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W. R. SHELDON ET AL

2,125,321

NONREFILLABLE BOTTLE

Filed Oct. 16, 1937

Fig. 1

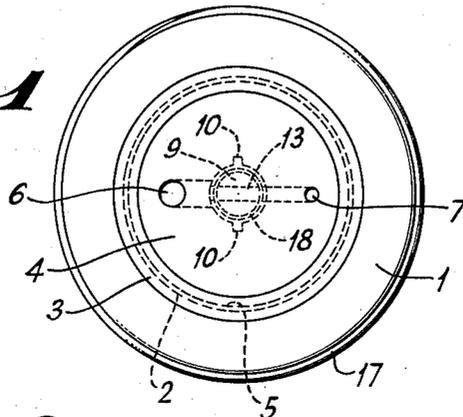


Fig. 2

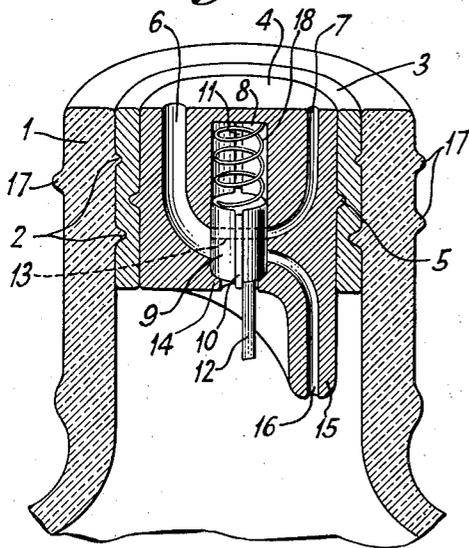


Fig. 3

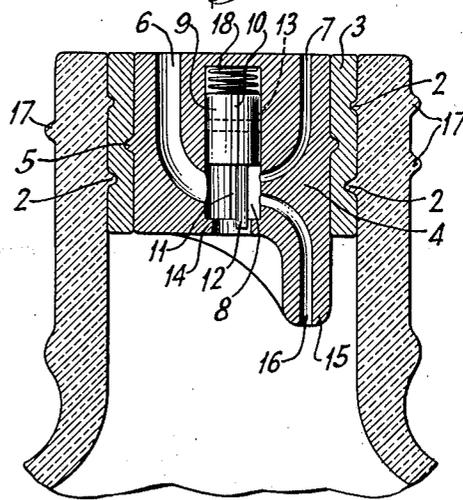


Fig. 4

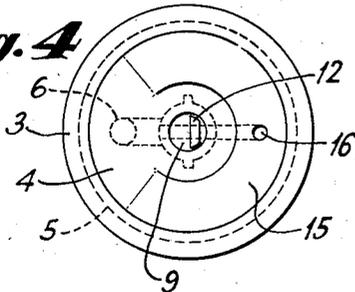
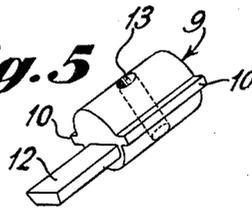


Fig. 5



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NONREFILLABLE BOTTLE

William R. Sheldon and James F. Meehan, Jr.,
Brooklyn, N. Y., assignors, by direct and mesne
assignments, of one-fourth to said Meehan and
three-fourths to Abraham Siegel, Brooklyn,
N. Y.

Application October 16, 1937, Serial No. 169,393

5 Claims. (Cl. 215—19)

This invention relates to non-refillable bottles, and has for one of its objects to provide an economical construction which is simple and effective to enable the fluid in the bottle to flow freely therefrom when the bottle is tilted, and yet of such nature as to prevent the bottle from being refilled by pouring liquid inwardly through one of the vents of the structure.

Another object of the invention is to construct a bottle which, through the use of a valve, prevents the bottle from being refilled with spurious contents once the original contents have been emptied therefrom.

The construction of the bottle is such that there are separate vents or channels for the flow of liquid and the flow of air, which vents are normally closed by a valve when the bottle is righted to prevent evaporation. This valve is adapted to be unseated by the downward flow of the liquid when the bottle is tilted, and to be resealed by gravity and/or a spring when the bottle is righted. A feature of the invention, though not a necessary construction, is a passage through the valve communicating with both vents when the valve is seated, to insure that spurious liquid forced through one vent will be returned through the other vent without any of the spurious liquid entering the interior of the bottle below the valve. Another feature which may be used, if desired, is a spring between the top of the valve and the chamber for insuring closure of the valve when the bottle is empty and in a tilted position, to prevent refilling in the inverted position.

The following is a detailed description of the invention, in conjunction with a drawing, wherein:

Fig. 1 illustrates a top or plan view of the neck of a bottle embodying the invention;

Fig. 2 illustrates a vertical sectional view through the neck of the bottle of the invention, showing the valve seated;

Fig. 3 illustrates the same sectional view of Fig. 2 showing the unseated position of the valve when the bottle is in inverted or tilted position. In order to more easily compare both of these figures, Fig. 3 has been shown in upright position, although it will be appreciated that, in practice, the valve of Fig. 3 will be in the open position shown, only when the bottle is tilted;

Fig. 4 is a bottom view of the device of the invention, with the outer glass shell of the bottle neck omitted, for simplicity of drawing; and

Fig. 5 is a detail view of the valve per se.

The bottle to which the invention may be applied may be of any size desired, and has a neck

portion provided on its outer surface with a helical thread 17 and on its inner surface with a pair of spaced inwardly projecting annular ribs 2, 2. A sleeve or shell 3 of a suitable material, such as cork, is snugly fitted within the neck of the bottle. This sleeve or shell is tightly wedged between the bottle neck 1 and an interior stopper 4, of porcelain or other desired material. The stopper 4 is provided with a projecting annular rib 5, such that this rib and the ribs 2, 2 of the neck of the bottle press tightly into the cork sleeve 3, as shown, to produce a firm tight seal between the cork sleeve and the adjacent elements. By this arrangement, the stopper will be securely held in place and prevented from being removed in order to refill the bottle.

In order that liquid may flow from the bottle through the stopper, there has been provided a liquid vent 6 and a smaller air vent 7 which extend from the upper end of the stopper to a chamber 8 in the interior of the stopper. Chamber 8 is designed to accommodate a cylindrical valve 9 in the form of a piston, and is provided at its lower end with a reduced mouth produced by a circular flange 14 to restrict the movement of the valve. Valve 9 has, at its lower end, an off-center stem or pin 12, and at its upper portion a pair of oppositely disposed keys 10, 10 which slide in correspondingly located keyways 11, 11 to prevent the valve from turning in the chamber 8. At substantially the center of the upper part of the valve there is located a transverse hole 13 which communicates with both vents 6 and 7 when the valve is seated, i. e., in its lowermost position. A tinned small metal spring 18 is located between the top of the valve 9 and the upper wall of the cylinder 8, as shown. This spring 18 is of such construction that the valve 9, under pressure of only 1 dram of liquid, will compress same when the bottle is tilted.

In order to provide an air bubble in the bottle at a point below the mouth of the chamber 8, the stopper 4 has a portion 15 which extends below the flange 14, and which is provided with an air passageway 16 located on the same side of the chamber 8 as the air vent 7. Passageway 16 communicates with chamber 8 and, together with air vent 7, enables a free flow of air from the outside of the bottle to the lower interior thereof when the bottle is tilted to raise or unseat the valve to the position shown in Fig. 3.

Flow of liquid is controlled by means of the valve 9 which in its lower position (note Fig. 2) tightly seals the mouth of chamber 8 from the vents 6 and 7. This seal, together with the close

fit of the valve in the chamber 9, prevents evaporation of the contents of the bottle. In this position of the valve, it is impossible to refill the bottle with spurious liquid, mainly because any liquid forced from the outside through one of the vents 6 or 7 will flow through hole 13 and out of the other vent. Moreover, even if there was no hole provided in the valve, the force of the spurious liquid applied in this way would aid in further tightening the seal between the valve 9 and the flange 14, the fit between the valve 9 and the wall of the chamber 8 being sufficiently close to prevent any real flow between these parts. The valve 9 will be seated in the position shown in Fig. 2 by gravity, whenever the bottle is righted.

When the bottle is tilted, the pressure of the liquid contents on the bottom of the valve 9 will cause the valve to slide toward the upper end of chamber 9 and to assume the position shown in Fig. 3. In this position, the spring 18 will be depressed, this spring being of such construction that an extremely small amount of liquid in the bottle will be sufficient to move the valve to the location shown in this figure. The liquid contents are thus free to flow through chamber 8 and out of vent 6, but will be prevented from entering either air vent 7 or air passageway 16 by the stem 12, which due to its construction effectively separates the lower part of chamber 8 into two chambers. In the unseated position of valve 9, air will flow freely into the bottle through vent 7, the right hand chamber produced by stem 12, and air passageway 16.

What is claimed is:

1. In a non-refillable bottle, a stopper adapted to be fitted into a bottle neck, a sleeve tightly wedged between said stopper and said neck, a chamber in the interior of said stopper and communicating at its lower end with the interior of said bottle, the opening of said chamber into the interior of said bottle being smaller than the widest portion of said chamber, a liquid passage and an air passage leading upwardly from and on substantially opposite sides of said chamber, another air passage leading downwardly from and substantially on the same side of said chamber as said first air passage, a valve slidable in said chamber from a lowered position in closing relation to said opening to a raised position, said valve having at its lower end a stem which when said valve is in raised position divides said chamber into two chambers, one of which enables the flow of liquid from the interior of said bottle into said liquid passage, and the other of which provides a path of travel for the air flowing from said upwardly leading air passage to the other air passage.

2. In a non-refillable bottle, a stopper adapted to be fitted into a bottle neck, a sleeve tightly wedged between said stopper and said neck, a chamber in the interior of said stopper and communicating at its lower end with the interior of said bottle, the opening of said chamber into the interior of said bottle being smaller than the widest portion of said chamber, a liquid passage and an air passage leading upwardly from and on substantially opposite sides of said chamber, another air passage leading downwardly from and substantially on the same side of said cham-

ber as said first air passage, a valve slidable in said chamber from a lowered position in closing relation to said opening to a raised position, said valve having at its lower end a stem which when said valve is in raised position enables the flow of liquid from the interior of said bottle into said liquid passage and obstructs the passage of said liquid from said chamber into said air passages.

3. In a non-refillable bottle, a stopper adapted to be fitted into a bottle neck, a sleeve tightly wedged between said stopper and said neck, a chamber in the interior of said stopper and communicating at its lower end with the interior of said bottle, the opening of said chamber into the interior of said bottle being smaller than the widest portion of said chamber, a liquid passage and an air passage leading upwardly from and on substantially opposite sides of said chamber, another air passage leading downwardly from and substantially on the same side of said chamber as said first air passage, a valve slidable in said chamber from a lowered position in closing relation to said opening to a raised position, said valve having at its lower end a stem which when said valve is in raised position enables the flow of liquid from the interior of said bottle into said liquid passage and obstructs the passage of said liquid from said chamber into said air passages, said valve having a hole extending transversely therethrough, said hole being so constructed and arranged as to communicate with said liquid passage and said upwardly leading air passage when said valve is in closing relation to said chamber opening.

4. A non-refillable bottle in accordance with claim 1, characterized in this that said stopper is porcelain, said sleeve is cork, and the outer surface of said stopper and the inner surface of said bottle neck are provided with annular ribs pressing tightly into said cork sleeve to produce a firm seal between the sleeve and said neck and stopper.

5. In a non-refillable bottle, a stopper adapted to be fitted into a bottle neck, a sleeve tightly wedged between said stopper and said neck, a chamber in the interior of said stopper and communicating at its lower end with the interior of said bottle, the opening of said chamber into the interior of said bottle being smaller than the widest portion of said chamber, a liquid passage and an air passage leading upwardly from and on substantially opposite sides of said chamber, another air passage leading downwardly from and substantially on the same side of said chamber as said first air passage, a valve slidable in said chamber from a lowered position in closing relation to said opening to a raised position, a compressible spring located between the top of said valve and the upper end of said chamber, said valve having at its lower end a stem which when said valve is in raised position divides said chamber into two chambers, one of which enables the flow of liquid from the interior of said bottle into said liquid passage, and the other of which provides a path of travel for the air flowing from said upwardly leading air passage to the other air passage.

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