(No Model.) 2 Sheets—Sheet 1.

W. B. STERRIT.

MOLDING MACHINE.

No. 491,273. Patented Feb. 7, 1893.

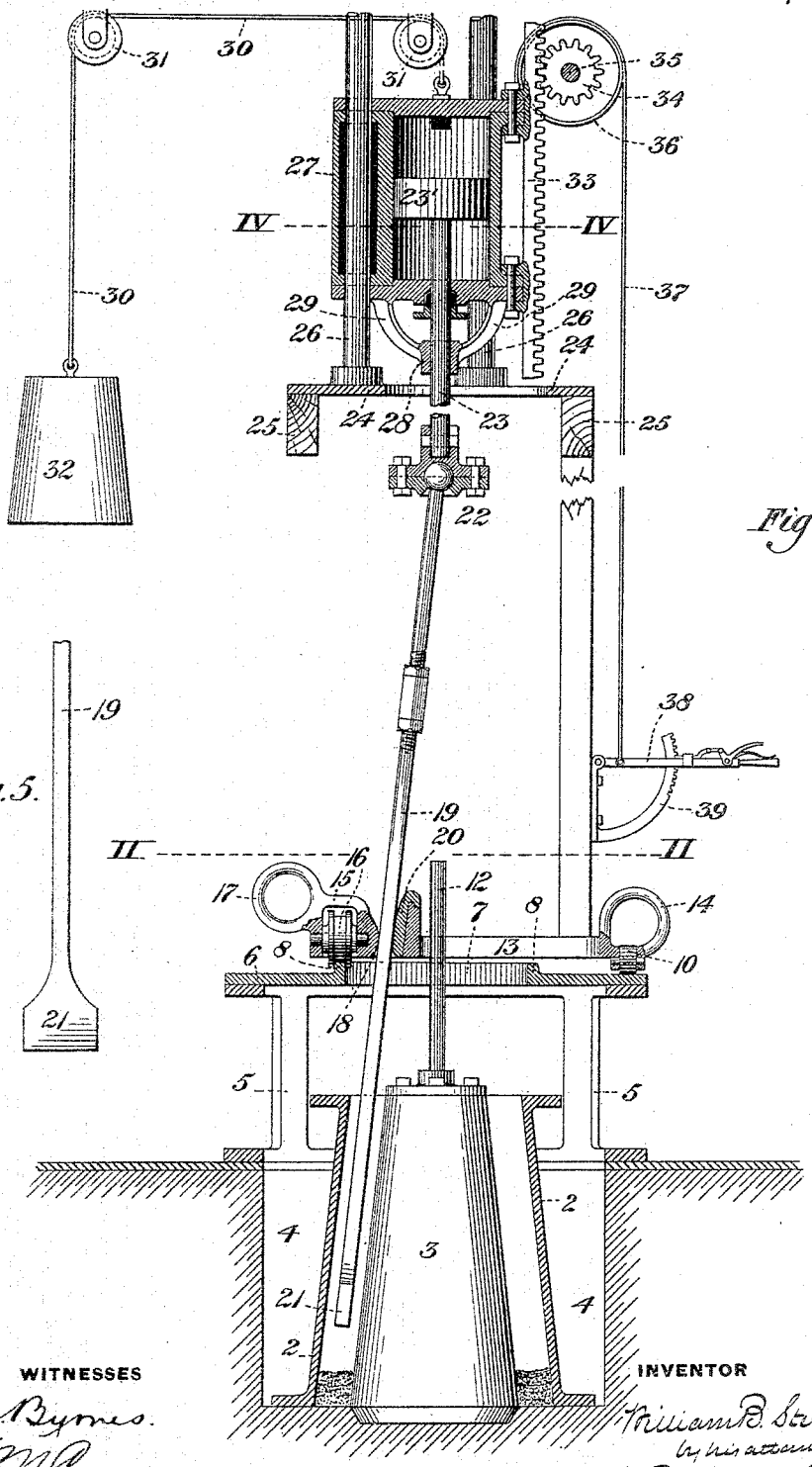

Fig. 1.

Fig. 5.

WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

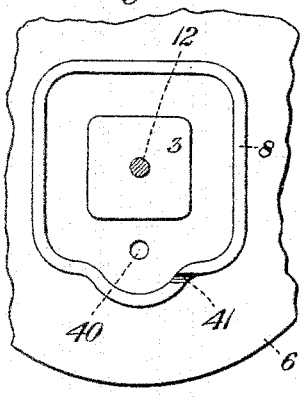


Fig. 2.

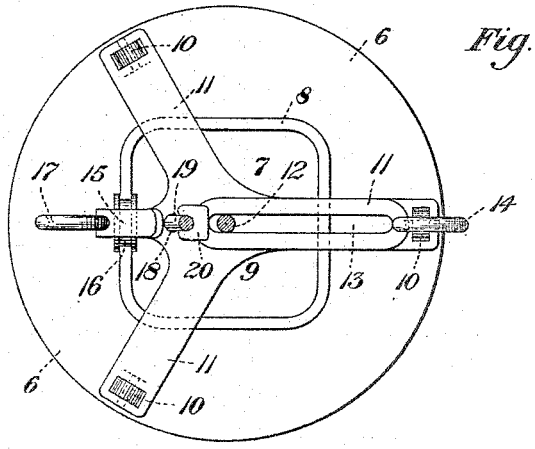


Fig. 4.

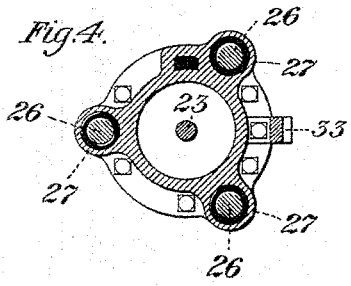
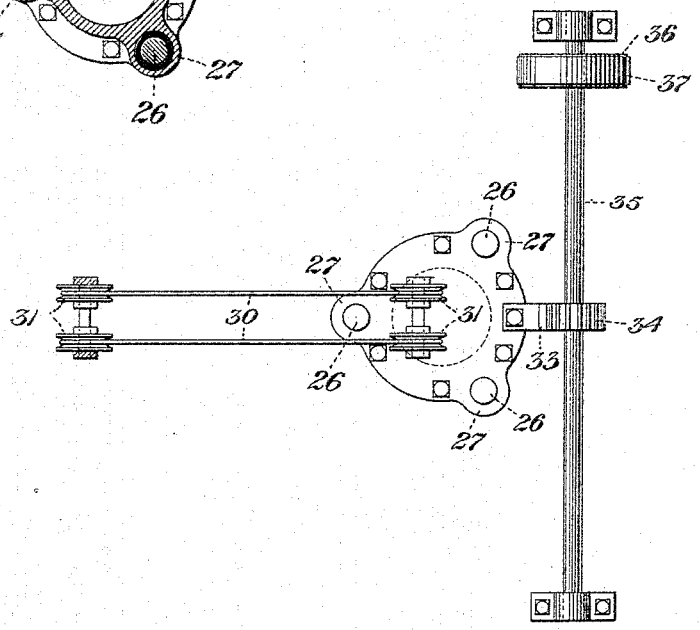


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM B. STERRIT, OF PITTSBURG, PENNSYLVANIA.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 491,273, dated February 7, 1893.

Application filed March 21, 1892. Serial No. 425,683. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. STERRIT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Molding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, of my improved molding machine. Fig. 2 is a horizontal section on the line II—II of Fig. 1. Fig. 3 is a top plan view of the cylinder and its connections. Fig. 4 is a horizontal section on the line IV—IV of Fig. 1. Fig. 5 is a face view of the rammer; and Fig. 6 is a top plan view of a modification of the mold-plate.

Like symbols of reference indicate like parts in each.

My invention relates to those machines which are employed for the tamping of sand into flasks in the formation of molds, and it consists in a vertically adjustable motive cylinder whose piston rod is connected at its lower end with a rammer and actuates the same, the cylinder being so arranged that it will rise automatically and adjust itself to the height of the sand in the mold.

It also consists in a movable carriage set upon the top of the mold and arranged to guide the rammer to the various portions of the matrix during its reciprocation; as well as in the construction and arrangement of the parts as hereinafter more fully described and set forth in the claims.

In the drawings, 2 indicates the flask, and 3 a pattern placed therein, the flask being located in a pit 4 in the foundry floor, and a frame 5 surrounding said pit and carrying a top-plate 6. This top plate is provided with a central aperture 7, and a raised rim or flange 8 surrounding said aperture, this rim being of the same size and shape as the top of the flask in which the mold is formed. Upon the top plate rests the carriage 9 of the form shown in Fig. 2, having three supporting-rollers 10 which rest upon the surface of the plate 6. This carriage is of skeleton form, and the rollers are carried at the outer ends of three radiating arms 11. One of these arms is slotted at 13, and through this slot passes a guiding-stem 12 which extends upwardly from the center of the pattern, while at the outer end of the arm, over the roller, a handle in the form of a rigid ring 14 is provided. A short extension 15 between the other two arms carries a guiding-wheel 16, which rides upon the rim 8 and is held thereon by its side flanges. This extension carries another handle 17 and is provided with a hole 18 for the passage of the rammer rod 19, this hole having convex curved sides as shown, to allow play in the movements of the rammer and prevent binding thereof. As the most of the wear comes upon the inner edge of this hole, a lining piece 20 is removably inserted therein, this piece being replaced by a new lining when worn. The rammer rod carries the rammer 21 at its lower end, and at its upper end is joined by a ball-and-socket joint 22 to the piston-rod 23 projecting from the piston 23′. Below this joint the rod is divided and the two parts are joined by a screw-threaded sleeve engaging right and left handed screw-threads at the ends of the two parts of the rod, as shown in Fig. 1. The piston-rod passes through an apertured plate 24 supported upon suitable standards 25, and this plate bears three vertical guide-rods 26, which pass through cylindrical projections 27 cast integral with the cylinder and through registering holes in the cylinder heads. The lower head of the cylinder carries beneath it a guide 28 supported by arms 29 and movable with the cylinder, while to the upper head of the cylinder are secured the cords 30 passing over the pulleys 31 and supporting a counterweight 32. Upon one side of the cylinder is bolted a rack 33, which engages a pinion 34 carried upon a shaft 35 which bears a brake-wheel 36, over which passes the brake-band 37; this band being connected at its lower end to the pivoted lever 38, having a spring catch arranged to engage slots in the curved bar 39.

The operation of the device is as follows:—The brake being set and sand filled gradually into the mold through the side apertures of the frame, the piston is reciprocated and the rammer accordingly actuated. By the handles 14 and 17 the carriage and the rammer are moved around the pattern to the various parts of the mold. As the sand rises the brake is momentarily released, upon which

the counterweight raises the cylinder and rammer, when the brake is again set and the operation continued. It is evident that the counterweight may be so arranged as to gradually raise the cylinder as the sand rises in the mold.

In Fig. 6 I show a modification of the top plate for the mold for use when the side of the mold has an outward bend to make sufficient thickness of sand for the sprue 40. In this case the flange 8 is of the same form as the top of the flask, but a slot 41 is provided so that after the wheel has run around the rim of the plate and rammed the sand between the sprue and mold, it can be run through the slot off the plate, the carriage then resting upon its three casters, the rammer being guided between the sprue and the pattern. The ball and socket joint allows the rammer to move freely to the various parts of the mold, and the wheel 16 preserves the rammer in the annular space between the flask and pattern.

It is apparent that wide variations may be made in the form and arrangement of the parts. Thus the pinion may be placed upon the cylinder and the rack be stationary. A single cord may be used to support the weight. A pawl and ratchet may be used to hold the cylinder in its various positions; and many other modifications will suggest themselves to those skilled in the art without departure from the invention claimed.

The advantages of my invention are obvious. The device is simple, positive in all its movements and not liable to get out of order, while its operation is efficient in the highest degree, all hand work being obviated.

What I claim is:—

1. In a molding machine for deep molds, a vertically movable cylinder, a rammer having a flexible connection with the piston rod of said cylinder, and guides on which the cylinder is arranged to rise automatically as the sand rises in the mold; substantially as and for the purposes described.

2. In a molding-machine, the combination of a vertically movable motive-cylinder having suitable guides, a counterweight connected to the cylinder, and a rammer having a flexible connection with the piston-rod of said cylinder; substantially as described.

3. In a molding-machine, the combination of a vertically movable motive-cylinder having a rack and pinion connection, a brake arranged to check the vertical movement of the cylinder, and a rammer connected to the piston-rod of said cylinder; substantially as described.

4. In a molding-machine, the combination of a vertically movable motive-cylinder, means for allowing the same to rise as the sand rises in the mold an apertured guide fixed to and carried beneath the cylinder, and a rammer having a flexible connection with the piston-rod of the cylinder, which rod passes through the guide; substantially as described.

5. In a molding-machine, the combination of a motive-cylinder, means for moving the same vertically, a rack fixed to the side of the cylinder and engaging a pinion, a brake upon the pinion-shaft, and a rammer connected to the piston-rod of the motive-cylinder; substantially as described.

6. In a molding-machine, the combination of a motive-cylinder, means for moving the same vertically, a rammer connected to the piston-rod of said cylinder by a ball and socket joint, and a guide for the rammer above the top of the mold; substantially as described.

7. In a molding-machine, the combination of a rammer, means for vertically reciprocating the same, and an independently supported guide through which the rammer passes, said guide arranged to be moved over the various parts of the mold; substantially as described.

8. In a molding-machine, the combination with the mold, of a rotary carriage mounted thereover, a rammer flexibly connected to an actuating part, a guiding aperture in the carriage through which the rammer passes, and means for reciprocating said rammer; substantially as described.

9. In a molding-machine, the combination with the mold, of a rotary carriage mounted thereover, a pattern having a stem passing through a slot in the carriage, a guiding aperture in the carriage through which the rammer passes, and means for reciprocating the rammer; substantially as described.

10. In a molding machine, the combination with the mold, of a plate having an aperture and an encircling flange of substantially the same shape as the mold, and a carriage having a wheel arranged to ride upon the flange, and having a guiding aperture for the rammer; substantially as described.

In testimony whereof I have hereunto set my hand this 11th day of March, A. D. 1892.

WILLIAM B. STERRIT.

Witnesses:
W. B. CORWIN,
H. M. CORWIN.