H. W. RIES.

NON-REFILLABLE BOTTLE.

APPLICATION FILED FEB. 8, 1915.

1,166,786.

Patented Jan. 4, 1916.

FIG. 1.

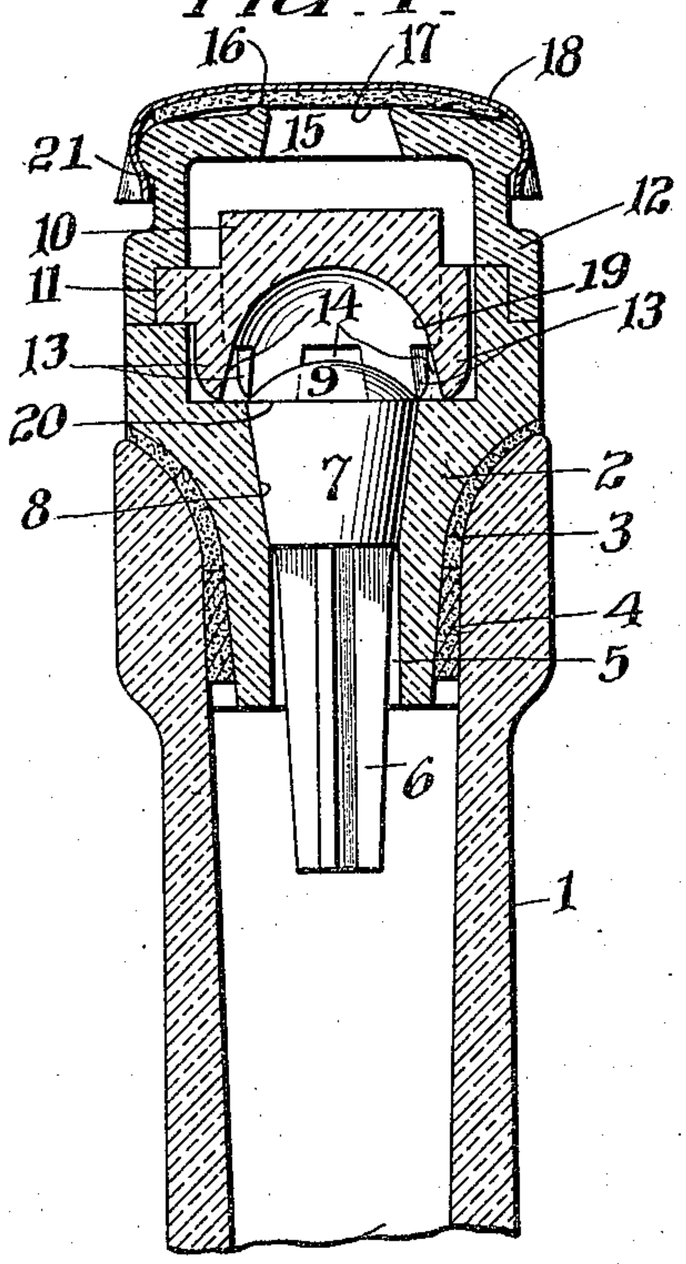


FIG. 2.

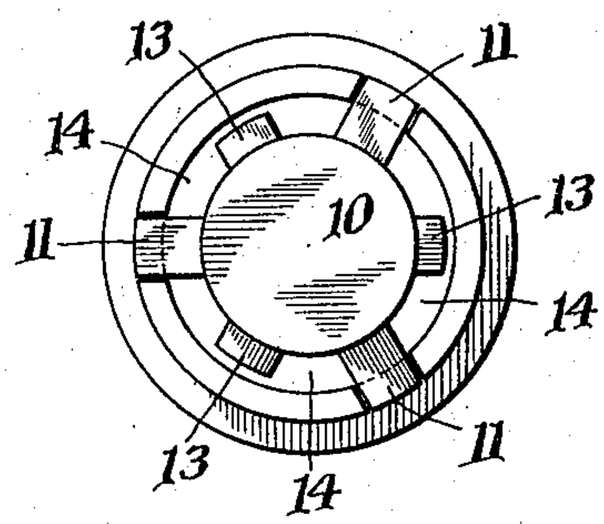


FIG. 3.

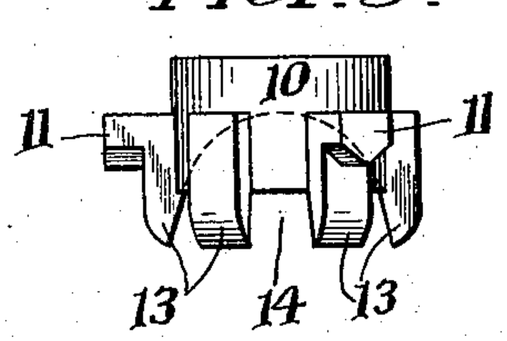
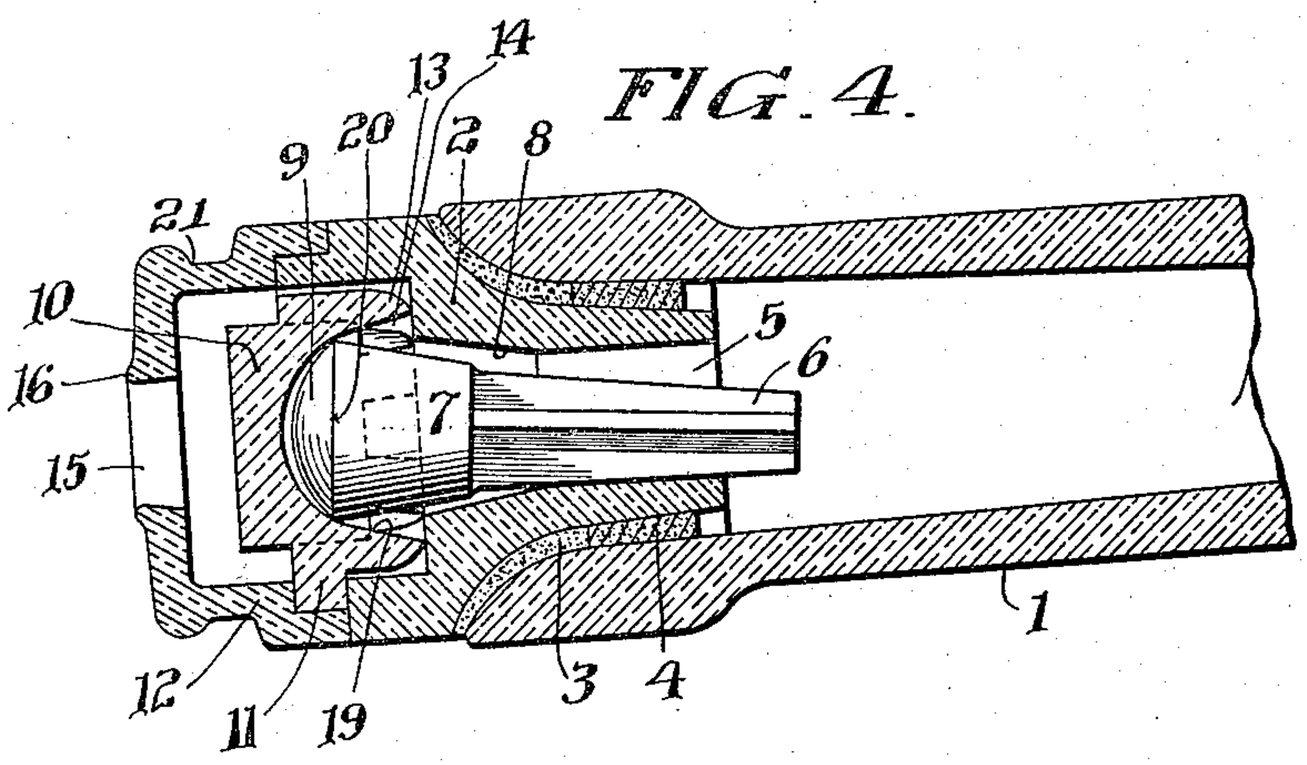


FIG. 4.



WITNESSES

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NON-REFILLABLE BOTTLE.

1,166,786. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed February 8, 1915. Serial No. 6,728.

To all whom it may concern:

Be it known that I, HARRY W. RIES, a citizen of the United States, and resident of Collingswood, county of Camden, and State of New Jersey, have invented an Improvement in Non-Refillable Bottles, of which the following is a specification.

This invention relates to a closure for bottles and more particularly to a non-refillable type of bottle.

The object of the invention is to provide a closure, for a bottle or like receptacle, which opens automatically when the bottle is inverted, to allow the free flow and discharge of the liquid contents of the bottle and which also automatically closes when the bottle is being returned to its normal upright position, the automatic closing taking place at a time when the bottle is approximately horizontal and before the air could escape if the bottle was submerged in a liquid in an endeavor to refill it.

A further object is to provide a closure consisting of few parts so arranged and combined as to operate in an efficient and positive manner to the end desired.

With the above and other objects in view, the nature of which will be more fully understood from the description hereinafter, the invention consists in the novel construction of closure for bottles as hereinafter more fully described and defined in the claims.

Referring to the drawings: Figure 1 represents a sectional elevation of a bottle closure embodying my invention; Fig. 2 represents a plan of certain parts of the device; Fig. 3 represents a side elevation of one part detached; Fig. 4 represents a similar section as Fig. 1 with the parts turned so that the contents of the bottle may be discharged.

1 designates the neck of a bottle or like receptacle for containing liquids, and to the mouth of which the closure of my invention is adapted to be secured in a suitable manner. As here shown, the body 2 of the closure, which is preferably of glass, may be cemented to the neck as indicated at 3, and is also provided with an encircling bushing 4 of cork or other suitable packing material disposed between the cementing medium and the interior of the neck as a safeguard against leakage by way of the cement or its joint. It will be understood that this means of securing the body 2 to the neck is merely one form of available construction, as I do not wish to be limited to any particular means of securing these parts together.

The body 2 is provided with a longitudinally disposed passageway 5 therethrough to form a discharge outlet for the liquid contents of the bottle and it also serves to guide the stem 6 of the conical valve piece 7 and maintain the latter in proper operative relation to its adjuncts. The stem 6 of the valve piece is preferably of fluted construction in order that the liquid may flow along the side passages thus provided, and with the least frictional resistance to movement of the valve piece on closing. The outer portion of the passageway 5 is outwardly flared to form a conical seat 8 corresponding in contour to the conical or truncated configuration of the valve piece 7, so that in seated position of the valve piece communication by way of the passageway 5 is entirely cut off. The valve piece 7 is preferably provided with a rounded top 9 which gives added weight to the end of the valve piece 7 and with it constitutes a weighted head, for a purpose which will later be explained.

The passage way 5 opens into an enlarged chamber, formed by the projecting circumferential flanged wall of the body 2, which is adapted to contain a control member 10 for the valve piece 7. This member 10 is provided with radially disposed lugs 11 which seat within suitable notches formed in the cap 12, whereby cementing of the cap to the body 2 permanently fixes the member 10 in its operative position.

The face of the member 10, juxtaposed to the valve piece 7, is preferably of cupped construction to provide a suitable clearance for outward movement of the valve piece 7.

13 designates a plurality of lugs formed integral with the member 10 and contacting with the body 2 to properly maintain the parts in spaced relation so that the discharged liquid may pass through the ports 14 formed by the spaced lugs, into the cap chamber whereby it may be discharged through the outlet 15. As here shown, the outer circumferential edge of the outlet 15 is provided with a small bead 16 to form a tight contact joint with the cork filler or lining 17 of the metal closure cap 18. The cap 12 is provided with the annular undercut groove 21 near its outer part to form a shoulder over which the perimeter of the

metal closure 18 may be clamped. This closure 17, 18 may be of any well known construction suitable for sealing the discharge outlet until it is desired to make use of the liquid contents. When the closure 18 is removed, the bottle may be sealed with an ordinary cork stopper, and it is manifest that such a stopper may be used in place of the closure 18, if so desired.

In connection with the cupped construction of the member 10, it will be noted that the outer portion of its inner circumferential wall is downwardly and outwardly flared in order to provide an incline, in certain positions of the bottle, upon which the relatively sharp edge 20 of the valve piece is adapted to rest and slide under the action of gravity. This action takes place more particularly when the bottle neck is substantially horizontal or inclined to the horizontal when the neck is raised after a discharging operation.

As the valve piece head portion is circular the edge 20 is a circle, and as its diameter is less than the diameter of the space formed between the opposite walls and lugs of the member 10, it follows that the actual contact is hardly more than a point and hence produces very little friction.

In the position indicated in Fig. 4 the bottle neck is supposed to be returinig to its normal upright position, after a quantity of liquid has been discharged; and it will be seen that the effective action of the incline portion 19 is coming into operation. Consequently the weighted valve piece head is guided down the inclined surface and as the neck continues its upward movement the valve piece and stem are guided quickly and accurately to their normal position to close the passage 5. It will be noted that the inclined surface 19 is quite steep where the valve edge 20 rests upon it in Fig. 4, and consequently the weighted head exerts considerable tendency to slide down; this impetus given to the rest of the valve piece will, as the incline of the surface 19 decreases, cause the valve piece to be shot into its seat to seal the bottle before it can assume a position which could permit the inflow of liquid and outflow of air, if attempts were made to refill it.

It will be manifest that the essential feature of this invention is in providing the valve and valve seat with means which will shield it against being tampered with, and at the same time will provide a propelling action to the valve piece under the action of gravity, when the body is approximately in a horizontal position; and while I have described a construction which I believe is most preferable, on account of the commercial making and assemblage of the parts, both from an effective and economical point of view, I do not in any manner restrict myself to the detailed construction of the elements making up the device. While the member 10 acts to provide the inclined guideway for the weighted head of the valve piece, it also provides a shield between the outlet 15 and the valve piece to prevent the insertion of any wire or instrument to hold the valve piece in open position or otherwise tampering with it. While I have shown the members 10 and 12 as made separate and connected together in the assemblage of the closure as a whole, it is manifest that the making of these parts in separate pieces, instead of one piece, is merely to overcome the difficulties of molding or otherwise forming them, especially as it is desirable that they shall be made of glass or refractory material which will take a high finish, and thereby eliminate as much as possible friction between the operative parts. It will be understood that these parts may be made in one piece if that were conveniently and economically possible, such as if the parts were molded from metal, but I prefer to use vitreous substances, such as glass, for obvious reasons, and in those cases it is not conveniently possible to mold intricate structures providing channels such as 14. I therefore do not confine myself to the manner of making and assembling the several parts 2, 10 and 12, so long as they bear a fixed relation to each other and provide a seat for the valve piece associated with the necessary fluid passages, and also provide the cam or inclined surface 19 for the operation of the valve piece, as hereinbefore described.

In the construction here illustrated, the body 2, member 10 and the cap 12 are all preferably of glass or like material, cemented or similarly connected together to form a complete unitary structure. The parts therefore provide smooth surfaces for the passage of the liquid contents and insure the desired sanitary condition necessary in an article of this kind.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

Having now described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a device of the character stated, a structure adapted to be secured to the neck of a bottle and having an irregularly shaped chamber terminating at the top in a dis-

charge orifice and at the bottom in a conical valve seat, and having within the chamber a shielding central portion in alinement between the discharge orifice and the conical valve seat, and having its under side recessed and the recessed portion flaring outwardly toward the conical valve seat and providing an annular guide surface, combined with a conical valve having a shank at the bottom extending through the conical valve seat and loosely guided thereby and having its upper or head portion made heavy and bounded by an annular guiding edge adapted to coöperate with the annular flaring guide surface for automatically causing the weighted head portion of the valve piece to slide by gravity and the valve piece to move longitudinally of its length into seating position when the structure and the bottle attached thereto is in substantially a horizontal position.

2. In a device of the character stated, a structure adapted to be secured to the neck of a bottle and having an irregularly shaped chamber terminating at the top in a discharge orifice and at the bottom in a conical valve seat, and having within the chamber a shielding central portion in alinement between the discharge orifice and the conical valve seat, said portion having its under side recessed and the recessed portion flaring outwardly toward the conical valve seat and providing an annular guide surface and in which the outer part of the shielding central portion has a plurality of radial lugs which extend toward the valve seat and have their inner surfaces inclined and continuous with the flaring portion of the under recessed surface, combined with a conical valve having a shank at the bottom extending through the conical valve seat and loosely guided thereby and having its upper or head portion made heavy and bounded by an annular guiding edge adapted to coöperate with the annular flaring guide surface for automatically causing the weighted head portion of the valve piece to slide by gravity and the valve piece to move longitudinally of its length into seating position when the structure and the bottle attached thereto is in substantially a horizontal position.

3. In a device of the character stated, a body adapted to be fixedly secured to the neck of a bottle and having a passage therethrough having its outer end portion outwardly flared to form a substantially conical valve seat, a cap secured to said body provided with a discharge outlet, a valve piece freely movable in said passage and having a stem extending into the portion of the passage beyond the valve seat and said valve piece provided with a substantially conical upper part to form a weighted head adapted to coact with said valve seat to close said passageway in certain positions, said head also having a circumferential edge, a control member fixed between said body and the cap provided with longitudinally arranged ports for the passage of liquid and having a recessed chamber of curved contour inclosing the end of the head of the valve piece in all positions and having its walls outwardly flared to form an inclined part upon which the circumferential edge of the head is adapted to slide and return the valve piece by gravity to its closed position.

In testimony of which invention, I hereunto set my hand.

HARRY W. RIES.

Witnesses:
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