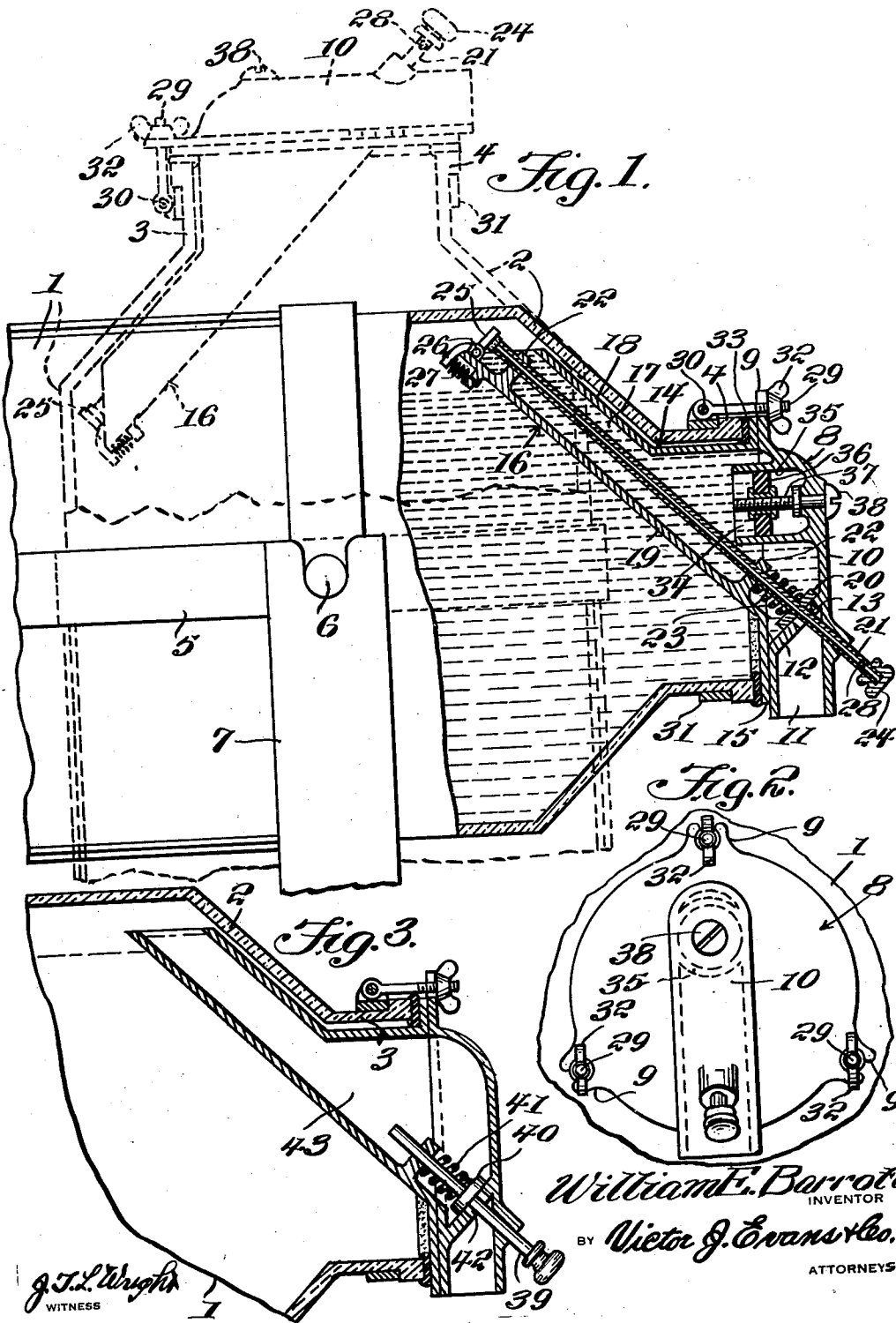


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W. E. BARROTT
VOLUMETRIC LIQUID DISPENSER
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J. L. Wright
WITNESS

William E. Barrott,
INVENTOR
BY Victor J. Evans & Co.
ATTORNEYS

UNITED STATES PATENT OFFICE

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VOLUMETRIC LIQUID DISPENSER

William E. Barrott, Aurora, Ind.

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6 Claims. (Cl. 221—98)

My invention relates to liquid dispensing and measuring closures for bottles and the like and is designed as an improvement over the structure disclosed in my co-pending application, Serial No. 20,251, filed May 7, 1935, for volumetric liquid dispensers which issued as Patent No. 2,042,455 on June 2, 1936.

In my co-pending application a special liquid container is disclosed, equipped with a built-in measuring and dispensing chamber adapted to be filled by tilting the container and to dispense liquid therefrom in measured quantities by way of selected discharge ports located at different levels from the bottom of the chamber for the flow of different quantities of liquid therefrom.

My present invention is directed particularly toward providing a liquid-dispensing and measuring closure for bottles of standard construction and embodying the general type and arrangement of the chamber of my former application but provided with improved means for effecting the discharge of the liquid from said chamber and measuring the same to predetermine the quantity of liquid to be discharged.

Another object is to provide a closure of the type and for the purposes set forth, equipped with improved means for predetermining the quantity of liquid to be dispensed by way of a single discharge port, together with means for admitting air into the bottle, as an incident to opening the discharge port.

Other and subordinate objects, together with the exact details of my improvements, will be readily understood when the following description and claims are read in conjunction with the drawing accompanying and forming part of the specifications.

In said drawing:

Figure 1 is a fragmentary view partly in side elevation and partly in longitudinal section, of a bottle mounted for tilting and equipped with my improved dispensing and measuring closure, the bottle being shown in normal position in dotted lines and in tilted position in full lines.

Figure 2 is a fragmentary view in top plan, and Figure 3 is a fragmentary view in longitudinal section of a bottle equipped with a modified form of my invention.

Reference being had to the drawing, my invention in its preferred embodiment has been illustrated as applied to a bottle 1 of the usual construction, including a conical neck portion 2, a straight mouth portion 3 and an exterior flange 4 extending around the outer end of the portion 3. The bottle 1 is supported for tilting in a cage

5 having gudgeons, as at 6, rotatably mounted in a supporting frame 7.

The measuring and dispensing closure comprises an outer cylindrical cover section 8 formed with bifurcated edge lugs 9, and a diametrically disposed boss 10 at its outer face closed at one end and forming at its other end a nozzle 11. A flange 12 extends across the nozzle 11 adjacent the outlet end thereof and is formed with an outlet port 13 therein for a liquid-containing chamber presently described. The boss 10 beyond the partition 12 is open at its rear side.

Opposed to the cover section 8 is a liquid-containing section 14 comprising a circular outer end 15, of substantially the same diameter as the cover section 8, and welded or otherwise secured to the inner face of said cover section 8, and a spout-like part 16 having open inner receiving and outer discharge ends and forming together with the open portion of the boss 10, a liquid-containing chamber 17 discharging into the port 13. The spout-like part 16 is designed to incline along the portion 2 of the bottle 1 to dispose its inner receiving end slightly beyond said portion and contiguous one side of the bottle 1 so that said inner end is located above the level of the liquid in the bottle when the latter is tilted to an appropriate position in one direction. For this purpose the spout part 16 is provided with an outer angled wall 18 paralleling the bottle neck and mouth portions 2 and 3 and an opposite oblique wall 19 substantially parallel with the neck portion 2. The partition 12 extends from the inner end of the wall 19 at a right-angle thereto, for a purpose presently seen.

The discharge port 13 is designed to be opened and closed by a disc valve member 20, fast upon a tubular valve rod 21 slidably mounted, in the boss 10 and in the lugs 22 on the wall 19, to extend from the outside of the cover section 8 into the port 13 and the chamber 17, slightly beyond the inner end of the latter and parallel with the oblique wall 16. The valve member 20 and the valve rod 21 are yieldingly held in an outward position by a coiled spring 23 interposed between the said member and one of the lugs 22 whereby the said member is seated against the flange 12 to close the discharge port 13. A knob 24 fast upon the outer end of the valve rod 21 and closing the said end, provides for manual manipulation of the said rod inwardly to open the port 13.

The valve rod 21 is designed to act as an air vent or by-pass member for the admission of air into the bottle 1 during the dispensing of liquid therefrom.

For this purpose a flap valve 25 is pivoted, as at 26, on the wall 19 at the inner end of the said tube and tensioned by a suitably arranged spring 27 to bear against and close the said end of the rod in the outward position of the said rod. The outer end of the rod 21 is provided with an air inlet port 28 communicating with the interior of the rod. The sections 8 and 14 are secured against the outer edge of the mouth portion 3 of the bottle by means of the bolts 29, pivoted, as at 30, on a collar 31 taking under the flange 4, the said bolts passing through the lugs 9 and having wing nuts 32 thereon. A gasket 33 of any suitable material is interposed between the section 14 and the outer edge of the mouth portion 3 of the bottle 1.

Co-operating with the liquid-containing chamber 17 is an auxiliary chamber 34 formed by a cylindrical extension 25 projecting into the said chamber 17 from the boss 10. A piston plunger 36 is slidably mounted in the said cylinder 35 for adjustment axially thereof by means of a bolt 37 threaded through the said plunger and rotatably mounted in the boss 10 to extend outside the latter. The bolt 37 is provided with the usual kerfed head 38 for screw-driver adjustment of the bolt 37. Normally the plunger 36 is located centrally of the cylinder 35, whereby its inner end is open to the liquid in the chamber 17. The chambers 17 and 35 are designed to contain measured amounts of liquid in different positions of the plunger 36. By varying the position of the plunger 36 the amount of liquid to be contained in said chambers may be predetermined.

In the use of the described embodiment of the invention, the bottle 1 is tilted into an inverted position and then to a horizontal position, the full line position, tilted clock-wise as viewed in Figure 1 from its normal dotted line position. During this operation the chambers 17 and 35 are filled with the liquid and the inner end of the said chamber 17 is swung above the level of the liquid in the bottle 1. By movement of the valve rod 21 inwardly, the valve member 20 is unseated off the flange 12 and the discharge port 13 thereby opened to permit the contents of the chambers 17 and 35 to be discharged by way of the nozzle 11. As an incident to such movement of the said rod 21, and the opening of the discharge port 13, the flap valve 25 is swung rearwardly by the said rod 21 to open the inner end of the latter and permit air to enter the bottle by way of the port 28 and the said rod. Upon release of the rod 21, the parts are returned to normal position under the combined action of the springs 23 and 27. When the bottle 1 is tilted back to its vertical position, the chambers 17 and 35 will quickly drain back into the bottle.

In the modification shown in Figure 3, the air-emission and auxiliary chamber features are omitted. In this form of the invention a short valve rod 39 is utilized, which is mounted in a manner similar to that described with reference to the valve rod 21 for operating a similar valve 40 against the tension of a spring 41 to open and close a discharge port 42. Otherwise the construction and arrangement of the parts is the same as that described in reference to the preferred embodiment of the invention. In this form of the invention the liquid-containing chamber 43 dispenses a fixed quantity of liquid at each operation of the valve rod 39.

The foregoing description of my invention will, it is believed, suffice to impart a clear under-

standing of the construction and operation thereof.

It is to be understood, however, that the details disclosed in the foregoing are illustrative rather than restrictive and that right is herein reserved to modifications in addition to that disclosed, falling within the scope of the claims appended hereto.

What I claim is:

1. A closure of the class described for attachment to a bottle having a body portion and a reduced neck portion comprising, a cover section for attachment to the mouth of the bottle and having an outlet port therein, a spout section having its discharge end connected with the cover and communicating with the outlet port thereof and extending from the inner side of the cover section obliquely thereof for location of its inner receiving end adjacent to the said wall of the body portion of the bottle and communicating at its other end with said outlet port, and a manually manipulative valve means normally closing communication between the discharge end of the spout and the outlet port of the cover.
2. A closure of the class described for attachment to a bottle having a body portion and a reduced neck portion comprising, a cover section for attachment to the mouth of the bottle and having an outlet port therein, a spout section having its discharge end connected with the cover and communicating with the outlet port thereof and extending from the inner side of the cover portion obliquely thereof for location of its inner receiving end adjacent to the side wall of the body portion of the bottle, said spout section, together with said cover section, forming a liquid-containing chamber opening into said outlet port, a manually manipulative valve means normally closing communication between the discharge end of the spout and the outlet port of the cover, an extension on the inner side of said cover section forming an auxiliary liquid-containing chamber opening into the first-mentioned chamber, and a manipulative means for varying the size of the auxiliary chamber.
3. A closure of the class described for attachment to a bottle having a body portion and a reduced neck portion comprising, a cover section for attachment to the mouth of the bottle and having an outlet port therein, a spout section having its discharge end connected with the cover and communicating with the outlet port thereof and extending from the inner side of the cover portion obliquely thereof for location of its inner receiving end adjacent to the side wall of the body portion of the bottle, said spout section together with said cover section forming a liquid-containing chamber opening into said outlet port, a manually manipulative valve means normally closing communication between the discharge end of the spout and the outlet port of the cover, an extension on the inner side of said cover section forming an auxiliary liquid-containing chamber opening into the first-mentioned chamber, manipulative means for varying the size of the auxiliary chamber and including a plunger slidable in said auxiliary chamber, and settable means for sliding said plunger operative from the exterior of said cover section.
4. A closure of the class described for attachment to a bottle having a body portion and a reduced neck portion comprising, a cover section for attachment to the mouth of the bottle and having an outlet port therein, and a spout section extending from the inner side of the cover

section obliquely thereof for location of its inner end adjacent to the said wall of the body portion of the bottle and communicating at its other end with said outlet port, a valve on the inside of said
5 spout for opening and closing said port, and manipulative means for opening and closing said valve and admitting air into said bottle as an incident to opening of the valve, said means comprising a by-pass member extending through
10 said cover section and through and beyond the inner end of said spout section.

5. A closure of the class described for attachment to a bottle having a body portion and a reduced neck portion comprising, a cover section
15 for attachment to the mouth of the bottle and having an outlet port therein, a spout section extending from the inner side of the cover section obliquely thereof for location of the inner end of the spout section adjacent to the side wall of the
20 body portion, said cover and spout sections forming together a liquid-containing chamber opening into said discharge port, a valve for opening and closing said port and tensioned for closing movement, manipulative means for opening said
25 valve and admitting air to said bottle as an incident to opening of said valve, said means comprising a tubular valve rod extending through said cover section and chamber and having its opposite ends projecting beyond the outer face
30 of said cover section and the inner end of said spout section, respectively, and a valve at one

end of the rod normally closing said end thereof and movable to opening position by manipulation of said rod.

6. A closure of the class described for attachment to a bottle having a body portion and a
5 reduced neck portion comprising, a cover section for attachment to the mouth of the bottle and having an outlet port therein, a spout section extending from the inner side of the cover section obliquely thereof for location of the inner end of
10 the spout section adjacent to the side wall of the body portion, said cover and spout sections forming together a liquid-containing chamber opening onto said port, a valve for opening and closing said port tensioned for closing movement, ma-
15 nipulative means for opening said valve and admitting air to said bottle as an incident to opening of the valve and comprising, a tubular valve rod slidably mounted in said cover section and
20 spout section and having its opposite ends projecting beyond the outer face of said cover section and the inner end of said spout section, respectively, and a valve at one end of the valve rod normally closing said end and movable to
25 opening position by sliding movement of said rod, the other end of said rod having a hand-grip portion thereon closing said end and a port therein intermediate said hand-grip portion and cover section.

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