R. S. BUCH.

MOLDING MACHINE.

APPLICATION FILED JULY 19, 1909.

953,894. Patented Apr. 5, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

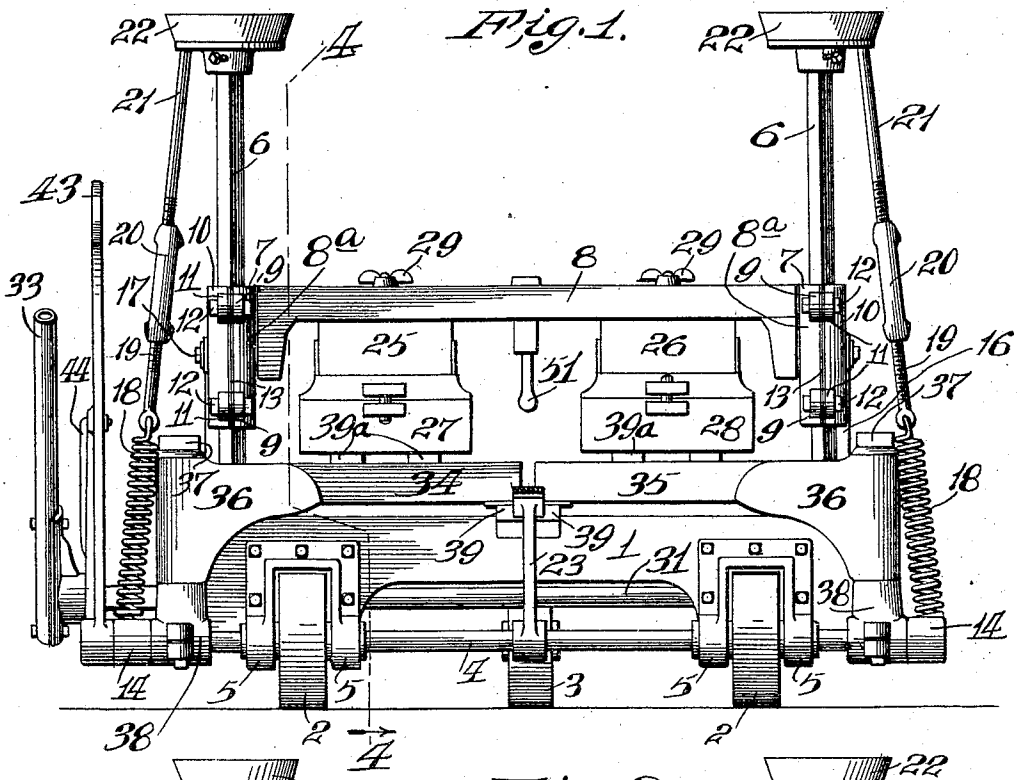
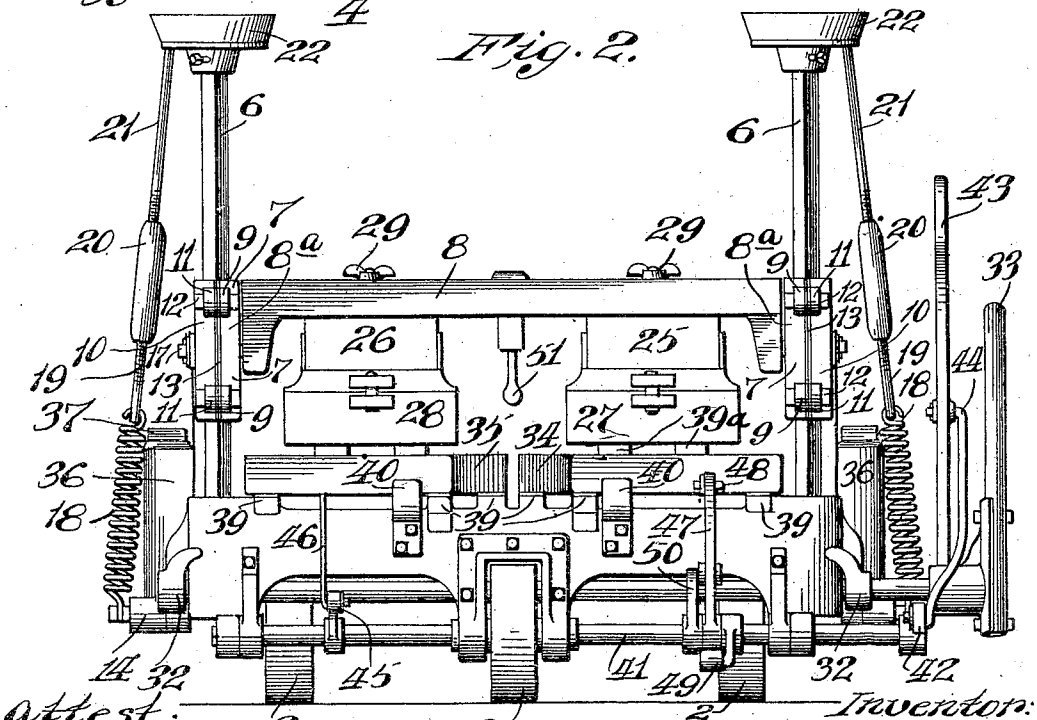


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 4.

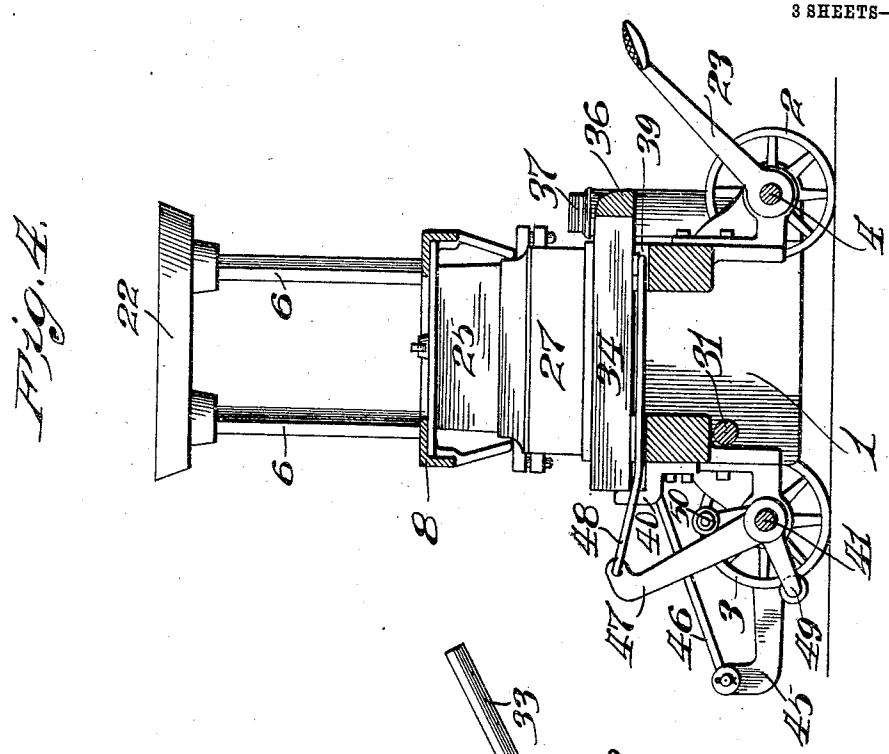
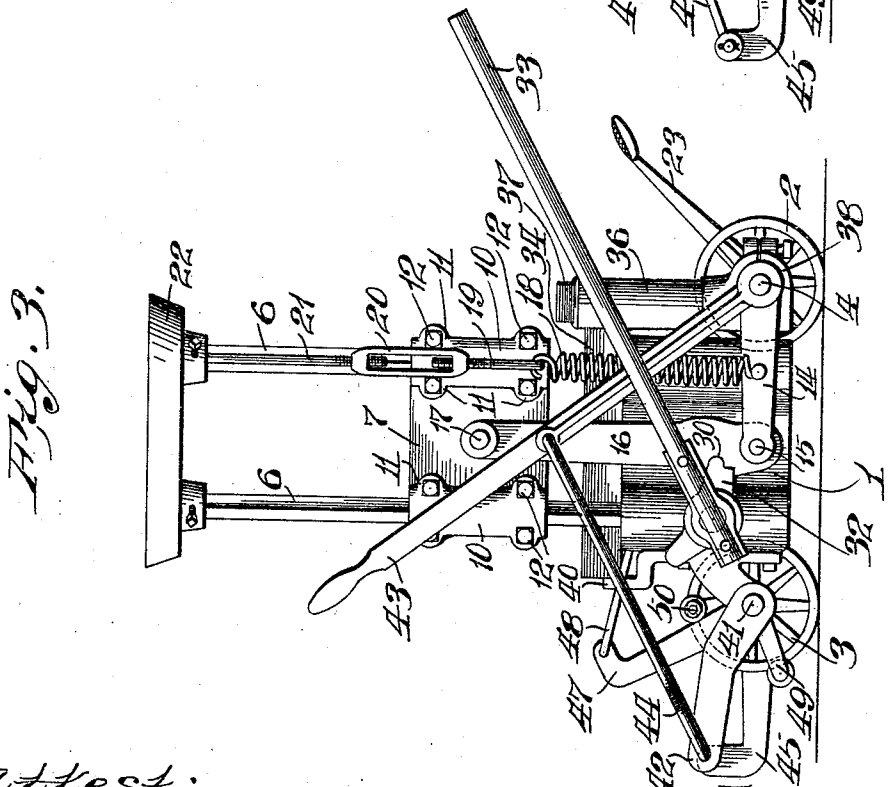


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 6.

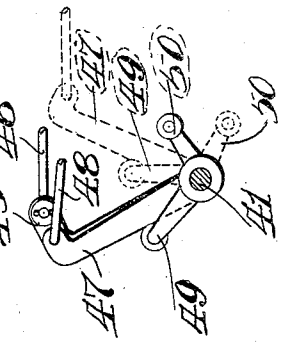


Fig. 7.

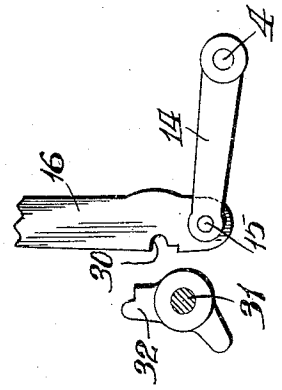
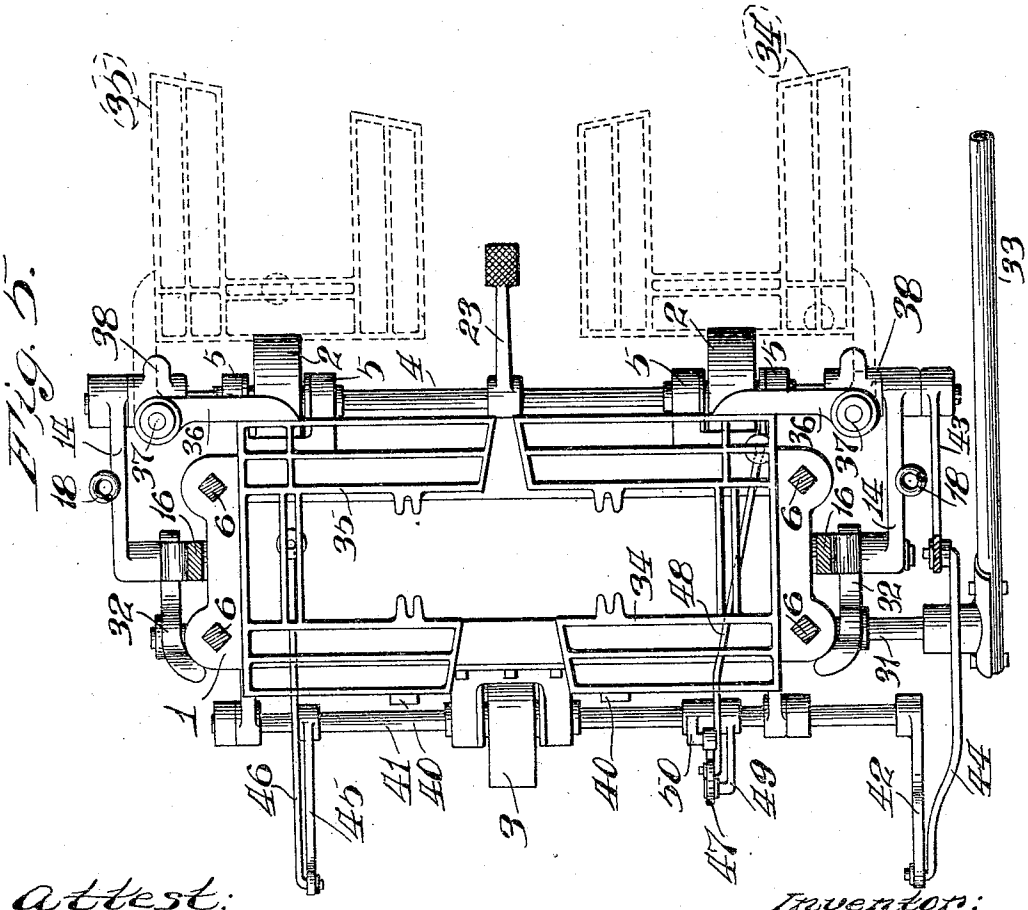


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROYER S. BUCH, OF ELIZABETHTOWN, PENNSYLVANIA.

MOLDING-MACHINE.

953,894. Specification of Letters Patent. Patented Apr. 5, 1910.

Application filed July 19, 1909. Serial No. 508,484.

To all whom it may concern:

Be it known that I, ROYER S. BUCH, a citizen of the United States, residing at Elizabethtown, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Molding-Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in that type of molding machines which operate by jarring to pack the sand in the flask, and relates particularly to improvements in the molding machine on which Letters-Patent were granted to Dennis Parks, February 2, 1909, No. 911,066.

The present invention has for its object to provide means, preferably in the form of pivoted tables, for receiving and delivering parts of the flask, combined with means for moving the tables, the one in advance of the other; and to provide means for "squeezing" the sand in the flask members and for drawing the pattern from the same.

The invention is illustrated in the accompanying sheets of drawing, in which—

Figure 1 is a view in front elevation of a machine with my improvements applied thereto. Fig. 2 is a view in rear elevation of said machine. Fig. 3 is a view in side elevation. Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1. Fig. 5 is a sectional plan view, the delivery position of the tables being shown in dotted lines. Fig. 6 is a diagrammatic view illustrating the manner of operating a lever-arm which controls the movement of one of the tables, and Fig. 7 is a broken detail view illustrating the operation of the mechanism for "squeezing" the sand in the parts of the flask and for withdrawing the pattern from the sand.

Referring now to the drawings, 1 indicates the base of the machine which is supported on two front wheels 2 and a rear wheel 3. The wheels 2 are mounted on a shaft 4 which is supported in suitable bearings 5 on the base 1. Extending upward from the base 1 at each end thereof are two preferably rectangular standards 6, on each pair of which standards is slidably mounted a head 7, on which the flask-support, or cradle, 8, is pivotally mounted at each end. Each of the heads 7 is formed at opposite ends with a rectangularly grooved boss 8^a adapted to embrace one-half of the standard 6, and is provided at opposite ends with apertured ears 9. A similarly grooved plate 10, having at opposite ends apertured ears 11 is fitted about the other half of each standard 6 so that the apertures of the ears on the head and plate aline, and bolts 12, passed through the respective ears, secure the plates to the head to form with the latter bearings inclosing the respective standards, the construction being the same at each end of the machine. Strips of paper, leather, or the like, 13, are inserted between the head 7 and plates 10, and as the bearings become worn by removing one or more of these strips and drawing up the bolts the bearings may be made to again snugly embrace the standards.

On each end of the shaft 4 is secured a lever 14 which at its inner end is pivotally connected as shown at 15, to an arm 16, which at its upper end is pivotally connected to the head 7 as shown at 17, the pivot 17, or an extension thereof, serving also as a pivot for the flask-support 8, as shown more clearly in Fig. 2. To each of the levers 14, intermediate its ends, is secured the lower end of a strong spiral lift-spring 18, which has a screw-threaded extension 19 engaging a turn-buckle 20, which in turn receives the screw-threaded end of a rod 21 secured at its upper end in a head 22 mounted on and bracing the standards 6. The tension of the springs 18 may be adjusted by turning the turn-buckle 20, as will be understood, and is such that they will tend normally to approximately exactly counterbalance the weight of the cradle 8 with the two parts of the flask thereon containing the sand. A treadle 23 on the shaft 4 is adapted to be pressed down by the foot of the operator to turn the shaft 4 and thereby lift the cradle 8 and the flask thereon to assist in jarring the flask to pack the sand therein, or for elevating the cradle without the flask when the former is to have its position re-

versed to have the cope and drag placed in position thereon.

25, 26 indicate, respectively, pattern supports, the one adapted to receive a pattern for the cope 27, and the other a pattern for the drag 28, of the flask. It will be understood that in this machine the sand is packed about the pattern in the two parts of the flask in one operation, the patterns are simultaneously withdrawn, the cope put upon the drag, the flask removed from the machine and the mold discharged, and that this operation is repeated indefinitely. The two parts of the flask are connected to the pattern supports 25 and 26 in any preferred manner, and the latter are secured to the cradle by rods and thumb-nuts as indicated at 29. Each of the arms 16 is provided on its inner end above its point of connection with the lever 14 with a shouldered recess 30. Extending across the machine from side to side thereof is a shaft 31, and at opposite ends of said shaft are secured dogs 32, each of which has an end shaped to engage the shouldered recess 30, the latter being more clearly shown in Fig. 7. On one end of the shaft 31 is secured a lever 33 which projects outward beyond the front of the machine in a position to be readily grasped by the operator. Fig. 3 shows one extreme position of this lever and dog, that is to say, with the parts in their lowermost position, and Fig. 7 illustrates the position of the dog when the shaft 31 has been turned by the lever 33 to cause the dogs 32 to raise the arms 16 and subsequently pass out of engagement therewith.

34, 35 indicate two tables for receiving the two parts of the flask after packing, as well as for receiving the impact of the sand during the jarring operation. These tables are also utilized for delivering the two parts of the flask from the machine as will hereafter be described. To this end each table is mounted on a strong hinge member 36 which turns about a pintle 37 and is supported on a bearing 38. The tables when in the machine rest upon supports 39 mounted on the top of the base 1, and stops 40 are provided for limiting the inward movement of these tables. In order to manipulate these tables I provide the construction now to be described.

The single rear wheel 3 is mounted on a shaft 41 extending from side to side of the machine at the rear thereof, and on one end of this shaft is secured a crank-arm 42. On the corresponding end of the shaft 4 is loosely mounted one end of a lever 43, and intermediate its ends this lever 43 is pivotally connected to the outer end of the crank-arm 42 by means of a connecting rod 44. Near one end of the shaft 41 there is fixedly secured a crank-arm 45, in the outer end of which is pivotally secured one end of a connecting rod 46, the other end of which is pivotally secured to the under side of the table 35. Near the opposite end of the shaft 41 a lever-arm 47 is loosely mounted, in the outer end of which is pivotally secured a connecting rod 48, the other end of which is pivotally secured to the under side of the table 34. From the construction shown, it will be manifest that the two tables cannot be moved at one time from beneath the cradle, but one table (35) must be moved in advance of the other, both in the outward and return movement of the tables, in order that they may clear each other. As shown and described, the table 35 will be positively operated from the shaft 41, and will move in advance of the table 34. In order to provide for moving the table 34 at the proper time with respect to the movement of the table 35, I secure on the shaft 41 two contact-arm 49 and 50, the contact-arm 49 being adapted, in the turning of the shaft 41, to engage the rear side of the lever-arm 47 to throw the table 34 out, and the arm 50 being adapted to engage the front edge of the lever-arm 47 in the reverse movement of the shaft 41 to return the table to its normal position.

In Fig. 6 the relative position of the contact-arms 49 and 50, with respect to the lever-arm 47, is clearly shown, the full lines indicating the position of the parts described when the contact-arm 49 has been turned by the shaft 41 to engage the lever-arm 47, and the dotted lines showing the relative position of the parts when the said lever-arm has been moved to swing the table 34 outward. The movement of the tables is, of course, effected by throwing the lever 43 toward or from the operator, which movement, through the connecting rod 44 and arm 42, will turn the shaft 41 in one direction or the other. Thus, if the lever 43 be grasped by the operator and pulled toward him, the table 35 will first be moved outward a given distance through the medium of the crank-arm 45 and connecting rod 46. After such movement the contact-arm 49 will be brought into engagement with the lever-arm 47 and the movement outward of the table 34 will begin. The point of connection of the rod 48 with the table 34 is so adjusted, that the shorter movement of the lever-arm 47, as compared with the movement of the crank-arm 45, will operate to complete the movement of the table 34 in either direction coincident with that of the table 35. To effect the faster movement of the table 34, as compared with that of the table 35, the point of connection of the rod 48 with the table 34 is placed nearer to the hinge pintle of the said table 34 than

is the point of connection of the rod 46 with the hinge pintle of the table 35. 51 indicates one member of a clamp device for use in locking the two parts of the flask to the cradle, and for holding removable bottoms on the flasks for retaining the sand therein after jarring and while their position is being reversed. 39^a indicates cleats on the under side of these removable bottoms, and in Figs. 1, 2 and 4 these cleats are shown resting directly on the tables. The bottoms themselves, being within the flask are not shown. The retention device comprises simply a board which is placed under the cleats of both members of the flask and engaged by the clamp 51. The means described for retaining the sand in the flask and for clamping the flasks to their supports are old in the art and form no part of the present invention.

Referring now to Figs. 1 and 2, and assuming that the two parts of the flask have been jarred in the usual manner to effect the packing of the sand therein about the patterns, and the cradle turned over to the positions shown in these figures, the next operation would consist in "squeezing" the sand in the flask which is effected by the operator pressing down on the lever 33, the latter being then in the position shown in Fig. 3. This operation, causing the dogs 32 to force the arms 16 downward, results in pressing the pattern into the sand to better effect the final packing of the same, and the making of a well-formed mold. At this time the clamp is removed from the molds. The next operation would consist in gently raising the cradle 8 to withdraw the pattern from the mold. This is effected by the operator raising the lever 33, the dogs 32 then raising the arm 16, and the heads 7 in this operation moving up on the standards 6 evenly and smoothly and effecting the withdrawing of the pattern with practically no liability of breaking down the mold at any point. After the pattern is withdrawn the operator may then use his foot to press down the treadle 23, which will further raise the cradle 8, when the latter may be turned over in position to have the two parts of the flask again placed on them when the same are ready for making a new mold. After the cradle has been raised, as described above, the operator then grasps the lever 43 and pulls the same toward him, which operation results in moving the tables 34 and 35 outward to the position shown in Fig. 5, the drag being on one table and the cope on the other in a convenient position to be reached by the operator. The latter then lifts the cope from the table 34 and places it on the drag of the table 35 and then places the completed flask on the floor and in the well-known way lifts the flask as a whole from about the molded pattern. The two parts of the flask are next separated and placed over the patterns supported on the cradle 8, sand placed therein and the preceding operations repeated.

It will be understood by those skilled in the art that the type of machine to which my improvements relate is adapted for use with what is known as "snap" flasks, that is, flasks for making small castings, and which are usually of metal and used over and over again for making the same casting, the flask being removed from about the mold before the molding operation.

By moving the lever 43 in the opposite direction to that described above the tables are readily returned to their position beneath the cradle ready to receive the parts of the flask after the jarring operation.

I claim:

1. In a molding machine, in combination with a reciprocable and reversible flask-support, a pair of swinging tables pivotally mounted, respectively, at each side of the machine for receiving and delivering the parts of the flask.

2. In a molding machine, in combination with a reciprocable and reversible flask-support, a pair of swinging tables for receiving and delivering the parts of the flask, and means for operating said tables.

3. In a molding machine, in combination with a reciprocable and reversible flask-support, a pair of swinging tables for receiving and delivering the parts of the flasks, and means for moving said tables into and out of the machine, the one table moving in advance of the other.

4. In a molding machine, in combination with a reciprocable and reversible flask-support, means for depressing said support to compress the sand in the flask and for elevating said support to withdraw the pattern from the flask, and additional means for further raising said support.

5. In a molding machine, in combination with reciprocable heads carrying the flask-support, means for raising said heads comprising arms pivotally connected therewith, said arms having shouldered recesses therein, a shaft having dogs adapted to removably engage in said recesses, a lever for rotating said shaft whereby to depress or elevate said arms, and means for further raising said heads comprising lever mechanism connected to said arms and operated by a treadle.

6. In a molding machine, in combination with a pair of pivoted tables for receiving and delivering the parts of the flask, a shaft having a crank-arm thereon, a rod pivotally connecting said crank-arm and one of said tables, a lever-arm loosely mounted on said

shaft, a rod pivotally connecting said lever arm and the other of said tables, a pair of contact-arms fixedly secured on said shaft and positioned to the front and rear of said lever-arm at adjusted distances therefrom, respectively, and a lever for turning said shaft, whereby one of the tables will move in unison with said shaft in either direction and the other table will be moved in either direction subsequent to the initial movement of the first table by contact of one or the other of said contact-arms with said lever-arm.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROYER S. BUCH.

Witnesses:
I. E. SHOOP,
H. B. HAMILTON.