G. V. STEIN.

NON-REFILLABLE BOTTLE.

APPLICATION FILED JUNE 28, 1909.

988,953. Patented Apr. 4, 1911.

Fig. 1.

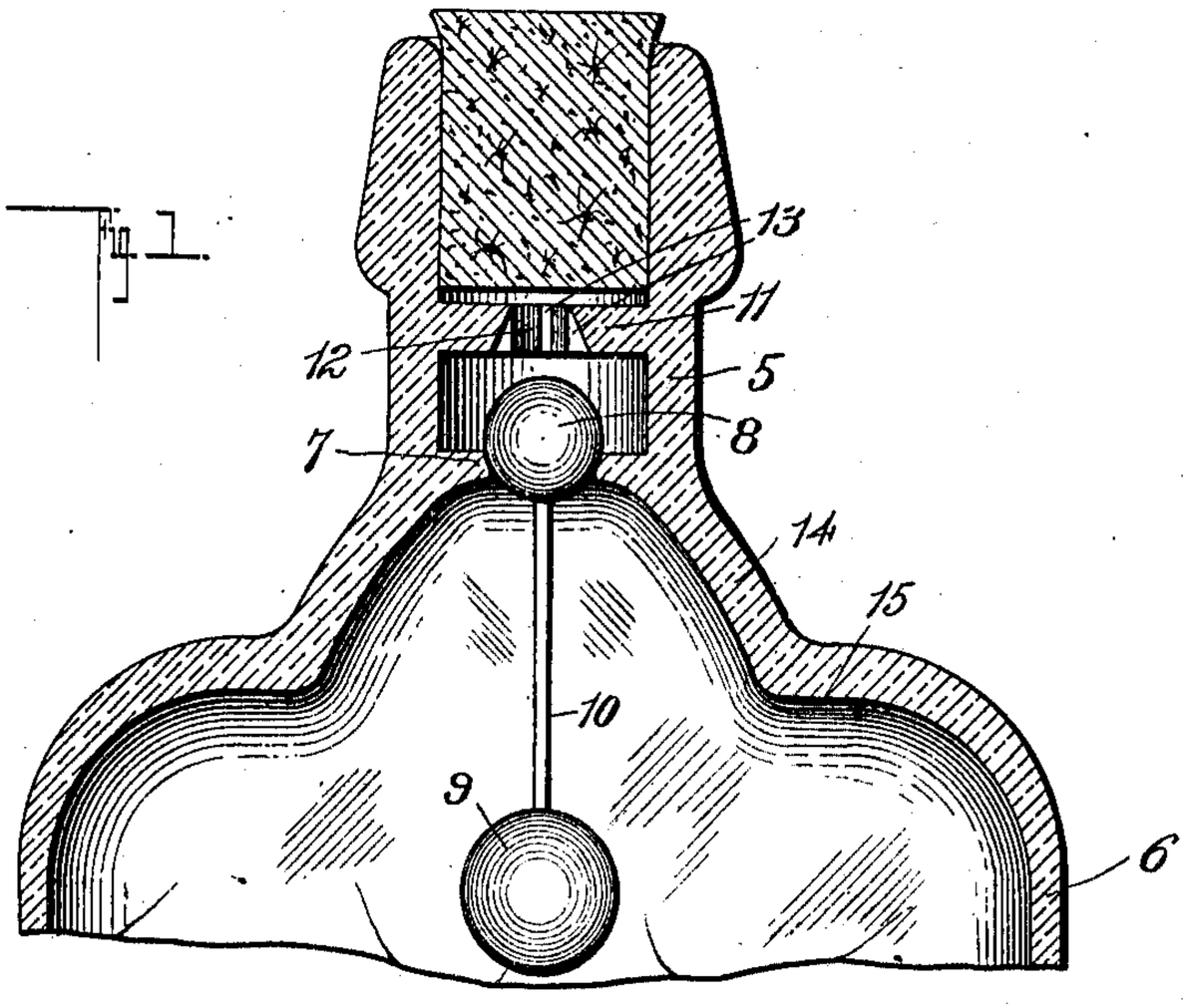


Fig. 2.

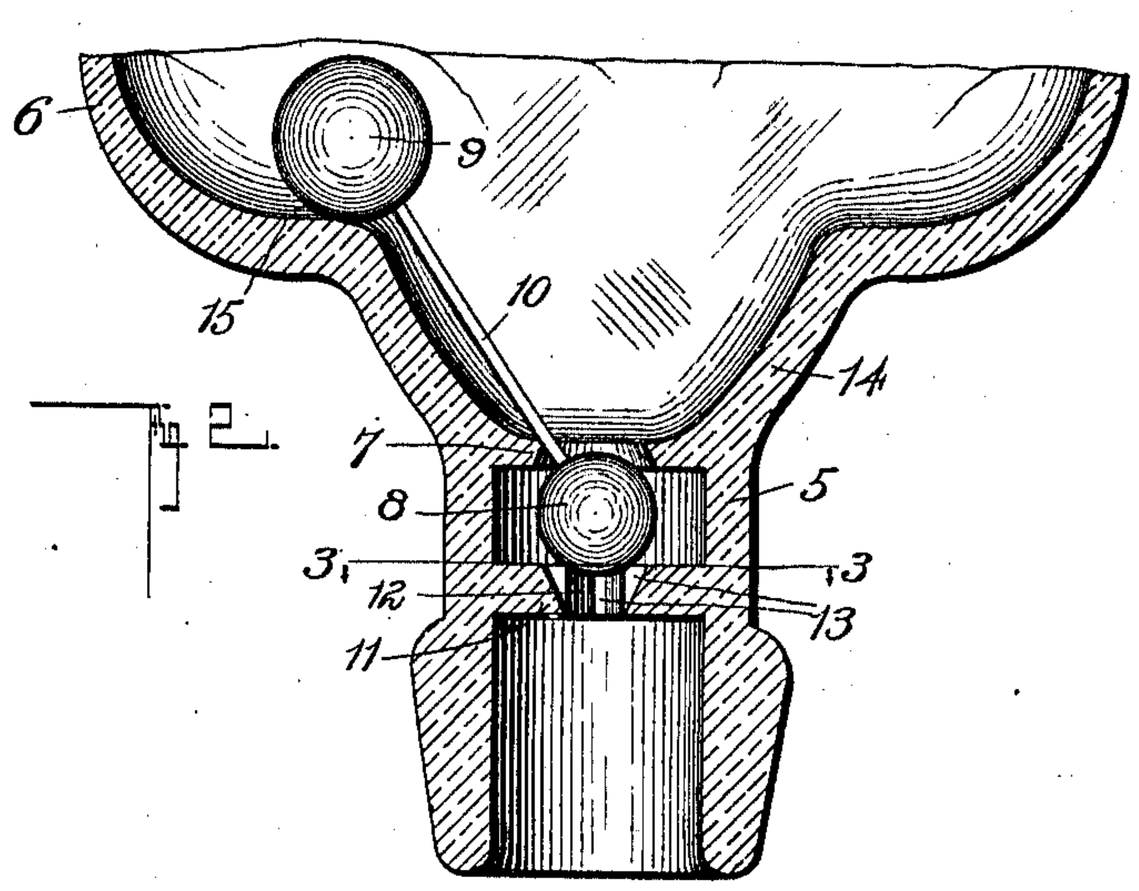
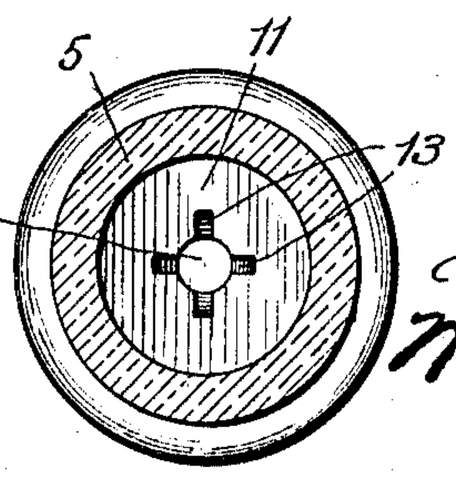


Fig. 3.



WITNESSES

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GEORG V. STEIN, OF WASHINGTON, INDIANA, ASSIGNOR OF ONE-FOURTH TO ADAM B. KNAPP, ONE-FOURTH TO JOHN E. CRANE, AND ONE-FOURTH TO JOSEPH P. MOLEN, ALL OF WASHINGTON, INDIANA.

NON-REFILLABLE BOTTLE.

988,953. Specification of Letters Patent. **Patented Apr. 4, 1911.**

Application filed June 28, 1909. Serial No. 504,700.

To all whom it may concern:

Be it known that I, GEORG V. STEIN, a citizen of the United States, residing at Washington, in the county of Daviess and State of Indiana, have invented certain new and useful Improvements in Non-Refillable Bottles, of which the following is a specification.

This invention relates to that class of non-refillable bottles in which the neck of the bottle is provided with a valve which is controlled by a pendent weight, and it consists in a novel construction and arrangement of parts to be hereinafter described and claimed.

It is the object of the present invention to provide a valve which will automatically leave its seat when the bottle is inverted to pour out its contents, and which will drop back to its seat immediately upon restoring the bottle to its normal position.

Another object is to provide the interior of the bottle with a surface which is engaged by the weight, and which surface is so presented to the longitudinal axis of the bottle that it forms an incline when the bottle is tilted from the perpendicular, and down which incline the weight slides to close the valve.

The invention also has for its object to provide a bottle of the kind stated which is entirely practical, and which can be easily manufactured, all the parts, with the exception of the valve and its weight, being formed integral with the bottle.

In the accompanying drawing forming a part of this specification, Figure 1 is a vertical section of a fragment of a bottle constructed in accordance with my invention. Fig. 2 is a similar view showing the bottle inverted. Fig. 3 is a cross section on the line 3—3 of Fig. 2.

In the drawing, 5 denotes the neck of a bottle 6. In the neck is an annular valve seat 7 which is engageable by a spherical valve 8, the seat being properly shaped so that the valve may fit snugly thereon. The valve carries a spherical weight 9 connected thereto by a rigid stem 10.

Above the valve seat 7, the neck contains a partition 11 which serves as a guard to prevent the valve from moving too far off its seat. This partition has a central opening 12 which is circular, and of considerably less diameter than that of the valve, so that the latter may not get stuck therein. In the wall of the opening 12 are grooves 13 through which the contents of the bottle flows when the latter is inverted, and the valve is off its seat. The grooves gradually decrease in depth in the direction of the mouth of the bottle, and their depth and number are such that the contents of the bottle may flow freely therethrough. The grooves merge with the wall of the opening at that end of said opening which is next to the bottle mouth. By this arrangement the area of the opening at this end is not increased to expose a large portion of the valve, which would facilitate access thereto, and by providing the grooves it is possible to make the opening quite small, the grooves forming an additional outlet.

Below the valve seat 7, the interior surface of the bottle neck is flared as indicated at 14, until it reaches the interior surface of the body of the bottle. That portion of the interior surface of the bottle body which joins the flared portion 14, extends at a right angle to the longitudinal axis of the bottle, as indicated at 15.

The stem 10 is of such a length that the weight 9 engages the surface 15, adjacent to the apex of said surface and the surface 14, when the valve is in open position. The partition 11 is engaged by the valve when it is open, so that by properly spacing the partition from the valve seat, the weight will assume the position herein described. Inasmuch as the surface 15 extends at a right angle to the longitudinal axis of the bottle, it will be evident that said surface becomes an incline when the bottle is tilted from the perpendicular while in inverted position, and the weight slides down this incline and thus carries the valve to its seat. Inasmuch as the valve and weight are both spherical, there is no tendency of said parts getting stuck. The surface 15 extends entirely around the interior of the bottle, so that the bottle may be rotated without unseating the valve. The distance between the valve seat and the partition is also such, that the movement of the valve is just enough to uncover the seat. In view of this restricted space in which the valve moves, it cannot get caught in unseated position.

When the bottle is in upright position, the

weight 9 is pendent as shown in Fig. 1, and the valve is held securely to its seat. It will remain in this position until the bottle is inverted and placed in perpendicular position, whereupon it drops off its seat, and assumes the position shown in Fig. 2, the contents of the bottle then being free to flow out of the same through the valve seat, and the grooves 13. The valve also opens by inverting the bottle and shaking it. Of course, only a small quantity of liquid then flows from the bottle, as the valve seats again after each shake, unless the bottle is held in perpendicular position. Upon restoring the bottle to its upright position, the weight slides down the incline 15 as already described, and the valve seats, the weight finally assuming the position shown in Fig. 1. This closing movement of the valve takes place immediately upon tilting the bottle from the perpendicular.

By the structure herein described it will be impossible to hold the bottle in a position to be refilled, and if an attempt is made to fill it by pressure, the valve will be forced to its seat by the pressure. The opening 12 and grooves 13 are too small to permit access to the valve for the purpose of holding it off its seat.

The bottle has no complicated parts, and can be made as usual, the neck being pressed, and the body blown. The seat and partition are formed integral with the neck, the valve and its weight being positioned before the bottle is finished. There will be a piece of fine wire embedded in, or otherwise connected to the valve, of sufficient length to extend out of the bottle mouth, in order that the valve may be held off its seat when the bottle is originally filled, and after this, the wire is pulled off, whereupon the valve drops to its seat into operative position. There is sufficient space between the partition and the mouth of the bottle to permit the insertion of a cork; or, if desired, the closure may be an ordinary metal cap.

I claim:

The combination with a bottle having a neck provided with a valve seat, and a shoulder in the bottle below the neck, said shoulder extending around the entire interior of the bottle, and at a right angle to the longitudinal axis of the bottle; of a valve engageable with the seat, a straight stem extending from the valve, a weight carried by the stem, said weight being spaced from the valve by the stem a distance to engage the aforesaid shoulder when the bottle is inverted, and a valve guard in the bottle neck above the valve, the length of the stem of the valve and the distance between the valve seat and the guard being such that the weight remains behind the shoulder in all positions of the valve.

In testimony whereof I affix my signature in presence of two witnesses.

GEORG V. STEIN.

Witnesses:
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