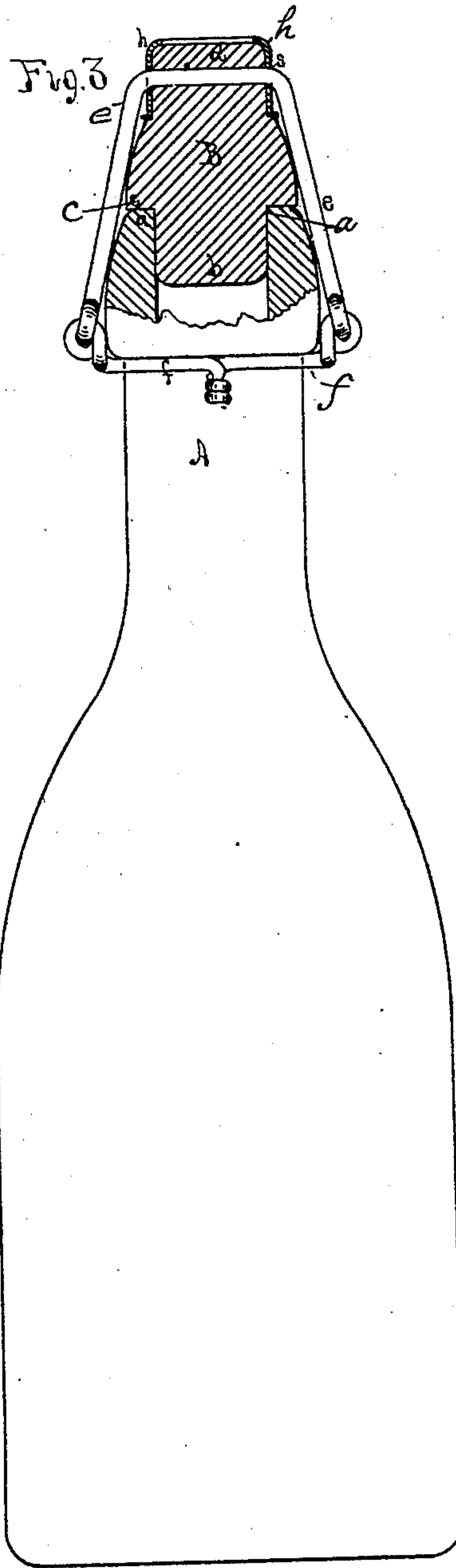
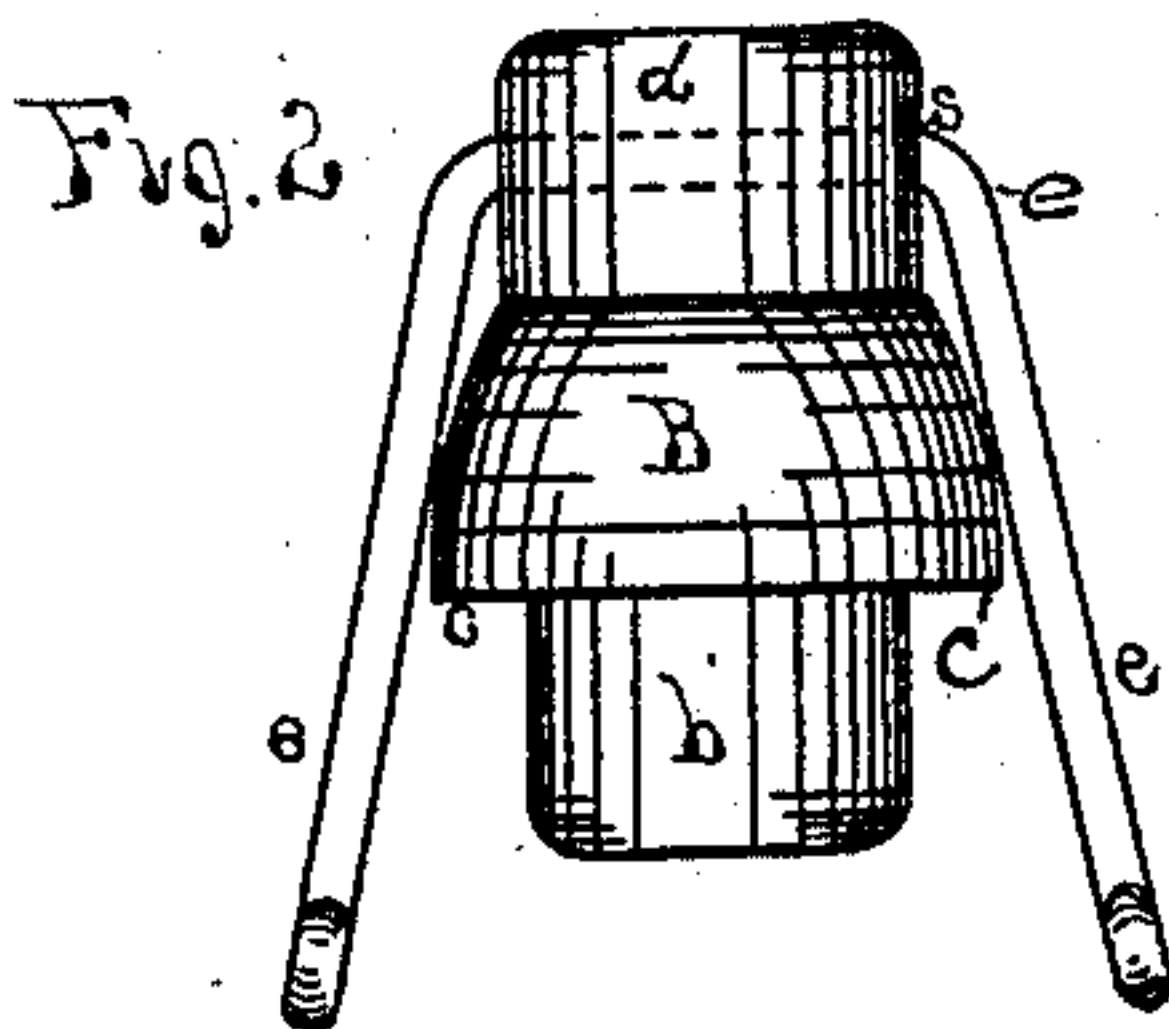
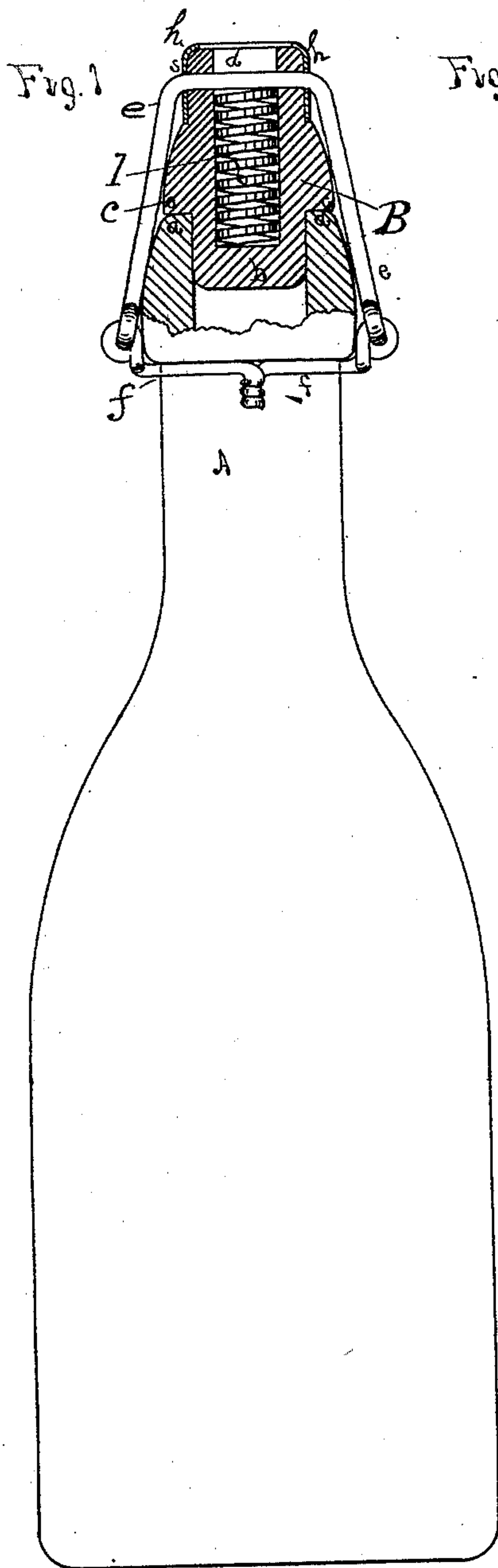


G. D. DUDLEY & D. SHERWOOD.
Bottle-Stopper.

No. 223,325.

Patented Jan. 6. 1880.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE D. DUDLEY AND DANIEL SHERWOOD, OF LOWELL, MASSACHUSETTS,
ASSIGNORS TO WOODS, SHERWOOD & CO., OF SAME PLACE.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 223,325, dated January 6, 1880.

Application filed September 12, 1879.

To all whom it may concern :

Be it known that we, GEORGE D. DUDLEY and DANIEL SHERWOOD, of the city of Lowell, county of Middlesex, and State of Massachusetts, have invented a certain new and useful invention or Improvement in Bottle-Stoppers, of which the following is a specification.

The object of our invention is to provide a bottle-stopper which will effectually close the bottle to which it may be applied, which can be quickly and easily applied and removed, and which will resist great pressure exerted from within the bottle.

The invention consists in combining with the ordinary band and bail used to retain bottle-stoppers in place an elastic stopper formed with a shank which enters the bottle-neck, a shoulder which rests upon the bottle-mouth, and a neck through which the bail passes, and by means of which the necessary support is given to the shank and shoulder, and by which a proper hold may be obtained upon the stopper when it is desired to stop or unstop the bottle.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is an elevation of the neck of a bottle with our device attached, broken away to show it in section. Fig. 2 is an elevation of the stopper. Fig. 3 is a sectional view of a modification of our device shown.

A is the neck of the bottle; *a*, the mouth; B, the elastic stopper, made of vulcanized rubber or equivalent material, and composed of the shank *b*, shoulder *c*, and neck *d*, through which the bail *e* passes in an opening of such shape as to permit no movement of the stopper upon the bail except that of rotation, by means of which, in connection with the band *f*, the stopper B is kept in place to resist the pressure exerted by the contents of the bottle acting upward upon the shank *b*. *s* is the hole through the neck through which the bail passes.

The part *d* of the stopper we inclose in a metal band or ferrule, *h*, which supports it, while allowing it sufficient freedom of movement to be readily placed in position. This ferrule, through which the bail *e* passes in round holes but very slightly larger than itself,

serves to equalize the pressure upon the mouth of the bottle exerted by the elastic material of the stopper when the bail presses it down. This pressure without the ferrule would be greatest directly under the bail; but with it it is the same on all parts which press upon the mouth *a*. The flange formed upon the bottom of the ferrule gives additional support to the shoulder, and prevents the ferrule cutting into it; but the ferrule can be omitted without departing from the spirit of our invention.

The spiral spring *l* is placed within the stopper to give additional strength and elasticity to the bottom of the shank *b*. It is placed in a hole formed in the stopper B, which extends from the top nearly to the bottom, and is held in place by the bail *e*, which is inserted after the spring is put in place.

It will be observed that the spiral spring as well as the elastic stopper, as a whole, has an elasticity both lengthwise and sidewise, which is essential to the construction of a stopper connected with a rigid straight bail.

The operation of the device is as follows: When it is desired to place the stopper in position it is taken by the neck *d*, and the point of the shank *b* is sprung down so that it enters the mouth of the bottle *a*. The neck *d* is then lifted or swung over, when the shoulder *c* will be compressed between the ferrule *h* and the mouth *a*, and the opposite side of *b c d* will be sprung in the arc of a circle. When, however, the bail *e* is brought more nearly perpendicular, the shank *b* enters the neck of the bottle, and the shoulder *c*, where compressed, expands until, the bail being perpendicular, the shoulder is brought to bear upon the mouth all around equally. After being so placed, any pressure exerted from within tends first to expand the elastic shank *b*, making it fit more perfectly, and causing it to act, when supported by the parts above it, like a solid stopper held down with a bail to such an extent that it will resist an internal pressure of one hundred and eighty pounds to the square inch, while at the same time the stopper can be quickly and easily removed by pressing the neck *d* over to one side until the bail at its top is outside of the mouth *a*, the pressure

required to do this being only that required to compress the shoulder *c*, and not in any degree to overcome the pressure exerted upon the stopper by the contents of the bottle—in fact, that pressure tends to assist the operation from its very beginning.

We produce in this manner a bottle-stopper all parts of which are always attached to one another and in position for use, which can be placed in position in the bottle with a single movement of one hand, and which will resist a pressure as great or greater than any of those in use.

What we claim is—

1. In combination, the elastic stopper B, the fixed neck-band *f*, and inextensible bail *e*, pivoted, substantially as described, in the neck of the stopper and in the eyes of the band, and made straight from one of those points to the other, substantially as described.

2. In combination, the fixed band *f*, the bail *e*, and stopper B, pivoted upon the bail at the point *s*, so that that point shall at all times be equidistant from the eyes of the band, substantially as described.

3. The combination of a bottle-stopper having an elastic shoulder, *c*, shank *b*, and neck *d*, spiral spring *l*, the bail *e*, and band *f*, substantially as described.

4. In combination, the elastic shoulder *c*, shank *b*, having a solid bottom, neck *d*, and bail *e*, pivoted in the eyes of the fixed band *f*, and in the neck of the stopper in a circular

opening which traverses its axial line, substantially as described.

5. In combination with the vertically-elastic and horizontally-flexible spring C, the vertically-elastic and horizontally-flexible stopper B, directly connected to the fixed neck-band *f* by the bail *e*, substantially as described.

6. In combination, the ferrule *h*, elastic shoulder *c*, elastic shank *b*, and neck *d*, directly connected with the fixed band *f* by the bail *e*, substantially as described.

7. In combination, the elastic shank *b*, elastic shoulder *c*, and neck *d*, attached to the bottle by the inextensible bail *e*, pivoted into the eyes of the fixed band *f*, substantially as described.

8. In combination, the elastic stopper B and fixed band *f*, united by the inelastic bail *e*, directly attached to both at determined and unchangeable points of contact, substantially as described.

9. In combination, the vertically-elastic shoulder *c* and the vertically-elastic and horizontally-flexible shank *b*, directly connected to the fixed band *f* by the inextensible connecting-bail *e*, having unchangeable points of bearing in the band and in the stopper, substantially as described.

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Witnesses:

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