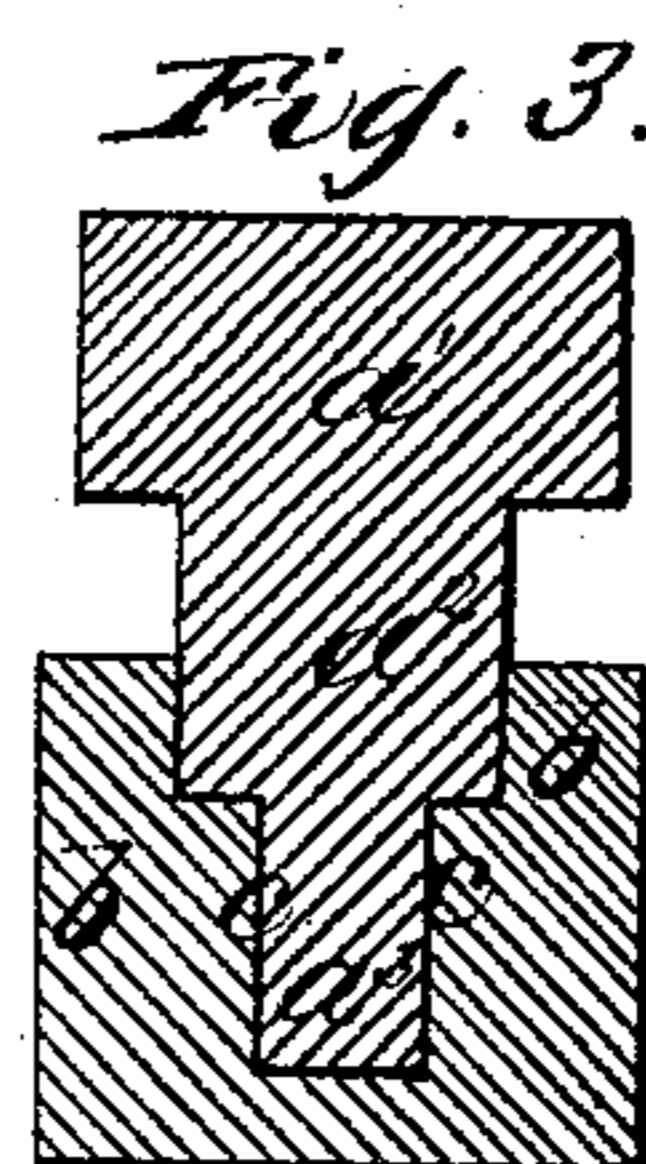
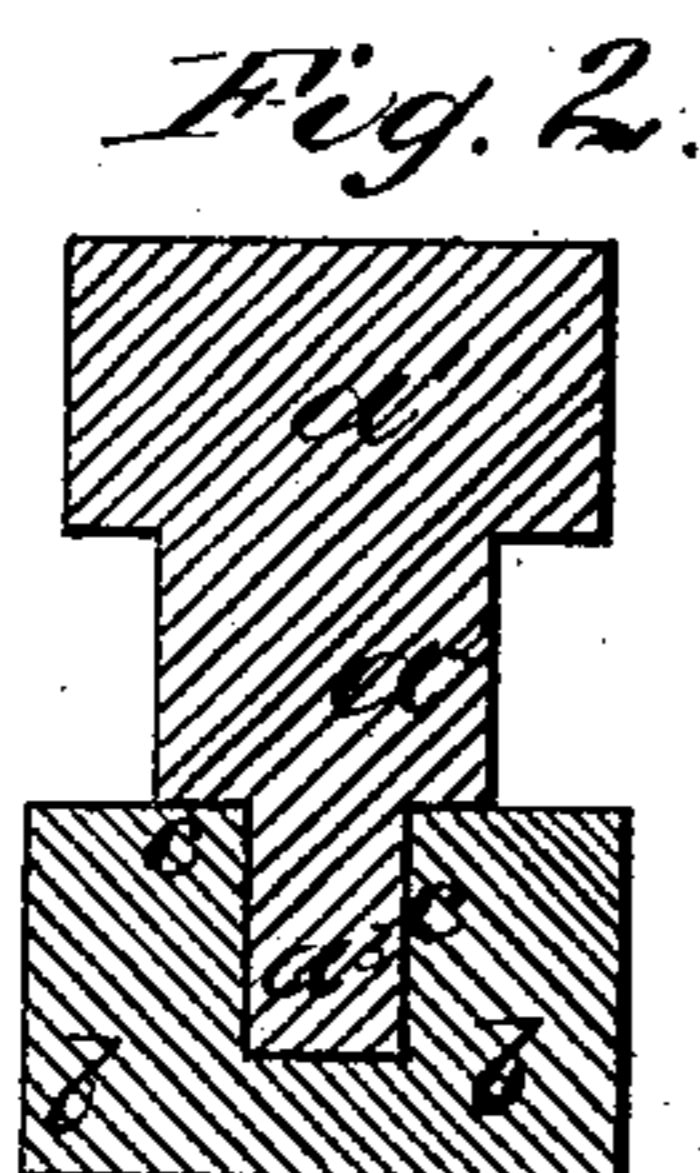
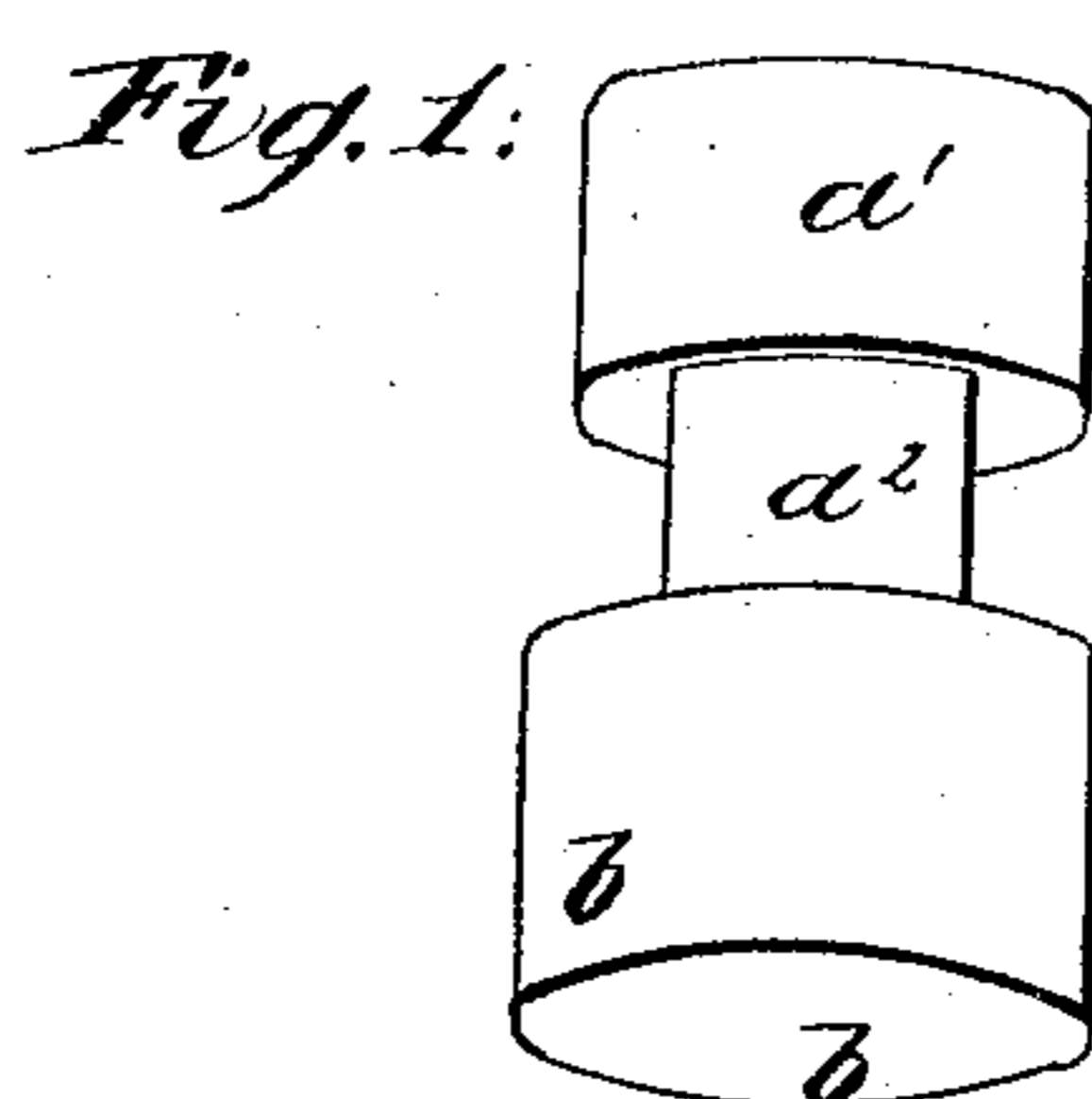


Fox & Hall,
Bottle Stopper,
N^o 70,986, Patented Nov. 19, 1867



Witnesses
Wm. Hing
Robert Moss

Inventors
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United States Patent Office.

HOWARD BUSBY FOX, OF OXTON, AND JAMES TURNER HALL, OF LIVERPOOL, ENGLAND.

Letter Patent No. 70,986, dated November 19, 1867.

IMPROVED BOTTLE-STOPPER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, HOWARD BUSBY FOX, of Oxtton, and JAMES TURNER HALL, of Liverpool, both in that part of her Britannic Majesty's dominions called England, have invented a certain "Improved Stopper for Bottles, Jars, Casks, and other vessels;" and we do hereby declare that the following is a full and exact description thereof.

We will first describe what we consider the best means of carrying out our invention, and will afterwards designate the points which we believe to be new. The accompanying sheet of illustrative drawings, and the letters and figures thereon, form a part of this specification.

The object of our invention is to provide cheap and efficient stoppers, suitable for closing the mouths or filling openings of vessels generally, particularly well adapted for closing wine, soda-water, and other bottles with necks of the ordinary construction, and free from the objections which pertain to most of the compound stoppers previously known.

Figure 1 represents in perspective, and

Figure 2 in vertical section, a stopper suitable for closing an ordinary wine-bottle.

$a^1 a^2 a^3$ denote the rigid portion formed with two shoulders or changes of diameter, and made, by preference, of wood; but glass, earthenware, vulcanite, or other hard substance or composition can be used, while b is an elastic substance, made, by preference, of cork, in the form of a ferrule, and fitted on so as to cover only the part a^3 . Caoutchouc and other gums can for some purposes be employed instead of cork. These two portions, the rigid part $a^1 a^2 a^3$, and the elastic part b , are secured together by dipping the ends of the rigid part into dissolved shellac or other liquid cement, and then forcibly introducing it into the elastic part, so as to firmly unite the parts by cementing, as indicated by c . We would state that grooves or projections may be formed on the rigid portion, so as to secure or assist in securing the elastic portion thereto. The cement is not indispensable, as grooves or recesses are sometimes sufficient of themselves.

Figure 3 represents a vertical transverse section of a modification, in which the cork b is fitted over the part a^3 , and also over a portion of part a^2 .

We would have it understood that, with the view of producing a very cheap stopper, the elastic part b , instead of being made of one piece, as represented, could be made of a ring and a plug, the latter to fill the end of the rigid portion, and that in some cases the said plug could be dispensed with and the ring only used; but when this last construction is adopted the wood must have all its pores closed by being impregnated under pressure with any of the well-known innocuous substances now used for impregnating wooden casks, or its end must be coated with tin-foil or other metal impervious to liquids. And we would also have it understood that the rigid parts of our stoppers can be variously modified, and the size of the elastic portion of our ferrule, whether in a single piece, as shown on the drawings, or in two pieces, or made like a simple ring, can be varied at will without departing from our combination above set forth. The forms shown by the drawings are, however, much the best.

That others, and particularly those skilled in the art of making stoppers, may fully appreciate the merits of our invention, and be enabled to carry the same into effect, we would here state that the rigid portion is turned or otherwise formed in any of the modes now practised in working the particular substance of which it is elected to make it; that the elastic portion has a recess or opening cut out or made to receive the part a^3 , or it is moulded or formed as is most suitable in working the material of which it is made.

Some of the advantages secured by our stoppers, which, as is above implied, we propose to use in the place of ordinary corks are, that they can be forced in by percussion or by pressure; they can be withdrawn by hand without a corkscrew, without being damaged; they can be used over and over many times; they can be used for closing aerated-water bottles without metal caps, the wires being led directly over the top of the rigid portion, and they are efficient closers, and are cheap and durable.

Some of the advantages due to certain features of our invention may be separately enumerated as follows:

First, by reason of the fact that our stopper is formed of wood and cork, in combination as specified, we are able to produce it by the aid of machinery, so as to employ the finest and softest cork for the tight material

at a less cost than usual, while the top may be able to resist distortion, and to allow the application of any required means to insert or remove the stopper, or to hold it tightly confined without any injury to the more delicate material.

Second, by reason of the fact that the rigid portion of our stopper is formed with the three parts of different diameters, $a^1 a^2 a^3$, we are able to secure a good thickness of cork for the tightly-fitting portion, a good bearing for the forcing action, an extended surface for cementing, and an enlarged head, adapted to remain outside of and rest against the mouth of the bottle or other vessel in which the stopper is used, and afford a convenient means for preventing the stopper from being forced in too far, as also to aid in its extraction when required.

Having now fully described our invention, what we claim as new therein, and desire to secure by Letters Patent, is as follows:

1. We claim a stopper formed of wood and cork in combination, forming a cheap and durable stopper, substantially as and for the purposes herein set forth.

2. We claim the within-described construction and arrangement of the rigid parts $a^1 a^2 a^3$, having three different diameters, and fitted within and upon the elastic part b , in the manner and for the purpose herein set forth.

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

HOWARD BUSBY FOX,
JAMES TURNER HALL.

Witnesses:

JOHN P. KING,
ROBERT MOSS.