

No. 607,152.

Patented July 12, 1898.

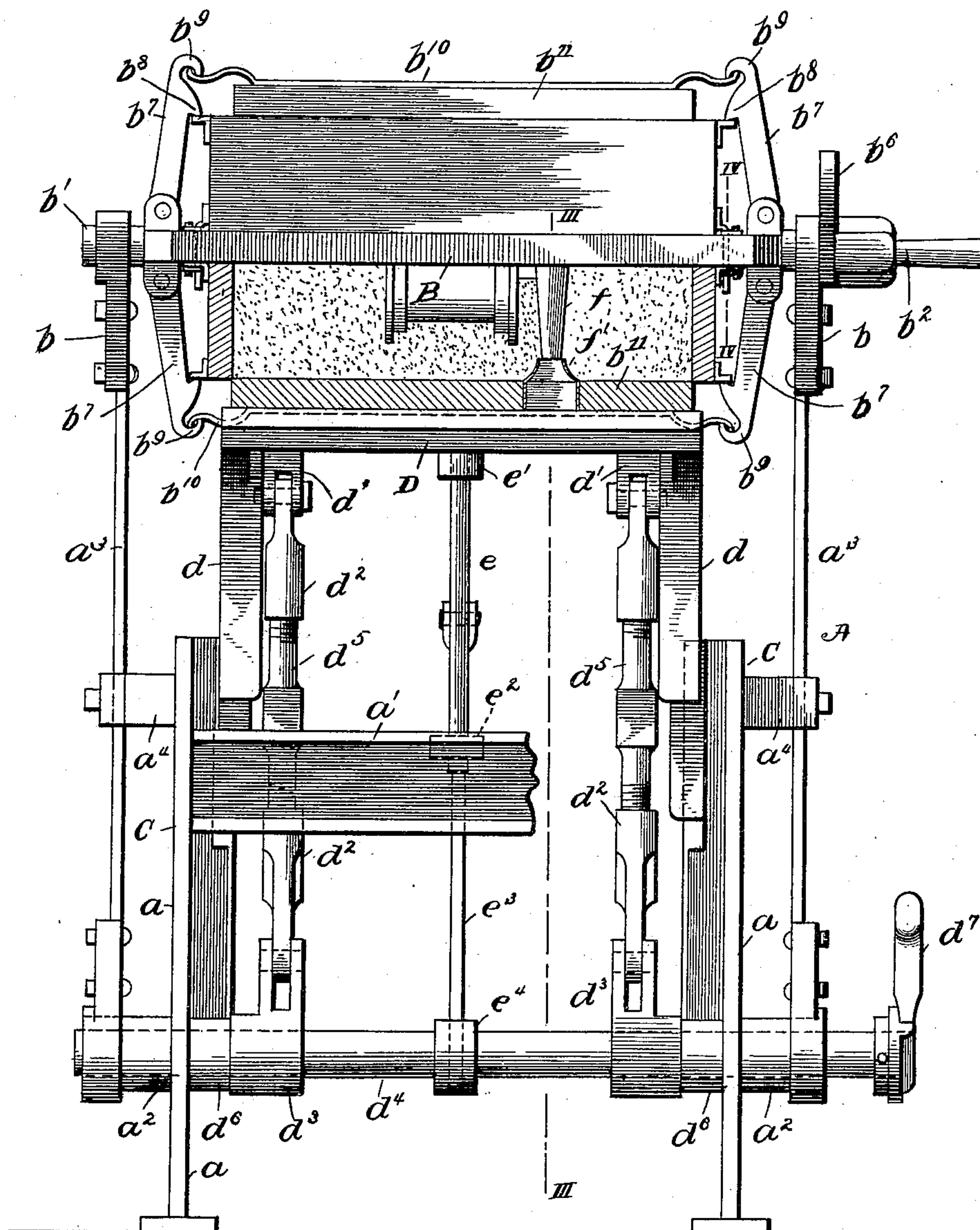
W. D. WIMAN.
MOLDING MACHINE.

(Application filed Mar. 27, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses.
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2 Sheets—Sheet 2.

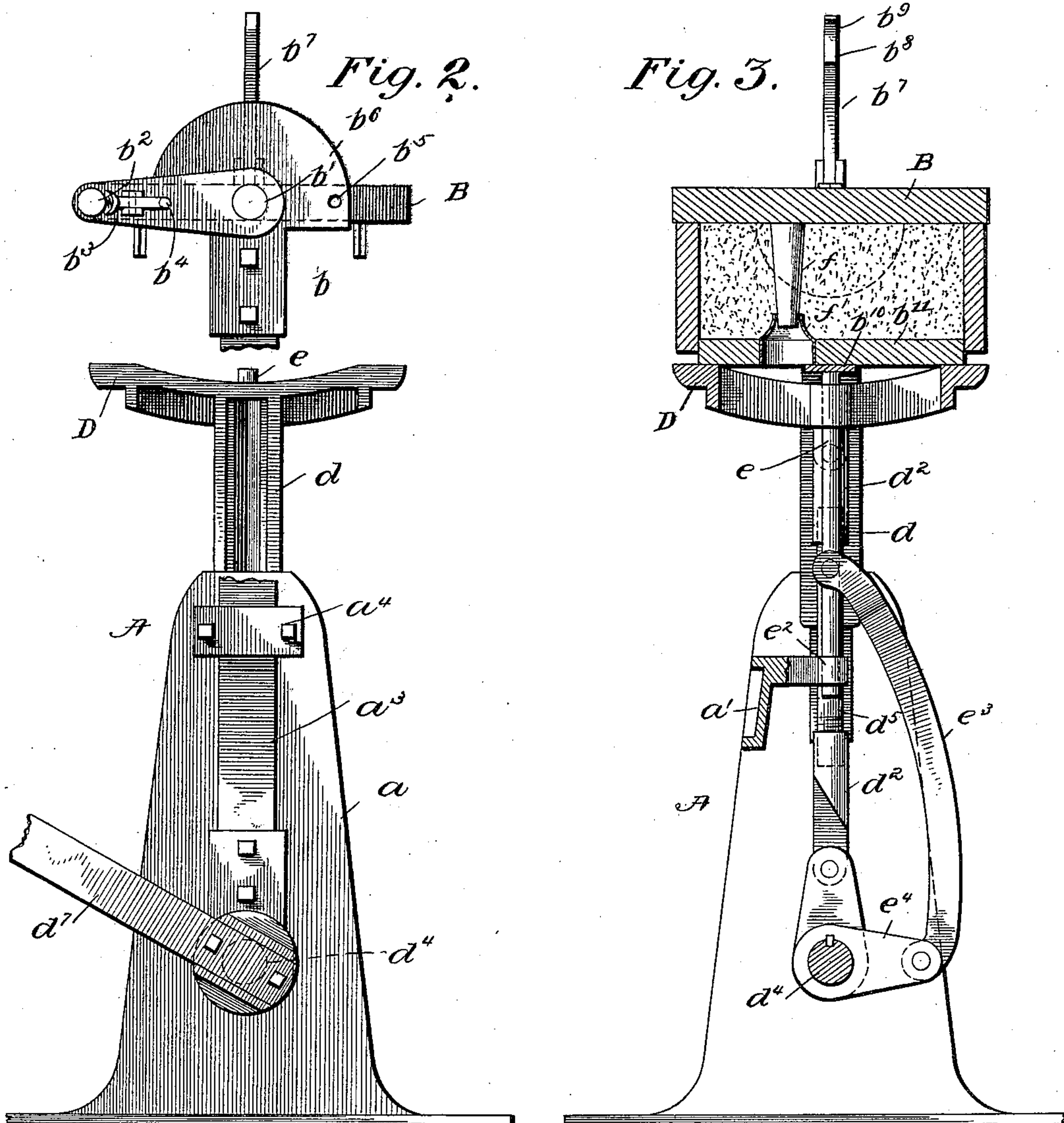
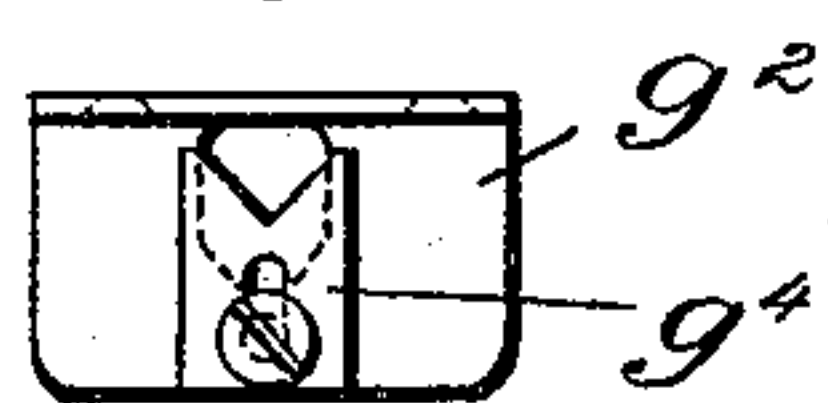
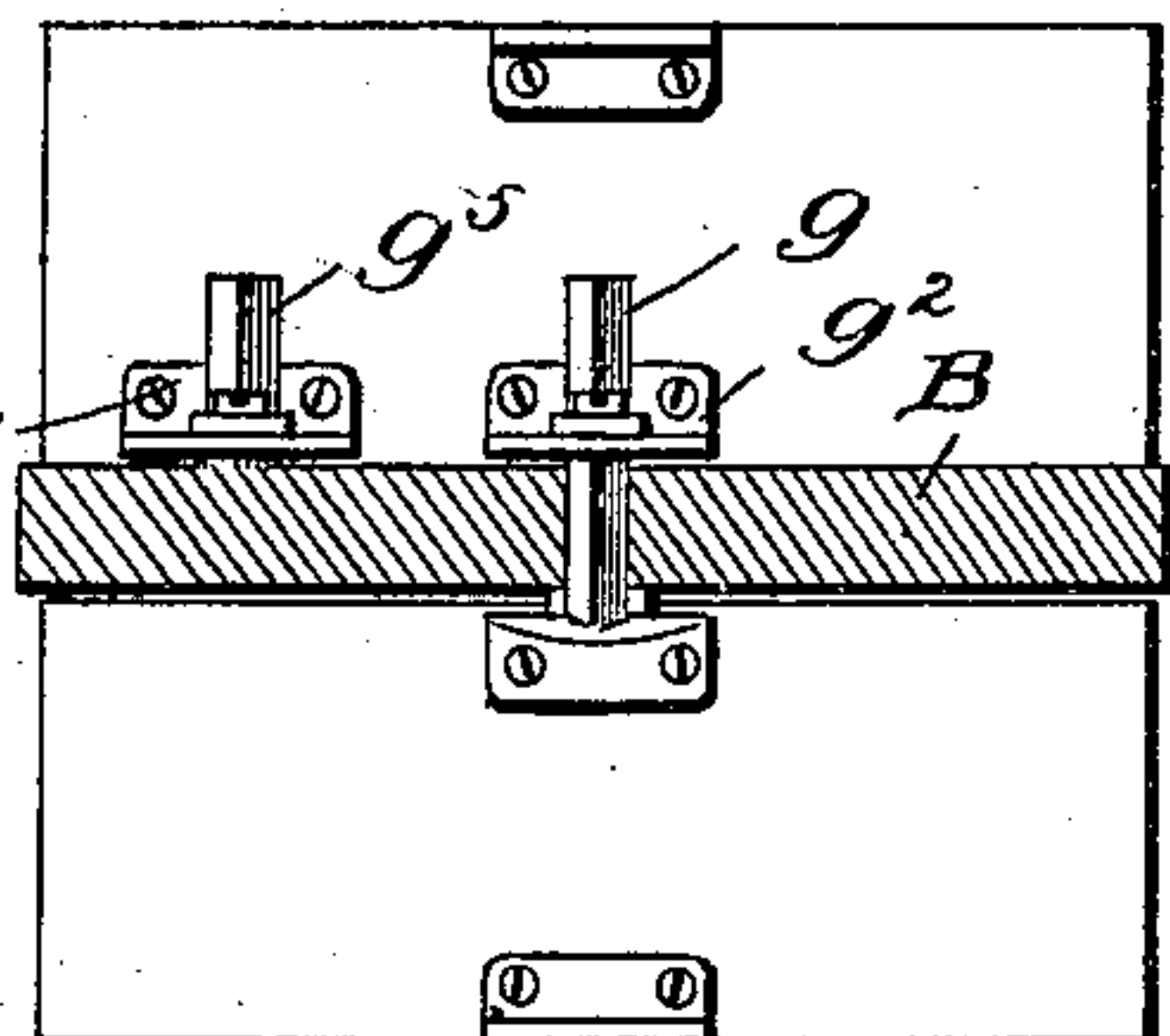
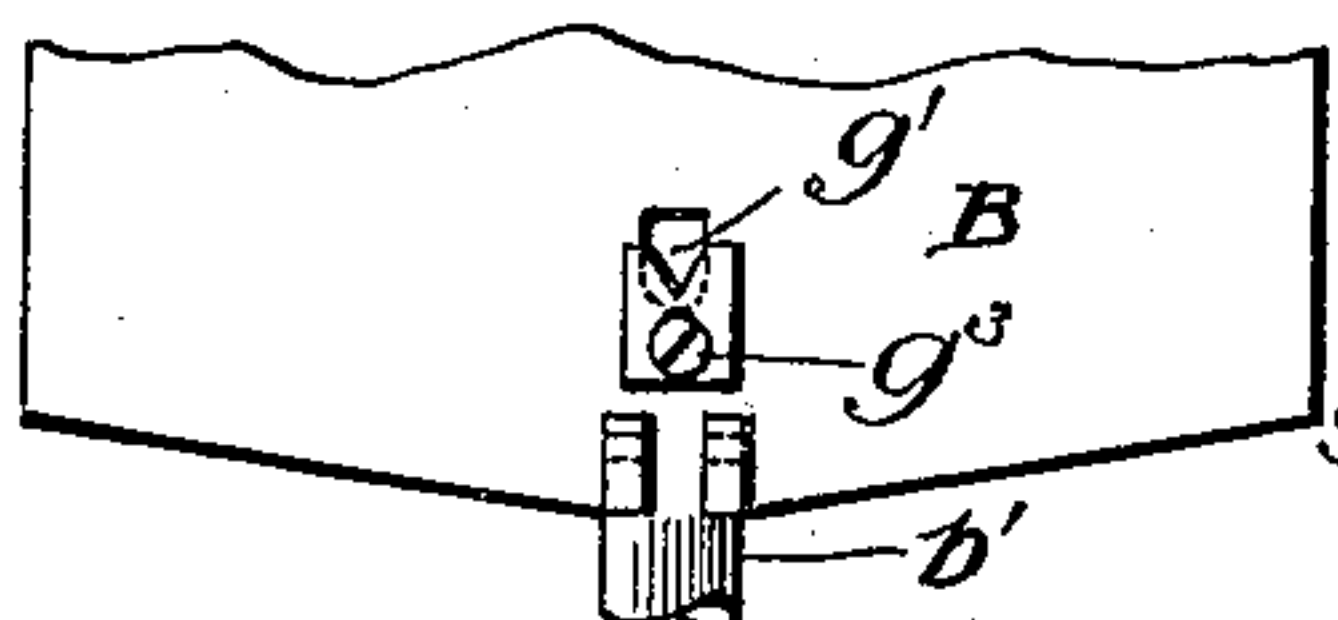


Fig. 5.

Fig. 4.

Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM D. WIMAN, OF MOLINE, ILLINOIS.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 607,152, dated July 12, 1898.

Application filed March 27, 1897. Serial No. 629,529. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. WIMAN, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Molding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to molding-machines, but more particularly to machines adapted to form molds from split patterns.

The primary object of the invention is to provide means whereby the portions of the molds contained in the drag and the cope flasks may be formed in the same machine without using the usual stripping-plates or employing the complicated mechanism incident to many of the machines as ordinarily constructed.

Further objects are to provide simple and efficient means for holding and securing the pattern-plate revolubly upon the machine, so as to present the faces thereof upon which the patterns are secured normally in a horizontal plane, to provide means for removably securing the flasks in position upon the pattern-plate, and to provide simple and efficient mechanism for properly ramming or compressing the sand about the patterns.

The invention will first be hereinafter more particularly described with reference to the accompanying drawings, forming a part of this specification, and then pointed out in the claims at the end of the description.

In the drawings, wherein similar letters of reference denote similar parts, Figure 1 is a front elevation, partly broken away, illustrating the cope and drag in position on the pattern-plate and the means for removably securing them thereto. Fig. 2 is a side elevation of one of the uprights or standards broken away and the cope and drag being detached from the pattern-plate. Fig. 3 is a vertical sectional view taken on the line III III of Fig. 1. Fig. 4 is a detail sectional view taken on the line IV IV of Fig. 1, showing the means for centering the cope and drag on the pattern-plate. Fig. 5 is a detail plan view of a portion of the pattern-plate, showing one of the centering-plates for the pin or projection

carried by the drag; and Fig. 6 is a detail plan view of one of the centering plates or ears attached to the cope.

The frame A may be of any suitable form and may comprise the side or end pieces *a a*, which are rigidly held together by one or more cross-pieces *a'*. These end pieces may be provided with bosses *a²*, to which the lower ends of the vertical standards or uprights *a³* may be secured, said uprights being also braced and secured to the end pieces by suitable brackets, as at *a⁴*, though it is obvious that the standards may be made a continuation of or formed integrally with the end pieces when desired.

The standards or uprights *a³* may be provided at their upper ends with registering bearings *b b*, adapted to receive the stub-shafts or journals *b' b'*, which latter may be secured to or formed integrally with a pattern-plate B, so as to project outwardly from the opposite ends thereof. This plate has the patterns secured to the faces thereof and is adapted to rotate or oscillate in its bearings and may have one of its shafts *b'* longer than the other and provided with a suitable crank-handle, as at *b²*, so as to permit the pattern-plate to be readily rotated. The handle *b²* may be provided with a spring or other latch, as at *b³*, which may be pivoted thereto so as to be readily moved on its pivot when said handle is operated to revolve the pattern-plate, and said latch may have a pin or projection at one end thereof adapted to engage diametrically-opposed recesses or apertures *b⁴ b⁵* in a plate or bracket *b⁶*, the latter being secured to or formed integrally with the adjacent standard *a³*. By this means the pattern-plate may be rotated and after each half-revolution secured so as to successively present the opposed surfaces thereof in proper alinement with the sand-compressing mechanism, so that the compression of the sand in the flasks or members thereof, which are secured to the pattern-plate, may be equally distributed over the entire surface, in order to properly pack the sand around the pattern.

For the purpose of removably holding the flasks on the pattern-plate B, I may arrange on each face of said plate and at each end thereof, contiguous to the standards *a³*, lugs

or projections to which the dogs or catches b^7 are pivoted. These dogs or catches may be formed with the hooks b^8 , adapted to engage the edges of the flasks, so as to retain them in place when the pattern-plate is revolved, and hooks b^9 , adapted to engage with the arched or bowed ends of the spring-metal strips b^{10} , to retain the ram plate or board b^{11} , Fig. 1, in position when placed on the surface of the sand in said flasks. The ram plate or board b^{11} may be rectangular in shape and may have approximately the same area as the surface of the sand in the flasks and follows the sand into the flasks while the same is being compressed therein around the pattern.

The mechanism for compressing the sand in the flasks may be variously constructed, and as a means therefor I may provide a ram D, having downwardly-projecting cross heads or bars d , provided with grooves therein and fitting guides C, secured to or formed on the end pieces a of the frame, so as to permit said ram to reciprocate vertically, though other means adapted to permit the ram to be reciprocated may be provided. This ram may be rectangular in form and somewhat smaller than the ram-plate b^{11} , against which the ram is adapted to bear, and may have concaved ends and open body portion, so as to support the ram-plate at or near its outer edges. At d' are lugs secured to or formed integrally with the ram, to which are pivoted the upper ends of the pitmen d^2 , while the lower ends of said pitmen may be pivoted to cranks or rock-arms d^3 , secured to the rock-shafts d^4 , said pitmen being preferably formed with adjusting sections or bolts d^5 , which have their ends oppositely screw-threaded and engaging threaded apertures or recesses in the end or socket pieces thereof, so that by rotating said adjusting-bolts the ends may be spread apart or brought nearer together to adjust the ram relatively to said cranks or rock-arms and the pattern-plate. These rock-arms may be keyed to or otherwise arranged on the rock-shaft d^4 , which latter may be journaled in the bearings d^6 and in the bosses a^2 on the end pieces of the frame, the bearings d^6 , as well as all other bearings, being preferably made sand and dust proof and arranged to take up any wear that may occur therein. A hand-lever d^7 may be rigidly secured to the shaft d^4 to permit the latter to be readily rocked in its bearings, so as to reciprocate the ram and force the ram-plate into the flask to compress the sand. The rock-arms are preferably arranged at such an angle on the shaft d^4 that at the end of the upward stroke of the ram the pitmen and said arms shall be in substantially the same plane, thus securing a toggle-lever action, so as to exert a great pressure at or near the end of the stroke.

To automatically release the dogs or catches from the flasks and the strips b^{10} , I may provide a vertically-reciprocating plunger or rod e , adapted to strike against the metal strips b^{10} and disengage the hooks of said dogs or

catches after the ram has sufficiently compressed the sand about the pattern in the flask. This plunger may work in the guides e' and e^2 , the guide e' being secured to or formed on the ram by webs or otherwise, while the guide e^2 projects outwardly from the cross-piece a' . The plunger or rod may be reciprocated by a link or lever e^3 , which has one end thereof pivoted to said plunger intermediate the guides and its other end pivoted to a crank or rock arm e^4 , secured on the rock-shaft d^4 . This rock-arm e^4 is at an angle to the rock-arm d^3 and is somewhat longer, in order to enable the plunger e to strike the strip b^{10} with sufficient force to disengage it from the hooks, and thereby cause the dogs or catches to fall back to their normal position or away from the flasks. The strip b^{10} is free to yield to the blow of the rod or plunger e , for the reason that the ram plate or board b^{11} has been forced by the ram into the flask away from said strip.

In order to form a sprue or ingate in the flask while forming the mold, I may fasten or arrange a preferably tapered and cylindrical stem or plug on the cope side of the pattern-plate B to form one portion of the sprue. The ram-plate employed to compress the cope and in a corresponding position to the plug f may have a tubular and tapered cutter f' . This cutter, Fig. 1, may pass through the ram-plate and project on one side thereof and is adapted to register with the plug f , so as to complete the sprue or ingate when the ram-plate is forced into the flask. There may be more than a single plug and cutter, and other means may be employed for forming the sprue when desired.

The flask may be centered on the pattern-plate in any desired manner. In the drawings, Figs. 4, 5, and 6, I have shown the drag provided with pins g , arranged centrally at each end thereof, which pass through opening g' in the pattern-plate B to center the drag thereon, and when the drag is removed the pins pass through the ears or plates g^2 , carried by the cope, as is usual. The pattern-plate may be provided with an adjusting-plate g^3 , located over the opening provided therein to assist in centering the drag. To center the cope on the pattern-plate, the latter may be provided with pins or projections g^5 on diagonally opposite corners, which project through adjusting ears or plates g^6 on the cope, which are similar in construction to the ears g^2 . (Shown in Fig. 6.)

The operation of the invention will be readily understood from the foregoing description when taken in connection with the accompanying drawings. The members of the patterns are secured to the opposite faces of the pattern-plate in any proper manner and the drag placed over the pattern on the drag side of said plate. The flask is filled with sand and may be tamped, the surplus struck off, as is usual, and the ram plate or board placed in position, after which one of the metal

strips b^{10} is laid across the ram-plate, and the hooks on the dogs b^7 made to engage the flask and the ends of the strip. By releasing the latch b^3 the handle b^2 may be operated, 5 so as to place the projection or pin on the latch in engagement with the opposite perforation in the plate b^6 , thus completely inverting the flask and placing the ram-plate directly in the path of the ram. The lever d^7 10 is then manipulated to rock the shaft d^4 and the rock-arms d^3 and e^4 , by which operation the ram will be elevated against the ram-plate and will force said plate into the flask against the sand, so as to compress the latter 15 around the pattern. At or near the end of the stroke of the ram the plunger e will strike against the spring-metal strip and by the blow will free the hooks of the dogs or catches b^7 from said strip and the flask, so as to permit 20 said dogs to fall or drop to the side of said flask. The ram with the flask resting thereon may now be lowered and the flask and mold removed. After the removal of the drag the cope is centered and secured upon the 25 cope-face of the pattern-plate, which face is now uppermost. The cope-face of the pattern-plate, as hereinbefore described, may have the plug f , while the ram-plate employed in connection with this flask may have the 30 cutter f' , so that as the cope passes through the same operation as the drag the sprue or ingate will be formed therein. The cope after the formation of the mold therein may be removed from the machine and secured to the 35 drag in the usual manner, so as to complete the mold. I thus provide a simple and efficient molding-machine adapted to have the cope and drag portions of the mold consecutively formed thereon and at the same time 40 provide automatic means for releasing the flasks from the pattern-plate.

In using the word "flask" it is intended to include a flask having one or more members or one in which the cope or drag may comprise one or more parts. 45

It is obvious that various changes may be made in the construction and arrangement of some of the parts or that some of the parts may be dispensed with and others substituted 50 therefor without departing from the spirit of my invention, and hence I do not desire to limit myself to the precise construction shown and described.

In the claims I have used the word "flask," 55 intending thereby to include either a whole flask or any section thereof in which a pattern-imprint is to be formed.

Having thus fully described my invention, what I claim as new, and desire to secure by 60 Letters Patent of the United States, is—

1. In a molding-machine, the combination with a reversible pattern-plate and a ram, one bodily movable toward and from the other, of a flask adapted to bear against the pattern- 65 plate, a ram-plate, laterally-movable devices for holding the flask and ram-plate to the pattern-plate, and means for automatically

effecting disengagement of such devices from the flask and ram-plate by the relative movement between the ram and pattern-plate, and 70 thereby disconnecting the flask and ram-plate from the pattern-plate and causing them to lodge on the ram, substantially as described.

2. In a molding-machine, the combination with a revoluble pattern-plate, the flask, 75 devices for holding the flask on the pattern-plate, and a ram-plate, of a ram adapted to bear against the plate to compress the sand in the flask, and means for releasing the 80 devices for holding the flask when depending from the pattern-plate, said means being operated by the ram-operating means whereby the flask is released from the pattern-plate and lowered with the ram, substantially as 85 described.

3. In a molding-machine, the combination with a revoluble pattern-plate, the flask, means for retaining the flask on the pattern-plate, the ram-plate held on said flask, the 90 ram engaging said plate to compress the sand in the flask, means for operating the ram, and means operated at the end of the stroke of the ram to disengage the retaining means from the flask and ram-plate, whereby the 95 flask is removed from the pattern-plate when the ram is lowered, substantially as described.

4. In a molding-machine, the combination with a pattern-plate, the flask and ram-plate, the ram bearing against said plate to compress the sand in the flask, and means for operating the ram; of pivotal catches for suspending the flask from the pattern-plate in position for ramming and means for releasing the catches from the flask while in said position, said means being operated by the ram- 100 operating means, substantially as described. 105

5. In a molding-machine, the combination of a pattern-plate, a flask-section, a ram-plate, catches attached to the pattern-plate, and a ram-plate-retaining device engaging 110 said catches and adapted to suspend the flask from the pattern-plate when in position for ramming, with a ram, mechanism for operating the same to cause it to engage the ram-plate and compress the sand in the flask-section; and mechanism for disengaging said retaining device from said catches after the ram-plate has been engaged by the ram so as to free the flask from the pattern-plate, substantially as described. 115 120

6. In a molding-machine, the combination of the revoluble pattern-plate, and pivotal catches carried thereby, the flask adapted to be removably held on said plate by the catches, the ram-plate, the ram for engaging the said 125 plate, and means for operating the ram; with a plunger operated by the ram-operating means whereby the catches may be automatically released from the flask at the end of the stroke of the ram, substantially as described. 130

7. In a molding-machine, the combination with a pattern-plate, of a ram adapted to compress the sand in the flasks, means for operat-

ing the ram, pivotal catches or dogs for retaining the flasks in position upon the pattern-plate, a ram-plate, and a strip having its ends engaging the catches, and its body
5 portion adapted to retain the ram-plate against the surface of the sand in the flask, substantially as described.

8. In a molding-machine, the combination of a revoluble pattern-plate, pivotal catches
10 for retaining flasks in position upon the pattern-plate, a ram-plate and the spring engaging with the pivotal catches and ram-plate to secure the latter in place upon the surface of the sand in the flask, a ram adapted to com-
15 press the ram-plate against the sand, a rock-shaft journaled in the frame of the machine, and pivotal connections between the ram and rock-shaft, substantially as described.

9. In a molding-machine, the combination
20 of a revoluble pattern-plate, the flasks, piv-

otal catches for retaining the flasks in position upon the pattern-plate, a ram-plate and a spring-strip carried by the ram-plate with which the pivotal catches engage to secure the ram-plate in place upon the surface of
25 the sand in the flask, a ram adapted to compress the ram-plate against the sand, mechanism for operating the ram, a plunger adapted to engage the spring-strip, and means for operating said plunger to engage the strip so
30 as to release the pivotal catches from the strip and flask, whereby the flask may be lowered by the ram, substantially as described.

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

WILLIAM D. WIMAN.

Witnesses:

BURTON F. PEEK,
WM. BUTTERWORTH.