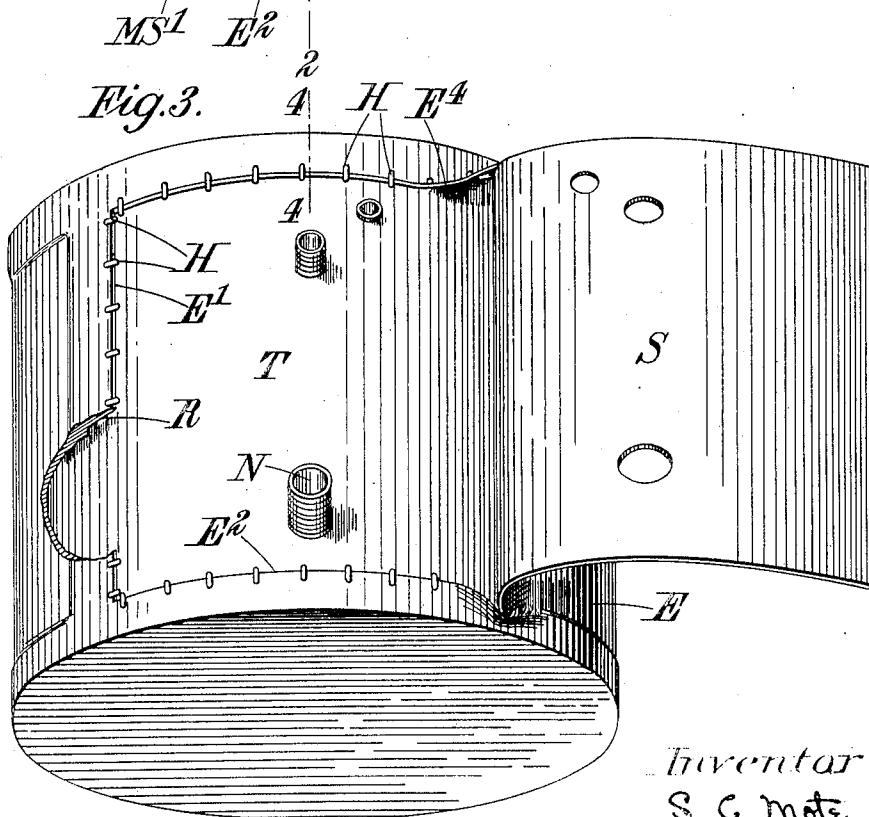
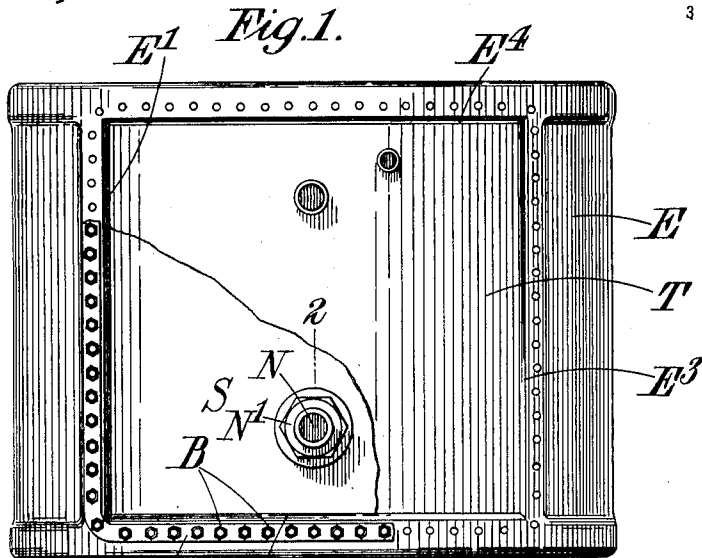


S. C. MOTE.
 RUBBER COVERED TANK FOR CONTAINING INFLAMMABLE LIQUIDS.
 APPLICATION FILED NOV. 13, 1919.

1,406,478.

Patented Feb. 14, 1922

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 2.

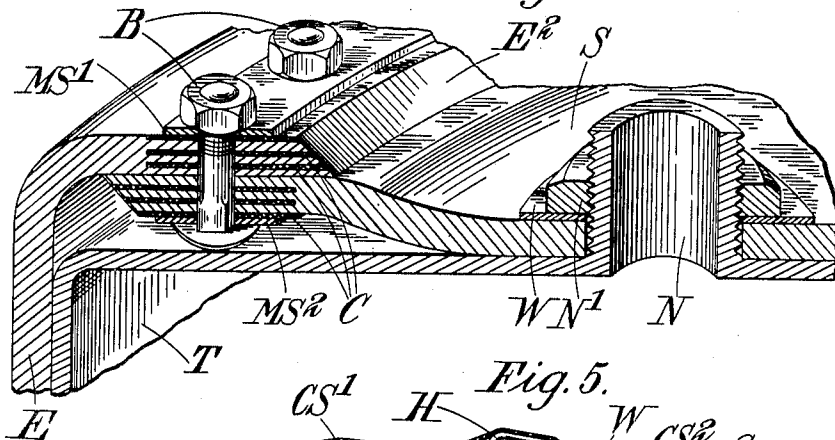


Fig. 5.

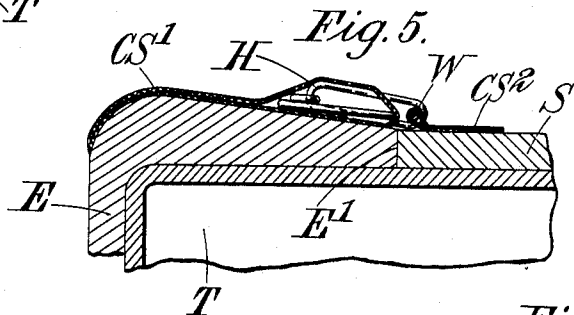
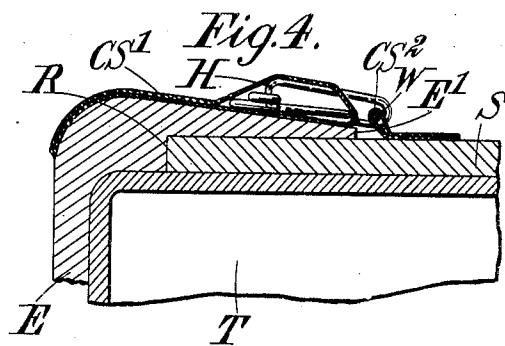
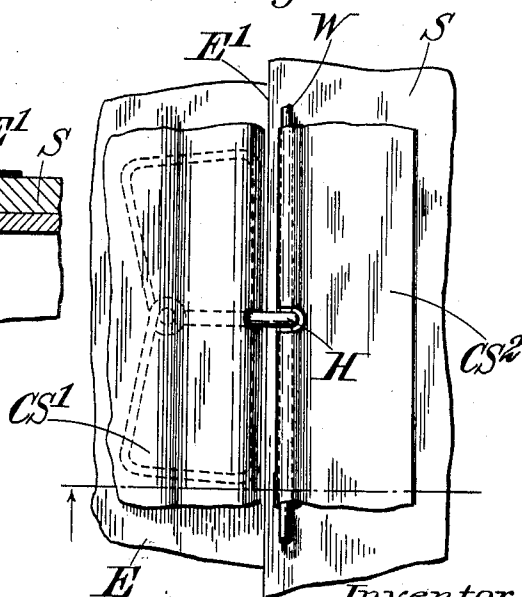


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

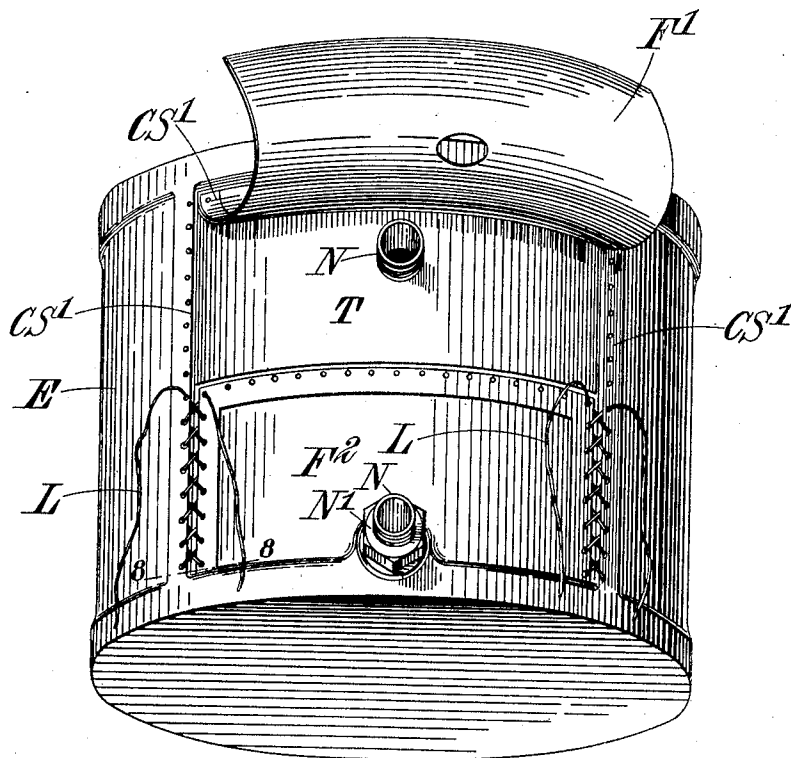
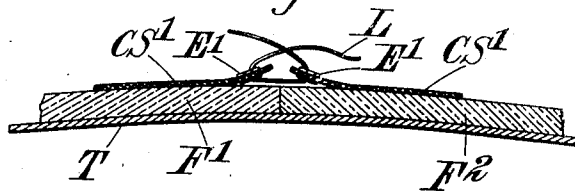


Fig. 8.



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UNITED STATES PATENT OFFICE.

SYDNEY CHARLES MOTE, OF LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO ARCHER PHILIP CROUCH, OF LONDON, ENGLAND.

RUBBER-COVERED TANK FOR CONTAINING INFLAMMABLE LIQUIDS.

1,406,478.

Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed November 13, 1919. Serial No. 337,803.

To all whom it may concern:

Be it known that I, SYDNEY CHARLES MOTE, a subject of the King of England, residing at London, in England, have invented certain new and useful Improvements in Rubber-Covered Tanks for Containing Inflammable Liquids, of which the following is a specification.

This invention relates to tanks contained in an envelope of flexible waterproof material and employed for holding inflammable liquids. Such tanks have heretofore been made with a rubber cover or envelope permanently secured around the tank, with the result that if damage occurred say by perforation of the tank or by the bursting thereof, the whole construction became useless for the reason that the damaged tank was removed by methods which rendered the cover useless. The object of the envelope was to serve as a self-sealing device when penetrated by a bullet, or upon the bursting of the tank in a crash, to receive and retain the liquid contents of the tank; in either case the liquid contents were prevented from coming into contact with that which might have accidentally ignited them, or from becoming lost.

If the damaged tank were to be removable without destruction of the envelope, a repair or reconstruction could be effected by placing the repaired tank or a new tank in the same envelope; to effect such a repair or re-construction by the employment of such an envelope as is hereinafter described is one object of the present invention. It should be noted that the envelope hereinafter described can be applied to a new tank, or applied to an old tank in substitution for a worn or damaged envelope, without the need in either case for sending the tank to the envelope-maker. This had formerly to be done when the envelopes were permanently seamed around the tank, and it involved subjecting the tank to heat applied when the envelope was vulcanized in place on the tank. But envelopes of the present invention whether of rubber or not can be made, stored, and suitably taken care of till they are needed for use when they can be sent to the place at which the tanks await them and be put on the tanks without heat being there applied either to tank or to envelope.

The present invention comprises an envelope of any suitable flexible material, say of

rubber sheet, and having in it an opening sufficiently large to admit of the introduction of a tank, a closure-piece for the opening separate from or integral with the envelope, and means for securing the said closure-piece in position in such manner as to close the said opening in the envelope, the characteristic feature of the means being, according to this invention, their construction in such a form that they exert a pull on the margin of the closure-piece in the direction of the adjacent margin of the opening in the envelope, and thus are enabled to keep the opening closed without aid from the body of the tank, which latter in certain circumstances, e. g. in the case of severe distortion by accident, may be distant from the joint between closure-piece and envelope, which thus can at all times be satisfactorily maintained whether the body of the tank supports the joint or not.

In the accompanying drawings which illustrate the application of the invention to a tank with elliptical flat ends:—

Figure 1 is a plan of such a tank, in the envelope, a part of the closure-piece being broken away;

Figure 2 is a section on the line 2—2, Figure 1;

Figure 3 is a perspective view of a similar tank, with a different arrangement of closure-piece;

Figure 4 is a section on the line 4—4 of Figure 3, taken when the opening is shut;

Figure 5 is a section similar to Figure 4 but showing an alternative construction.

Figure 6 is a plan view of the details that in Figure 5 are seen in section;

Figure 7 is a perspective view of a tank with flat elliptical ends with two closure-flaps for the opening, such as are hereinafter described, and

Figure 8 is a section on the line 8—8 of Figure 7.

Figures 2, 4, 5, 6 and 8 are on a larger scale than that of the remaining figures.

Like letters of reference indicate like parts throughout the drawings.

With reference first to Figures 1 and 2, the tank T is in an envelope E which has a large square opening, the margins of which, bevelled, are at E¹, E², E³, E⁴. This opening is big enough to enable the tank to be inserted into the envelope, the envelope stretching slightly to permit this to be done. The

bevel edge of this opening is clearly to be seen at E² in Figure 2. The closure-piece of this opening is a sheet S of flexible material larger than the opening through which the tank is introduced; the margins of the sheet S when it is in place in the opening are as in Figure 2 underneath the overlapping margins of the opening in the envelope. To hold the closure-piece in situ, bolts B are passed through its margins, which may be strengthened with canvas strips C, a similar strengthening being also applied to the margins of the opening in the envelope, through which the bolts also pass. The heads of these bolts bear on metal strips MS¹ MS², see Figure 2. These strips may be united to form rectangular open frames as shown, or may consist of separate strips laid in line around the four sides of the rectangular opening and of the closure-piece. Where filling-necks of the tank such as the neck N in Figure 2, pass through the closure-piece or through the material of the envelope, such material is gripped between the face of the tank against which it rests on the one hand and a washer W on the other hand, which washer is forced down upon it by a nut N¹ screwed on to an externally screwthreaded portion of the filling-neck.

The tank shown in Figure 3 is provided with a closure-piece which is a sheet S of flexible material integral with the envelope E. The sides E¹ E² E⁴ of the envelope are rebated as at R, Figures 3 and 4, with an undercut rebate, and the edges of the closure-piece S when the opening is closed are received in the rebate in the manner indicated in Figure 4. Resilient or other hooks H indicated diagrammatically in Figure 3 (but see Figures 4, 5, and 6) which of themselves are not of the present invention are secured to the envelope around the margin of the opening by means of canvas-strips CS¹ and engage with a wire W secured by canvas strips CS² to the margin of the closure-piece S. The resilient hook illustrated in Figures 4, 5 and 6 is preferred for drawing the margin of the closure-sheet S into contact with the adjacent part of the envelope E, but obviously any hook which will perform this function may be substituted therefor.

In Figure 5 the closure-piece S abuts against the edge E¹ of the opening in the envelope E instead of going under a rebate therein, and the abutting edges are kept in contact by the pull of the resilient hooks H upon the wire W.

In the modification illustrated in Figures 7 and 8, there are two flaps F¹ and F² each of which closes a corresponding half of the opening in the envelope E through which the tank T can be seen; these two flaps abut against one another and similarly abut against the contiguous portions of the margin of the opening. Where the flaps abut

against one another or the flaps and envelope abut, they are kept in close contact, when the flaps are closed down, by means of lacings L which pass, through eyes E¹ in canvas strips CS¹ secured on the margins that are to abut (see Figure 8).

The closure-piece in addition to being kept closed by the devices hereinbefore described or other suitable means, may be cemented to the margins of the hole in the envelope.

The envelope may in the first instance be a closed envelope completely enclosing the tank on all sides and need not have in it any opening sufficiently large to admit of the introduction of the tank, for this opening may be neatly made upon the first occasion of the removal of the tank from the envelope and may subsequently be closed by such methods of closure as have hereinbefore been described.

According to the present invention a tank-cover, adapted to have the opening made in it in situ as above described, is provided in anticipation at the plate at which the opening is to be made, with devices such as are shown in Figure 5 or Figures 7 and 8 which will hold together the edges of the cut after it has been made.

What I claim as my invention and desire to secure by Letters Patent is:—

1. For a tank, the combination of a liquid-proof envelope having therein an opening sufficiently large to permit the introduction or removal of a tank, a closure piece for the opening having at least three sides thereof separate from the envelope, and co-operating means adjacent all of the edges of said closure piece and said envelope by which they may be secured together to form a fluid tight joint, and a pull exerted on the margin of the closure piece in the direction of the adjacent margin of the opening in the envelope to keep the opening closed fluid tight without aid from the body of the tank, substantially as described.

2. For a tank, the combination with a liquid-proof envelope adapted to have formed therein an opening sufficiently large to permit the introduction or removal of a tank, of independent series of co-operating means provided on the envelope and so positioned as to lie on opposite sides of the division line defining the cut, for the purpose of tightly holding together the free edges of the cut in a fluid tight manner after it has been made, substantially as described.

3. For a tank, the combination with a flexible envelope adapted to have formed therein an opening sufficiently large to permit of the introduction or removal of a tank, of independent adjacent rows of co-operating means provided on the envelope and so positioned as to lie on opposite sides of the division line defining the cut for the purpose of tightly holding together in a fluid tight

manner the edges of the cut after it has been made, substantially as described.

4. For a tank, a liquid-proof flexible envelope having therein an opening sufficiently large to permit the introduction or removal of a tank, a closure piece separate from said envelope, and co-operating means on the adjacent edges of said closure piece and said envelope by which they may be tightly secured together, and a pull exerted on the margin of the closure piece in the direction of the adjacent margin of the opening in the envelope for holding said closure piece in fluid tight position without aid from the body of the tank, substantially as described.

5. For a tank, a liquid-proof flexible envelope having therein an opening sufficiently large to permit the introduction or removal of a tank, said opening having overhanging edges forming undercut shoulders, a closure piece for the opening adapted to engage said shoulders, and co-operating means on the adjacent edges of said closure piece and said envelope by means of which they may be secured together to form a fluid tight joint and a pull exerted on the margin of the closure piece in the direction of the adjacent margin of the opening in the envelope for keeping the closure piece in fluid tight position without aid from the body of the tank, substantially as described.

6. For a tank, the combination of a liquid-

proof envelope having therein an opening sufficiently large to permit the introduction or removal of a tank, a closure piece for the opening having at least three sides thereof separate from the envelope, and cooperating means adjacent all of the edges of said closure piece and said envelope by which they may be tightly secured together to form a fluid tight joint, and a resilient pull exerted on the margin of the closure piece in the directions of the adjacent margins of the opening in the envelope to keep the opening closed fluid tight without aid from the body of the tank, substantially as described.

7. For a tank, a liquid-proof flexible envelope having therein an opening sufficiently large to permit the introduction or removal of a tank, said opening having overhanging edges forming undercut shoulders, a closure piece for the opening adapted to engage said shoulders, and cooperating means on the adjacent edges of said closure piece and said envelope by means of which they may be secured together to form a fluid tight joint and a resilient pull exerted on the margin of the closure piece in the direction of the adjacent margin of the opening in the envelope for keeping the closure piece in fluid tight position without aid from the body of the tank, substantially as described.

In testimony whereof I affix my signature.

SYDNEY CHARLES MOTE.