(No Model.)

C. DE WITT.

BOTTLE STOPPER.

No. 527,672. Patented Oct. 16, 1894.

Fig. 1.

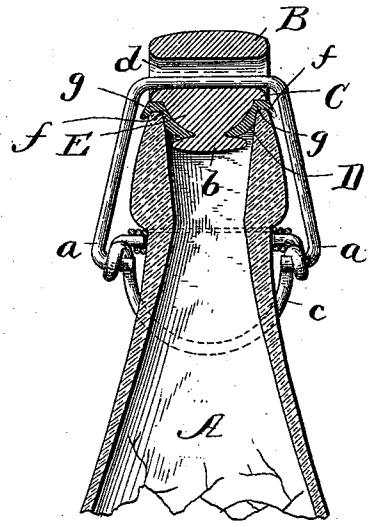


Fig. 3.

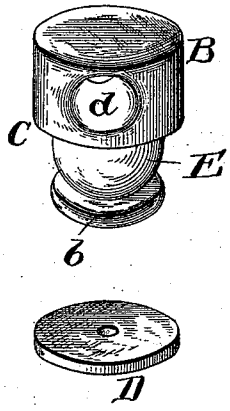
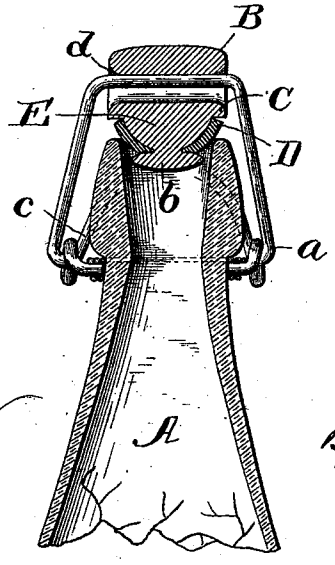


Fig. 2.



Witnesses:
J. B. McGirr.
K. E. Naumann.

Inventor
Charles De Witt,
By Howson & Howson,
his Attys.

UNITED STATES PATENT OFFICE.

CHARLES DE WITT, OF BALTIMORE, MARYLAND.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 527,672, dated October 16, 1894.

Application filed August 20, 1894. Serial No. 520,838. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DE WITT, a citizen of the United States, residing at Baltimore, State of Maryland, have invented Improvements in Bottle-Stoppers, of which the following is a specification.

My invention relates to bottle stoppers and more particularly to means for hermetically sealing the mouth of the bottle in order to prevent leakage and the escape of gases arising from the liquid within the bottle, and also to prevent the ingress of air. Many stoppers have been designed for this purpose and have been in use for considerable time but in all, of which I am aware, the liquid within the bottle becomes vitiated in a very short time due to the imperfect sealing of the mouth of the bottle by such stoppers. In one form of stopper, a metal disk is employed, such disk having a projecting nipple to which is fitted a rubber washer that is adapted to be inserted wholly within the mouth of the bottle. In the use of such a stopper, it is found, particularly in connection with beer bottles, that it is impossible to keep the rubber clean, so much of the surface being exposed to the action of the gases within the bottle; and furthermore, this stopper fails to make a perfect seal. As an improvement upon this stopper, a tapering porcelain stopper having a flexible annular washer, attached to a nipple thereon, has been substituted in many instances so that very little of the surface of the washer is exposed to the gases in the bottle, thus overcoming the objection of uncleanliness found in the first mentioned stopper; but a continued use of these stoppers has demonstrated the fact that in none is a perfect seal secured, which is due to the fact that the pressure which is applied to retain the stopper in place to compress the washer against the side of the mouth of the bottle is practically uniformly distributed around the washer thereby compressing the washer with substantially equal force in a radial direction, and thus providing a straight surface of contact between the mouth of the bottle and the washer so that there is nothing to prevent the escape of gas along this surface when there is sufficient pressure of gas within the bottle to enter between the lower edge of the washer and the side walls of the bottle mouth. As bottles are most generally made with an inwardly tapering mouth at the top, the washer, in this case, is naturally forced or pressed within the mouth between the two parallel surfaces of the bottle plug and of the inwardly tapering wall of the mouth of the bottle.

After a careful consideration of the defects which exist in bottle stoppers of the kind above referred to, I have invented a form of stopper which overcomes such defects and in which I secure a better and more perfect seal than heretofore.

With the object of providing a stopper which would not only overcome the defects that now exist but one which can be easily and cheaply manufactured, my invention consists in the novel construction hereinafter described and claimed, with reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the neck of a bottle with my stopper applied in its sealing position. Fig. 2 is a similar view of the stopper unseated. Fig. 3 is a detail of the stopper and flexible washer.

Referring to the drawings, A, indicates the neck of the bottle to which is preferably applied, the ordinary bail or yoke, *a*, and eccentric lever, *c*, as the means for seating and unseating the stopper plug, B, which is provided with a hole, *d*, extending transversely thereof, through which hole, the upper portion of the bail passes. This hole, *d*, is preferably enlarged at each end for the purpose of allowing the ready removal of the stopper plug, B, from the bail without straightening either of its arms.

The stopper plug, B, is preferably provided with a downwardly projecting hemispherical portion, E, from which the enlarged nipple or button, *b*, extends, forming a groove at the lower portion of the nipple, E, in which groove is sprung the flexible washer, D, the perforation of which is preferably of considerably less diameter than the diameter of the bottle plug at the groove. Extending transversely of the bottle plug is an annular flange, C, which is adapted to bear upon the washer when seated so as to compress the same between itself and the top of the bottle. This washer, when applied to the stopper, assumes the position shown in Fig. 2. The compression, upon the

surface of the washer around the central perforation, when applied to the groove on the bottle plug, causes the said washer to readily assume the cup-shape, conforming to the contour of the nipple, E. From this description, it will be seen that when the bail, *a*, is lowered by the lever, *c*, the flexible washer will come in contact with the mouth of the bottle and will be forced firmly against the same, the flange, C, causing the upper rim of the washer to slightly protrude from the side of the mouth, but out of contact with the yoke or bail, thus forming two break-joints at, *f*, and, *g*, respectively.

It will be observed that the wedging action of the nipple, E, as it is forced into the mouth of the bottle, will change the tension of the outer surface of the washer at *g*, causing the upper rim of said washer to turn outward so as to be in shape to be readily compressed by the flange C, of the stopper, thus forming the second break joint at, *f*.

While I have shown the bail and lever mechanism for seating and unseating the stopper, it is to be understood that any suitable means may be employed for this purpose as it forms no part of my invention; and although I prefer to use a stopper with the nipple, E, of the spherical form shown, this nipple may be made tapering or otherwise so long as the pressure surfaces are formed so that the washer may be compressed between the flange, the upper part of the nipple and the bottle mouth, substantially as shown and defined. I may state further that when the bail and lever connection is used, the hole, *d*, may be flaring at the ends, as shown, heart-shaped, or triangular-shaped, or other irregular shape, if desired; and if it should not be desired to make the stopper removable from the bail, the hole may be cylindrical to fit the bail.

I am aware that a stopper provided with a flange adapted to be seated upon the top of the mouth of the bottle is old, but I am not aware that such a stopper combined with a flexible washer, in the manner described, has been heretofore known, and it is upon the novel combination of these two features, from which important and advantageous results, are derived, that I base my claim of invention.

I claim as my invention—

1. A bottle stopper consisting of a stopper plug having a flange, adapted to project over the sides of the bottle mouth, and a downwardly projecting nipple to be inserted within the mouth of the bottle, in combination with a flexible disk washer sprung into place around said nipple so as to be in close contact therewith, and means for seating said stopper on the bottle and holding it in position thereon so as to compress the said washer between the bottle mouth, the flange, and the nipple on said plug within the mouth of the bottle, forming a double break joint, substantially as set forth.

2. The combination with a bottle, of a bottle plug provided with a nipple adapted to be inserted within the mouth of the bottle; a flange extending outwardly from said plug, a flexible disk washer sprung into a groove on said nipple and extending around and in close contact with said nipple, whereby its outer surface is placed under tension and its inner surface under compression, with means for seating said stopper upon the bottle and holding the same in position thereon so as to tightly compress the upper portion of the washer between the flange, nipple, and bottle mouth, forming a double break joint, substantially as described.

3. The combination with the bottle having a tapering mouth, of a bottle stopper plug, a flange projecting therefrom, and extending over the edges of the mouth, a nipple of spherical contour depending from the plug and adapted to project within the mouth of the bottle, a flexible disk washer sprung into place close around said nipple, with its outer edge extending up to the flange, with means for seating and holding said stopper plug on the bottle, so as to forcibly compress the washer between the flange, nipple, and the bottle mouth whereby the said bottle mouth may be hermetically sealed by two break joints, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES DE WITT.

Witnesses:
R. T. FRAZIER,
ALBERT POPKINS.