

A. CHOINIERE.  
MOLDING MACHINE.  
APPLICATION FILED SEPT. 23, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

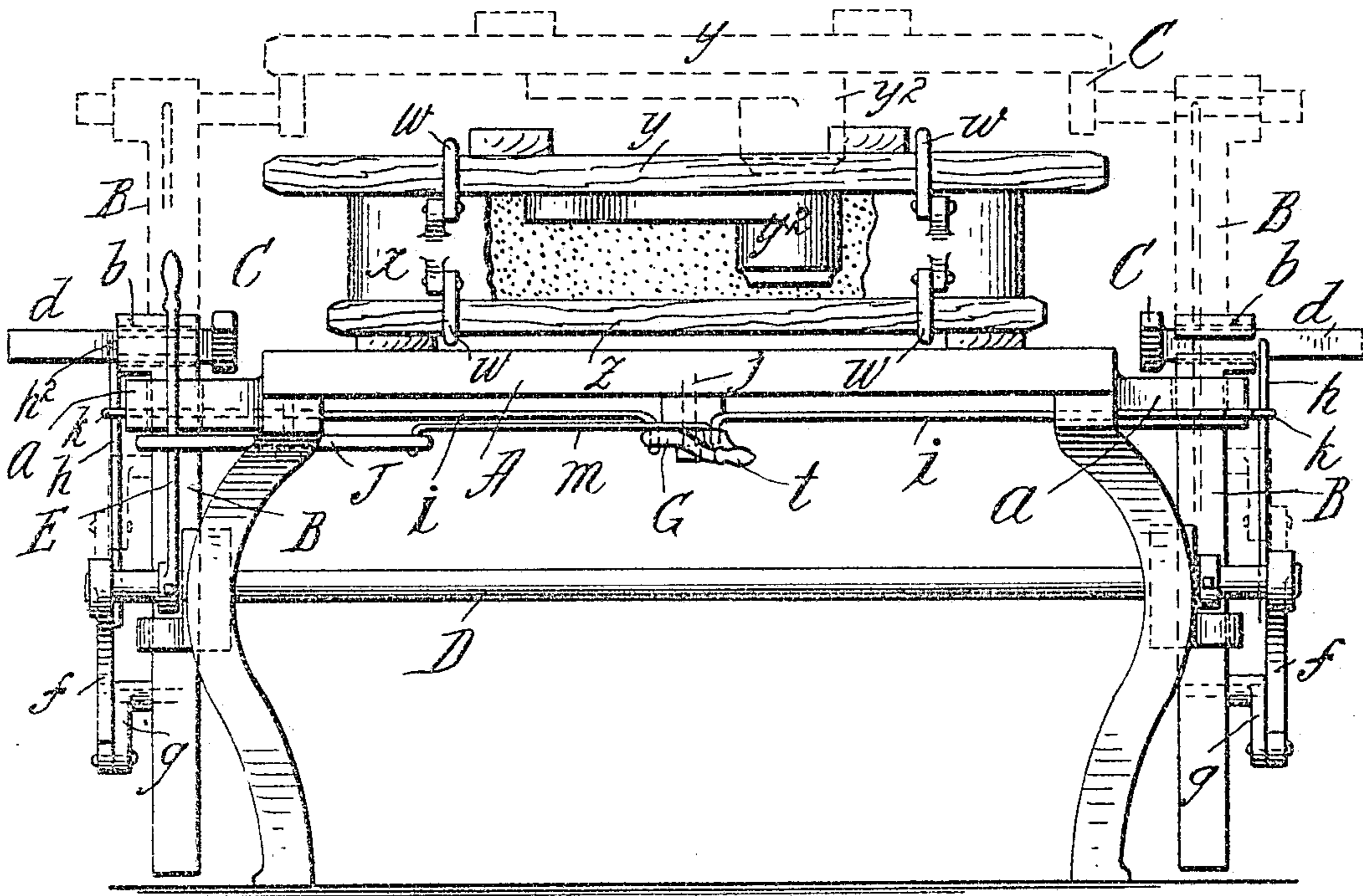
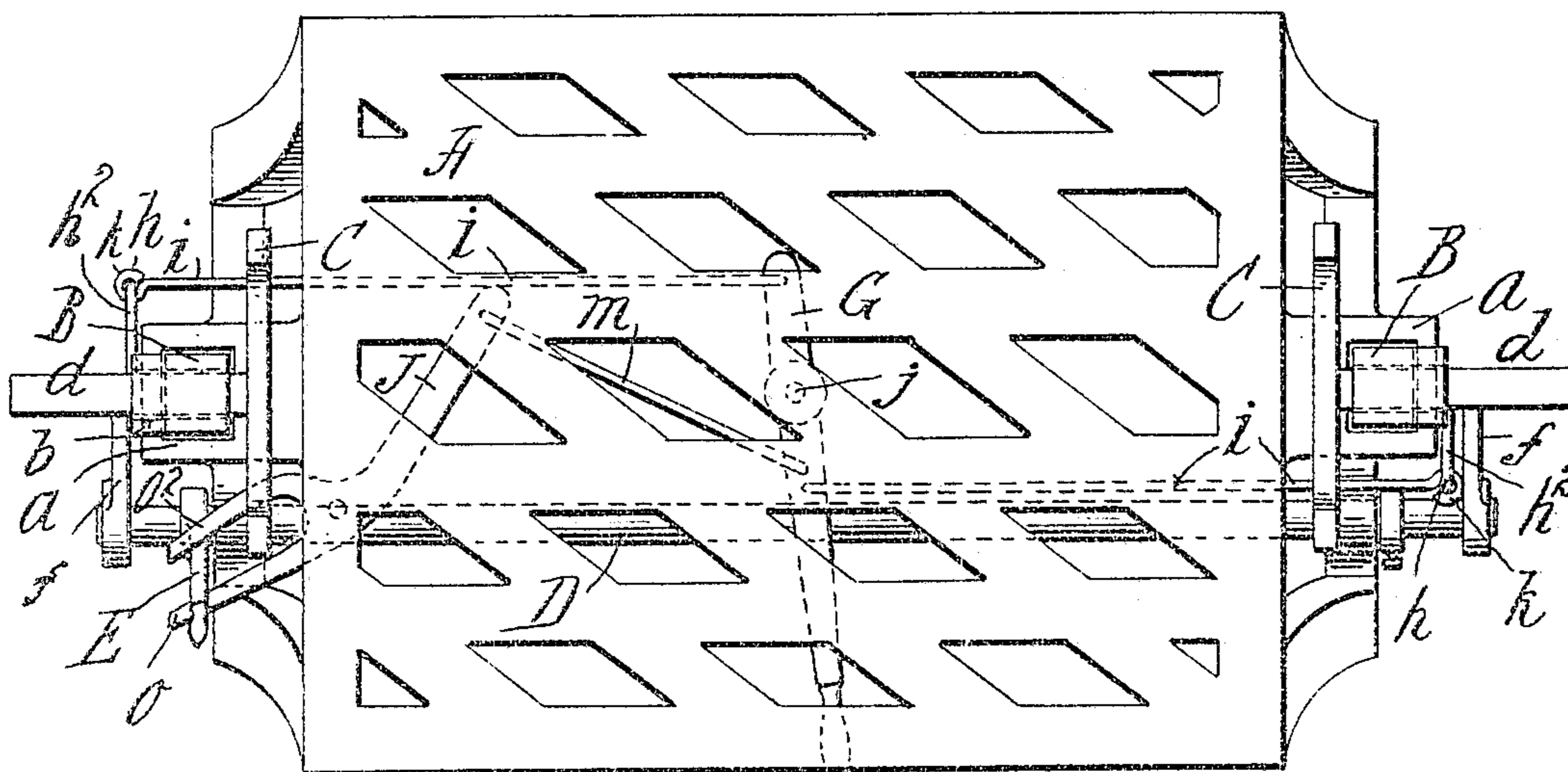


Fig. 2.



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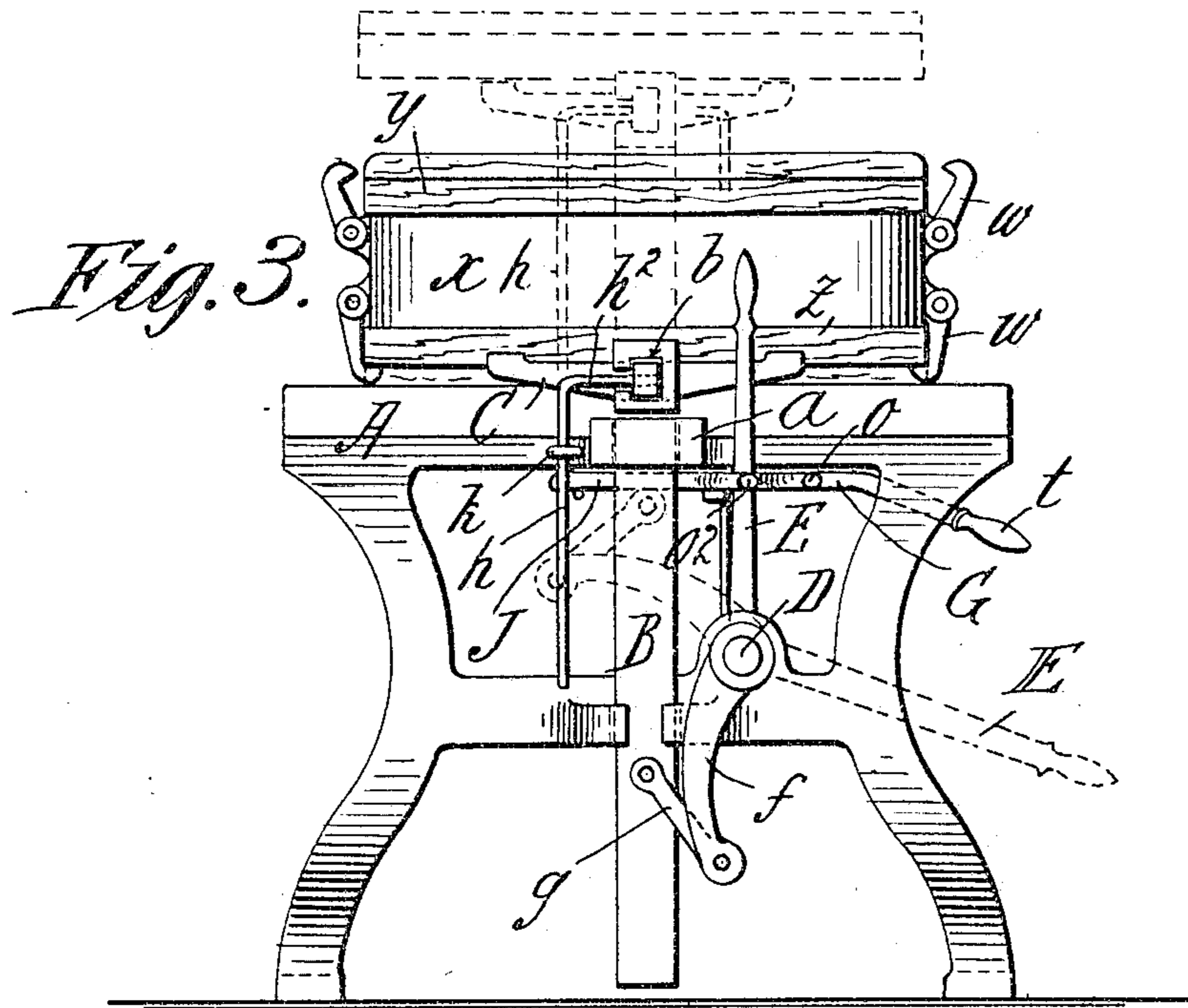
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No. 787,078.

PATENTED APR. 11, 1905.

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2 SHEETS—SHEET 2.



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## UNITED STATES PATENT OFFICE.

ARTHUR CHOINIERE, OF HOLYOKE, MASSACHUSETTS.

## MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 787,078, dated April 11, 1905.

Application filed September 23, 1904. Serial No. 225,698.

*To all whom it may concern:*

Be it known that I, ARTHUR CHOINIERE, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Molding-Machines, of which the following is a full, clear, and exact description.

This invention relates to a molding-machine, having for its object to remove the mold-plate from the flask after the flask has been filled with sand to acquire therewithin the depression for the casting freely and without any tilting motion, which might result in breaking the sand at the boundaries of the casting depression.

It is desired that the machine shall be capable of convenient, comparatively quick, and certain operation time and time again and to have the parts thereof so constructed, arranged, and operating as to leave the table on which the flask and mold-plate are supported during the sand-filling operations clear and unobstructed for the easy performance of the work.

The invention consists in combinations and arrangements of parts, all substantially as hereinafter described, and set forth in the claims.

The improved machine is represented in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a plan view, and Fig. 3 is an end elevation.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the table, the horizontal support on which the mold-making work is to be performed,  $x$  representing the flask,  $y$  the mold-plate, sometimes in shop parlance termed the "bottom plate," and  $z$  is termed the "top plate."

It will be explained with reference to Fig. 1 that the flask  $x$  is first placed on the table the other side up from the position shown in Fig. 1 and with the mold-plate  $y$  thereunder, the pattern  $y^2$ , being understood as a part of the mold-plate, being formed as one therewith or attached thereto, and the plate  $z$  will initially be absent. After the sand has been filled and rammed into the flask and evened at the top the

top plate  $z$  is placed over the flask and the flask and plates  $y$  and  $z$  are temporarily confined by the clamps  $w$ , whereupon the so-clamped parts are overturned to the position shown in Fig. 1, the end portions of the mold-plate  $y$  overhanging the ends of the flask. It now becomes the object to mechanically lift the mold-plate  $y$  to carry it and the pattern  $y^2$  gently, steadily, and without tilting clear and away from the top of the flask—for instance, to the position represented in Figs. 1 and 3 of the drawings—and the machine for the performance of this step of the molding operation will be now described.

At the opposite ends of the table are provided vertical bars B B, arranged for straight vertical movements in and through the guides  $a$ , which are provided at the opposite ends of the table. The heads or upper end portions of the said vertical bars B have alined horizontal guideways  $b$  for the horizontal stem-shanks  $d$  of the lifters C, which latter, with the stems  $d$ , have a T-shaped formation. A rock-shaft D extends lengthwise under and from end to end of the table, the same having at one end an operating handle-lever E, and means are provided between the rock-shaft for imparting from the oscillation thereof rising-and-falling motions to the vertical bars B B, said means, as shown, consisting of a pair of levers  $f, f$  at the opposite ends of the rock-shaft and rigidly affixed thereto, and to the ends of these levers links  $g$  are pivoted, such links being also pivoted at the outer faces of the vertical bars B B. Hence the swinging of the handle-lever and rocking of the shaft will vertically move the bars B B either up or down, according to the direction of oscillation of the shaft.

The lifters, as shown, have rods  $h, h$ , straight, vertical, and parallel with the bars B B, the upper ends of said rods being horizontally turned, as represented at  $h^2$ , and rigidly connected with the lifters and form runners for the slidable engagement of the means for insuring the inward projections of the lifters over the table and then to the projecting ends of the mold-plate and for outwardly withdrawing the lifters when they are lowered.

A lever G is pivotally mounted horizontally under an intermediate portion of the table, said

lever being hereinafter referred to as the "intermediate" lever for avoidance of confusion in designation of the several levers comprised in the machine.

5 Horizontal rods *z z* are connected with portions of the intermediate lever *G* at opposite sides of the pivot *j*, these rods having eyes *k* at their outer extremities which loosely encircle the vertical rods *h*, which are understood as depending rigid members or parts of the lifters, so that endwise motions of the rods *z z* will correspondingly impart endwise motions to the lifters, and yet the rising-and-falling movements of the rods *h*, carried by the lifters, will be freely permitted, as such rods *h* have the capability of movement through the eye-formed ends of the connecting-rods *z z*.

The lever *G* is automatically and seasonably swung by the swinging movement which is correspondingly imparted to the horizontally-pivoted lever *J*, the connection between the levers *G* and *J* being by the connecting-rod *m*.

The extremity of the lever *J* which projects beyond the one end of the table and across the range of working movement of the rock-shaft handle-lever *E* is adapted to be so engaged by such handle-lever that after the latter lever has been swung forwardly a short distance and sufficiently to bodily elevate the lifters *C* to positions slightly above the top of the table such lever will be swung during a portion of the further movement of the handle-lever to secure the inward projections of the lifters to their positions under the ends of the mold-plate, and so that such lifters will in being carried upwardly bodily at the upper ends of the vertical bars by the continued and final movement of the handle-lever and rocking of the shaft *D* lift the mold-plate, maintaining it perfectly level, and carrying the pattern out from the sand and above the upper edges of the flask.

As shown, the outer extremity of the lever *J* is of forked shape, and on the initial forward swinging of the handle-lever *E* the fork member *o* is engaged for the effect last above set forth, it being understood that after the handle-lever *E* has been swung sufficiently toward its position represented by the dotted lines in Fig. 3 it becomes disengaged from the fork member *o*, which has become swung to a position to let the lever *E* clear it, so that of course the latter considerable upward movement of the lifters will be without any further inward motions, and it will also be taken into account that the lever *J* will acquire in being swung as aforesaid to a position so that the other fork member *o*<sup>2</sup> will be engaged by the handle-lever as the handle-lever is returned to its original position, (which original position is represented in Fig. 3,) and the lever *J* will be finally swung as the vertical bars *B B* and lifters resume their lowered positions to cause, through the con-

nections *z z*, the lifters to resume their outwardly-withdrawn positions. (Represented by the full lines in Figs. 1 and 2.)

The intermediate lever, as shown, is provided with a forwardly-extended handle *t*, so that this lever may be manually operated, if desired, in case the lever *J* and its connection *m* become deranged or inoperative or in case such parts *J* and *m* are removed or absent from the machine, so that it is optional with the molder whether the inward and outward movements of the levers be insured automatically as a resultant of the manual operations imparted to the handle-lever *E* or by properly-timed manual operations of the intermediate lever at its handle extension *t*.

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

1. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of lifters bodily carried by the bars, and guided thereon, for acquiring horizontal inwardly projected, and retracted, positions, means for elevating the bars, and means operated by the bar-elevating means for concurrently changing the positions of the lifters.

2. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, a rock-shaft, a handle-lever carried thereby and another lever carried by said shaft, a link connecting the second-named lever with one of the bars, means for vertically moving the other of said bars concurrently with the vertical movements of the one bar, and means for horizontally inwardly projecting and withdrawing the horizontally-movable lifters.

3. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, a rock-shaft extended horizontally under the table, a handle-lever carried thereby, and paired levers carried by said shaft, and links connecting the rock-shaft with the vertically-movable bars, and means for horizontally inwardly projecting and withdrawing the horizontally-movable lifters.

4. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, a rock-shaft having a handle-lever, a pair of levers carried by and at the ends of said shaft, links connecting the pair of levers with the bars, and means for horizontally inwardly projecting and withdrawing the horizontally-movable lifters en-

gaged and operated by the rock-shaft handle-lever for actions in unison with the actuation of said vertically-movable bars.

5. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, means for elevating the bars, a rock-shaft, having a handle-lever carried thereby, and a pair of levers also carried by said shaft, links connecting the pair of levers with the bars, a horizontally-swinging lever positioned to be engaged and swung by the rock-shaft handle-lever, a lever arranged under an intermediate portion of the table, and connected with said horizontally-swinging lever, and connections between the intermediate lever and the lifters, for the purposes set forth.

6. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, means for elevating the bars, a rock-shaft having a handle-lever carried thereby, and a pair of levers also carried by said shaft, links connecting the pair of levers with the bars, a horizontally-swinging lever positioned to be engaged and swung by, and then disengaged from, the rock-shaft handle-lever and to be reengaged and reversely swung on the return motion of the handle-lever, a lever arranged under an intermediate portion of the table, and connected with said horizontally-swinging lever, and connections between the intermediate lever and the lifters, for the purposes set forth.

7. In a molding-machine, the combination with a table and bars vertically movable at op-

posite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, means for elevating the bars, a rock-shaft having a handle-lever carried thereby, and a pair of levers also carried by said shaft, links connecting the pair of levers with the bars, a horizontally-swinging lever positioned to be engaged and swung by the rock-shaft handle-lever, a lever arranged under an intermediate portion of the table, and connected with said horizontally-swinging levers, and rods connected with the intermediate lever, and having vertically-sliding engagements relatively between their outer ends and suitable portions of the lifters.

8. In a molding-machine, the combination with a table and bars vertically movable at opposite ends thereof, of mold-plate lifters bodily carried by the bars, and guided thereon to have horizontal inwardly projected, and retracted, positions, means for elevating the bars, a rock-shaft having a handle-lever carried thereby, and a pair of levers also carried by said shaft, links connecting the pair of levers with the bars, a horizontally-swinging lever having a forked-shaped extremity positioned to be engaged and swung by the rock-shaft handle-lever, a lever arranged under an intermediate portion of the table, rods connecting said intermediate lever with said horizontally-swinging lever, vertical rods provided on the lifters, and a pair of rods connected with the intermediate lever and having slide engagements with the vertical rods of the lifters.

Signed by me, at Springfield, Massachusetts, in presence of two subscribing witnesses.

ARTHUR CHOINIERE.

Witnesses:

WM. S. BELLOWS,  
G. R. DRISCOLL.