

L. CHASE.

Propulsion of Vessels.

No. 133,758.

Patented Dec. 10, 1872.

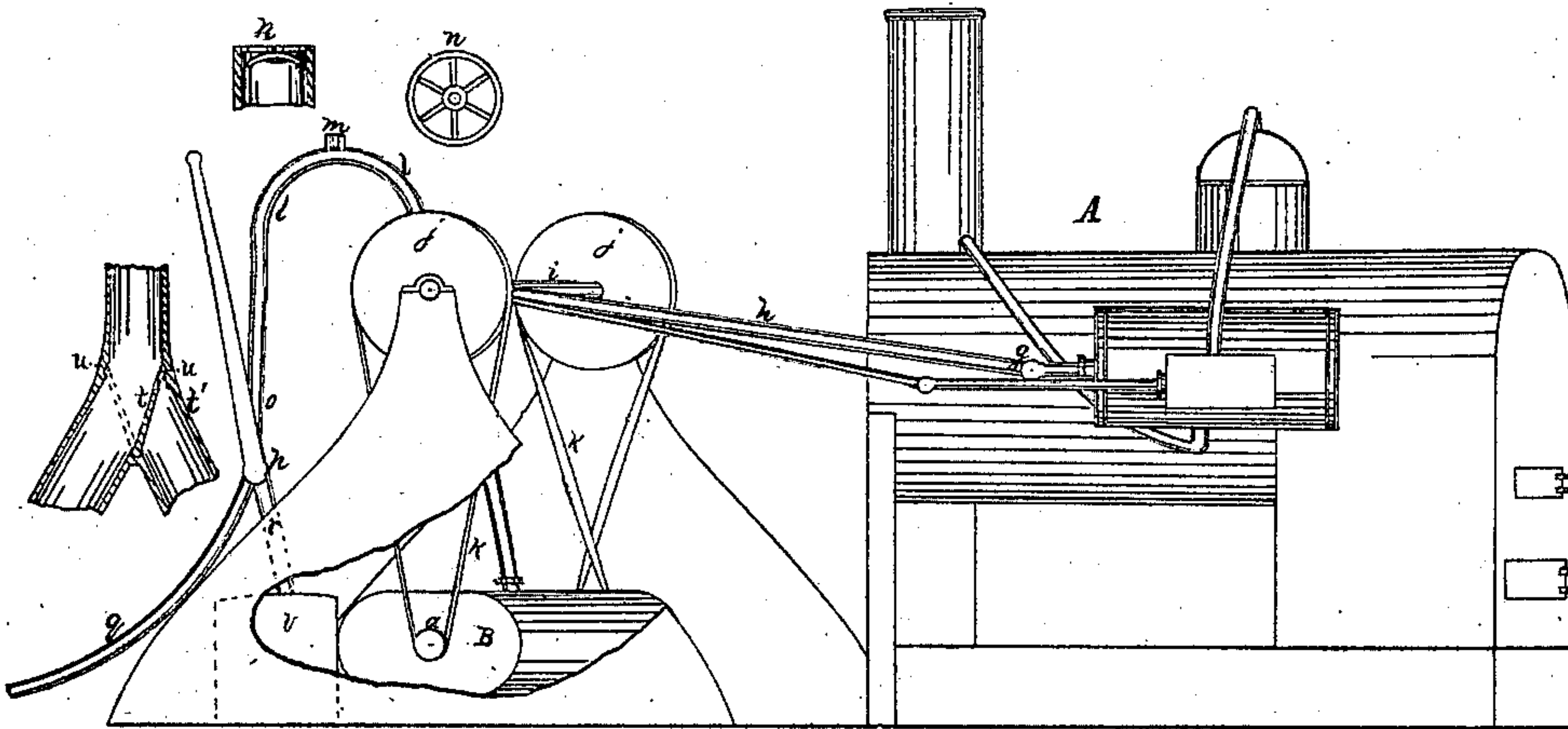


Fig. 1.

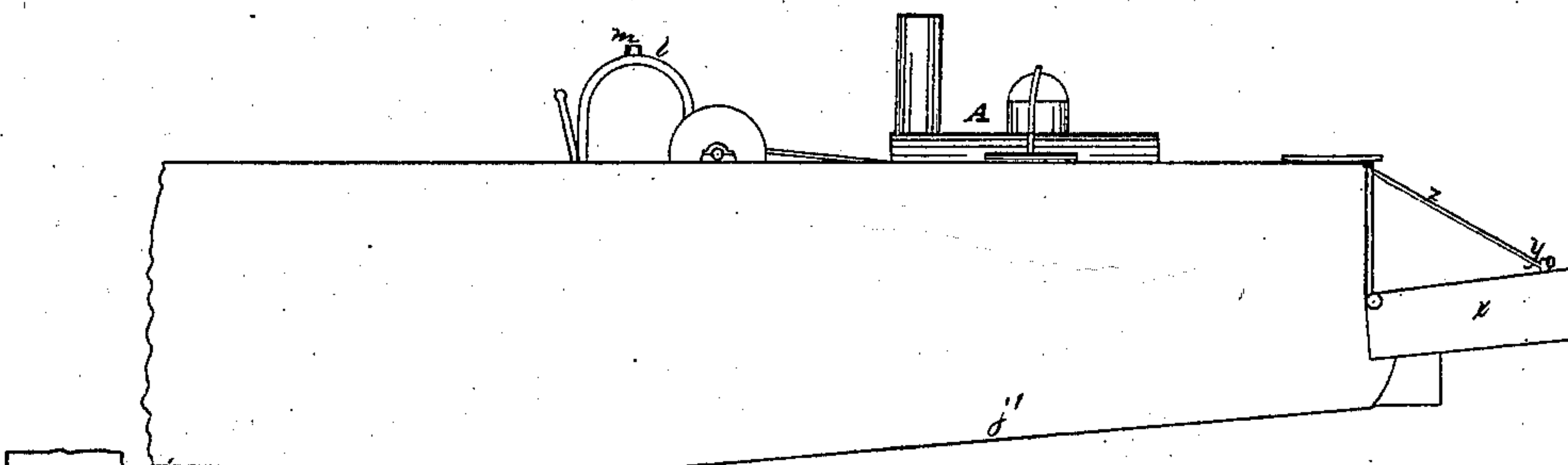


Fig. 2.

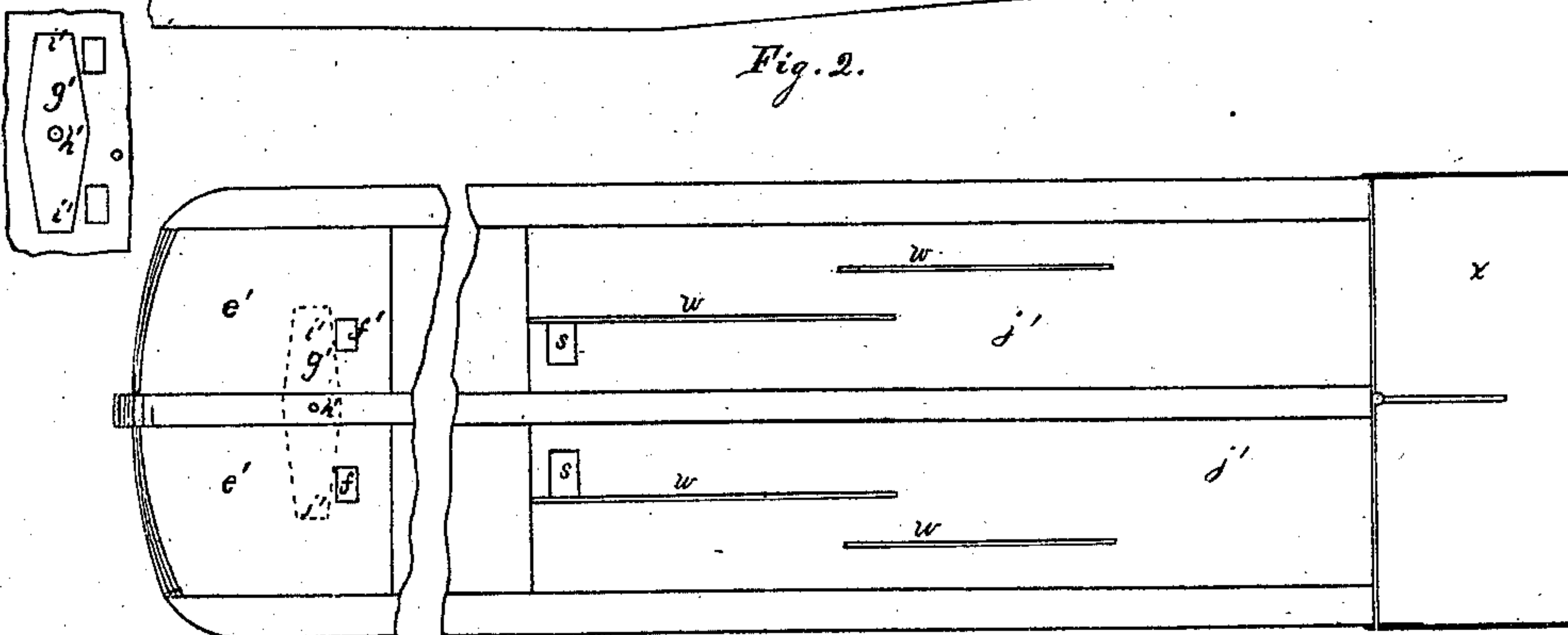


Fig. 3.

Witnesses:

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Edwin L. Chase.

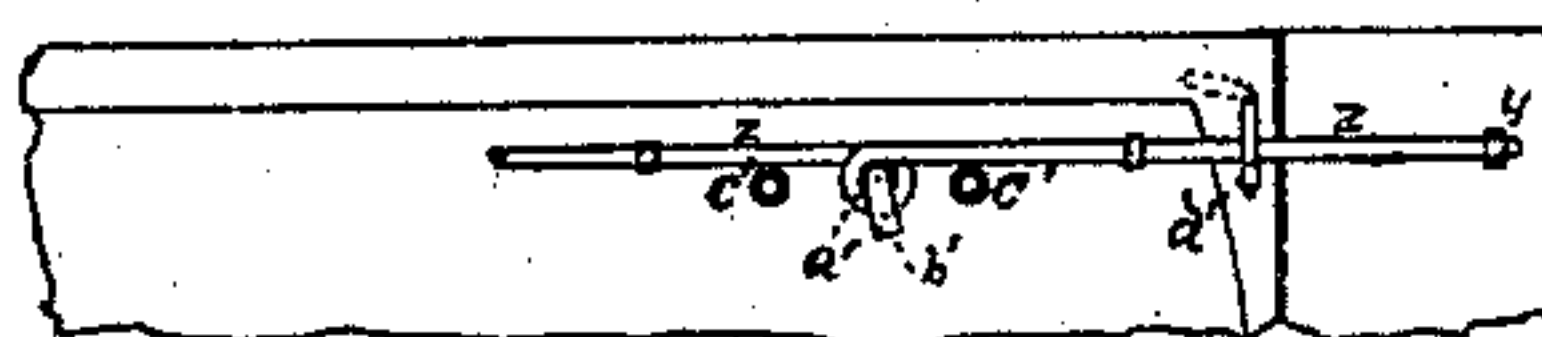


Fig. 4.

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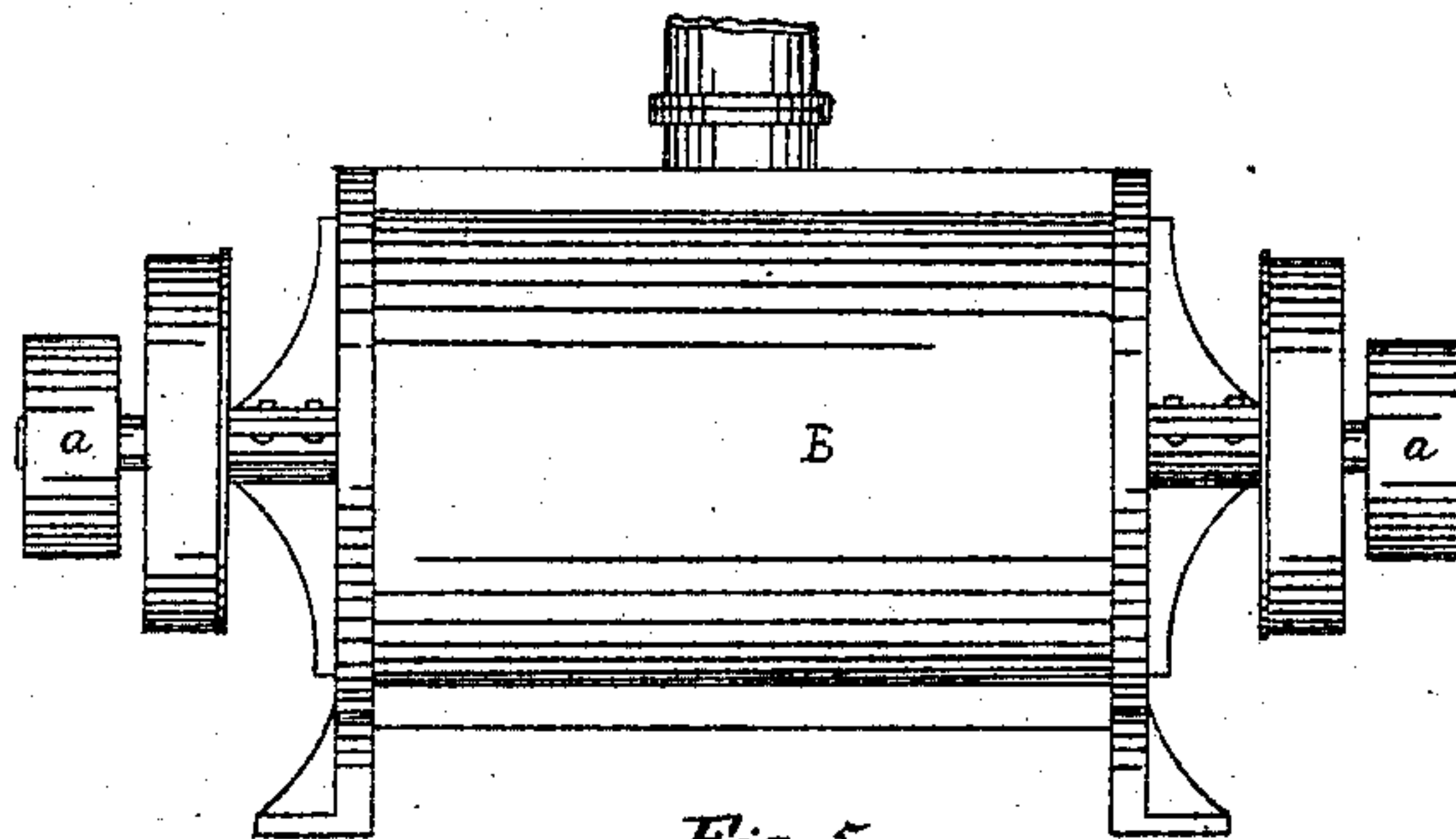


Fig. 5.

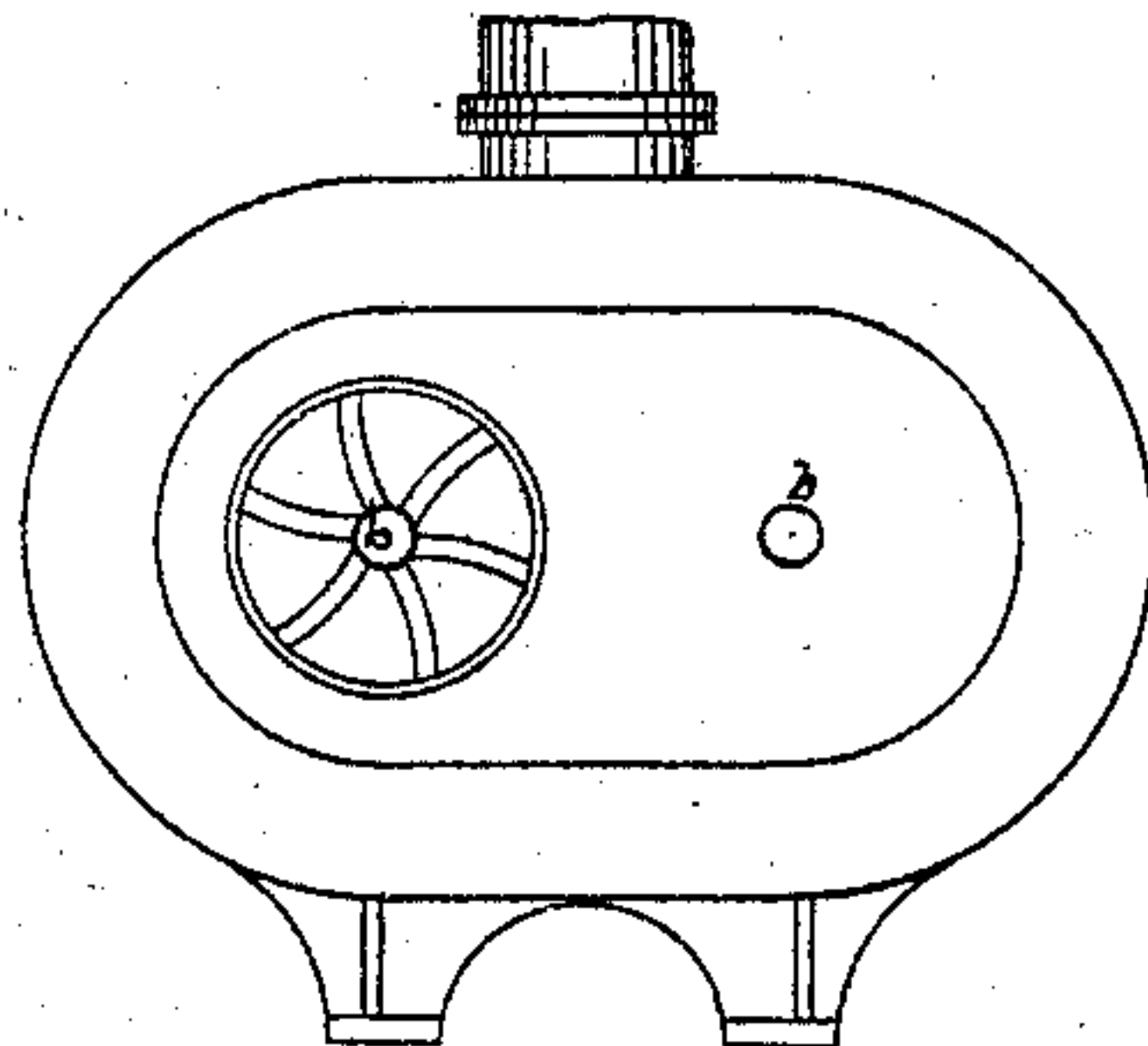


Fig. 6.

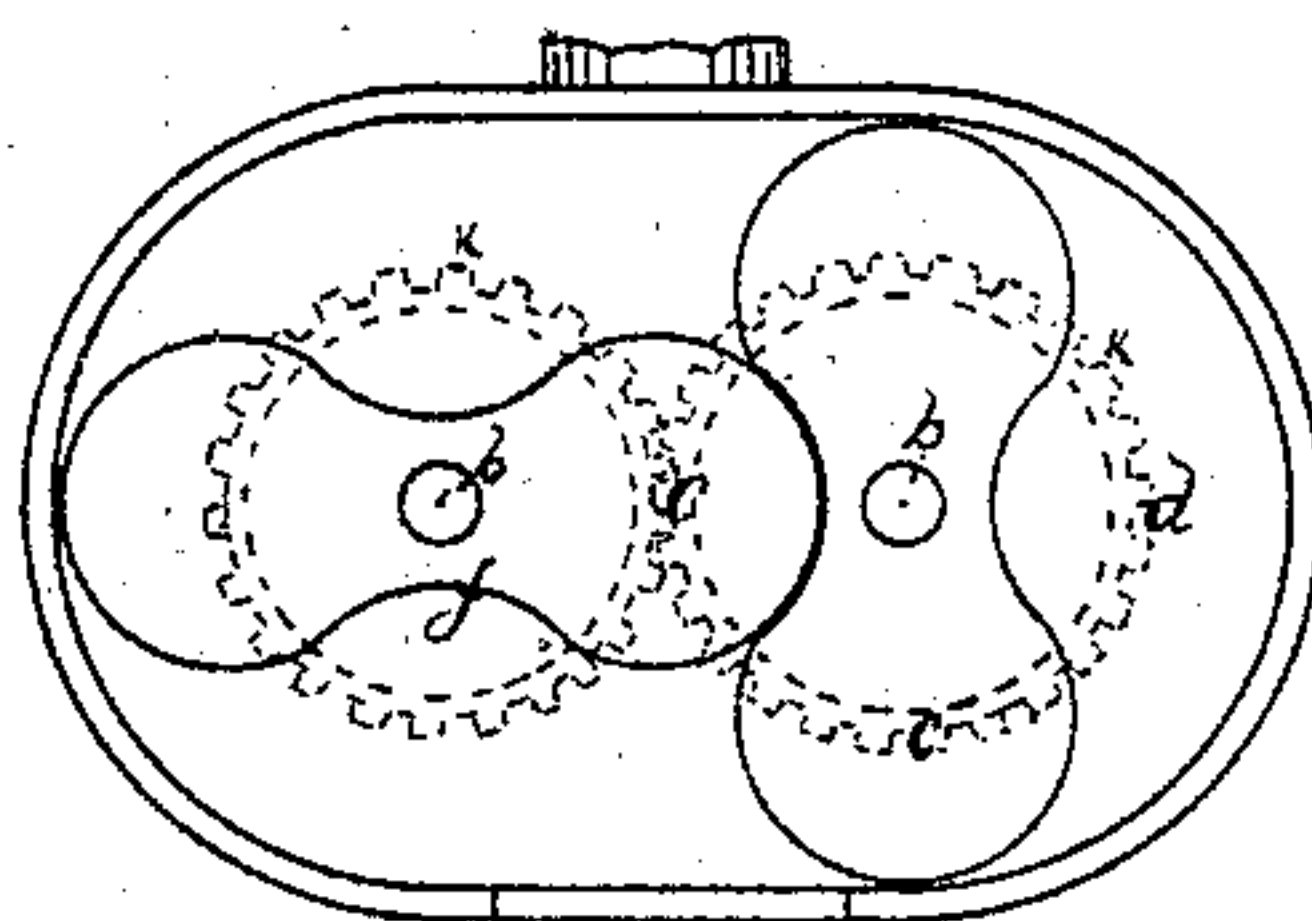


Fig. 7

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# UNITED STATES PATENT OFFICE.

LORENZO CHASE, OF PORTLAND, MAINE, ASSIGNOR OF ONE-HALF HIS  
RIGHT TO CHARLES W. CAHOON, OF SAME PLACE.

## IMPROVEMENT IN THE PROPULSION OF VESSELS.

Specification forming part of Letters Patent No. 133,758, dated December 10, 1872.

*To all whom it may concern:*

Be it known that I, LORENZO CHASE, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Devices for the Propulsion of Vessels; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing which is hereby made a part of this specification, in which—

Figure 1 is a side elevation, part in perspective, of the engine-blower, and their attachments; Fig. 2 is a side elevation of the hull of a vessel having my improvements, showing the position of the propelling devices; Fig. 3 is a plan view of the ends of the bottom of a hull having the progressive partitions and the apertures, by means of which the steering is effected; Fig. 4 shows the devices for operating the adjustable stern; Fig. 5, Sheet 2, is a side view of a rotary pressure-blower, as herein described; Fig. 6, Sheet 2, is an end view of the same; and Fig. 7, Sheet 2, is an interior view of the same as seen from the end.

Same letters show like parts.

The object of the different devices herein described, is to improve that class of vessels which have been heretofore propelled by the expulsion of air or other similar elastic fluid from a point at or near the bottom of the hull, and utilizing the progressive and expansive forces of the fluid upon an inclined plane or planes, acting in conjunction with the resistance of the water. The first part of my invention relates to the combination and arrangement of certain mechanical devices to produce the propelling power of this class of vessels.

In the hull I place a rotary pressure-blower, B, Fig. 1, Sheet 1. This blower, to attain the desired result, must produce a constant current of air, and I use, preferably, one of the following description. At Fig. 5, Sheet 2, is shown a view of the blower with the driving-pulleys *a a* upon each end. Through this run the two shafts *b b*, Fig. 6, Sheet 2, provided with the arms *c c*, Fig. 7, Sheet 2, touching the periphery of the chamber *d*, in which they revolve or nearly so. These arms *c c*, driven in opposite directions, so pass each other in their line of motion that at each revolution the semicircular ends of the arms pass through the cav-

ity *f* near the center of motion of each other. The geared wheels *k'*, Fig. 7, Sheet 2, prevent any change in the relative position in the arms *c c*, by slipping of the belts or otherwise.

At A, Fig. 1, Sheet 1, is shown a steam-engine of ordinary construction. The piston-rod *g* of the engine A is connected by the connecting-rod *h* with the crank-shaft *i*. This crank-shaft *i* has upon its ends the driving-pulleys *j j*, from which the belts *k k* pass downward to the pulleys *a a* upon the blower. By the action of the blower, actuated by the engine, the air is forced into the U-shaped pipe *l* on the upper side of the blower, it being taken into the blower from the under side. This pipe is of sufficient length so that its extreme upper part will always be above the water-line to guard against any possibility of water being allowed to pass into the blower, and the valve *m* is also placed at the upper part of the curve in the pipe, working inwardly, so that in case the engine should be accidentally reversed, water will not be drawn up into the blower. This valve is also shown enlarged at *n*, Fig. 1, Sheet 1, and is such as is commonly employed in air-engines made to resist pressure from within, and to yield to it from without, thus securing the object here desired. Upon the downward-bent limb *o* of the U-shaped pipe it is bisected at *p*, the longer limb *q* of the bisection running forward to the bow of the vessel, and the shorter member *r* passes downward with a slight divergence from the perpendicular and outward through the bottom at the apertures *s s*, Fig. 3. This divergence need only be sufficient to permit of the ready working of the valve *t*, which valve is for the purpose of diverting the current of air from the blower from one pipe to the other, as described. This valve is also shown enlarged at *t'*, and, as there seen, is provided with two seats, *u u*, to permit of its being tightly closed. The pipe *r* conducts the current of air from the blower into the air-chest *v*, and from thence it issues through the orifices *s s*, for the propulsion of the vessel.

I have already suggested that the object of the herein-described devices were to improve vessels provided with inclined planes, such as are shown at *j'*, Figs. 2 and 3, Sheet 1, to be acted upon by air or elastic fluid; and the second



part of my invention relates to an improvement in the devices for using the air-current after it has issued from the orifices. All vessels of this kind, so far as I have been able to learn, have been made with the incline of the stern, either entirely plain and smooth or with channels cut upon it, extending throughout its length. Instead of these I place upon the incline the progressive partitions *ww*, the partitions having a constantly-increasing width between each succeeding pair, so that when the air from the orifices *ss* passes backward toward the stern of the vessel it is at first closely confined as to the width of the current, while it retains its initial velocity; but as it passes onward in its course, and loses by its action upon the water a portion of its impetus, it is allowed to expand by the pair of partitions next in order in the progression, and thence onward, increasing in the same manner, to the point of exit. Through the spaces between the progressive partitions *ww* the air has not only direct action upon the water, but it has also additional effect by its suction upon the water behind it.

The object of the third part of my invention is to furnish a ready means of fixing the adjustable stern, shown at *x*, Fig. 2, Sheet 1, such as is usually employed in this class of vessels, rigidly in its place, at any desired point of inclination, and also for changing it from one angle of inclination to another, as circumstances may demand. At *y* I attach the link *z*, passing forward, and provided with the perforation *a'*, through which a pin, *b'*, passes into orifices *c' c'* in the rail, or any other most convenient part of the vessel. These orifices *c' c'* correspond in number to the different degrees of inclination at which it may be desired to present the adjustable stern to the water, and the pin *b'* is changed from one to the other of these orifices *c'* for that purpose. This link *z* when placed in the desired

position is there held firmly by the vibrating arm *d'*, Fig. 4, acting in conjunction with the pin *b'*. This arm is so arranged that when it is turned around upon the link *z* it presses the latter firmly down in its position and rigidly holds it there.

The bow of the vessel is made of similar form to the stern, that is, having the inclined plane *e'*, but which, of course, is not so large in extent as the other, and is not adjustable or movable, and has the orifices *f' f'* for the passage of the air from the pipe *q* when it is used for steering or backing the vessel. These orifices *f' f'* are provided with the diamond-shaped piece of metal *g'*, Fig. 3, which is pivoted to the under side of the chamber at *h'*. This piece of metal *g'* has the wings *i' i'*, and is operated by a handle passing up through the deck of the vessel. By turning this handle either one of the orifices *f' f'* may be covered while the other is open, or they may both be open at the same time for the purpose of backing the vessel. The current of air issuing from one alone of these orifices will divert the course of the vessel from the line of the side on which the open orifice is situated.

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

1. The combination of the blower *B*, valve *p*, pipe *l*, and orifices *s s*, with the inclined plane *j'*, pipes *r* and *q*, or their equivalents, in the manner and for the purposes as set forth.

2. The progressive partitions *ww*, when used in the manner and for the purposes as set forth.

LORENZO CHASE.

Witnesses:

CHAS. W. CAHOON,  
EDWIN L. CHASE.