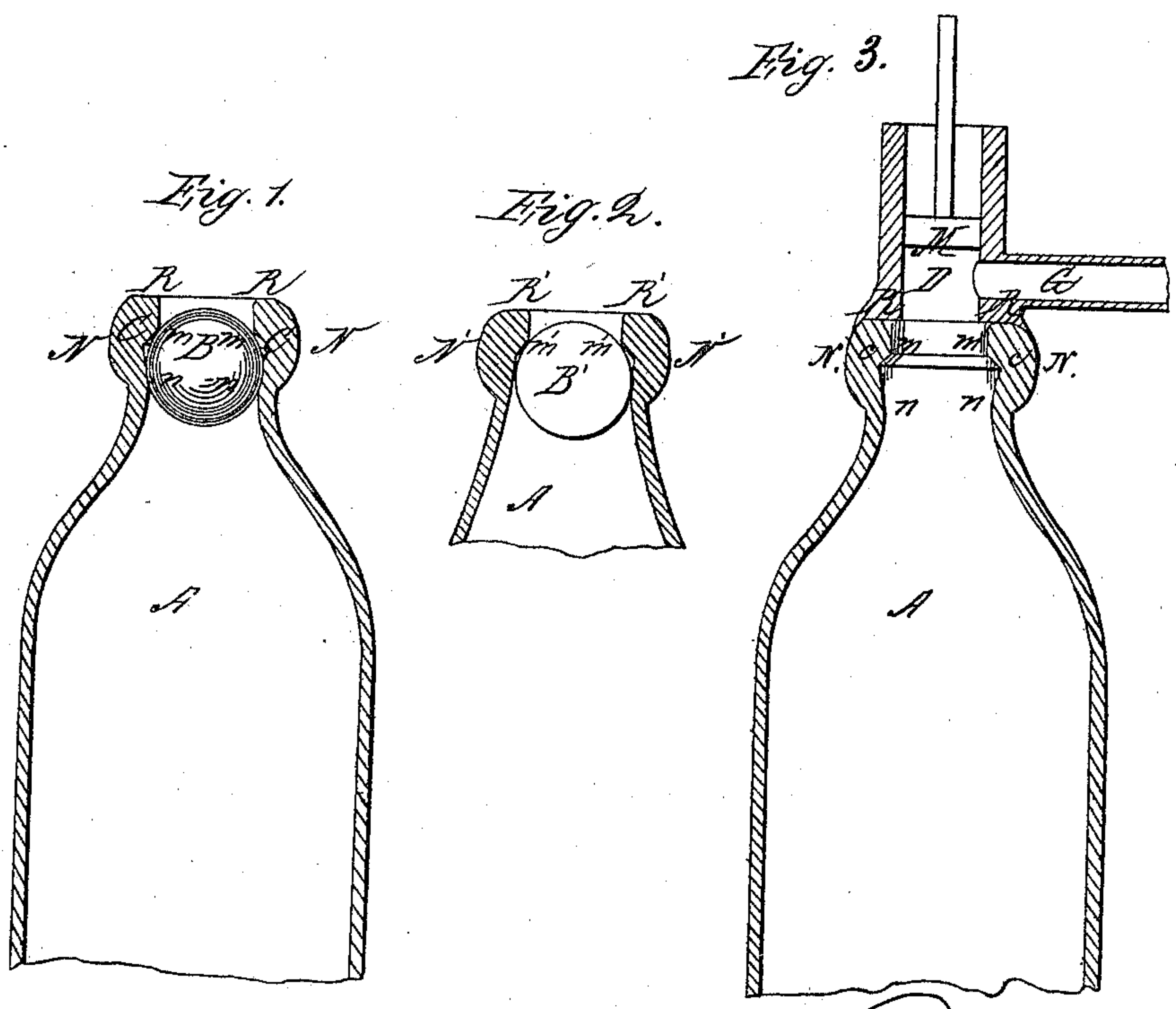


*Amended in the original
and in part of*

E. HAMILTON.
CLOSING OR STOPPING BOTTLES.

No. 42,188.

Patented Apr. 5, 1864.



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UNITED STATES PATENT OFFICE.

EDWARD HAMILTON, OF CHICAGO, ILLINOIS.

CLOSING OR STOPPING BOTTLES.

Specification of Letters Patent No. 42,188, dated April 5, 1864.

To all whom it may concern:

Be it known that I, EDWARD HAMILTON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Closing and Stopping Bottles Wholly or Partially Filled with Liquid Fluid and Whether Charged or Not with Gases; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to a new method of stopping or closing bottles for which Letters Patent of the United States were issued to me assignor to Edward Hamilton and Henry B. Goodyear. In the specification annexed to said patent I have described a mode of bottling liquid charged with gases or stopping bottles containing such liquids by means of elastic and impervious balls specifically lighter than the liquid, but of a diameter larger than that of the neck of the bottle.

The object of the present invention is to extend the application of the principle of that invention to bottling still liquids or to stopping or closing bottles or other like receptacles containing or designed to contain liquids not charged with gases or liquid charged with gases whose pressure shall be inadequate to effect the closing of the bottle automatically by the expansion of the gases within.

To this end my invention consists in the method hereinafter described of bottling liquids or of stopping bottles containing liquids by the employment of an elastic impervious ball of a specific gravity greater than that of the liquid in combination with contracting or recessing the neck of the bottle in such manner that the ball when let from within the bottle into the neck will be held therein by pressure upon its circumference. Also, in the method of bottling still liquids or of stopping or closing bottles containing or designed to contain liquids not charged with gases or liquids charged with gases whose pressure is inadequate to effect the closing of the bottle automatically by the expansion of the gases within it, by forcing an elastic impervious ball which the bottle contains into its seat in the recessed or contracted neck of the bottle by suction. Also, in forming the seat of the ball in the neck of the bottle by so contracting the outlet as to present a conical, spherical or other impinging annular surface or surfaces to the ball. Also, in combining with

an internal stopping ball, a bottle with a short and recessed or contracted neck that is to say a neck whose recessed or contracted ball seat is as near to the rim or outlet as practicable in view of the strength requisite. Also, in closing bottles containing an elastic impervious ball lighter than the liquid to be bottled, by filling such bottles with the liquid and by then forcing air or other gaseous fluid into them.

To enable others to make and use this invention, I shall now describe the manner in which the same is or may be carried into effect.

In the accompanying drawings the figures represent in sectional elevation the part of bottles made in accordance with my invention, Figure 1, showing a bottle closed by means of a ball held in the neck.

The bottle is made of the usual form. The neck I prefer to make shorter than in bottles which are to be closed by corks. In the latter it is preferable and perhaps necessary to give the neck sufficient length to afford great frictional hold of the cork in the neck of the bottle and also to prevent the escape of gases from within or the penetrating of air from without. With my improved method of closing bottles the long neck may be dispensed with as the closing and hermetic joint does not depend on the length of the neck. But when elastic and impervious balls are used to close the bottles from within it is important to reduce the neck and consequently the space above the ball seat to a minimum (due regard being had to the resistance of the glass) because of the dust and dirt which may accumulate in the neck above the ball.

By constructing the bottle substantially as shown in the several figures the strength requisite to resist the pressure from within and knocks attendant upon the handling of the bottles is attained while the space in the neck above the ball when it is placed in its seat is sufficiently shallow to exclude dust or dirt or to render the cleaning of the bottle of it previous to opening it a matter of comparative ease. The thickness of the neck N, is therefore increased toward its outlet or rim R, swelling around the seat of the ball when in place to close the bottle. The seat of the ball is formed in the neck by means of two bevel surfaces converging toward a horizontal plane and forming a recess C, whose opening toward the outlet or rim of the bottle is smaller than the

opening toward the body of the bottle. The latter opening I prefer to make of a diameter but slightly smaller than that of the ball, while the upper opening may be considerably smaller yet of such diameter as to impinge on the ball when in its seat in order to produce a tight joint. The ball when forced home will be kept in its place by being held between two annular surfaces *m* and *n* as shown in Fig. 1.

For the bottling of ale, syrups or other liquids not charged with gas I use in connection with the bottle described a ball of vulcanized india rubber or other elastic impervious substance made specifically heavier than the liquid to be bottled and I proceed as follows: The bottle being filled with liquid will contain the ball which being heavier than liquid will sink to the bottom. I then apply the thumb to the outlet of the bottle or insert in the neck of the bottle a temporary stopper and turn the bottle upside down. The ball will at once sink into the neck and the weight of the liquid particularly if aided by a jerk will force the ball into its seat. When this is done the thumb or temporary stopper may be removed and the bottle is stopped by the ball and will remain so until the ball is pushed down the neck. To bottle still liquids such as ale, cider, mineral water, wines etc. in self-closing bottles in which balls lighter than the liquid are used I proceed as follows: I use a small cylinder *D*, (see Fig. 3,) the lower end of which is made to cap and tightly fit the neck or outlet of the bottle. From this cylinder branches off a tube *G*, which may be connected by means of an india rubber sleeve or pipe with a barrel or receptacle containing the liquid to be bottled. In the cylinder and above the branch pipe there is a piston *M*, snugly fitting the bore of the cylinder. The piston rod is provided with a suitable handle and a branch pipe with a cock. This little apparatus being connected with the barrel from which the liquid is drawn, is adapted to the bottle and held down by one hand while the other hand opens the cock to allow the liquid to enter the bottle; when the bottle is full the operator shuts off the cock and seizes the handle of the piston and imparts to it an upward motion—the effect of which is to produce suction whereby the ball, which floating on the surface of the liquid but in contact with the contracted part of the neck, is drawn up into its seat. The ball thus forced into its seat is impinged between the bevel surface or surfaces of the contracted neck before described and remains in place until forcibly displaced therefrom. A similar effect may be produced by a forcing pump. The liquid in the bottle is charged with air or other aeriform fluid whose expansive force will cause the ball to enter the

neck and be firmly seated as soon as pressure from above the ball is relieved.

I do not wish to be understood as confining myself to a recess formed of two converging bevel faces in the neck of the bottle. I have made numerous experiments and have found different shaped recesses to answer the purpose well. For bottling gaseous liquid I prefer to use in connection with a ball lighter than the liquid, a bottle whose neck is simply contracted at or near the outlet. In Fig. 2, I have shown one form of contracted neck. In this instance a bevel edge *m'*, *m'*, is formed in the neck which is made to impinge on the ball if forced up into the neck either by pressure from within or by suction from without the bottle.

And having now fully described my invention and the manner in which the same is or may be performed, I claim—

1. The method herein described of bottling liquids or of stopping bottles containing liquid by the employment of an elastic impervious ball of a specific gravity greater than that of the liquid, in combination with recessing or contracting the neck of the bottle in such manner that the ball when let from within the bottle into the neck will be held therein by pressure upon its circumference.

2. The method of bottling still liquids or of stopping or closing bottles containing or designed to contain liquids not charged with gases or liquids charged with gases whose pressure is inadequate to effect the closing of the bottle automatically by the expansion of the gases within it, by forcing an elastic impervious ball which the bottle contains, into its seat in the recessed or contracted neck of the bottle by suction.

3. In bottles to be closed from within by means of a ball I claim forming the seat of the ball in the neck of the bottle by so contracting the outlet as to present a conical spherical or other impinging annular surface or surfaces to the ball.

4. Combining with an internal stopping ball, a bottle with a short and recessed or contracted neck that is to say a neck whose recessed or contracted ball seat is as near to the rim or outlet as practicable in view of the strength requisite.

5. Closing bottles containing an elastic impervious ball lighter than the liquid to be bottled by filling such bottles with the liquid and by then forcing air or other gaseous fluid into them.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

E. HAMILTON.

Witnesses:

H. B. GOODYEAR,
I. B. GOODYEAR.