

J.B. Eads.
Screw Propeller
No 37,157 *Patented Dec. 16, 1862.*

Fig. 1.

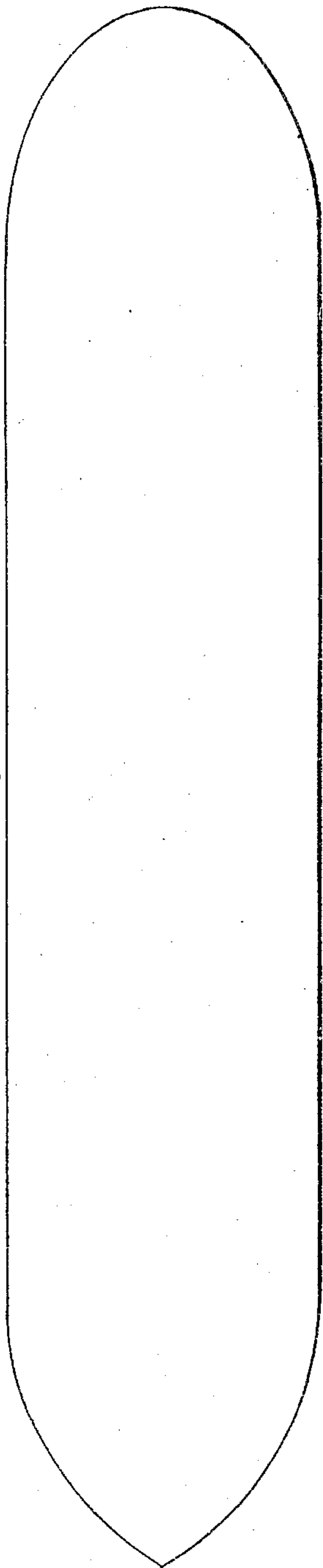


Fig. 2.

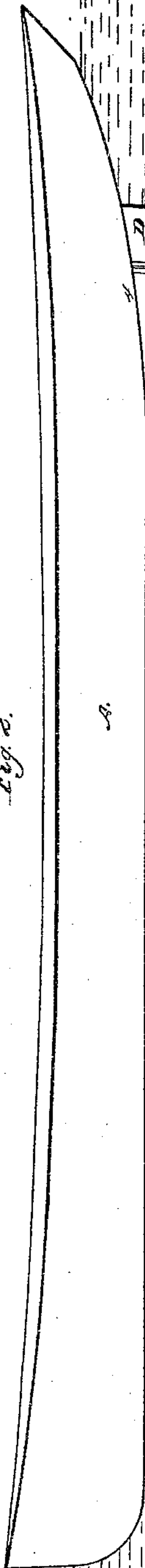


Fig. 3.

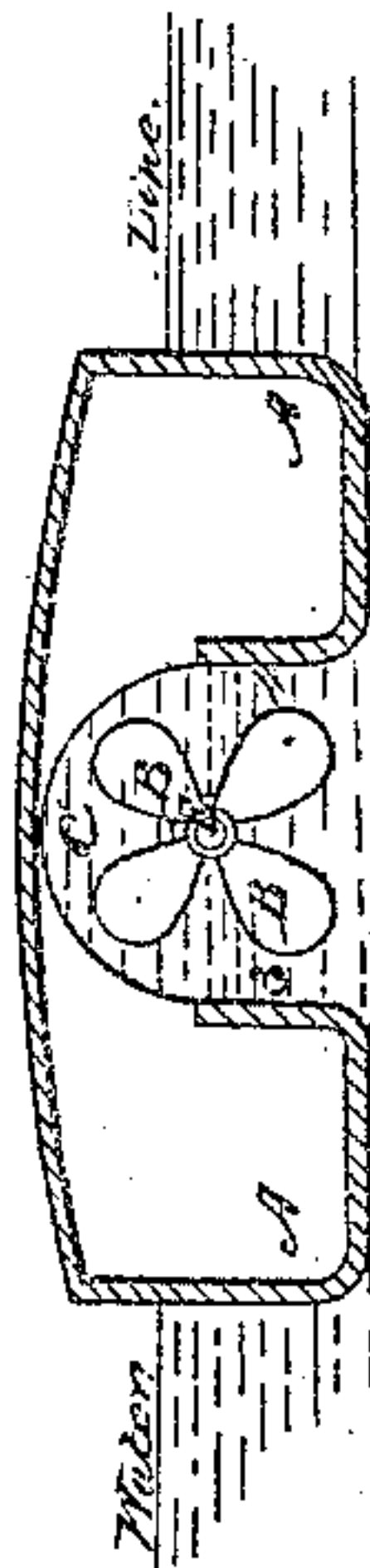
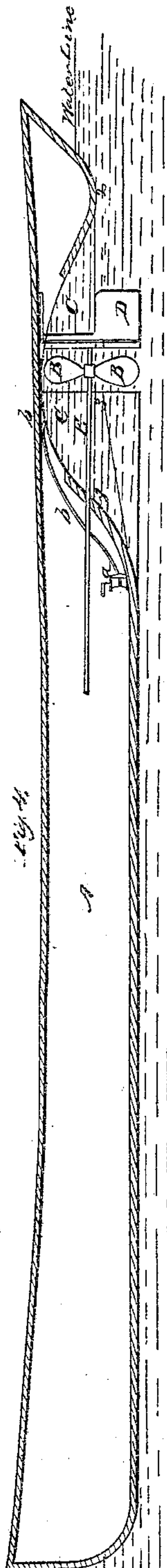


Fig. 4.



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IMPROVED WAVE PROPELLERS FOR SHALLOW WATER.

Specification forming part of Letters Patent No. 37,157, dated December 16, 1862.

To all whom it may concern :

Be it known that I, JAMES B. EADS, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in the Application of Large Propellers to Light-Draft Vessels, which I term a "Wave Propeller;" and I do hereby declare that the following is a full, clear and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 may represent the deck of a vessel. Fig. 2 represents a side elevation thereof. Fig. 3 represents a transverse vertical section near the stern of the vessel, showing the propeller and the chamber in which it works; and Fig. 4 represents a longitudinal vertical section through the vessel, showing the propeller and its chamber.

I am aware that a case or covering has been placed over the upper portion of a propeller, and that a paddle-wheel has been worked in an air-tight chamber, but neither of these things accomplish the object I have in view.

My invention consists in the use of a chamber filled with water by atmospheric pressure above the level of the water in which the vessel floats, and in using a large propeller on light-draft vessels, the propeller finding a resisting medium in the wave or column of water thus made in the chamber, which shall entirely, or nearly so, cover it.

In light-draft boats or vessels it has been found almost impossible to get a propeller of sufficient capacity to give such a vessel any degree of speed and yet be secured against accidents by shot, shell, or such impediments to navigation as are encountered in shallow waters. Such light-draft vessels must be flat-bottomed and have great beam, which are incompatible with speed. The depth of hold is of course restricted, and a large propeller cannot, as heretofore applied, be used advantageously and be shielded from accident or damage.

These difficulties in the application of proper and safe propulsion to light-draft vessels have led me to the invention which I have made, and which I have above briefly referred to.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents the hull of a vessel of light draft, in or near the stern of which is formed a chamber, C, in which the propeller B works. The lines or "run" of this chamber should be so made as not to impede the ingress or egress of water to or from it. This chamber I propose to fill and keep filled with water, as shown in Figs. 3 and 4, so that the propeller B shall find a resisting medium in the piled-up water in this chamber. It will be perceived (presuming the vessel to be submerged to the line designated "water-line" on the drawings) that the chamber C is entirely cut off and protected from the surrounding air by the sides 1 2 3 4, all of which are below said water-line.

To fill the chamber *c* with water an air-pump, *a*, may be used (the pipe *b*, of which may enter at or near the top of the chamber) to exhaust the air therefrom, and of course the atmospheric pressure outside will force the water into the chamber until it is filled.

The propeller, B is now entirely covered with water, though it may have a diameter of, say, nine feet, while the vessel may not draw more than, say, three or four feet.

The propeller, being set in motion by the engine, finds a resisting medium throughout its entire diameter, and although its rotation may tend to empty this chamber of its water, still there is no obstruction to the free inflow of other water to take its place, and hence it will remain always comparatively full.

Should the vessel roll or "lurch" so as to raise any of the inclosing sides of the chamber out of the water, of course the wave or column of water in it would escape and air would take its place. The "righting" of the vessel again would, by the use of a valve or valves above the chamber and opening outward, allow the air to escape, and a column or bank of water immediately take its place, and thus keep the propeller covered.

I do not allege that by running a propeller in a column of water, say, nine feet high, when the vessel is drawing but, say, four feet, that I have all the advantages of a nine-foot draft; but I have an advantage, and a material one, over a simple four-foot draft, as the resistance of the column of water above the natural surface upon the upper portion of the propeller imparts power of propulsion to it, which it would not have if moving in air or out of water.

D represents the rudder, and E the pro-

propeller-shaft, which is below the water-line. The chamber may be made to contain one or two propellers, as may be preferred; and by being thus placed they are entirely protected from shot or shell, or more than one chamber may be used with a propeller in each.

The chamber or chambers, instead of being at or near the stern of the vessel, may be placed in such other part of the vessel as may be desired.

Should the chamber or chambers lose the inclosed water by a swell or wave, or a depression caused by a swell, the succeeding swell or wave will by its pressure immediately restore it, in whole or in part, the valves acting as in the case of a lurch, as above mentioned. The action of the propeller itself will drive or carry out any small quantity of air remaining in the chamber without the aid of the valves or air-pump.

Another advantage of this tight chamber

consists in the facility afforded for repairing the propeller, as by reversing the air-pump the water may be driven out of the chamber below the level of the surrounding water, the workman having been previously introduced through a man-hole which has been closed airtight after him. By "light draft," I mean of less draft than the diameter of the propeller.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

Providing light-draft vessels with a chamber in which the propeller works when said chamber is filled with water by atmospheric pressure to a height above that of the water in which the vessel floats, for the purpose and in the manner substantially as herein described and represented.

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