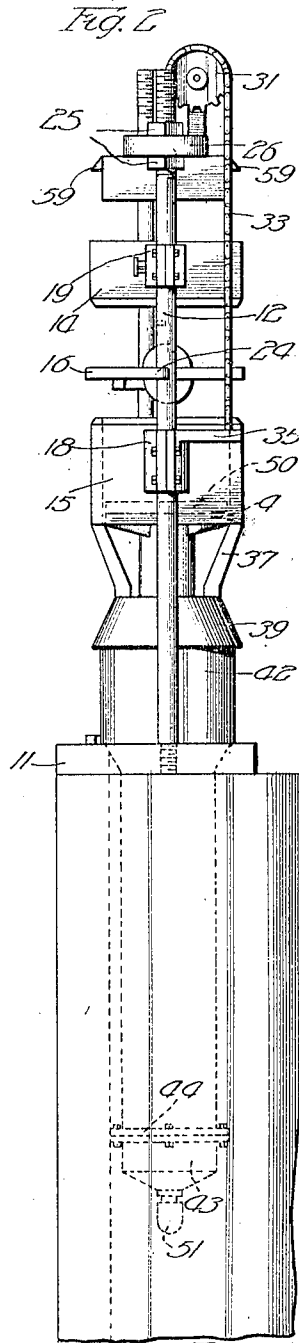
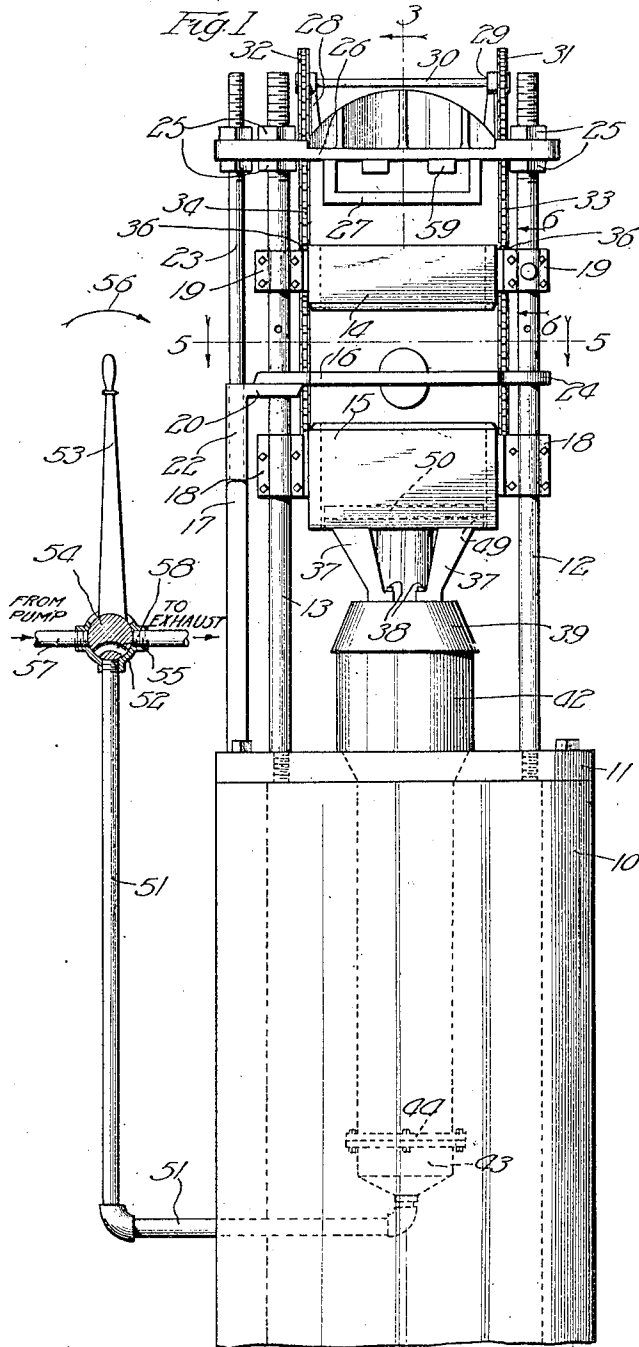


J. MICHELE.
MOLDING MACHINE.
APPLICATION FILED JUNE 17, 1918.

1,291,996.

Patented Jan. 21, 1919.

2 SHEETS—SHEET 1.



Witnesses:
Arthur H. Carlson
Robert H. Weiss

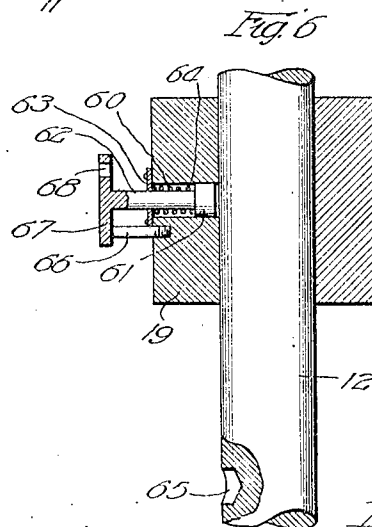
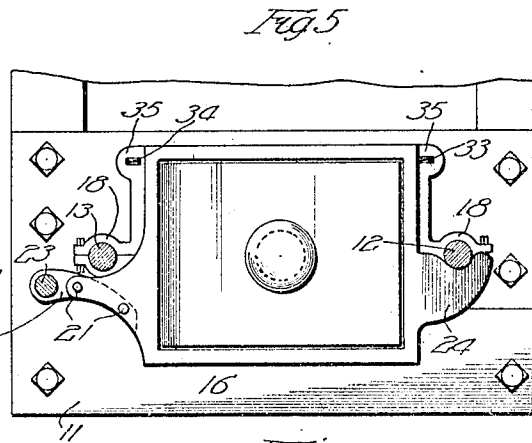
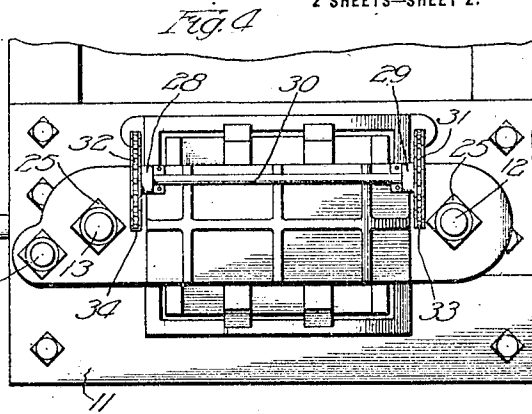
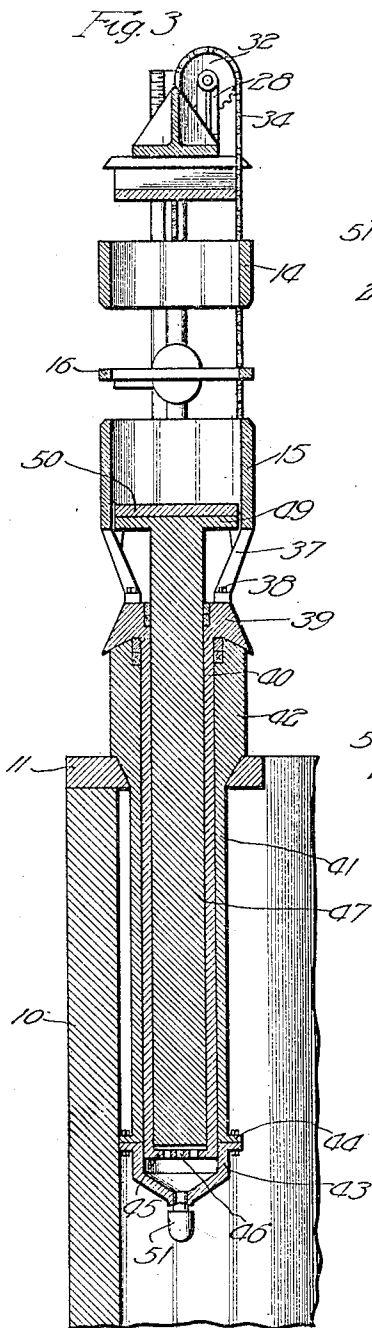
Inventor:
John Michele
By Offield Towle Graves & Soans Attys.

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2 SHEETS—SHEET 2.



Witnesses:
Arthur M. Carlson
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UNITED STATES PATENT OFFICE.

JOHN MICHELE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO HERMAN W. BRANDT AND ONE-THIRD TO JOHN KUMMER, BOTH OF CHICAGO, ILLINOIS.

MOLDING-MACHINE.

1,291,996.

Specification of Letters Patent.

Patented Jan. 21, 1919.

Application filed June 17, 1918. Serial No. 240,305.

To all whom it may concern:

Be it known that I, JOHN MICHELE, a subject of the Emperor of Austria, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

My invention relates to improvements in molding machines, and has particular reference to a type of automatic molding machine in which a source of power, such as a supply of water under pressure, may be employed.

The object of the invention is to provide an improved molding machine which shall be simple and convenient to manipulate, rapid, efficient, and economical in operation, inexpensive to manufacture, and, in general, to provide an improved molding machine of the character referred to.

In the drawings accompanying this application I have illustrated a preferred embodiment of my invention. In said drawings—

Figure 1 is a side elevation of the machine;

Fig. 2 is an end elevation of the same;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a plan view of the machine;

Fig. 5 is a section taken on the line 5—5 of Fig. 1; and Fig. 6 is an enlarged view showing the details of an improved stop for temporarily arresting the movement of the upper flask.

Referring to the drawings, 10 represents a well or cylinder of concrete or other suitable material, over the upper end of which extends a slab or bed-plate 11 of cast iron, constituting the foundation for the machine, and in which are suitably secured a pair of heavy steel columns or guides 12 and 13. Said columns 12 and 13 constitute slideways for the upper flask 14 and the lower flask 15, while the pattern frame or plate 16 slides upon a third upright guide-rod 17 also secured in the said bed-plate 11.

Suitable split bearings, as indicated at 18 and 19, enable the slide-lugs of the upper and lower flasks to be suitably adjusted so that they will move freely up and down the columns 12 and 13. The pattern frame 16 is secured to a small bracket 20 by means of a screw 21, so as to enable the pattern frame to be adjusted slightly with reference to the

boss 22 of said bracket 20, which slides upon the reduced upper end 23 of the rod 17.

It will be observed that the position of the pattern frame 16 is fixed by reason of the fact that the lower end of the said slide-boss 22 is arrested in its downward movement by the shoulder caused by the reduction in diameter of the rod 17. By reason of the fact that the rod 23 is round, the pattern plate or frame can be swung out through approximately 180° so as to be out of the way of the ascending or descending flasks, whenever desired. The pattern frame is held in operative position by reason of the lug 24 resting against the side of the guide column 12. If desired, any suitable form of catch may be employed to hold the lug 24 in engagement with the said column 12.

The upper ends of the columns 12 and 13 are threaded to receive two pairs of nuts 25 used for positioning the upper head or cap 26 of the machine, said head 26 having a depending box-shaped portion 27 which is of the proper dimensions to enter within the upper end of the upper flask 14, for a purpose which will hereinafter appear. The said cap member 26 is also fitted with a pair of pedestal brackets 28 and 29 rotatably supporting a shaft 30, and on said shaft 30 are keyed a pair of sprocket wheels 31 and 32 around which are trained a pair of chains 33 and 34. The rear ends of said chains are connected to small lugs 35 projecting from the rear sides of the split bearings 18 of the lower flask, and the front ends of said chains are connected to rings 36 centrally secured at the sides of the upper flask 14, so that when either of the flasks is moved vertically, the other flask will also move vertically but in reverse direction.

Referring particularly to Fig. 3, it will be observed that the bottom flask 15 has at its lower end two or more feet or depending brackets 37, by means of which the said flask 15 is secured by bolts 38 to an annular cap 39 which forms the head of a vertical cylindrical sleeve piston 40, said sleeve piston 40 acting as a ram in the stationary vertical cylinder 41. Said vertical cylinder 41 has an enlargement 42 at its upper end by which it is firmly seated in the foundation block 11, the lower end of said cylinder 41 being closed by a bottom head 43 bolted to a flange 44 on the lower end of the cylinder.

The lower end of the sleeve piston 40 is provided with a bottom head or end 45 perforated, as shown at 46, in order to admit the operating fluid to the interior of the said sleeve piston 40, within which slides a secondary or inner piston or ram 47. On the upper end of the said inner ram 47 is fixedly mounted a solid plate 49 of the proper dimensions to reciprocate freely within the bottom flask 15 and also within the upper flask 14 for a purpose which will hereinafter appear. The ram head 49 constitutes a support for the removable mold plate 50.

In order to actuate the sleeve and its inner ram, fluid is supplied to the bottom end of the cylinder 41 through a pipe 51 which leads from a control valve 52 actuated by a handle 53. On inspection of Fig. 1, it will be seen that the valve plug 54 is circular and fits rotatably within the outer casing of the valve 52, a passageway 55 being formed in the valve plug 54, so that by moving the handle in the direction of the arrow 56, the passageway 55 places the pipe 51 into communication with the pressure pipe 57 to elevate the ram and piston, while, when the handle is moved in the direction opposite to that shown by the arrow 56, the pipe 51 is placed in communication with the exhaust pipe 58, whereupon the sleeve and ram descend in the cylinder.

Normally, the parts occupy the position shown in Figs. 1 and 3. When it is desired to make a mold of, for instance, a sphere, as shown in the figures, or other objects, the lower flask is filled with sand, and, with the pattern in position, the valve handle 53 is moved in the direction of the arrow and pressure fluid flows into the bottom end of the cylinder. When this occurs, the outer sleeve 40 rises, carrying with it the bottom flask 15, but the inner ram 47 does not move upward relative to the sleeve 40, for the reason that the inner ram carries a considerable weight, being in itself heavy, in addition to which there is the presence of the sand above the plate 50 and also the usual amount of frictional resistance to the ram's movement within the sleeve piston 40. When the bottom flask 15 rises, the upper flask 14 obviously descends, being permitted to do so by the chains 33 and 34, such movement of the flasks continuing until the upper edge of the bottom flask 15 strikes against the lower face of the pattern plate 16, which is pushed into engagement with the bottom edge of the flask 14. The handle 53 is then turned to normal, leaving the parts in such midway position, permitting sand to be placed in the upper flask 14.

After the upper flask 14 has been filled with sand, the handle 53 is again moved in the direction of the arrow 56 and the flasks and the pattern plate are elevated as a unit by the further upward movement of the

sleeve piston 40. As soon as the upper surface of the sand in the upper flask 14 engages the lower face of the stationary presser 27, the resistance to the movement of the flasks is increased considerably and the pressure in the lower end of the cylinder rises sufficiently to cause movement of the inner ram 47, which moves upwardly relative to the outer sleeve piston 40.

As the resistance to movement increases, the pressure in the cylinder increases to overcome such resistance, and both pistons become effective to compress the sand in the upper and lower flasks. When the pressure of the fluid has moved the parts upwardly and equilibrium has been reached, it will be found that the upper flask 14 has been raised until its upper edge is a short distance below the safety stops 59, formed as parts of the head 26, the presser 27 having entered the upper flask 14 the necessary distance to compress sufficiently the sand in the said upper flask. The pressure of the fluid is suitably adjusted in proportion to the weights of the parts, the diameter of the cylinder, and the diameter of the inner ram 47 so that the sand in both of the flasks will have been properly compressed.

Having filled the flasks and compressed the sand therein, with the pattern interposed between the flasks, two things are now necessary: First, to remove the pattern from between the flasks; and secondly, to remove the two-part mold from the flasks. To perform the first operation, the handle 53 is simply moved over in a direction to exhaust the fluid from the bottom end of the cylinder, whereupon both rams descend to the position shown in Figs. 1 and 3, the bottom flask 15 being depressed, and the top flask 14 being correspondingly elevated, while the pattern plate 16 is left freely suspended in between the two flasks, as shown in Figs. 1 and 3, its downward movement being arrested by the shoulder on the rod 17 which engages the boss 22. The pattern having thus been freed from the molds, is swung out horizontally, after which the handle 53 is again moved in the direction of the arrow 56 to permit fluid to enter the bottom end of the cylinder. When this occurs the bottom flask 15 rises and the top flask 14 descends until the bottom edge of the upper flask 14 engages the upper end of the bottom flask 15, at which time further vertical movement of the upper flask 14 is arrested by the following described device.

Referring to Fig. 6, it will be observed that in one of the bearing lugs 19 there is drilled a cylindrical horizontal aperture of sufficient diameter to accommodate a cylindrical plunger 61, the latter being equipped with a stem 62 which extends outwardly through a cover plate 63 suitably secured to the outer face of the lug 19. The

inner end of the stem 62 is surrounded by a coil compression spring 64 which tends to force the plunger 61 inwardly against the surface of the column 12; and when the flask 14 has descended to the proper distance, said plunger 61 will enter a small cylindrical recess 65 drilled in the side of said column, thereby arresting further movement of the upper flask 14. Normally, unless it is desired to arrest the movement of the upper flask 14, the plunger 61 is prevented from entering the said aperture 65 by a fixed pin 66 set into the face of the lug 19, the outer end of said pin engaging the inner face of a head 67 secured on the end, or forming a part, of the stem 62. An aperture 68 is drilled at one side of said head 67 so that when desired the stem can be turned to bring said aperture 68 into register with the pin 66 so as to permit the plunger 61 to be moved inwardly by the spring 60 into the recess 65.

After the flasks 14 and 15 have been locked against further vertical movement, by reason of the locking device just described, the movement of the outer sleeve piston 40 is thus arrested, and, as fluid continues to enter the cylinder, the ram 47 moves upwardly carrying with it the mold-supporting plate 50 and the lower and upper parts of the completed mold resting thereon. Finally after the ram has elevated the mold sufficiently to expose the mold-supporting plate 50 above the upper edge of the flask 14, the control handle 53 is moved back to normal and the completed mold can be removed.

Subsequently, by means of the handle 53, the fluid is exhausted from the lower end of the cylinder and the plunger 61, having been withdrawn, the flasks are permitted to return to their normal positions, as shown in Figs. 1 and 3.

In view of the fact that the described details of construction may be modified considerably, without sacrifice of efficiency or losing the benefits of the invention, it will be understood that the embodiment herein described is intended to be merely illustrative of one application of my invention, the scope of which should be determined by reference to the appended claims.

I claim—

1. In a molding machine, the combination of vertically extending guiding means, an upper and a lower flask vertically movable along said guiding means, a pattern capable of being interposed between and vertically movable with said flasks, a pulley rotatably supported above the upper flask, a flexible, substantially inextensible member trained over said pulley and having its ends respectively secured to the upper and lower flasks, a presser member stationarily supported above the upper flask and adapted to enter the upper end thereof, means for raising the lower flasks whereby said upper

flask is correspondingly depressed, a vertically movable pressure plate adapted to enter the bottom end of said bottom flask, means for raising said pressure plate, and means for locking said upper flask against movement whereby movement of said pressure plate becomes effective to discharge a completed mold.

2. In a molding machine, the combination of a movable upper flask, a movable lower flask, guiding means for causing said flasks to move vertically, means linking said flasks together to cause the same to move in opposite directions when the lower flask is raised or lowered, a piston for moving said lower flask, a pressure plate forming the bottom of said lower flask, a second piston for moving the said pressure plate in said lower flask, and cylinder means for containing a supply of pressure fluid acting simultaneously on said pistons.

3. In a molding machine, the combination of a movable upper flask, a movable lower flask, guiding means for causing said flasks to move vertically, means linking said flasks together to cause the same to move in opposite directions when the lower flask is raised or lowered, a piston for moving said lower flask, a pressure plate forming the bottom of said lower flask, a second piston for moving the said pressure plate in said lower flask, cylinder means for said pistons, and a single conduit for conducting a supply of pressure fluid to or discharging the same from said cylinder means simultaneously.

4. In a molding machine, the combination of a movable upper flask, a movable lower flask, guiding means for causing said flasks to move vertically, means linking said flasks together to cause the same to move in opposite directions when the lower flask is raised or lowered, a piston for moving said lower flask, a pressure plate forming the bottom of said lower flask, a second piston for moving said pressure plate in said lower flask, cylinder means for said pistons, a single conduit for conducting a supply of pressure fluid to or discharging the same from said cylinder means simultaneously, and means for controlling the flow of pressure fluid into or out of said conduit.

5. In a molding machine, the combination of a vertically movable lower flask, an upper flask mechanically linked to said lower flask to move in unison therewith but in reverse direction, a pressure plate constituting a movable bottom for said lower flask, a cylinder, and a pair of pistons telescopically mounted in said cylinder and connected, one to the lower flask and the other to said plate.

6. In a molding machine of the class described, the combination of a pair of vertical guide columns, a pair of molding flasks mounted to slide vertically along said columns, a cap piece supported by said

columns, a pulley mounted on said cap piece, a belt passing over said pulley and having its ends respectively connected to the flasks, a presser depending from said cap piece and adapted to enter the upper end of the upper flask, means for locking said upper flask against vertical movement, a pressure plate mounted to move vertically in and constitute a bottom closure for said bottom flask, a vertical cylinder beneath said bottom flask and having an annular piston therein connected to said bottom flask, and an inner piston member slidably mounted in said first piston member and operable upon by the fluid in said cylinder and connected to said pressure plate.

JOHN MICHELE.

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