No. 827,668. PATENTED JULY 31, 1906.

G. T. REED.

SEALING CLOSURE FOR VESSELS.

APPLICATION FILED NOV. 13, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

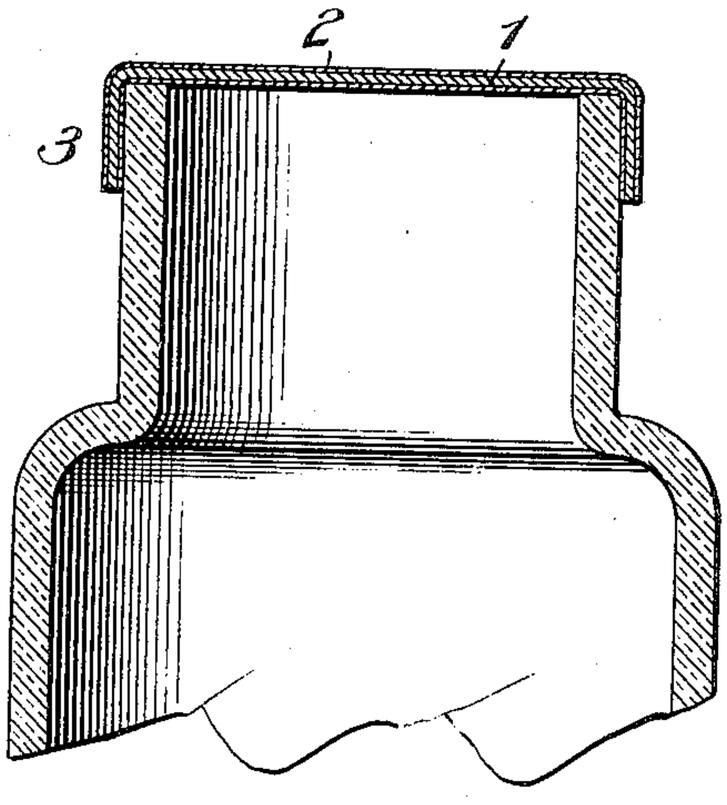


Fig. 2.

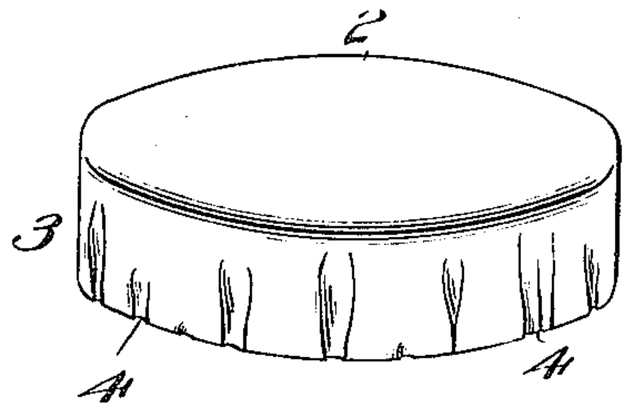


Fig. 3.

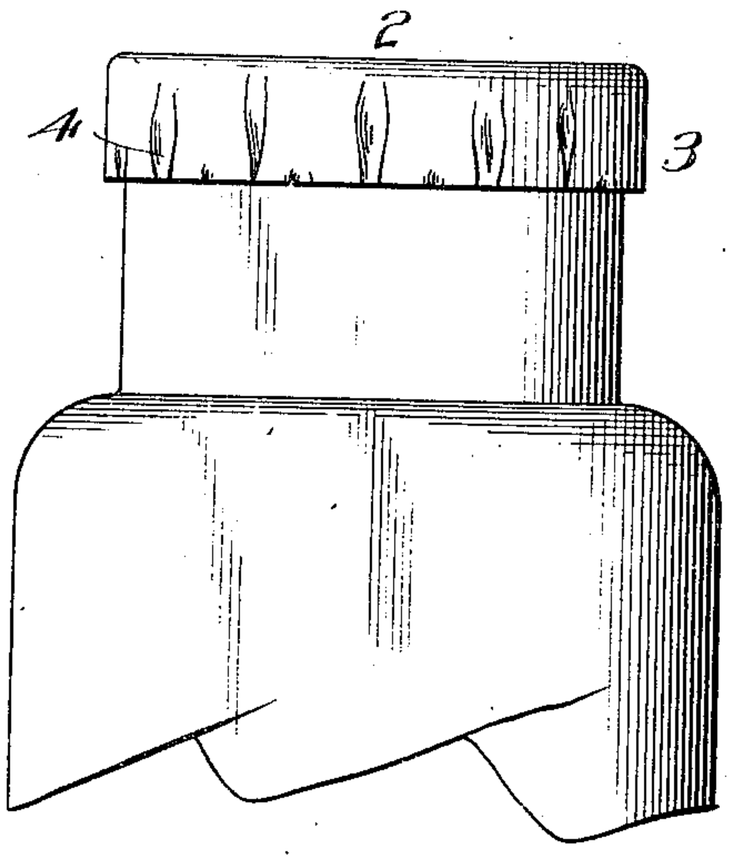


Fig. 4.

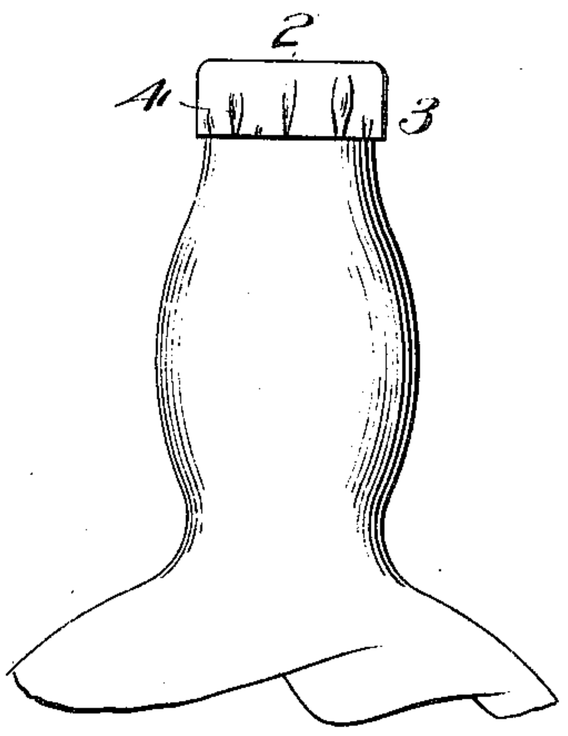
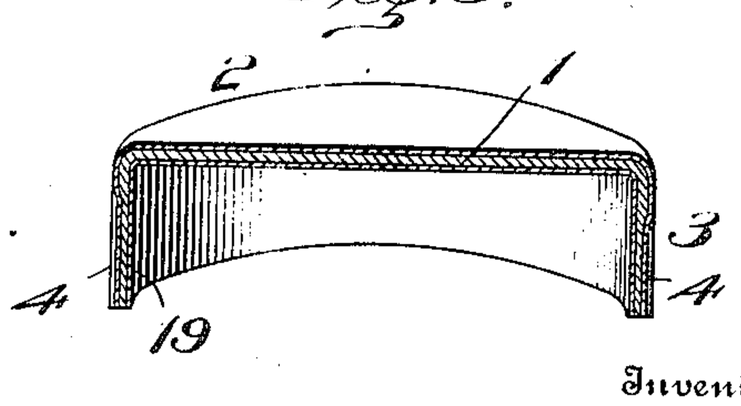


Fig. 5.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 6.

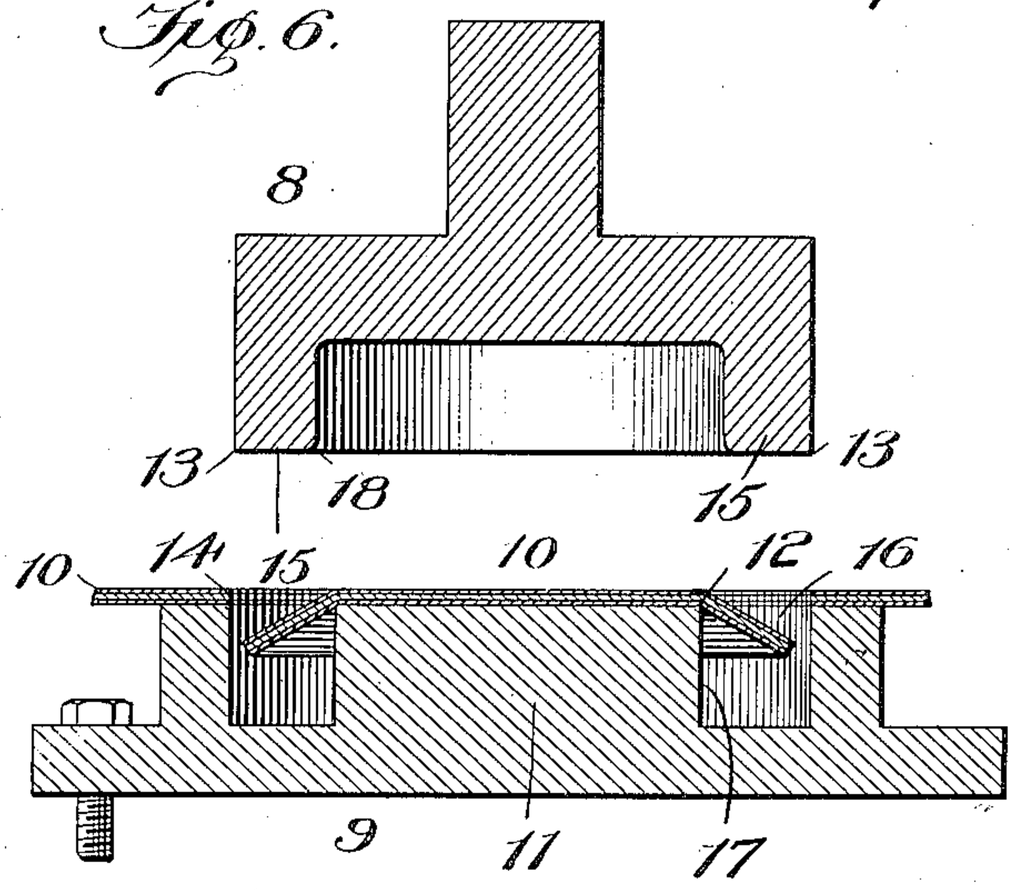


Fig. 7.

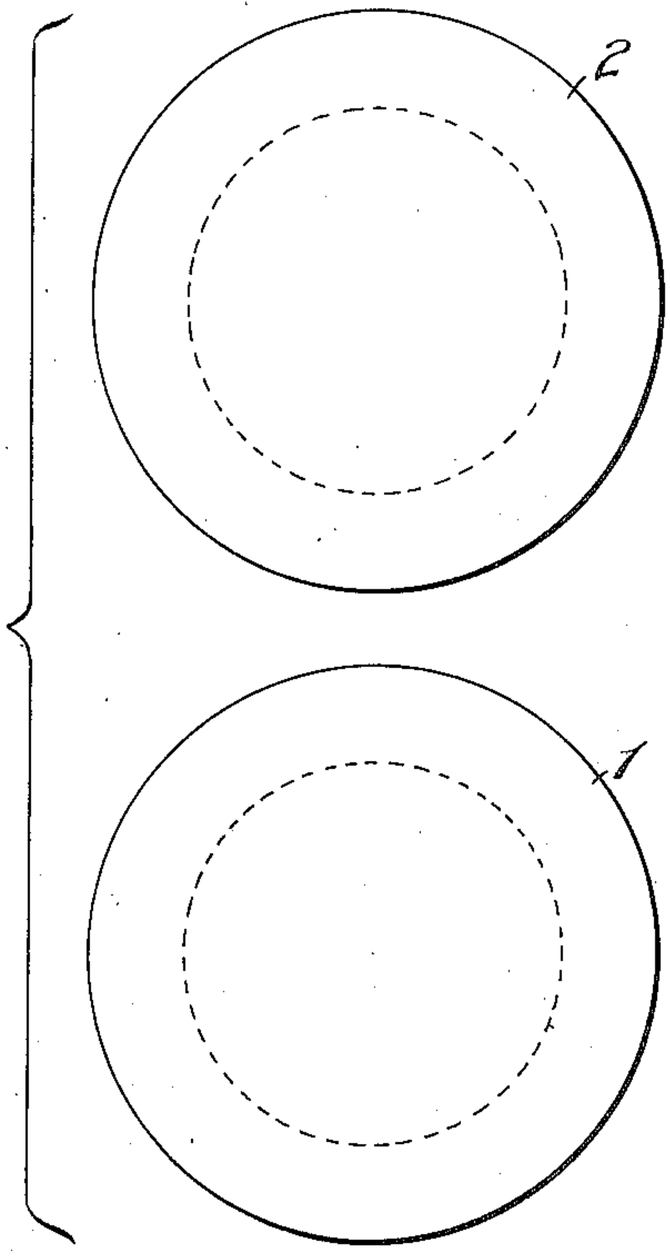


Fig. 7a

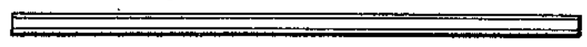


Fig. 9.

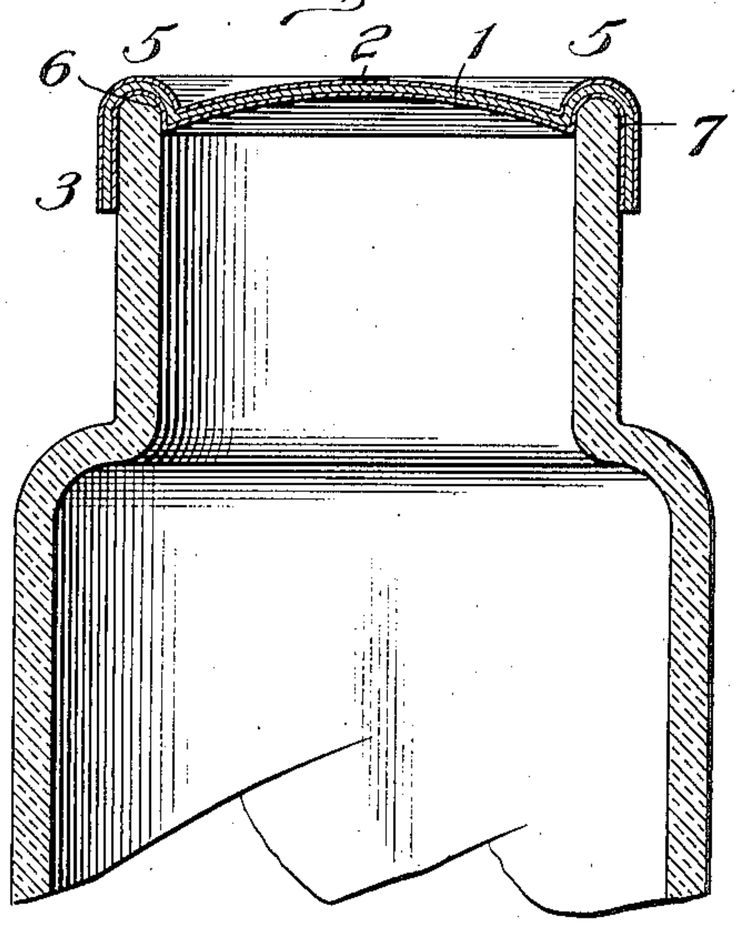
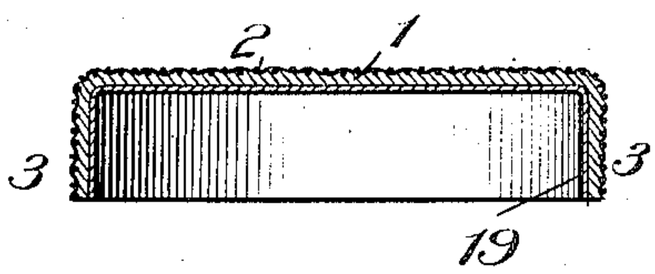


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE THORN REED, OF BALTIMORE, MARYLAND, ASSIGNOR TO CONTINENTAL JAR & BOTTLE STOPPER COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION.

SEALING-CLOSURE FOR VESSELS.

No. 827,668. Specification of Letters Patent. Patented July 31, 1906.

Application filed November 13, 1905. Serial No. 287,138.

To all whom it may concern:

Be it known that I, GEORGE THORN REED, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Sealing-Closures for 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.

For sealing jars, bottles, and jelly-glasses I have produced a two-ply or double-walled closure-cap composed of two separate and distinct bodies or layers of different materials, one metal, as tin, and the other flexible and adhesive, as a fiber lining formed under pressure and united together at one and the same operation, whereby the fiber body or lining is reinforced and forms a cushion and adhesive lining to the metal body or cap, whereby it is adapted to be applied by hand to the mouth of a vessel held securely thereon as a closure and effecting an air-tight seal with the advantage of being easily and quickly removed without impairing its efficiency as a seal, so that it may be used until the vessel is emptied of its contents.

The accompanying drawings illustrate my invention, and in connection therewith I will describe, and point out in the appended claims, that which is new in the closure-sealing device.

Referring to the drawings, Figure 1 shows in vertical section the neck of a jar with my two-ply metal and fiber cap-closure applied thereto. Fig. 2 shows my metal and fiber cap-closure in perspective. Fig. 3 shows the neck of a jar with my metal and fiber cap-closure in elevation. Fig. 4 shows a bottle-neck sealed with my metal and fiber cap-closure. Fig. 5 shows in section and in half perspective my metal and fiber cap-closure. Fig. 6 shows in vertical section the dies for forming my metal and fiber cap-closure. Fig. 7 shows the blanks for the metal and for the fiber cap. Fig. 7ª is an edge view of the fiber blank. Fig. 8 shows in section the fiber cap or lining reinforced by a separate cap of wire-cloth. Fig. 9 shows in vertical section the neck of a jar with my two-ply metal and fiber cap-closure applied thereto with a crown-groove.

The fiber body or layer is preferably made of wood treated in pulp form to render it sanitary and in sheet form with paraffin-wax, which is caused to penetrate the fiber, making it proof against moisture and acids, rendering it adhesive, and giving it compactness of body. The fiber thus prepared and with a corresponding sheet of metal the two are placed together upon a die the metal uppermost and pressed into cap or cup form, producing thereby a two-ply cap-closure of fiber 1 and of metal 2 both of the same area and forming at the same operation a band or rim 3, with the fiber pressed upon and forming a lining covering the entire inner wall of the metal cap and causing the fiber lining by its adhesive function to stick to every part of the metal to unite the separate bodies and cause the fiber lining to act with a yielding cushioning effect when it is placed on the vessel to be sealed. As the metal cap is to give firmness and a clasping function to and upon the fiber lining, the band may be of any desired width to suit the vessel to be sealed, and while I prefer tin as a reinforcing and grasping closure for the fiber lining obviously any suitable material may be used that will give the desired support, stiffness, and binding function to the fiber lining upon the vessel—such, for instance, as wire-cloth—which in the action of the dies for uniting the bodies under pressure is embedded into the surface of the fiber, and thereby makes it a laminated cap of metal and fiber, and in either construction the metal provides a housing for the fiber.

The fiber is produced in sheets in a semi-plastic state and is cut in strips the width of the blank needed, which are then passed through a paraffin-machine (not shown) and both surfaces coated lightly with paraffin-wax and in a pliable condition is with the metal blanked and pressed into form by dies in one operation. The cap thus produced is treated on its inner or fiber side with one or more coats of pure paraffin-wax 19, as in Figs. 5, 8, and 9, as this is preferred because it gives the best results in causing the cap to adhere to the walls of the vessel to seal it and because the adhesive function is necsesary to hold the cap in place; but obviously any suitable resinous substance which will penetrate the fiber and give it a spongy character, causing it to fill all the minute crevices and to ad-

here tightly to the surface on which it is forced, may be used. The action of the dies in bending that portion of the metal and fiber blanks to form the band over the edge of the die will cause a fullness which turns into crimps or indentations 4, the depth of which will depend in a measure on the degree of pressure in forming the band, it being understood that the fullness which causes the crimps results from the bending together the circumferential portions of the blanks which form the band, for without the fiber layer the band would be formed without the crimps. Another important matter is the fiber blank is of greater thickness than the metal blank, and the crimps or corrugations are only pressed into the surface of the fiber, thereby causing the interlocking of the metal band with the fiber band, so that they cannot be turned one independent of the other and the one cannot slip upon the other in removing the cap from the vessel. The crimps or corrugations also provide an indented outside surface, giving a better hold for the hand for removing the cap. The crimps while being pressed into the fiber lining merely enter its surface deep enough to interlock the two together and are prevented from interrupting or impairing the smoothness of the sealing-wall of the fiber lining by the smooth wall of the die against which the band is pressed and formed at the same time the tucks are pressed upon and into the comparatively soft bed of fiber. The band being struck up of two different and separate layers, the one metallic and the other fibrous, when released from pressure by the forming-dies the fiber or lining will expand inwardly slightly, and thereby cause it to have a yielding or cushioning function and an impinging sealing action when applied on the surface, while the crimps in the outer surface of the band will open a little and allow it to expand outwardly in pressing it hard and tight in its closing function. In this function the metal band acts as a barrier to prevent the fiber lining from expanding outward, and this, in connection with the adhesive function of the lining, serves to make the closure a compound seal—that is, both air-tight and adhesive—and having an adjuvant clasping function is securely held as a closure against the pressure of the gases or contents. In applying the cap to the mouth of the vessel it is pressed until the crown is firmly seated upon the edge of the mouth, with a cushioned air-tight joint extending from the edge of the vessel to the edge of the band, with the effect of the latter to compress the waxed fiber upon the walls of the vessel.

While I prefer to form the cap with a plain top surface which rests upon the edge of the vessel, with the fiber lining forming a seal upon the edge and to the edge of the band, as in Fig. 1, the cap-top may be formed with an arched groove 5 around its edge rising above the top and terminating in the band, forming thereby a double-sealing fiber wall 6 and 7 on the inner and on outer walls of the mouth of the vessel, forming a grasping adhesive wall on the outer and on the inner walls of the vessel.

I have shown dies adapted for the production of the above-described two-ply or double-walled cap-closure only as one form consisting of a top die 8 and a bottom die 9 and in which I have illustrated the two-ply blank having been cut from a two-ply sheet 10 and the band of the cap partially formed over the solid bed 11 of the bottom die over the sharp angle 12, of which that part of the blanks which are to form the band receives the action of the upper die. In this action the blanks to form the cap are first cut together from the sheet by the shearing of the sharp angle edge 13 of the upper die and the sharp angle edge 14 of the lower die, the circular forming part of the upper die pressing the band-forming part 15 down into the annular space 16 of the lower die against its smooth vertical wall 17, the bending of the blank over the sharp angle of this wall being effected by the rounded edge 18 of the inner circular edge of the top die to prevent the shearing of the blank at the annular angle edge 12 of the bed-die. As the annular forming part of the upper die descends into the annular space of the lower die the band-forming part is forced down, and the fullness which this bending produces in the metal is pressed into crimps, as stated, which enter the surface of the fiber, while its inner wall 19 is left smooth as the sealing-wall of the cap. For this purpose the upper die is caused to form the band against the vertical wall of the bed-die; but it will be understood that in this operation the crimps or indentations are only formed in the metal and pressed into the fiber and that the double coating of the paraffin is only on the inner wall of the band and applied after the cap has been formed; but it is the coating of the fiber under pressure that renders it impervious to air or moisture and prevents the contamination of the contents.

I claim—

1. A closure for vessels consisting of a metallic cap having a depending band and a fibrous adhesive lining and adapted to form grasping adhesive walls on the outer and on the inner walls of the vessel and effect thereby a continuous inner and outer adhesive fiber seal.

2. A closure for vessels consisting of a two-ply or double-walled metal binding-cap, and a fibrous lining coated on both its sides with an adhesive substance, both formed into a closure-cap including a metal band and a lining therefor the inner sealing-surface of which is supplemented with a second adhesive sealing-coating.

3. The process herein described of forming a two-ply closure for vessels consisting in forming a pair of blanks of the same size one of metal the other of fiber, coating the fiber blank on both sides with an adhesive substance, placing both blanks together the metal upon the fiber, forming both under pressure into a closure-cap and supplementing the fiber on its inner wall with a second adhesive coating.

4. The process herein described of forming a two-ply sealing-cap for vessels which consists in placing together a pair of blanks of the same size one of metal, the other of wood fiber the metal upon the fiber, coating the fiber blank on both sides before being so placed with an adhesive substance, and forming both under pressure into a closure-cap to unite them and form an inner sealing-wall.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE THORN REED.

Witnesses:
AMBROSE W. ZIMMER,
EDWARD H. CURLANDER.