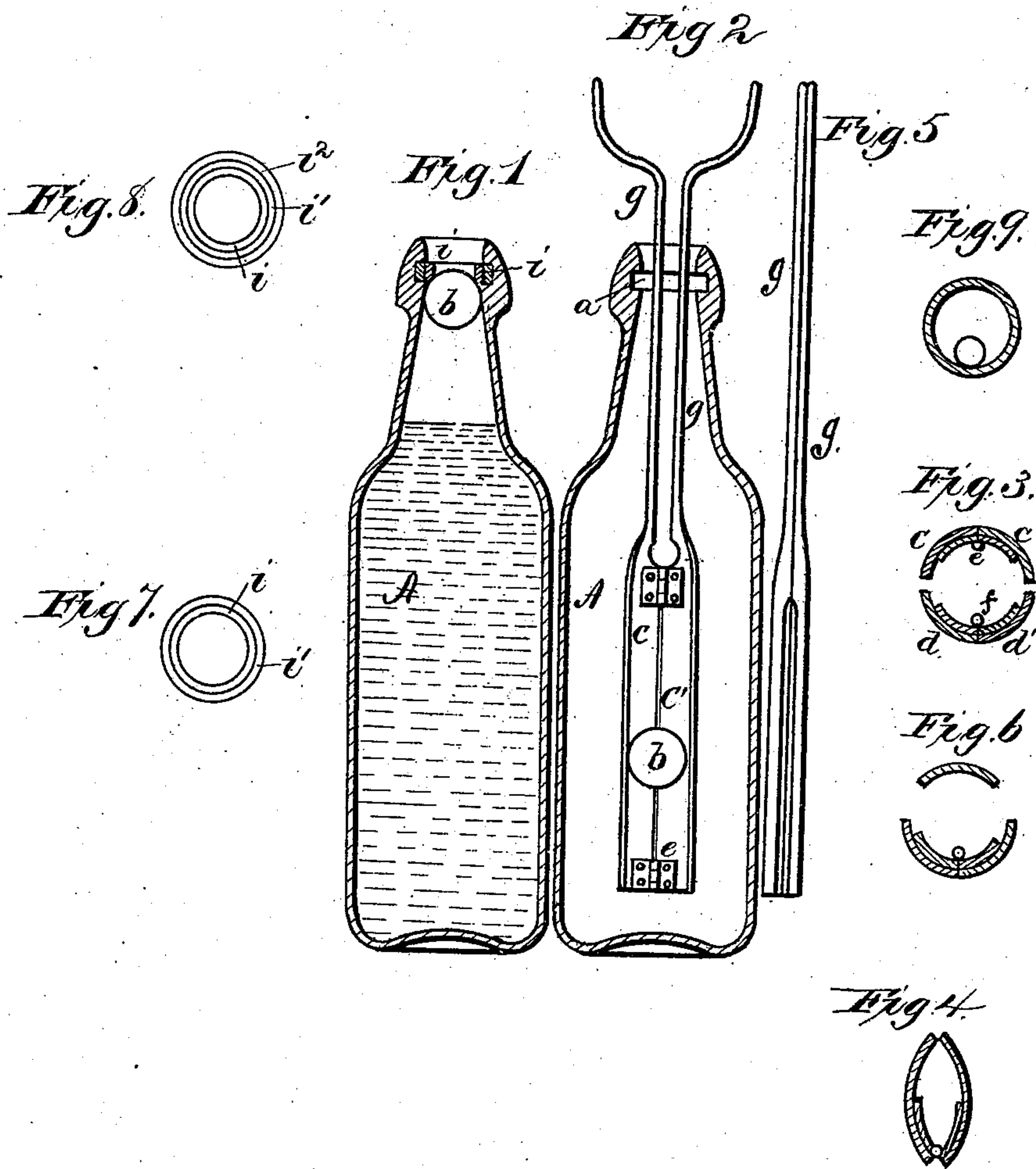


H. BARRETT.
Stoppering Bottles.

No. 237,946.

Patented Feb. 22, 1881.



Witnesses.
P. L. Ouraud
Alex. Scott

Inventor.
Henry Barrett
By John J. Halsted
his Atty

UNITED STATES PATENT OFFICE.

HENRY BARRETT, OF LONDON, ENGLAND.

STOPPERING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 237,946, dated February 22, 1881.

Application filed August 26, 1879. Patented in England May 10, 1879.

To all whom it may concern:

Be it known that I, HENRY BARRETT, of London, England, have invented certain Improvements in Stoppering Bottles, of which the following is a specification.

This invention relates chiefly to improvements in stoppering that class of bottles for containing aerated or gaseous liquids which, when filled, are closed by means of an internal ball of glass, porcelain, or similar material held by the pressure within the bottle against an elastic seat consisting of a ring of india-rubber placed in a groove in the interior of the neck of the bottle.

There are many objections to this class of stoppers and bottles as hitherto constructed, among which may be mentioned that the ball forming the stopper has to be introduced into the bottle before the manufacture of the bottle is completed, the mouth of the neck of the bottle being afterward contracted. The bottle has then to be annealed. Consequently the ball forming the stopper has to be formed of a material, such as glass or porcelain, which will not be affected by the heat of the annealing process; and as such materials are of a heavy and brittle nature it has been found necessary to form the lower part of the bottle-neck of less diameter than the ball, and with a chamber or recess to receive the ball when the bottle is opened, to prevent the ball falling to the bottom of the bottle, so as to avoid the breakage or starring of the bottle or ball, and also to prevent the ball rolling back to the mouth; and the hereinbefore-described contraction of the neck of the bottle and the forming of the chamber or receptacle in the neck add to the cost of manufacture and weaken the bottle, and if the ball break or become starred the bottle is rendered useless. Further, the hereinbefore-described ring, being simply sprung or placed in the groove provided for it in the neck of the bottle, frequently comes out during the washing of the bottle, or otherwise, and is a source of loss and inconvenience. Now, by my improvements these defects are obviated, and the manufacture of the bottles and stoppers is simplified and rendered much less costly.

In carrying out my invention I manufacture the bottle in the ordinary manner, forming it

with an annular groove in the neck, but without any receptacle or chamber in the neck to receive the ball, and without subsequently contracting the mouth of the neck, and I then form within the bottle a ball, (or other shaped stopper,) as hereinafter described, of such a size that it cannot fall out of or be taken out of the bottle without damaging either the ball or the stopper.

My improvements in the elastic seating placed in the groove in the neck of the bottle are as follows: Instead of employing the usual soft-rubber ring for fitting into the annular groove in the neck of the bottle, I employ a ring of combined hard and soft rubber—that is to say, a soft-rubber ring around which is vulcanized a hard-rubber ring.

My improvements are also applicable to stoppering bottles containing beer and other malt liquors.

To make my invention better understood, I will now proceed to describe the same by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a bottle closed by means of an internal ball of greater diameter than that of the opening of the neck of the bottle according to my invention. Fig. 2 is a sectional elevation, showing the method of forming the ball within the bottle; Fig. 3, cross-section of the tool I employ for forming the ball within the bottle; Fig. 4, section, and Fig. 5 an elevation, showing one part of the tool closed up.

A A is the bottle of the ordinary form, but made with an annular groove, *a*, in the neck, and *b* is the ball formed within the bottle, and having a greater diameter than the opening of the neck of the bottle. To form this ball I employ the tool shown in Figs. 2, 3, 4, 5, and 6. This tool is constructed of a tube formed in four segments, *c c'* and *d d'*, the two segments *c c'* being hinged together at *e*, and the two segments *d d'* being hinged together at *f*. The upper parts of the tubes are formed with handles *g g*. The tool thus consists of two parts, each of which can be closed on its hinges, as shown in Figs. 4 and 5, so as to allow of its being introduced into the bottle, and it can then be expanded or opened out, as shown in Fig. 2; or the tool may be formed in

three segments only, two of these being hinged, as shown in Fig. 6. The interior diameter of the tool must be the same as the diameter of the ball to be formed.

5 To fashion or shape the ball, I take a portion of a composition or material—such as that known as “lionite”—and in some cases I first mold the said material into such a shape as to allow it to pass into the bottle; or I soften it
10 by heat, and, after placing it within the bottle, I introduce the hereinbefore-described tool and take hold of the said material by the tool, and by sliding the two parts of the tool one on the other I press and roll the composition or mate-
15 rial into a ball between the two parts of the tool, and to produce a good finish or surface to the ball the said tool is used hot or heated. The diameter of the ball thus formed will be that of the interior diameter of the tool, and conse-
20 quently greater than the diameter of the neck of the bottle. In Fig. 2 only one part of the tool is shown in the bottle, the other part having been removed, the ball *b* being completed. Or I mold the material or composition to such
25 shape as to allow it to enter the bottle and place it in the bottle without softening—that is to say, while it is hard—and then, by means of the said tool, I take hold of the molded composi-
30 tion, and I am enabled, by the fact of the tool being heated, to reduce the molded composition already inside the bottle and to mold, press, and roll it into a round ball of a diameter greater than that of the neck of the bottle, as herein-
35 before described, so that the ball cannot be removed from the bottle without damage to either the ball or the bottle; or I may form the ball by introducing sufficient of the material into the bottle, and, when the material has been soft-
40 ened by heat, by revolving the bottle in all directions until the ball is formed. The ball *b* having been thus formed, I then introduce the ring which forms the seating into the annular groove *a* in the neck of the bottle. This ring is formed of combined hard and soft rubber—
45 that is to say, a soft-rubber ring, *i*, around which is vulcanized a hard-rubber ring, *i'*, as shown in Fig. 7, which is a plan of one of these rings. By subjecting this ring to heat the hard portion
50 *i'* of the ring becomes soft and pliable, and allows of its being fitted in the annular groove *a* in the neck of the bottle, and the outer portion of the ring—namely, the part *i'*—which is made of hard rubber, when cold, will become again hard, and will be firmly fixed in the groove
55 *a* in the bottle, and cannot easily come out, as is the case when a ring of soft rubber only is employed; or, in case of any irregularity in the groove in the neck of the bottle, the above-mentioned ring may be formed of a central portion of hard rubber, *i'*, and an inner ring, *i*, and
60 an outer ring, *i''*, both of soft rubber, as shown in Fig. 8. The bottle thus stoppered is filled in the usual well-known manner and opened

by the stopper being pressed down, as is well understood.

65 Instead of forming the ball within the bottle, and of lionite, as hereinbefore described, I sometimes make a ball of hard india-rubber, known as “vulcanite” or “ebonite,” of a diame-
70 ter larger than the opening of the neck of the bottle, and then soften the same under the action of heat and elongate the said ball, so as to reduce its diameter and pass it into the neck of the bottle. After its introduction into the
75 bottle it is again rendered soft, and in again becoming hard it will retake its original shape and will not pass out of the bottle. But when employing such a material as vulcanite to form the ball, I prefer to form it hollow, as shown in
80 Fig. 9, with a shot or weight, *j*, within it to render it of greater specific gravity than water. By thus making the ball hollow it is more easily softened and elongated to allow of its being
passed into the bottle.

85 I would here remark that although I have described and shown the ball *b* of a greater diameter than the neck of the bottle, yet this is not necessary. I reserve the right to employ, in combination with the seating of hard and
90 soft rubber, a ball of less diameter than the neck, placing such ball within the bottle before the ring is placed in its groove. I also reserve the right to use the ordinary soft elastic seating in combination with an internal stopper
95 formed within or introduced into the bottle, as hereinbefore described, and having a greater diameter than that of the neck of the bottle.

It will also be understood that a stopper other than that of a spherical shape may be employed.

100 Having thus described my said invention and the best means with which I am acquainted for carrying the same into effect, I wish it to be understood that I do not confine myself to the precise details herein laid down, and shown
105 in the drawings, as the same may be varied without departing from the peculiar character of my invention.

I do not in this application claim the described tool for making the internal stopper, re-
110 serving that for another application; but

What I do claim is—

1. The described method of providing a bot-
115 tle with an internal stopper, consisting in inserting into the bottle, through its mouth, a mass of plastic material, and then shaping the same, while within the bottle, into the form of an operative stopper, substantially as set forth.

2. An internal seating in the neck of bottles stoppered by means of internal stoppers, com-
120 posed of a ring of combined hard and soft rubber, substantially as set forth.

H. BARRETT.

Witnesses:

G. F. REDFERN,
A. ALBUTT.