D. J. CAMPBELL.

MOLDING MACHINE.

APPLICATION FILED MAR. 6, 1914.

1,187,039.

Patented June 13, 1916.

2 SHEETS—SHEET 1.

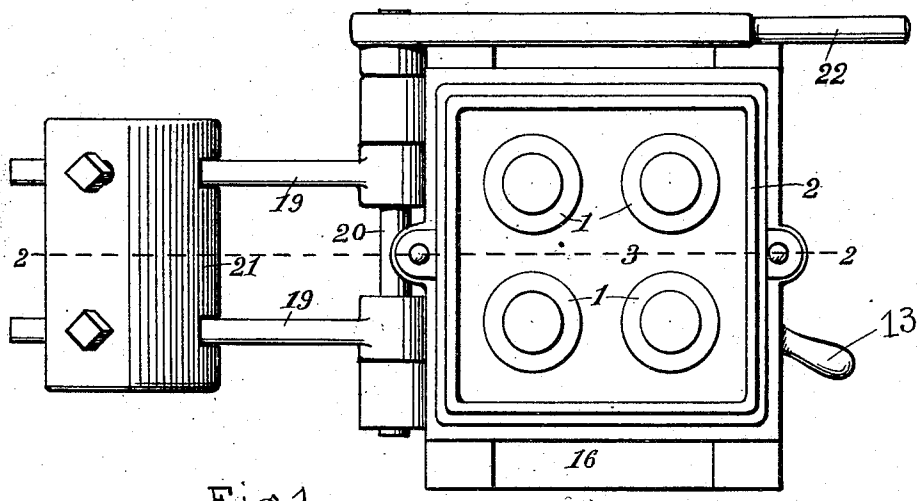


Fig. 1.

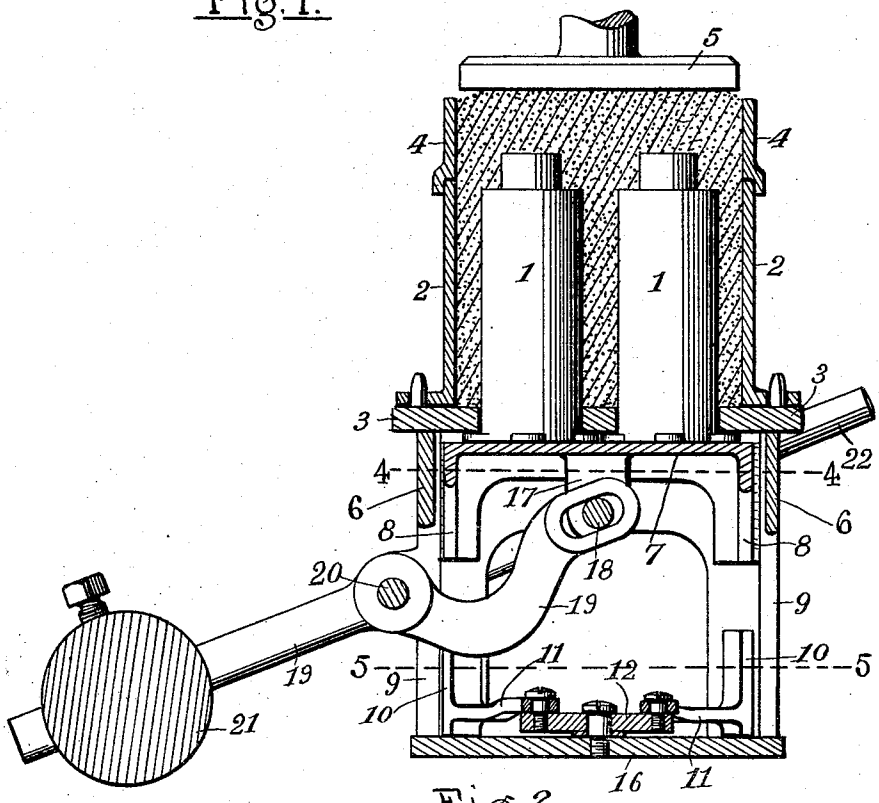


Fig. 2.

Witnesses

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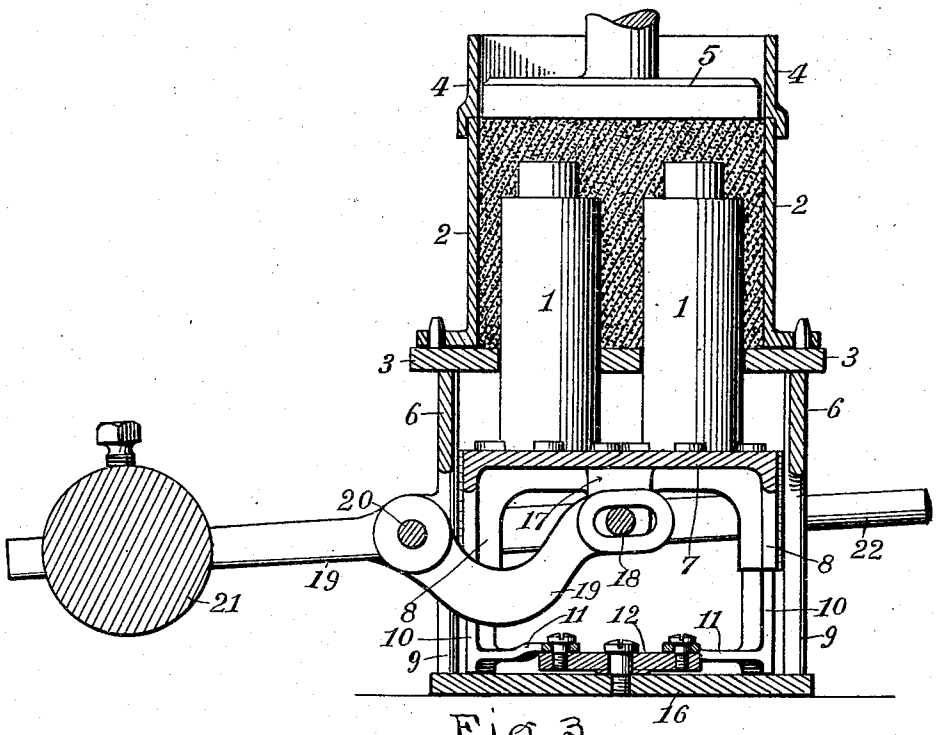


Fig. 3.

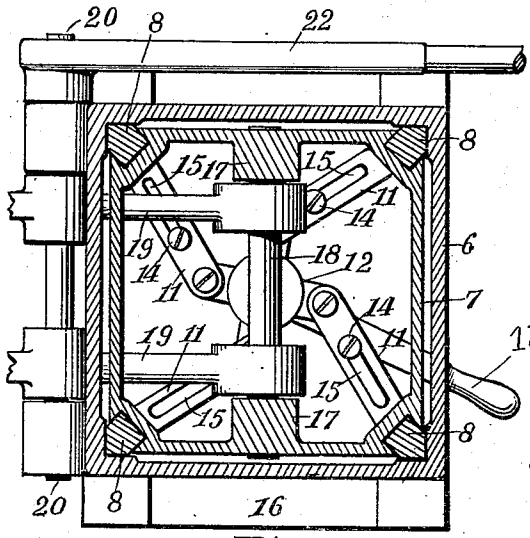


Fig. 4.

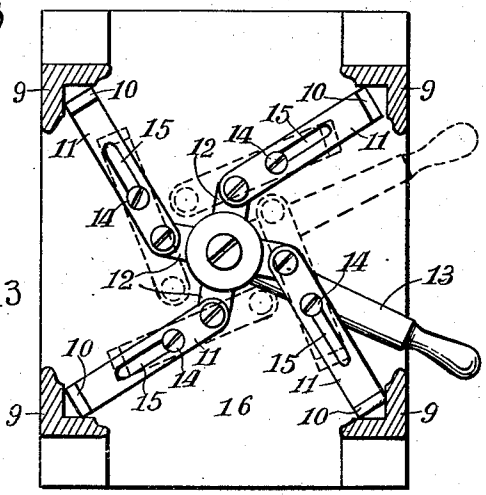


Fig. 5.

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MOLDING-MACHINE.

1,187,039. Specification of Letters Patent. Patented June 13, 1916.

Application filed March 6, 1914. Serial No. 822,834.

To all whom it may concern:

Be it known that I, DONALD J. CAMPBELL, a citizen of the United States of America, residing at Muskegon Heights, in the county of Muskegon and State of Michigan, 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.

My invention relates to improvements in molding machines, and more particularly to such machines for foundry use, and its object is to provide a device that will operate satisfactorily on patterns having considerable depth in the direction that pressure is applied to the sand when it is compressed, and to provide the same with various new and useful features hereinafter more fully described and particularly pointed out in the claims.

My invention consists essentially of a device in which the sand is compressed between two members moving in opposite directions relative to the pattern and comprising an upper follower or ram and a lower opposing member through which the pattern projects and is movable therein, this lower member being fixed and the patterns movable downward through the same during the operation of compressing the sand, whereby the sand is moved oppositely relative to the pattern, both from above downward and from below upward with equal pressures, and in various features of combination and arrangement as will more fully appear by reference to the accompanying drawings representing a preferred embodiment of my invention, in which:—

Figure 1 is a plan view of the device; Fig. 2 a vertical section of the same on the line 2—2 of Fig. 1, with the parts in position before compressing the sand; Fig. 3 the same, with parts in position after the sand has been compressed; Fig. 4 a horizontal sectional plan on the line 4—4 of Fig. 2; and Fig. 5 the same on the line 5—5 of Fig. 2.

Like numbers refer to like parts in all of the figures.

1 represents patterns which in this case are for cylindrical bodies, such as the piston of internal combustion engines or the like. These patterns are made of greater length than the finished article by the amount of relative movement of the stripper plate 3 and the patterns, through which plate the patterns project and are vertically movable therein.

Obviously any pattern other than cylindrical may be used in this machine by merely forming the extension which moves within the stripper plate 3 with vertical sides to fit an opening in the said plate and slide therein to the required extent.

2 represents the flask to contain the sand mold as usual, and 4 is a removable frame or extension above the flask to hold the sand before compression.

5 represents the follower or ram of any suitable press in which the device is placed to compress the sand. This press is not shown, for that, any convenient press may be used, and forms no part of the invention.

6 is a suitable frame supporting the stripper plate 3, through which the patterns project.

7 is a table carrying the patterns, which table has downwardly projecting legs or guides 8 vertically slidable in ways in the legs 9 of the frame.

10 are stops interposed between the guides 8 and the base plate 16, one being provided for each slide 8 whereby when the guides engage the stops the table 7 will be prevented from further downward movement. These stops are adapted to be moved away from under the guides to permit the table to descend to withdraw the patterns from the sand after the latter has been compressed. For this purpose each stop is provided with an inwardly projecting slotted arm having a stud 14 therein to guide the movement of the stop and fixed in a bed plate 16.

Centrally located on the bed plate is a spider pivoted at its center to the bed plate 16 and having radiating arms 12 respectively pivoted to the inner ends of the arms 11, and a lever 13 projects from the spider to manually adjust the same to simultaneously move the stops into and out of operative position. Projecting downward from the table 7 are lugs 17, in which is a transverse rod 18 engaged by one end of a slotted lever 19 intermediately fixed on a rock shaft 20, and provided with a counterweight 21 to balance the weight of the table and patterns thereon. This rock shaft is provided with a manually operated lever 22,

whereby the table can be moved downward to withdraw the patterns from the sand or moved upward to restore the patterns to elevated position within the flask as occasion requires.

From the foregoing description the operation of my invention will be readily understood. With the patterns elevated within the flask as shown in Fig. 2 and the required quantity of molding sand placed in the flask and the device placed in a suitable press; by forcing the ram 5 downward the sand will be compressed in a downward direction and at the same time the patterns being free to move with the sand are moved downward in the stripper plate 3 and thus the sand will be compressed equally from opposite directions and uniformly about the part of the pattern above the stripper plate. When the guides or legs of the table strike the stops 10 the patterns will have moved downward the required distance through the stripper plate 3, that portion of the patterns remaining above the plate constituting the patterns proper to form the cavities in the sand. By shifting the spider 12 the stops 10 will be withdrawn from beneath the guides 8 and then the patterns can be wholly withdrawn from the mold by depressing the lever 22, whereupon the mold can be removed, the patterns restored to elevated position and the operation repeated indefinitely.

What I claim is:—

1. A molding machine comprising a relatively movable stripper plate and table, patterns carried by the table and slidably projecting through openings in the plate, radially slidable stops at the respective corners of the table to control said movement, a spider connected to the stops to simultaneously move the same into and out of operative position, a lever to manually move the spider, and means for relatively adjusting the plate and table.

2. A molding machine, comprising a stripper plate having openings therein, pattern extensions vertically slidable in said openings, a frame supporting the plate, a table vertically slidable in the frame, a counterbalance lever supporting the table and permitting free vertical movement thereof, means for manually operating the counterbalance lever to raise and lower the table and pattern extensions, stops to limit the downward movement of the table, and means for manually adjusting the stops into and out of operative position.

3. A molding machine, comprising a fixed stripper plate, a freely movable table below the same, a pattern mounted on the table extending through the plate and slidable therein, a counterbalance lever connected to the table, means for manually operating the lever to move the table, movable stops under the respective corners of the table, a spider to simultaneously move the stops into and out of operative position, and a lever to manually adjust the spider.

4. A molding machine, comprising a vertically movable follower, a fixed stripper plate below the same, a frame supporting the said plate, a table having legs at the respective corners vertically slidable in the frame, movable stops under the respective legs, a spider pivoted at the center and having arms connected to the respective stops to simultaneously move the same into and out of operative position, and means for manually adjusting the spider.

5. A molding machine, comprising a vertically movable follower, a fixed stripper plate below the same, a frame supporting the said plate, a table vertically movable in the frame and having legs slidable in the frame, movable stops beneath the respective legs of the table and having inwardly projecting arms, a centrally pivoted spider attached to the respective arms of the stops, means for manually adjusting the spider, a counterbalance lever supporting the table, and means for manually operating said lever to move the table.

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

DONALD JAMES CAMPBELL.

Witnesses:

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LEON G. COOKE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."