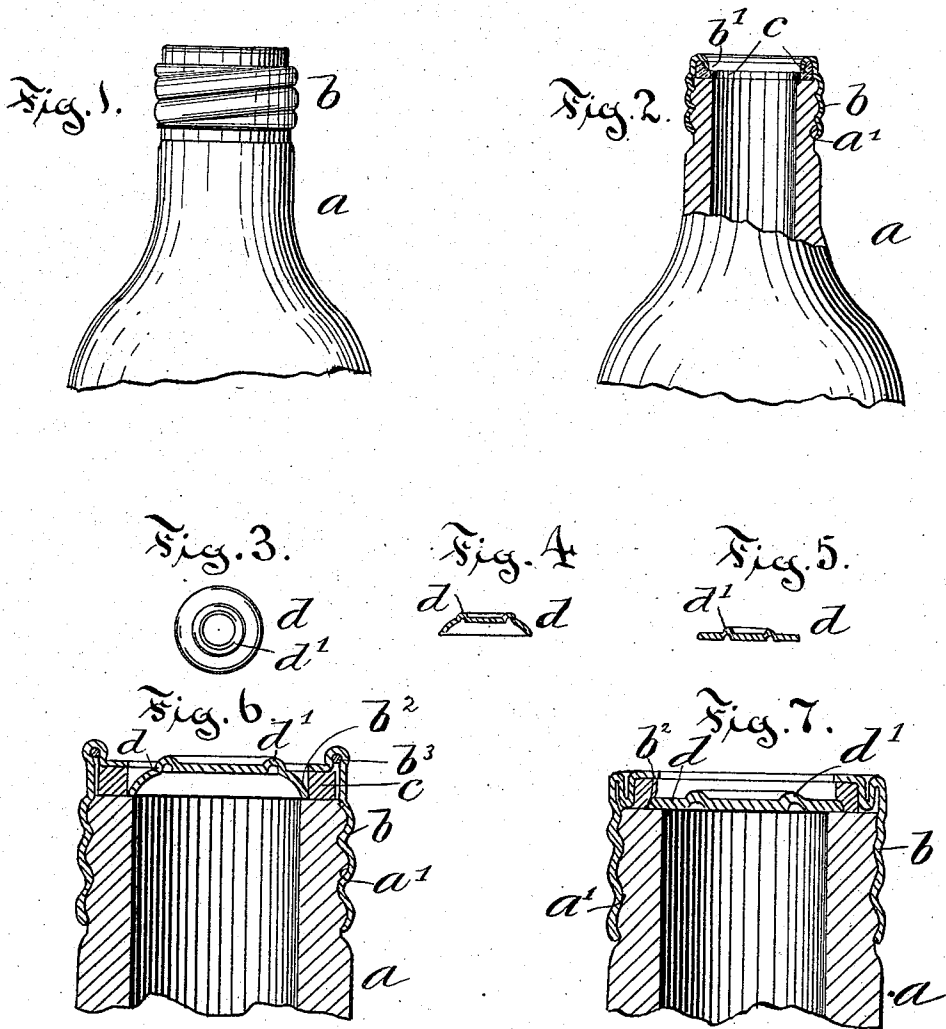


(No Model.)

F. B. THATCHER.
BOTTLE STOPPER.

No. 532,498.

Patented Jan. 15, 1895.



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UNITED STATES PATENT OFFICE.

FREDERICK B. THATCHER, OF PAWTUCKET, RHODE ISLAND.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 532,498, dated January 15, 1895.

Application filed September 22, 1893. Serial No. 486,186. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK B. THATCHER, of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a full, clear, and exact description, whereby anyone skilled in the art can make and use the same.

My invention relates to the class of bottle stopping devices in which the part depended on to immediately close the mouth is used but once while the body part of the stopper remains in place on the mouth of the bottle.

The object of my invention is to provide a simple, cheap and secure fastening device which is particularly adapted for use in closing bottles which contain liquids under pressure and one which is particularly applicable to the large class of aerated beverages such as soda, sarsaparilla and the like light drinks which are used in great quantities during certain seasons.

My invention consists in a bottle stopper comprising a cap piece having a socket, and a valve disk of thin metal adapted to be expanded into place to close the mouth of the bottle, and it further consists in details of the several parts making up the bottle stopper as a whole and in the combination of such parts as more particularly hereinafter described and pointed out in the claims.

Referring to the drawings: Figure 1 is a detail side view of the upper end of a bottle provided with my improved stopper. Fig. 2 is a view in vertical central section of the mouth of the bottle and of the socket piece. Fig. 3 is a detail top or plan view of the stopple. Fig. 4 is a detail view in central section through the stopple before expansion. Fig. 5 is a detail view in central section of the expanded stopple. Fig. 6 is a detail view in central section of the bottle mouth showing the socket piece and the stopple in place before expansion. Fig. 7 is a detail view in central section of the mouth of the bottle and through the stopper with the stopple expanded into place closing the bottle.

In the accompanying drawings the letter *a* denotes a bottle the mouth of which is provided with a socket piece *b* preferably secured so as to in part overlie the mouth of the bottle. In the form shown the bottle has

an external screw thread *a'* and the socket piece is made of metal with a thread which engages that on the bottle so that the socket piece is held in place by the engagement of the two threads. The socket piece has a socket formed by the flange *b'* which is turned inward and overlies the edge of the bottle and in the socket is located a packing ring *c* preferably of india rubber or like material and by turning the socket piece the degree of compression of this packing ring may be adjusted. The socket piece and packing ring are in the relative position shown in the sectional view in Fig. 2 of the drawings and the open mouth of the bottle is closed by means of an expandible stopple *d*. This stopple is a thin metallic disk having an annular corrugation *d'* or like reinforce to prevent it from bending under the pressure of the liquid in the bottle after it has been expanded into place. The diameter of the disk in its concave shape is such as to enable it to fit snugly within the cap, as shown in Fig. 6 of the drawings. By pressure exerted upon the upper part of this stopple it is then flattened out or expanded, its edge being thrust underneath the inward and downturned edge *b²* of the socket piece and into the mass of the packing ring. When the stopple is thus expanded into place it securely closes the mouth of the bottle and expands the packing ring in the socket so as to close all of the joints against the escape of the liquid or of the gases contained in the bottle.

The socket piece is preferably made of thin metal which may be spun to shape or formed in a press, or it may be otherwise made, but when of thin metal the upper edge is reinforced either by securing a reinforce *b³* within the downturned part or by forming a number of folds as shown in Figs. 6 and 7 of the drawings.

The packing ring is preferably larger in interior diameter than the mouth of the bottle, the edge of the mouth forming the abutment on which the lower edge of the stopple disk rests so when pressure is applied it is resisted by the rigid material of the bottle and expands laterally, pressing into the substance of the packing. It does not always underlie the packing but takes such position as the pressure from within the bottle may force it

into. The disk is when expanded greater in diameter than the opening through the socket piece so that its edge underlies the inner edge of the flange, the latter holding the stopple 5 securely against being forced out of place by the pressure of the liquid in the bottle.

To unseal the bottle the sharp point of a suitable tool is thrust through the center of the disk and the latter pulled out of place.

10 The essential feature of my improvement is in the expanding stopple and it is obvious that it may be made of various forms and have various shapes of reinforcing ribs or corrugations to strengthen it, and it is also 15 obvious that the socket piece may be secured or attached to the bottle either adjustably or by any means provided the socket piece contains the socket for the packing ring and a flange beneath which the edges of the stopple 20 can be expanded. For these reasons my invention is not limited to the particular form of socket piece and stopple shown, although they are the preferred forms.

I claim as my invention—

25 1. In a bottle stopper in combination with a removable metallic socket piece having an inturned flange or holding edge, and secured

to the bottle a packing underlying such flange and the thin metallic expansible stopple, expanded into place against the packing all substantially as described. 30

2. In combination with a bottle having an exterior thread at the mouth, a threaded socket piece fitting the thread on the bottle and having an inturned flange and reinforced 35 edge, a packing ring underlying the flange on the socket piece, and an expanded thin metallic disk with its edge extending underneath the flange or shoulder on the socket piece and into the body of the packing, all 40 substantially as described.

3. In combination with a bottle having a packing socket at its mouth, an annular packing ring located in the socket, and a reinforced stopple greater in diameter than the mouth 45 of the bottle expanded into place by the flattening of the stopple and with its edge underlying the upper part of the packing socket, all substantially as described.

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Witnesses:

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