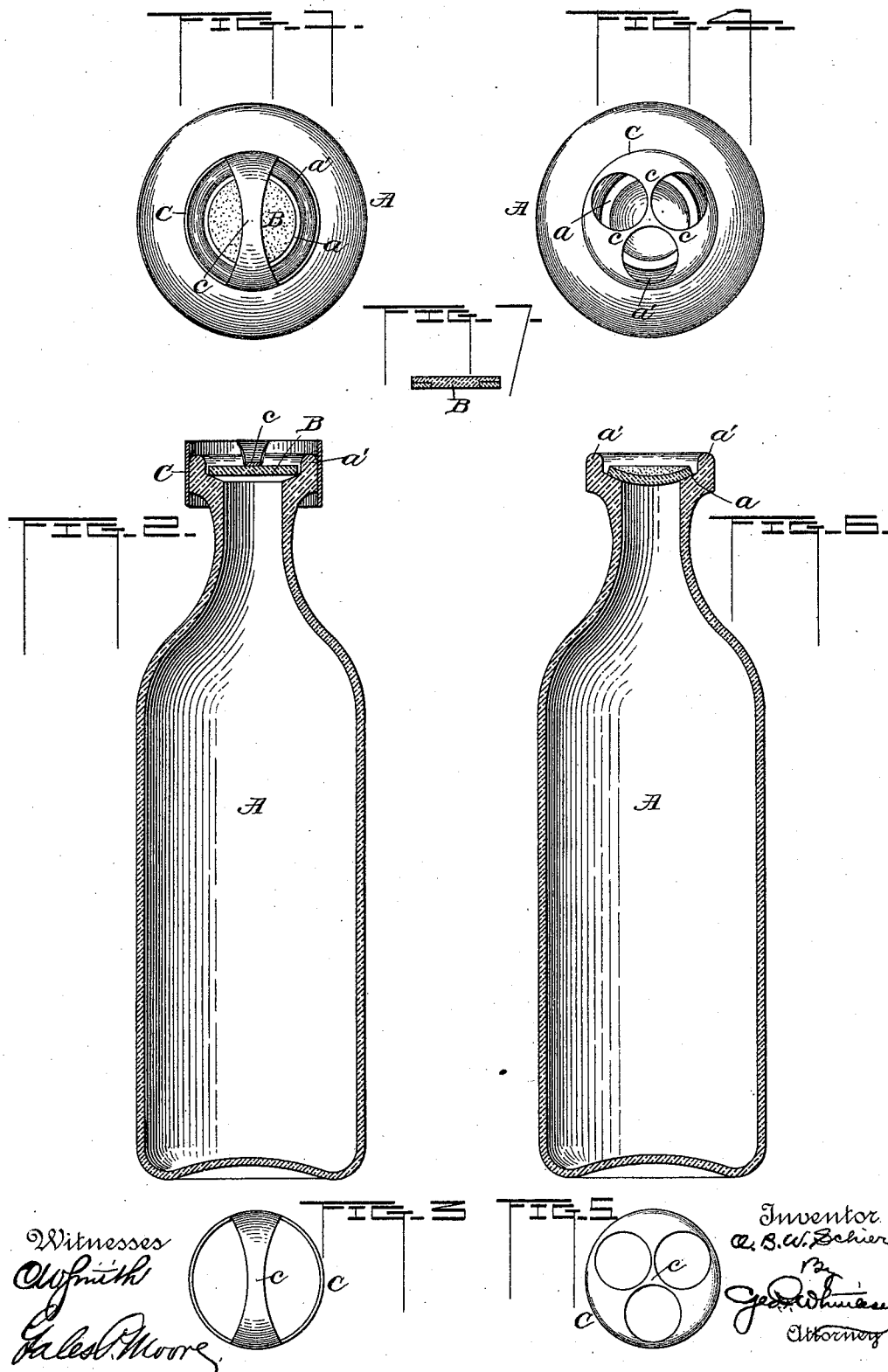


(No Model.)

O. B. W. SCHIER.  
RECEPTACLE FOR STERILIZING PURPOSES.

No. 522,235.

Patented July 3, 1894.



# UNITED STATES PATENT OFFICE.

OSCAR BERNHARD WILHELM SCHIER, OF BALTIMORE, MARYLAND.

## RECEPTACLE FOR STERILIZING PURPOSES.

SPECIFICATION forming part of Letters Patent No. 522,235, dated July 3, 1894.

Application filed April 7, 1894. Serial No. 506,780. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR BERNHARD WILHELM SCHIER, a citizen of the United States, residing in Baltimore city and State of Maryland, have invented certain new and useful Improvements in Receptacles for Sterilizing Purposes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to receptacles for sterilizing milk, chocolate or any other liquid, as well as fruits, &c., and its object is to provide such receptacles with an automatically closing stopper, which shall remain air-tight and be protected from accidental displacement during the necessary handling of the receptacles in packing and shipping them.

Milk and other substances are usually sterilized in the bottles in which they are transported to consumers, and the proper closing of the bottles at the end of the sterilizing process is a matter of some difficulty. When sterilizing bottles are not closed automatically, it is almost impossible to prevent germs from being conveyed into them from the hand of the operator during the closing of the stoppers. It has been proposed to use a flexible disk stopper, larger in diameter than the mouth of the bottle, and resting flat upon it during the processing, but forced into a concave or cup shape by the atmospheric pressure, upon the formation of a vacuum in the bottle when the contents are cooled. But this stopper is very liable to be thrown off by the escaping vapors during the processing, and it is exposed to displacement by accidental knocks during the handling and shipping of the bottles. Moreover, the shape of the bottle mouth is not such as to give a broad, flat seat for the stopper, a point of great importance when the bottle is to be kept for any length of time, since it is less likely to leak when the stopper has a good bearing surface.

My invention is an improvement on this class of devices, and in carrying it into practice, I provide each bottle with a countersunk mouth, and I place in the countersink a disk

of soft flexible material capable of enduring the heat of the sterilizing process. The diameter of this disk is less than that of the mouth of the bottle, so that as it rests on the shoulder at the bottom of the countersink, there is an annular space all around it. The shoulder supporting the disk is preferably coned. A guard is slipped over the neck of the bottle, having an arm or cross-bar resting upon the center of the disk, and preventing it from displacement, by the escaping steam and hot air. At the conclusion of the processing, the heat is quickly turned off, and the cold air is suddenly admitted to the sterilizing tank, the effect of which is to suddenly condense the heated vapor in the bottle and cause the disk to be sucked tightly down upon the coned shoulder, thereby hermetically and automatically closing the bottle. The guard may be then removed, and the bottle is ready for shipment, the disk being fully protected by the surrounding rim of the countersunk mouth.

In the drawings, Figure 1 is a top plan view of the bottle provided with a guard and ready for the sterilizing process. Fig. 2 is a vertical section of the same. Fig. 3 is a plan view of the guard. Fig. 4 is a top plan view, showing a modified construction of the guard. Fig. 5 is a plan view of this guard. Fig. 6 is a vertical section of the bottle hermetically closed and Fig. 7 is a section of a modified stopper.

The bottle A is made of glass, and the walls and bottom are of uniform thickness, and free from sharp corners, to enable it to successfully withstand the heating and cooling to which it is subjected. The mouth of the bottle is countersunk, forming an annular shoulder  $\alpha$ , which is preferably coned as shown.

The stopper B is composed of a disk of soft flexible material, such as parchment paper, soaked in paraffine, though I prefer the best quality of pure Para rubber, since the perfection of the closure, and the maintenance of the vacuum depend entirely upon the contact between the disk and its seat. The disk may be composed of two or more materials. Thus the under side of the rubber may be centrally covered with paper, cloth or the like to protect it from the milk. Or the disk may be of paper or the like with a gasket of rubber, attached to it or loose, as desired, (see

Fig. 7.) The disk is cut a little smaller than the mouth of the bottle, so as to leave all round it an annular space for the escape of the hot air and vapor.

5 The bottle having been filled, and the disk dropped into place, a guard C is slipped over the neck of the bottle. This consists preferably of a ring fitting easily upon the bottle, and provided with a finger, arm, cross bar or  
10 bars *c* projecting inwardly and downwardly so as to rest upon the center of the disk. This leaves the edges of the disk free to rise and permit the vapor to escape during the sterilizing process, but prevents the disk from being  
15 tilted to one side or otherwise displaced. At the end of the process, the steam is shut off from the heating coils, and the cover of the sterilizing tank is opened, admitting a rush of cold air, which suddenly forms a vacuum  
20 in the bottle, causing the disk to be sucked inward until it assumes the concave or dished shape shown in Fig. 6, with the edges in close contact with the shoulder *a*. The disk must be thick enough to resist being sucked into  
25 the bottle. In this condition, the disk is subjected to an atmospheric pressure of eight or ten pounds, which is quite sufficient to hold it tightly closed. Should any leakage occur, it can be readily detected by the change in  
30 the appearance of the disk, which by reason of its elasticity tends to resume its normal flat shape when the pressure is reduced. In the same way, any tampering with the bottle can be detected. The rim *a'* of the bottle  
35 mouth surrounds and protects the disk so that after the guard C is removed, the bottle can be freely handled without danger of displac-

ing the stopper. If desired, however, the guard may be left on the bottle, with the central arm resting on the stopper, to afford an  
40 additional safeguard against any accidental displacement of the stopper.

To open the bottle, it is first warmed to the proper temperature, thus reducing the vacuum and counteracting in some degree the  
45 pressure upon the stopper, which can then be readily pried up and removed.

By reversing the disk at each filling of the bottle, it will be prevented from getting permanently dished, and so will last for a long  
50 time.

While I have shown and described my improvements as applied to a bottle, yet I do not limit myself thereto, but wish it to be understood that they are applicable to any receptacle used for sterilizing purposes.

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

The combination with a receptacle for sterilized food, provided with a countersunk mouth having a flat coned seat *a* surrounded by the rim *a'*, of an elastic disk resting on said seat and of less diameter than the same, and adapted to be automatically closed upon  
65 said seat and held there by atmospheric pressure only, substantially as described.

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

OSCAR BERNHARD WILHELM SCHIER.

Witnesses:

R. G. WARE,

CHARLES T. DAVIS.