portion of the pattern c extends through and above the templet. The extent of the projection of the working portions c' and c'' of the pattern may be adjusted and regulated by means of the set-screws d^8 , which extend through the respective templets into a position adapted to contact with the pattern-carrying plate b and thus serve to limit the range of motion of the templets d and d' . The employment of the distance pieces or pins d^6 , working in the apertures d^7 in the pattern-carrying plate b , not only insures the proper alignment of the working portions of the pattern with the corresponding openings in the the templets, but also add strength and rigidity to the machine.

Various types of mechanism may be employed for shifting the templets d and d' with reference to the patterns c ; but such mechanism must not in anywise interfere with the freedom of rotation of the pattern-carrying plate. However, a description will now be given of one form of mechanism that has been found practically efficient for the accomplishment of this purpose. e is a treadle ranging transversely of the machine and con-

nected with one of the respective extremities of two treadle-levers e' , keyed or otherwise connected with the rotatable brace or tie rod a^1 . e^2 are toggle-links pivotally connected at their respective extremities with the treadle-levers e' and with travelers e^3 , adapted to work in the ways a^2 . f are projections or lugs attached to or formed integral with each of the templets and having the outer faces thereof rounded or cut away, as is shown at f , Figs. 2 and 3, for a purpose to be presently more fully described. g are bolts inserted into suitably-tapped orifices formed in the travelers e^3 . The heads of the bolts g may be shifted into contact with the lugs f and the templets d and d' elevated by the simple operation of depressing the treadle e , as shown in Fig. 5. Moreover, the range of travel of the templets, and consequently the extension or the projection of the working portions c' and c'' of the patterns therethrough, may be regulated or adjusted by screwing either or both of these nuts into or out of the travelers e^3 .

The mode of operation of the hereinabove-described machine is as follows: The treadle e is permitted to occupy an elevated position and the pattern-carrying plate b is shifted into a horizontal position, with the templet d exposed at the upper part of the machine, and is then locked to place by means of one of the spring-catches b^2 engaging the lug b^3 of the plate b , as shown in Figs. 1 and 2. One of the frames—for example, the frame 1—of a two-part flask, Fig. 6, is then fitted onto the templet d , and may be secured to place by fitting the dowel-pins of the frame into suitable apertures d^9 , formed in the templet. Of course the weight of the two templets will cause the templet d to rest upon the upper face of the pattern-carrying plate b , so that the portion c' of each of the patterns c projects upward into the space included by the frame 1 of the two-part flask or molding-box. This frame 1 is then filled up with sand or other preferred material and tamped in the usual or in any preferred manner. The side walls of the molding-frame 1 may be slightly inclined outward from the edges to the center thereof, as shown in Fig. 6, in order to retain the sand or other molding material firmly to place during the operation of drawing the patterns. After the frame 1 has been filled in all around the patterns with sand or other preferred material and thoroughly rammed, the pattern may be "drawn" or removed from the sand by the simple operation of depressing the treadle e . The depression of the treadle e causes the templets to be shifted upward with reference to the pattern-carrying plate b , and thus lifts the molding-frame 1 and the sand contained therein above the patterns, so that the frame 1, having the imprint of the patterns in the sand which it contains, may be lifted from off the machine and laid aside for subsequent use. The other portion of the mold is formed by releasing the treadle e and rotating the pattern-car-

rying plate *b* until the templet *d'* is exposed at the top of the machine. The frame 2 is then placed upon the templet *d'* and secured to place by fitting the pins *d*¹⁰, projecting from the templet *d* into the dowel-holes of the frame 2, whereupon the frame 2 is filled and the patterns drawn in precisely the same manner as has been hereinabove described with reference to the frame 1. After a portion of the mold has been formed in each of the frames 1 and 2 these latter are placed together in the usual manner and form a complete mold, as shown in Fig. 6.

Although my invention has been described in connection with a machine adapted to form molds for solid castings, still it will be obvious that the patterns may be provided with extensions or projections adapted to form core-prints, into which cores may be inserted by hand before the two frames of the flask are placed or joined together.

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

1. A molding-machine provided with a rotatable pattern-carrying plate, templets carried by the rotatable pattern-plate and afforded a range of play transversely thereof, and reciprocating mechanism arranged in position to act on one of the templets and shift both of them relative to the pattern-plate, substantially as and for the purposes set forth.

2. A molding-machine provided with a rotatable pattern-plate, templets rigidly connected together by distance-pieces working in apertures in the pattern-plate, and reciprocating mechanism arranged in position to act on one of the templets and shift both of them relative to the pattern-plate, substantially as and for the purposes set forth.

3. In a molding-machine, a rotatable pattern-carrying plate having a pattern extending through the same and projecting from the respective faces thereof, templets located on opposite sides of said pattern-carrying plate, distance-pieces working in apertures in said pattern-carrying plate and rigidly connected at the respective extremities thereof with said templets, and means engaging one of said templets to shift the other templet with relation to its corresponding pattern, substantially as and for the purposes set forth.

4. In a molding-machine, a main frame, a pattern-carrying plate journaled in said frame and provided with lugs adapted to contact with said frame, templets rigidly connected together and afforded a range of play transversely of said pattern-carrying plate, and catches for locking said lug in contact with said frame, substantially as and for the purposes set forth.

5. A molding-machine comprising a main frame provided with travelers and complementary treadle mechanism for reciprocating said travelers, a pattern-carrying plate journaled to said frame, and templets rigidly connected together and afforded a range of play transversely of the pattern-plate, the construction being such that one of said templets is shifted into range of the travelers by the rotation of the pattern-carrying plate, substantially as and for the purposes set forth.

6. A molding-machine comprising a main frame provided with travelers and complementary treadle mechanism for reciprocating said travelers, a pattern-carrying plate journaled to said frame, templets rigidly connected together and afforded a range of play transversely of said pattern-plate, and adjusting-screws engaging said travelers and having their heads in range of one of said templets, substantially as and for the purposes set forth.

7. A molding-machine provided with a rotatable pattern-carrying plate having portions of the pattern projecting from the respective faces thereof, templets located on opposite sides of said pattern-carrying plate and having openings corresponding, respectively, with the contour of the adjacent portions of the patterns, distance-pieces working in apertures in said pattern-carrying plate and connected with said templets, screw-bolts extending through said templets and adapted to contact with said pattern-carrying plate, and means for shifting said templets with relation to said pattern-carrying plate, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WILLIAM EVANS.

Witnesses:

GEO. W. REED,
THOMAS M. SMITH.