

No. 778,329.

PATENTED DEC. 27, 1904.

E. PIPHER,
MOLDING MACHINE.
APPLICATION FILED MAR. 5, 1901.

2 SHEETS—SHEET 1.

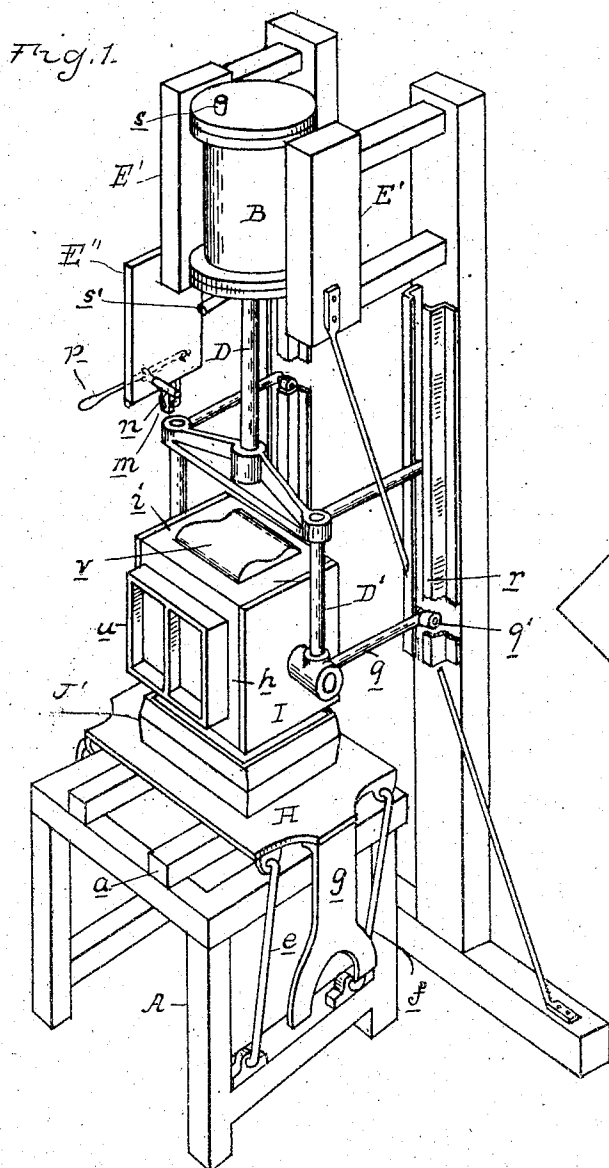


Fig. 5.

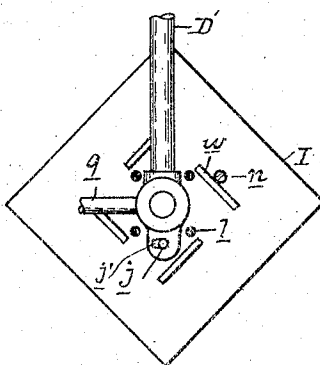
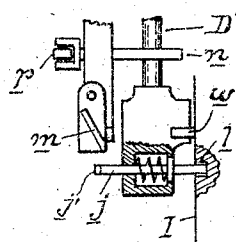


Fig. 6.



Witnesses
R. C. Smith
W. B. Dugan

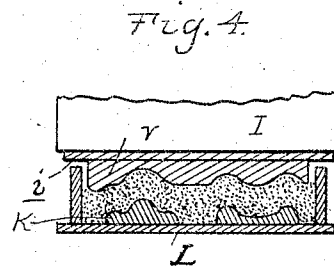
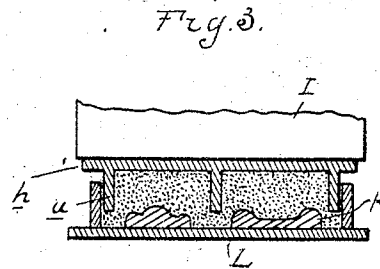
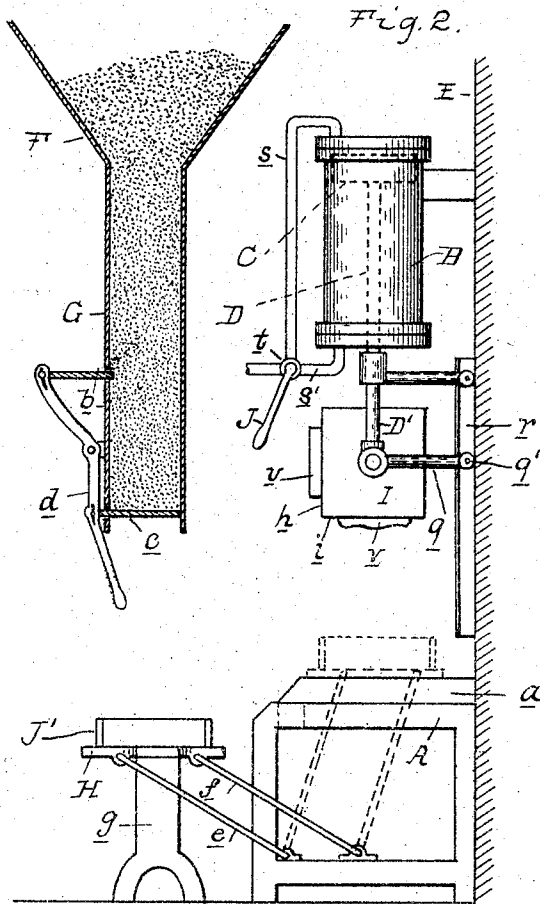
Inventor
Edward Pipher
Attys.
J. B. McGuire

No. 778,329.

PATENTED DEC. 27, 1904.

E. PIPHER.
MOLDING MACHINE.
APPLICATION FILED MAR. 5, 1901.

2 SHEETS—SHEET 2.



Witnesses
B. C. Smith
Wm. D. Gherety.

Inventor
Edward Pipher
By *Wm. D. Gherety*
Attys.

UNITED STATES PATENT OFFICE.

EDWARD PIPHER, OF DETROIT, MICHIGAN, ASSIGNOR OF TWELVE
TWENTY-FIFTHS TO HIRAM T. BUSH, OF DETROIT, MICHIGAN.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 778,329, dated December 27, 1904.

Application filed March 5, 1901. Serial No. 49,845.

To all whom it may concern:

Be it known that I, EDWARD PIPHER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to molding-machines; and it is the object of the invention to provide means for packing the sand about the pattern without the necessity of hand-ramming.

15 It is a further object to obtain a machine by means of which the work may be done more expeditiously without requiring the attention of a skilled workman.

20 The invention consists in the peculiar construction and arrangement of a power press or ram; further, in the construction and arrangement of a movable flask-supporting table; further, in the construction of a multi-
25 faced head for the press, together with means for automatically rotating the same to bring the different faces in position for operation, and, further, in the peculiar construction, arrangement, and combination of parts, as hereinafter described and claimed.

30 In the drawings, Figure 1 is a perspective view of my machine. Fig. 2 is a sectional side elevation. Figs. 3 and 4 are sections through a portion of Fig. 2, showing the operation of the machine. Fig. 5 is an elevation of the opposite side of the machine from that shown in Fig. 2. Fig. 6 is a sectional front elevation of the parts shown in Fig. 5.

35 My machine comprises mechanism for performing the following operations: first, the filling of the proper quantity of loose sand into the mold-flask around the pattern therein; second, the peening of the sand—i. e., the pressing of those portions around the margin of the flask and between the different patterns, so as to pack the sand very hard; third, the pressing of the sand above the patterns, so as to pack it to a uniform degree of hardness, which is less than that of the peened portions,

and, finally, the striking off of the sand at the top of the flask. The apparatus necessary for performing these operations consists of, first, a sand spout or hopper preferably having means for discharging a measured quantity of sand therefrom; second, a bench or bed for supporting the flask; third, a vertically-movable plunger above said bench or bed; fourth, a forming or pressing head carried by said plunger. The apparatus is also preferably provided with a movable table or carrier for conveying the mold-flask from a position where it receives the loose sand to a position supported upon the bench or bed beneath the plunger and adapted to be operated upon by the forming-head. These parts are preferably arranged as shown in the drawings, in which—

A is a bench or bed preferably formed, as shown, of an open framework having the top cross-bars *a* for supporting the work. Directly above this bed is arranged the plunger mechanism, comprising the cylinder B, the piston C therein, and a depending piston-rod D. The cylinder B is mounted in such a manner as to leave a space in front and at the sides of the bed A unobstructed. This may be accomplished, as shown, by securing the cylinder directly to the side wall E of the building, as by a projecting framework E' of suitable construction, the bench A being also arranged adjacent to the side wall.

80 F is a sand-hopper preferably arranged in front of the cylinder B and having the depending discharge-spout G. This spout is preferably provided with suitable means for discharging a measured quantity of sand therefrom, which is shown as comprising the gate-valves *b* and *c*, connected by a lever *d* for alternately moving them across the spout.

H is a swinging table or carrier secured to the bench A by the parallel links *e* and *f*, which are so arranged as to carry the table from the position shown in full lines in Fig. 2 to the position in dotted lines therein. In the full-line position the table H is arranged directly beneath the spout G and is supported by standards *g*, secured at opposite sides of

the table. When swung up into the position in dotted lines, the table will rest upon the cross-bars *a* of the bench in a position directly beneath the cylinder B.

5 The piston-rod D is provided at its lower end with a rotary multifaced head I. As shown, this head is of rectangular form, having the separate faces *h i*, &c., and is pivotally secured in a bifurcation D' of the piston-rod. The latter is guided in its travel by means of arms *q*, projecting rearwardly and having antifriction-rolls *q'* at their ends engaging with vertical ways *r*, secured to the wall.

15 *m* is a cam pivotally secured to a stationary part of the framework and adapted in the upward movement of the piston and head I to engage with the bolt *j* and retract it from the recess *l*. This arrangement is effected by a projecting finger *j'* on the bolt *j*, in the path of which the cam *m* is arranged.

n is a slidable bolt secured to a hand-lever *p*, fulcrumed to a projecting portion E'' of the frame E'.

25 *w* represents a series of lugs or flanges upon the head I, with which the bolt *n* is adapted to engage in one position of the lever and when the head is moving upward, the arrangement being such that the head will be rotated through one-quarter of a revolution by one of the flanges so engaging with the bolt *n*.

The cylinder B is connected with any suitable motive agent, (not shown,) such as compressed air or steam, which is admitted thereto through pipes *s s'*, controlled by the valve *t*. This valve is preferably arranged with its operating handle or lever J in a convenient position to be reached by the operator when standing in front of the machine, as shown in Fig. 2. Two faces *h* and *i* of the head I are of a configuration to respectivelypeen and press the sand in the mold-flask. Thus the face *h* is provided with a marginal depending flange *u* for firmly packing the sand at the margin of the flask. The face *i* has secured thereto a suitable form, such as *v*, which in its general lines is a counterpart of the pattern to be used.

50 The parts being constructed and arranged as above described, the operation of the machine is as follows: The hopper F is filled with sand properly prepared for use and preferably automatically conveyed to said hopper by mechanism. (Not shown.) The operator taking his position in front of the machine first places one section of the empty mold-flask J' upon the table H. He then places the pattern, such as K, therein, or where necessary the pattern K in its follower-board L is placed first on the table and the flask-section above the same. He next operates the handle *d*, controlling the valves *b* and *c*, which, as will be readily understood, discharges a measured

quantity of sand (the amount between the two valves) into the flask. The table H is then swung into the position shown in dotted lines, Fig. 2, where it will rest upon the cross-bar *w* of the bed and will be directly in line with the head I. The latter being in the position where its peening-face *h* is turned downward, the operator seizes the handle J and operates the valve *t* to admit the motive agent into the upper end of the cylinder B, so as to press the piston and its depending piston-rod downward. This will cause the peening-face *h* to press upon the loose sand in and above the flask, packing the whole of said sand to some degree, but more particularly packing the marginal portions. The operator then reverses the position of the lever J, which admits the motive agent beneath the piston and raises the same, together with the rod D and head I. In this upward movement the bolt *j* engages with the cam *m*, which disengages it from the recess *l*, unlocking the head. The bolt is then engaged with one of the flanges *w* and rotates the head through a quarter-revolution, which will turn the peening-face *h* upward and bring the face *i* down into position for operation. The lever J is then again reversed, causing the head I to again descend and press against the sand with the forming-face *v*. As the latter conforms in a general way to the lines of the pattern, it is evident that a uniform pressure will be brought upon all portions of sand in contact with the pattern, so as to give the requisite hardness. The head I is then raised once more and the table H swung downward into its outer position, when the operation will be repeated with the second section of the flask. When this is accomplished, the mold is removed, preferably at one side of the bench or bed, and placed upon the vibratory table for rapping and removing the patterns, which, however, forms no part of the present invention and is not illustrated in the drawings.

From the above description of the construction and operation it will be understood that the work of forming the molds may be carried on rapidly by a single workman and without the exercise of any great degree of skill. One of the advantages of the construction is that the space around the bench and table is left unobstructed, as both sand-hopper and press-cylinder are supported from above. Thus the workman may carry on the operation more expeditiously than where limited in his movements by obstructions, such as the framework of a machine.

What I claim as my invention is—

1. A molding-machine comprising a bed or table, a cylinder supported above the same, a piston in said cylinder having a depending piston-rod, a multifaced head rotatively secured to the lower end of said piston-rod, and means for automatically turning said head in

the upward movement thereof whereby a different face will be presented to the work in the succeeding downward movement.

2. A molding-machine comprising a bed, a
5 press-cylinder supported above the same leaving an unobstructed space to the front and sides of said bed, a sand-discharge spout above and to the front of said bed, a table and an oscillatory support therefor adapted to carry
10 the table from a position beneath said sand-discharge spout to a position supported upon said bed beneath said press said bed being maintained in a horizontal plane during said movement, and a multifaced head actuated by
15 said press-cylinder.

3. A molding-machine comprising a bed, a press-cylinder mounted above the same leaving an unobstructed space to the front and sides and a swinging table consisting of a top,
20 standards at the sides thereof and parallel links connecting said top to said bed, said table being adapted to be swung from a position in front of said bed where it is supported on said standards, to a position supported upon
25 said bed beneath said press.

4. A molding-machine comprising a bed, a support therefor, a cylinder above the same, a piston in said cylinder having a depending piston-rod, a multifaced head at the lower end
30 of the rod, and an oscillatory work-support pivotally connected to the bed-support whereby the work-support may swing from a position upon said bed to a position at one side thereof and be maintained in a horizontal
35 plane during said movement.

5. In a molding-machine, a bed or table, a reciprocating piston-rod above the bed, a rotatable head journaled in the lower end of the piston-rod, means for locking the head against
40 rotation during its operation and automatic means for unlocking the head as it is retracted.

6. In a molding-machine, a bed or table, a reciprocating piston-rod above the bed, a rotatable head journaled in the lower end of the
45 piston-rod, means for locking the head against rotation during its operation, automatic un-

locking means for the head as it is retracted, and means for turning the head while it is unlocked.

7. A molding-machine comprising a bed, a
50 cylinder supported above the same, a piston in said cylinder having a depending bifurcated piston-rod, and a multifaced head rotatably secured at the lower end of said rod intermediate the furcations thereof, and means for
55 automatically moving said head to present different faces.

8. A molding-machine comprising a bed, a cylinder supported above the same, a piston in said cylinder having a depending bifurcated
60 piston-rod, a multifaced head rotatably secured at the lower end of said rod intermediate the furcations thereof, means for automatically moving said head to present different faces to the bed, and an antifriction-guide
65 for the rod.

9. A molding-machine comprising a bed, a cylinder supported above the same, a piston in said cylinder having a depending bifurcated
70 piston-rod, a multifaced head rotatably secured at the lower end of said rod intermediate the furcations thereof, and means for automatically turning said head in the upward movement thereof whereby a different face
75 will be presented to the bed in the succeeding downward movement.

10. A molding-machine comprising a bed, a reciprocating press above the same, a table, an oscillatory support therefor, comprising
80 links pivoted to the respective sides thereof whereby the table may be swung from a position in front of said bed to a position supported thereupon beneath the press, and be maintained in a horizontal plane during said
85 movement.

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

EDWARD PIPHER.

Witnesses:

M. B. O'DOHERTY,
H. C. SMITH.