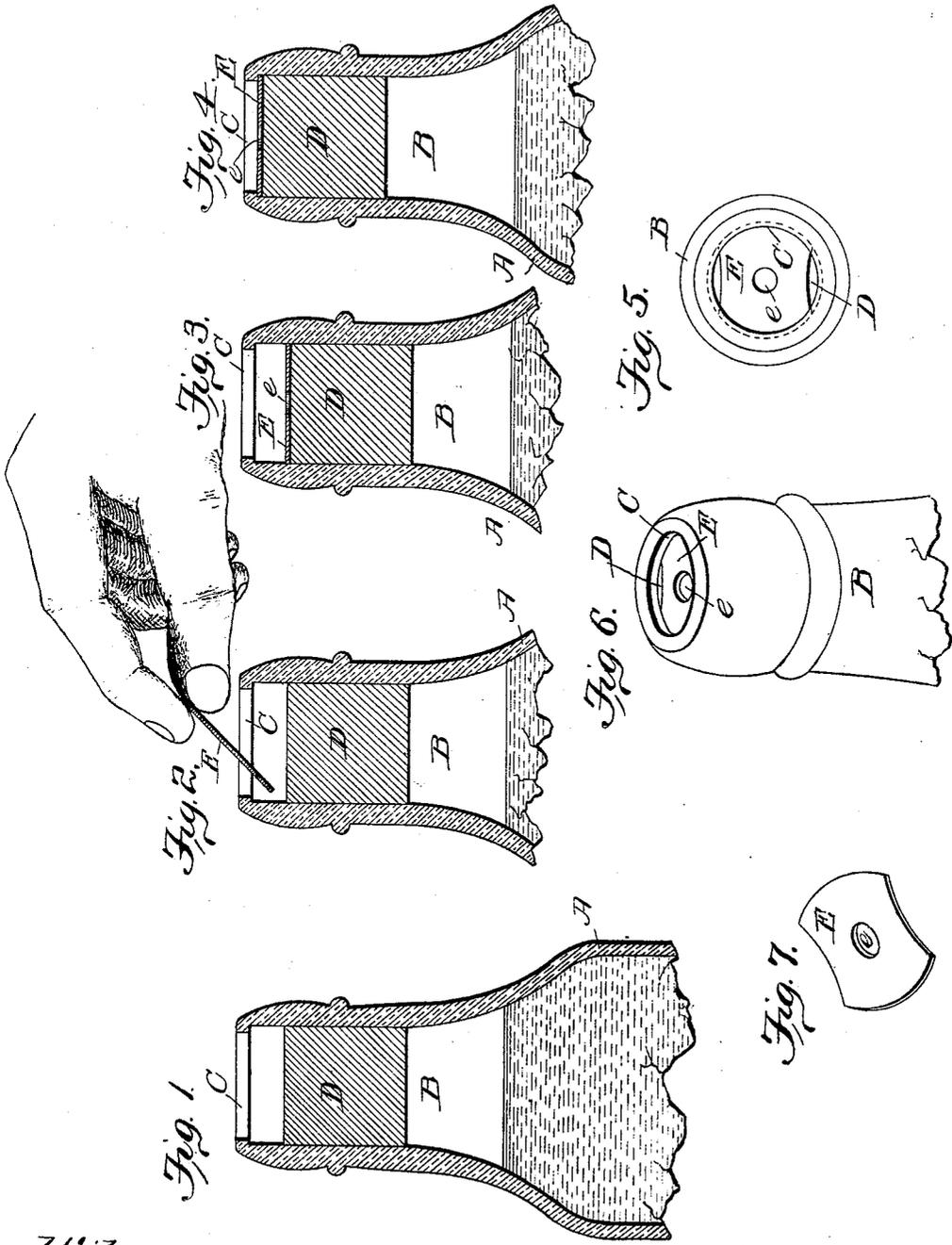


(No Model.)

R. S. GRAHAM.
STOPPER FASTENER.

No. 596,366.

Patented Dec. 28, 1897.



Witnesses:

G. A. Pennington,
F. R. Cornwall

Inventor:

Robert S. Graham,
by
Paul Beakwell
his attorney

UNITED STATES PATENT OFFICE.

ROBERT S. GRAHAM, OF ST. LOUIS, MISSOURI, ASSIGNOR OF THREE-FOURTHS
TO ROBERT J. LUCAS, OF SAME PLACE.

STOPPER-FASTENER.

SPECIFICATION forming part of Letters Patent No. 596,366, dated December 28, 1897.

Application filed May 8, 1897. Serial No. 635,648. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. GRAHAM, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Stopper-Fasteners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a view of a portion of a bottle with which my improved fastener is adapted to cooperate. Fig. 2 is a similar view showing the method of introducing my improved fastener in position. Fig. 3 is a similar view showing my improved fastener on the cork ready to be locked in position when the contents of the bottle expand to force the cork outwardly. Fig. 4 is a similar view, the parts being shown in the position they assume when the contents of the bottle have forced the cork outwardly, which locks the fastener in place. Fig. 5 is a top plan view showing the fastener in operative position. Fig. 6 is a detail view of the neck of a bottle, showing my improved fastener in position. Fig. 7 is a detail view of my improved fastener.

This invention relates to a new and useful improvement in devices for holding corks in bottles, the object being to utilize the expansion of the contents of a bottle as an active medium to lock the fastener in position.

The object of my invention is to provide a non-expansible fastener, which is to be inserted loosely in position on the cork in the neck of the bottle manually or by machine, as desired, after which no further manipulation thereof is required, the contents of the bottle expanding and forcing the cork outwardly and locking the fastener and the cork in place. When the fastener has been locked in place, it will firmly hold the cork against further outward movement, and by providing a hole in the fastener a corkscrew may be inserted to remove the cork, which can easily be done, or the fastener may be first pulled out of place by the introduction of the end of a corkscrew or other instrument thereunder and the cork subsequently removed.

With these objects in view the invention consists in the combination, with a bottle hav-

ing a contracted mouth formed by a shoulder, of a non-expansible fastener adapted to be inserted loosely on top of the cork, the expanding contents of the bottle forcing the cork outward to lock the same and the fastener in place under the shoulder forming the contracted mouth portion of the bottle.

In the drawings I have shown my invention as being applied to a bottle of ordinary construction, with the exception that a shoulder is formed at or near its mouth and the manner of introducing my improved fastener; but it will be obvious from the following description that instead of introducing the fastener by hand suitable machinery may be employed to place the fastener loosely on the top of the cork after the cork has been forced some distance below the shoulder forming the contracted mouth of the bottle.

A indicates a bottle, and B the neck, which neck may be formed with parallel side walls, as shown in the drawings, or it may be formed with convexed inner walls, making a "choke-neck," as is well known. This, however, forms no part of my invention, and I have not illustrated this choke-neck in the drawings.

C indicates the contracted mouth of the bottle, formed at or near the extremity of the neck and preferably by an internally-disposed flange, which affords a shoulder against which the fastener and cork abut or are arrested in their outward movement when the contents of the bottle expand and force the cork and its carried fastener outwardly.

D indicates the cork.

E indicates my improved fastener, which may be termed "non-expansible," because so far as its original shape is concerned it does not change during the time it cooperates with the cork or the shoulder forming the contracted mouth of the bottle. This fastener is preferably of disk form, as shown in Fig. 7, having curved ends described from a center common to the axis of the neck of the bottle, while the sides of said disk fastener are flattened, preferably by making the side edges thereof slightly concaved. A central aperture *e* is formed, through which a corkscrew or other instrument may be inserted to remove the fastener and through which a

corkscrew may be introduced to remove the cork without previously disturbing the fastener. This is possible, because when the fastener is in place and a corkscrew is inserted through the central aperture the pull is central and will bulge the fastener to such an extent that its ends will be disengaged from the flange forming the contracted mouth of the bottle.

My fastener is designed more particularly to be used in connection with beer-bottles or other bottles containing carbonated waters or a gaseous liquid, which, expanding, will exert a pressure on the under side of the cork and force the cork outwardly to lock the fastener in position.

In practice where my fastener is used in connection with bottles containing beer the cork is forced down below the shoulder forming the contracted mouth some little distance, as shown in Fig. 1, after which my non-expandible fastener is loosely introduced, as shown in Fig. 2, which may be either manually or by machinery. By the presence of the flat sides of the disk the same may be inserted through the contracted mouth, and once passing the shoulder forming said contracted mouth will lie against the upper face of the cork, as shown in Fig. 3. Bottles containing beer, when the same are to be opened at some future time, are generally placed in a steaming-chest and steamed—that is, the contents of the bottles are heated until the internal pressure in the bottles is raised to about sixty pounds to the square inch. When bottles having my improved fastener on top of the cork, as shown in Fig. 3, are placed in the steaming-chest, the contents of the bottle will force the cork and fastener upwardly or outwardly until the curved ends of the fastener are arrested by the shoulder forming the contracted mouth of the bottle, as shown in Fig. 4, when the cork will be locked in position. From practical experience I have found that this fastener, arranged as shown and in connection with bottles containing beer, will very effectually lock the same and form a tight seal for the bottle.

My invention is also advantageous in that it is entirely contained in the neck of the bottle and is not liable to be displaced in the handling, as are some forms of stopper-locks at present in use.

I am aware that corks for bottles containing beer have been locked in position by wires, but such fasteners are objectionable because the wires will cut into the cork when the bottle is passed through the steaming process, and therefore it is necessary to use a disk or cap on top of the cork and outside the neck of the bottle, and in so doing it frequently happens that the enormous pressure on the under side of the cork will force the same outwardly and to one side, thus breaking the cork or cocking the same.

I am also aware that rubber seals have been used for bottles containing beer, but such

have been most usually employed where beer is to be consumed at an early date, and are seldom used where the beer is for export purposes. In the use of these rubber seals an extra clamp is usually employed to hold the stopper in position while the bottles and their contents are being steamed.

I am further aware that there are certain patented devices employing expanding spring-followers which are so arranged above the cork that when they are expanded they engage a groove in the neck of the bottle. Such constructions are, however, not reliable in that the cork has to be located at a certain point just below the groove before the follower will properly register and engage the groove in the neck of the bottle. This groove is also a serious drawback in the manufacture of the bottle, as but a small percentage of the number made could be used owing to imperfections in the groove. These devices are also expensive and are not easily manipulated and do not form as efficient a lock as does my improved fastener, which practically covers the entire upper area of the cork.

I am still further aware that bottles having contracted mouths of non-circular form have been used, through which contracted mouths a thin cork disk has been passed sidewise by special machinery, after which the disk is turned to fill the neck and form a seal. In this construction, however, there is no fastener whatever employed. The thin disk of cork cannot form a perfect seal and is practically of no value for that reason.

In my invention it will be noted that there are two conditions absolutely necessary to make the invention operate successfully, one being that the neck of the bottle shall be so constructed that the cork can have a free longitudinal movement therein, the other being that the invention can only be used in connection with bottles whose contents constantly exert a pressure on the under side of the cork.

A feature of my invention which I consider broadly new is the use of a non-expandible fastener, which in itself performs no function and has no office until the contents of the bottle have acted upon the cork and have forced the same outwardly to a point where the fastener becomes engaged with the shoulder forming the contracted mouth of the bottle. I am not aware that such a fastener has ever before been employed, nor do I know of a fastener which has been introduced at an angle through the contracted mouth of the bottle, falling loosely on the cork and remaining in this inactive position until some medium not connected with the fastener nor emanating therefrom acts upon the cork to lock the fastener in position.

By the use of my invention brewers are enabled to use a much shorter cork than is now employed for bottles containing beer. Heretofore one-and-one-half-inch to two-inch corks

have been employed, while by the use of my fastener one-inch corks or shorter can be successfully used, and so far as cheapness is concerned the difference in price of short corks and long corks will more than pay for the fastener, besides leaving a profit to the brewer. It is well known that corks and their fastening devices for beer-bottles are the chief items of expense to brewers simply because the same are removed and thrown away or destroyed, while bottles have to be accounted for.

There may be some slight changes in the shape of my improved fastener which can be advantageously used; but I have not deemed it necessary to show the same, because the principle of my invention is amply illustrated in the drawings hereto attached. I desire, however, to be understood as comprehending various shapes of fasteners.

Having thus described my invention, what claim, and desire to secure by Letters Patent, is—

1. The combination with a bottle having a contracted mouth formed by a shoulder, of a cork adapted to be forced below said shoulder, and a non-expansile fastener, which is passed through the contracted mouth and placed loosely on top of the cork, the expanding contents of the bottle forcing the cork outwardly to lock the same and the fastener

in place under the shoulder forming the contracted mouth portion of the bottle; substantially as described.

2. The combination with a bottle having a contracted mouth, of a cork forced through and below said contracted mouth, a non-expansile fastener having flat sides, which is passed through the contracted mouth and placed loosely on the cork, the expanding contents of the bottle forcing the cork and the fastener outwardly to lock them in place; substantially as described.

3. The combination with a bottle having a contracted mouth formed by a shoulder, of a cork, and a non-expansile fastener having flatsides and a central aperture, said fastener being introduced loosely on top of the cork the expanding contents of the bottle forcing the cork and the fastener outwardly to lock them in place, the central aperture of the fastener permitting the passage of a corkscrew for the purpose of removing the same; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 4th day of May, 1897.

ROBERT S. GRAHAM.

Witnesses:

F. R. CORNWALL,
HUGH K. WAGNER.