

(No Model.)

2 Sheets—Sheet 1.

W. VON SCHLIEFFEN.

PNEUMATIC STOPPER FOR BOTTLES.

No. 288,603.

Patented Nov. 13, 1883.

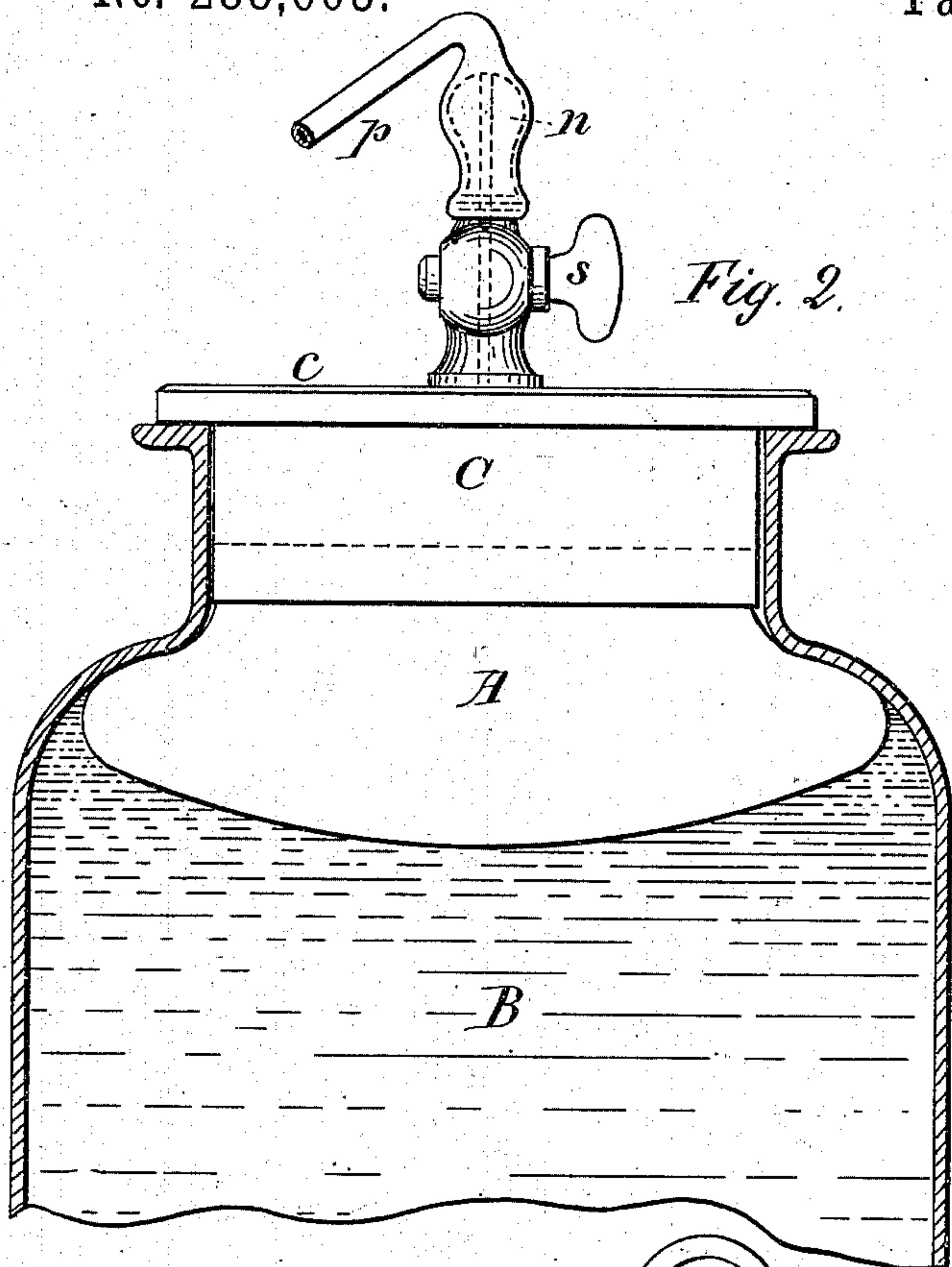


Fig. 2.

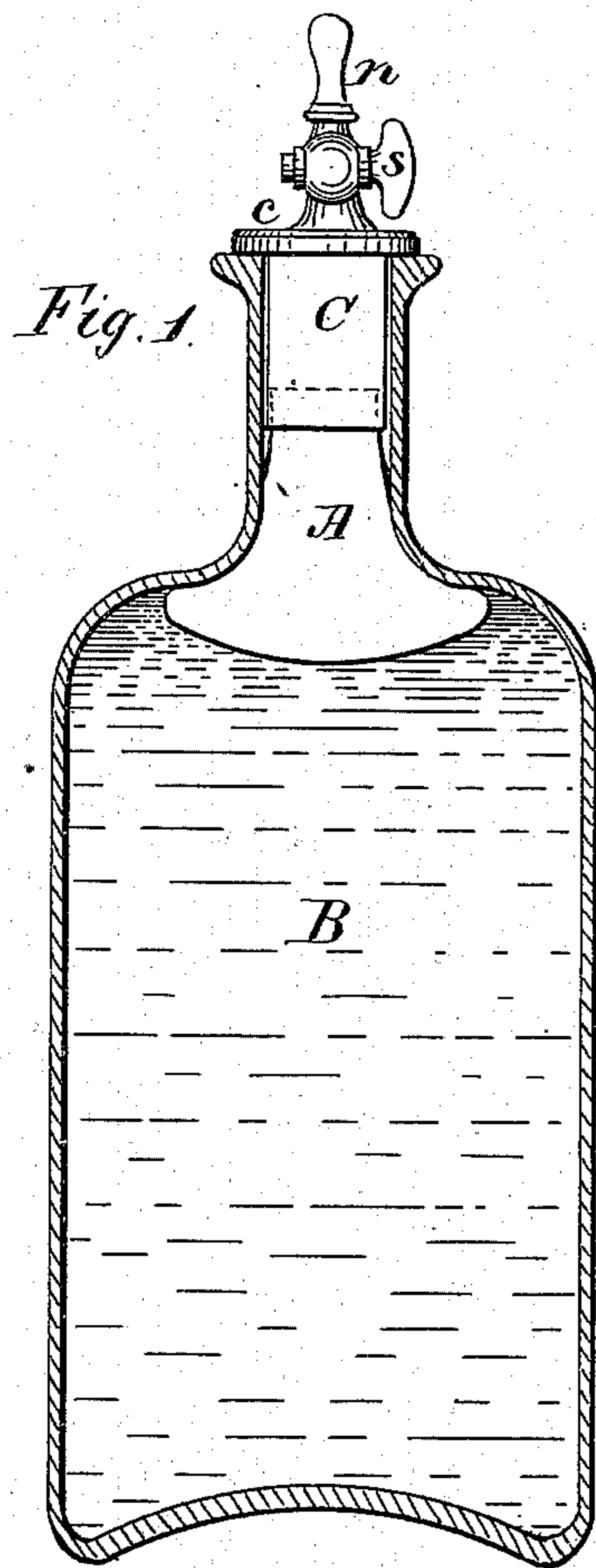


Fig. 1.

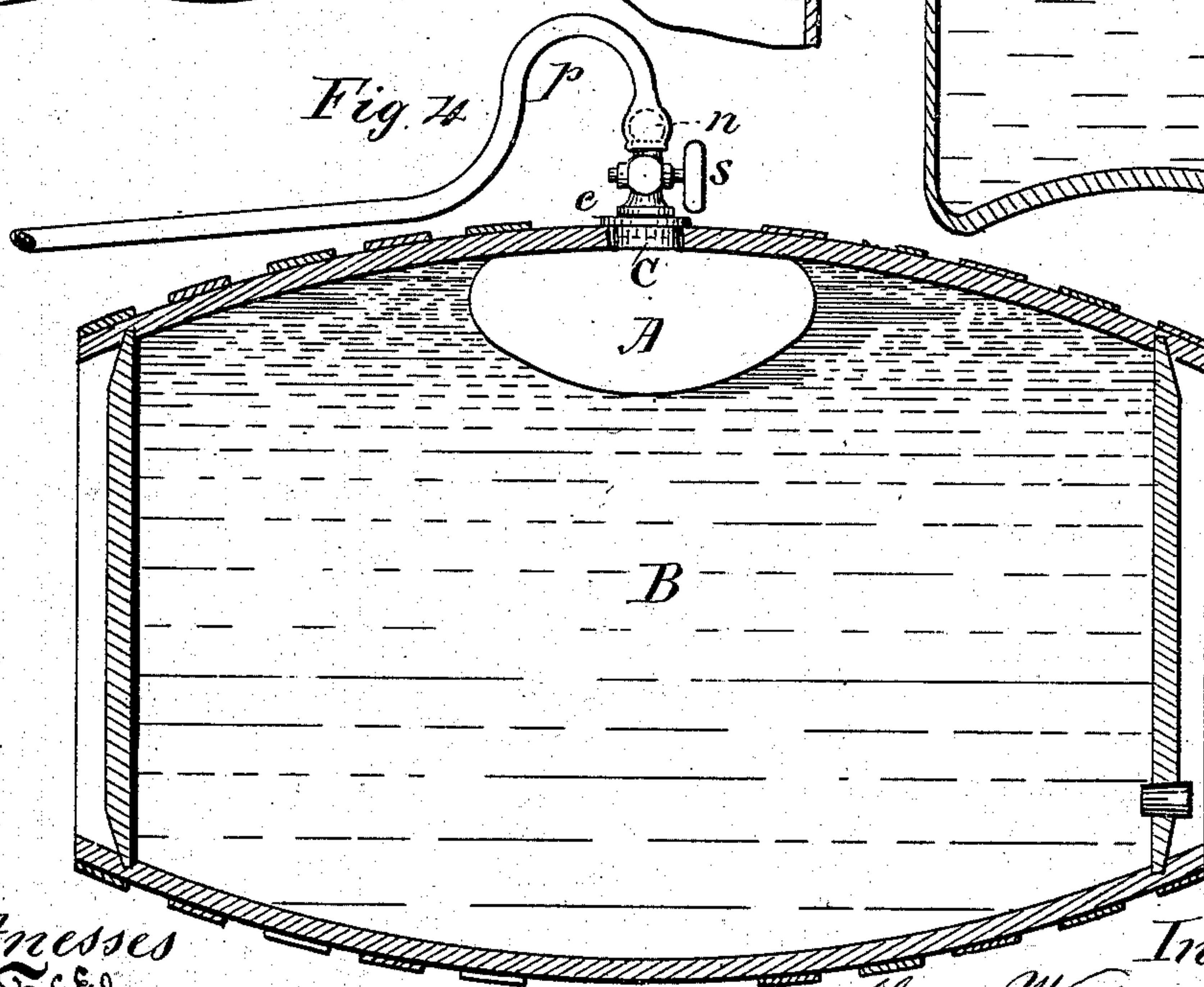


Fig. 4.

Witnesses
Wm. A. Fox & Co.
Chas. B. Fowler.

Inventor
Count Wilhelm von Schlieffen
per Henry Othman

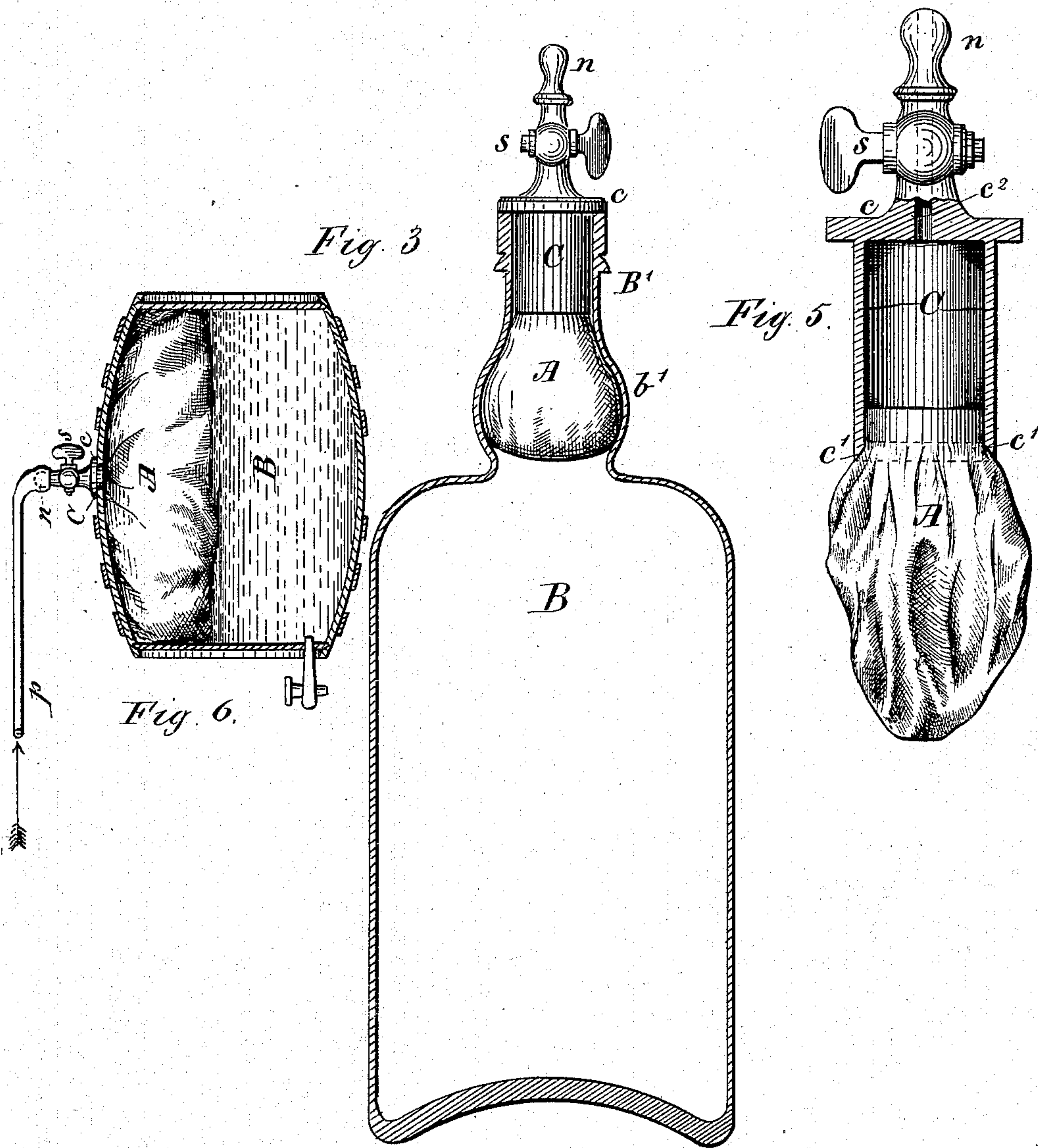
(No Model.)

2 Sheets—Sheet 2.

W. VON SCHLIEFFEN.
PNEUMATIC STOPPER FOR BOTTLES.

No. 288,603.

Patented Nov. 13, 1883.



Witness
Wm. A. McOliver.
G. B. Tucker.

Inventor
Count Wilhelm von Schlieffen
per Henry Othman

UNITED STATES PATENT OFFICE.

WILHELM VON SCHLIEFFEN, OF SCHLIEFFENBERG, GERMANY.

PNEUMATIC STOPPER FOR BOTTLES.

SPECIFICATION forming part of Letters Patent No. 238,603, dated November 13, 1883.

Application filed April 17, 1882. (No model.) Patented in Belgium March 31, 1882, No. 57,495; in France March 31, 1882, No. 148,199; in England March 31, 1882, No. 1,569; in Denmark February 9, 1883; in Sweden February 28, 1883, and in Norway May 25, 1883.

To all whom it may concern:

Be it known that I, COUNT WILHELM VON SCHLIEFFEN, a subject of the Grand Duke of Mecklenburg-Schwerin, residing at Schlieffenberg, in the Grand Dukedom of Mecklenburg-Schwerin, have invented certain new and useful Improvements in Pneumatic Stoppers for Bottles and other Liquid-Containing Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to means for sealing or closing bottles, barrels, and analogous vessels; and it consists in devices whereby a flexible or yielding cushion is formed between the neck and the body of the bottle or vessel by the expansion of a flexible or expansible receiver, into which air, liquid, or gas is forced, substantially as herein described, and specifically pointed out in the claims.

In the accompanying drawings, Figures 1, 2, 3, and 4 illustrate the methods of effecting the closure of vessels of various shape. Fig. 5 is a sectional elevation of the novel means employed for effecting a closure of the mouth or other orifice of vessels, and Fig. 6 illustrates the means for sealing a vessel and forcing the liquid therefrom.

In carrying out my invention I form a cushion around the mouth or other orifice of the vessel on the inside thereof, and this may be a hydraulic or pneumatic cushion, seated upon the inner walls of the vessel, and covering, and, preferably, partially filling, the said mouth or orifice.

Usually all bottles, flasks, or other vessels for containing liquids, semi-liquids, or quasi-solids, or solids of an effervescing or volatile or deliquescent nature or not, require a hermetic closure to prevent the contents from leaking out of such vessels, or to prevent the access thereto of air, or dust, or other impurities, and

all such vessels are provided with a neck usually of a less diameter than the body of the vessel, forming a shoulder, and to all such vessels my invention may be applied, as well as to all vessels that have their orifice formed in the walls thereof, as the said walls then form a seat for the cushion. The application of this invention is therefore practically universal.

In the drawings I have shown a very simple and effective device that not only presents the means for forming the elastic cushion, but also the means for readily destroying the same to uncover the mouth or orifice of the vessel. C is a hollow plug, that for general use is preferably made of hard rubber and of cylindrical shape. Its diameter is slightly less than the diameter of the neck, mouth, or orifice of the vessel, and is provided with a seat or flange, *c*, that is seated upon the outer face of said neck, mouth, or orifice. It is further provided with a short pipe and nipple, *n*, between which latter and the plug the pipe has a stop-cock, *s*.

A is a bag, that for general use is preferably made of soft rubber. Said bag is attached to the inside of the open cylindrical part of the plug C, Fig. 5, in any desired manner, either by means of glue, cement, rubber, or other means.

It is evident that when the collapsed bag, Fig. 5, with the plug, is inserted into the neck, mouth, or orifice of a bottle, flask, jar, or other vessel or cask or barrel filled with liquid, or semi-liquid, or quasi-solid, or even solids, and said bag is inflated by forcing air through the nipple *n*, either by blowing into said nipple or by connecting the nipple with an air-forcing apparatus by means of a pipe or tube, *p*, an elastic air-cushion will be formed over the outlet-orifice, said cushion being seated against the walls around and adjacent to said orifice, and forming a hermetic closure thereof. If the stop-cock *s* is now closed, the closure of the vessel will be permanent, and by opening the stop-cock *s* the air at once rushes out, and the plug may be

withdrawn. The uncorking or opening of such vessel is therefore almost an instantaneous one.

In the bottling or barreling of many liquids and in the preservation of semi-liquids or quasi-solids, and even of solids where it is essential that the outer air should not come in contact with the contents of the vessel, the described closure not only forms a hermetic closure, but by means thereof any air remaining in the vessel after filling may be driven out. In filling bottles, for instance, if these are filled to or nearly to the neck, the inflation of the bag A will displace a certain quantity of the liquid and force it out of the neck, the plug C being slightly narrower than said neck, and of course, with the liquid, all the air on the surface thereof is also driven out. In filling vessels with preserves, for instance, where quasi-solids are mixed with liquids or semi-liquids, it is necessary that the filling should be so effected as to prevent the formation of air-bubbles in the body of the preserves. This may readily be avoided by the above-described devices, inasmuch as the inflation of the bag A will compress the substances and drive out the air, and the inflation and exhausting of the bag may be repeated until all such air is removed from the jar or vessel.

In drawing or sampling liquids, to which air should have no access, the bag A will serve as a forcing device, and in this case the air may be compressed therein to allow the bag to expand whenever a quantity of liquid is drawn from the vessel, this expansion continuing so long as there is an excess of air present in the bag. In the care and treatment of wines, and for forcing beer, this will be found to possess advantages, inasmuch as the last drop of wine or beer may be expelled without admitting air to the barrel, and it is well-known that the constant admission of atmospheric air to a cask or barrel containing alcoholic or fermented liquids, to replace the liquid drawn therefrom, is injurious to such liquids. For this purpose a bag, A, of the same capacity as the barrel may be employed, which, when the barrel is filled, is introduced therein with the plug and partially inflated to form the air-cushion and closure of the bung-hole. When the barrel is tapped, the nipple may be connected with any usual or well-known automatic air-compressing devices, and as glass after glass of liquid is drawn from the barrel it is replaced by an equal volume of air that is forced into the bag, instead of into the barrel, as shown in Fig. 6.

Another advantage in providing the elastic cushion lies in the fact that vessels are not so apt to burst or break when handled or violently shaken, inasmuch as the cushion will yield more or less.

Instead of a pneumatic cushion, a hydraulic cushion may be formed to effect the closure of the vessel, and in such cases where rubber would impart a taste to the contents of the

vessel, or where the contents are liable to injuriously affect the rubber, other substances may be employed—such as bladders or skins of animals, or fabrics rendered air-tight by any of the well-known agents, and made proof against the deleterious influences of the contents of such vessels upon the expansible substance or upon such substance and its plug.

To adapt the bag to expand in close proximity to the lower peripheral edge of the plug, which is of great advantage in vessels where the depth of the orifice does not exceed the thickness of the material in which such orifice is formed, I bevel the inner periphery of the plug outwardly to form a knife-edge, or practically a knife-edge, as shown at *c'*, Fig. 5.

In Fig. 3, I have shown a bottle, the construction of the neck of which is especially adapted for sealing by means of the described devices. As will be seen, the neck B', between its upper part and the body of the bottle B, has a swell or bulge, *b'*, of nearly spherical shape, within which the bag A may be readily expanded, and produce a perfectly hermetic closure.

Fig. 1 shows a bottle of usual construction, sealed by means of the described devices. Fig. 2 shows these devices as applied for sealing a wide-mouth jar, and Fig. 4 shows the devices applied for sealing a barrel, B.

I have hereinbefore alluded to a novel method of and means for forcing liquids from vessels, though I do not desire to claim these in this application, as I contemplate making a separate application for patent for the same.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a bottle having an enlargement or chamber formed between the orifice of the neck and its junction with the bottle, of a pneumatic stopper consisting of a tubular stem, C, provided with a stop-cock, and carrying a flexible bag or bladder introduced into the chamber of the neck and inflated therein, substantially as and for the purposes specified.

2. The herein-described device for sealing bottles, barrels, and analogous vessels, which consists of a tubular stem having a seat-flange, *c*, and a suitable stop-cock, and provided at one end with a nipple, *n*, and carrying at the other end an inflatable or expansible bag, capable of being introduced and inflated within said vessel, substantially as and for the purpose specified.

3. The expansible receiver or bag A, in combination with the plug C, having its inner peripheral edge, *c'*, beveled outwardly, as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILHELM VON SCHLIEFFEN.

Witnesses:

G. LOUBIER,
B. ROI.