F. GERHARD.

BOTTLE STOPPER.

APPLICATION FILED OCT. 15, 1908.

944,671. Patented Dec. 28, 1909.

Fig. 1

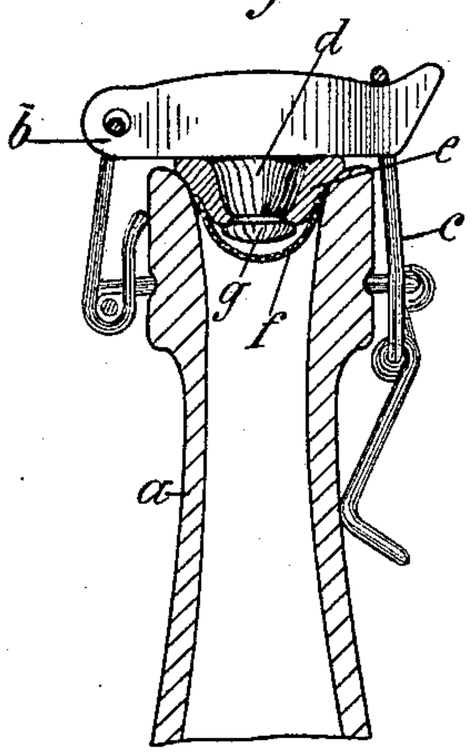


Fig. 2

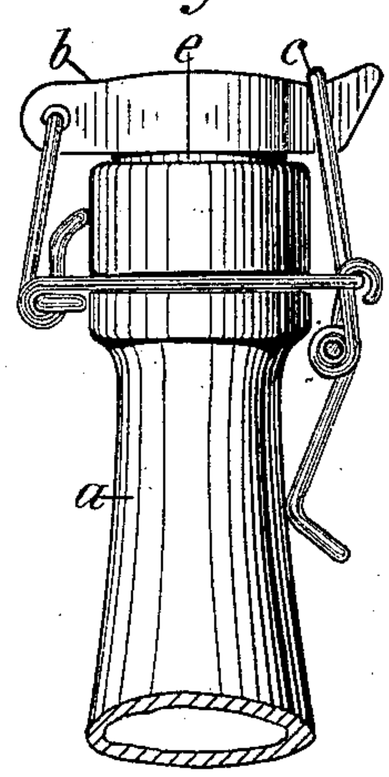


Fig. 6

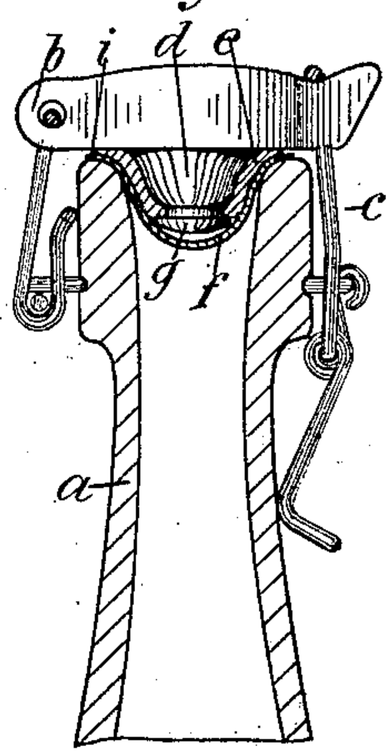
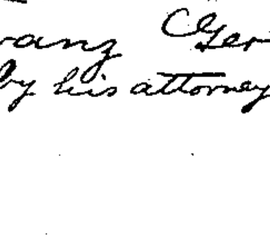


Fig. 3

Fig. 4

Fig. 5



Witnesses:
H. R. Schultz.
C. H. Schork.

Inventor:
Franz Gerhard
by his attorney Frank P. Brieen

UNITED STATES PATENT OFFICE.

FRANZ GERHARD, OF TRABEN-TRARBACH, GERMANY.

BOTTLE-STOPPER.

944,671. Specification of Letters Patent. **Patented Dec. 28, 1909.**

Application filed October 15, 1908. Serial No. 457,779.

To all whom it may concern:

Be it known that I, FRANZ GERHARD, a subject of the King of Prussia, residing at Traben-Trarbach-on-the-Mosel, in the German Empire, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a specification.

This invention relates to bottle stoppers and refers to that class of such stoppers wherein the body of the stopper consists of porcelain or the like provided with a tightening rubber ring for insuring a gas or liquid seal. With stoppers of this kind the drawback has been noticed that the contents of the bottle tend to act upon and destroy the rubber ring, and in some cases the rubber ring acts upon the contents of the bottle and causes deterioration, accompanied by a disagreeable taste.

My present invention refers to the protection of the rubber ring from acting upon or being acted upon by the liquid by means of a capsule or cover, preferably of metal.

In order that my said invention may be better understood I will proceed to describe the same with reference to the drawings accompanying my specification, in which—

Figure 1 is a vertical section through the neck of a bottle with my invention applied to the stopper; Fig. 2 is an elevation of the neck with stopper attached; Fig. 3 shows the protective capsule; Figs. 4 to 6 show modified forms of the invention.

The same letters of reference are employed to denote the same parts in all the views:—

The neck *a* of the bottle is provided in the usual manner with a stopper *b*, consisting of porcelain, held in position and operated by a wire lever *c*.

e is the tightening rubber ring secured to the conical part or plug *d* of the stopper *b*.

Instead of the rubber ring pressing directly against the neck of the bottle in the usual way, a capsule *f* (shown in detail at Fig. 3) presses against the neck of the bottle. This protective capsule consists of a material which cannot be affected by the contents of the bottle and which cannot act upon or affect the taste of the contents. It is sufficiently flexible to fit tightly against the neck when pressed upon by the rubber ring. It may consist, for instance, of flexible tin or sheet aluminum and is of such size as to enter, when in position, so far into the neck of the bottle that its upper edge comes a little below the edge of the neck of the bottle.

When the stopper is closed the lower part only of the rubber ring engages with the protective capsule, pressing it against the inner surface of the neck, the upper part of the said ring fitting directly against the glass, thus guaranteeing a proper seal in the event of the capsule not pressing sufficiently tightly against the surface of the neck or becoming permeable by the formation of folds or the like.

When the stopper is closed the protective capsule is held tightly to the rubber ring by suction so that when the stopper is opened the capsule comes out of the bottle with the rubber ring. Moreover, as a small space is left between the porcelain body and the protective capsule, when the bottle is filled with a liquid containing gas under pressure, for instance, carbonic acid gas, the contents of the bottle act upon the capsule and press same upward. This causes folds to be formed in the longitudinal axis of the capsule, the radius of which decreases in such a way as to force the capsule to engage with and to attach itself to the button *g* at the bottom of the conical part of the body of the stopper.

In order to facilitate the adjustment and suction, the capsule may be suitably provided with small wavy grooves at its upper end as shown at Fig. 4, especially where the bottle is not intended to contain liquids under pressure. When the stopper is closed these grooves are flattened, fitting tightly against the inner surface of the neck, as well as against the rubber ring, and causing the capsule to cling tightly to the ring by suction.

Referring to the modification shown at Fig. 5, in this case, the protective capsule is not provided with grooves, but with a suitable number of indentations *h* made laterally in the wall of the capsule. In this case the rubber ring *e* is secured to the body of the stopper and the capsule is also passed over the said stopper and secured to the same by the indentations *h*, engaging in the grooves between the button *g* at the bottom of the conical portion and the conical portion itself of the stopper, thus preventing the capsule from becoming disengaged from the stopper when the latter is open. Instead of securing the capsule to the stopper by means of indentations before closing the stopper, it may, in some cases, be

provided with indentations *h* of such diameter that it may be passed over the button *g* of the stopper without engaging same. The capsule is then brought into the neck of the bottle and the stopper closed. The capsule is stretched in the direction of the axis of the neck of the bottle, and by this means its diameter is decreased and the indentations *h* engage with the grooves between the button *g* and the conical body *d*. In this instance, moreover, the bottle is protected from accidental leakage in consequence of insufficient adhesion of the capsule to the neck of the bottle by the upper part of the rubber ring *c* fitting tightly against the inner surface of the neck.

In the modification shown at Fig. 6, there are no grooves or lateral indentations, but the capsule is provided with an upper horizontally bent edge *i* lying on the upper edge of the bottle neck. The stopper is pressed down, the capsule *f* is pressed tightly against the inner surface of the neck by the rubber ring *e* secured to the conical part *d* so that the liquid is prevented from escaping.

I have simply described and shown these methods of carrying out my invention by way of example as I may modify the method of carrying out the invention without departing from the principle thereof.

What I claim, and desire to secure by Letters Patent of the United States, is:—

1. A bottle having a neck, combined with a stopper having a depending plug, a flexible metal cap separable from said stopper and adapted to be interposed between neck and stopper, the cap being normally spaced from the plug.

2. A bottle having a neck, combined with a stopper having a depending plug, a rubber gasket encircling the plug, and a flexible metal cap separable from the stopper and having a grooved upper section, said cap being adapted to be interposed between neck and stopper.

Signed by me at Cologne, Germany, this 29th day of September, 1908.

FRANZ GERHARD.

Witnesses:
CHAS. VANDORY,
BESSIE F. DUNLAP.