H. W. VAN LEIR.

BOTTLE FILLING MACHINE.

APPLICATION FILED AUG. 20, 1909.

966,270.

Patented Aug. 2, 1910.

Fig. 1.

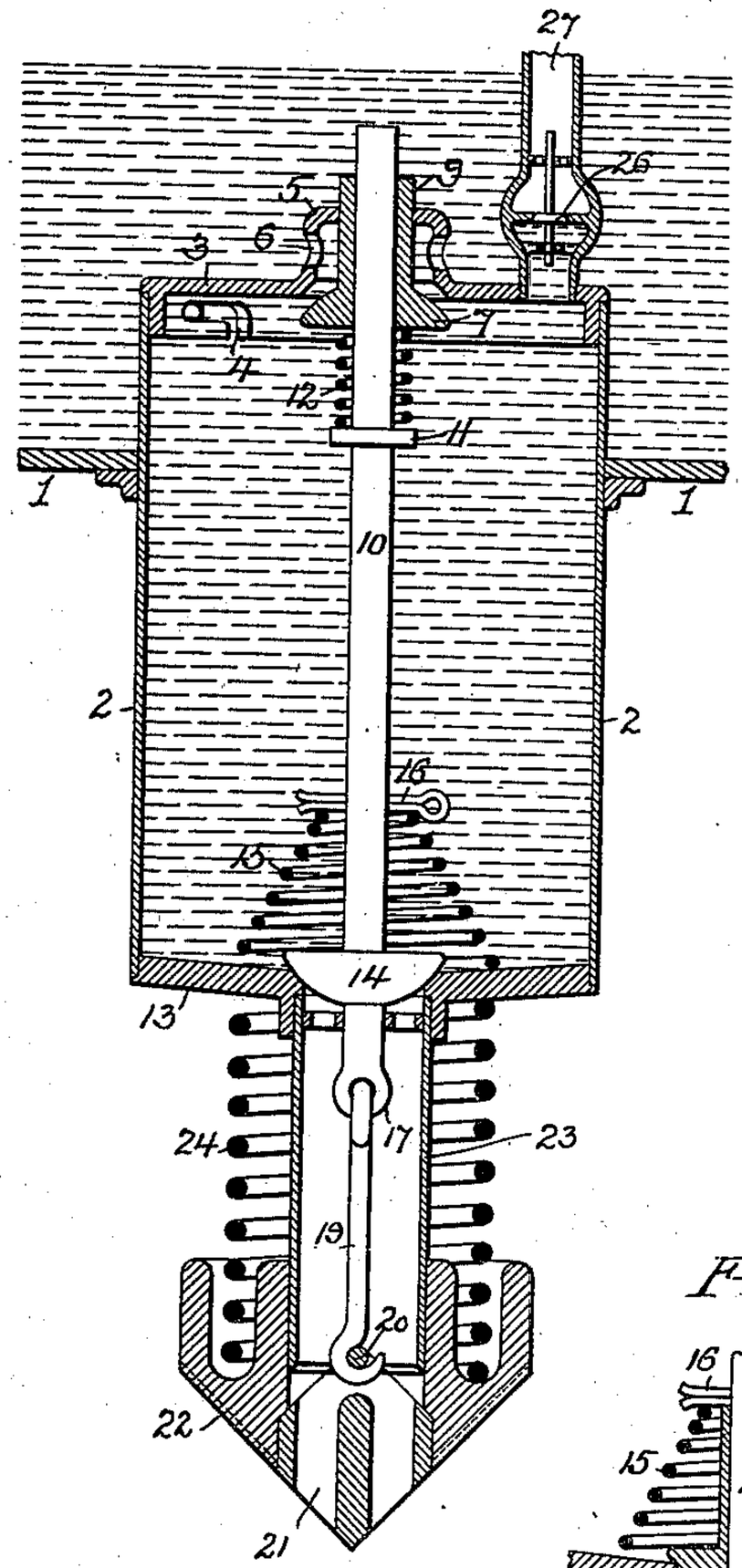


Fig. 2.

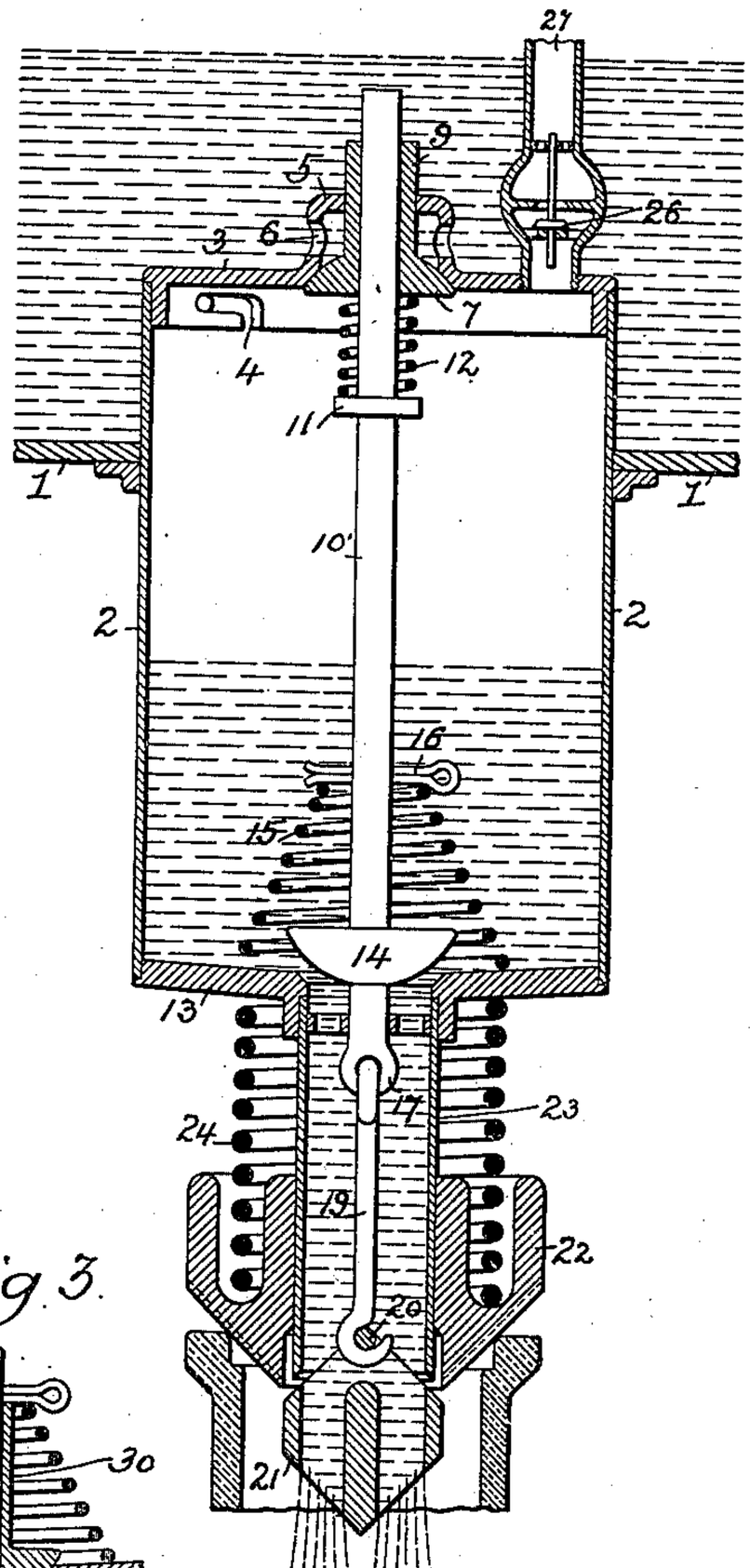
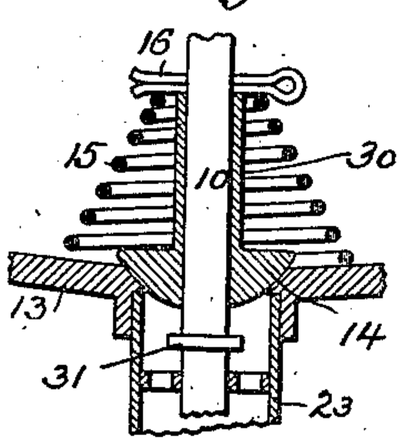


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY W. VAN LEIR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO S. S. WENZELL MACHINE COMPANY, OF CHARLESTOWN, WEST VIRGINIA, A CORPORATION OF WEST VIRGINIA.

BOTTLE-FILLING MACHINE.

966,270. Specification of Letters Patent. **Patented Aug. 2, 1910.**

Application filed August 20, 1909. Serial No. 513,786.

To all whom it may concern:

Be it known that I, HENRY W. VAN LEIR, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Bottle-Filling Machines, of which the following is a specification.

The object of my invention is to provide a bottle filling machine with a liquid measuring device which will be automatically closed against inflow and opened to outflow when the bottle reaches the position which it is intended to occupy while being filled, and will be automatically closed against outflow and opened to inflow on the removal of the bottle. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical sectional view of my improved measuring device, with the parts in the positions assumed by them while said measuring device is being filled; Fig. 2 is a similar view showing the parts in the positions assumed by them when the measuring device is emptying its contents into the bottle, and Fig. 3 is a vertical sectional view illustrating a special feature of construction constituting part of my invention.

In Figs. 1 and 2 of the drawing, the bottom of the main tank containing the liquid with which the bottle is to be filled is represented at 1, and the casing of the measuring device is represented at 2, said casing being suitably secured to the bottom of the tank and projecting into the same. At the top of the casing 2 is a detachable cap 3 secured in position by a bayonet joint 4, or in any other suitable way, this cap having a central hollow boss 5, with openings 6, through which the liquid can flow from the tank into the measuring vessel when the inlet valve 7 is open, said inlet valve being adapted to a suitable seat on the inner side of the cap and having a tubular stem 9 which is guided in the top of the boss 5 and serves as a guide for a central rod 10, the latter having a collar 11 between which and the under side of the valve 7 is interposed a coiled spring 12.

The bottom 13 of the measuring vessel has a seat for the outlet valve 14, which is connected to the rod 10, a coiled spring 15 being interposed between the bottom 13 of the vessel and a cotter pin 16, or other suitable projection, on the rod 10, so as to have a constant tendency to lift the latter and thereby open the outlet valve 14 and close the inlet valve 7. The rod 10 projects below the valve 14 and has at its lower end an eye 17 for engagement with the hooked upper end of a link 19, whose lower end is also hooked and engages a pin 20 upon a block 21, the latter having therein openings for the passage of the liquid and being adapted to fit snugly to a central recess in the lower face of a cap 22, which is free to slide vertically upon a tube 23 depending from the bottom of the vessel 2, said cap being acted upon by a coiled spring 24 tending to depress it with a force in excess of the lifting action of the spring 15. When thus depressed the internal shoulder at the base of the recess in the cap bears against the block 21 and correspondingly depresses the same, this movement being transmitted, through the medium of the link 19, to the rod 10, so as to close the outlet valve 14 and open the inlet valve 7, thereby permitting flow of the liquid from the tank into the measuring vessel. This flow is stopped when the liquid reaches the level of a check valve 26 in a relief pipe 27 which extends upwardly from the cap on the measuring vessel to a point above the level of the liquid in the tank 1, the rise of the liquid in said pipe lifting and closing the check valve 26. The under side of the cap 22 is in the form of an inverted cone and is provided with grooves or passages, as shown by dotted lines in Fig. 1.

The normal position of the parts is that shown in Fig. 1, but when a bottle is disposed below the cap 22 and raised beneath said cap it will, as shown in Fig. 2, lift the cap, compress the spring 24, and relieve the block 21 from the downward pressure of the cap, the spring 15 then acting to raise the rod 10, close the inlet valve 7 and open the outlet valve 14, thus permitting the liquid in the measuring vessel to flow through the tube 23 and into the bottle, the check valve 26 opening so as to permit inflow of air into the measuring vessel through the pipe 27 during the discharge of the liquid contents of said vessel into the bottle and the escape of air from the latter being per-

mitted by the grooves in the under face of the cap 22. As soon, however, as the bottle is lowered after being filled, the cap 22 acts upon and depresses the block 21, thereby pulling down upon the rod 10 so as to close the outlet valve 14 and open the inlet valve 7, at the same time compressing the spring 15 so that the latter will react to raise the rod 10 and its valves as soon as the cap 22 is again raised.

By reason of the link connection between the block 21 and the rod 10, said block exercises no lateral control over the rod, consequently the valve 14 is free to seat itself on the bottom of the measuring vessel without regard to the lateral movements of the block 21. The spring 12, interposed between the inlet valve 7 and the collar 11 on the rod 10, permits vertical movement of said rod in excess of the permitted movement of the valve 7, and thereby renders unnecessary the accurate adjustment of the various parts in respect to one another which would otherwise be required.

The construction shown in Figs. 1 and 2 provides for the opening of the outlet valve 14 simultaneously with the closing of the inlet valve 7 and vice versa, and thus may permit the entrance of a small quantity of the liquid into the measuring vessel 2 before the valve 14 is closed to prevent its outflow, but this can readily be provided for in regulating the capacity of the measuring vessel in respect to the amount of liquid which actually has to be delivered by the latter on each operation of the machine. When, however, it is desired to effect the closure of the inlet valve before the opening of the outlet valve, a lost motion connection can be provided between said outlet valve and the rod 10, as, for instance, by mounting said valve upon a sleeve 30 free to slide on the rod, as shown in Fig. 3, and having a certain amount of play thereon between the pin 16 or other projection on the rod above the valve, and a collar 31 or other projection on the rod below the valve, the rod 10 in this case having vertical movement somewhat in excess of that provided for when the inlet and outlet valves are constructed and operate in the manner shown in Figs. 1 and 2, whereby when the inlet valve 7 has been closed against its seat, the further upward movement of the rod 10, necessary to lift the outlet valve 14, will effect compression of the spring 12 interposed between the inlet valve 7 and the collar 11 on the rod.

The cap 22 only influences the downward movement of the block 21, the upward movement of said block being due to the reaction of the spring 15 and ceasing when the inlet valve 7 has been closed and the outlet valve 14 opened, but any desired amount of further upward movement of the cap 22 is permitted, so that the operation of the device will not be influenced by differences in the height of the bottles which have to be filled, sufficient vertical play of the cap 22 being permitted to accommodate any such differences as are likely to be met with in practice.

Any desired means may be employed for imparting the lifting movement to the valve-governing rod 10, and the depressing spring 24 may be dispensed with if the weight of the cap 22 is sufficient to overcome the lifting force imparted to said rod.

I claim:

1. The combination of a measuring vessel having connected inlet and outlet valves, and a cap connected to said valves so as to impart downward movement thereto, said cap being adapted to be raised by contact with the bottle to be filled and being free to rise independently of the valves.

2. The combination of a measuring vessel having connected inlet and outlet valves, a spring for raising the same, and a cap connected to said valves so as to impart downward movement thereto, said cap being adapted to be raised by contact with the bottle to be filled and being free to rise independently of the valves.

3. The combination of a measuring vessel having connected inlet and outlet valves, a cap connected to said valves so as to impart downward movement thereto, said cap being adapted to be raised by contact with the bottle to be filled and being free to rise independently of the valves, a spring for imparting upward movement to the valves, and a stronger spring for imparting downward movement to the cap.

4. The combination of a measuring vessel having connected inlet and outlet valves, means for raising the same, a cap adapted to be raised by contact with the bottle to be filled, and a member which is flexibly connected to the lower valve and is engaged by said cap on the descent of the latter.

5. The combination of a measuring vessel having connected inlet and outlet valves, means for raising the same, a cap adapted to be raised by contact with the bottle to be filled, and a member which is engaged by said cap on its descent and is connected to the lower valve by a swinging link.

6. The combination of a measuring vessel having inlet and outlet valves with a yielding connection between them, a cap adapted to be raised by the bottle to be filled, and a connection whereby said cap on its descent is caused to impart downward movement to the outlet valve, the cap being free to rise independently of the valves.

7. The combination of a measuring vessel having inlet and outlet valves with a yielding connection between them, means for raising the valves, a cap adapted to be raised by the bottle to be filled, and a connection whereby said cap on its descent is caused to

impart downward movement to the outlet valve, said cap being free to rise independently of the valve.

8. The combination of a measuring vessel having inlet and outlet valves, a connection between them providing a yielding support for the inlet valve, on which connection the outlet valve can slide, a cap adapted to be raised by the bottle to be filled, and means whereby the valves are caused to partake of the movements of said cap, the cap being free to rise after the rising movement of the valves has ceased.

9. The combination of a measuring vessel having inlet and outlet valves, a connection between said valves providing a yielding support for the inlet valve on which connection the outlet valve can slide, a spring support for said connection, a cap adapted to be raised by the bottle to be filled, and a connection whereby the valves are caused to partake of the movements of said cap, the latter being free to rise after the rising movement of the valve has been arrested.

10. The combination of a measuring vessel having inlet and outlet valves, means for raising the same, a cap adapted to be raised by contact with the bottle to be filled, and means whereby said cap on its descent is caused to impart downward movement to the valves with a force greater than the lifting movement exerted thereon.

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

HENRY W. VAN LEIR.

Witnesses:
HAMILTON D. TURNER,
KATE A. BEADLE.