

W. R. VOSS.

NON-REFILLABLE BOTTLE.

APPLICATION FILED JUNE 4, 1909. RENEWED MAY 8, 1911.

997,525.

Patented July 11, 1911.

Fig. 8

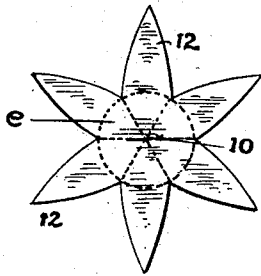


Fig. 1

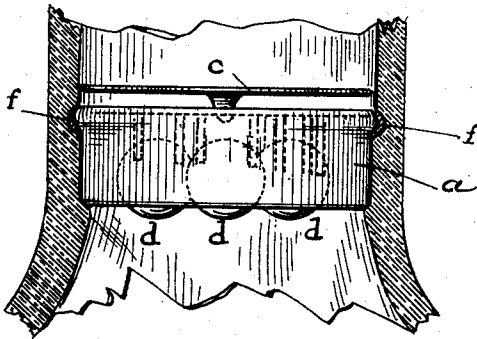


Fig. 6

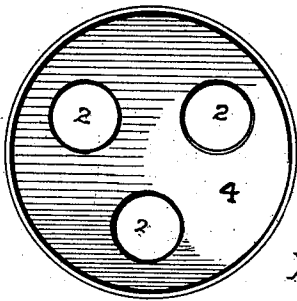


Fig. 2

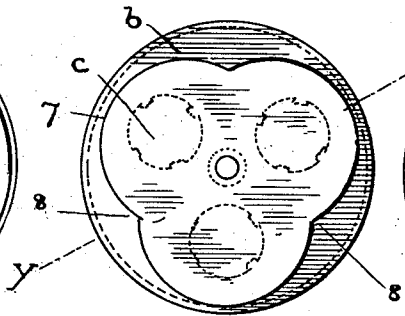


Fig. 7

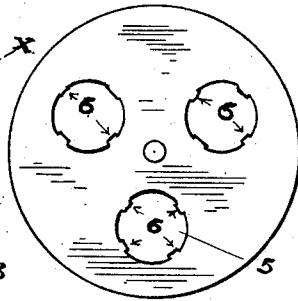


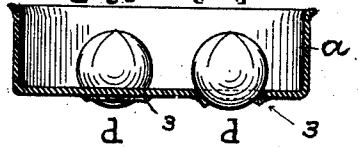
Fig. 5



Fig. 4



Fig. 3



Witnesses:

M. Regner
R.S. Tidwell

Inventor:

William R. Voss
By *G. G. Osborn*
his Atty.

UNITED STATES PATENT OFFICE.

WILLIAM R. VOSS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO COMMERCIAL NON-REFILLABLE BOTTLE STOPPER COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

NON-REFILLABLE BOTTLE.

997,525.

Specification of Letters Patent. Patented July 11, 1911.

Application filed June 4, 1909, Serial No. 500,239. Renewed May 8, 1911. Serial No. 625,760½.

To all whom it may concern:

Be it known that I, WILLIAM R. VOSS, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented new and useful Improvements in Non-Refillable Bottles, of which the following is a specification.

This invention relates to improvements in devices for controlling the outlet and passage through the neck of a bottle to prevent the bottle from being refilled after it has been emptied of its contents.

The invention has as its object to provide a device adapted by its construction to be inserted and fixed in the neck of a bottle, and by reason of the small number and the simplicity of its parts capable of being produced and manufactured in quantities at such a low cost as to render its application and use practicable in all grades or classes of bottled goods.

A further object is to provide a device of that character bearing the quality of preventing the inflow of liquid into a bottle the same affording a free outflow and discharge of the liquid from the bottle.

My said invention comprises a cage or body having valve-controlled openings and valves and valve guides of peculiar and novel construction combined and arranged for operation in and with a bottle as hereinafter explained.

A non-refillable bottle of my invention consists of the parts and combination of parts as described and shown in the accompanying drawing.

Figure 1 of the drawing represents a part of the neck of a bottle with the non-refillable device fixed in place; the latter being shown partly in section. Fig. 2 is a top-view of the device. Fig. 3 is a vertical sectional view of the shell or casing of the device with the valves and the other parts removed. Fig. 4 is a similar view of the top-plate and the valve guides. Fig. 5 is a side-view of the guard-plate detached from the top-plate. Fig. 6 is a plan or top-view of the valve casing. Fig. 7 is a similar view of the top-plate. Fig. 8 is a plan of the sheet metal blank from which the spherical valve is produced. These several views are on an enlarged scale.

The non-refillable device or attachment of my invention is composed of the three prin-

cipal parts which are herein termed for convenience of description, the valve casing *a*, the valve cage *b* and the guard plate *c*. These with the hollow spherical valves *d* comprise the complete device. In their form and general construction I have had in view the production of all the parts from aluminum, as that metal has not only the property of being unaffected by and of unaffecting many liquids which are used as foods or beverages; but that metal is also particularly serviceable on account of its lightness and other properties.

The form of the casing lends itself readily to being struck up out of sheet metal, or of being cast. If formed of sheet metal the marginal edges of the openings 2 in the bottom are preferably turned down or flanged, as shown at 3, in order to furnish a broader and closer seat for the valve than would be furnished by the thickness of the metal. Usually, openings in the bottom 4 for these valves will be found to afford a sufficient area of outlet through the neck; and the arrangement or spacing of three apertures at uniform distance apart around the circle has the advantage of reducing the superficial dimensions of the guard-plate over the outlets in the top, so that there will be less obstruction by the plate to the outflow of the liquid. There is also more space afforded in the casing by limiting the number of valves to three, than there otherwise would be with a greater number.

The part *b* termed the valve-cage, is composed of a thin circular plate having openings 5 in the top, corresponding in number and arrangement with the openings 2 in the casing, but of somewhat larger area; each one being situated over one of the openings 2 in the bottom of the casing. Around the edges of each opening and extending into the space beneath prongs or fingers 6 form a cage within which the valve *d* is confined to such an extent that while it is freely movable to and from its seat, the prongs prevent the valve from moving out of position and keep it always in line with the opening controlled by it.

The prongs 6 are preferably formed by slits in the metal within the circle of the opening and removing those portions of the metal which are not required for the prongs and then bending perpendicularly down or

inward the integral portions of the metal. The prongs 6, usually four in number to each valve, are situated at intervals apart around the edge of the opening.

5 After the valves *d* are placed in position the cage *b* is fixed in the casing *a* by turning the edge of the plate over the rim of the casing, the parts being united by spinning or crimping the metal or otherwise secur-

10 ing them to produce a tight joint.

In devices of this character containing valved controlled openings the valves are usually protected from access and prevented from being tampered with by providing a guard between the valves and the mouth of the bottle, in the form of a wire screen or of a perforated plate fixed over the outlets in the casings—the openings in which are either of sufficiently small area to prevent the introduction of a wire or similar appliance by means of which the valve may be held away from its seat while the bottle is being tilted and its mouth held under the surface of a body of liquid to effect a refilling of the bottle; or else the passage or space above the valve is made more or less circuitous to prevent the use of such means for holding the valve away from its seat. The guard or protection *c* for the same purpose in my improved device consists of a solid or unperforated plate having lobes or portions 7 of curved outlines lying directly over and covering the openings in the top of the casing, and cusps or cut-away portions 8 between the lobes. At the last named points the metal is removed between the lobes, uncovering the top of the casing between the outlet openings, and affording a larger outlet area for the liquid than there is in the combined area of the outlet openings in the top of the casing. The lobes or portions 7 lying over the openings in the top plate extend beyond the marginal edges of these openings at and near the circumference of the casing and prevent the valves from being reached under the plate *b* and held off the seat by a wire or other means inserted through the mouth of the bottle. This guard-plate has advantages over the perforated plate and the wire screen, not only in efficiency and in the feature of cleanliness—but also in the feature of being equally efficient and clean when in use with a thick or heavy liquid, as with a thin liquid.

A novel feature in the non-refillable bottle of my invention consists in the combination with the valve-casing and cage of a spherical valve having the quality of floating on the surface of the liquid, and of such extreme buoyancy that it will be invariably carried to its seat and held in the opening by the inflowing liquid, on any attempt be-

ing made to introduce the liquid by immersing the mouth of the bottle below the surface of the liquid; or to refill, by forcing in the liquid while the bottle is held inverted.

An important quality in the valve *d*, therefore in addition to its spherical shape whereby it will seat on its opening 2 in all positions of the valve and of the bottle is its buoyancy, and to that end I form or produce a hollow sphere from a single piece of sheet metal by cutting the blank *e* to the shape or outline shown in Fig. 8, and then bring the blank to a spherical shape by means of dies or formers. This is readily done by drawing or pressing the center portion 10 into a semi-spherical shape, and afterward bending over and drawing together the segments 12 evenly until their edges join on curved lines converging to the center. The first operation wherein one half of the sphere is produced from the center portion 10 is performed by hemispherical male and female dies of any well known construction, the second operation is carried on by means of a cup-shaped female die, and in that operation the segments are gradually bent and brought together with close joints that are sufficiently tight to keep the liquid from getting inside and securing the required buoyancy.

The device is fixed in place in any well known manner, but preferably by providing a groove in the inner wall and a shoulder below the groove on which the bottom of the valve-casing will seat when the casing is forced into the neck of the bottle. The groove is filled with cement or a packing ring is forced in between the casing and the groove for the same purpose.

I claim:—

1. In a device to prevent the refilling of a bottle, a valve casing having a flat bottom, openings in the bottom, a spherical buoyant valve fitted to a seat in each opening, means for limiting the movements of the valves and alining them with respect to the valve-seats comprising the top plate having depending valve-guides and having openings between the guides.

2. In a device of the character described, the combination with a valve-casing having a flat bottom and a standing rim and provided with openings in the bottom, of a buoyant spherical valve adapted to seat on each opening, an apertured top-plate having valve guides on the underside, and a guard plate standing clear of the top plate and adapted to cover the openings therein.

WILLIAM R. VOSS.

Witnesses:

M. REGNER,
EDWARD E. OSBORN.