A. F. ABIGT.

MOLDING MACHINE.

APPLICATION FILED APR. 7, 1920.

1,376,129.

Patented Apr. 26, 1921.

3 SHEETS—SHEET 1.

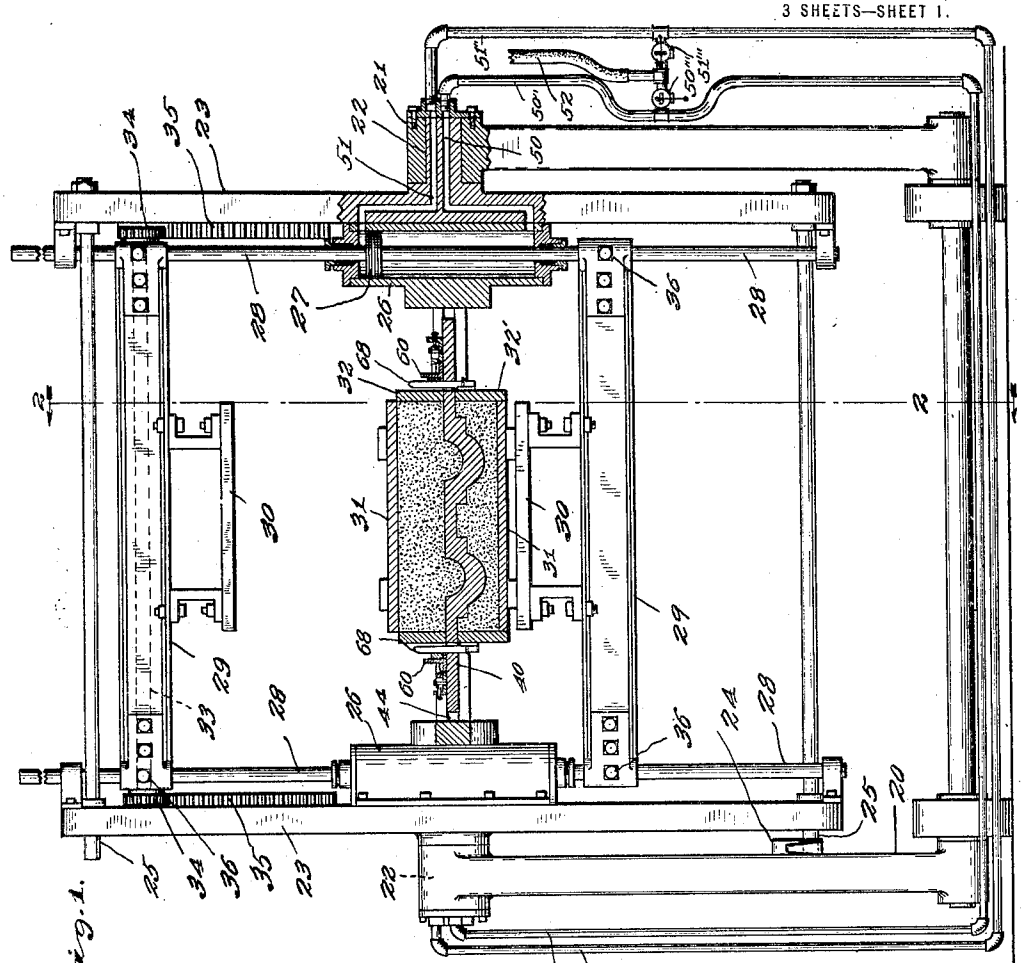


Fig. 1.

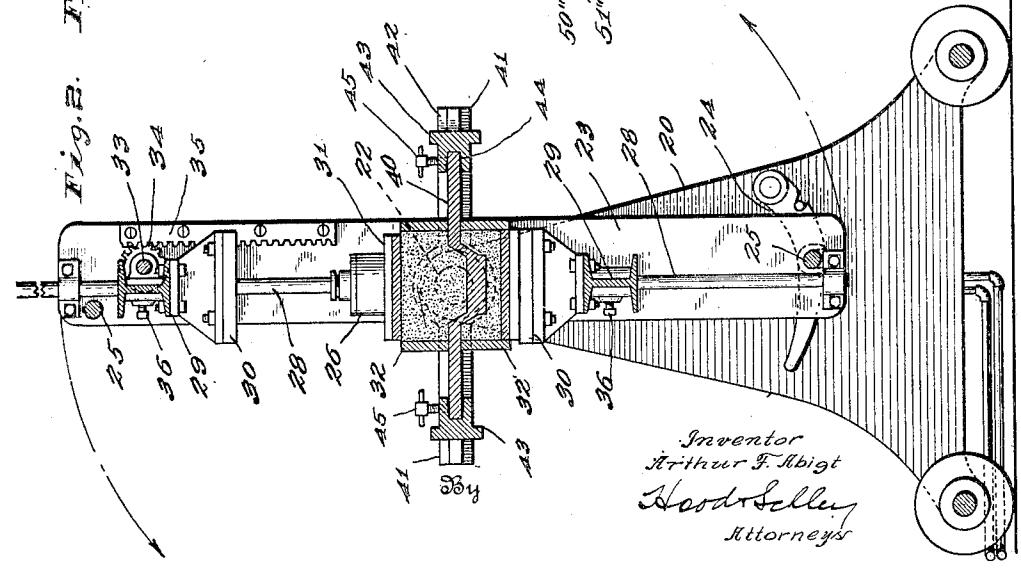


Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3.

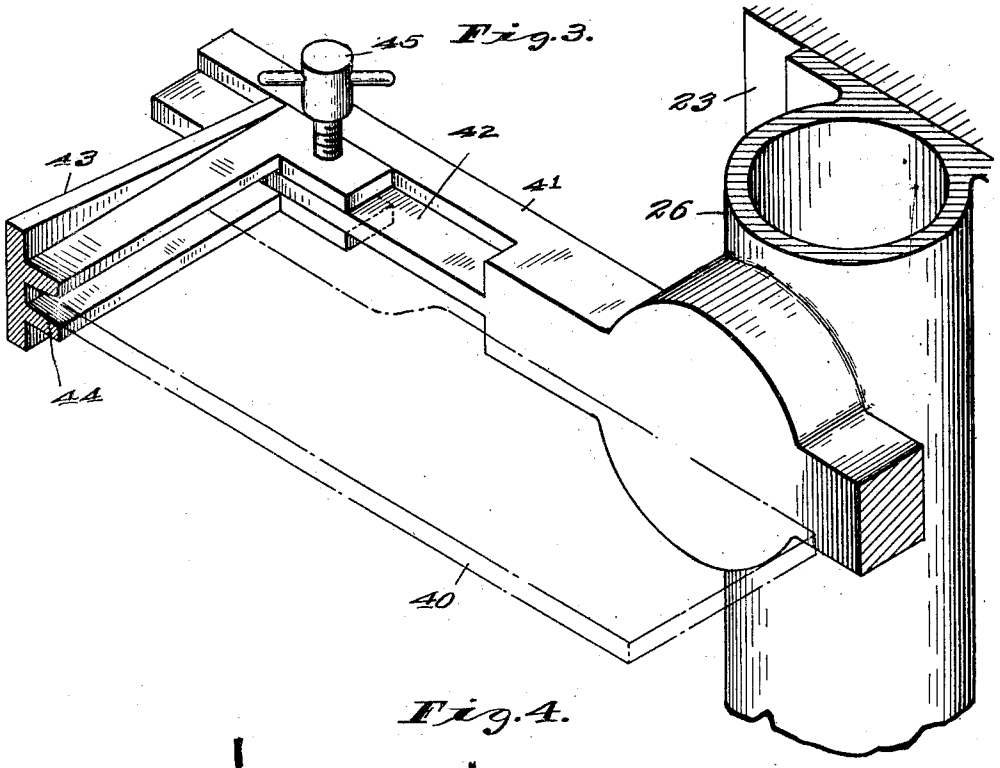


Fig. 4.

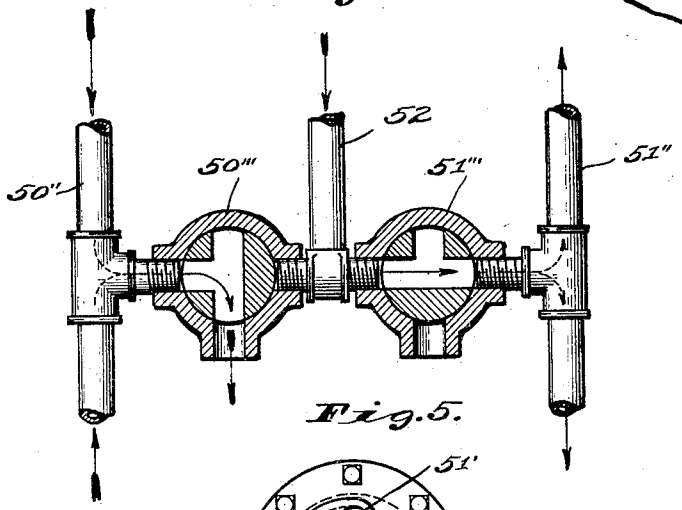
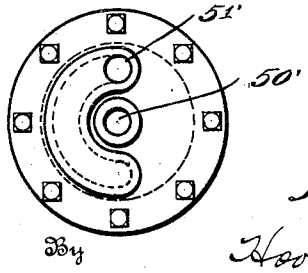


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

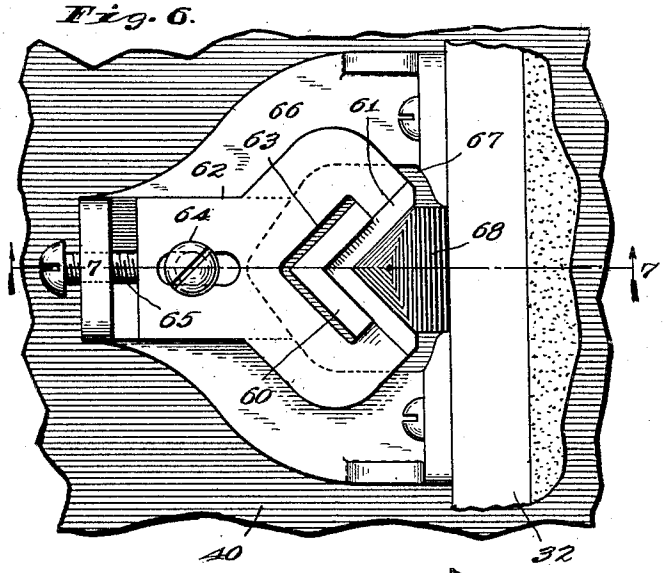


Fig. 8.

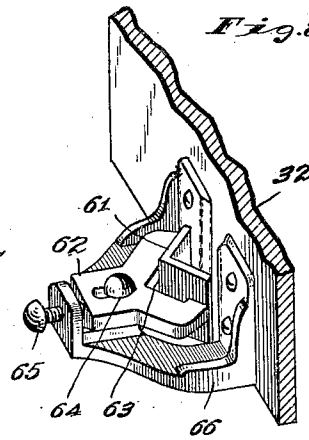


Fig. 9.

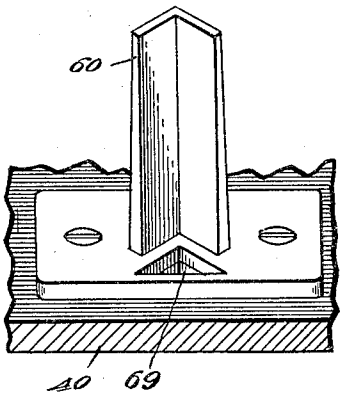


Fig. 7.

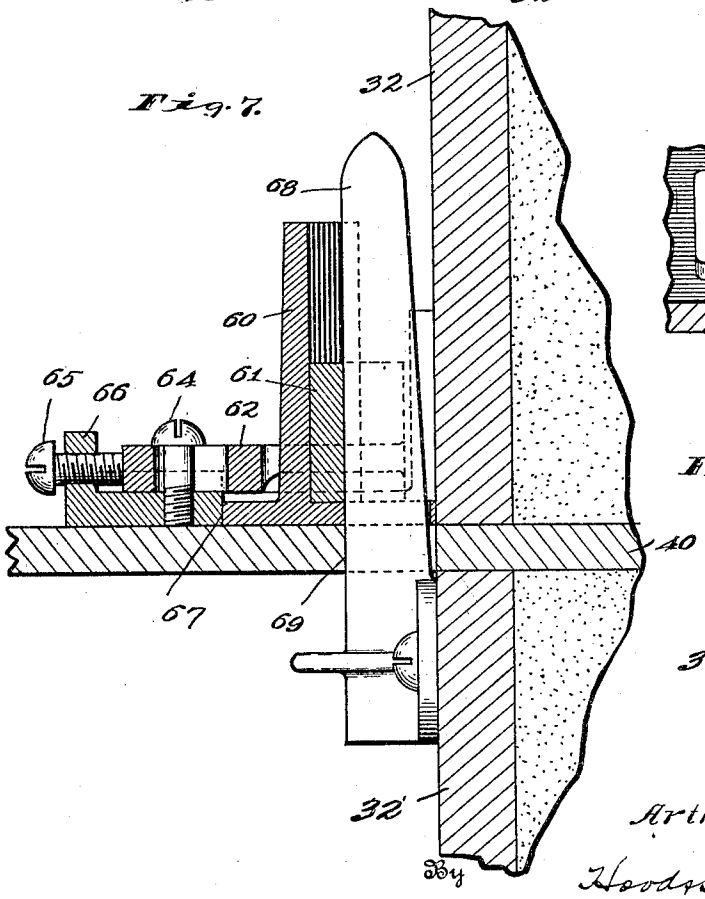
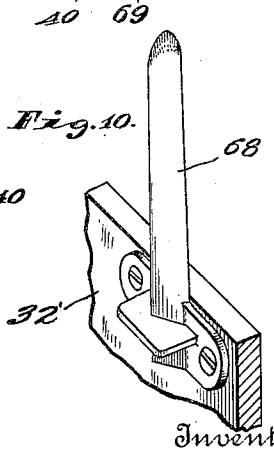


Fig. 10.



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UNITED STATES PATENT OFFICE.

ARTHUR F. ABIGT, OF INDIANAPOLIS, INDIANA.

MOLDING-MACHINE.

1,376,129. Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed April 7, 1920. Serial No. 371,793.

To all whom it may concern:

Be it known that I, ARTHUR F. ABIGT, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Molding-Machine, of which the following is a specification.

The object of my invention is to produce a machine by which the formation of sand molds may be materially facilitated.

The accompanying drawings illustrate an embodiment of my invention. Figure 1 is a front elevation in partial vertical section; Fig. 2 a section on line 2—2 of Fig. 1; Fig. 3 a fragmentary perspective of the match-plate holder; Fig. 4 a fragmentary detail, in partial section, of the air-valves and adjacent piping; Fig. 5 an elevation of one of the coupling plates; Fig. 6 a plan of my improved flask pin and adjacent parts; Fig. 7 a vertical section on line 7—7 of Fig. 6; Fig. 8 a perspective of the cope member of my improved flask-pin; Fig. 9 a perspective of the match-plate member to coöperate with the flask members; and Fig. 10 a perspective of the drag member.

In the drawings, 20 indicates a suitable supporting frame having a pair of horizontal bearings 21, 21 in which are journaled the trunnions 22 of a swinging frame 23 which is temporarily locked in either of its vertical positions by a latch 24 arranged to engage either one of pins 25, 25.

Frame 23 comprises two air-cylinders 26, 26 in each of which is mounted a piston 27, each carrying a piston rod 28. The rods 28 carrying, at each end of the cylinders, a cross head 29 provided with a table 30 adapted to engage the usual bottom board 31 commonly used in conjunction with the flask members 32, 32′.

In order to insure uniformity of action of the two pistons, I journal a shaft 33 on one of heads 29 and this shaft carries pinions 34 which mesh with stationary racks 35 on frame 23. Heads 29 are adjustable lengthwise of the piston rods and are held at desired points by any suitable means such as set screws 36.

The pattern plate 40 in general of usual form, must be supported between the two cross-heads 29 in frame 23, and for this purpose, I have provided laterally projected arms 41 having guides 42 adapted to receive and guide the ends of retaining bars 43 which are provided with grooves 44 formed to receive the longitudinal edges of the match plate 40.

Bars 43 are held in any desired position by screws 45 so that match plates of various sizes may be used in the machine.

Arranged axially of each trunnion 22 is an air passage 50 which leads to one end of the adjacent cylinder 27. A passage 51 is arranged eccentrically in each trunnion and this passage leads to the opposite end of the adjacent cylinder. Coöperating with the outer end of each trunnion 22 is a coupling plate provided with a passage 50′, which always registers with adjacent passage 50, and an arc-shaped passage 51′, which always registers with passage 51. Passages 50′ are connected by pipes 50″ and passages 51′ are connected by pipes 51″. A main air supply pipe 52 is connected, through two-way valves 50‴ and 51‴, with pipes 50″ and 51″, as shown in Fig. 4, the arrangement being such that, by proper manipulation of the valves, pistons 27 may be controlled in their movement in their cylinders.

It is, of course, exceedingly important, that the flasks be accurately held and guided in their separation from the match plate and their assembly after the mold is completed. For this purpose, I have provided the improved construction shown in detail in Figs. 6 to 10.

Erected upon the pattern plate, at each end of the pattern space, and preferably in the drag side, is a guide post 60 which I prefer to make V-shaped in horizontal section, although this is not necessary. The cope flask member 32 carries a guide member 61, formed to coöperate with post 60, and this member 61 is preferably carried by a bracket 62, perforated at 63 to permit the insertion of post 60, and adjustable laterally of post 60 by screws 64 and 65 which are carried by a holding bracket 66 attached to the cope flask 32 and perforated at 67 for the free passage of post 60 and the drag pin 68, which is secured, in the usual manner, to the drag flask member 32′. The pattern plate 40 is perforated at 69 at the foot of each post 60 to permit the accurately

guided passage of a pin 68. The pin 68 is formed to have a straight line sliding engagement with member 61, and this member 61 has a straight-line sliding engagement with post 60.

It will be noted that, by the above-described arrangement, the two flask members, even while associated with the match plate, are guided in their relationship to each other, not only by the sliding engagement of pins 68 with the match plate, but also by the coöperation of pins 68 with the adjacent members 61 (with which they are to coöperate when the molds are finally assembled for pouring) and consequently the copes and drags of the finished molds are sure to fit accurately.

Starting with the machine empty and frame 23 in one of its vertical positions, the operation will be as follows: By proper manipulation of valves 50''' and 51''', pistons 27 will be moved upwardly and there held by the air pressure in the lower ends of the cylinders. A match plate 40 will be then inserted in its holder, drag face up, and a drag flask with its pins 68 placed in position with the pins 68 accurately fitting openings 69. Sand will then be placed in the drag-flask, bottom board 31 placed thereon, and the upper cross head brought down so as to properly compress the sand. Frame 23 is then inverted; a cope flask placed in position with its fittings 61—66 in sliding engagement with posts 60 of the match plate and pins 68 of the drag flask, and the operation repeated. As the pistons 27 are manipulated this time, the completed drag drops away from the pattern plate, pins 68 sliding freely, but accurately, against members 61 and through perforations 69, while the cope is held accurately in place by the engagement of members 61 with the posts 60 of the match plate. The operator soon learns to manipulate valves 50''' and 51''', so that the lower mold is dropped away from the pattern without injury. When the downward movement of the piston is completed, the lower mold is carried away; the frame 23 is reverted, and the operation repeated, a completed flask being presented for withdrawal each time a new flask is being completed.

I claim as my invention:

1. In a molding machine, an invertible frame provided with an open-frame match-plate holder, means by which flasks may be accurately associated either simultaneously or independently with the appropriate face of the match plate and with each other, two flask-supporting sand-compressing members carried by the swinging frame at opposite sides of the match plate holder, and means by which said members may be moved toward and from the plane of the match plate.

2. In a molding machine, an invertible frame provided with an open-frame match-plate holder, means by which flasks may be accurately associated either simultaneously or independently with the appropriate face of the match plate and with each other, two flask-supporting sand-compressing members carried by the swinging frame at opposite sides of the match plate holder, pistons and associated cylinders controlling said members, and fluid pressure controlling means associated therewith.

3. In a molding machine, an invertible frame provided with an open-frame match-plate holder, means by which flasks may be accurately associated either simultaneously or independently with the appropriate face of the match plate and with each other, means by which sand in the upper flask may be compressed, and means for supporting and lowering the lower flask away from the match plate, simultaneously with the movement of the pressing means to active position.

4. In a molding machine, an invertible frame having a pattern plate holder, a pattern plate supported thereby and perforated to receive and guide flask pins, guide posts carried by one face of the pattern plate adjacent said perforations, and two flasks for coöperation with the opposite faces of the pattern plate, one flask being provided with a guiding member formed to slidingly engage said posts adjacent the perforation, and the other flask being provided with a guiding member formed to slidingly engage the pattern plate perforation and the guiding member of the other flask.

5. In a molding machine, an invertible frame having a pattern plate holder, a pattern plate supported thereby and perforated to receive and guide flask pins, guide posts carried by one face of the pattern plate adjacent said perforations, and two flasks for coöperation with the opposite faces of the pattern plate, one flask being provided with a guiding member formed to slidingly engage said posts, and the other flask being provided with a guiding member formed to slidingly engage the pattern plate perforation and the guiding member of the other flask.

6. The combination with a match plate, of a guide post carried by said plate and provided with two guide surfaces formed to determine both lateral and longitudinal relative positions, a flask member carrying a pin adapted to coöperate with one of the post guide surfaces, a second flask carrying a guide having outer and inner guide surfaces adapted to coöperate respectively with the pin of the other flask member and the other guide surface of the match plate post, and means for adjusting said guide piece toward and from the flask.

7. The combination with a match plate, of

a guide post carried by said plate and provided with two guide surfaces formed to determine both lateral and longitudinal relative positions, a flask member carrying a pin adapted to coöperate with one of the post guide surfaces, and a second flask carrying a guide having outer and inner guide surfaces adapted to coöperate respectively with the pin of the other flask member and the other guide surface of the match plate post.

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 2nd day of April, A. D. one thousand nine hundred and twenty.

ARTHUR F. ABIGT.