No. 663,180. Patented Dec. 4, 1900.

D. MASON.

MEANS FOR CLEANING AND PAINTING OR TREATING SURFACES SUBMERGED IN WATER.

(Application filed Apr. 27, 1900.)

(No Model.)

Fig. 1.

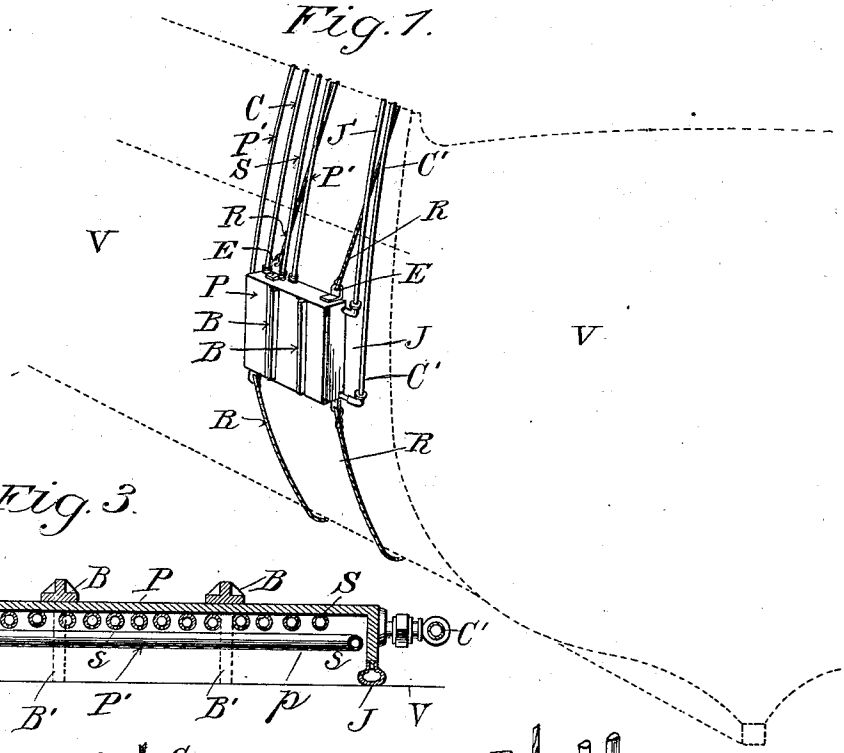
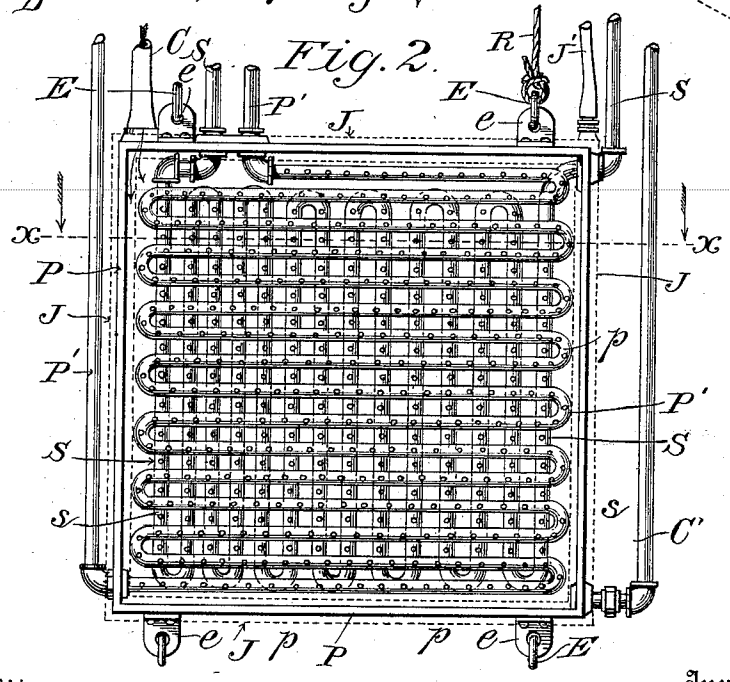


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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MEANS FOR CLEANING AND PAINTING OR TREATING SURFACES SUBMERGED IN WATER.

SPECIFICATION forming part of Letters Patent No. 663,180, dated December 4, 1900.

Original application filed January 20, 1900, Serial No. 2,226. Divided and this application filed April 27, 1900. Serial No. 14,579. (No model.)

To all whom it may concern:

Be it known that I, DAVID MASON, a citizen of the United States, residing at New York, borough of Manhattan, in the county of New York and State of New York, have made a new and useful Invention in Means for Cleaning and Painting or Treating Surfaces Submerged in Water, of which the following is a specification.

My invention has for its objects, first, to provide means for effectually cleaning the bottoms and sides of floating vessels and other submerged surfaces, and, second, to provide means for applying a paint or other protective agent thereto after the same has been thus cleaned and also for effectually drying said paint or protective agent after it has been applied.

My invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 represents in dotted lines a part of the hull of a vessel, my novel means for effecting the results sought being shown in perspective view in full lines and secured to the side of the vessel at a point below the surface of the water. Fig. 2 is an enlarged plan view of the apparatus as seen looking at Fig. 1 of the drawings from the right toward the left-hand side thereof; and Fig. 3 is a transverse sectional view of Fig. 2, taken on the line $x\,x$ and as seen looking thereat from the top toward the bottom of the drawings in the direction of the arrows.

My invention contemplates generically means or apparatus adapted to be lowered beneath the surface of the water and securely attached to the side of a vessel or other submerged surface in such manner as to render its union thereto water-tight, after which the water inclosed between said means or apparatus and the surface of the vessel beneath the apparatus is pumped out.

It contemplates, further, the use of means located within the before-mentioned means or apparatus adapted to subject the protected surface to a spray of superheated steam or of an acid of such a nature as will release such substances as usually become attached to the bottom or sides of a vessel.

It contemplates, further, the use of an apparatus for drying the surface thus cleaned and for subjecting said surface to a spray of paint or such other protective liquid agent as will attach itself thereto, and, finally, the drying of the paint or other protective agent, after which the apparatus is removed to a new or adjacent position and similar treatment effected, said operations being repeated until the entire submerged surface is cleaned or treated.

Referring now to the drawings in detail, in which like letters of reference represent like or equivalent parts wherever used, and first to Fig. 1, V represents the vessel, and P the exterior surface of the preferred form of means or apparatus for accomplishing the result sought, said means or apparatus consisting in the present instance of a rectangular-shaped box or pan made, preferably, of strong steel and having the desired area or surface, but of relatively shallow depth. To the under edge of this box or pan is firmly secured a yielding pneumatic tube J, extending entirely around it, the same being adapted to constitute a sealing means for effectually sealing the apparatus to the side of the vessel or surface to be treated. This pneumatic tube is connected to a strong flexible hose-pipe J′, running to a point above the water, which is adapted to be attached to an air-pump.

e e e represent lugs or ears secured to the four corners of the box or pan and provided each with a metallic ring E, to which are secured the operating-ropes R R R R, four in number.

C represents a strong hose-pipe, which is secured to a tubular fitting entering the upper edge of the box or pan, running to a force or suction pump (not shown) on board the vessel. C′ represents an outlet hose-pipe secured in a similar manner to the bottom of the box or pan, said outlet hose-pipe running also to the pump or to any desired point.

P′ represents a hose-pipe secured by fittings to the opposite ends of a tube coiled back and forth in lines parallel with each other, so as to fill the entire inner surface of the box or pan, said tube being continously perforated, as shown at *p p*.

S represents an additional hose-pipe connected to the opposite ends of a second tube coiled back and forth at right angles to and behind the first-named tube and perforated at *s s*, as shown.

Both of said coiled tubes are firmly secured to the inner surface of the box or pan P.

The outer ends of the several hose-pipes C, C′, P′, J′, and S are carried above the surface of the water and are adapted to be connected to a pump, as will be described in connection with the description of the mode of operation.

B B represent angle-irons riveted or otherwise secured to the outer or bottom surface of the box or pan P for the purpose of giving it sufficient strength to withstand the pressure of the exterior water after the water in the interior thereof has been removed.

B′ B′ represent in dotted lines vertical standards secured to the bottom of the box or pan and adapted to take the place of the angle-irons B B, if preferred. However, I prefer the angle-irons, for the reason that inasmuch as the inner ends of the standards B′ B′ rest against the surface to be treated they will therefore prevent the cleaning and painting of that portion thereof immediately under them.

The operation of the apparatus is as follows: The box or pan is first lowered into any desired position below the surface of the water by the ropes R R R R and firmly secured to the side of the vessel by tightening said ropes by winches or any other preferred means, after which an air-pump is applied to the hose-pipe J′ and air forced into the pneumatic tube J in such manner as to effectually seal the edges of the box or pan to the side of the vessel or surface to be treated. A pump is then attached to the hose-pipes C C′ and all of the water in the box or pan P pumped or forced out, after which the hose-pipe S is attached directly to a source of superheated steam, and the steam is forced therethrough and through the perforations *s s* against the side of the vessel until the surface within the box or pan is effectually cleansed. In place of steam I may use sulfuric, nitric, or hydrochloric acid under high pressure or any well-known acid or liquid which would thoroughly cleanse the surface. In the event of using such acids, however, it will be understood that the box or pan P, the perforated tubes, and their fittings must all be of such materials as are not readily attacked by such acids, and all of the hose-pipes should be lined with a material not attackable by acids of this nature. The hose-pipe S is then connected to a source of hot air or other drying medium and the same is forced through the perforations against the side of the vessel or surface to be cleaned until it is thoroughly dry, after which the hose-pipe P′ is connected to a source of liquid paint or other liquid material designed to treat the surface thus dried and the same is forced therethrough and through the perforations *p p* until the surface already treated is thoroughly covered or impregnated with a coating of the liquid paint or preservative, after which the hose-pipes S S and also the hose-pipes P′ P′ are connected to a source of intensely-hot air or other drying circulating medium and the same forced through all of the perforations *s s p p* until the paint or other agent is thoroughly dry. The air is then released from the pneumatic tube J and the ropes loosened, so that the box or pan can be moved to a new surface, which is treated in like manner until the entire area of the vessel or other submerged surface to be cleaned has been fully treated.

I do not limit myself to the use of the especial means or apparatus hereinbefore described for effecting the results sought, as it is obvious that the same might be modified in many details and still come within the scope of my claims hereinafter made. I make no claim hereinafter, however, to the method of operation by which the results hereinbefore referred to are effected, as this feature constitutes the subject-matter of an application filed by me in the United States Patent Office on the 20th day of January, 1900, bearing Serial No. 2,225, and of which the present application is a division.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. Means or apparatus for cleaning and painting or treating submerged surfaces, consisting of a box or pan provided with means for sealing and securing it to the surface to be treated; in combination with means within said box or pan operatively connected by one or more hose-pipes with means above water for cleaning and treating the surface to which the box or pan is secured, substantially as described.

2. Means or apparatus for cleaning and painting or treating submerged surfaces, consisting of a box or pan provided with means for sealing and securing it to the surface to be treated; in combination with cleansing means located within said box or pan and operatively connected with a hose-pipe extending above water; together with additional means in the box or pan for painting the surface by a spraying action, said means being operatively connected by a hose-pipe with a source of paint-supply located above the surface of the water, substantially as described.

3. Means or apparatus for cleaning and painting or treating submerged surfaces, consisting of a box or pan provided with means for sealing and securing it to the surface to be treated; in combination with means oper-

atively connected with said box or pan for withdrawing the water therefrom; together with additional means located within the box or pan and operatively connected above the surface of the water with means for cleaning the surface by a spraying action, substantially as described.

In testimony whereof I have hereunto subscribed my name this 26th day of April, 1900.

DAVID MASON.

Witnesses:
C. J. KINTNER,
M. F. KEATING.