

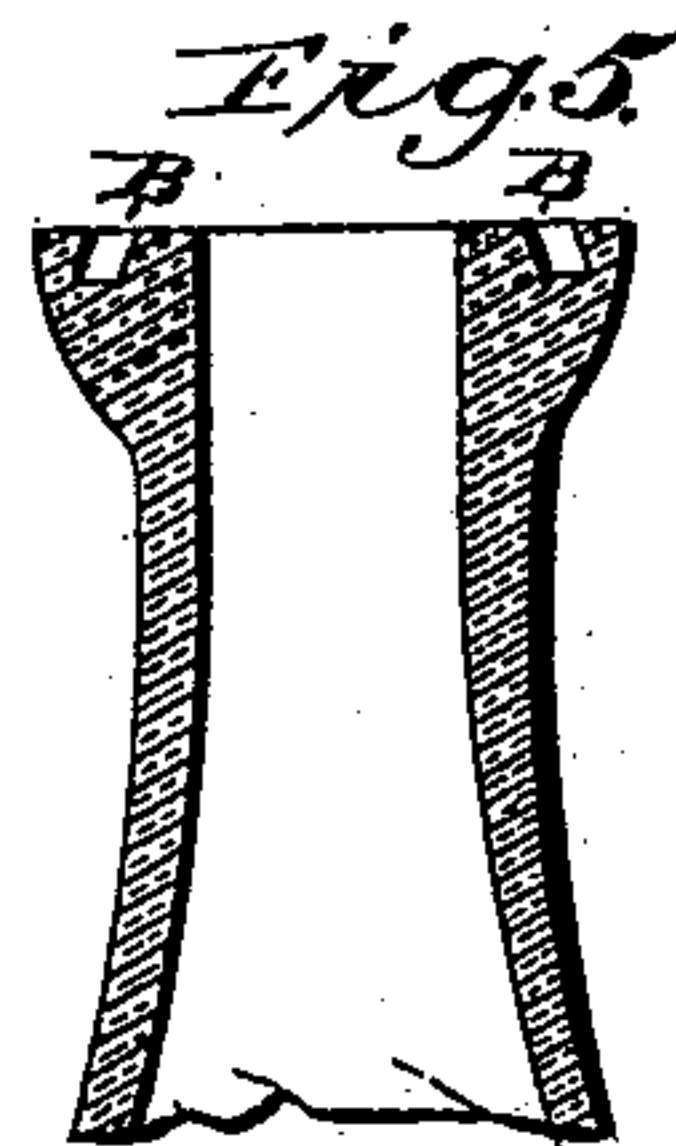
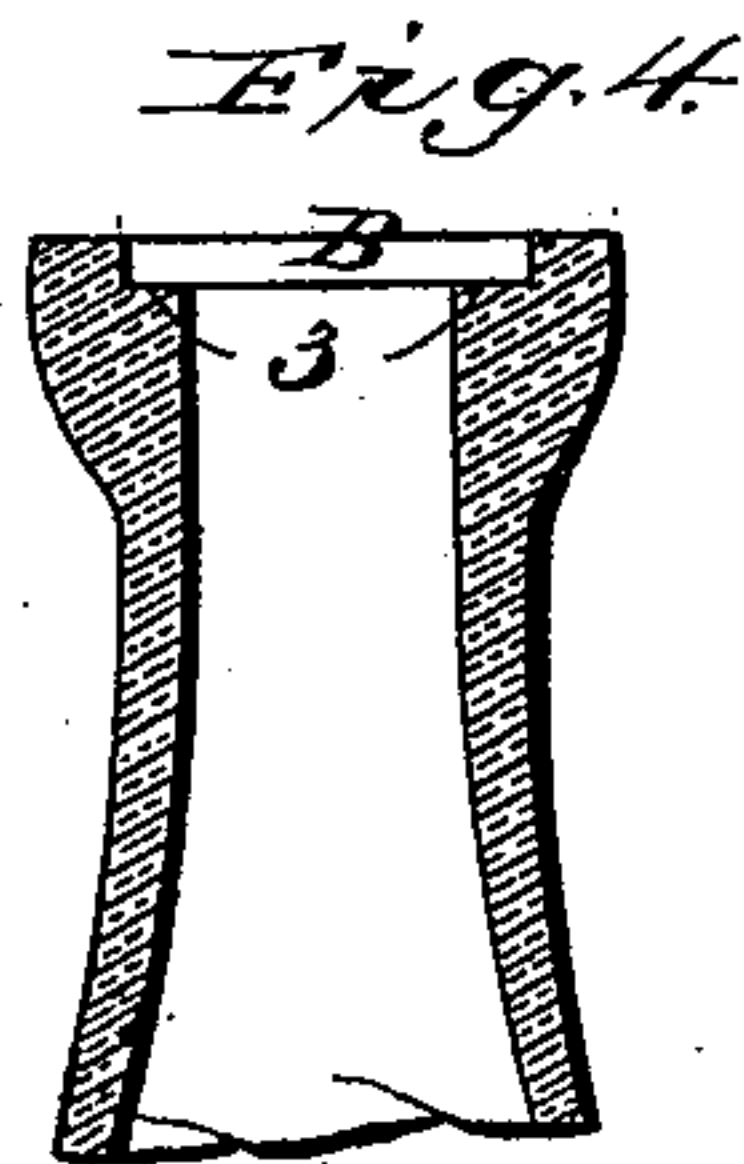
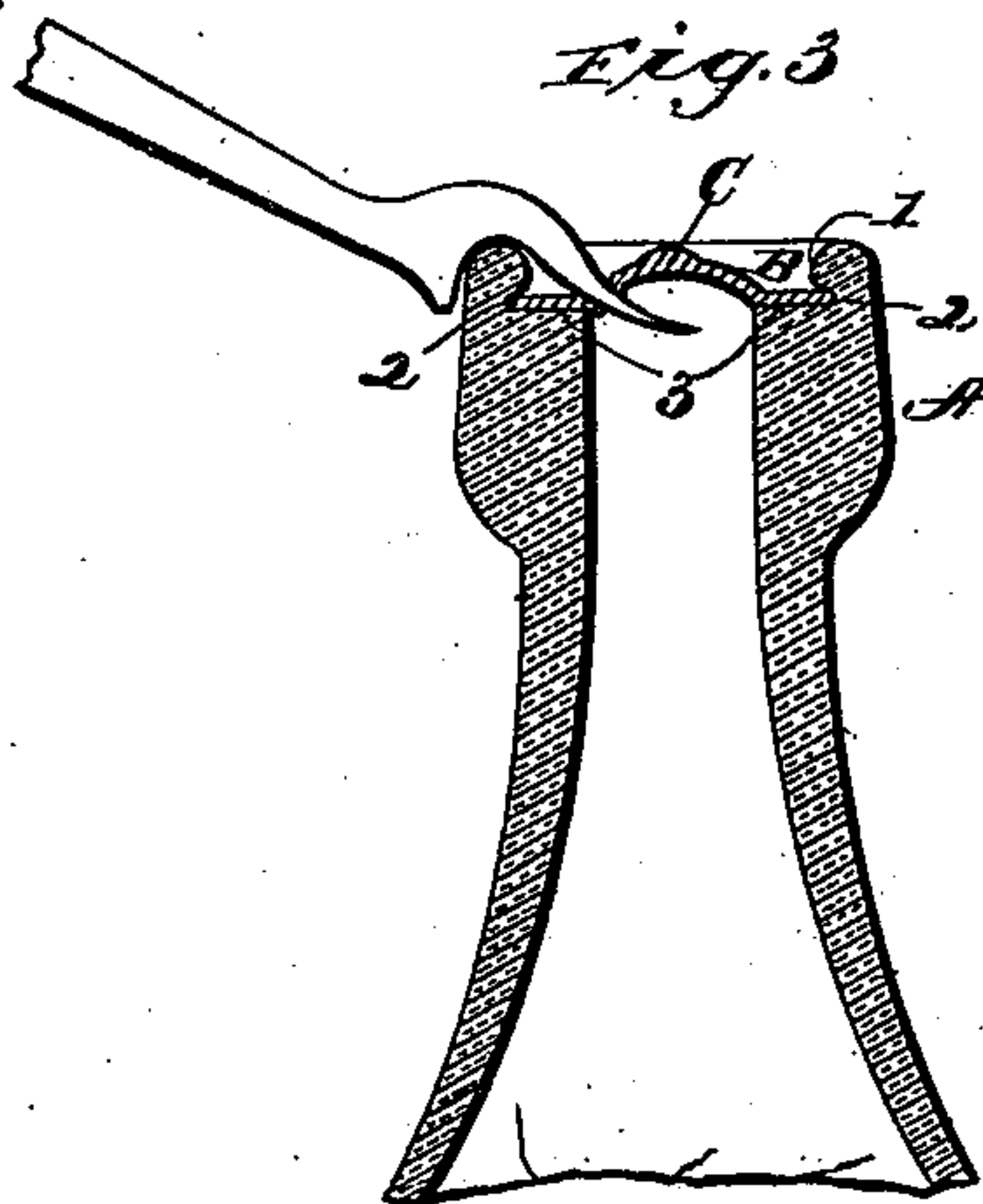
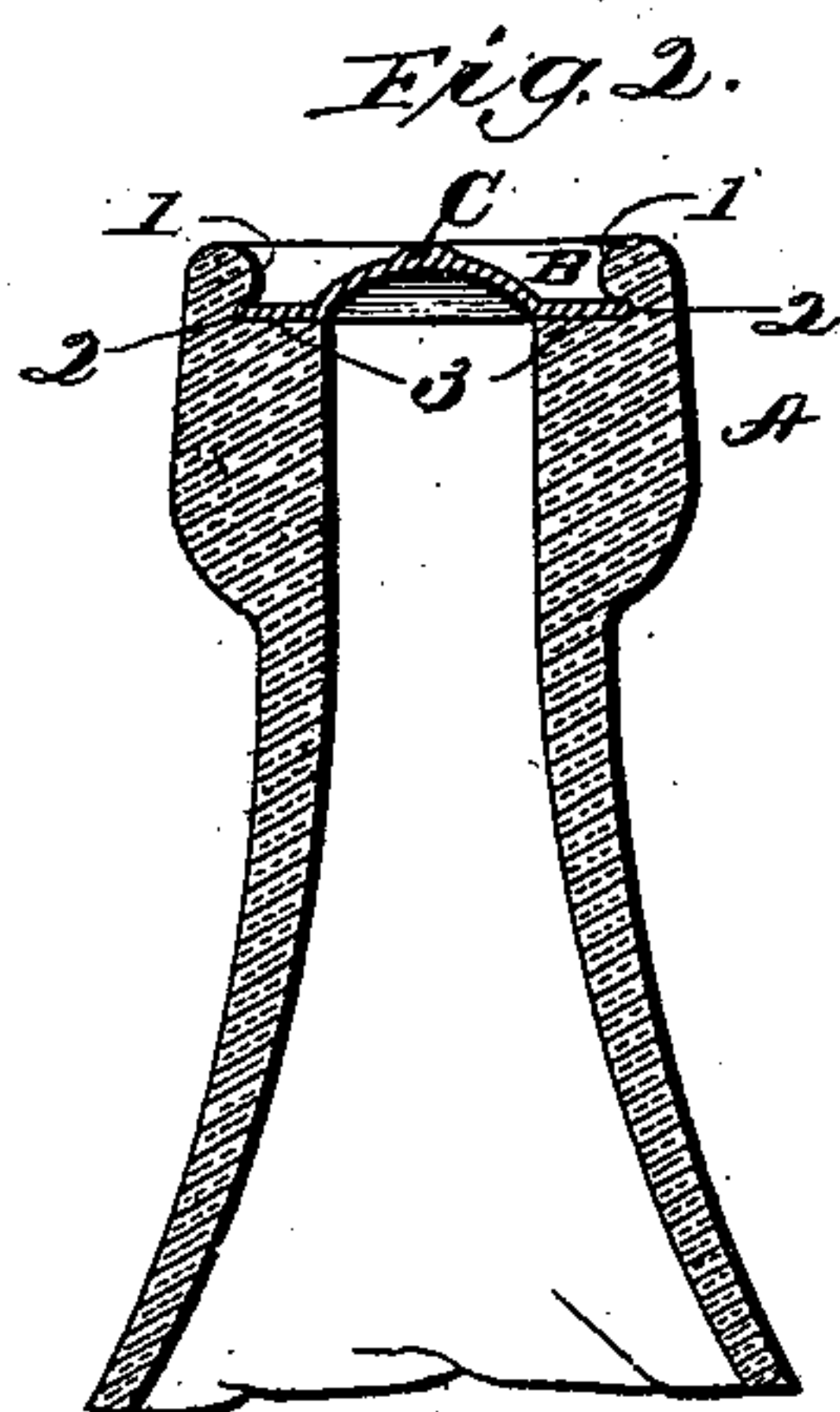
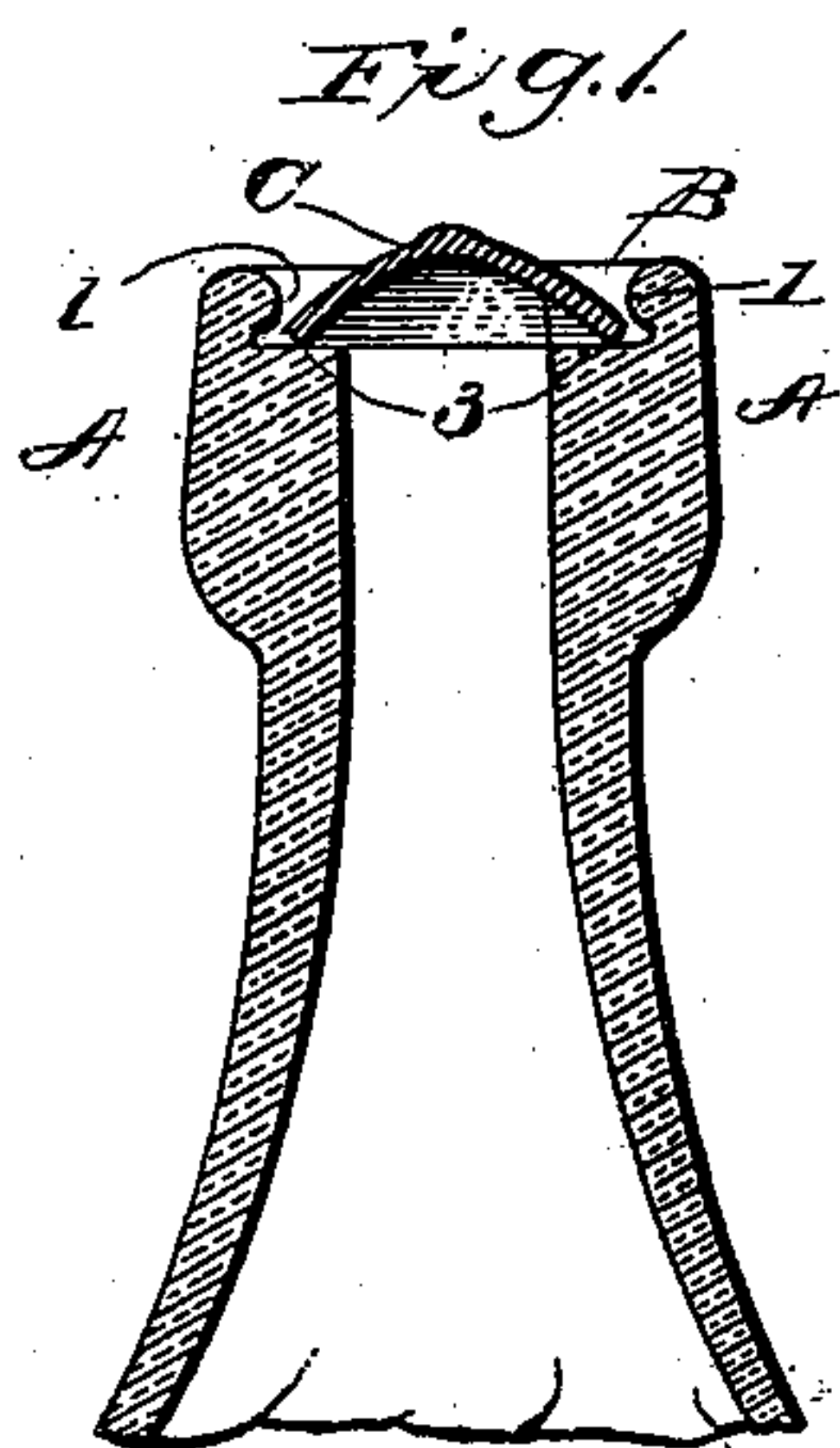
(No Model.)

W. B. MANN.

MEANS FOR AND METHOD OF SEALING BOTTLES.

No. 532,978.

Patented Jan. 22, 1895.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## MEANS FOR AND METHOD OF SEALING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 532,978, dated January 22, 1895.

Application filed January 23, 1894. Serial No. 497,774. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. MANN, of Baltimore, in the State of Maryland, have invented new and useful Improvements in Means for and Method of Sealing Bottles; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

My present invention relates to a new and improved means for and method of sealing bottles and other like receptacles intended for the reception and storage of fluids, especially such as are maintained under pressure, as for example beer, wine, &c, but likewise applicable where such pressure is not generated or maintained; and it has for its object to provide a cheap, convenient and efficient means for at once supplying a stopper to close the orifice and form an air tight joint.

In the accompanying drawings: Figure 1 is a sectional view of a portion of a bottle with stopper inserted. Fig. 2 is a similar view with stopper expanded to form the seal. Fig. 3 illustrates the manner of applying an extractor for unsealing the bottle and removing the stopper. Figs. 4 and 5 illustrate modified forms of bottles for receiving the stopper. Fig. 6 illustrates a modified form of stopper.

Similar letters and numerals of reference in the several figures indicate the same parts.

There are many varieties of stoppers now in use designed, as mine is, to retain liquids and fluids under pressure, but they exhibit, in practice, objectionable features due in some instances to the presence of objectionable materials, in others to the insufficiency of the sealing properties, and in others still to the complicated, expensive and unstable character of the fittings employed. Thus objectionable odors spring from the use of rubber and similar materials; leakage, due to defective cork, or other packing material; accidental displacement of the stopper resulting in the unsealing of the receptacle; difficulty in readily and conveniently effecting the unsealing when it is desired to remove or permit access to be had to the contents; and numerous other defects incident to special constructions and materials which go to make up the sealing devices.

My invention is designed to avoid all these and in its simplest form of embodiment it involves the use of a bottle or other receptacle provided with a seal or sealing chamber, the exterior or sealing walls of which are either substantially parallel or slightly inclined, as by beveling or undercutting, and a seal or stopper composed in whole or in part of malleable or ductile material, such for example, as lead and its alloys, the two being united and firmly held together to form a tight joint at the points of contact of the one with the other by the application of pressure to the material of the seal or stopper in a direction to displace, spread or expand the material of the seal laterally against the walls of the sealing chamber or seat forming a close contact which is maintained by the changed condition or arrangement of the material composing the seal.

One of the preferred forms in which my invention has been embodied is represented in Figs. 1, 2 and 3 of the drawings, wherein A designates the top or upper end of a bottle, and B the seat or sealing chamber formed therein. In this instance, the sealing chamber is formed with a slightly undercut wall 1, the mouth or entrance to said chamber being slightly smaller than the portion 2 forming the seat for the edge of the seal or stopper C. Below the seat 2 is formed a ledge or shoulder 3 extending inward slightly beyond the mouth or entrance to the sealing chamber, said legs constituting an anvil for the purpose hereinafter described.

The cap, seal or stopper C is cut, cast or struck up from lead or other malleable or ductile material, preferably metallic, in the form of a concavo-convex disk of a size adapted to readily enter the mouth of the sealing chamber wherein it is inserted with the concave surface downward and resting upon the ledge or anvil 3, as shown in Fig. 1. The seal, cap or stopper C having thus been brought into position pressure is applied thereto, preferably by means of a spinning tool or roller, in a direction to flatten out the margin and condense the latter so that the edge of the disk will be expanded and pressed laterally against the walls of the sealing chamber, at once forming a tight joint and maintaining the same, the ductile or malleable material flowing or being expanded by the pressure



and becoming set tightly against the surrounding wall of the sealing chamber so that upon the removal of pressure, the seal will not yield or spring and thereby destroy the seal. The ledge 3 serves as a convenient support for resisting pressure during the spinning or compressing operation, and it also determines the plane and position of the under surface of the concavo-convex disk when pressure is applied to flatten it.

It will be observed that the seal, stopper or cap C is of such shape and dimensions that it can readily be inserted within the sealing chamber in the mouth of the receptacle without compression. In other words that it is normally of smaller diameter than the mouth of the chamber, that it is composed of a material impervious to fluids and of such a degree of malleability or ductility that it can be displaced or expanded laterally to form a tight joint or packing, and that it is of such strength and rigidity as to resist the pressure within the bottle or receptacle and maintain its sealing position.

For ordinary purposes sheet lead of from No. 18 to No. 20 wire gage has been found in practice to furnish a seal capable of resisting a pressure from within the bottle of from forty to eighty pounds, and when lead is employed, if for any reason it should be desired to prevent the contents of the bottle from coming in contact with the lead, a thin coating of tin or other protecting media may be applied to the face of the stopper, seal or cap either before or after it has been struck up into form and previous to its insertion and fixing within the bottle.

The seal can conveniently be removed by a puncturing instrument, such as that shown in Fig. 3, the point penetrating the raised central portion of the seal, and by its leverage against the mouth of the bottle bending and withdrawing the seal therefrom.

It is obvious that the invention can be embodied in and practiced by the use of other forms of seals, stoppers or caps, and sealing chambers, the essentially novel feature being the formation of the seal between the stopper and the walls of the sealing chamber by the lateral displacement of a portion of the material forming the seal or stopper, and, further, that any metal alloy or material possessing sufficient strength, malleability or ductility for the purpose may be employed as an equivalent for lead.

Although it is feasible to effect the necessary lateral displacement of the metal by pressure applied in various ways, I prefer the spinning process because there is less liability of breaking the bottle, and while the anvil or ledge 3 is very convenient as an aid in effecting the sealing operation, it is not essential.

In illustration of some of the many forms or modifications of which my invention is susceptible, I have shown in Figs. 4 and 5 two forms of sealing chambers and in Fig. 6 a modification of the stopper, seal or cap.

The seat or sealing chamber B of Fig. 4 is formed with substantially parallel walls and with an anvil or ledge 3.

In Fig. 5 the sealing seat or chamber B is formed in the end or face instead of within the mouth of the bottle and its outer walls are undercut, to assist in forming a tight joint and retaining the stopper, cap or seal, which latter may be of the form shown in Fig. 1.

The stopper or seal represented in Fig. 6 is made in the form of a flat disk of ductile or malleable material, such as lead, and is of proper dimensions to readily enter the sealing chamber or seat B, as in Figs. 1 or 4, after which it is secured in position and caused to form a tight joint by the compression and lateral displacement of its periphery by pressure applied to the surface at or near the margin of the disk.

Should it be desired for any purpose to isolate the stopper or seal from the contents of the bottle or to supplement its action by the addition of packing or sealing material, the latter may be introduced beneath the stopper or seal before the latter is subjected to pressure as described.

Having thus described my invention, what I claim as new is—

1. The hereinbefore described improvement in the art of sealing the mouths of bottles and like articles to form a liquid and air tight stopper which consists in inserting a disk of malleable material, such as lead, within a sealing chamber and subsequently compressing the said material at or near the margin by the gradual and progressive application of pressure, as by a spinning operation, the pressure being applied in a direction to cause lateral displacement or flowage of the material against and into intimate contact with the surrounding walls of the sealing chamber substantially as described.

2. The hereinbefore described improved bottle stopper, the same comprising the bottle having a sealing chamber, and a seal or stopper composed of ductile material having its margin compressed and the material thereof displaced or flowed laterally, as by spinning, against the surrounding wall of the sealing chamber.

3. In a closure, the combination with the vessel mouth having a sealing chamber and an anvil extending inwardly therefrom, of a seal of ductile material, such as lead resting on the anvil and sealed by having its margin compressed against the anvil, as by a spinning process, flowing and condensing the material of the seal in the sealing chamber and forcing the same into intimate contact with the wall of said chamber; substantially as described.

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Witnesses:

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