Feb. 18, 1941. A. F. NELSON 2,232,129

NONREFILLABLE BOTTLE

Filed Jan. 18, 1939

Fig. 1.

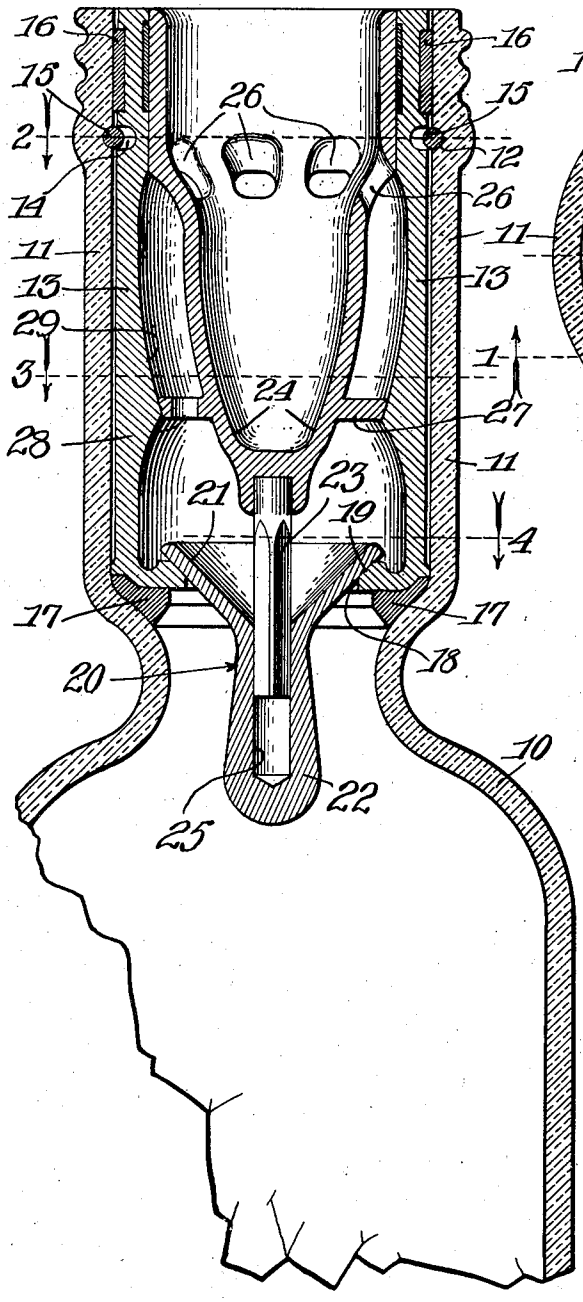


Fig. 2.

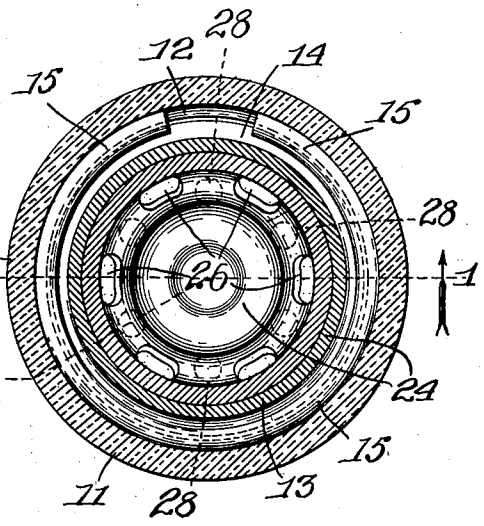


Fig. 3.

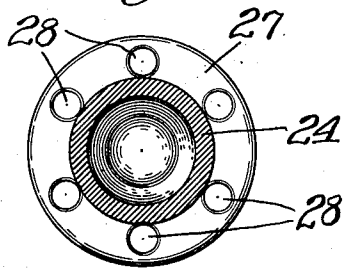
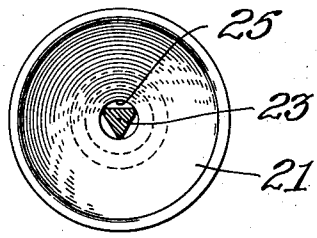


Fig. 4



Inventor:
Arthur F. Nelson,
By Chritton, Wiles, Davies, Hirschl & Dawson,
Attys.

Patented Feb. 18, 1941 2,232,129

UNITED STATES PATENT OFFICE

2,232,129

NONREFILLABLE BOTTLE

Arthur F. Nelson, Chicago, Ill., assignor of one-third to Seymour B. Levy, Cook County, Ill.

Application January 18, 1939, Serial No. 251,620

3 Claims. (Cl. 215—21)

This invention relates to a nonrefillable bottle, and more particularly to apparatus designed to be locked and sealed in the neck of a bottle to permit liquid to flow therefrom but not back thereinto.

One feature of this invention is that it is very effective for the purpose for which it is designed, yet simple and easily manufactured; another feature of this invention is that it successfully withstands methods now commonly used for defeating other allegedly nonrefillable closures for bottles; other features and advantages of this invention will be apparent from the following specification and the drawing, in which:

Figure 1 is a vertical sectional view of apparatus embodying my invention; Figure 2 is a transverse sectional view along the line 2 of Figure 1; Figure 3 is another transverse sectional view along the line 3 of Figure 1; and Figure 4 is a view along the line 4 of Figure 1.

The desirability and advantages of nonrefillable bottles have long been appreciated in such fields as liquor, drugs and the like. A reputable manufacturer is frequently damaged by unscrupulous retailers who buy a bottle of his goods, as liquor, and then after it is empty refill it with much inferior merchandise which is sold as the manufacturer's.

Despite the great amount of work which has been done in the field of making closures to render a bottle nonrefillable, all of such closures now commercially available are subject to various objections. The principal objection in most cases, of course, is the fact that they may be easily defeated and the bottle refilled. Some such closures may be defeated merely by tipping the bottle slightly; others by filling the bottle upside down; and others by using a wire, for example.

My invention obviates these and other difficulties in present structures, and provides very effective apparatus adapted to serve as a closure or valve means to render a bottle nonrefillable.

In the particular embodiment of my invention illustrated herewith, a bottle 10, as for example, a liquor bottle, is provided with a neck 11 having a cylindrical inner surface and provided at one place with an annular groove 12 therein. The bottle is adapted to be first filled by any conventional means, and then to have inserted in the neck thereof, and locked and sealed therein, apparatus so constructed and arranged as to enable the liquid to be dispensed from the bottle but to prevent other liquid from entering the bottle if an attempt is made to refill it.

This apparatus is here shown as comprising as its principal part a body member 13 which is substantially cylindrical in form and adapted to be received by the neck 11 of the bottle. The body member is provided, at a place adapted to register with the annular groove 12 in the bottle neck, with another annular groove 14. This groove is adapted to have a locking ring of spring metal 15 lie therein when the member is being inserted in the neck of the bottle, the tension in the ring being such that as soon as the grooves 12 and 14 register with each other the ring springs outwardly to the position shown in the drawing, locking the closure apparatus into the bottle neck in such a way that it cannot thereafter be removed. Appropriate means are also provided for sealing the apparatus in the neck of the bottle to prevent fluid flow between the bottle and the body member, this means being here shown as gaskets 16 and 17.

At the bottom end thereof, speaking with respect to the position shown in the drawing, the body member is provided with an opening 18 through which all liquid entering or leaving the bottle must pass when the apparatus is in place in the neck. The edge of the opening is formed with an annular sloping surface 19 to provide a seat for the valve member 20 having a conical portion 21 and a depending portion 22. The slope of the surface 19 and the exterior of the conical portion of the valve member are such that they cooperate to make good sealing engagement when the conical portion is seated to close the opening 18. The valve member is preferably constructed of quite light material, as a light metal or a molded plastic.

In order to limit the valve member to movement in a desired path, and to prevent defeating the apparatus by tipping the bottle to one side to throw one edge of the valve member off the seat, guide means is provided. This guide means is here shown as consisting of two cooperating elements. One of these is the rod 23 carried by a supporting structure 24 in the body member and so located as to be co-axial with the opening 18 and to extend therethrough. This rod is preferably polygonal in cross section, here being triangular, as may be best seen from Figure 4.

The depending portion 22 of the valve member is provided with the other element of the guide means. This is a bore 25 adapted to receive the rod 23 and to be slidably splined thereon. By this arrangement the valve member is limited to movement along the axis of the opening 18, between the closed position shown in Figure 1 and an open position when the valve member is high-

er on the guide rod than shown in the view. The use of circular and polygonal cooperating elements as guide means for the valve member enables the desired guidance of movement without any restriction thereon. That is, there is no dashpot effect in the bore **25**.

In order to prevent the valve member from being hooked or otherwise moved from closed position by a wire or other instrument, the inside of the body member is provided with two barriers. One of the barriers is the supporting structure **24**, which is pierced near the upper part thereof with holes **26**. The other barrier is the annular ring **27** closing the space between the lower end of the supporting structure **24** and the main or outer part of the cylindrical body member **13**. This second barrier also has holes therethrough, here identified as **28**. As may be seen from a consideration of Figures 1 and 2, these holes are not in register. That is, they are staggered so that any instrument or wire could not be conveniently inserted through the holes in both barriers; and even if a wire were deformed and passed through both barriers it could not be manipulated to be of any effect.

An even more important provision to prevent defeat of this apparatus by usual methods is the provision of a flow path or flow channel designed to direct liquid entering the bottle toward the axis of the opening **18**, so that it flows into the inside of conical portion **21** of the valve member. This is accomplished by curving at least a portion of the inner wall of the body member **13**, as the portion **29**, in such a way that liquid flowing into the bottle through the upper barrier openings **26** is directed through the lower openings **28** in such a way that the direction or path of flow is toward the upper end of the rod **23**. It will be readily apparent that if the bottle is turned upside down and an effort made to fill it by forcing liquid into the neck, the path of flow of the liquid will be into the inside or concavity of the conical portion **21** of the valve member. Since the valve member is preferably designably light, even a very gentle flow in this path will lift the valve member up into seated or closing position with respect to the opening, and prevent any liquid entering the bottle from getting past the valve member into the main interior portion of the bottle **10**.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as permissible, in view of the prior art.

I claim:

1. Apparatus of the character described for rendering a bottle nonrefillable, including: a substantially cylindrical body member adapted to be locked and sealed in the neck of a bottle and having an opening therein, at least a portion of the inner wall of said member being so shaped as to direct the flow of the liquid entering said bottle toward the center of said opening; a valve member movable with respect to said body member and adapted to close said opening, said valve member having a hollow thin-walled conical portion adapted to seat in said opening and a depending portion adapted to extend therethrough into said bottle, whereby the path of flow of liquid entering said bottle is into the concavity of said conical portion; and guide means limiting the movement of said valve member to a desired path, said guide means comprising as elements thereof a rod on one of said members and a bore in the other, said elements being co-axial with said opening and one being round and the other polygonal.

2. Apparatus of the character described for rendering a bottle nonrefillable, including: a body member adapted to be locked and sealed in the neck of a bottle and having an opening therein through which any liquid flowing into said bottle must pass; a valve member movable with respect to said body member and adapted to close said opening; and guide means limiting the movement of said valve member to a desired path, said means comprising as elements thereof a rod on one of said members and a bore in the other, one of said elements being round and the other polygonal.

3. Apparatus of the character described for rendering a bottle nonrefillable, including: a body member adapted to be locked and sealed in the neck of a bottle and having an opening therein through which any liquid flowing into said bottle must pass; a valve member movable with respect to said body member and adapted to close said opening, said valve member having a conical portion of sheet material and a depending portion; and guide means limiting the movement of said valve member to a desired path, said guide means comprising as elements thereof a polygonal rod on said body member coaxial with said opening and extending therethrough and a circular bore in the depending portion of said valve member adapted to receive said rod.

ARTHUR F. NELSON.