C. W. Cahoon.

Hydraulic Propeller.

No. 60,471. Patented Dec. 18, 1866.

Fig: 1.

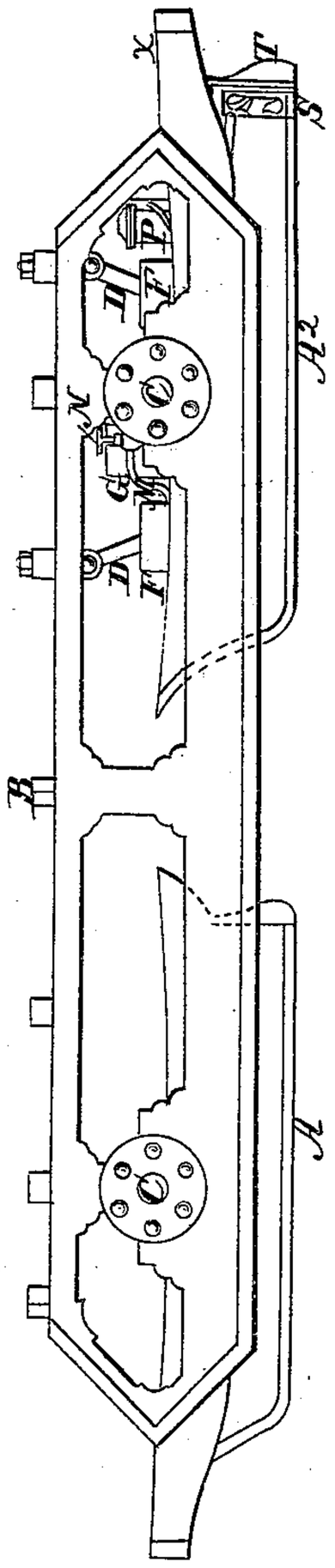


Fig: 2.

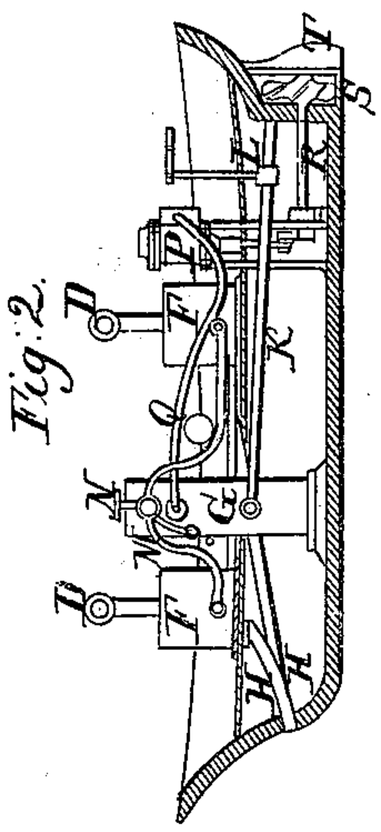


Fig: 4.

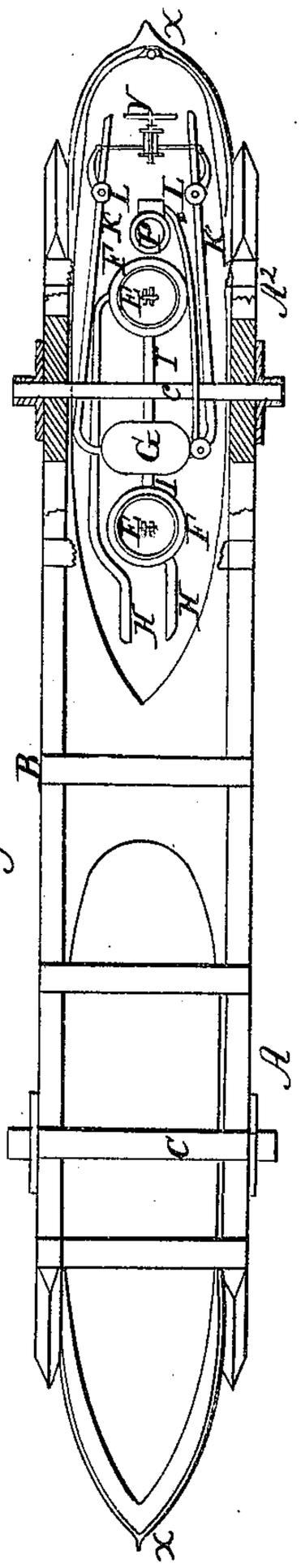
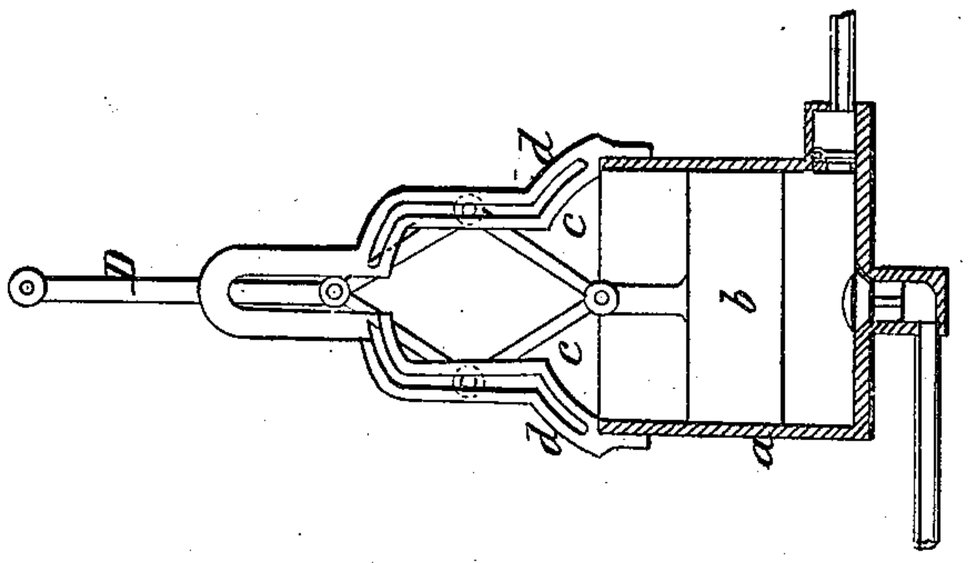


Fig: 5.

Fig: 3.



Witnesses;
John A. Lidback
James B. Cahoon

United States Patent Office.

IMPROVED MEANS FOR PROPELLING VESSELS.

CHARLES W. CAHOON, OF PORTLAND, MAINE.

Letters Patent No. 60,471, *dated December* 18, 1866.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES W. CAHOON, of Portland, in the county of Cumberland, and State of Maine, have invented a new and useful improvement in the Propulsion of Vessels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 represents a side elevation of my invention.

Figures 2, 3, 4, and 5 represent sectional views of parts of the same.

Similar letters of reference in the different figures refer to the same things.

The object of my invention is to apply the undulatory motion of the sea to the propulsion of vessels through the medium of pumps.

Also to afford a means of regulating the movement of the connecting-rods by which the pumps are actuated, so that the length of stroke of the pistons may be governed.

Also to propel vessels by direct impact of fluid when the propelling streams are made to issue in a flaring manner, and to steer vessels thereby.

Also to cause the impelling fluid to act obliquely downwards to the line of motion of the vessel when being propelled.

In order that those skilled in the art may be able to construct my invention, I will proceed to describe it.

A A^2, fig. 1, represent two sea-going vessels, one being forward of and at a short distance from the other. B represents a framing extending vertically down by the sides of both vessels nearly to their keels, and reaching from within a short distance of the stem of the forward vessel to within a short distance of the stern of the after one, extending above the tops of the vessels about one-quarter further than below, and being connected at the top by lateral framework. This framing is made of great thickness and strength, and has the lower part which enters the water made in wedge form. It is jointed to each vessel by shafts, C C, and allowed to vibrate, the shafts passing laterally across the decks of the vessels about midships. Attached to this framing is other framing which passes around the stem of the forward vessel and the stern of the after one, having its shape corresponding to that of the vessels, so that the entire framing encloses both vessels, allowing them to play inside of it for propulsion by the waves; the latter framing being represented by the letters *x x*. The shafts are also of great strength, and are attached to the framing by caps passing over their ends with bolts passing through the sides of the caps and the shafts, having their rims made very broad and bolted to the framing, the shafts turning with the framing on bearings attached to the vessels. D D are connecting-rods attached to framing B, and to the pistons E E, these pistons being parts of two force-pumps, F F, on vessel A^2. G is an air chamber. H H are induction pipes leading from the outside of the vessel near the stern, to the force-pumps F F. I I are pipes leading from the force-pumps to the air chamber G. K K are eduction pipes leading from the air chamber G, through the stern and outside of the vessel, running in an oblique downward direction, this direction being for the purpose of causing the impact of the fluid towards the most resisting part of the water. The outlet ends of these pipes are flattened and curved, so as to give the streams a flaring form, a longitudinal lateral section thereof being shown in fig. 5, the straight part being that nearest the stern of the vessel, and the flaring part the farthest therefrom, so that a very quick and decided action will be made upon the vessel in steering, as well as the exposure of a large frictional surface in the impact. In these pipes, K K, near the stern, are placed valves L L, for steering the vessels, these valves being connected with a wheel and pulley, V, on deck, so that each can be operated alternately at the same time; that is, one shut or partially while the other is open or partially. These pipes, K K, are made smaller in diameter than the induction pipes, so as to produce rapid streams.

The operation is this: as the vessels change their relative positions by the undulating motion of the sea, the framing B is caused to vibrate, and the pumps F F to be worked, drawing the water in through the induction pipes, which are large in diameter, and forcing it out through the eduction pipes, which are small in diameter, against the water outside of the vessels, causing them to be propelled thereby.

M represents a pipe extending from one of the force-pumps to the other, having a valve, N, in the same, a spout, O, leading therefrom outside of the vessel, for the purpose of regulating the speed. When the valve N is open the pumps will not act to propel the vessels, but when partially open there would be some action, depend-

ing upon the extent of the opening. The spout O is to carry off outside of the vessel any water that might issue from the valve N. Fig. 3, *a* represents a force-pump, *b* the piston, *c c* two rods jointed to the centre of the piston and extending outwards; *d d* are two slotted arches attached to the sides of the pump, and extending upwards from the top about the same distance as the length of the pump. *e e* are two rods jointed to the rods *c c*, and extending inwards and jointed to the main connecting-rod, D; the pins which join the rods *c c* and *e e* passing through the slots in the arches on both sides, causing the rods to follow the direction of the slots, the lower part of which, and for about one-third of their length, having an oblique curved course inward towards each other; after which, and for about one-third more of their length, they have a straight parallel course, and for the rest of their length they have again an inward oblique curved course, so that the piston can be confined to a limit of stroke without regard to any irregularity of the waves; requiring less length of pumps, preventing unusual strain upon the machinery, or sudden and dangerous increase of speed; and allowing the use of double-acting pumps when desired. When the waves are of the average height the rods will move only in the parallel part of the slots, but when above they will be carried into the oblique part. P represents a double-acting trunk engine; Q a pipe leading from the same to the air chamber G. Attached to the under side of the piston of the engine P, is a connecting-rod leading to a crank on a longitudinal shaft, R, on the end of which is a propeller, S, so that the propeller may be used in propelling the vessels in conjunction with the streams from the eduction pipes K K, and the streams be used mainly for steering. T represents an ordinary rudder which may be used in conjunction with the streams. U is a pipe for carrying off the fluid after it has been through the engine. The operation when the propeller-wheel is used is this: as the undulatory motion of the sea acts upon the pumps F F, they will draw water from the outside of the vessel, cause it to be forced into the air chamber G, and from thence through the pipe Q, to the engine P, and operating the engine it will pass into the pipe U, and be carried to the outside of the vessel, the operation of the engine causing the propeller-wheel to be revolved and the vessels propelled.

Having thus described my invention, I would remark that air may be used in the pumps instead of water if desired, in which case the induction pipes should open into the air; also, that a common engine governor may be connected with the machinery to regulate its action, either with a valve in the air chamber or in one of the pipes leading therefrom. A flexible pipe may extend from the air chamber on vessel A^2, along the framing B, to an engine on vessel A, the engine being connected with a crank-shaft extending through the stern of the vessel, with a propeller on its end, so that both vessels may have propellers operated by one set of pumps. I would further remark that in the construction of the framing connecting the two vessels, I recommend that it be made of the best ship timber, and planking, in several thicknesses, placed vertically and horizontally, bolted together with great regard to strength, having knees both of wood and iron wherever they can be advantageously placed, with bolts running diagonally from the top of the framing to the bottom; the whole work thereon being done with a view of approximating to the same strength in the connections as if the two vessels were one; that is, as strong as a vessel would be of the length of the two in any part of her. If it should be desired to have but little framing above the tops of the vessels, as with naval ships, an arm may extend from the main shaft to which the framing is attached on the after vessel, down into the hold of the vessel, and the pumps F F placed also in the hold horizontally, having their connecting-rods operating the piston attached to this arm, so that as the shaft was turned by the vibration of the framing, the pumps would be operated by the arm, and the vessels propelled. The framing in this case could be made proportionably thicker, and, for naval vessels, iron plated. Auxiliary engines may be upon one or both of the vessels to propel them in and out of harbors.

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

The application of the undulatory motion of the sea to the propulsion of vessels by means of pumps, and substantially as described.

I also claim controlling the movement of the connecting-rods by which the pumps are actuated, so that the length of stroke of the pistons may be governed, substantially as described.

CHAS. W. CAHOON.

Witnesses:

JAMES B. CAHOON,

JOHN A. LIDBACK.