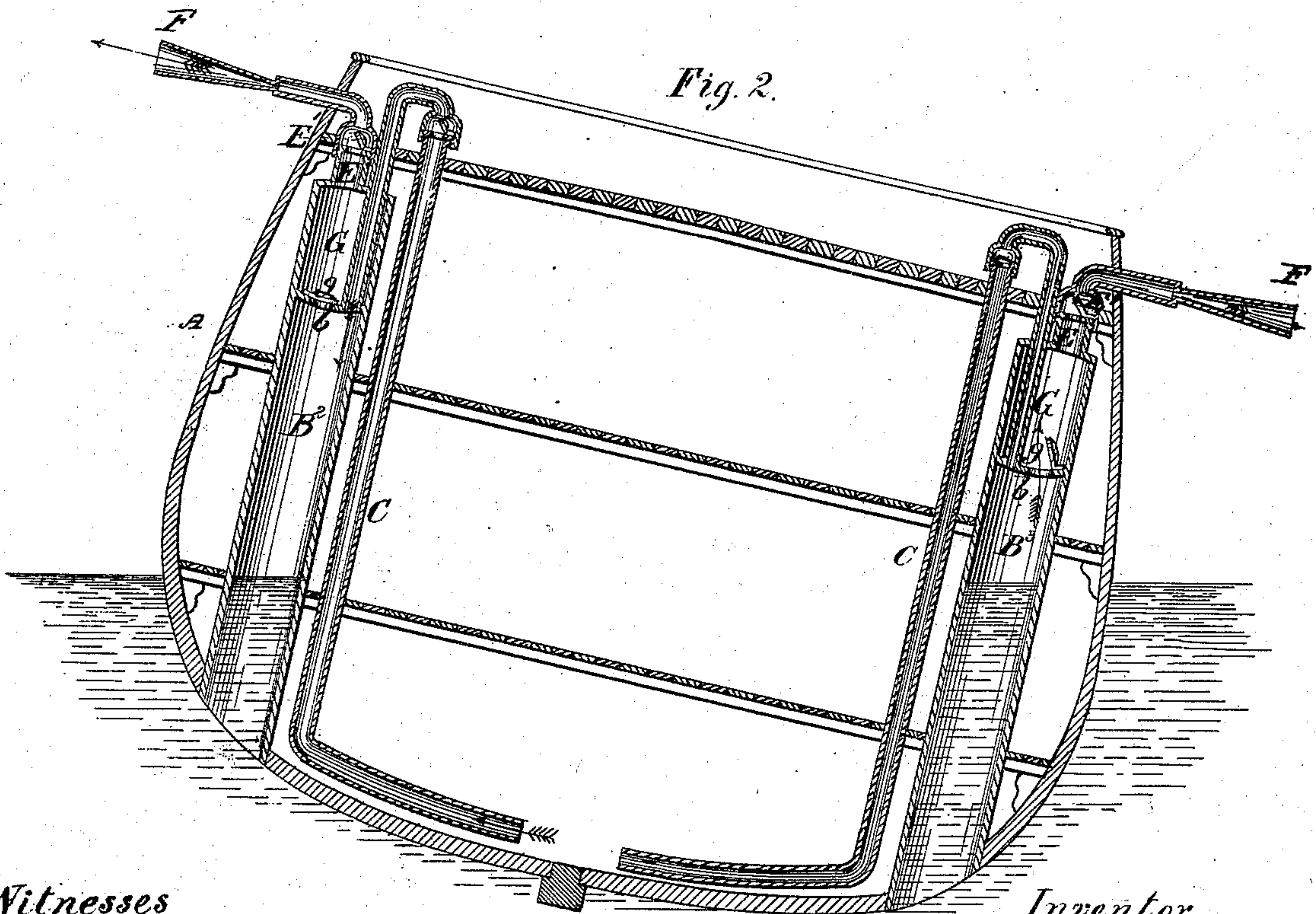
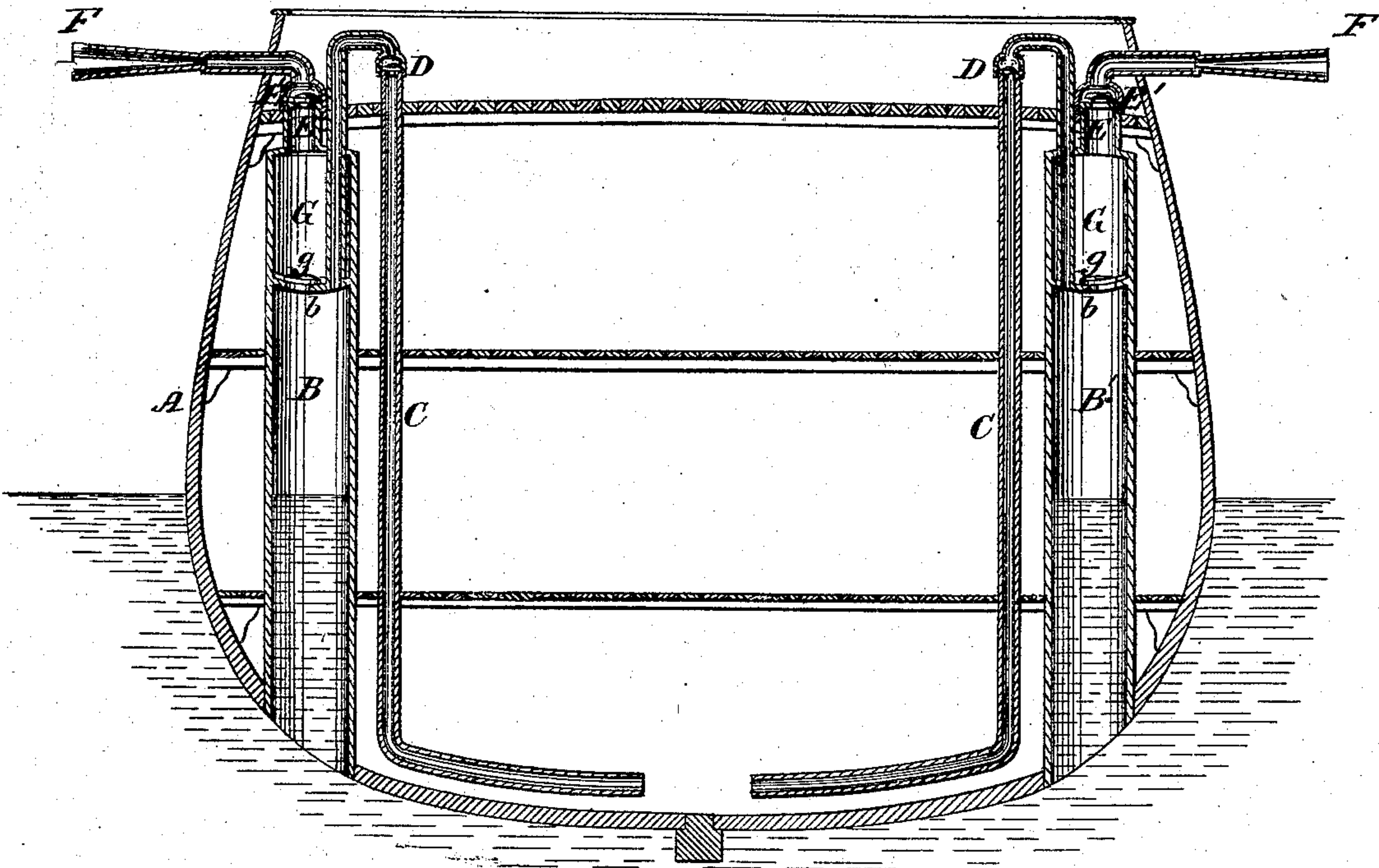


Apparatus for Ventilating Vessels.

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Fig. 1.

PATENTED JUL 25 1871



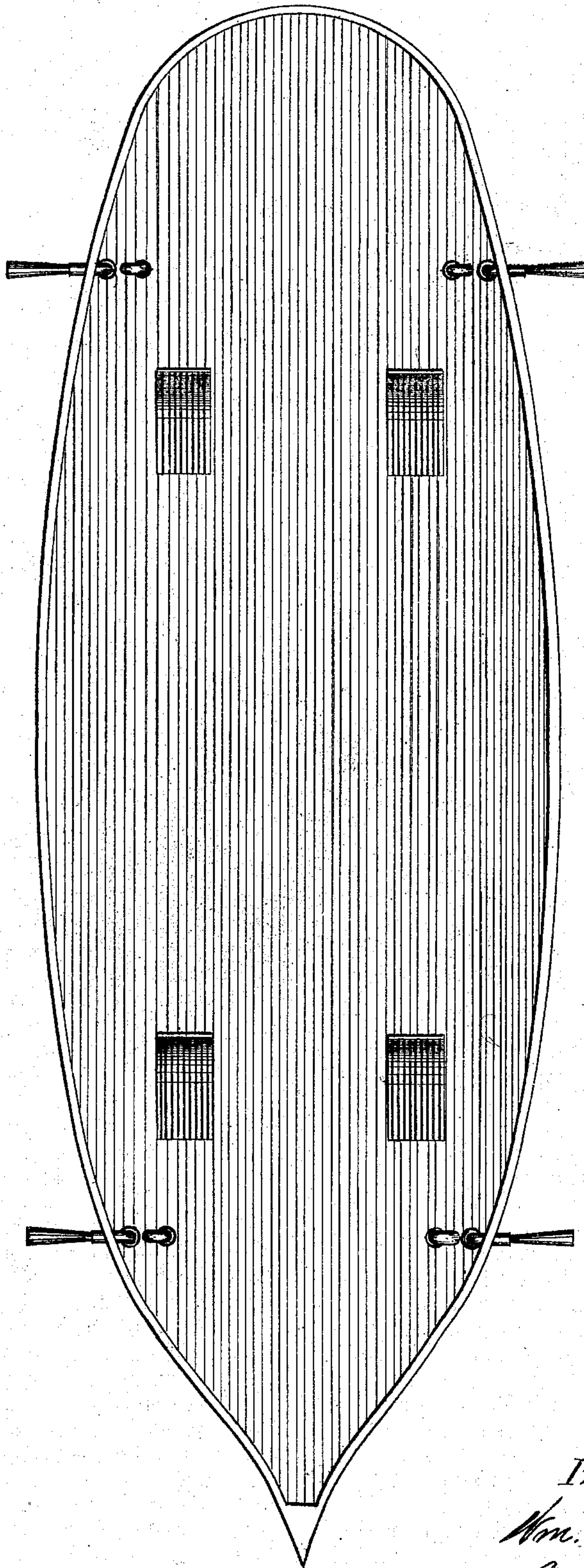
Witnesses
Geo. L. C. Wain
Walter Allen

Inventor
Wm. F. J. Thiers
By *[Signature]*

Plates

Wm. Fitz James Thiers M.D. ^{Plate 2.}
Apparatus for Ventilating Vessels.
Fig. 3.

117484



Witnesses.

Geo L. Ewin

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UNITED STATES PATENT OFFICE.

WILLIAM FITZ JAMES THIERS, OF NEW YORK, N. Y., ASSIGNOR TO UNIVERSAL SHIP-VENTILATOR, ALARM, AND BILGE-PUMP MANUFACTURING COMPANY, OF NEW YORK CITY.

IMPROVEMENT IN VENTILATORS FOR SHIPS.

Specification forming part of Letters Patent No. 117,484, dated July 25, 1871.

To all whom it may concern:

Be it known that I, WILLIAM FITZ JAMES THIERS, M. D., of the city, county and State of New York, have invented a new and useful Method and Apparatus for Ventilating Vessels, of which the following is a specification:

My invention relates to an improved method and device for employing the weight, inertia, or momentum of water to impart motion to air, which, by means of a suitable arrangement of pipes and valves, may cause a continuous current, so as to exhaust foul or vitiated air from below the deck of a steam or sailing-vessel of any kind or dimensions, or may displace foul air by forcing fresh air in from the exterior. For this purpose I employ any suitable arrangement of pipes, chambers or cylinders, communicating at their lower ends with the water in which the vessel floats, and at their upper ends with any suitable system of ventilating-pipes controlled by automatic valves, so that a rocking or pitching motion of the vessel, by causing the first-named pipes, chambers, or cylinders to alternately descend to a greater depth in the water and again rise therein, will alternately eject a portion of the air contained in such pipes or chambers, and, by again partially exhausting them, cause an influx of air from another source. My invention further consists in combining with a water-chamber, applied substantially as herein set forth, a chamber arranged to receive air from the said water-chamber and prevent its return or to imprison a body of compressed air, and, by means of a fog-horn or other appliance, to sound a continuous alarm when required. In carrying out the invention it is preferred that the exhaustion of such pipes or chambers, by the descent of the water within them, shall cause them to be filled with vitiated air from the ship's hold or other part below the deck, and the reflux of water into such pipes or chambers shall eject the air on the outside of the vessel. The heaviest or foul air may thus be removed from any part of the ship's hold, and its place will naturally be supplied by fresh air forced in by atmospheric pressure.

Figure 1 is a transverse section illustrating my apparatus, the vessel being on an even keel. Fig. 2 is a similar section, illustrating the operation of the apparatus when the vessel has a rolling motion. Fig. 3 is a plan, showing the location of the pipes at bow and stern.

A may represent the hull of the vessel. B B¹ B² B³ are vertical chambers or pipes of large capacity, which may be located between the planking of the vessel or within the hold, or, when the apparatus is to be adapted to vessels already built, the chambers may be applied on the outside thereof. The lower ends of said pipes or chambers communicate with the water in which the vessel floats, and preferably at a sufficient distance below the surface to prevent their said lower ends rising above the water by any motion of the ship, though this is not essential or important, except inasmuch as it is desirable to effect by the motion of the ship as great a motion of the lower openings of the pipes through the water as may be practicable, in order to secure the most effectual action of the apparatus. C C represent air-pipes communicating from the upper parts of the chambers B B¹ B² B³ to any part of the vessel which it is desired to ventilate. In the preferred form of my invention these pipes are provided with check-valves D, which permit the air to flow freely from said pipes C into the chambers B B¹ B² B³, but prevent the reflux of air from the said chambers into or through the pipes C. E E represent pipes, also communicating with the upper parts of the chambers B B¹ B² B³, and discharging in any place external to the vessel. The pipes E E are provided with check-valves, E¹, which prevent the reflux of air through them into the chambers B B¹ B² B³. Fog-horns F may be applied to one or more of the discharge-pipes E and arranged to be sounded when desired, as described in my former patent, dated November 29, 1870. The chambers B may be divided by diaphragms b having valves g, so as to provide air-reservoirs G above.

The parts being constructed and arranged in any manner substantially as above described, it will be evident that the descent of any one of the chambers B B¹ B² B³ into the water will, by the rise of water into such chamber, cause a portion of the contained air to be ejected therefrom through the discharge-pipe E, while any one of the said chambers which rises in the water will, by the fall of water within it, be partially exhausted, causing air to be forced into it through the pipe C by atmospheric pressure, and as the pipe C communicates with any part of the vessel which is to be ventilated, vitiated air will be taken therefrom and its place supplied by fresh air from with-

out. By this means any pitching or rolling motion of the vessel will, as long as it is continued, produce a constant and active ventilation of the hold or other interior part of the ship, the weight, inertia, or momentum of water received from outside into the chambers B B¹ B² B³, and again discharged therefrom, constituting the motive power. As a modification of my invention, the valves may be reversed so that E will act as the induction-pipe, taking fresh air from without, and the pipes C will deliver it into the interior part of the vessel, thus displacing and discharging the vitiated air therein contained. This modification of the invention is considered inferior to that first described, because, as it frequently happens that the vitiated air is heavier than the atmosphere, there is danger that the worst air may not be removed; whereas, by employing the suction-pipes C to remove the vitiated air, said pipes, by communicating with the lowest stratum, may be made to effectually carry off that which it is most important to discharge or change. For some purposes it is preferred to provide the chambers B with diaphragms *b* through which the air-pipes C pass and in which diaphragms check-valves *g* are applied. By this means a chamber, G, is provided above said diaphragms *b* to receive air which is ejected from the water-chamber B, and prevent its return. If, now, any excessive pressure be produced in the chamber G, by reason of air being forced out of the chamber B into the chamber G faster than it can escape from the latter, the air may continue to escape from said chamber during the return motion of the vessel,

and leave the water-chamber B free to receive a new charge of air through the pipe C, and when a fog-horn, F, is employed in connection with the air-chamber G the apparatus may be made to sound a continuous alarm by a body of air being at each motion imprisoned and slightly compressed in the chamber G.

My present improvement differs essentially from the apparatus having connected water-chambers in these respects: First, the action of the various chambers is entirely independent. Second, the effect is produced not only by the motion of the vessel itself, but by the undulatory motion of the water independently of the vessel. The apparatus is thus rendered much more sensitive and effective.

I claim as my invention—

1. The method and apparatus herein described for ventilating vessels, by means of chambers B B¹ B² B³ communicating at their lower parts with the water in which the vessel floats, and at their upper parts with air-pipes controlled by valves, substantially as explained.

2. The air-chamber G, in the described combination with the water-chamber B, employed in connection with the valve *g* to prevent the reflux of air into the said water-chamber, or for use, in connection with a horn, F, to sound a continuous alarm.

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

Witnesses:

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