

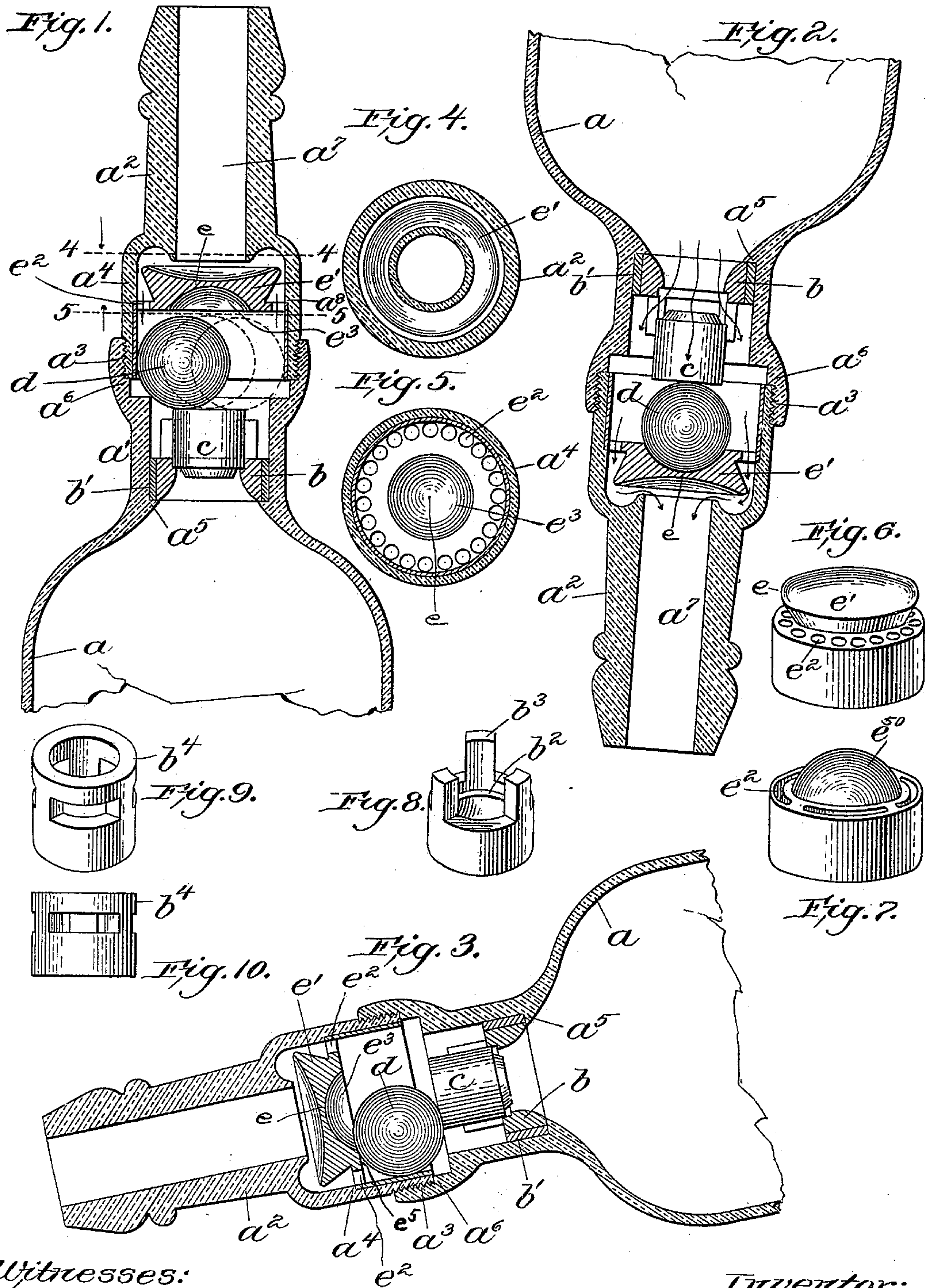
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Patented Feb. 21, 1899.

F. S. ELWELL.
ANTIREFILLING BOTTLE.

(Application filed Mar. 8, 1898.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

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ANTIREFILLING BOTTLE.

SPECIFICATION forming part of Letters Patent No. 619,945, dated February 21, 1899.

Application filed March 8, 1898. Serial No. 673,075. (No model.)

To all whom it may concern:

Be it known that I, FRED S. ELWELL, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Antirefilling Bottles, of which the following is a specification.

This invention has relation to antirefilling bottles; and it consists of a bottle possessing certain features of construction and arrangement of parts, all as illustrated upon the drawings now to be described in detail and finally pointed out in the claims.

Reference is to be had to the accompanying drawings, and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Figure 1 represents a portion of a bottle embodying the invention, the bottle in this figure being upright. Fig. 2 represents the bottle inverted to permit the escape of the contents thereof. Fig. 3 represents the bottle in a horizontal position. Fig. 4 represents a section on line 4 4 of Fig. 1, looking downward. Fig. 5 represents a section on the line 5 5, looking upward. Fig. 6 represents in perspective view the preferred form of guard which is employed to prevent tampering with the valve. Fig. 7 represents in perspective view another form of guard which may be used. Fig. 8 represents in perspective view the preferred form of valve-seat. Figs. 9 and 10 represent another valve-seat which may be used, if desired.

Referring to the drawings, *a* indicates a bottle of any desired configuration or shape, having at its upper end a neck *a'*, to which is secured the upper or false neck *a²*. The neck *a'* *a²* is formed in two parts, so that the valve and other operative parts may be placed therein, and consequently the upper portion of the neck *a'* is enlarged at *a³* to receive the lower enlarged end *a⁴* of the upper portion *a²* of the neck. The lower portion of the neck is internally shouldered, as at *a⁵*, to receive the valve-seat, which I shall subsequently describe, and is shouldered, as at *a⁶*, near its upper end to receive the lower end of the upper portion of the neck, the said portion being secured in place by cement or in any other suitable way.

Through the upper part of the false neck *a²* extends a reduced discharge-aperture *a⁷*, which communicates with an enlarged chamber formed in the lower portion of the false neck and in the lower portion *a'* of the neck, in which chamber are placed the valve-seat *b*, the valve *c*, a ball *d*, and a guard *e*.

The valve-seat *b* rests upon the shoulder *a⁵* and is surrounded by a packing-ring *b'* of any suitable material, or the valve-seat may be made integral with the bottle. The seat is rabbeted at *b²* to form a double seat for the cylindrical valve *c*, which by this construction can be partially withdrawn without permitting the liquid to flow past it, as shown in Fig. 3, the valve-seat having an annular face which bears on the inner end of the valve and a cylindrical face which bears on the periphery of the valve. The valve itself is guided in its longitudinal movement and held against lateral vibration by guides or fingers *b³*, projecting up from the seat, as shown in Fig. 8, and, if desired, the upper ends of the fingers may be connected by a cylindrical band *b⁴*, as illustrated in Figs. 9 and 10.

The guard *e* is cup-shaped, as shown in Fig. 6, with an upper crown-like portion *e'*, which is concave on top, and surrounding the base of the crown are numerous small apertures *e²*, through which liquid may pass from the interior of the guard in a sinuous path past the edges of the crown and out through the aperture *a⁷*, the crown being less in cross-diameter than the internal diameter of the chamber in the upper portion *a²* of the neck. The guard is internally concave, as shown at *e³*, the concaved portion extending into the crown, as illustrated in Fig. 1. The guard itself is secured in the false neck and rests against the shoulder *a⁸* therein.

The ball *d* is placed between the valve *c* and the crown *e'* and is free to move laterally in the enlarged chamber in the guard. When the bottle is inverted, as shown in Fig. 2, the ball drops into the socket or concave portion *e³* of the crown and permits the valve to entirely leave its seat, whereby the contents of the bottle may flow through the seat, past the crown of the guard, and out through the discharge-aperture in the false neck.

The valve *c* is preferably formed of alumi-

um, or else it may be constructed of glass with a hollow interior, whereby it is lighter than the liquid, and consequently if it should be desired to force liquid into the bottle when it is inverted the valve would float upon the liquid and be forced by the pressure thereof against the seat. The valve may, however, be made of any other suitable material or materials. When the bottle is on its side, however, as shown in Fig. 3, the ball rolls down into the contracted space between the crown and the valve and holds the valve, so that the valve cannot be moved outward longitudinally far enough to allow liquid to pass either from the bottle or into it. In this connection the importance of the cylindrical form of the valve and of the valve-seat formed to bear on the periphery of the valve for a considerable distance from its inner end will be readily seen, the elongation of the bearing of the valve-seat on the valve in the direction of movement of the latter permitting the valve to have a limited end shake without opening a passage into the bottle, so that when the ball is in the position shown in Fig. 3 it will not become wedged or stuck between the guard and the valve, because when the bottle is restored to a vertical position the valve will drop slightly, and thus liberate the ball. There is no liability, therefore, of the valve being stuck in a closed position.

It should be noted that the distance between the margin of the socket e^3 in the guard and the wall of the chamber containing the ball d is such that when the bottle is held horizontally, as shown in Fig. 3, the ball cannot be forced into the socket e^3 to permit the valve to open by shaking the bottle endwise, the bottom surface of the guard surrounding the socket e^3 forming a stop or shoulder e^5 of sufficient height to prevent a movement of the ball into the socket e^3 when the bottle is in the position last described.

It is obvious that the details of construction of this device may be changed in various ways without departing from the spirit and scope of the invention. For instance, the guard may be constructed as shown in Fig. 7, in which case the crown is omitted and a dome e^{50} is formed in place of it, and instead of a large number of perforations the dome may be surrounded by three or four elongated slots.

The function of the guard is to extend below the aperture a^7 in the false neck and prevent the insertion of a wire into the chamber in the neck for the purpose of tampering with the ball and the valve.

I use the term "cylindrical" in connection with the valve c to conveniently indicate that the valve has a surface which extends in the direction of the movement of the valve and has a sliding fit on the corresponding face of the valve-seat; but it is obvious that the said surface and the cooperating face on the valve-seat may be made of polygonal instead of true cylindrical form without departing from the spirit of my invention, care being taken to

maintain a close sliding fit between the valve and the outer face of the seat when the valve is in the positions shown in Figs. 1 and 3.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. An antirefilling bottle having a neck formed with a portion of its passage-way enlarged to form a chamber, a cylindrical valve, a valve-seat in the neck of the bottle formed to bear simultaneously on the periphery and the inner end of the valve, a guard secured in the neck and having a stop, or shoulder, such as e^5 , and a ball between the guard and the valve, the form and arrangement of said parts being such that the valve has a full opening movement when the bottle is inverted, and a limited movement without separating the cylindrical portion of the valve from the corresponding face of the valve-seat when the bottle is held in an approximately horizontal position, whereby the ball is prevented from becoming wedged between the valve and guard, as set forth.

2. An antirefilling bottle having a neck provided with an internal shoulder, a false neck having an enlarged chamber in its lower portion and secured to the neck of the bottle, a valve-seat resting on the shoulder of the bottle and provided with two faces formed as described and with upwardly-projecting guides, a cylindrical valve sliding in said guides and fitting the two faces thereof, a guard secured in the lower portion of the false neck and internally concaved as at e^3 , said guard being provided with circumferential apertures to permit the passage of liquid from the interior of the bottle through the false neck, and a ball between the guard and the valve and arranged to permit a limited and inoperative movement of the valve when the bottle is held horizontally, and an opening movement of the valve when the bottle is inverted.

3. An antirefilling bottle having a two-faced valve-seat in its neck, one of the faces of said seat being annular and the other cylindrical, a cylindrical valve the periphery of which has a sliding fit within said cylindrical face, a fixed guard in the neck of the bottle above the valve and valve-seat, said guard having a concave recess in its under side and a stop, or shoulder, such as e^5 , surrounding said recess, and a loose ball interposed between the guard and valve and adapted to drop into the recess in the guard and permit the opening of the valve when the bottle is inverted, and to drop to the lower side of the neck and permit a limited and inoperative outward movement of the valve when the bottle is held in an approximately horizontal position.

4. An antirefilling bottle having a chamber in the passage-way of its neck, a two-faced valve-seat at one end of said chamber, a cy-

lindrical valve formed to bear simultaneously on the two faces of the valve-seat and having a sliding fit on one of said faces, a guard at the other end of the chamber having a central socket e^3 and a stop or shoulder surrounding said socket, and a ball between the guard and valve, said parts being formed and arranged as shown, whereby when the bottle is held in an approximately horizontal position the ball permits a limited movement of the valve without permitting it to open, the stop or shoulder on the guard preventing the displacement of the ball when the bottle is shaken.

5. An antirefilling bottle comprising a neck having a chamber or enlargement, a valve-seat between said chamber and the body of the bottle having a face extending lengthwise of the bottle-neck, a valve movable lengthwise of said neck, and having a sliding fit on

said face, the valve and face being formed so that the valve may have a limited outward movement without opening the passage closed by the valve, a guard at the outer portion of said chamber, having a recess or cavity and a stop such as e^5 surrounding said recess, and a ball between the guard and valve, said parts being formed and arranged so that when the bottle is held in an approximately horizontal position the ball permits a limited outward movement of the valve without permitting it to open, the stop or shoulder on the guard preventing the displacement of the ball when the bottle is shaken.

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

FRED S. ELWELL.

Witnesses:

C. F. BROWN,

WILLIAM QUINBY.