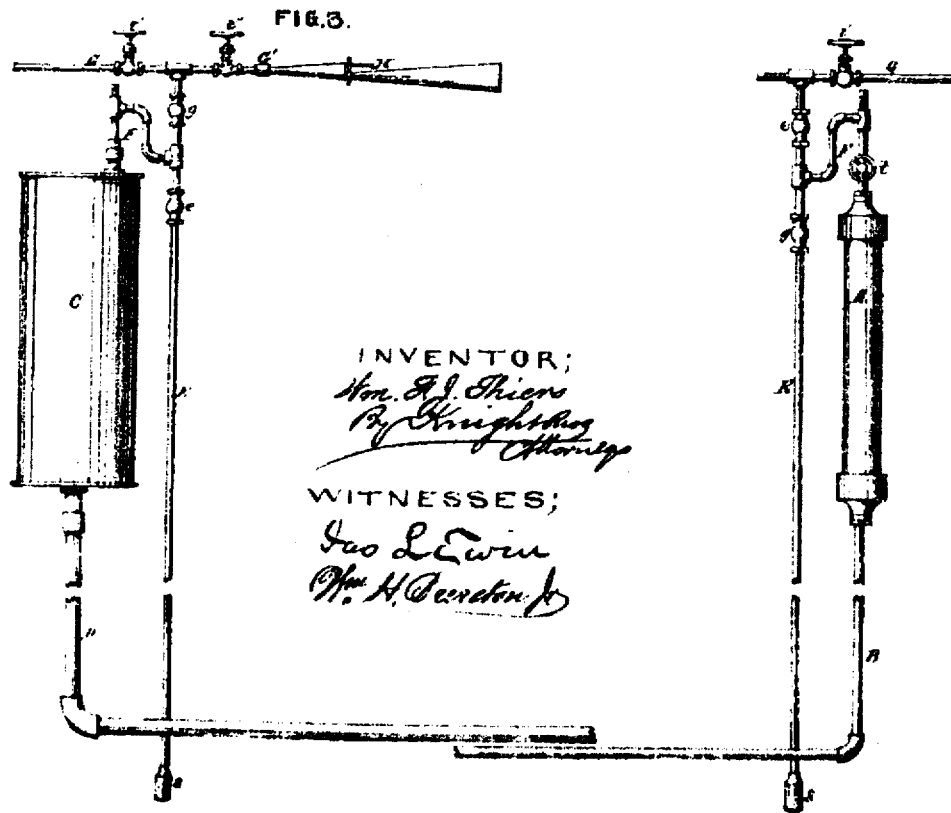
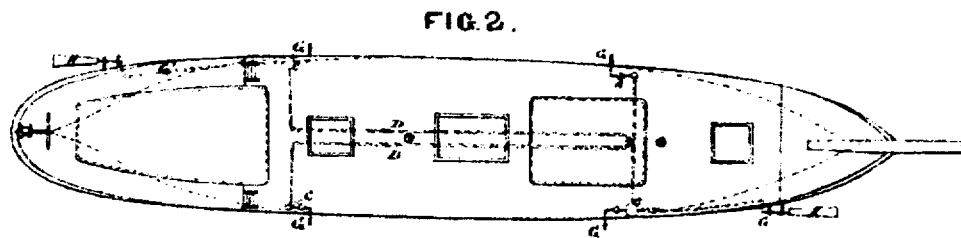
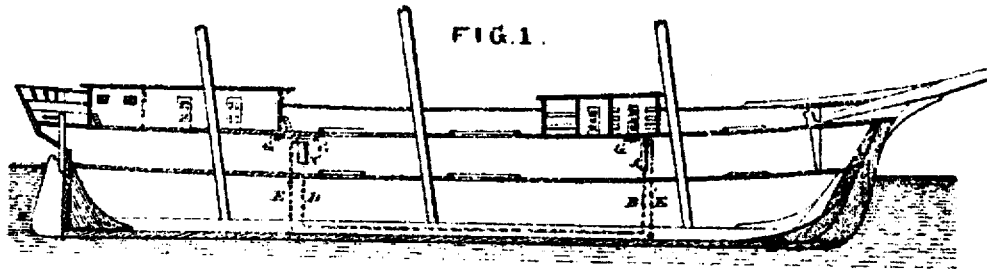


W.F.J. Thiers, 2, Sheets, Sheet 1.

Bilge Water Discharging

No. 109779.

Patented Nov. 29. 1870



INVENTOR;

Wm. F. J. Thiers
By *Augustus* *Attorney*

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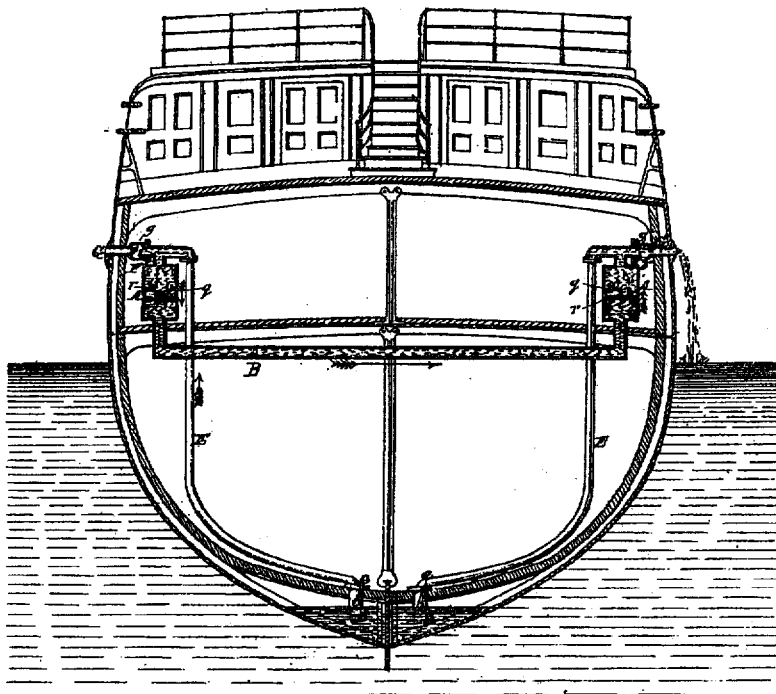
W.F.J. Thiers,

Bilge Water Discharging.

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Patented Nov 29 1870.

FIG. 4



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM F. J. THIERS, OF NEW YORK, N. Y.

IMPROVEMENT IN VENTILATORS, ALARMS, AND BILGE-PUMPS FOR VESSELS.

Specification forming part of Letters Patent No. 109,779, dated November 29, 1870.

I, WILLIAM F. J. THIERS, M. D., of the city, county, and State of New York, Doctor of Medicine, have invented an Automatic Ventilator, Alarm, and Bilge-Pump for Vessels, of which the following is a specification:

Nature and Objects of the Invention.

In carrying out my invention I employ a pair of air-tight chambers or cylinders, applied at or near opposite sides or ends of a vessel, and connected at their lower parts by a pipe or pipes, so that water, quicksilver, or other heavy fluid which may fill the connecting-pipe and partially fill the chambers will, by reason of its own gravity and the motion of the vessel, be caused to pass from one chamber to the other, thereby expelling air or water through suitable discharge-ports from the chamber, which is, for the time being, lower, and causing a partial vacuum in the upper one, so that air or water may be forced into this by atmospheric pressure, to be again expelled at the next motion of the vessel.

For pumping bilge-water, the chambers are supplied with quicksilver. An induction-pipe leads from the bilge of the vessel to each of the air-tight chambers, and the eduction-pipes discharge over the side.

For pumping air, for ventilating, or for an alarm, water may be used in the chambers, the induction-pipe connecting from the hold or other part below decks from which mephitic air is to be taken, and discharged either through a horn or not, according to whether an alarm is or is not required to be sounded.

In practice I prefer to use for pumping air a water-chamber near the bow, communicating with one near the stern and at the opposite side of the vessel, and for pumping water a similar diagonal arrangement of the mercury apparatus, so that both systems may be operated by either a rolling or pitching motion of the vessel.

In order to prevent corrosion from the contact of salt water or moist air, I make or coat the valves and the delicate parts of the alarm-horns with platinum or other metal which will not readily become oxidized. Automatic valves in the several cylinders prevent the discharge of the pumping-fluids.

Description of the Accompanying Drawing.

Figure 1 is a longitudinal section of a ship

provided with my apparatus. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal elevation of the apparatus on one side of the vessel on a larger scale. Fig. 4 is a transverse section of a vessel and of a modification of the apparatus in the same, illustrating the operation.

In the several figures like letters of reference indicate corresponding parts.

General Description.

A A represent water-tight chambers or cylinders, adapted to contain quicksilver, arranged respectively at the bow and stern of a vessel, and on opposite sides, and connected at their lower parts by a pipe, B. C C represent the chambers or cylinders, and D the connecting-pipe of a similar apparatus, adapted to contain water, the cylinders C C being arranged opposite to the mercury-cylinders A A. The two chambers or cylinders of each apparatus or system are thus arranged diagonally with relation to each other, their connecting-pipes crossing. The latter may be laid in any convenient lines. E E represent suction-pipes, and F F branches connecting the said suction-pipes with the cylinders A C at their upper parts. G G represent discharge-pipes, leading from the pipes F. *e g* represent check-valves in the suction-pipes E and discharge-pipes G.

The suction-pipes connecting with the mercury-cylinders A extend to the dead-well or extreme bottom of the hold, so as to take in any bilge-water which may be there, and terminate in strainers *s*, to prevent any obstruction entering. The suction-pipes connecting with the water-cylinders C may be likewise extended and furnished, but are designed chiefly for extension, by branches, to the various parts of the vessel which it may be desirable to ventilate, being adapted to take in the impure air.

G' G' represent branches of the discharge-pipes G of the water-cylinders C, leading to horns H. *t t' t''* are stop-cocks for controlling the operation of the apparatus.

The apparatus A B A and C D C are supplied with sufficient quicksilver and water, respectively, to fill the pipes B D and partially fill the several cylinders A C when the vessel is at rest. This being done, the apparatus operate automatically at all times, the slightest roll or pitch in either direction serving to

fill one pair of the cylinders, forcing out the water or air previously contained and exhausting the other, and thereby drawing from the hold or other part of the ship water or air to fill it. The operation is continuous unless it is checked by closing the cocks *t* in the pipes *F*, leading from the upper parts of the cylinders. Through the pipes leading to and from the mercury-cylinder, bilge-water, if present, and, if not, air, is ejected, while through the other set of pipes the foul air is drawn from the several compartments of the vessel, leaving its place to be supplied by pure.

On closing the cocks *u* in the discharge-pipes of the air-cylinders *C* and opening *u'* in the branches *G'*, the air, as it is forced out, is made to pass through the horns *H*, and an alarm is thus continuously sounded when and as long as it may be necessary.

I propose coating the surfaces of the several valves and valve-seats, the sensitive parts of the horns *H*, and such other parts of the apparatus as it may be deemed advisable, with platinum, or some similar metal or other substance which will resist the corroding effects of sea-water, moist air, and acid. Besides, in this respect the several parts of the apparatus may be of any suitable material and their particular form varied.

In Fig. 4 the apparatus represented is of modified form, a single transverse system being employed. *r r*, Fig. 4, represent buoyant valves, adapted to float on the surfaces of the

pumping-fluids, mercury or water, to prevent the discharge of the same by closing the mouths of the pipes *F*. *q q*, Fig. 4, represent levers for guiding the valves *r*.

Although I have described one apparatus or set of appliances supplied with mercury and another with water, for the respective purposes of pumping water and air, and have shown the cylinders *A* and *C* of the relative size which would result, I do not confine myself in these particulars. It is evident that either mercury or water would perform either or both operations, and I propose so arranging the apparatus when, for any reason, it may be desirable.

Claims.

I claim as my invention—

1. The chambers *A* or *C*, connecting pipe or pipes *B* or *D*, induction port or ports *E*, and eduction port or ports *G*, arranged to operate in combination, substantially as and for the purposes set forth.

2. The diagonal arrangement of the connected chambers or cylinders of the respective systems, to adapt them to be operated by either the pitching or rolling motion of the vessel, as set forth.

WM. F. J. THIERS, M. D.

Witnesses:

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WM. H. BRERETON, JR.