

(No Model.)

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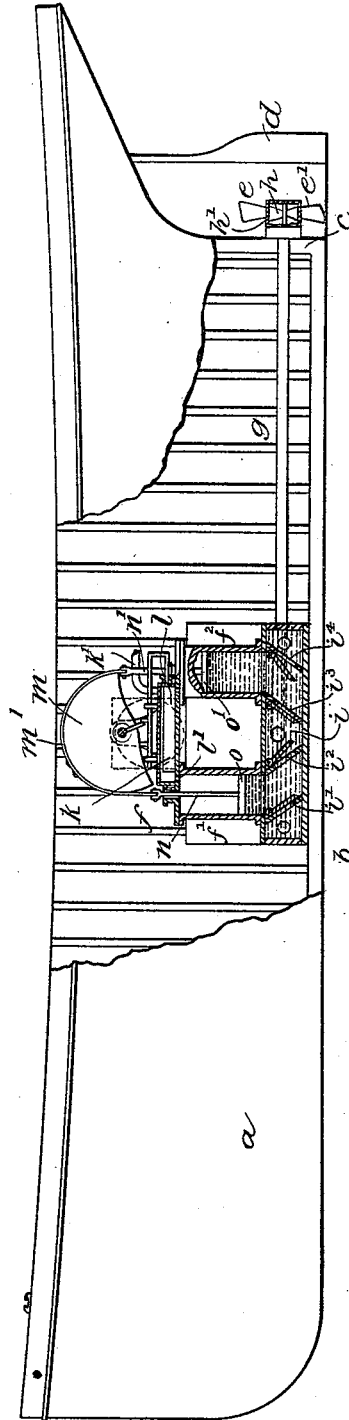
J. WIDMER.

HYDRAULIC METHOD OF PROPELLING VESSELS.

No. 525,881.

Patented Sept. 11, 1894.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

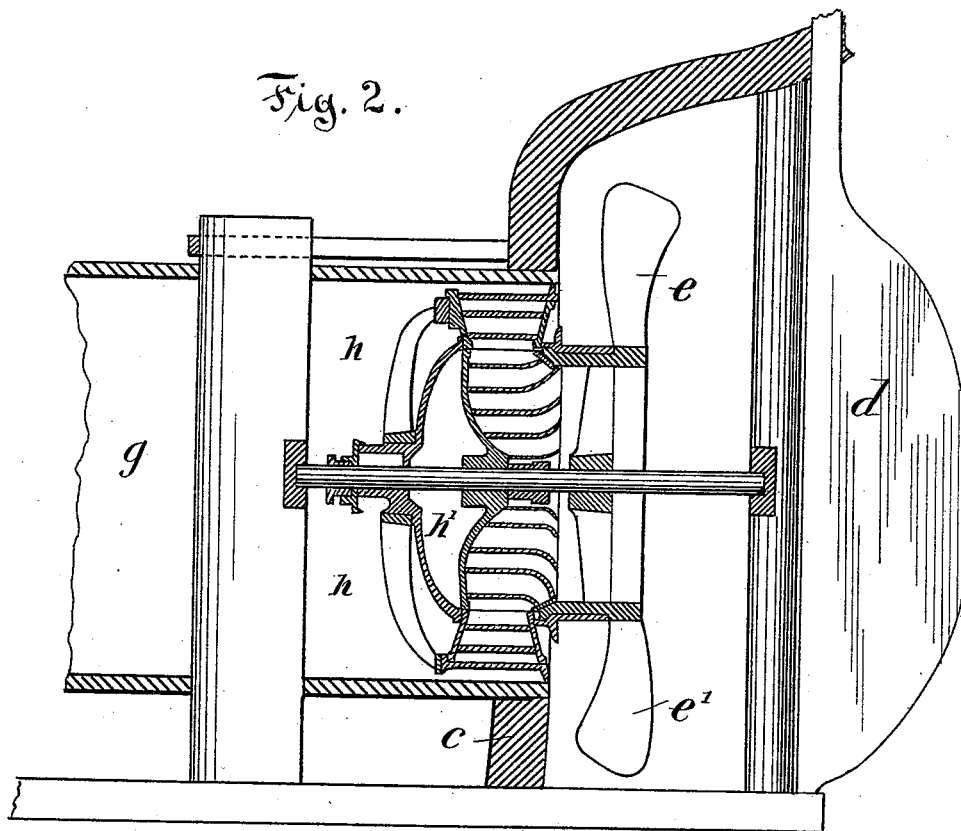
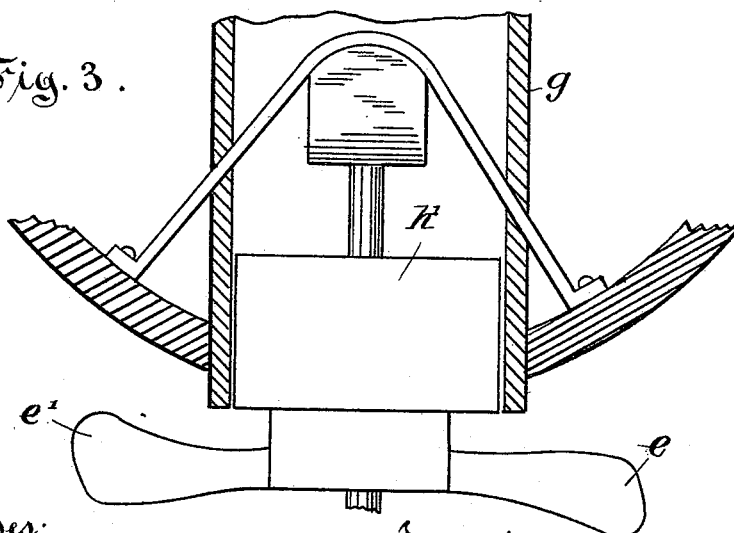


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC METHOD OF PROPELLING VESSELS.

SPECIFICATION forming part of Letters Patent No. 525,881, dated September 11, 1894.

Application filed September 28, 1892. Serial No. 447,200. (No model.)

To all whom it may concern:

Be it known that I, JACOB WIDMER, of New Hartford, in the county of Litchfield and State of Connecticut, have invented certain
5 new and useful Improvements in Methods of Propelling Vessels, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

10 My invention relates to methods of propelling vessels the driving mechanism of which comprises a propeller screw and the object of my invention is to provide a method and means for propelling a vessel at great speed in
15 an economical manner and by means that are comparatively simple and that may be used with a great economy of power.

To this end my invention consists in the method of propelling the vessel by a screw
20 propeller actuated from a turbine by a stream of water projected through the apparatus and in details of the several parts making up the method and device as a whole as more particularly hereinafter described and pointed
25 out in the claims.

Referring to the drawings; Figure 1 is a detail view in vertical central section of a ship showing the arrangement of the propelling means. Fig. 2 is a detail view on an enlarged scale in vertical section of the after
30 part of the ship showing the propelling mechanism. Fig. 3 is a detail view on an enlarged scale in horizontal section of the after part of a ship showing the propelling mechanism.
35 In the accompanying drawings the letter *a* denotes a steamship of ordinary construction; *b*, the keel; *c*, the stern post; *d*, the rudder, and *e* the screw propeller.

Within the vessel is arranged a series of
40 steam boilers for making steam to be used in driving the engine *f*. This steam engine is connected or coupled up to a pump that is used to force water through a discharge tube *g* in the outer end of which is fitted a turbine
45 wheel *h*. The casing *h'* of this wheel is mounted in the tube or on the end in such manner as to allow the propeller blades of the screw propeller *e* to be secured to the moving part of the turbine wheel so that as
50 the latter revolves the blades *e'* will turn with the wheel, such blades turning in the water

that surrounds the tube and in which the vessel floats.

In the form of apparatus illustrated in the within drawings I have shown a combined
55 steam engine and pump that is adapted for such use, although my invention is not limited to any particular construction of steam engine or pump, whether such apparatus are made separately or are combined.

In the engine shown the letters *f'* and *f''*
60 denote two cylinders that are mounted upon a water chest *i* in such manner that the space or chamber directly below the cylinders in such water chest directly communicates with
65 the interior of the cylinders. The water chest is provided with a series of check valves *i'*, *i''*, *i'''* and *i''''* arranged for a purpose that will be hereinafter described, two of the valves being appurtenant to the cylinder *f'* and two
70 others to the cylinder *f''*.

Above the two cylinders is arranged a steam chest *k* that is connected to the boilers as by a pipe *k'*, and within this steam chest a valve
75 *l* is arranged so as to alternately open and close the steam ports *l'* and *l''* that are appurtenant to the respective cylinders *f'* and *f''*.

A valve rod extends through a suitable stuffing box in the wall of the steam chest and is connected to a device for reciprocating
80 the valve. On suitable standards a wheel *m* is supported directly over the steam cylinders in such position that a flexible band *m'* secured to the wheel may be connected to the
85 upper ends of the piston rods *n*, *n'*, the lower ends of these rods being secured to the pistons *o* and *o'*, these parts being so arranged that when one of the pistons *o* is making a downward stroke the other piston *o'* will be making an upward stroke, and the movement
90 of the pistons will alternate as steam is admitted into the respective cylinders above the pistons or exhausted from the steam space.

The delivery tube *g* is connected to the discharge outlet of this water chest, the operation of the combined steam engine and pump being as follows: When steam is admitted to the cylinder *f'* by the opening of the steam port appurtenant to that cylinder, the piston
95 *o* is forced downward and any fluid beneath the piston is forced outward from the chamber passing through the opening made by the
100

lifting of the check valve v^2 ; the check valve v^3 being closed by the same movement of the fluid that tends to open the check valve v^2 . At the time the piston o is moving in the direction just described the piston o' is being lifted in the cylinder in a reverse direction with a result that water is drawn from any suitable source of supply connected to the water chest into the cylinder by the opening of the check valve v^4 , this upward movement of the water into the cylinder f^2 tending also to close the check valve v^3 .

By the operation of the valve mechanism the steam port communicating with the cylinder f' is closed and the other into the cylinder f^2 is opened. The steam pressure upon the pistons o' operates to force the latter downward and to supply the water from the cylinder and from the chamber just below it through the opening made by the lifting of the valve v^3 . The piston o is being lifted while the piston o' is moving downward so that there is an alternate filling of the several cylinders with water and an emptying of such cylinders by this alternate reciprocating movement of the several pistons. The water is driven forcibly from the central chamber in the water chest through the discharge tube g and is discharged in a manner that causes the turbine wheel to be driven with great force and speed. This rotary movement of the turbine carries with it the screw propeller and operates to drive the vessel. The pro-

pulsion of the vessel is also aided by the forcible discharge through the turbine of the water used to turn it in the manner described.

The suction pipes from the water chest may, if desired, extend from the bow of the vessel so that the water used in propelling the screw may be drawn from the mass of water immediately in front of the vessel and in a manner that will somewhat relieve the bow from the pressure of the mass through which the vessel is being forced.

I claim as my invention—

1. The within described method of propelling vessels that consists in arranging a turbine wheel at the discharge end of a tube g through which water is forced, the said turbine wheel being provided with external projecting propeller blades e, e' , all substantially as described.

2. In a mechanism for propelling vessels, in combination with a steam engine and a force pump, a discharge tube connected to said pump and opening through the walls of the vessel, a turbine wheel arranged within the tube and having external screw propeller blades secured to the moving part of the turbine and projecting beyond the surface of the tube, all substantially as described.

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Witnesses:

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