

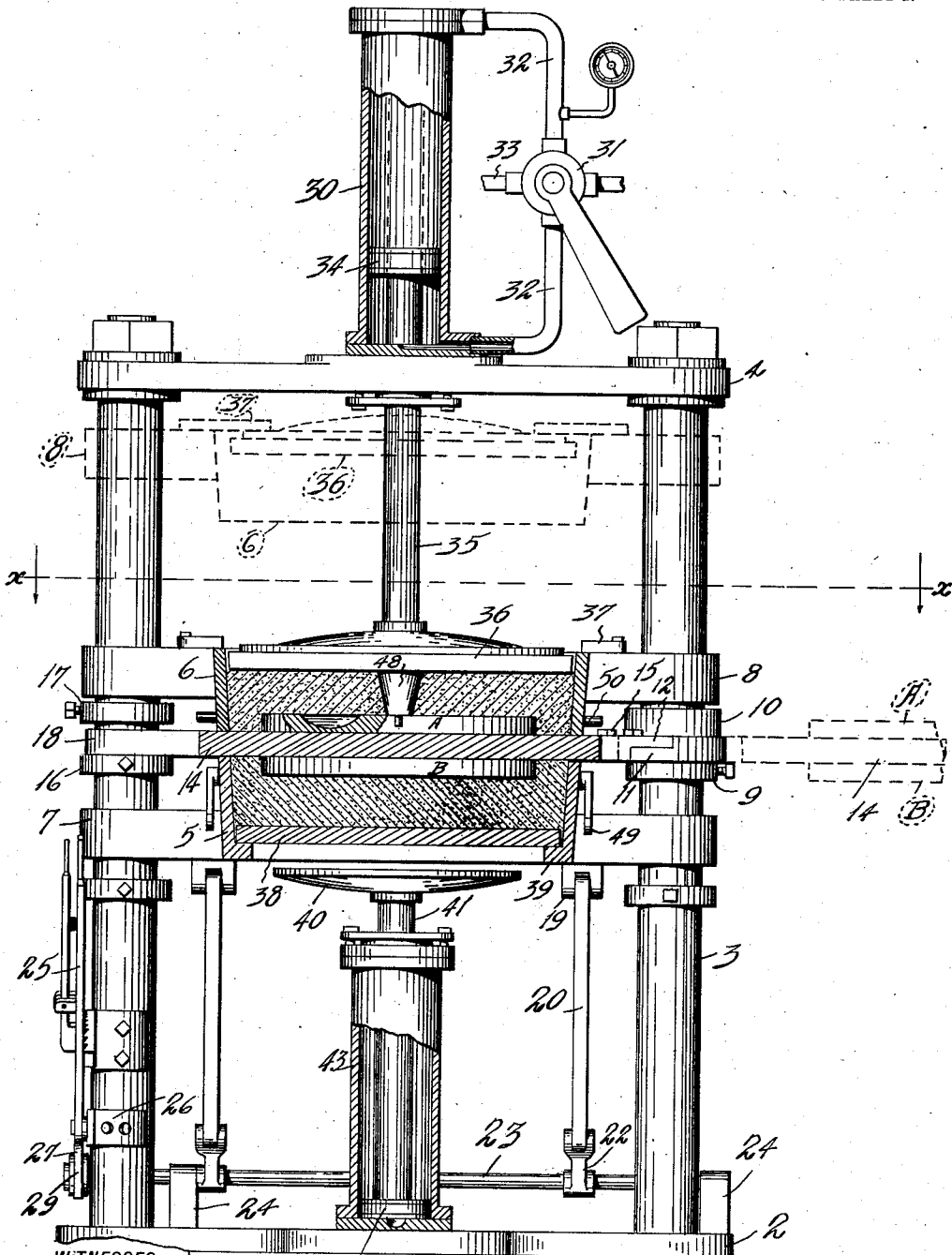
H. MacKAY.
MOLDING MACHINE.

APPLICATION FILED OCT. 16, 1911.

1,021,938.

Patented Apr. 2, 1912.

2 SHEETS-SHEET 1.



WITNESSES:
J. B. Bowling
W. S. Castle

Fig. 1.

INVENTOR
Hugh Mackay.
BY
Jack A. Schley
ATTORNEY

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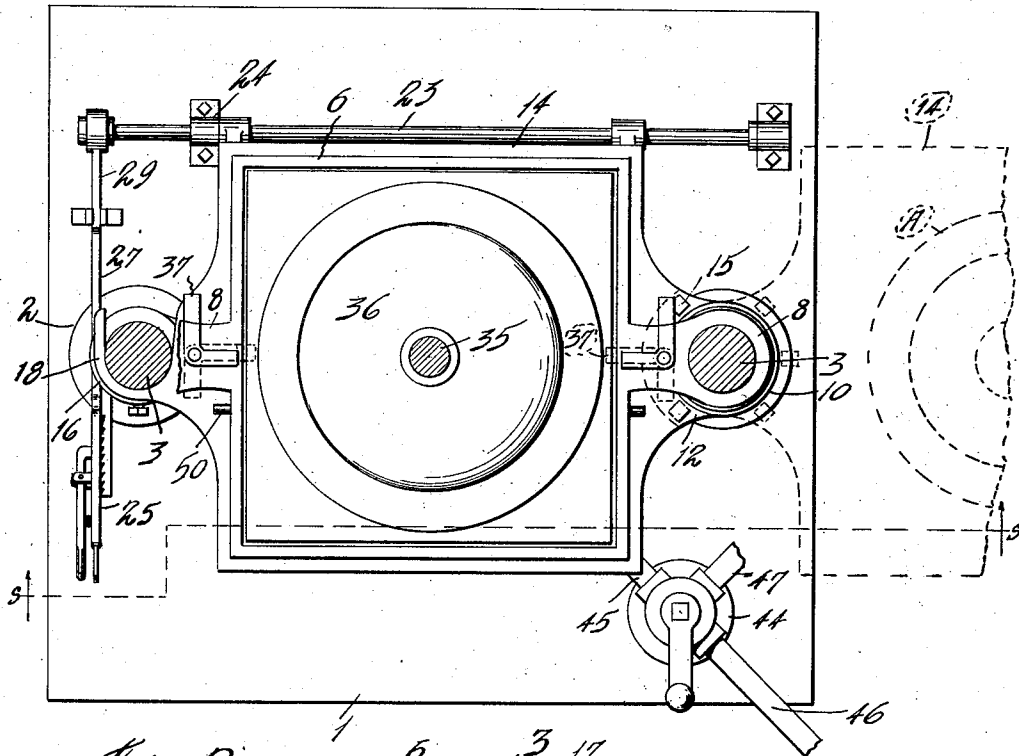
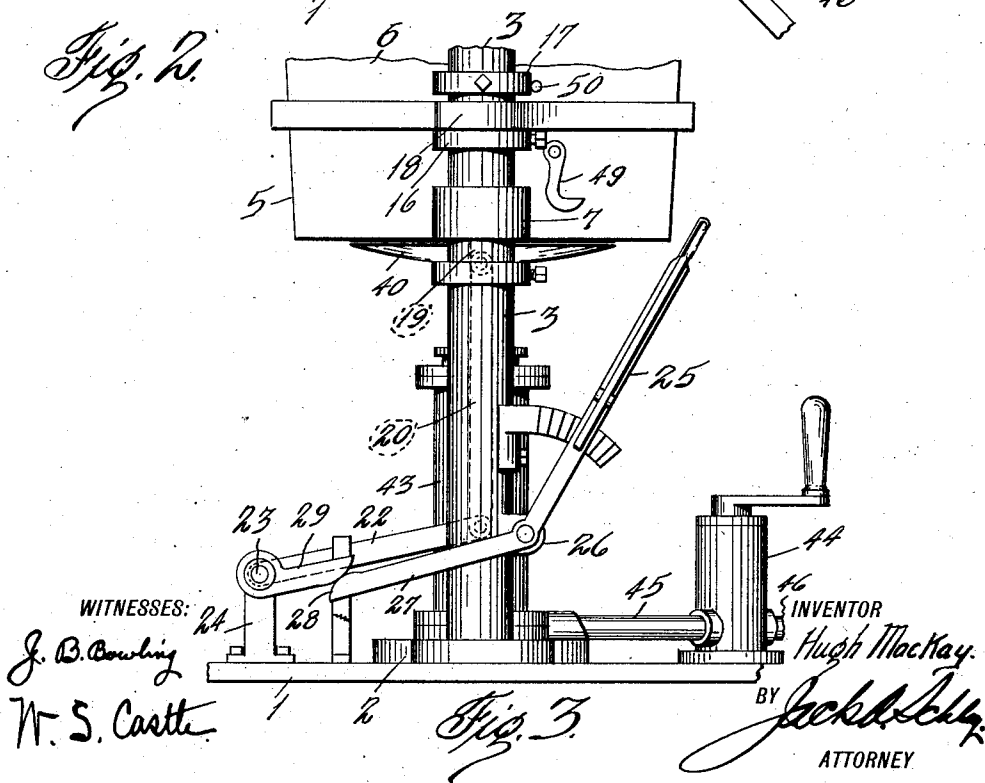


Fig. 2.



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J. B. Bowling
W. S. Castle

Fig. 3.

INVENTOR
Hugh Mackay
BY *Jack A. Schley*
ATTORNEY

UNITED STATES PATENT OFFICE.

HUGH MacKAY, OF DALLAS, TEXAS.

MOLDING-MACHINE.

1,021,938.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed October 16, 1911. Serial No. 654,825.

To all whom it may concern:

Be it known that I, HUGH MacKAY, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

This invention relates to molding machines and particularly to machines for forming molds for casting.

The object of the invention is to provide a machine having oppositely movable mold frames mounted above and below a laterally movable pattern support, each frame having its walls integral and without joints.

Among other features are the provision, of a molding plunger and a pressure cylinder for raising and lowering the same; a mold raising plunger for raising the completed mold from the frame and a pressure cylinder for operating said plunger; mechanism for raising and lowering the lower frame; means for fastening the upper frame against upward movement when the mold is removed; and devices arranged to connect the molding plunger and the upper frame when it is desired to raise the same or to be thrown out of operation when it is desired to raise the molding plunger and not the upper frame.

A still further object is to provide a machine of the character described that will be strong, durable and efficient, simple and comparatively inexpensive to construct, easily and expeditiously operated, also one in which the several parts will not be likely to get out of working order.

With the above and other objects in view the invention has relation to certain novel features of construction and operation, an example of which is described in the following specification and illustrated in the accompanying drawings, wherein:

Figure 1 is a vertical sectional view on the line *s-s* of Fig. 2 with certain parts partially in section and partially in elevation. Fig. 2 is a horizontal cross sectional view on the line *x-x* of Fig. 1, and Fig. 3 is a partial end elevation.

In the drawings the numeral 1 designates a base plate on which a longitudinal base member 2 is provided. At each end of the base member vertical cylindrical standards 3 are mounted. These standards are connected at their upper ends by a longitudinal crosshead 4 secured thereon. Between

the standards a lower molding frame 5 and an upper molding frame 6 are provided. These frames are shaped substantially the same as the members of an ordinary flask except that they are not hinged. At each side the frame has at its lower portion an ear 7. The frame 6 has similar ears 8 projecting from its sides at the upper portion. These ears embrace the standards whose surfaces are smooth so as to permit the ears to slide freely thereon.

On one of the standards between the ears 7 and 8 a collar 9 is adjustably fastened and supports a collar 10 arranged to be rotated about the standard. The collar 10 has a curved flange 11 reduced in thickness and receives a correspondingly shaped flange 12 provided at one side of a pattern support or plate 14 disposed horizontally of the machine. The said flanges are secured together by screws 15. By this arrangement the pattern support may be disconnected from the collar 10 and other supports substituted. On the other standard collars 16 and 17 are adjustably secured while the adjacent end of the pattern support has an integral hook 18 adapted to engage about said standard as is best shown in Fig. 2. The collar 16 is horizontally alined with the collar 9 and supports the hook. The collar 17 has its upper surface in horizontal alinement with the upper surface of the collar 10, said collars forming stops and limiting the downward movement of the upper frame 6 when the pattern support is swung from between the frames.

As shown in the drawings the pattern support fits between the frames 5 and 6 and the latter contacts therewith. Patterns A and B are suitably fastened to the upper and under sides of said support so as to project into the frames in proper position. It is apparent that various patterns may be secured to the support and other supports having patterns thereon may be substituted by removing the screws 15.

It is apparent that before the pattern support can be swung laterally and thus withdrawn from between the frames, the lower frame 5 must be lowered and the upper frame 6 raised in order to permit the patterns to clear said frames. From each ear 7 adjacent the frame 5, lugs 19 depend and pivotally receive the upper ends of vertical links 20. These links have their lower ends pivoted to the outer ends of arms

22 which latter extend forward and incline upward from a rock shaft 23 on which they are fixed. This shaft is mounted in bearings 24 at the rear of the base plate 1.

By rocking the shaft 23 the arms are swung and the links raised and lowered and in this way the frame 5 is raised and lowered. For rocking the shaft a lever 25 is provided and pivoted on a bracket 26 secured to one of the standards. This lever has a portion 27 extending rearwardly at an angle thereto and terminating in a boss 28. An arm 29 fixed on the end of the shaft 23 has its outer end rounded and bearing on the boss. When the lever 25 is swung forward the portion 27 will be swung upward and through its boss swing the arm 29 upward thereby rocking the shaft 23. This movement will raise the frame 5. When the lever 25 is swung inward the portion 27 will be swung downward and the frame 5 will lower itself by its own weight thereby returning the parts to the first position.

At the center of the cross head 4 a pressure cylinder 30 is mounted and extends upward. A suitable valve 31 is supported adjacent the cylinder and is provided with branch pipes 32 leading the upper and lower ends of the cylinder and is also provided with an outlet or exhaust pipe 33. This valve is of ordinary construction and forms no particular part of the invention. A plunger head 34 is mounted in the cylinder and secured on the upper end of a plunger rod 35 which passes down through the cross head. On the lower end of the plunger rod a molding head 36 is secured. The molding head is of such size as to pass into the frame 6 but not entirely through the same.

It is obvious that when fluid under pressure is admitted to lower end of the cylinder 30 below the plunger head, the plunger will be elevated and when said fluid is admitted to the cylinder over the plunger head the plunger will be forced downward. When it is desired to elevate the frame 6 the plunger is lowered so that the head 36 will project into said frame. Latches 37 pivoted on the ears 8 and normally out of the path of the head 36 are swung over said head so that when the plunger is elevated, the frame 6 will be elevated as shown in dotted lines in Fig. 1.

For supporting the mold a pallet 38 is provided for each mold. At the bottom of the frame 5 an inwardly directed flange 39 is provided and forms a support for the pallet. As in the ordinary flask the frames 5 and 6 are flared upward and the pallet may be elevated through both frames when it is desired to remove the mold. For elevating the pallet a raising or elevating plunger is provided. This plunger comprises a support 40 fixed on the upper end

of a plunger rod 41 which carries at its lower end, a plunger head 42 working in a pressure cylinder 43 mounted on the base member 2. For controlling the supply of fluid to the cylinder a suitable valve 44 is mounted on the base 1 and has connection with the lower end of the cylinder by means of a pipe 45. Fluid is supplied to the valve by a pipe 46 and exhausted therefrom by a pipe 47.

The operation is as follows: Assuming that the frame 5 is lowered and the frame 6 elevated as shown in dotted lines in Fig. 1 and the pattern support 14 swung to one side as shown in dotted lines in Figs. 1 and 2, the machine is ready to receive the molding sand. The pallet 38 having been placed in the frame 5, sand is then deposited in said frame in the required quantity. The proper patterns A and B having been secured to the support 14 the latter is swung into position. The valve 31 is then operated to lower the molding plunger which carries the head 36 and whereby the frame 6 is lowered on to the pattern support. The latches 37 are swung out of the path of the head 36 and the latter elevated. The frame 5 is now raised by swinging the lever 25 and the pattern B forced into the sand. After this is accomplished sand is placed in the frame 6 and the molding head 36 lowered to compress the sand about the pattern A, a plug 48 having first been placed on the pattern A. It will be noted that there is a small space between the collars 16 and 17 and should the pattern support be raised when the lever 25 is swung to raise the frame 5 and the pattern B not being entirely forced into the sand, it will be understood that when pressure is applied by the head 36 both frames will be forced in contact with the pattern support and the patterns properly embedded in the sand. After the mold has been formed the frame 5 is again lowered, the latches 37 are again swung over the head 36 and the frame 6 elevated. The two halves of the mold are thus separated and the pattern support is free to be swung to one side and thus withdrawn. The next step is to lower the frame 6 and then raise the frame 5 so that said frames are in contact. The latches 37 are thrown back and hooks 49 mounted on the frame 5 are swung up and engaged over pins 50 projecting from the frame 6 thereby locking the frame together and fastening the frame 6 against movement upward. The head 36 is then raised. The mold is now ready to be removed. The valve 44 is operated to supply fluid under pressure to the cylinder 43 whereby the plunger head 42 is elevated. This brings the support 40 into engagement with the pallet 38 and continued upward movement of the plunger elevates the pallet and mold through the

frame until said pallet is above the frame 6 when the mold and pallet may be removed from the machine. The plunger head 42 is then lowered and the machine is in position 5 for forming another mold.

What I claim, is:

1. In a molding machine, a pair of standards, upper and lower mold frames disposed between the standards and slidable 10 thereon, a molding plunger over the upper frame, a molding head mounted on the plunger, and latches carried by the upper frame arranged to be swung into the path of the molding head.

15 2. In a molding machine, a pair of vertical standards, upper and lower mold frames slidable on the standards, a horizontal pattern support hinged on one of the standards and provided with a hook engaging the 20 other standard, patterns mounted on the upper and lower sides of the pattern support, an internal flange provided at the bottom of the lower frame, a pallet resting on said flange, a pressure cylinder mounted 25 below the lower frame between the standards, a raising plunger working in the cylinder and having a support at its upper end under the pallet, links depending from the lower frame, a rock shaft, arms fixed on the 30 rock shaft and pivoted to the links, a lever

device for rocking said shaft, a cross head mounted on the standards, a second pressure cylinder mounted on the cross head, a plunger working in the second cylinder and having a rod extending down through the cross 35 head, a molding head mounted on the lower end of the rod of the plunger, and latches carried on the upper frame arranged to be positioned in the path of the molding head.

3. In a molding machine, a pair of vertical 40 standards, upper and lower mold frames slidable on the standards, a pattern support mounted on one of the standards and arranged to swing between the mold frames, a pallet supported in the lower mold frame, 45 a plunger head under the pallet and free therefrom, an upper plunger movable vertically over the upper mold frame and free therefrom, said upper plunger having a head adapted to enter the upper mold frame, 50 and latches mounted on the upper mold frame and arranged to be swung into the path of the upper plunger above its head.

In testimony whereof I have signed my name to this specification in the presence of 55 two subscribing witnesses.

HUGH MacKAY.

Witnesses:

CHRISTINA MacKAY,
JACK A. SCHLEY.