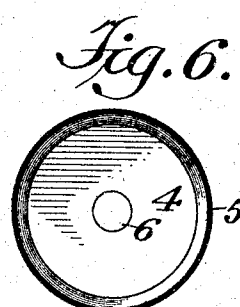
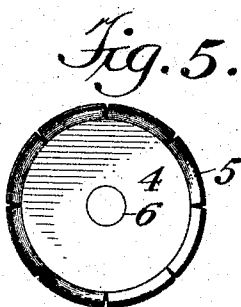
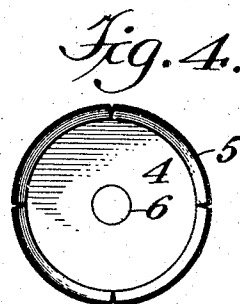
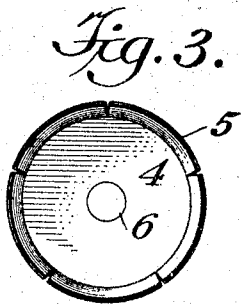
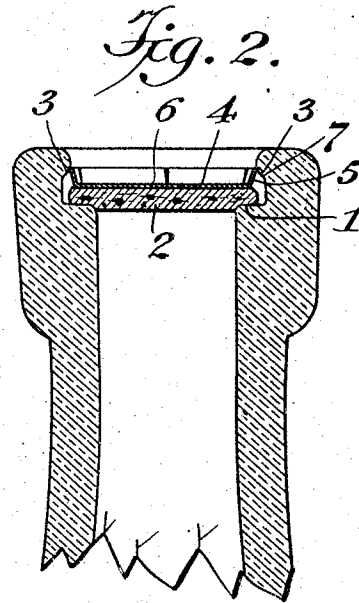
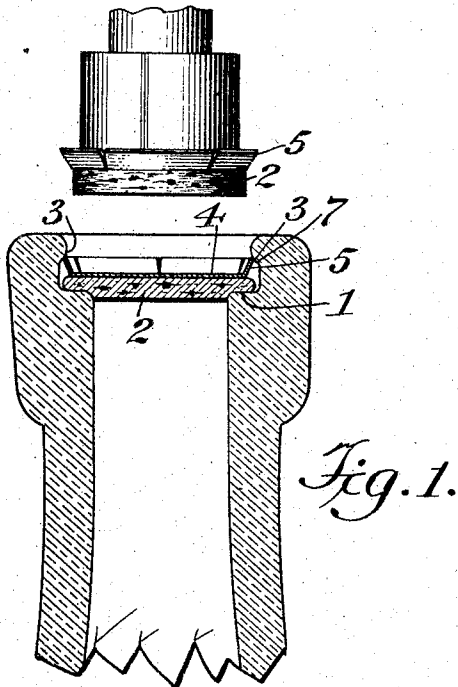


No. 780,732.

PATENTED JAN. 24, 1905.

E. D. SCHMITT.
BOTTLE SEAL.

APPLICATION FILED AUG. 13, 1904.



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BOTTLE-SEAL.

SPECIFICATION forming part of Letters Patent No. 780,732, dated January 24, 1905.

Application filed August 13, 1904. Serial No. 220,680.

To all whom it may concern:

Be it known that I, EDWARD D. SCHMITT, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Bottle-Seals, of which the following is a specification.

This invention relates to bottle-seals of the class disclosed in my Patent No. 756,715, of April 5, 1904, and comprises certain improvements upon the structure therein disclosed by means of which it is deemed the sealing operation is improved.

In the drawings, Figure 1 is a central sectional view of the upper portion of the neck of the bottle formed in accordance with my invention with the seal therein in section, showing also above the bottle-mouth the seal and plunger with which it may be applied. Fig. 2 is a similar view of the bottle and seal, showing a slight variation in the point of engagement between the overhanging locking-surface and the edge of the short resilient flange of the seal. Fig. 3 is a plan view of the preferred form of sealing member. Figs. 4 and 5 show slightly-modified sealing members, and Fig. 6 is a plan view showing a sealing member with the flange solid or unslitted.

In the present invention the bottle is formed with a sealing-seat 1, extending inwardly beyond the wall of the mouth of the bottle and upon which seats a sealing-disk 2 of appropriate material, such as cork. The walls extending upwardly from the sealing-seat lie outside of the walls of the bottle-mouth and are shown as inclining slightly inwardly and merging at 7 in an annular convexly-curved locking-surface 3, the curve of which may be and preferably is the arc of a circle. Above the line of minimum diameter of the bottle-opening, which minimum opening is termed the "bottle-mouth," the wall is shown as forming a continuation of the arc constituting the locking-surface; but the contour of the wall above the bottle-mouth or point of narrowest diameter is not material, although it should not in my opinion be a vertical wall coincident with the wall bounding the narrowest diameter of the opening into the bottle. The securing

member, to the bottom of which the cork 2 may be cemented, is cup-shaped, comprising a flat base or bottom 4 and a short outwardly-flaring flange 5. It is made of a metal having sufficient resiliency to accomplish the purpose of this invention. The base or flat bottom 4 is of such diameter as to pass freely through the bottle-mouth, but the diameter across the edge of the flange is greater than the bottle-mouth. When the securing member 4 5 is forced by the pressure of a suitable plunger through the bottle-mouth, the flange 5 is of course contracted, but possesses such resiliency as after insertion to expand against the convexly-curved locking-surface 3, the exact point of engagement of the edge of the flange with such surface depending upon the depth of insertion of the sealing member, which will vary within small limits either because of slight irregularities in the interior walls of the bottle-neck or because the cork-disks may possess variable degrees of compressibility or because of variations of pressure of the plunger. Thus in Fig. 2 the flange engages the locking-surface nearer to the bottle-mouth than in Fig. 1. The relation of the convexly-curved locking-surface and the inclined wall connecting it with the horizontal wall of the sealing-seat is preferably such as not to form an abrupt shoulder. If, however, the parts were so proportioned that the edge of the securing member could never pass to the extreme bottom of the convexly-curved locking-surface, the occasion for such expressed preference would not exist and the upright walls might join the locking-surface at any angle.

As shown in Fig. 4, the securing member has four slits in the flange, while a greater number of slits is shown in Fig. 5. The construction of Fig. 3 is, however, preferred. Whether the flange be slit, as in Figs. 3, 4, and 5, or unbroken, as in Fig. 6, all parts of its edge are concentric. The slitting of the flange serves to enhance its resiliency and tends to prevent buckling; but the flange may be solid.

Experiment has shown that a suitable metal for the cup-shaped securing member is rather soft steel tin-plate the hardness or resiliency

of which is increased by the manipulation to which it is subjected in being formed into cup shape. Such seals readily enter the bottle-mouth without danger of rupturing it. They have sufficient resiliency to expand against the curved locking-surface and hold with sufficient friction to resist internal pressures and have strength enough to resist any internal pressure without danger of collapse. When the seal has been forced into the bottle-mouth, the slits are closed, or nearly so, producing a continuous or substantially continuous locking engagement between the flange and the locking-surface.

As shown in Fig. 1, the flange of the securing member is initially greater in diameter than the opening in the bottle-mouth, thus making it necessary for the flange to yield inwardly when the seal is forced into the bottle-mouth, wherein it will expand into locking engagement with the locking-surface and hold the sealing member compressed against the sealing-seat, the flange taking hold at any point of the locking-surface that the sealing-pressure leaves off. These features of the construction of the bottle and seal will be better understood by reference to Figs. 1 and 2, in the former of which the seal is shown with its flange in engagement with the locking surface or shoulder at a point lower than in Fig. 2. It will thus be understood that a perfect seal is in no wise dependent upon the flange of the securing member engaging a sharp definite shoulder. On the contrary, the lock is formed by the close frictional engagement between the flange and the locking-surface produced by the resiliency of the flange and its resulting tendency of said flange to expand.

The numeral 6 indicates a central weakened portion of the seal, which weakening is accomplished by punching the metal of the securing member almost through, as is better shown in Figs. 1 and 2, and is for the purpose of permitting the ready entrance of a pointed tool for removing the seal. This weakened portion need not be centrally located in the securing member, but may be to one side thereof, and it may be made in any desired shape and size.

The tool for removing the seal may be a simple sharpened implement like that illustrated in the patent above referred to. The convexly-curved locking-surface permits ready extraction of the securing member, which rolls easily out of position under stress of the extracting-tool.

I am aware that it is old to form a bottle with a sealing-seat substantially like that shown and an overhanging locking surface or shoulder; but so far as I know I am the first to combine a shoulder or locking-surface like that shown with a securing member formed with a resilient upturned flange adapted to make locking engagement at different points on said shoulder, thereby presenting a simple

construction of bottle, easily and cheaply made, and a seal possessing highly desirable locking possibilities. I am further aware that it is old to seal bottles with the assistance of a non-resilient metal forced or crowded into a groove in the bottle-neck and held therein by reason of its being flattened out or distorted from its original shape; but my invention differs from this class of inventions in that the employment of such a metal would defeat the very purpose of my invention, which depends upon the resilient characteristics of the metal to cause the flange to expand into locking engagement with the locking-surface after passing through the contracted bottle-mouth.

Experience has shown that where the bottom of the securing member, or that part thereof from which the flange extends, is flat or horizontal, as shown, the resilient action of the flange in expanding is somewhat more effective than when the bottom is grooved, as shown in my prior patent above mentioned.

I claim—

1. In a bottle-seal, the combination with a bottle having a sealing-seat in its neck extending inwardly beyond the mouth of the bottle, and a convexly-curved locking-surface overhanging said seat, of a metallic securing member formed with a short upturned resilient flange of normally greater diameter than the bottle-mouth and adapted when the securing member is forced into said mouth, to expand into locking engagement with the locking-surface, and a circular sealing member of compressible material held on the sealing-seat by the securing member, substantially as described.

2. In a bottle-seal, the combination with a bottle having a sealing-seat in its neck extending inwardly beyond the mouth of the bottle, and a convexly-curved locking surface or shoulder overhanging said seat, of a metallic securing member formed with a short upturned resilient slitted flange of normally greater diameter than the bottle-mouth, and adapted when said securing member is forced into said mouth, to expand into locking engagement with the locking-surface, and a circular sealing member of compressible material held on the sealing-seat by the securing member, substantially as and for the purpose set forth.

3. In a bottle-seal, the combination with a bottle having an annular groove near its mouth shaped to form a sealing-seat extending inwardly beyond the bottle-mouth, slightly inwardly inclined walls 3, and overhanging convexly-curved locking-surface 4, of a metallic securing member formed with an upturned resilient rim of normally greater diameter than the bottle-mouth and adapted when the securing member is forced into the bottle-mouth to expand into locking engagement with the overhanging surface, and a sealing

member of compressible material held in sealing contact with the sealing-seat, substantially as described.

4. In a bottle-seal, the combination with a
5 bottle having a sealing-seat in its neck extending inward beyond the mouth of the bottle and a locking-surface overhanging said seat and extending downwardly and outwardly from the bottle-mouth and connected with
10 the sealing-seat by walls lying outside of the wall of the bottle-mouth, of a metal securing member, formed with a flat bottom or base of a diameter that will readily enter the bottle-mouth, and with a short, upturned, resilient flange, all parts of the edge of which are

concentric, of greater diameter than the bottle-mouth and adapted when the securing member is forced into said mouth, to expand into locking engagement with the locking-surface, and a circular sealing member of
20 compressible material held on the sealing-seat by the securing member, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD D. SCHMITT.

Witnesses:

LILLIE F. BROWNING,
E. F. PORTER.