

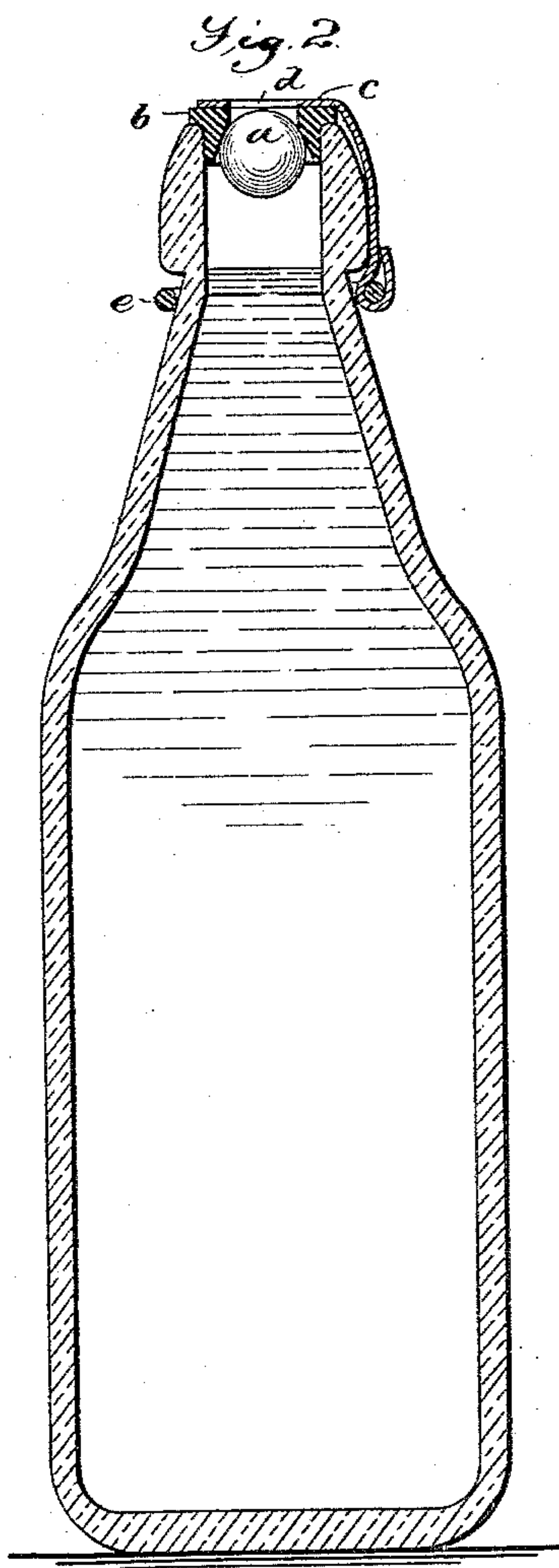
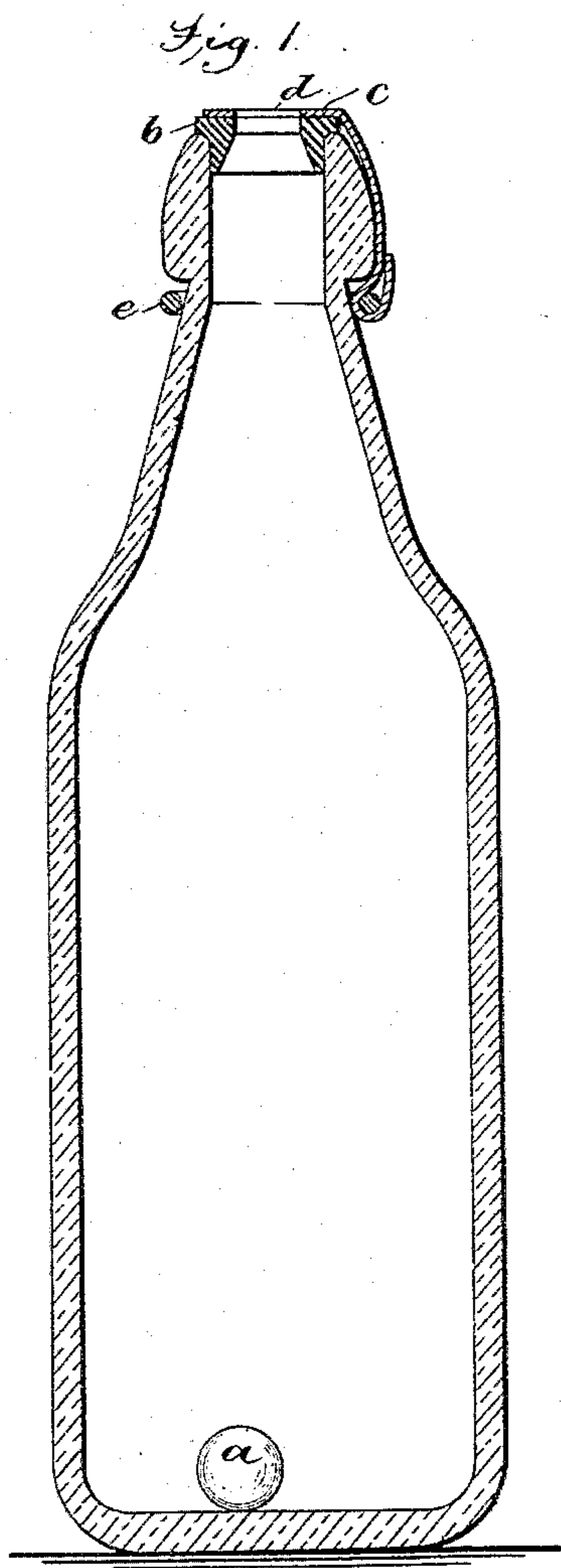
(No Model.)

W. STEWART.

BOTTLE STOPPER.

No. 339,592.

Patented Apr. 6, 1886.



Witnesses:

Geo. H. Bolts.

Wm. N. Finckel

Inventor:

William Stewart

By Ernest C. Webb

Att'y

UNITED STATES PATENT OFFICE.

WILLIAM STEWART, OF BROOKLYN, NEW YORK.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 339,592, dated April 6, 1886.

Application filed October 19, 1885. Serial No. 180,313. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM STEWART, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a full, clear, and exact description.

This invention relates to a new and improved self-acting internal stopper for bottles containing or intended to contain soda-water or other liquid charged with gases; and the objects are to produce a stopper which can be used in any bottle, which will be bouyant enough to float on the liquid and light enough to be lifted by the internal pressure to its seat in the neck of the bottle without requiring a lifting device or the bottle to be tilted or inverted, and which will not necessitate the use of any special kind of machine for filling or cleaning the bottle.

Heretofore internal stoppers, usually of a spherical shape, have been employed, and such stoppers may be divided into two classes—viz., first, gravitating stoppers, or stoppers of greater specific gravity than the liquid, and, second, floating stoppers, or stoppers of less specific gravity than the liquid. Stoppers of the first class have heretofore consisted of a solid glass ball or a weighted hollow ball, and in some cases of a flat disk of pearl, ivory, or glass, and those of the second class of hollow balls composed of glass, porcelain, or sheet metal, and in some cases a flat or nearly flat disk of several layers of cork or pearl or cork and india-rubber, or a ball composed of elastic material has been employed; but all such stoppers were objectionable, in that they required special manipulation in filling and cleaning them, and, further, because to bring the stopper to its seat in the neck of the bottle, after the latter had been filled, it was necessary to use a lifting device or to tilt the bottle, so that the stopper would drop into the neck, thus causing a waste of liquid and gas.

By my invention I seek to produce a stopper which will obviate all these objections; and to this end my invention consists in a self-acting internal stopper, preferably composed of hard non-elastic material—such as vulcanized rubber—and which is bouyant

enough to float on the liquid and light enough to be impelled to and seated against the packing-ring automatically by the gaseous pressure within the bottle without extraneous assistance or manipulation, as hereinafter particularly pointed out and claimed.

In the accompanying drawings, in the several figures of which like parts are designated by similar letters of reference, Figure 1 is a sectional view of an empty bottle supplied with my improved stopper. Fig. 2 is a similar view of a bottle filled with the liquid. Fig. 3 is a section of my improved stopper.

The stopper *a* is composed of two semi-spherical shells, united to form a hollow ball.

I propose to make these stoppers of hard vulcanized rubber, as this is the only material I have been able to find from which it is possible to make a practically useful stopper of the requisite buoyancy and lightness.

I have found by careful practical experiments that it is not possible to make a self-acting stopper from glass, porcelain, sheet metal, or elastic material, and that while cork is light enough for the purpose it is very objectionable, because it will rot, and thus render the stopper useless in a short time.

A stopper of elastic material, as heretofore made, is not light enough to be self-acting to close the bottle when the bottle is in the usual upright position during the filling process, and is too bouyant to roll into the neck to close the mouth of the bottle when the bottle is inverted; hence it is necessary to use a lifting device to draw the stopper to its seat after the bottle has been filled. Such stoppers are also objectionable, in that unless they are of greater diameter than the inside diameter of the neck of the bottle they are liable to be blown out of the bottle by the internal pressure.

I have also found that stoppers composed of glass, porcelain, or sheet metal, besides not being self-acting, are objectionable, because of the liability of breakage of the bottle or the stopper during the washing, filling, or emptying of the bottle, and, further, because they require a bottle of special construction to prevent the stopper from rolling back to its seat in the neck when the liquid is being poured out. I have also found that a floating stopper composed of a flat or nearly flat disk is

objectionable, in that it is difficult to get such a stopper properly seated, as it requires a special construction of the neck of the bottle to make a gas-tight joint.

5 In Figs. 1 and 2 of the drawings I have shown my improved stopper in connection with a bottle supplied with a cap of the construction described and claimed in an application for a reissue of Letters Patent No. 320,189, granted to me June 16, 1885, for an improvement in bottle-stoppers, said applica-
10 tion being filed on even date herewith, and designated as Serial No. 192,447.

In these figures of the drawings, *a* designates the stopper, *b* a soft packing, and *c* a metal cap. The packing is ring shaped, and is laid over the edge of the mouth of the bottle, and held there by the cap, which has a central aperture, *d*. This cap is provided
15 with arms, which are bent around a fastening-wire, *e*, which encircles the bottle-neck. The bottle itself is of ordinary construction, and the stopper of less diameter than the inside diameter of the neck. When the bottle is
20 filled, the stopper *a* rises to the surface of the liquid, and is then lifted by the internal pressure to its seat against the packing, thus closing the bottle. When the liquid is to be poured out, the stopper is pushed from its
25 seat by means of a rod or other suitable implement, and rises through the liquid to the highest part of the bottle, when the latter is tilted or inverted to discharge its contents.

My improved stopper, with a ring-shaped
35 packing and apertured cap, can be applied to any bottle, and the bottle can be filled by any ordinary bottling-machine in the market, thus enabling a bottler of soda-water or other liq-

uids charged with gas to utilize bottles which are now practically useless, resulting in a saving to the bottling trade of many thousand
40 dollars every year.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. As an improved article of manufacture, the self-acting internal bottle-stopper composed of hard rubber or equivalent non-elastic material, and which is buoyant enough to float on the liquid and light enough to be impelled and seated against the packing-ring
45 automatically by the gaseous pressure within the bottle without extraneous assistance or manipulation.

2. The combination, with a bottle for gaseous liquids, of the internal stopper composed of hard rubber or equivalent non-elastic material, and which is light and buoyant, and a packing-ring of soft material arranged in the neck of said bottle, the said stopper being seated against said packing-ring automatic-
55 ally by the gaseous pressure within the bottle without extraneous assistance or manipulation, substantially as specified.

3. The two semi-spherical shells of hard vulcanized rubber, united substantially as set forth, and constituting, when applied inside of a bottle containing gaseous liquid, a light, buoyant self-acting bottle-stopper, as described.

In testimony whereof I have hereunto set
65 my hand this 17th day of September, A. D. 1885.

WILLIAM STEWART.

Witnesses:

ERNEST C. WEBB,
ARTHUR C. WEBB.