E. T. Ligon.

Propelling Vessels.

105098

PATENTED JUL 5 1870

fig. 3.

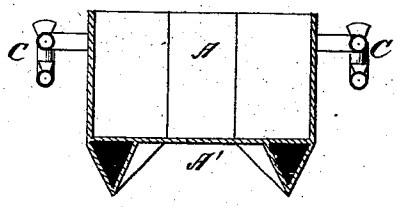


fig. 2.

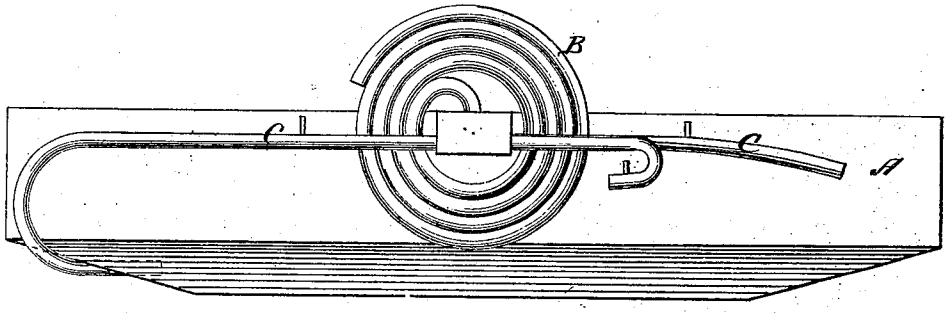
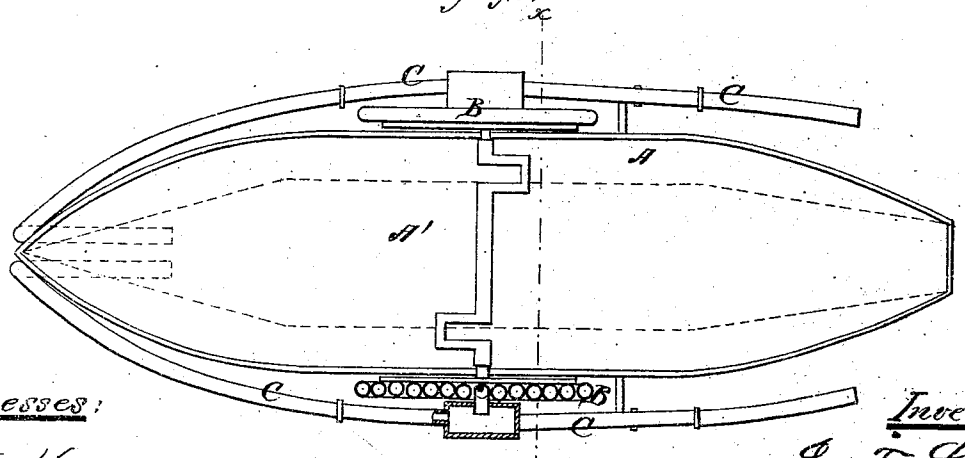


fig. 1.



Witnesses:

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EDWIN T. LIGON, OF DEMOPOLIS, ALABAMA.

Letters Patent No. 105,098, *dated July* 5, 1870.

IMPROVEMENT IN PROPELLING APPARATUS.

The Schedule referred to in these Letters Patent and making part o the same.

To all whom it may concern:

Be it known that I, EDWIN T. LIGON, of Demopolis, in the county of Marengo and State of Alabama, have invented a new and useful Improvement in Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a plan view of a vessel, with horizontal sections of the helical-pumps, and dotted lines showing the air-chamber;

Figure 2 is a side elevation; and

Figure 3, a transverse vertical section in the line *x x*, fig. 1.

This invention is carried out by discharging currents of air, or air and water, into a chamber formed between a vessel's bottom and the water over which she is moving.

The object sought to be effected by this arrangement is to diminish friction, render the vessel more buoyant than she would otherwise be, and directly assist in her propulsion.

In the drawing—

A is a sea-going vessel, about whose construction there is nothing peculiar, except that lengthwise of her under side is made, amidships, an open chamber, A′, extending nearly from the stem quite to the stern, and without bottom or rear end.

B B are Wirtz's helical or spiral pumps, vertically placed at the extremities of a shaft running transversely of the ship, said pumps serving instead of paddle-wheels, the shaft being rotated by an engine.

The helical-pumps, after the fashion of this machine, on revolving rapidly, take in air and water at their outer ends, and discharge the same from their inner ends into pipes, C C, extending horizontally along the ship's side, outside the pumps; said pipes running forward, and being curved downward and backward, so as to enter the chamber A′ at its front end; said pipes also extending aft the helical-pumps, and terminating at any required point outside the air-chamber A′.

Valves are placed in the pipes, both forward and aft, by which the direction of the mingled currents of air and water received by the pipes from the helical-pumps is controlled. If the rear valves be closed, these currents are directed into the chamber A′, where they form a stratum of air between the bottom of the vessel and the water beneath, which, it seems reasonable to suppose, diminishes the friction attendant upon the progress of the vessel. It also increases the buoyancy of the ship.

It is a well-known fact that, when steamers are under rapid headway, they show a tendency to bury themselves in the water, and this I account for on the supposition that their motion creates a partial vacuum beneath them. Whatever be the cause, the difficulty is remedied by the stratum of air in the chamber A′.

The air and water currents discharged from the pipes C also serve, by reaction, to assist in the propulsion of the vessel. If the forward valves be closed, the contents of the pipes C are discharged rearward, and simply perform the last-mentioned function of aiding in propulsion.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

A vessel, provided with a chamber in her bottom, and with pipes leading thereinto, and with helical-pumps, all combined and operating as described, for the purpose of forming an air stratum in the chamber, and discharging currents of air, or air and water, which may aid in the propulsion of the ship.

E. T. LIGON.

Witnesses:

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