

(No Model.)

F. R. H. THOMAS.
INTERNAL BALL VALVE BOTTLE.

No. 551,102.

Patented Dec. 10, 1895.

Fig. 1.

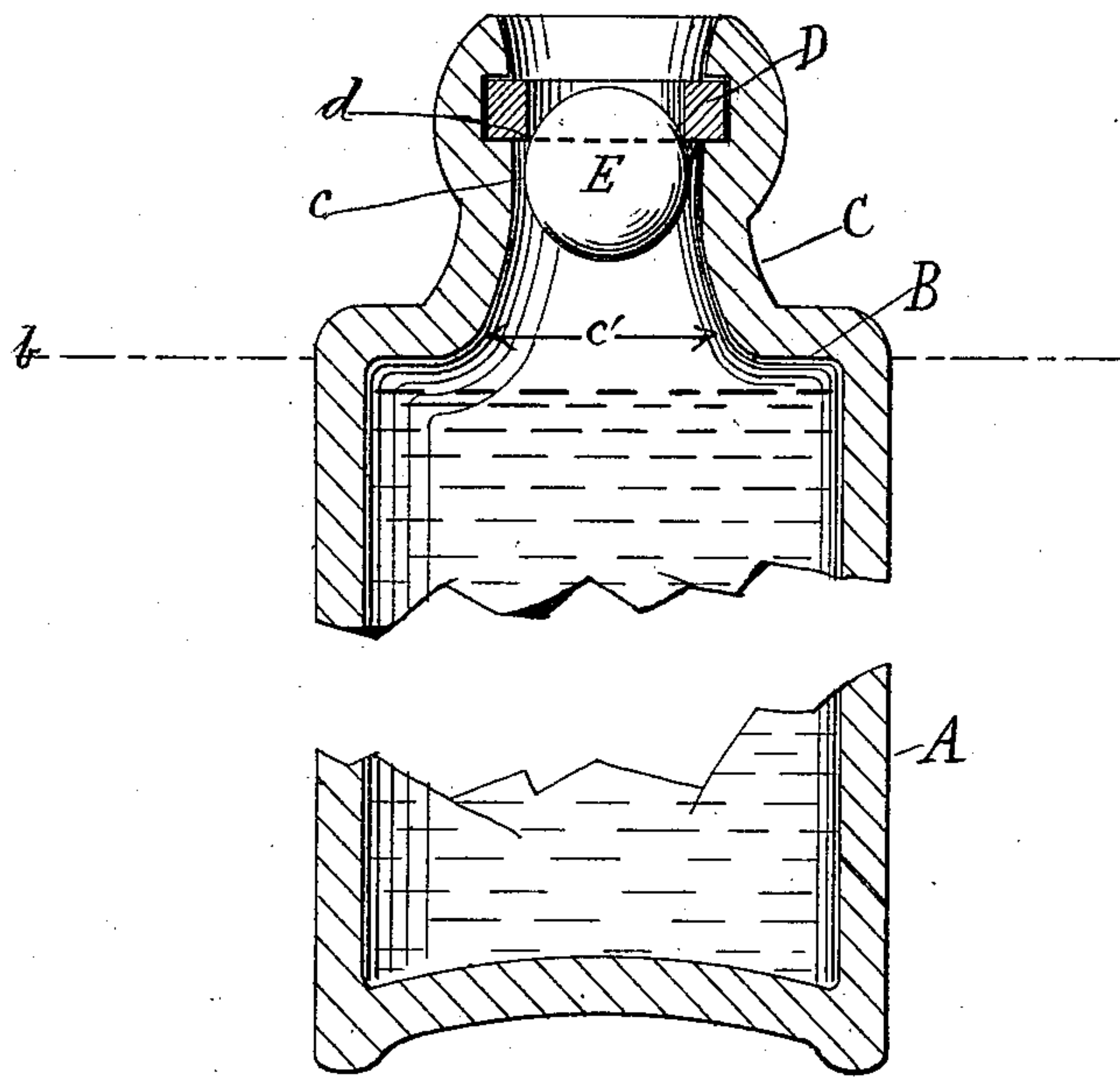
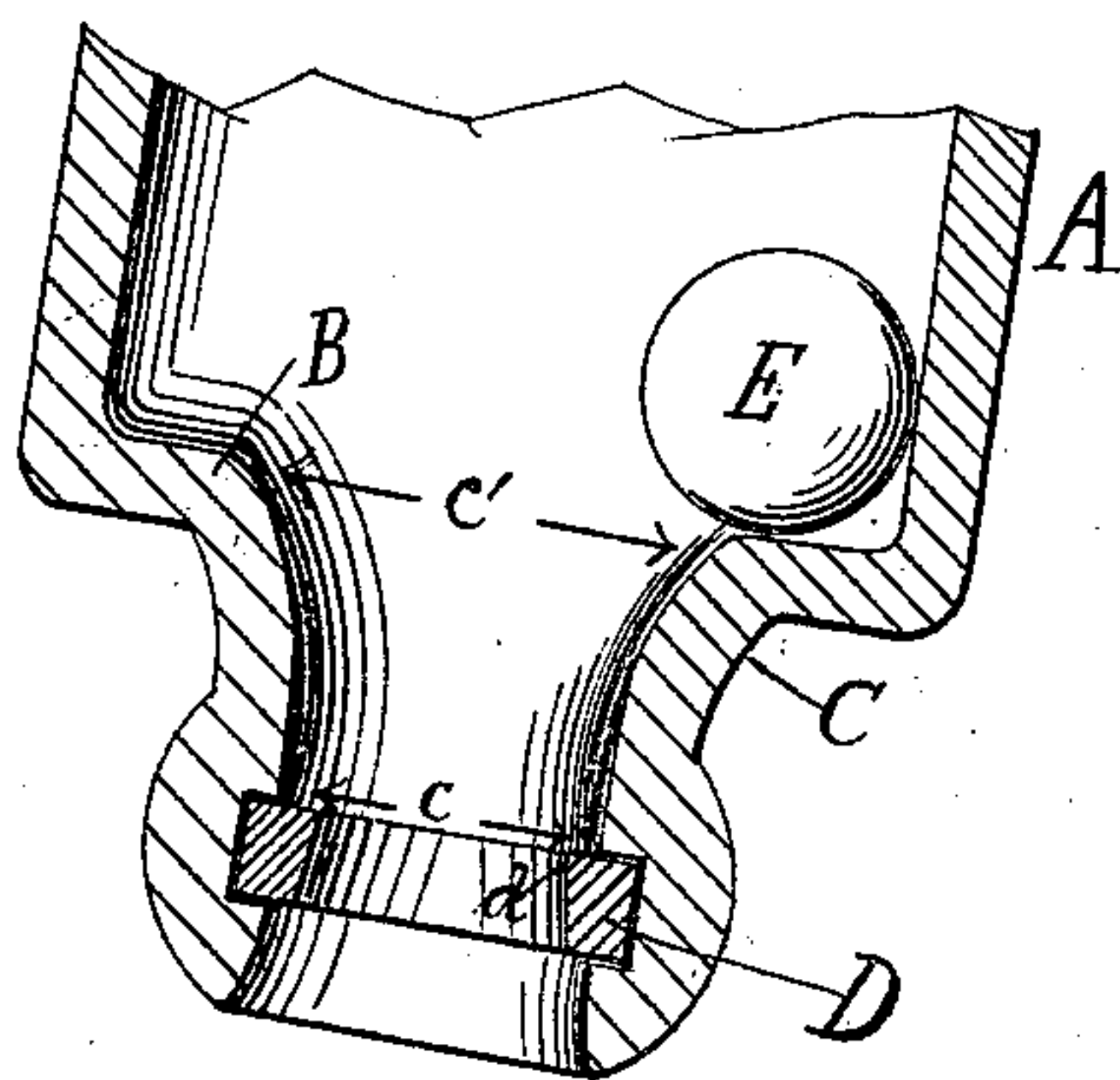


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

FREDERIC R. H. THOMAS, OF CATSKILL, NEW YORK, ASSIGNOR TO IMOGEN N. THOMAS, OF SAME PLACE.

INTERNAL-BALL-VALVE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 551,102, dated December 10, 1895.

Application filed March 12, 1892. Serial No. 425,444. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC R. H. THOMAS, a citizen of the United States, and a resident of Catskill, in the county of Greene and State of New York, have invented certain new and useful Improvements in Internal-Ball-Valve Bottles, of which the following is a specification.

My improvement relates to bottles having, interiorly, ball-valves closing against seats in the neck of the bottle by the outward pressure of the gas contained in the bottled liquid—such as the carbonic-acid gas of ordinary “soda-water,” so called, ginger-ale, &c. In relation to the ball-valves used such bottles may be divided in two classes—those having heavy or sinking valves and those having light or floating valves. In order to prevent the valve of the former class from rolling to its seat and shutting off the flow when pouring out the liquid, the bottles are provided in the neck or in the side near to the bottom with pockets formed in the molding, to receive and retain the ball-valve while emptying. Beside the inconvenience of manipulating the bottle so that the ball will reach and lodge into one of the said pockets, the pockets gather dirt and gum, which not only causes the ball to stick there when not wanted, but makes cleaning difficult and tedious. Moreover, the location of the valve-seat too far below the mouth of the bottle makes the valve inconvenient of access in opening and the long, narrow cylindrical, or too slightly conical neck makes it necessary to use special means, beside the fingers, to push the ball so far down as to prevent its being pushed back toward the seat by the outward rush of the liquid impelled by the gas-pressure. In bottles having floating ball-valves and improved by having no pockets another objection exists—namely, that the very light ball jumps back to its seat time and again when opening, thereby causing the gas-charged liquid to spatter over the person who opens it, and sometimes it lodges on the foam and is slow to recede from the neck even though the bottle be inverted. Again at times when after emptying a small portion of the liquid remains, the sweet or gummy ingredients therein will cause the light ball to adhere to the inner surface of the bottle so hard

as to impede considerably the process of washing. The usual length of the necks of bottles of both classes makes them all very liable to be broken. In those having sinking ball-valves and pockets at the bottom the bottle must be held upright until the ball has lodged in the said resting-place. In the meantime the liquid foams out of the bottle without getting into the drinking-glass and is wasted. If the bottle is inclined before the ball has thus lodged, the ball immediately rolls into the neck and stops the flow of the liquid.

The valve-seat of the ring in the bottle-neck, as heretofore constructed, has unnecessarily large surface, requiring proportionately too high pressure to tighten the valve and requiring larger depression to remove it from its seat in opening.

In order to obviate the aforesaid objections, my improvement comprises a bottle whose breast forms a square shoulder at the junction of the body and neck, of a depth not less than the semi-diameter of the ball, to form a retaining-ledge, a very short downwardly abruptly flaring or widening neck, narrowest at its upper end, where it meets the square cut groove, and of a length substantially the same as its width at the said narrowest point, as shown in the drawings, and a valve-ring seated in a groove so as to project therefrom, presenting a sharp edge for contact with the valve and located so near to the mouth of the bottle as to bring the ball within, say, one-fourth of one inch below the same, and thus easily accessible to be depressed by the thumb to drop from its seat when desired to empty the bottle.

In the accompanying drawings, Figure 1 represents a bottle embodying my improvements and in upright position with valve closed. Fig. 2 shows the same inverted and with valve open as when just emptied.

The body A of the bottle is preferably cylindrical. The breast forms a square shoulder B with the body, the line *b b* being at right angles to the side of the bottle. When the bottle in emptying is held at an inclination even as steep as that shown in Fig. 2, the ball-valve E rests upon the said shoulder B and does not fall to its seat until the bottle is placed vertical. The neck C is very

short and abruptly flaring or widening inward from the narrowest point c to c' , the width at c' being at least forty percent. greater than that at c and considerably greater than
5 the length of the neck from the valve-seat d to the shoulder B, said length being substantially the same as the diameter at the said narrowest point, as shown in the drawings. Thereby is gained the advantage that in opening
10 the valve drops instantly, there being plenty of space between the valve and the inner surface of the neck for the liquid to pass without carrying the valve with it, and the contents are never spattered. The extra
15 shortness of the neck saves breakage and the bottle is much easier cleaned than bottles heretofore used for gaseous beverages.

Another great advantage of the shortness and increasing width of the neck is that after
20 filling the bottle the ball will take its seat upon the ring D quickly, thereby saving largely in gas, gas-water, flavor, &c., otherwise spilled and wasted. The valve-seat is formed by a rubber-ring D, inserted in a
25 groove in the bottle-neck, as usual, but the seat proper is not beveled, the hole in the ring being cylindrical, as in Fig. 1, or tapering inward, as in Fig. 2, in either case leaving

a sharp corner or annular edge d to receive and seat the ball-valve. The ball is of
30 the heavy or sinking kind.

I claim—

A cylindrical bottle having an interior sinking ball valve closing outward, an annular
35 internal groove close to the mouth of the bottle, an elastic valve ring inserted in the said groove and having a sharp projecting annular seat, a short inwardly flaring neck whose
40 length is substantially the same as its minimum width at the valve ring groove, and a breast forming a square shoulder at the junction between the flare of the short neck and
45 the body of the bottle, of a depth not less than the semi-diameter of the ball, whereby the valve is supported in any inclined position of the bottle, and kept from entering the
neck while the bottle is being emptied, substantially as specified.

Signed at Catskill, in the county of Greene
and State of New York, this 16th day of December, A. D. 1891. 50

FREDERIC R. H. THOMAS.

Witnesses:

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