(No Model.)

# A. STUTZER & J. SCHÄFER.

## BOTTLE STOPPER.

No. 515,626. Patented Feb. 27, 1894.

*Fig. 1.*

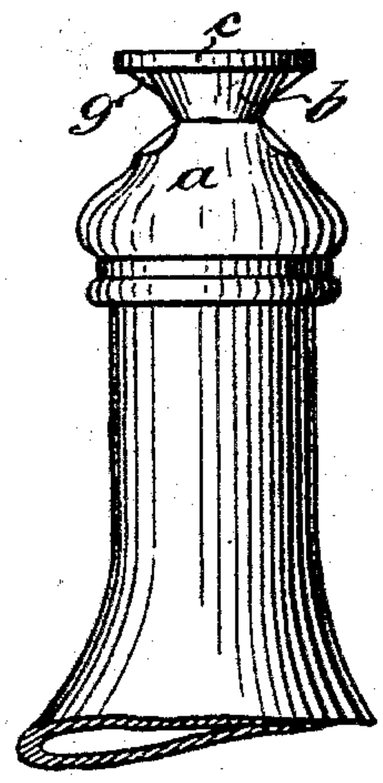


*Fig. 2.*

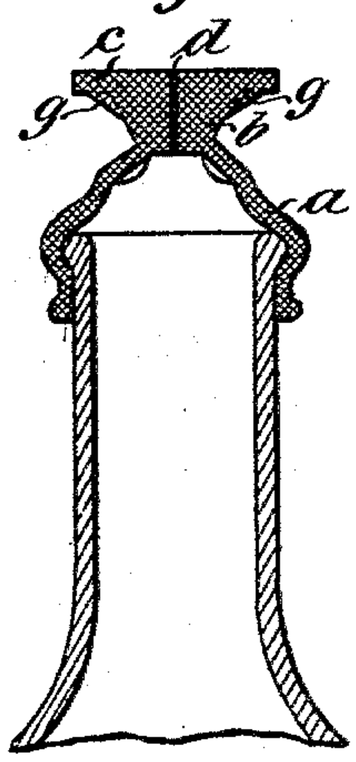


*Fig. 3.*

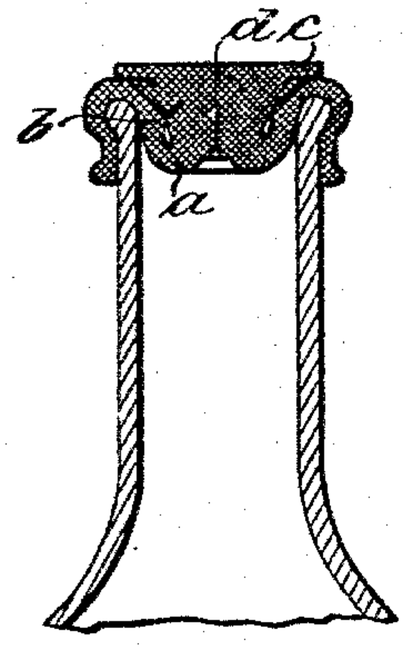


*Fig. 4.*


*Fig. 5.*


Witnesses;
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J. A. Saul.

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# UNITED STATES PATENT OFFICE.

ALBERT STUTZER AND JULIUS SCHÄFER, OF BONN, GERMANY.

## BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 515,626, dated February 27, 1894.

Application filed November 9, 1893. Serial No. 490,481. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT STUTZER and JULIUS SCHÄFER, subjects of the Emperor of Germany, and both residents of 53[b] Weberstrasse, Bonn, in the Empire of Germany, have invented an Improved Bottle-Stopper, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to a bottle stopper. This bottle stopper comprises an elastic cap with a valve and serves for use in bottles containing liquid to be sterilized. The said valve acts in such a manner that, on the air being rarefied in the vessel, it is closed by the outer pressure, while gases generated in the interior of the bottle can escape freely.

As compared with other stoppers of the same class our improved device possesses the feature that the part carrying the valve, when the air is rarefied in the bottle, will be almost entirely sucked into the bottle neck and will not project thus obviating inconvenience in the handling and packing of the closed bottle. In addition to the automatic closing of the valve we provide for holding the cap more securely and tightly upon the orifice of the bottle neck in proportion as the rarefaction of the air in the bottle increases.

Referring to the accompanying drawings, Figure 1 is an elevation showing our stopper fitted upon the bottle neck. Fig. 2 represents a section of the same. Fig. 3 is another section showing the head of the stopper drawn into the bottle neck. Fig. 4 represents another view of the stopper arranged on the bottle neck. Fig. 5 is a plan of the stopper head showing the valve slit provided therein.

The cap *a* may be made of india rubber or other suitable elastic material, and is thickened at the lower edge in order to obtain a secure hold upon the orifice of the bottle neck.

This cap possesses a conical head *b* widening upwardly, wherein a valve *d* is arranged. It is expedient to make the cone *b* wider at the top so as to form a disk *c*.

When pressure prevails in the bottle the stopper occupies the position shown in Figs. 1 and 2, the gases and vapors being able to escape freely. As soon as the air is rarefied in the bottle the conical head *b* descends first into the cap *a* and then into the upper part of the bottle neck, as represented in Fig. 3.

In order to insure a specially tight closing of the valve slit *d*, we provide at opposite points of the head *b* noses or projections *g* in such manner that when the head *b* descends, the noses or projections *g* act on parts of the cap *a* which are supported by the bottle mouth and compress the head *b* to close the valve-slit *d*. In lieu of the aforesaid nose or projection we may, for achieving the same result, give the head *b* a somewhat different shape so that it will be compressed in the direction transversely to the slit. Besides serving for the tight closing of the valve the upwardly widening form of the said head has the effect that when the air is rarefied in the bottle the cap *a* will be held more securely than in the case of the stoppers heretofore employed, and that by the rarefaction of the air the said cap will also make a better joint with the orifice of the bottle neck, inasmuch as it is pressed by the head firmly against the curved edge of this neck, the pressure augmenting with the degree of rarefaction of the air in the bottle. This action will be clearly understood on inspection of Fig. 3. The widening of the head *b* to form the disk *c* has for its object to prevent the head being sucked too far into the bottle neck.

Great importance is attached to the double object of the special form of the stopper head constructed as hereinbefore set forth.

What we claim is—

1. In a stopper for bottles containing liquid to be sterilized, the combination with an elastic cap *a* of an upwardly widening head *b* having a valve slit or opening *d* therethrough and noses or projections *g* on its periphery, substantially as and for the purposes herein set forth.

2. In a stopper for bottles containing liquid to be sterilized the combination with an elastic cap *a* of an upwardly widening head *b* having a valve slit or opening *d*, noses or projections *g* and a disk *c*, substantially as and for the purposes herein set forth.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

ALBERT STUTZER.
JULIUS SCHÄFER.

Witnesses:
FRITZ SCHRÖDER,
SOPHIE NAGEL.