

(No Model.)

P. PHILIP.
FRUIT JAR.

No. 567,610.

Patented Sept. 15, 1896.

FIG. 1.

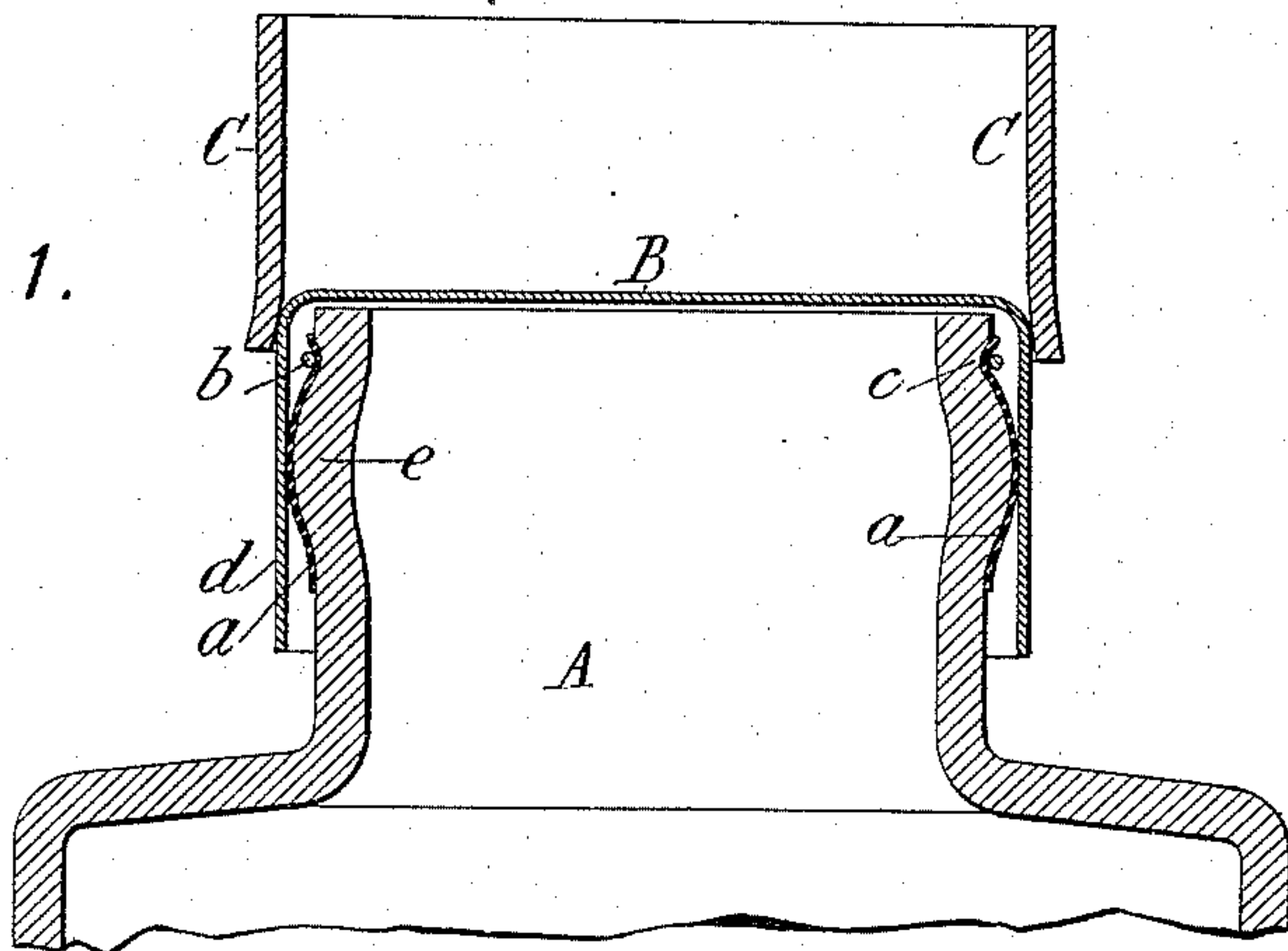


FIG. 2.

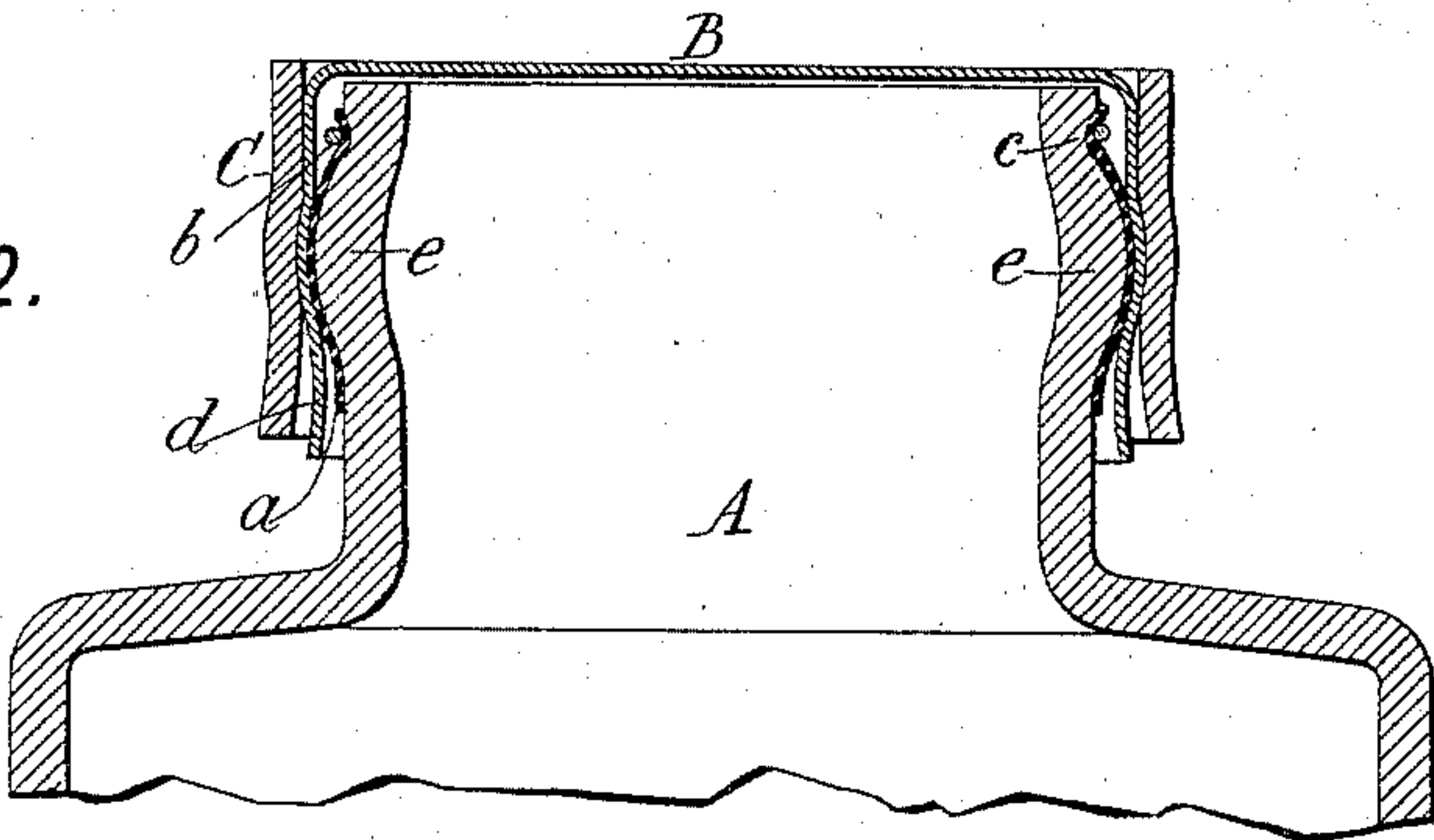


FIG. 4.

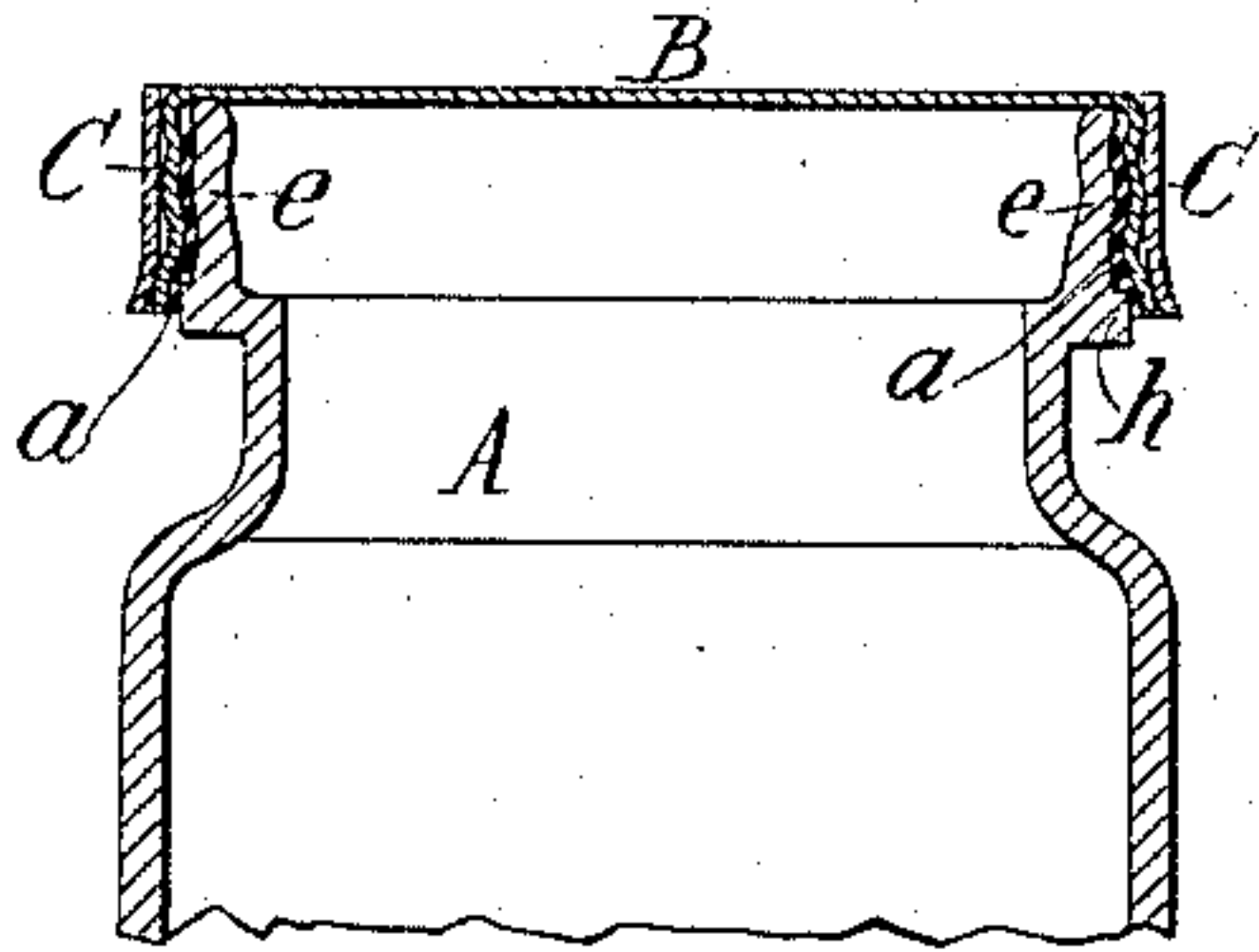


FIG. 5.

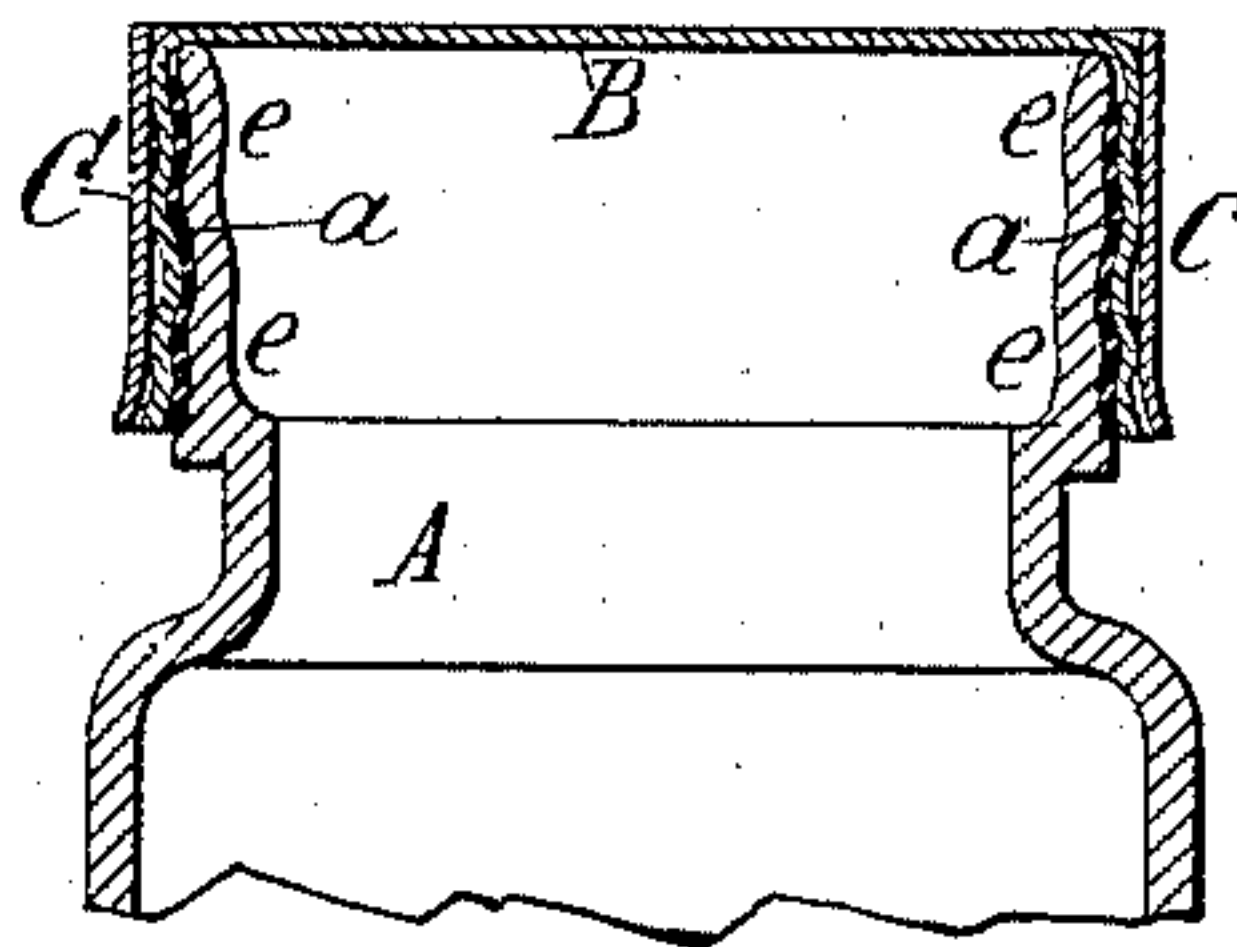
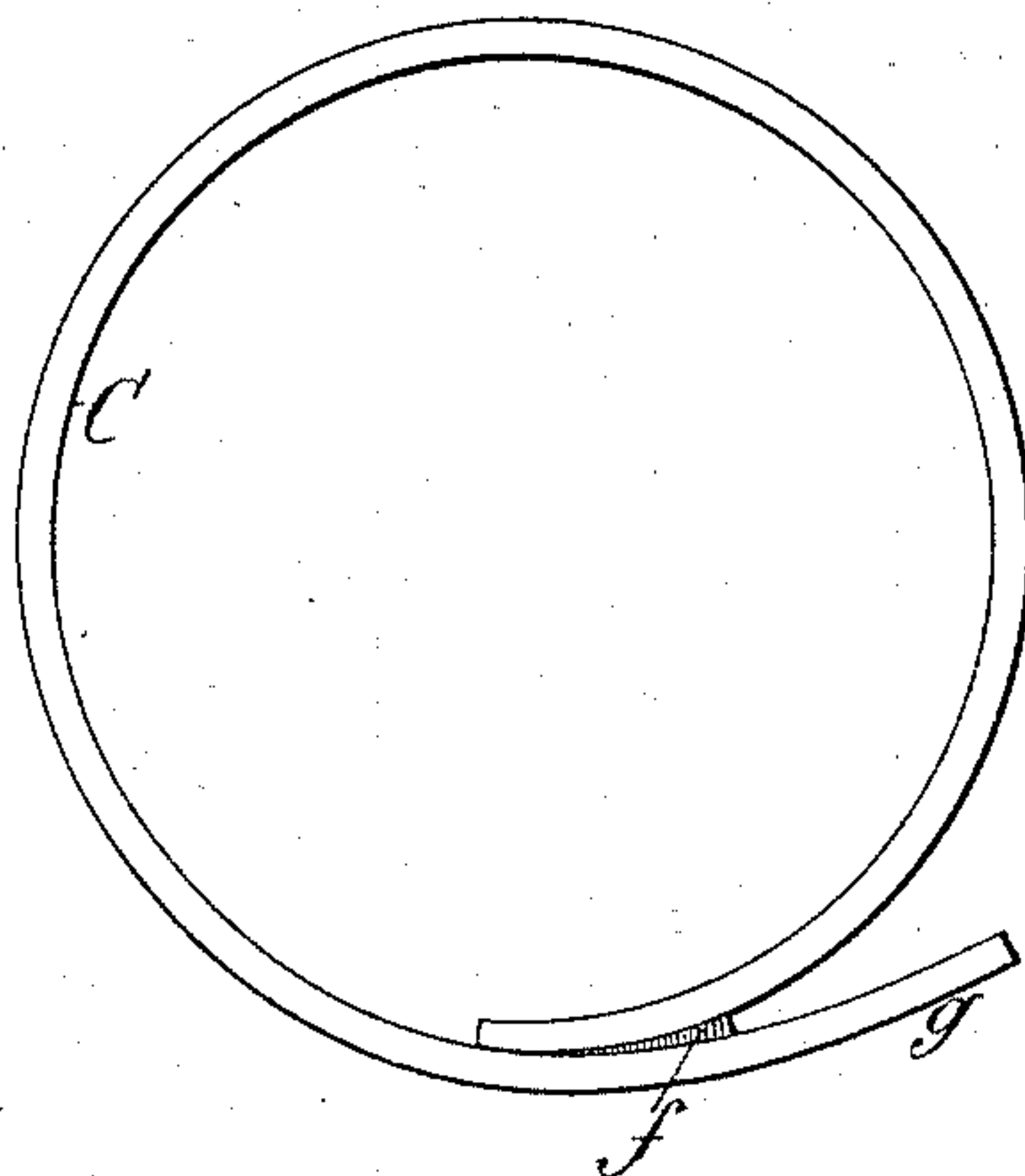


FIG. 3.



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UNITED STATES PATENT OFFICE.

PIERRE PHILIP, OF PARIS, FRANCE.

FRUIT-JAR.

SPECIFICATION forming part of Letters Patent No. 567,610, dated September 15, 1896.

Application filed June 30, 1896. Serial No. 597,576. (No model.) Patented in France August 20, 1894, No. 227,769; in England August 25, 1894, No. 16,242; in Belgium August 28, 1894, No. 111,588; in Germany August 29, 1894, No. 79,669; in Austria August 29, 1894, No. 5,045; in Spain September 1, 1894, No. 16,245, and in Italy September 9, 1894, No. 37,165.

To all whom it may concern:

Be it known that I, PIERRE PHILIP, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Fruit-Jars, of which the following is a specification.

This invention is the subject-matter of Letters Patent in France, No. 227,769, dated August 20, 1894; in Belgium, No. 111,588, dated August 28, 1894; in England, No. 16,242, dated August 25, 1894; in Germany, No. 79,669, dated August 29, 1894; in Austria, No. 5,045, dated August 29, 1894; in Italy, No. 37,165, dated September 9, 1894, and in Spain, No. 16,245, dated September 1, 1894.

My invention relates to a system of stoppering or closing jars, bottles, and like vessels, such as are used to contain preserved food.

The invention is characterized by the formation on the outside of the neck of the jar or bottle of one or more ribs or beads with a band of thin elastic rubber applied around the same, a metal cap having a flexible rim fitting over said band, and an exterior ring suitably tapered and adapted to be forced over the rim of the cap to contract the latter and flex it into intimate contact with the convex surface of said band to form thereby a hermetic seal between the neck, the band, and the cap.

To enable my invention to be fully understood, I will describe how it can be carried into effect, with reference to the accompanying drawings, in which—

Figures 1 and 2 are vertical mid-sections of the upper part of a jar or bottle constructed according to my invention, Fig. 1 showing it before the outer ring is forced down into place and Fig. 2 showing it after the forcing down of the ring, which completes the hermetic joint. Fig. 3 is a plan view of the outer ring. Figs. 4 and 5 are sections showing modifications of the construction first shown.

The jar or bottle has a neck A, which is formed on its exterior with a rib, bead, or corrugation *e*, as shown in Fig. 1, or with a plurality of such corrugations, as shown in Fig. 5. A band or ring *a*, of very thin flexible india-rubber, is applied to the periphery

of the neck, so as to cover the rib *e*. It may be caused to adhere to the neck by means of glue, varnish, or other cementitious material, or it may be fastened thereon by tying tightly a cord or thread *b*, fitting in a slight groove or depression *c*, formed in the exterior of the neck above the rib *e*. Over this neck is placed a thin and soft metal cap B, the rim *d* of which should fit somewhat closely over the rib on the neck, this rim being either made slightly conical or substantially cylindrical, as desired, although a slightly conical form, as shown, is deemed preferable. The rim of the cap must be capable of so yielding under external pressure as to adapt itself to the conformation of the rib *e* upon the neck.

An outer ring C is provided of an inner diameter only sufficiently larger than the exterior of the rib to afford room between for the thickness of the rim *d* and part of the thickness of the band *a* when the latter is flattened by compression. The ring C is preferably made of thin metal and must be so nearly incapable of stretching as to fit it to operate in the manner hereinafter described. It should further be sufficiently flexible to yield enough to adapt itself to the exact outline of the rib. Its lower portion should be slightly flared or conical, as shown, sufficiently so as to enable it to pass over the upper portion of the rim of the cap B. A very minute degree of flaring of the lower portion of the ring C will be sufficient for this purpose, especially if the rim *d* be flared or coned.

To close the jar, it is only necessary to place the outer ring over the cap, as shown in Fig. 1, and then by applying any suitable pressure by means of a screw-press or any similar mechanical power device to force the ring down uniformly to approximately the position shown in Fig. 2. By thus forcing the ring down over the cap the diameter of the cap is lessened, and as the ring is forced downwardly it contracts the rim of the cap, smoothly compressing it against the rib until it reaches the apex of the latter, or its portion of greatest diameter, where it compresses the rim smoothly and tightly against the rubber band, and that band likewise smoothly and tightly

against the rib. Below the apex of the rib the rim is forced inward or contracted somewhat in the manner shown in Fig. 2, so that it embraces or hugs under the rib, and by reason of the surplus of metal, due to the forcing of the rim into a smaller diameter, the lower edge of the rim becomes vertically corrugated with the inward bends of the corrugations forced beneath and against the rib, so that they serve to exert a mechanical resistance against any force tending to push the cap upward. Furthermore, the force necessary to bring the ring down to its place is so great that the ring itself is more or less bulged along its medial line, where the greatest pressure comes against it by reason of the convexity of the rib, and by reason of this bulging of the ring its mechanical grasp is added to that of the convexed rim, so that it serves to hold the rim firmly pressed against the rib and to prevent the displacement of the cap.

In my invention the closure of the jar or bottle is exceedingly efficient, an absolute hermetic closure being insured, and one which does not depend for its adherence upon the existence of a vacuum within the vessel. The mechanical grasp of the parts inclosed is sufficient to enable my jar to be effectively used in the cold canning of previously-sterilized products.

Fig. 3 shows the preferred mode of forming the outer ring C, namely, by bending a strip of tinned sheet-iron overlapping its ends and uniting them by solder at *f*, leaving one end *g* projecting slightly. This construction has the advantage of facilitating the opening of the vessel, since in order to break the hermetic seal it is only necessary to bend outward the end *g* sufficient to grasp it and then to pull it outward, so as to sever the soldered joint, the solder used being of such character as to offer no serious resistance to force thus applied, while yet the soldered joint as a whole amply resists the bursting strain incident to the forcing down of the ring in effecting the hermetic closure. My invention is not, however, limited to the use of this construction of outer ring. Nor is my invention to be understood as being limited absolutely and necessarily to a ring C, having initially a flared lower portion, as if the rim of the cap be sufficiently coned the device can be made operative if the ring C be devoid of any preliminary flare, since in the act of forcing it down it will, upon encountering the rib *e*, be expanded to a slight degree in being forced over this rib, and will be thereby given the only flare that is strictly necessary to enable it to properly conform the rim *d* to the rib. On the other hand, the only portion of the rim *d* which requires to be flared or coned is its upper portion, and this only requires sufficient coning to enable it to properly enter within the ring C, or, in other words, to admit the ring C to be started down over it. That

which is strictly essential to my invention is that the ring C, or that portion of it which in the final position embraces the apex of the rib *e*, shall be of such diameter in comparison with the diameter of the rib as to leave room between only for the thickness of the rim *d* and of the highly-compressed rubber band *a*. By reason of these relative dimensions the rim which originally was sufficiently larger than the rib to form a loose fit therewith is contracted into most intimate conformation to the rib and to so closely embrace it as to highly compress the intervening elastic band. By the forcing down of the ring against the outer surface of the rim while its inner surface is held in frictional contact with the rubber band the outer surface of the soft metal of the rim is stretched, as in the operation of metal-spinning, and the rim is thereby convexed and curved inwardly on its lower portion, so as to take under and grasp the convexity of the rib, this grasp being thus partly due to this spinning effect, independently of the fluting or corrugating of the rim, and partly to the described corrugation of the rim by reason of the folding together of the excess of metal incident to its being forced into a smaller circle.

Fig. 4 shows my invention as applied with a somewhat different shape of neck, an additional shoulder *h* being provided beneath the rib *e*. Fig. 5 shows a further modification wherein two ribs *e e* are provided upon the neck.

Instead of applying a separate rubber band, I can roughen the neck of the jar by subjecting it to the action of hydrofluoric acid, after which a solution of india-rubber may be applied until a sufficiently thick layer of yielding or elastic substance is formed. This covering adhering to the glass it can be vulcanized in the ordinary way.

The exterior band of india-rubber could have, if required, an exterior conical surface, so that the joint becomes tighter the farther the ring C is forced down.

I claim as my invention the following-defined novel features, substantially as specified, namely:

1. The combination to form a hermetically-closing vessel of a bottle having a neck formed with an external rib or bead, a band of thin elastic rubber applied around the beaded neck, a metal cap having a flexible rim fitting over said band, and an exterior ring of resistant metal and of such small diameter as when forced down over the rim of the cap to contract the rim and flex it into intimate conformity with the convex surface of said rib and to compress the band between and form a hermetic seal between the neck, the band and the cap.

2. The combination to form a hermetically-closing vessel of a bottle having a neck formed with an external rib or bead, a band of thin elastic rubber applied around the beaded

neck, a metal cap having a flexible rim fitting over said band, and an exterior ring of resistant metal flared sufficiently at its lower side to enable it to fit over the upper part of said rim, and of such small internal diameter as when forced down over the rim of the cap to contract the rim and flex it into intimate contact with the convex surface of said rib and to compress the band between and form a hermetic seal between the neck, the band and the cap.

3. The combination to form a hermetically-closing bottle having a neck formed with an external rib or bead, a band of thin elastic rubber applied around the beaded neck, a metal cap having a flexible rim fitting over said band, and an exterior ring of thin metal resistant to stretching and of such small diameter and such flexibility as when forced down over the rim of the cap, to contract the rim and flex it, and be itself flexed or bulged into intimate conformity with the convex surface of said rib to thereby compress the band

between said rim and rib and form a hermetic seal.

4. The combination to form a hermetically-closing bottle having a neck formed with an external rib or bead, a band of thin elastic rubber applied around the beaded neck, a metal cap having a flexible rim fitting over said band, and an exterior ring of thin metal resistant to stretching, formed of a sheet-metal strip soldered at *f* with a free projecting end *g*, said ring having such small diameter as when forced down over the rim of the cap to contract the rim and flex it into intimate conformity with the convex surface of said rib, and so compress the band between them as to form a hermetic seal.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PIERRE PHILIP.

Witnesses:

EDWARD P. MACLEAN,
AUGUSTE MATHIER.