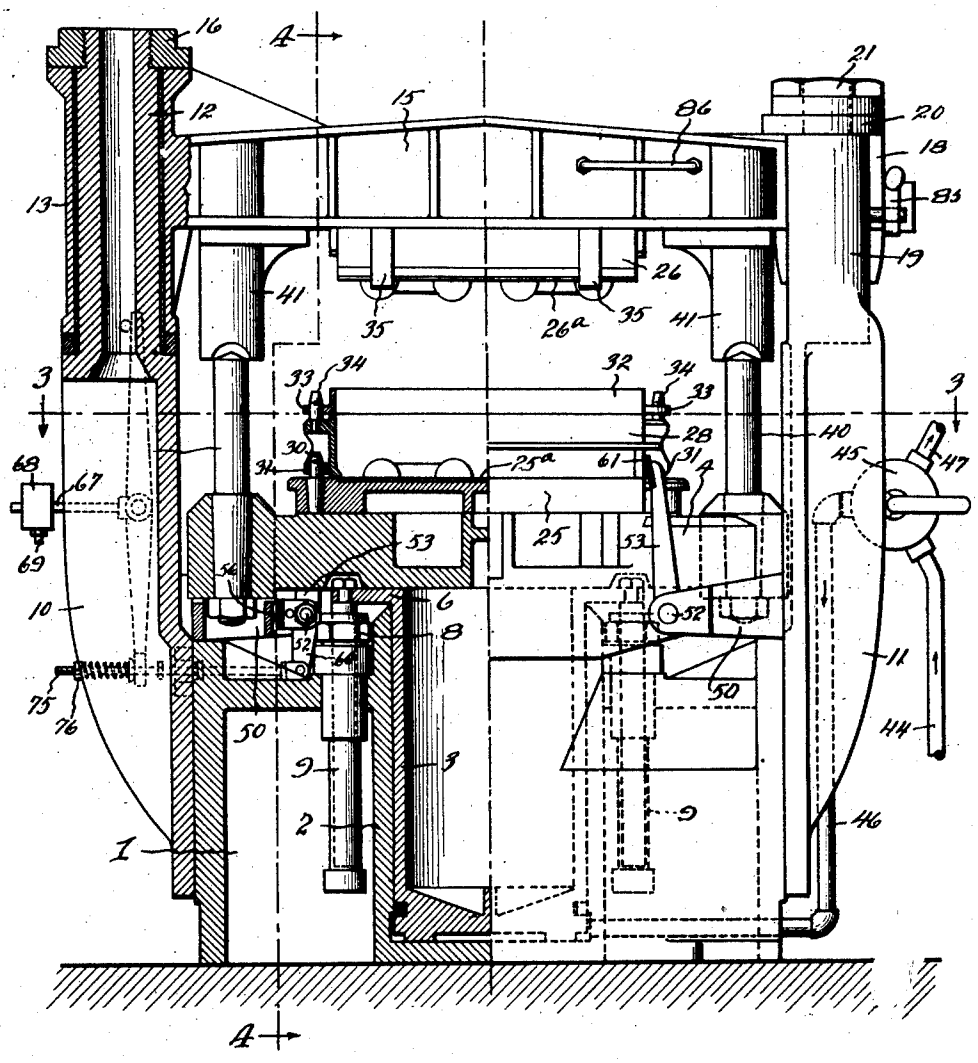
Aug. 24, 1926. 1,597,322

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MOLDING MACHINE

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Fig. 1



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Fig. 2

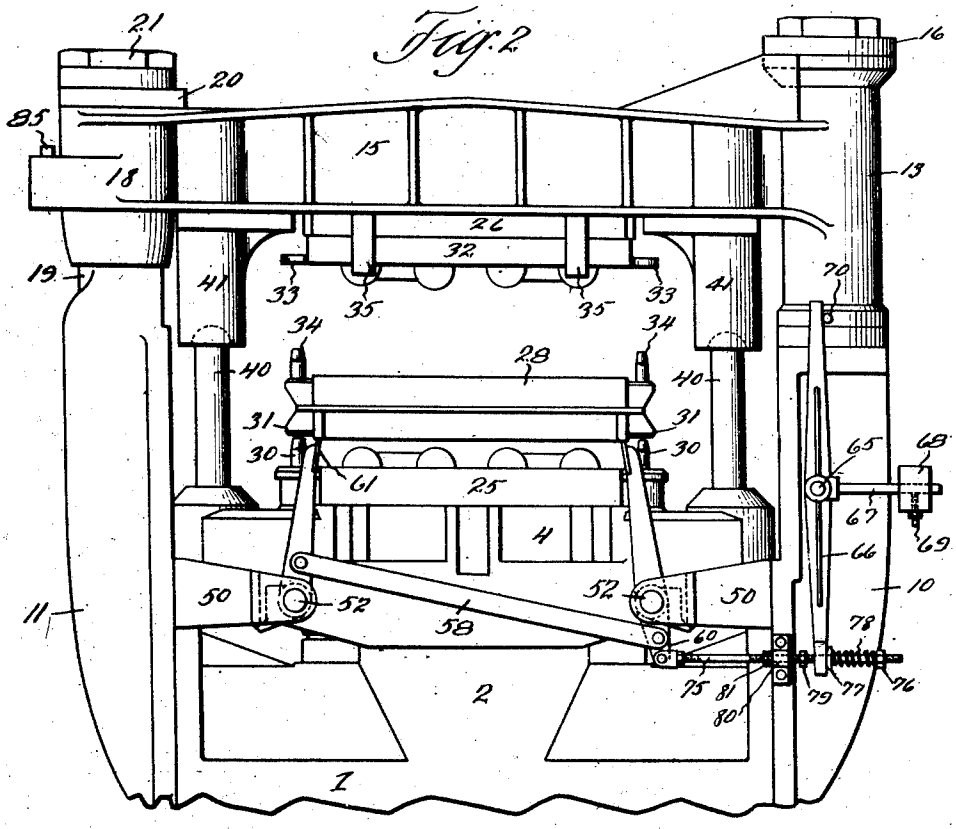
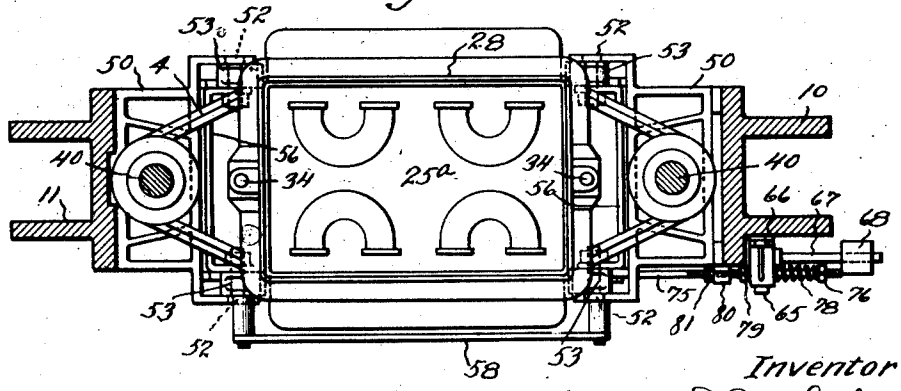


Fig. 3



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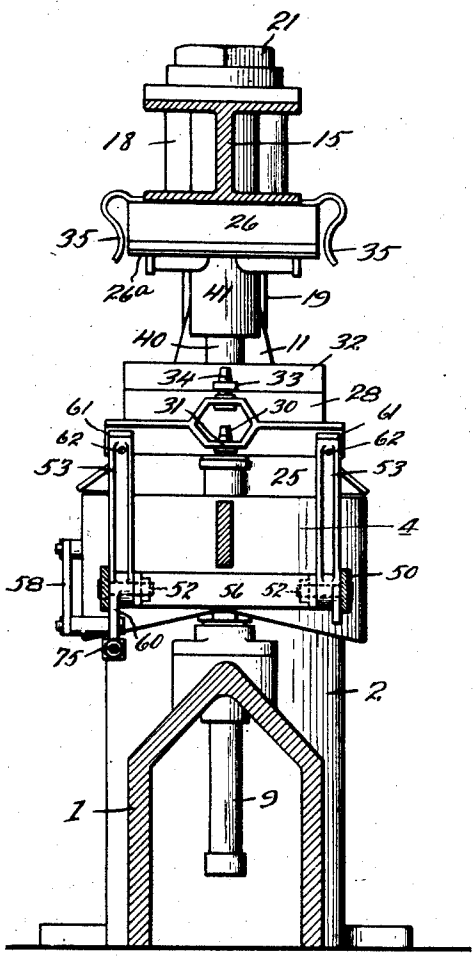
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3 Sheets-Sheet 3

Fig. 4



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UNITED STATES PATENT OFFICE.

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MOLDING MACHINE.

Application filed June 30, 1924. Serial No. 723,197.

This invention relates to molding machines, and more particularly to flask arresting and sustaining means for incorporation in the type of molding machines comprising, generally, a ramming head that is movable toward and from a pressure head and between which heads a pattern, that is carried by the ramming head, and a superposed sand-filled flask are adapted to be compressed, my improved means serving, as the ramming head returns to normal position, to arrest the movement of the flask thereby to cause the pattern to be withdrawn from the mold, and thereafter to sustain the flask until the flask is manually or otherwise removed.

The primary object of my invention is to provide, in a machine of the aforesaid character, means for arresting the movement of the flask during the return movement of the ramming head so that the pattern will be withdrawn from the mold and for sustaining the flask in such a position that it may be readily removed from the machine, the said means automatically withdrawing from flask arresting position when the flask is removed so that another flask may be applied to the pattern, and likewise resuming flask arresting position during the subsequent ramming operation.

Further objects are to provide comparatively simple and inexpensive means of the aforesaid nature which is thoroughly reliable, is not likely to get out of order, is convenient of embodiment in a molding machine of the character above referred to and is supported by a stationary part of the machine, thus relieving the moving parts of undue weight.

The foregoing objects, with others which will hereinafter appear, are attained in the structure defined by the claims annexed hereto and described in detail in the following specification, reference being had to the accompanying drawings wherein Fig. 1 is a sectional front elevation of a molding machine incorporating my improved flask arresting and sustaining means; Fig. 2 is a fragmentary rear elevation of the machine; Fig. 3 is a sectional plan on the line 3—3 of Fig. 1; and Fig. 4 is a transverse section on the line 4—4 of Fig. 1.

The molding machine wherein I have shown my invention incorporated comprises, generally, a base 1 involving an upwardly opening cylinder 2 containing a piston 3 on which is mounted a ramming head 4, said head being secured by suitable means to the top flange 6 of the piston. The piston is held against turning with respect to the base by plungers 8 that are secured at their upper ends to the flange 6 and operate within dash pots 9 that are sustained by the base, the dash pots serving to control the descent of the ramming head and parts carried thereby.

Secured to the ends of base 1 are columns 10 and 11 the former terminating at its upper end in a cylindrical post 12 on which is journaled a sleeve 13 of a swinging pressure head 15, a nut 16 being applied to the threaded upper end of the post 12. The free end of the swinging head is formed with a yoke 18 which is arranged to straddle the cylindrical upper end 19 of the column 11, a suitable abutment 20 being applied to the top of the column 11 and held in place by a nut 21 thereby to resist upward movement of the head.

Suitably attached to the ramming head 4 and the swinging head 15 are the respective pattern frames 25 and 26 which carry patterns 25^a and 26^a.

A mold flask 28 is adapted to be placed upon the pattern frame 25 and to insure the flask being properly positioned with respect to the pattern 25^a, the flask and pattern frame are provided with cooperating positioning parts. In the present embodiment these parts consist of guide pins 30 which rise from the ends of the pattern frame 25 and enter apertures in ears 31 which extend from the ends of the flask. Adapted to be placed upon the top of the flask 28 is a sand frame 32 which has perforated ears 33 for engagement over guide pins 34 that are carried by the flask. As is well known to those familiar with the art of molding the sand frame is used for the purpose of increasing the capacity of the flask sufficiently to accommodate sand in a loose condition which, when compressed, will properly fill the flask. Therefore, the presence of the sand frame upon the flask is required only during filling

and compressing operations. As will presently appear from the description of the machine's operation, the sand frame is projected over the top pattern frame, and is adapted to be sustained in this position during the descent of the flask by holding means 35.

To insure the proper alignment of the molding equipment carried by the respective heads 4 and 15, the former or ramming head 4 is provided with pilot pins 40, and the latter or swinging head 15 with guides 41 which contain sockets into which the pilot pins accurately fit.

Pressure fluid is supplied from a pipe line 44, through a three-way valve 45 and pipe 46, to the cylinder 2 for elevating the piston 3 and the ramming head 4, with the parts carried thereby. In one position the valve supplies pressure fluid to the cylinder while in a second position it permits the fluid from the cylinder to escape through a pipe 47.

Journaled within suitable brackets 50 that are fixed with respect to the base 1 and are shown as carried by the columns 10 and 11, are short shafts 52 which carry arms 53 that constitute my improved flask arresting and sustaining means. It will be observed from Figs. 3 and 4 that there are two shafts 52, with their respective arms, arranged adjacent each end of the machine and the upper ends of the opposed pairs of arms are adapted to swing inwardly beneath the flask 28. The arms of each pair are fastened rigidly together through a yoke 56 so that said arms are caused to move as one; and the two pairs of arms, which are located adjacent the opposite ends of the flask, are operatively connected together, so that the two pairs swing inwardly and outwardly at the same time, by means of a link 58 that is located on the rear side of the machine and has one of its ends connected to one of the arms 53 above its shaft 52 while its other end is connected to an arm 60 which depends from the rear shaft 52 of the other pair of arms, the latter pair being located on that end of the machine toward the column 10. Incidentally, shoes 61 of hardened metal may be secured, as by screws 62, to the flask engaging ends of the arms 53. Pivotally mounted upon a stud 65 which extends rearwardly from the column 10 is a lever 66 that has a laterally extended arm 67 along which a weight 68 is adapted to be adjusted and secured in any position thereon by a set screw 69. The weight tends to swing the lever 66 in a direction to advance its lower end toward the previously mentioned arm 60, but this is resisted by an abutment 70 in the nature of a pin that extends rearwardly from the lower end of the sleeve 13 of the swinging head 15.

A rod 75 has its inner end pivotally connected to the lower extremity of the arm 60 and its outer end plays freely through a hole in the lower end of the lever 66. The rod 75 is threaded inwardly a suitable distance from its outer end and has a nut 76 applied thereto between which and a collar 77 is confined a coil spring 78 which surrounds the rod, the collar being arranged to engage the adjacent side of the lever 66. Spaced from the opposite side of the lever is a nut 79 that is threaded to the rod. The rod is slidable through a guide 80 that extends rearwardly from an adjacent portion of the machine, and an adjustable stop for the rod is provided by lock nuts 81 which engage the guide 80 to limit the outward movement of the rod. The purpose of this stop will presently appear.

Suitable latch mechanism, designated 85, serves to hold the free end of the swinging head 15 to the upper end of the column 11.

In considering the operation of the mechanism, it will be assumed that the pressure head 15 has been released from the column 11 and swung rearwardly out of the way. The operator (after cleaning the pattern 25^a by means of compressed air in accordance with the usual practice) sets a flask 28 upon the pattern frame 25 with the perforated ears 31 of the flask engaged over the guide pins 30. He then applies the sand frame 32 to the upper end of the flask and fills the flask and sand frame with sand, scraping the surplus sand from the top of the sand frame so that the sand is flush with the top edge of the frame.

It may be explained at this point that when the pressure head 15 is swung to inoperative position, the abutment 70 moves away from normal position and allows the weight 68 to swing the lever 66 in a direction to engage its lower end with the nut 79 on the rod 75 thereby to thrust said rod inwardly and swing the lower end of the arm 60, to which said rod is connected, in a corresponding direction. As a result of this, and by reason of the connections above described in detail, the upper ends of the flask sustaining arms 53 are thrown outwardly beyond flask engaging position.

Returning now to the operation of the machine, after the operator has filled the flask he grasps the handle 86 of the pressure head 15 and swings the head to operative position with the yoke 18 embracing the portion 19 of the column 11, the latch mechanism 85 acting to secure the parts in such position. As the head swings to operative position, the abutment 70 rocks the lever 66 against the action of the weight 68 to compress the spring 78 between the collar 77 and the nut 76. This action results in the arms 53 being thrown inwardly with their upper ends against the ends of the flask 28. The operator next throws the valve 45 to a posi-

tion in which the supply pipe 44 is thrown into communication with the pipe 46 and pressure fluid is accordingly conducted to the cylinder 2 to elevate the piston 3 and the parts carried thereby. As the ramming head 4 rises, the pilot pins 40 enter the sockets of the guides 41 and properly align the cooperating mold parts that are carried by the heads, and as the ramming head completes its upward stroke the sand frame 32 is projected upwardly over the pattern frame 26 and is caught by the holding means 35, the sand being compacted until it now occupies only the flask, with mold cavities depressed in its upper and lower surfaces. As the ramming head ascended and the flask 28 withdrew from between the opposed pairs of arms 53, said arms were swung inwardly by the spring 78 to flask engaging position. It will be clear from an inspection of Fig. 2 that the arms are stopped in flask engaging position by the engagement of the nuts 81 with the guide 80.

The operator next throws the valve 45 to the position wherein the cylinder 2 is exhausted through the pipes 46 and 47, and the piston 3 with the parts carried thereby descends, the descent being controlled by the dash pots 9. In the descent of the parts, the flask is deposited upon the upper ends of the arms 53 while the ramming head with the pattern 25^a carried thereby settles to normal position thus withdrawing the pattern from the mold. The flask, free of all connections save as it rests by its own weight upon the arms 53, may be easily lifted from the machine.

In the starting of another operation, the pressure head 15 is unlatched from the column 11 and swung rearwardly, and as this is done the arms 53 are automatically retracted from flask engaging position through the above described mechanism. When another flask is placed upon the pattern 25^a, the operator removes the sand frame from the holding means 35 and applies it to the flask and continues as before.

From the foregoing it will be seen that my invention provides very simple yet thoroughly reliable means for arresting and sustaining the flask after the molding operation and which is automatically moved out of the way before another flask is placed in the machine. Furthermore, this means is supported solely by a stationary part of the machine and the moving parts may thus be made lighter than in the case of machines wherein the stripping mechanism is carried by the ramming head.

Having thus described my invention, what I claim is:—

1. In a molding machine, the combination of a base, a ramming head supported thereby for vertical movement, a pressure head movable from an operative position over the ramming head to a second position laterally of the former position, a pattern carried by the ramming head, a flask adapted to be applied to the pattern, opposed flask sustaining arms pivoted to the base, means tending to swing said arms inwardly into the path of the flask, and operative connections through which said arms are swung outwardly by the pressure head when the latter is swung to the aforesaid second position.

2. In a molding machine, the combination of a base, a ramming head supported thereby for vertical movement, a pressure head movable from an operative position over the ramming head to a second position laterally of the former position, a pattern carried by the ramming head, a flask adapted to be applied to the pattern, opposed flask sustaining arms pivoted to the base and adapted to swing into and out of the path of the flask, a member tending to shift said arms out of the path of movement of the flask, and yielding connections between said member and the arms, the pressure head and aforesaid member having parts cooperating to move said member to a position in which the flask sustaining arms are moved toward the path of movement of the flask when the pressure head is in operative position.

3. In a molding machine, the combination of a base incorporating a cylinder having its axis arranged vertically, a piston operating within said cylinder, a ramming head sustained by the piston, a pattern carried by the ramming head, a flask adapted to be applied to the pattern, columns rising from the opposite ends of the base, a pressure head journaled upon the upper end of one of said columns for swinging movement in a substantially horizontal plane, the free end of said head being designed for holding engagement with the upper end of the other column, opposed flask sustaining arms pivotally supported on axes fixed with respect to the base, connections between said arms whereby their upper ends are caused to swing inwardly and outwardly together, a lever pivotally supported by one of the aforesaid columns, a rod having operative connections with the aforesaid arms and yielding connection with the lower end of said lever, means tending to rock said lever and, through the intervention of the aforesaid rod, move said arms in a direction to withdraw their upper ends from flask engaging position, the pressure head and said lever cooperating to swing the lever in opposition to said means when said pressure head occupies operative position.

4. In a molding machine, the combination of two heads that are relatively movable toward and from each other along a given axis, one of the heads being shiftable to a position laterally of said axis, a pattern carried by one of the heads, a flask adapted to

be applied to the pattern, flask arresting and sustaining means movable transversely of the path of movement of the flask, mechanism acting to project said means into the path of the flask so as to receive the flask as the heads recede along said given axis, and further mechanism acting to withdraw said means from the path of the flask when the laterally shiftable head is moved laterally of said axis.

In testimony whereof, I hereunto affix my signature.

FRANK E. McCABE.