

(No Model.)

3 Sheets—Sheet 1.

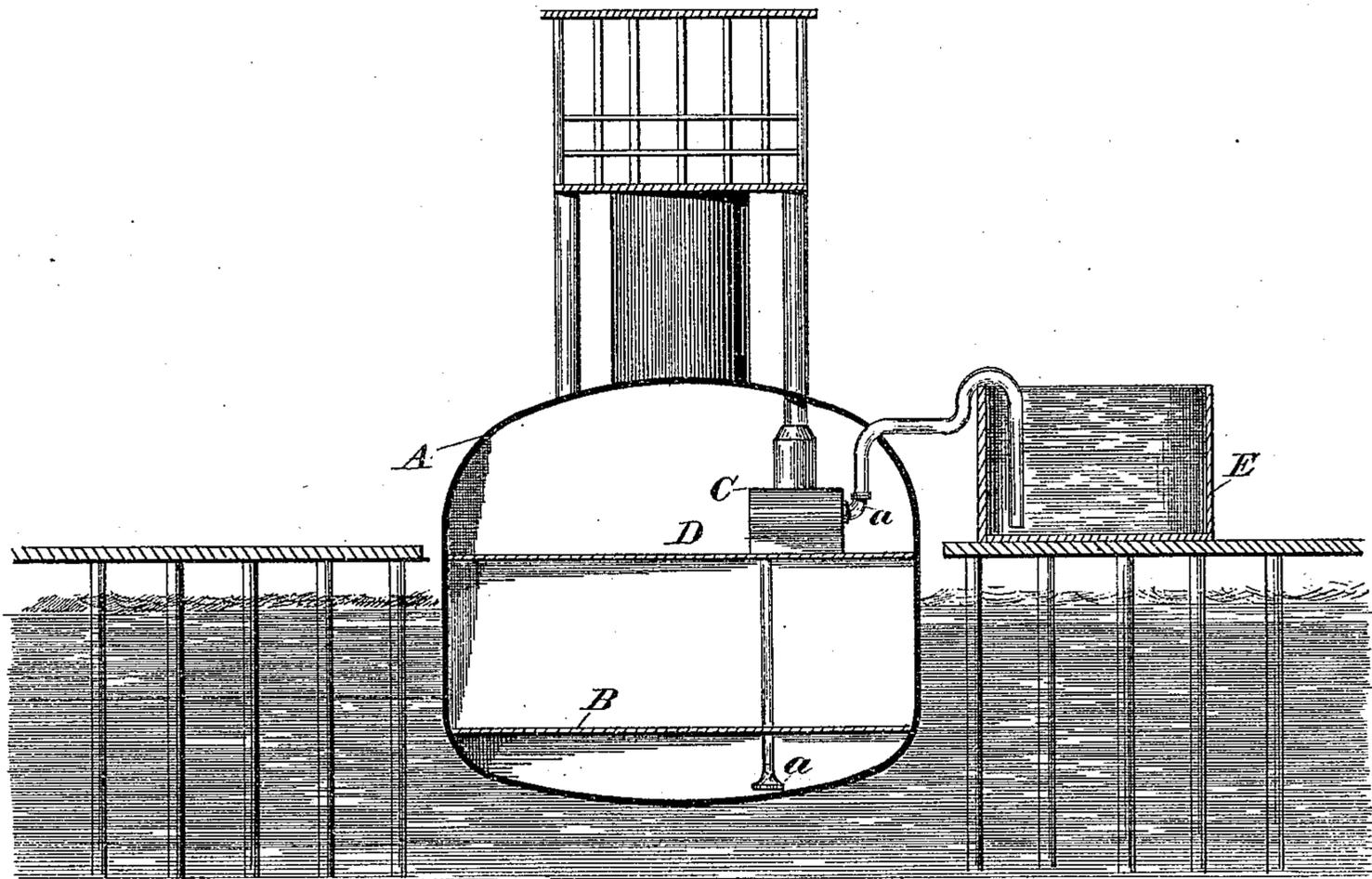
A. McDOUGALL.

METHOD OF COATING WATER BOTTOMS OF VESSELS.

No. 553,590.

Patented Jan. 28, 1896.

*Fig 1.*



WITNESSES

*Arthur W. Erb*

*Arthur D. Bennett*

INVENTOR

*Alexander M. Dougall*

*By Frank R. Nyer*

Attorney

(No Model.)

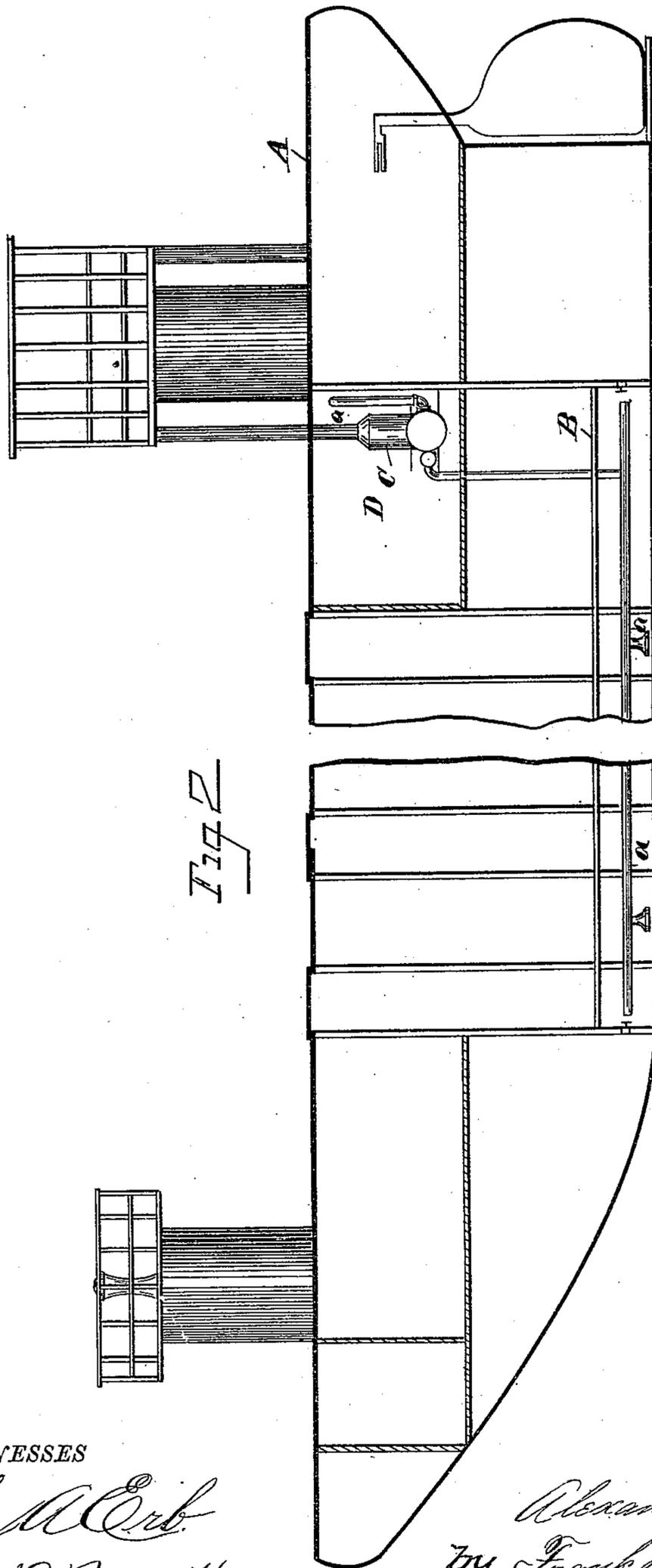
3 Sheets—Sheet 2.

A. McDOUGALL.

METHOD OF COATING WATER BOTTOMS OF VESSELS.

No. 553,590.

Patented Jan. 28, 1896.



WITNESSES

*Nathan A. Erb*  
*Arthur D. Bennett*

INVENTOR

*Alexander M. Dougall*  
by *Frank S. Nye*  
Attorney

(No Model.)

3 Sheets—Sheet 3.

A. McDOUGALL.

METHOD OF COATING WATER BOTTOMS OF VESSELS.

No. 553,590.

Patented Jan. 28, 1896.

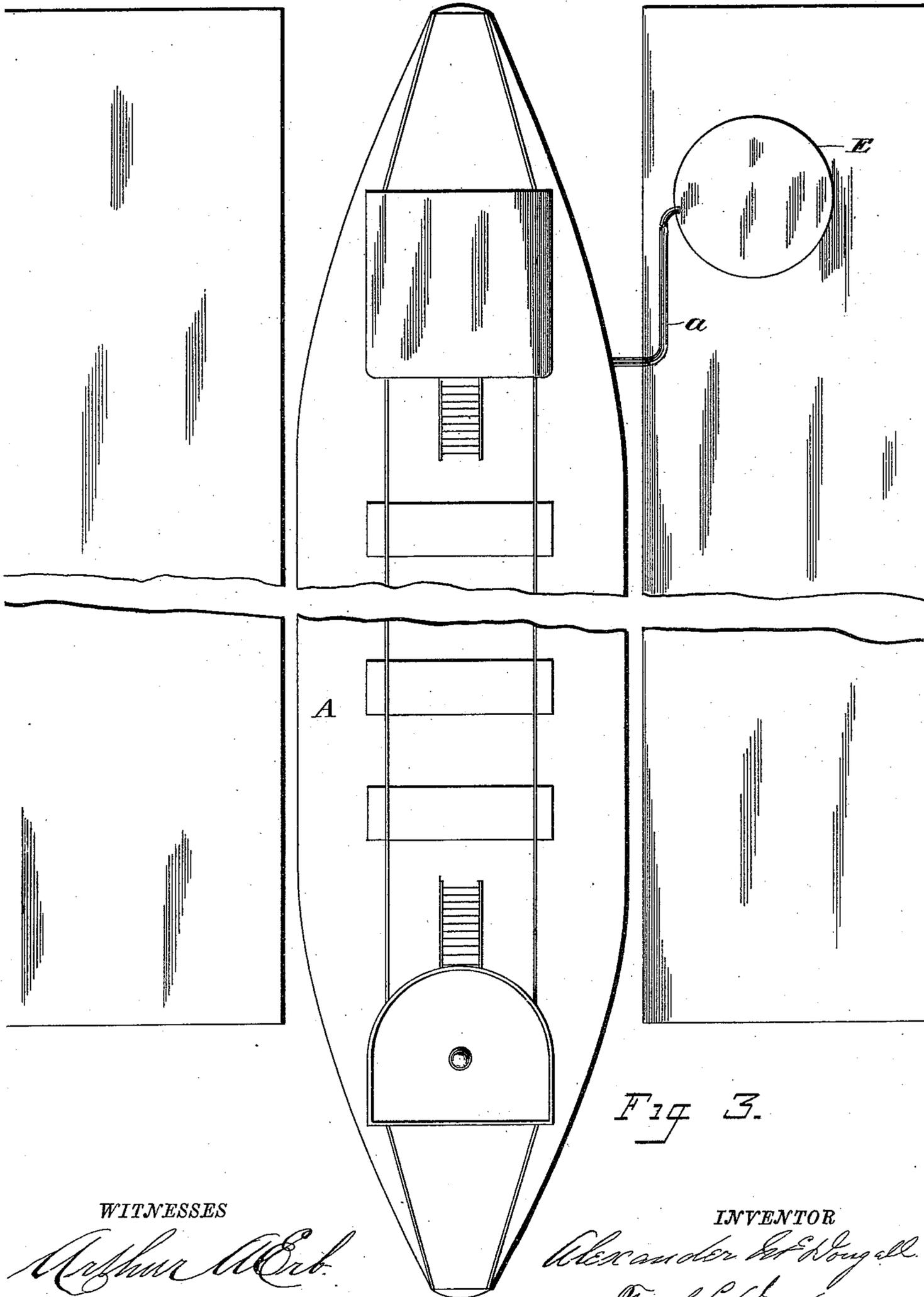


Fig 3.

WITNESSES

*Arthur M. Coe*  
*Arthur D. Bennett*

INVENTOR

*Alexander Mc Dougall*  
by *Frank R. Piper*  
Attorney

# UNITED STATES PATENT OFFICE.

ALEXANDER McDOUGALL, OF DULUTH, MINNESOTA.

## METHOD OF COATING WATER-BOTTOMS OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 553,590, dated January 28, 1896.

Application filed May 22, 1891. Serial No. 393,770. (No specimens.)

*To all whom it may concern:*

Be it known that I, ALEXANDER McDOUGALL, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Methods of Coating Water-Bottoms of Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

It has been found that the double bottom of iron vessels becomes affected and corroded by the salt bilge-water which accumulates therein. Under the regulations which are now prescribed to all American iron vessels it is required that the inside of the double bottom be coated with some impervious substance—such as coal-tar, creosote, or oil—so that the salt bilge-water will not affect the iron. This impervious coating has been found to last only about three years, so that it has to be renewed many times during the lifetime of a vessel. This has been done heretofore with an ordinary paint-brush, with which the substance is applied to the metal. Owing to the fact that the atmosphere within the double bottom of iron vessels is of such a character that a man cannot work therein for any extreme lengths of time, and for the reason that there are many extremely difficult angles and corners to be reached, it has been found that it is almost a matter of impossibility to have the work done in a thorough manner by the old process.

My present invention relates to an improved method of coating the double bottom of vessels with an impervious material for the purpose above set out; and the object of the invention is to provide a method whereby this may be accomplished in a perfect manner and in much less time than formerly without the necessity of a man going within the double bottom.

The present invention is especially applicable for use in connection with those metallic vessels which I have heretofore invented and which have been patented by me. Although the present invention can be conveniently used with vessels of that particular type, I do not wish to confine myself to

such use, since the invention may be also applied to other varieties of iron vessels.

For a better comprehension of my invention, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a sectional view of a vessel of the type invented by me, showing the present invention in connection therewith; Fig. 2, a longitudinal sectional view of the same, and Fig. 3 a top elevation.

In all of the above views corresponding parts are designated by the same letters of reference.

A represents the boat of the kind before referred to, being either a towboat proper or a steamboat. This boat is constructed of plates riveted to transverse ribs, so that the hull is practically a hollow shell. This hull is provided with a double bottom B. This double bottom answers the ordinary purposes of the same, viz: to be filled with water to partially submerge the hull when light and to prevent the bilge-water from coming in contact with the cargo. Water is allowed to enter this water-bottom from the outside through suitable valves, and this water is removed therefrom by means of pipes *a a* within the same and provided with bell-mouths extending near the bottom of the hull, and by which the water may be almost entirely withdrawn. A pump C, which is preferably a steam-pump, is mounted within an engine-room D at any suitable point, and is used to pump the water from the water-bottom.

In carrying out my improved method of coating the water-bottoms of metallic vessels I go about as follows, the description being applied to a boat of the form invented by me: The vessel is first moved within a suitable slip, which may be either cut into the land or else constructed of piling and timbers in the ordinary way. After entering the slip the vessel is secured therein in the ordinary manner by means of the usual hawsers. Instead of making use of a slip the vessel may be moved alongside of an ordinary wharf or dock, or, in some instances, the boat may be secured adjacent to the shore, so that, as will be understood, the slip is not absolutely necessary. Upon one or both sides of the slip

or the wharf or the shore I place a tank E, but a barrel or reservoir or pit will answer the purpose just as well. The tank E is now partially filled with water, either fresh or salt, and with this water is mixed the substance with which it is desired to coat the water-bottom. This substance, which is either oil, coal-tar, creosote, or analogous composition, will float on the surface of the water as soon as the agitation has ceased, caused by the introduction of the substance. It is not necessary to wait until the water and the composition have become thus separated in the tank, because the act of removing them therefrom will probably cause them to mix again. The water and composition are now removed from the tank on the dock-slip or shore and introduced within the water-bottom which is to be coated. This may be done by hand with buckets, or in any other suitable way, but I prefer to effect this transfer by means of the pump C and pipes *a a*, before described, since these elements form a part of the boat, and by means thereof the water and composition can be introduced within the water-bottom in a very little time.

The water-bottom is to be filled entirely with the water and composition, which is then allowed to settle until the composition has risen to the surface of the water, and will come in contact with the top of the water-bottom, so as to effectively coat the same. As soon as the composition has risen to the surface of the water and has coated the top of the water-bottom the pump C is started and the water is pumped out of the water-bottom through the pipes *a a* and back into the tank E. Owing to the fact that the bell-mouths of the pipes *a a* are located very near to the bottom of the vessel the water will be first removed from the water-bottom, and as the composition sinks with the water it will effectively coat the interior of the water-bottom, and in all its angles and corners, and in a perfect manner.

The water and composition which is returned to the tank may be used over and over again until exhausted.

After all the water and composition has been removed from the water-bottom I prefer to force air, preferably in a heated condition, within the water-bottom, so as to dry the composition which adheres to the sides

and top thereof. This air may be admitted through the pipes *a a*, and will blow off through the usual manholes in the top of the water-bottom. Instead of air, steam or any other drying agent may be used, and, if desired, the air may be of its normal temperature and not heated.

It will be evident that the final step in the method of forcing air within the water-bottom may be entirely done away with if it is not necessary to dry the composition quickly.

It will also be understood that the water-bottom may be filled entirely with composition, but it is preferable for economy's sake to mix the composition with water.

The apparatus for carrying out the present invention may be changed and modified in many respects, and it relates in no way to the present invention, which consists of the improved method set out in the claims.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. The method of coating the water bottoms of vessels with an impervious composition which consists in introducing a mixture of the water and the composition within the water bottom so as to entirely fill the same; then in allowing the composition to rise to the surface of the water so as to coat the under side of the top of the water bottom with the composition; then in removing the water first and the composition afterward so as to coat the sides of the water bottom with the composition, and also to coat the bottom of the water bottom with the composition, substantially as set forth.

2. The method of coating the water-bottom of vessels with an impervious composition, which consists in introducing a mixture of water and the composition within the water-bottom; then in allowing the composition to rise to the surface of the water; then in removing the water first, and the composition afterward leaving a residue or coating of composition; and finally in blowing air within the water-bottom so as to dry the coating of the composition, substantially as set forth.

ALEXANDER McDOUGALL.

In presence of—

FRANK L. DYER,

LEONARD H. DYER.