(No Model.)

C. SOOYSMITH.

METHOD OF CLOSING SPACES BETWEEN SUBMERGED BODIES.

No. 331,658. Patented Dec. 1, 1885.

Fig. 1.

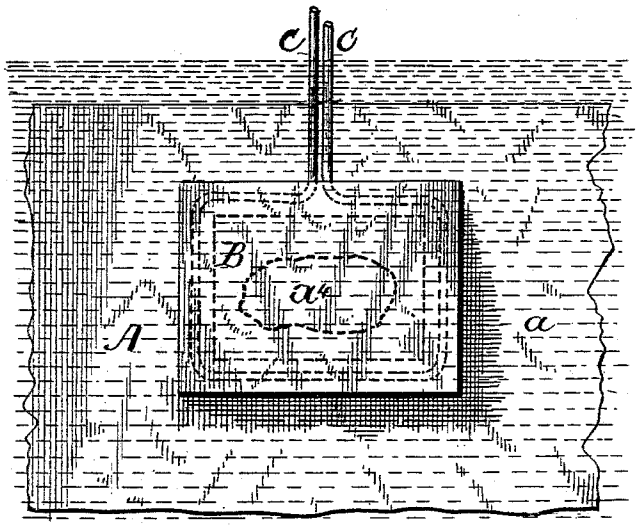


Fig. 2.

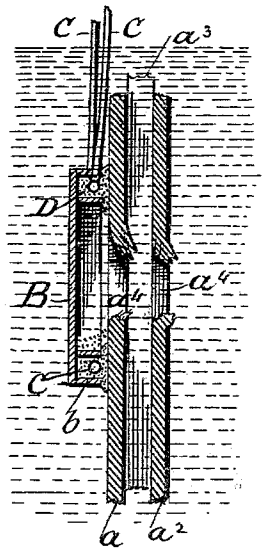
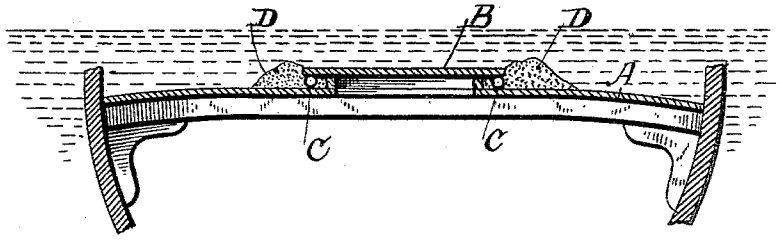


Fig. 3.



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N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES SOOYSMITH, OF CHICAGO, ILLINOIS.

METHOD OF CLOSING SPACES BETWEEN SUBMERGED BODIES.

SPECIFICATION forming part of Letters Patent No. 331,658, dated December 1, 1885.

Application filed August 11, 1885. Serial No. 174,093. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SOOYSMITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Method of Closing Spaces Between Submerged Bodies, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improved method of closing apertures in caissons, vessels, and other submerged bodies, and preventing the entrance of water therein while being repaired or pumped out, or before raising them; and the invention consists in the novel application of a freezing method for closing the joints between submerged bodies that have been broken into by collision or other causes, and the edges of temporary covers or patches used to cover the openings thus accidentally produced.

My invention consists, also, in the novel manner of raising submerged vessels by placing freezing-pipes (containing a circulating freezing-mixture) under the edge or adjacent to the edge of temporary patches, and covers used to close openings in the side or top of submerged bodies, packing mud, clay, or other substance of this nature against said pipes and edges, causing said mud, clay, &c., to congeal and adhere to the submerged body and to the temporary cover, and solidly unite these parts before exhausting the water and forcing air therein.

This invention is closely allied to the method of building tunnels, caissons, &c., described in a companion application for patent, and will hereinafter be particularly described, and specifically set forth in the claims.

In the accompanying drawings, Figure 1 is a side view of a submerged body, that may be a caisson used in submarine engineering or a vessel sunk by accident, but provided with a tarpaulin or temporary cover and a continuous pipe under its edges for the passage of a freezing-mixture. Fig. 2 is a vertical section through the same caisson or vessel, showing the hole in its side and its temporary cover. Fig. 3 represents a portion of the deck or hull of a submerged vessel, showing my means for sealing the edges of the hatch to the edges of the hatchway.

Like letters indicate like parts in all the figures.

In Figs. 1 and 2, A represents a portion of the walls of a submerged caisson, vessel, or other body. These walls are generally formed of planking a and a^2, secured to the outside and to the inside of vertical studding or ribs a^3, as the case may be. This planking is represented as having been damaged or perforated at a^4, and the object in view is to prevent the passage of water through said perforation. For this purpose a frame or covering, B, has been built to extend beyond the edges of the perforation a^4 when applied in position. This frame is shown as rectangular, but may be of any desired conformation. It is also shown as made of lumber or other rigid material; but it may be made of impervious canvas or rubber cloth, to permit it to take the form of the curved surface to which it is to be attached. To the under side of the covering B, adjacent to the edges, there is attached, for convenience in retaining the lute or packing (mud, clay, &c.) around these edges, a continuous trough, b, within which is placed the pipe C, through which a water-freezing medium—either gas or liquid—is made to circulate, and packing around said pipe is the lute of mud, clay, or other substance, D, (holding water in suspension,) that it is intended to congeal, and thus to seal the joints between the submerged body and the cover B. Before this cover is frozen fast to this body it is temporarily retained in proper position by chains passing around said body, or by screw-bolts inserted therein, or by other means, as the circumstance may direct.

In Fig. 3 the same method is applied to seal the joints between the hatch B and the deck A of sunken vessel, the lute or packing-clay being shown at D, and the freezing-pipe C embedded in the latter, so that when the hatch is securely frozen to the deck the water in the hold can be pumped out and air forced in its place to raise the vessel.

Having now fully described my invention, I claim—

1. The method of closing openings in submerged bodies and raising them, which consists in applying a covering-body near the opening, luting the space between said bodies and said covering with clay or any suitable

lute, inclosing a pipe in said lute, and circulating a freezing-mixture therethrough, then exhausting the water and admitting air in said bodies, substantially as and for the purpose described.

2. The method of uniting a covering-body to a submerged body, which consists in placing freezing-pipes between said covering and body, packing luting-clay around said pipes, so that the lute will be in contact with both bodies, and passing a current of a freezing medium through said pipes, whereby the packed clay is made to adhere by congelation to both of the submerged bodies, substantially as and for the purpose described.

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

CHARLES SOOYSMITH.

Witnesses:
JOHN RODGERS,
GEO. GERRY WHITE.