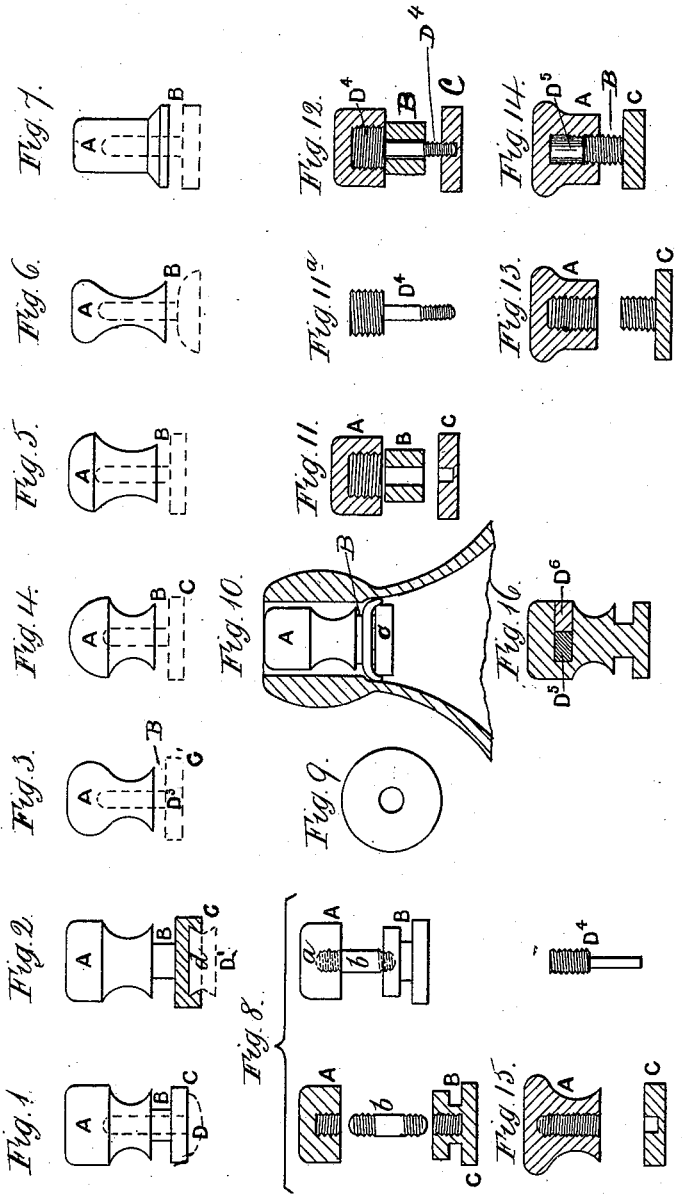
L. ROSE.

Bottle-Stopper.

No. 200,409. Patented Feb. 19, 1878.



Witnesses
Pennington Halsted

Inventor.
Lauchlan Rose.
by John J. Halsted his Atty

UNITED STATES PATENT OFFICE.

LAUCHLAN ROSE, OF LONDON, ENGLAND.

IMPROVEMENT IN BOTTLE-STOPPERS.

Specification forming part of Letters Patent No. **200,409**, dated February 19, 1878; application filed November 19, 1877; patented in England, March 9, 1877.

To all whom it may concern:

Be it known that I, LAUCHLAN ROSE, of London, England, lime-juice merchant, have invented a certain Improved Stopper for Bottles for Containing Gases, or gases combined with liquids, such as aerated beverages, whereby improvements in stoppering bottles can be effected, (English Patent No. 960, dated March 9, 1877, and sealed May 11, 1877,) of which the following is a specification:

The intention of this invention is to remove the difficulties attending the stoppering process as regards the bottling of aerated or gaseous liquids.

The difficulty hitherto experienced in the practical working of internal stoppers of bottles containing gaseous liquids has been the uncertainty of their action in obtaining a proper position in the neck of the bottle, so as to secure perfect stoppering. This difficulty has been attempted to be met in various ways, but none of which, so far as I am aware, have been fully satisfactory.

By way of remedy, I construct my improved stopper of a body or spindle, made preferably of china, earthenware, glass, bone, or ivory, although various metals, heavy woods, rubber, or other suitable material may be used. The body or spindle I make of such size as to pass freely through the neck of the bottle, the lower end being somewhat larger and passing less freely, or by some pressure through the neck. I also form a groove or recess a short distance from the lower end, in which to place a disk of rubber or other suitable material, which acts as a valve or washer. When the bottle is stoppered by means of the internal pressure of gas or liquid forcing the stopper into the neck of the bottle, the disk of rubber or other suitable material folding over the thick or lower end of the stopper, and so catching in the neck, prevents any internal pressure of gas or liquid forcing the stopper out of or beyond its proper position for closely stoppering the bottle. To secure this position of the stopper, essential to effectual stoppering, I fix or attach, by means of a recess in the end of a stopper, or in any suitable manner, a disk of cork, vulcanite, non-porous woods, or other suitable material, (although it will be understood only material of less specific gravity than the body of the stopper may be used,) so as to act partially as a float upon the end of the stopper, the body of the stopper thus falling into position in the neck of the bottle while sustained neck downward, and so securing effectual stoppering.

While this is the general construction I prefer for such stoppers, it will be obvious from the above description that variations may be adopted, such as the formation of the entire body of the stopper of a material of greater weight than the bottom, such as a combination of china, earthenware, or metal with a lighter material. Preferably, however, I adopt the form of construction first described, both as a matter of cheapness and efficiency, except in the construction of stoppers where the body or spindle is formed of bone or ivory, the bottom being made of a comparatively lighter material, such as horn, vulcanite, or non-porous woods — for instance, lignum-vitæ — which combination forms an elegant, cheap, and efficient stopper, not otherwise obtainable under the present mode of stoppering. Bone, being porous, is not, when used as before mentioned, a suitable material for such internal stoppers, but admirably adapted under my improved mode of construction. Such bone or ivory stoppers, also, by being dyed in various colors, may thereby indicate the nature of the contents of the bottles, and thus dispense with the labor and expense of labeling.

In all stoppers constructed of very hard or heavy material, such as glass, china, earthenware, or metal, where there may be danger to the bottle in the process of washing or filling, I cover the head and, if necessary, the ends with rubber or other suitable material. In all stoppers constructed of any porous material, or some woods, bone, ivory, &c., I cover the valve or lower end with rubber, vulcanite, or other suitable material, so as to form a perfectly air-tight seat for the valve when in position for stoppering.

Bottles constructed with a ridge in the neck as a seat for the valve are the most suitable for this form of stopper, although ordinary bottles may also be efficiently stoppered by selecting a proper diameter of stopper to fit the neck.

In the construction of stoppers of less specific gravity than ivory, bone, or earthenware, such as the various woods, vulcanite, xylonite, and other materials, I weight the body, and not merely the head of the stopper, with metal or other substance, constructing the stopper in such a manner as to prevent all contact of the metal with the liquid, which is a point of the first importance with aerated waters, on account of their action on all metals. In the construction of such stoppers I prefer vulcanite and xylonite, from their perfect resistance to the action of acids, under which all woods are more or less affected by fungoid growths, and consequent fouling of the stopper, from which, however, vulcanite and xylonite are entirely exempt, and thus form admirable materials for such stoppers.

The forms of construction hitherto adopted for inside stoppers have prevented the use of vulcanite and xylonite for this purpose, either as too expensive in the larger form of stoppers at present in use, or arising from the mode of construction adopted in those of smaller size.

My improvements relate more especially to stoppers denominated "internal" or "gravity" stoppers, and which are placed within the bottle, and the bottle inverted before being filled with the gaseous or aerated liquid, and when filled the heavier or weighted end of the stopper, which is of heavier specific gravity than the liquid, falls into the neck, and so closes the bottle, the internal pressure of the gas, when the bottle is again placed right side up, keeping the stopper in position, with its lighter end downward; and I make the head or top heavier than the bottom, to prevent the wrong end falling downward into the neck when the bottle is filled: but in all cases the stopper must be sinkable when loose in the liquid.

In the drawings, Figures 1 and 2 show views of stoppers made of china, clay, earthenware, glass, metal, or any suitable non-porous material. Fig. 3 shows view of stopper, the body of which may be made of ivory, bone, or any suitable material; Figs. 4 to 8, views of various other forms of combined stoppers; Fig. 9, plan of rubber disk or washer; Fig. 10, sectional view of stoppered bottle.

In these figures the same letters indicate corresponding parts.

A, body of the stopper; B, recess for the rubber disk or washer; C, bottom portion of stopper; D, Fig. 1, as represented in dotted lines, a plug of wood or other material, of less specific gravity than the body A; D^1, Fig. 2, cork or other light material fixed on bottom of the stopper, which may either protrude or be level with bottom, according to the specific gravity of the material from which the stopper is made, as indicated by the dotted lines at *d*. In using cork as a light material, fixed or attached to the bottom of the china, clay, earthenware, and other stoppers, I sometimes coat the cork with a solution of wax or other suitable material, to secure it against the action of the water or liquid; D^3, Fig. 3, bottom portion or plug, as represented in dotted lines, made of some non-porous material of lighter specific gravity than the body, such as vulcanite, horn, hard wood, or other suitable material.

In Fig. 8 a stopper is shown formed of three sections or parts. The head *a* of the body A of the stopper screws into the spindle *b*, the bottom portion C being also screwed on said spindle, as shown.

My further methods of construction are preferably in three forms, as shown by Figs. 11 to 15.

In Fig. 11 the stopper, as shown, consists of three parts, which are joined together by a metal spindle, D^4, Fig. 11^a, A being the head of the stopper; B, the body, of less diameter; C, the bottom, of about the same diameter as head; D^4, screwed metal spindle, joining or screwing together the three portions of the stopper, as above described. Fig. 12 shows a complete section of this form of construction.

In Fig. 13 the stopper is constructed of two parts, as shown. A is the body, with screwed hole for receiving the weight D^5 and spindle of bottom; C, bottom, with screwed spindle. Fig. 14 shows sectional view of this form of stopper.

In Fig. 15 the stopper also consists of two parts—body and bottom—joined together by a metal spindle, A being the body, with screwed hole for spindle; C, bottom, with hole to receive spindle; D^4, the spindle.

In Fig. 16 the stopper consists of one part or piece, the body or head of the stopper being pierced from the side of sufficient depth and diameter to admit the weight D^5, the aperture being closed by means of wax, D^6, or any suitable material.

The various stoppers hereinbefore described and shown in the drawings may be either formed by molding or by turning, according to the nature of the material.

The sectional view of the form of stopper shown at Fig. 15 is the same as shown by Fig. 14. Bottles stoppered with such internal stoppers may be filled by means of any filling-machine adapted for such purpose, either neck downward or in an upright position, according to the action of the machine.

I do not claim, broadly, internal stoppers, nor such stoppers having a central body or spindle and a piece of rubber or a washer attached at the end to act as a valve, and operating to close the bottle by means of the inward pressure of the gas or liquid; nor do I claim an internal stopper made entirely of a material of specific gravity greater than water; but

What I claim is—

1. In internal bottle-stoppers for bottling gases or aerated or gaseous liquids, the combination, with the stopper, of a lighter body, such as cork, vulcanite, horn, non-porous wood,

or other suitable material, fixed or adjusted in the end of the stopper, substantially as and for the purpose described.

2. In internal bottle-stoppers adapted for bottles to be filled with gases or aerated or gaseous liquids while the bottle is inverted, a stopper having a hermetically-sealed weight in that end which closes the bottle-neck, and the whole stopper having a specific gravity greater than the liquid, all as shown and described.

LAUCHLAN ROSE.

Witnesses:
G. F. REDFERN,
A. ALBUTT.