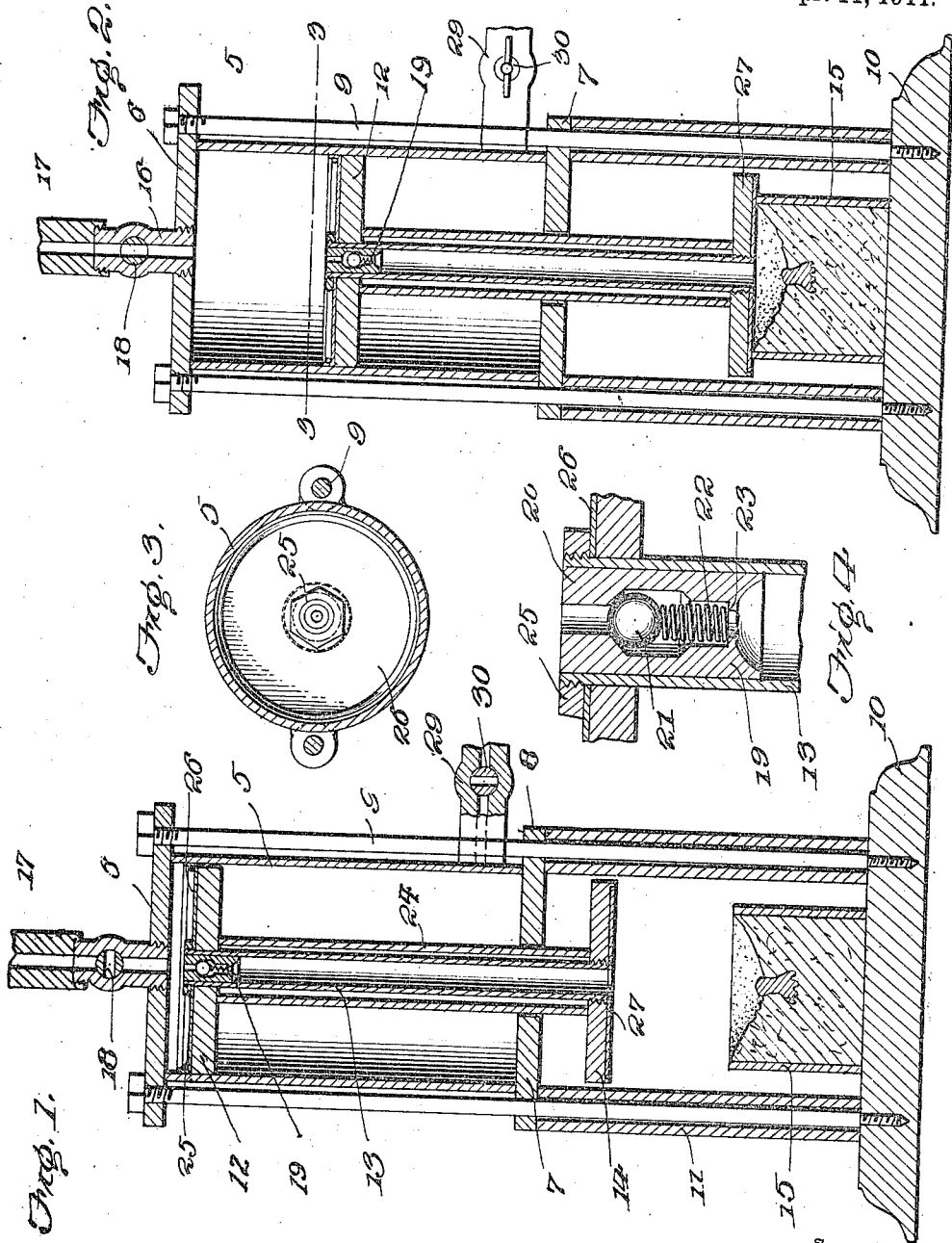


V. H. MILLS.
CASTING MACHINE.
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CASTING-MACHINE.

989,387.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VIRGIL H. MILLS, citizen of the United States, residing at Hubbard, in the county of Hill and State of Texas, have invented certain new and useful Improvements in Casting-Machines, of which the following is a specification.

This invention relates to fluid pressure casting machines and more particularly to a machine especially designed for use by dentists, jewelers, and other persons for making different kinds of castings.

The object of the invention is to provide a compact and thoroughly efficient machine, the construction of which is such as positively to prevent premature chilling of the molten metal in the flask, thus to insure the production of a casting practically free from flaws and similar defects.

A further object of the invention is to provide a casting machine including a cylinder having a piston operating within the same and provided with a terminal foot piece which forms a closure for the flask during the application of air to the molten metal in the latter.

A further object is to provide a casting machine in which fluid under pressure is admitted through the piston after the latter has been moved to operative position in engagement with the flask.

A further object is to provide a casting machine capable of being used in connection with flasks of different heights, means being provided for preventing the escape of air or actuating medium before the foot contacts with the flask, regardless of the height of the latter.

A further object is to provide a machine in which the initial application of fluid pressure will cause the foot to engage the flask, and a further application thereof, force the molten metal within the fissures of said flask.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a

knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical sectional view of a fluid pressure casting machine constructed in accordance with my invention; Fig. 2 is a similar view showing the foot in engagement with the upper end of the flask and the valve in open position so as to permit the passage of fluid under pressure to the molten metal in the flask; Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2, and Fig. 4 is an enlarged vertical sectional view of the valve casing and its associated parts, the ball valve being shown in elevation.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The casting machine forming the subject matter of the present invention comprises a cylinder 5 having oppositely disposed heads 6 and 7, the latter being provided with vertically alined perforated lugs 8 for the reception of anchoring devices 9, said anchoring devices being preferably in the form of bolts, the lower ends of which are threaded for engagement with a suitable supporting base, indicated at 10.

The lower head 7 is spaced from the upper surface of the supporting base 10 by means of tubular members 11 interposed between the head 7 and said base and surrounding the anchoring members or rods 9.

Slidably mounted in the cylinder 5 is a piston 12 having a threaded opening formed in the central portion thereof for engagement with the correspondingly threaded end of a tube or conductor 13, the opposite end of the tube or conductor 13 being threaded in a foot piece 14, the latter forming a closure for the flask 15. The flask 15 which may be of any suitable construction, is supported on the base 10 beneath the cylinder 5 so as to be in position to be engaged by the foot or closure 14 when the piston is forced downwardly.

Threaded in the upper cylinder head 6, is a nipple 16 to which is connected one end of a conductor 17, the opposite end of which communicates with a source of fluid pressure (not shown), there being a valve 18 mounted in the nipple 16 for controlling the flow of fluid to the cylinder 5.

Seated in the upper end of the tube or conductor 13 is a valve casing 19 having a seat 20 for engagement with a ball valve 21, the latter being normally and yieldably retained in closed position by means of a coil spring 22, one end of which bears against a shoulder 23 formed in the casing, while the other end thereof engages the valve, as shown.

The piston 12 is spaced from the foot or closure 14 by means of a tubular member 24, said piston being locked in engagement with the tubular member 24 by a nut 25 threaded on the upper end of the tube 13 and bearing against the adjacent surface of the piston 12, as shown.

The upper surface of the piston 12 is preferably provided with a cup shaped washer 26 to prevent the leakage of air, while the lower surface of the foot or closure 14 is covered by a strip of asbestos or similar material 27 in order to insure a tight joint between the flask and closure when the latter is moved to operative position in engagement therewith.

The tension of the spring 22 is such that on an initial application of air to the cylinder, the valve 20 will not be affected, but when the foot or closure 14 engages the upper end of the flask 15, the pressure of the fluid entering the cylinder through the conductor 17, will automatically open the valve so, as to admit fluid through the tube 13 to the molten metal and thus force the latter into the fissures or cavities of the flask.

In operation, the metal is placed in the flask 15 and heated, after which the valve 18 is rotated to admit air under pressure to the cylinder 5. As the air enters the cylinder 5, the piston 12 is forced downwardly until the foot 14 bears against the upper end of the flask 15 when the pressure of the air on the valve 21 will automatically open the same against the tension of the spring 22 and thus allow the passage of air through the tube 13 to the flask, in the manner before described. It will here be noted that by allowing the air to pass through the piston to the flask, the machine may be used in connection with flasks of different heights. It will also be noted that air cannot pass through the conductor 13 until the foot or closure 14 engages the flask owing to the fact that the valve will not open under pressure until the downward motion of the head 14 is arrested by contact with said flask thus effectually preventing the escape of air when the piston is in elevated or inoperative position. The valve 20 being timed to act after the foot or closure 14 is in engagement with the flask, a sudden and full application of air under pressure to the molten metal in the flask is insured, thus positively forcing the metal within the fissures of the flask before the metal has a chance to chill, and insuring

the production of a casting free from flaws and other defects.

Any suitable means may be employed for returning the piston to elevated or inoperative position after each application of the fluid pressure to the metal in the flask, and in the present instance, a conductor 29 is shown having one end thereof communicating with the interior of the cylinder and its other end communicating with a source of fluid pressure, there being a suitable valve 30 formed in the conductor for controlling the admission of air to the interior of the piston in order to raise the same after each application of air to the flask.

It will of course be understood that any type of valve may be employed for controlling the passage of fluid through the tube 13, and that if desired, said valve may be arranged at either or both ends of the piston, without departing from the spirit of the invention.

By arranging the cylinder 5 between the heads 6 and 7 and locking the latter in engagement with the cylinder by the tubular members 11, the machine may be readily detached from the supporting base and taken apart to facilitate cleaning the same or effecting any necessary repairs thereto, by merely removing the anchoring devices or bolts 9.

The device is exceedingly simple in construction and the parts thereof so arranged that the valve, air conductor and its associated parts are entirely housed within the piston thus to prevent injury thereto during the operation of the machine.

Having thus described the invention what is claimed as new is;

1. In a casting machine, a flask, a vertically movable closure for said flask, means for applying fluid under pressure to force the closure to operative position into engagement with the flask, and means for subsequently admitting the same fluid under pressure through the closure to said flask.

2. In a casting machine, a cylinder, a flask, a piston disposed within the cylinder and provided with a closure movable to operative position into engagement with the flask, means for admitting fluid under pressure to the cylinder to operate the closure, and means for admitting the same fluid under pressure through said closure to the flask.

3. In a casting machine, a cylinder, a flask, a piston disposed within the cylinder and provided with a foot adapted to form a closure for the flask, means for applying fluid under pressure to the piston to move the foot to operative position, and means for subsequently admitting the same fluid under pressure through the piston and foot to the flask when said foot is in engagement with said flask.

4. In a casting machine, a cylinder, a flask, a piston slidably mounted in the cylinder and provided with a foot adapted to form a closure for the flask, means for admitting fluid under pressure to the cylinder to operate the foot, and a valve movable automatically to open position to permit the passage of said fluid under pressure through the foot when the latter is in engagement with said flask.

5. A casting machine including a cylinder, a flask, a piston disposed within the cylinder and provided with a foot adapted to form a closure for the flask, means for admitting fluid under pressure to the cylinder to operate the foot, and a valve movable automatically to open position when the foot engages the flask, thereby to permit the passage of the same fluid under pressure through the piston and foot to said flask.

6. A casting machine including a cylinder, a flask, a piston slidably mounted in the cylinder and provided with a foot adapted to form a closure for the flask, means for admitting fluid under pressure to the cylinder to operate the foot, means for admitting said fluid under pressure to the flask when the foot is in engagement therewith, and a spring pressed valve for normally cutting off communication between the interior of said cylinder and said flask.

7. A casting machine including a cylinder having connection with a source of fluid pressure, a flask, a piston operating within the cylinder and provided with a foot adapted to form a closure for the flask, means for admitting fluid under pressure to the cylinder to operate the foot, and a valve timed to act after the foot is in engagement with the flask for admitting the same fluid under pressure to said flask.

8. A casting machine including a cylinder having connection with a source of fluid pressure, a flask disposed beneath the cylinder, a piston operating within the cylinder, a foot connected with the piston and adapted to form a closure for the flask, a spacing member disposed between the pis-

ton and foot, a conductor connecting said piston and foot, and a valve disposed within the conductor and arranged to automatically open when the foot engages the flask, thereby to permit the passage of fluid under pressure to said flask.

9. A casting machine including a cylinder having connection with a source of fluid pressure, a flask, a piston operating within the cylinder and provided with a depending conductor, a foot secured to the conductor and adapted to form a closure for the flask, a tubular member serving to space the foot from the piston, a casing seated in said conductor and provided with a valve seat, and a valve yieldably engaging said seat, said valve being movable automatically to open position to permit the passage of air to the flask when the foot is moved into engagement with said flask.

10. A casting machine having a cylinder including spaced heads having perforated lugs, anchoring members extending through said lugs for attachment to a support, tubular members interposed between the support and lower head, a flask supported beneath the cylinder, a piston operating within the cylinder, a fluid conductor having its upper end threaded in the piston, a foot engaging the lower end of the piston and adapted to form a closure for the flask, a tubular member surrounding the conductor for spacing the foot and piston respectively, a casing seated in said conductor, a spring pressed valve carried by the casing, a clamping nut engaging the threaded end of the conductor and bearing against the piston, a pipe having one end communicating with the upper end of the cylinder and its other end communicating with a source of fluid pressure, and a valve disposed within the pipe for controlling the flow of fluid to the interior of the cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

VIRGIL H. MILLS. [L. S.]

Witnesses:

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