2 Sheets—Sheet 1.

S. H. COWLES & B. B. BREWER.

Propelling Vessels.

No. 207,018. Patented Aug. 13, 1878.

Fig. 1.

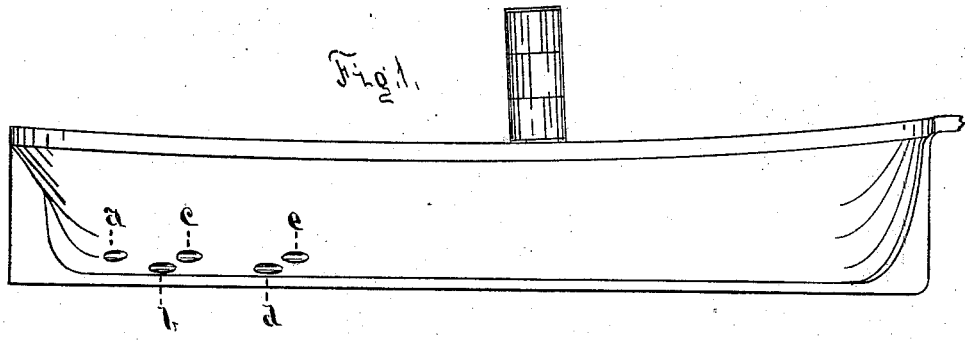


Fig. 2.

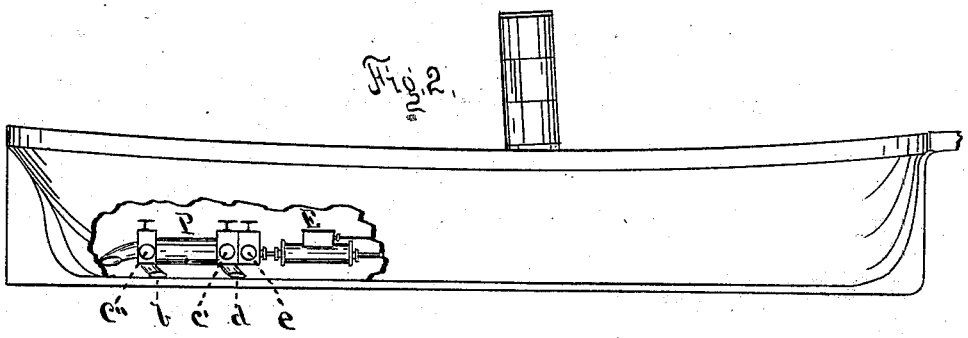
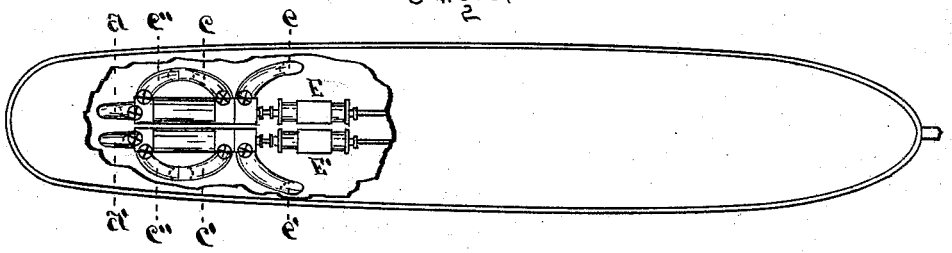


Fig. 3.



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2 Sheets—Sheet 2.

S. H. COWLES & B. B. BREWER.

Propelling Vessels.

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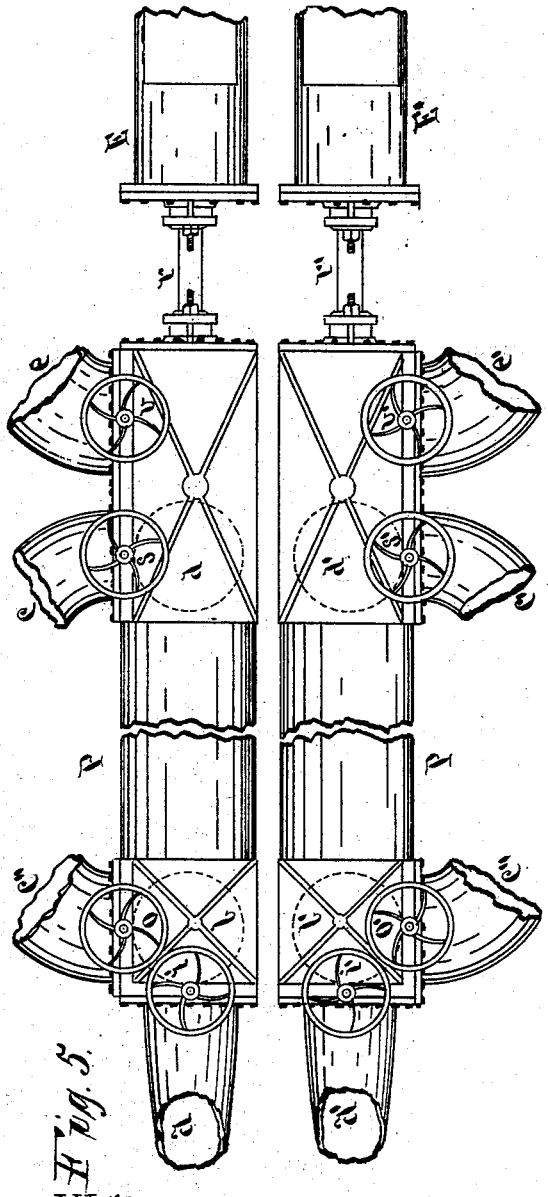

Fig. 3.

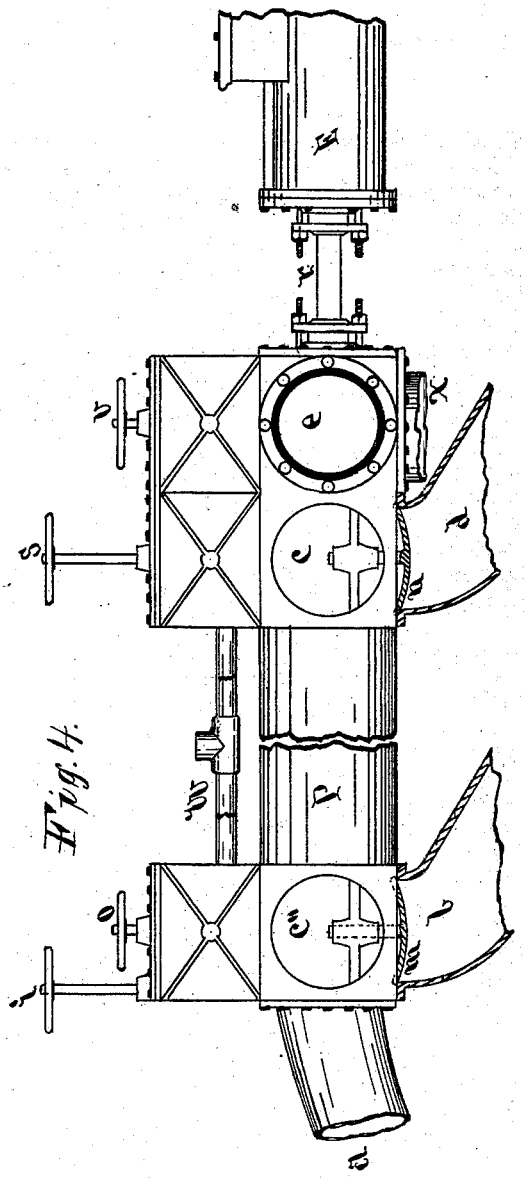

Fig. 4.

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UNITED STATES PATENT OFFICE.

SAMUEL H. COWLES AND BENJAMIN B. BREWER, OF SACRAMENTO, CAL.

IMPROVEMENT IN PROPELLING VESSELS.

Specification forming part of Letters Patent No. **207,018**, dated August 13, 1878; application filed May 15, 1878.

To all whom it may concern:

Be it known that we, SAMUEL HENRY COWLES and BENJAMIN BARTON BREWER, of Sacramento, in the county of Sacramento, and in the State of California, have invented certain new and useful Improvements in Device for Propelling Vessels; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The invention relates to that class or method of propulsion effected by means of drawing the water in from the direction that the vessel is to be propelled and forcing it out in the opposite direction, and is an improvement on Letters Patent No. 198,082, granted to Saml. H. Cowles, dated December 11, 1877.

The invention consists of a combination of water-passages, pumps, and engines, by which the water is acted upon for the purpose of producing a propelling force to the vessel.

The objects of this invention are, first, to avoid the necessity of having any external machinery connected with the vessel that would be liable to breakage from ice, rocks, or other causes; second, to economize in the complication and loss of power by friction to machinery, and the derangement and breakage to the same.

Referring to the accompanying drawing, Figure 1, on Page 1, shows a side elevation of a vessel, presenting the opening or the water-passages through which the water is forced in propelling the vessel. Fig. 2, Page 1, is a sectional elevation of Fig. 1, showing the pumps and engines that are used to propel the vessel. Fig. 3, Page 1, is a sectional plan of the same. Fig. 4, Page 2, is a sectional side elevation of the pumps and part of the engine used to work the same. Fig. 5, Page 2, is a plan of the same.

Fig. 1, Page 1, shows five openings on one side of the vessel, consisting of *a b c d e*, used, respectively, for the following purposes: When it is desired to propel the vessel forward the water is drawn in through the openings *b* and *d*, (see Figs. 2, 3, 4, and 5,) which enter the vessel from a forward direction and lead to the pumps P P′. From thence it is forced out through *a* and *a′* while the pumps make their backward stroke, and out through *c* and *c′* while the pumps make their forward stroke. In each case the water, passing through *a a′* and *c c′*, flows out the vessel in a rear or sternward direction, so that the power required in forcing the water out toward the stern reacts upon the vessel and gives it its forward motion. In case the vessel is to be propelled backward, the water is drawn in through *b* and *d* and ejected through the openings *e e′* while the pump is making its forward motion, and out through *c″ c″* while the pumps are making their backward motion. In each case, while forcing the water out through *e e′* and *c″ c″*, the water is forced toward the bow of the vessel, causing a reaction force which propels the vessel backward or to move in a stern direction. When it is desired to cause the vessel to describe a circular course—that is, to turn either to port or starboard side—the pumps are arranged with suitable valves that change the course of the water, either by causing the pump on one side to work while the one on the other side remains still or to have the pumps on one side to propel the vessel forward, as above described, while the pumps on the other side propel the vessel backward, thus producing opposite forces, that cause the vessel to turn in either direction, according to the action given to the pumps.

By reference to Fig. 3 it will be seen that the pipes or water-ways *c* and *c″* connect, so that both have their openings at *c*. (See Fig. 1.) Fig. 2, Page 1, shows an elevation of the vessel, with side broken away, in order to show the relative position of the engines E, pumps P, and the water-passages *b* and *d*, through which the water is taken into the pumps from the bottom of the vessel, also showing the pipes *e*, *c*, and *c″*, cut off. Fig. 3 is a plan of the vessel with the deck cut away in order to show the engines E E′, the pump P P′, and the pipes or water-passages through which the water is ejected, consisting of *a a′*, *c″ c″*, *c c′*, and *e e′*.

In order to more fully explain the method of working the pumps, for the purposes of producing the effect above stated, we will refer to Page 2, in which Fig. 4 shows an enlarged detail elevation of the part of the engine E and pump P, with the water-passages cut

off, but marked with letters corresponding to their respective openings, as shown in Fig. 1. In Fig. 4 the inlet-passages *b* and *d* are provided with proper valves *m* and *n*, used as check-valves for preventing the return of the water after it has passed through the ways into the pumps.

On the top of the pump P are shown hand-wheels *i*, *o*, *s*, and *v*, which are used to raise and regulate the shut-off valves to their respective openings or pipes *a*, *b*, *c*, *d*, and *e*. In working the valves that connect between the pumps and said pipes, instead of hand-wheels and screws, levers may be used, or any equivalent device by which the different valves may readily be opened or closed.

Fig. 5 is a plan of Fig. 4, showing the two engines E E′, the pumps P P′, worked by the piston-rods *r r′*, leading from the engines to the pumps; also, showing the various water-passages above described, which are shown cut off, but marked with the letters corresponding with their respective openings. (Shown in Fig. 1.)

It is the idea in constructing a vessel to arrange the water-passages *b* and *d*, through which the water enters the pumps, to have them provided with suitable valves, so that, in case that breakage should occur to the vessel, the pumps could draw from the water in the vessel and propel herself by pumping the water, as above described.

One device for drawing from the bilge or leak water is shown by the extra pipe X, Fig. 4; and in case that a fire should occur, the valves could be closed and the water conducted from the pump through proper hose or pipes W, Fig. 4, for the purposes required.

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

1. The combination of the two double-acting pumps P P′, propelling-ways *a a′* and *c c′*, with their respective gates, and the inlets *b d*, with check-valves *m n*, substantially as and for the purposes herein set forth.

2. The water-passages *c″ c″* and *e e′*, with their respective gates, the inlets *b d*, with valves *m n*, and the double-acting pumps P P′, all combined and used substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 13th day of April, 1878.

SAMUEL HENRY COWLES.
BENJAMIN BARTON BREWER.

Witnesses:
EDWARD CADWALADER.
F. T. JOHNSON.