J. H. GODFREY & J. B. POLO.

BOTTLE FILLING VALVE.

APPLICATION FILED JUNE 2, 1917.

1,282,810. Patented Oct. 29, 1918.

Fig. 1

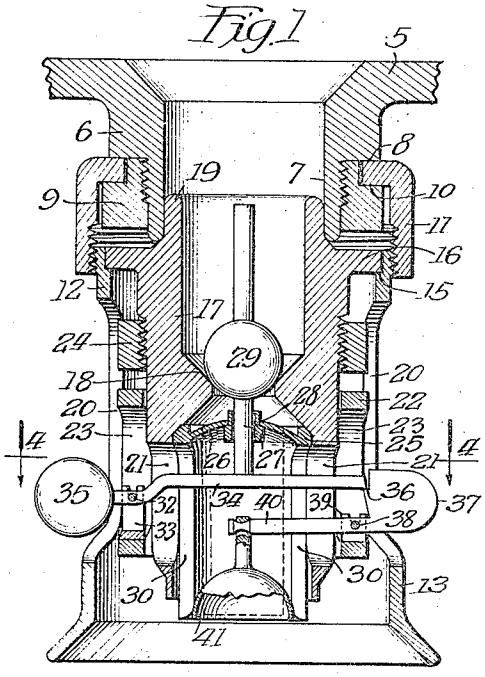


Fig. 2

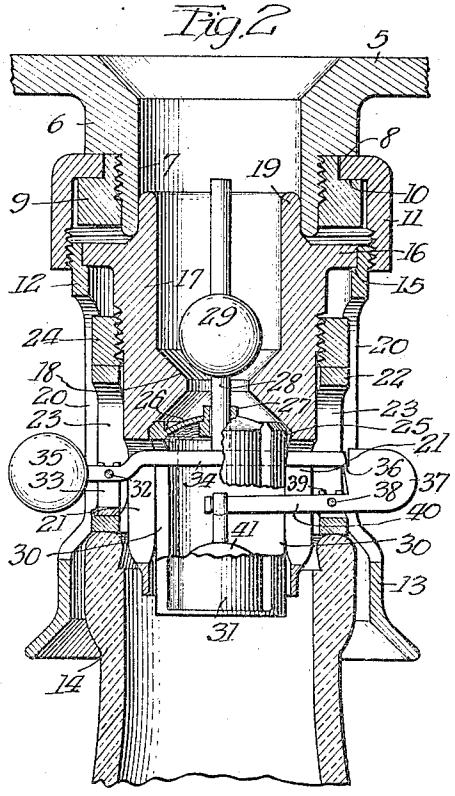


Fig. 3

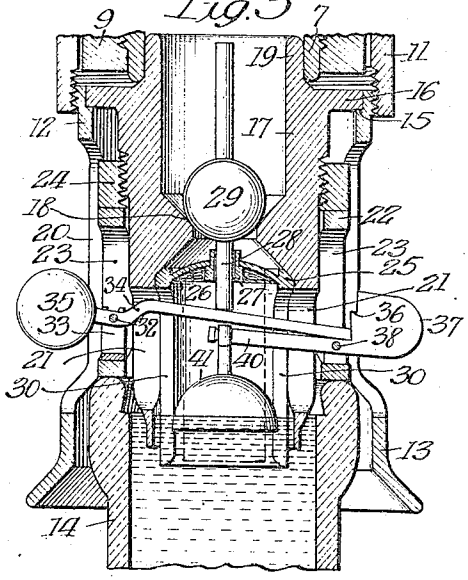
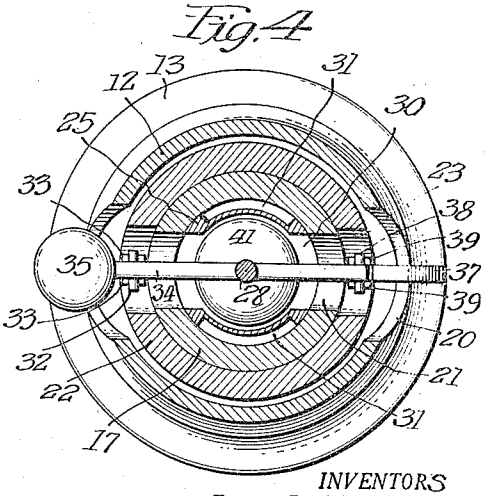


Fig. 4



WITNESS

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UNITED STATES PATENT OFFICE.

JOSEPH H. GODFREY, OF CHICAGO, ILLINOIS, AND JOSEPH B. POLO, OF FORT ATKINSON, WISCONSIN, ASSIGNORS TO THE GODFREY MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BOTTLE-FILLING VALVE.

1,282,810. Specification of Letters Patent. Patented Oct. 29, 1918.

Application filed June 2, 1917. Serial No. 172,386.

To all whom it may concern:

Be it known that we, JOSEPH H. GODFREY, a citizen of the United States, residing at Chicago, Illinois, and JOSEPH B. POLO, a citizen of the United States, residing at Fort Atkinson, Wisconsin, have jointly invented certain new and useful Improvements in Bottle-Filling Valves, of which the following is a specification.

This invention relates to valves for filling bottles and like containers with milk or other liquids, and has reference more particularly to valves of the automatic type wherein the valve proper is opened by the bottle as the latter is brought into engagement with the delivery mouth of the valve, and the valve proper is closed through the instrumentality of a float-controlled mechanism when the liquid in the bottle reaches a predetermined height.

Among the objects sought to be accomplished by the invention are to provide a simplified and improved bottle filling valve of a purely mechanical character and not requiring the use of electrical energy or control which is at present quite extensively used in valves of this character; to provide an improved valve wherein the parts that control the valve proper are automatically re-set as soon as the bottle is withdrawn; and to provide a mechanical valve-controlling mechanism of greater sensitiveness, reliability and uniformity of action than has hitherto been obtained.

Other objects and advantages of the invention will be readily understood and appreciated by those skilled in the art from the following description taken in connection with the accompanying drawing, forming a part of this specification, which illustrates one practical and workable embodiment of the invention, and in which—

Figure 1 is a central vertical section showing the valve closed and the parts in position to receive a bottle to be filled;

Fig. 2 is a similar view showing the parts in bottle-filling position with the valve open;

Fig. 3 is a similar view showing the bottle filled, the valve-controlling mechanism tripped by the float, and the valve closed; and

Fig. 4 is a cross-section on the line 4—4 of Fig. 1.

Referring to the drawing, 5 designates the bottom wall of a tank for containing the liquid to be charged into the bottles, and 6 is a hollow neck depending therefrom and from which the valve structure is suspended. The neck 6 has a reduced externally threaded lower portion 7 forming an annular shoulder 8. Engaging the portion 7 is a nut 9 formed with an annular shoulder 10 opposite the shoulder 8. Clamped between the shoulders 8 and 10 is an internally threaded depending coupling sleeve 11 from which is suspended a cylindrical housing member 12 terminating at its lower end in a bell-shaped mouth 13 that receives and guides the neck of the bottle indicated at 14. On the upper end of the housing 12 is an internal ledge or shoulder 15, on which is seated the circular flange 16 of a valve casing 17 that is formed, about midway of its length, with a valve seat 18; said valve casing having a reduced upper end 19 that fits within the lower end 7 of the neck 6. In opposite sides of the housing member 12 are long openings 20, and in opposite sides of the lower portion of the casing member 17 are similar but shorter openings 21 that register with the openings 20.

Slidably mounted on the lower portion of the valve casing 17 is a sleeve 22 formed with lateral openings 23 that register with the openings 20 and 21; and on the valve casing 17, above the sleeve 22, is an adjusting nut 24 that may be manipulated through the openings 20 of the housing 12 to regulate the extent of upward movement of the sleeve 22.

Lying within the lower portion of the valve casing 17 is a fixed sleeve 25 having a top wall 26 carrying a central guide 27 for the depending stem 28 of a ball valve 29 that normally occupies the valve seat 18 and shuts off the flow of liquid. Opposite sides of the sleeve 25 are formed with openings 30 that register with the openings 20, 21 and 23, and the walls of the sleeve between said open-

ings are externally countersunk, as shown at 31, to provide passageways for the flow of the liquid when the valve is open.

Pivoted at 32 between a pair of upstanding lugs 33 carried by the movable sleeve 22 is a lever 34 that extends through and crosswise of the registering openings 20, 23, 21 and 30 of the several coaxial members 12, 22, 17 and 25 respectively, and forms a direct support for the valve stem 28 and valve 29 when the latter is in its raised position (Fig. 2). The short arm of this lever carries a counterweight 35, and the free end of its long arm normally engages a shoulder 36 formed on a trigger member 37 that is pivoted at 38 between a pair of upstanding lugs 39 carried by the movable sleeve 22; said trigger having an inwardly extending arm 40 from the free end of which is suspended a float 41 movable in and guided by the lower portion of the fixed sleeve member 25.

The normal position of the parts is as shown in Fig. 1. When a bottle is raised into engagement with the lower end of the movable sleeve 22 and the latter is raised to the extent permitted by the adjustable stop nut 24, the valve 29 is raised, as shown in Fig. 2, and the liquid flows into the bottle, the air in the latter finding a ready vent around the lower end of the valve casing and through the openings 23 and 20. The stop 24, by adjustment up or down, varies the extent of opening of the valve and consequently the rapidity of the flow. At this time the weight of the float 41 and arm 40 of the trigger is slightly but sufficiently in excess of the downward thrust of the open valve to maintain the parts in the relative positions shown in Fig. 2. When the bottle has been filled to the required height, the raising of the float by the liquid in the bottle tilts the trigger, moving the supporting shoulder 36 thereof away from the free end of the valve-supporting lever 34, whereupon the parts instantly assume the relative positions shown in Fig. 3 wherein the valve 29 is closed, and the flow of liquid to the bottle is shut off. As the bottle is withdrawn the movable sleeve 22 descends, lowering the trigger member 37 and the lever 34, and at the same time the counterweight 35 operates to swing upwardly the lever 34 (now relieved of the weight of the valve 29), so that the parts automatically resume the latched or set position shown in Fig. 1. This automatic re-setting of the float-controlled valve-opening parts in a purely mechanical bottle-filling valve mechanism is a new result so far as we are aware, and constitutes an important feature of our present invention. It will also be observed that the weight or thrust of the valve, when open, is applied through the lever 34 to the trigger 37 at a point on the opposite side of the pivot of the latter from the float, thus tending to raise the latter. The float is, of course, heavy enough to resist this tendency (except when raised by the liquid in the bottle) but this arrangement makes practicable the use of a comparatively small float, and renders the mechanism very sensitive and uniform in its action, resulting in a uniform filling of the bottles served thereby.

While we have shown and described a particular form of mechanism for accomplishing the stated objects of the invention, it will be manifest to those skilled in the art that the same may be modified in detail within the operative principle of the invention and without sacrificing any of the advantages secured thereby. We therefore do not limit the invention to the exact mechanism shown and described, but include all equivalents thereof which come within the purview and spirit of the appended claims.

We claim:

1. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically movable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, and float-controlled valve-opening mechanism carried by said sleeve, said mechanism operating to open said valve when said sleeve is raised and permitting said valve to close when the liquid in the bottle reaches a predetermined height.

2. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically movable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, and a float-controlled valve-opening mechanism carried by said sleeve, said mechanism including normally engaged elements which operate to open said valve when said sleeve is raised, disengage under the action of the float and permit the valve to close when the liquid in the bottle reaches a predetermined height and automatically reëngage each other when said sleeve descends.

3. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a movable member adapted to be actuated by a bottle when brought into filling position, a valve-engaging member actuated by said movable member, and a float-controlled trigger normally holding said valve-engaging member in position to unseat said valve and hold the same unseated when said movable member is actuated.

4. In a bottle-filling device of the character described, the combination of a valve

casing having a valve seat, a valve movable toward and from said seat, a vertically slidable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, a movable valve-engaging member carried by said sleeve, and a float-controlled trigger normally holding said valve-engaging member in position to unseat said valve and hold the same unseated when said sleeve is raised.

5. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically movable member adapted to be lifted by a bottle when brought into filling position, a pivoted valve-engaging arm carried by said vertically movable member, and a float-controlled trigger normally engaging said arm and supporting it in position to unseat said valve and hold the same unseated when said vertically movable member is raised.

6. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically slidable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, a pivoted valve-engaging arm carried by said sleeve, and a float-controlled trigger normally engaging said arm and supporting it in position to unseat said valve and hold the same unseated when said sleeve is raised.

7. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically movable member adapted to be lifted by a bottle when brought into filling position, a movable valve-engaging member carried by said vertically movable member, a float-controlled trigger carried by said vertically movable member and normally holding said valve-engaging member in position to raise said valve when said vertically movable member is raised, and means for automatically resetting said valve-engaging member and trigger to valve-lifting position on the descent of said vertically movable member.

8. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically slidable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, a pivoted valve-engaging arm carried by said sleeve, a float-controlled trigger carried by said sleeve and normally holding said arm in position to raise said valve when said sleeve is raised, and means for automatically resetting said arm and trigger to valve-lifting position on the descent of said sleeve.

9. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve on said seat having a depending stem, a vertically slidable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, a lever pivoted on said sleeve and having one arm thereof engaging said valve stem, a counterweight on the other arm of said lever, a trigger pivoted on said sleeve and formed with a shoulder normally supporting the valve-stem-engaging arm of said lever, and a float suspended from said trigger.

10. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve on said seat having a depending stem, a vertically slidable sleeve on said casing adapted to be lifted by a bottle when brought into filling position, a lever pivoted on said sleeve and having one arm thereof engaging said valve stem, a counterweight on the other arm of said lever, a trigger pivoted on said sleeve and formed on one side of its pivot with a shoulder normally supporting the valve-stem-engaging arm of said lever, and a float suspended from said trigger on the other side of the pivot of the latter.

11. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve on said seat having a depending stem, a vertically slidable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, a fixed sleeve in said valve casing below said valve seat formed with a valve stem guide and a passageway for the liquid, a counterweighted arm pivoted on said slidable sleeve and extending across said fixed sleeve and engaging said valve stem, a trigger pivoted on said sleeve and formed with a shoulder normally supporting said arm, and a float suspended from said trigger within said fixed sleeve.

12. In a bottle-filling device of the character described, the combination of a valve casing having a valve seat, a valve movable toward and from said seat, a vertically movable sleeve on said valve casing adapted to be lifted by a bottle when brought into filling position, float-controlled valve-actuating mechanism carried by said sleeve, said mechanism operating to open said valve when said sleeve is raised and permitting said valve to close when the liquid in the bottle reaches a predetermined height, and an adjustable stop device for limiting the extent of upward movement of said movable sleeve, whereby to regulate the flow of the liquid.

13. A filling valve having, in combination, a valve member, a seat therefor, a device to support the valve member when unseated,

said device being movable by the package to be filled to unseat the valve member, and a float movable by the liquid in the package to disable the supporting device.

14. A filling valve having, in combination, a valve member, a seat therefor, a part movable by the package to be filled, a lever on said part arranged to unseat and support the valve member in such movement of said part, a device on said part to support the lever when carrying the valve member, means to move said device into and out of operative position and means to move the lever into valve-supporting position.

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