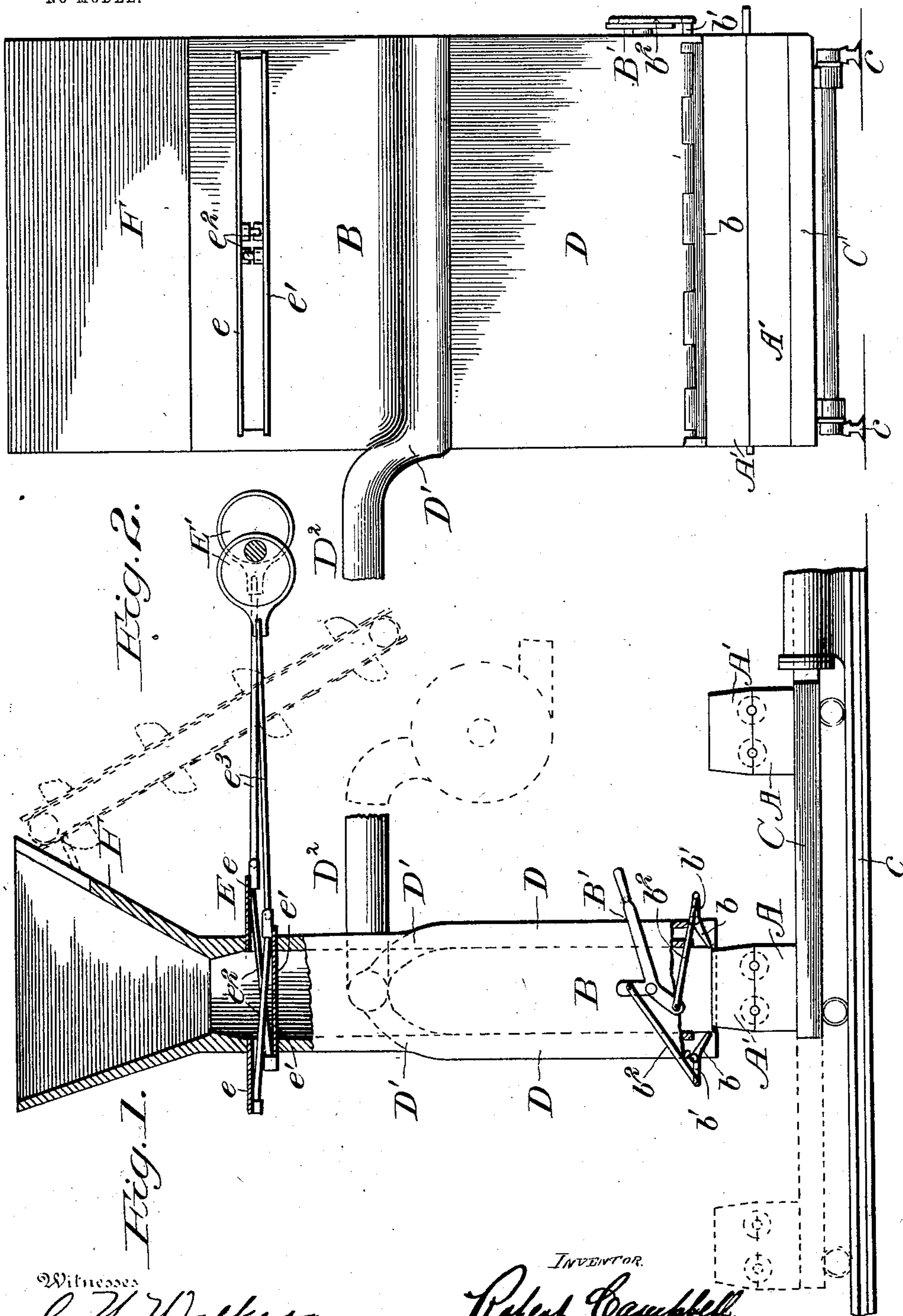


R. CAMPBELL.
MOLDING MACHINE.

APPLICATION FILED DEC. 20, 1902.

NO MODEL.



Witnesses
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ROBERT CAMPBELL, OF GADSDEN, ALABAMA.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 720,220, dated February 10, 1903.

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To all whom it may concern:

Be it known that I, ROBERT CAMPBELL, a citizen of the United States, residing at Gadsden, in the county of Etowah and State of Alabama, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

This invention relates to machines or apparatus for the production of sand molds such as are used in the manufacture of cast-metal pipes, the fittings therefor, or other analogous articles from cast metal.

The object of this invention is to provide a machine or apparatus which embodies in its construction means for delivering successive charges of compacted sand in a flask in such a manner that the charge will not be disintegrated or retarded in its passage or fall from the charge-forming mechanism to the flask, such result being accomplished by dropping the compacted charge through a vertically-disposed chute from which the air has been partially exhausted, the means for attaining such end being constructed so that air may be admitted to the chute as desired to change the force of the impact of the charge, as will be hereinafter set forth.

The invention consists in the construction and combination, in a molding-machine, of means constructed to deliver successive charges of sand to a flask or part thereof, such charge being released in a chute from which the air has been partially exhausted, also in the construction and combination of the parts, as will be hereinafter set forth and specifically claimed.

In the accompanying drawings, which illustrate one form of the invention, Figure 1 is an end elevation, partly in section, certain elements which are of the ordinary type being shown by dotted lines; and Fig. 2, a front elevation.

The upper part of the apparatus is supported in any suitable manner to admit beneath the same a platform, upon which are placed flask-supports A, constructed to maintain flasks A', so that when the platform C is reciprocated the flask-supports and the flasks may be positioned beneath a chute B. The platform C may be reciprocated by a piston, and the platform is mounted on rollers or slides which engage the tracks or rails c, and

the flask-supports A are of the usual construction, being made to maintain a flask or at one time the drag and at another time the cope. The cope and drag have their sides slightly beveled where they engage dampers b, and by engaging one of the dampers the other one will be actuated, as both dampers are connected to move in unison.

The vertically-maintained chute B is constructed so that the ends will depend below the lower ends of its side pieces, and on each side of the chute there are air-chambers D D, the lower open ends thereof carrying dampers b b, the supporting bars or pintles of the dampers having arms b' b', to which are attached bars b² b², which are also attached to the arms of a rock-lever B', so when the handle of the rock-lever is moved the dampers will be operated simultaneously. When the flask-supports and the part of the flask which rests thereon are not beneath the chute, the dampers will assume a vertical position, and in placing a part of the flask beneath the chute it will engage one of the dampers, raise it, and cause the other one to assume a similar position, the part of the flask will close the end of the chute, and the dampers will establish communication with the air-chambers D D. The ends of the air-chambers may be closed by the dampers to admit air to the chute, especially in packing the cope after the first charge of sand has been discharged therein. In packing the sand in the drag the dampers are positioned so that the chute and the air-chambers will be in communication; but after the first charge is allowed to fall in the cope the dampers are moved over the ends of the air-chambers and air is admitted to the chute under atmospheric pressure. The air-chambers D D are connected at their upper ends to flues D' D', which in turn are attached to a pipe D², through which air is exhausted from the air-chambers by means of an exhaust-fan or suction-blower to maintain a partial vacuum in the chute, and thus permit a compacted charge of sand to fall in said chute without meeting a resistance, which would be present if the air was not exhausted therefrom. When air is partially exhausted from the chute, the charge which has been previously compacted will fall into the drag or the cope as a solid mass and with much

greater force than if it met with a body of air in its descent, and the force of the impact can be regulated within certain limits either by shifting the position of the dampers or by changing the speed of the exhaust-fan or its equivalent air-exhaust mechanism.

The chute B, adjacent to its upper end and below the throat of the hopper, is provided with a charge forming and releasing mechanism E, comprising suitably-supported reciprocating slides arranged on different horizontal planes, the upper slides e being connected to opposite lower slides e' by bars e^2 , which cross each other, the ends of the bars being fastened to the outer ends of the slides, and to one side of the chute the bars are coupled to rods e^3 , which are reciprocated by the eccentrics E' , the shaft carrying the eccentrics being under the control of the workman having charge of the machine. When the inner edges of the lower slides abut, sand, which is fed to the hopper by an endless carrier, will be sustained by the lower slides, the weight of the sand will pack the same, and when it is desired to let a charge fall the upper slides are forced inward to form the bottom of the hopper and the lower slides are moved outward. Above the slides the throat of the hopper is provided with walls that converge upwardly to prevent the sand adhering to the walls of the throat.

In operation a part of a flask—that is, either the cope or the drag—is placed upon a flask-support which is carried by the platform, the platform is moved to position the pattern-frame and the part of the flask carried thereby beneath the chute, and during such movement the dampers will be inclined toward each other, the ends resting upon the cope or drag, and the chute is thus placed in communication with the air-chambers. Air is now exhausted from the chute, and the charge forming and releasing mechanism is operated to drop a compacted charge of sand into the portion of the flask beneath the chute. When the part of the flask has been filled by successive charges, the shaft which operates the eccentrics is rendered idle, and the platform is moved to carry the flask-support and the part of the flask which is supported thereby to one side of the chute, and during such movement one of the dampers will serve as a striker to level the sand and remove what projects above the sides of the part of the flask. While packing the drag the air is exhausted from the chute, and when it has been filled the drag, with its pattern-frame, is moved from under the chute. The cope, with its pattern-frame, is then placed under the chute, and a charge of sand is permitted to fall in the cope, while the air is partially exhausted therefrom. After one charge has been dropped in the cope either the exhaust-fan is stopped or the dampers are placed so as to close the lower ends of the air-chambers, which will admit air to the chute, and thus the charges last admitted to the cope will be

delivered with less force and in a less compact mass than the charges which are used to pack the drag.

It will be noted that by use of the herein-before-described apparatus the parts of a flask are filled by a succession of impacts or charges and that the force of the impacts can be regulated without extending the height of the chute and that the charge does not become disintegrated in its fall while packing the drag, and the sand is packed more uniformly and in less time than can be done by hand, and the construction and arrangement of the parts are such that they are not liable to get out of order.

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

1. In a molding-machine, the combination of means for successively forming and releasing a charge of sand, a chute beneath the charge forming and releasing means, means for exhausting air from the chute and a cope or drag positioned beneath the chute to receive the charges, substantially as set forth.

2. A molding-machine comprising a vertical chute, means for successively forming and releasing compact charges of sand in the chute, and means for exhausting air from the chute, for the purpose set forth.

3. As an improvement in the art of making sand molds, means for mechanically packing sand in a cope or drag of a flask comprising a charge forming, compacting and releasing mechanism, a chute below the charge-forming mechanism which receives the charge when released, means for supporting a cope or a drag beneath the lower end of the chute so as to partially close the same, and means for exhausting air from the chute, for the purpose set forth.

4. A molding apparatus consisting of a hopper, a chute in communication therewith, a charge forming and releasing mechanism which intersects the upper portion of the chute, chambers adapted to be placed in communication with the chute, air-exhaust mechanism connected with the chambers, and means for closing the lower end of the chute and placing it in communication with the chambers, substantially as set forth.

5. A molding apparatus, comprising a carriage or platform, flask-supports mounted thereon, a vertically-disposed chute open at its lower end and adapted to be partially closed by a part of a flask, air-chambers on each side of the chute, dampers which place the chute in communication with the air-chambers, means for exhausting air from the chambers and a charge forming and releasing mechanism adjacent to the upper end of the chute; whereby successive charges of compacted sand may be deposited in the part of the flask when placed beneath the chute, substantially as shown.

6. In a molding-machine, a charge-forming device having coacting slides on different

horizontal planes, a chute for the sand which is intersected by such charge-forming device, means for successively releasing a charge of sand which is delivered to a cope or drag positioned beneath the chute, and means for exhausting air from the chute.

7. In a molding-machine, a chute beneath which the cope or drag of a flask is placed, means for supplying successive charges of sand to the cope or drag, and means connected to the chute for exhausting air therefrom.

8. In a molding-machine, the combination with a charge compacting and releasing device, of a vertical chute, and means for exhausting air from the chute below the charge compacting and releasing device.

9. In a molding-machine, the combination with a chute, of chambers on each side of the

chute, and dampers connected to operate in unison to place the chute in or out of communication with the chambers, substantially as shown.

10. In a molding-machine, a hopper the discharge-throat thereof having walls which diverge from the lower end of the hopper, a vertically-disposed chute, slides between the lower end of the throat and the upper end of the chute, means for exhausting air from the chute, and dampers connected to operate in unison.

In testimony whereof I have signed my name to this application in the presence of two subscribing witnesses.

ROBT. CAMPBELL.

Witnesses:

W. R. MOORE,
OSCAR BAILEY.