

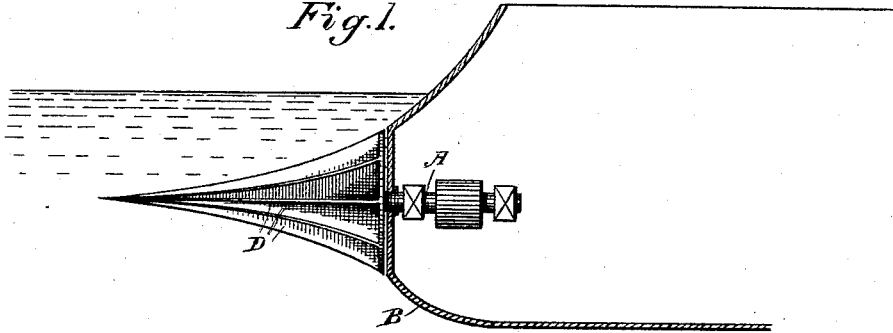
(No Model.)

R. STEVENSON.  
CENTRIFUGAL AUXILIARY PROPELLER.

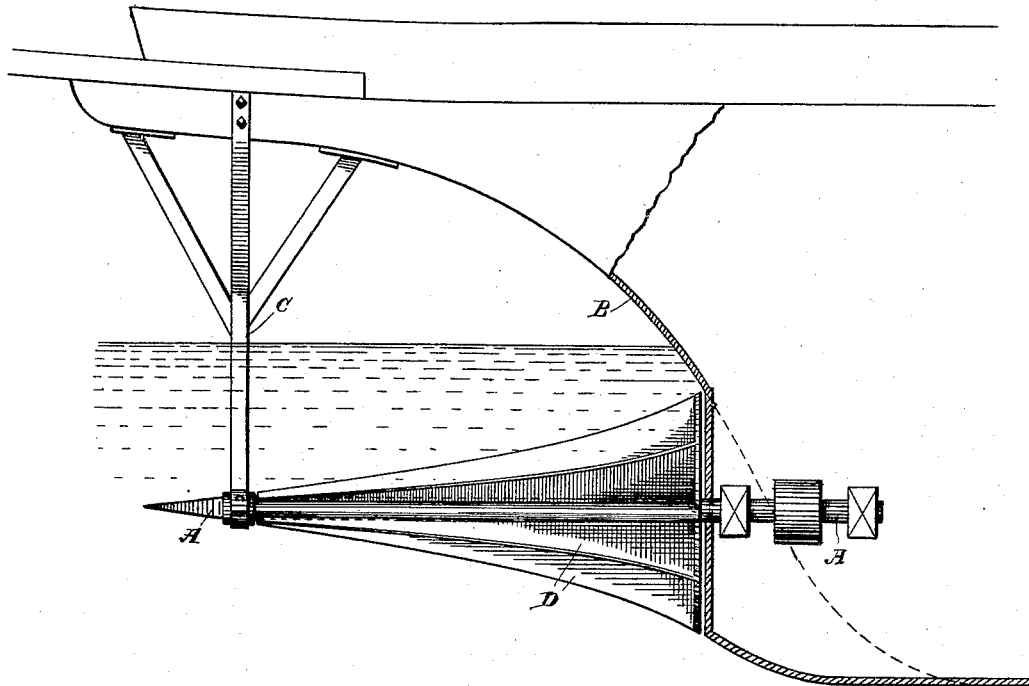
No. 417,888.

Patented Dec. 24, 1889.

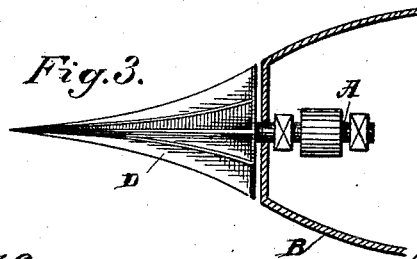
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses,  
Geo. H. Strong  
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# UNITED STATES PATENT OFFICE.

ROBERT STEVENSON, OF SAN FRANCISCO, CALIFORNIA.

## CENTRIFUGAL AUXILIARY PROPELLER.

SPECIFICATION forming part of Letters Patent No. 417,888, dated December 24, 1889.

Application filed May 4, 1888. Serial No. 272,821. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT STEVENSON, of the city and county of San Francisco, State of California, have invented an Improvement in Centrifugal Auxiliary Propellers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for assisting in the propulsion of vessels through the water.

It consists of radial blades or wings having the exterior edges either tapered or in straight or curved lines from front to rear and secured to a shaft projecting from the bow of the vessel and beneath the surface of the water, so that when driven at a high rate of speed the centrifugal action of these blades will throw the water outwardly and produce a partial vacuum or open space in front of the bow of the vessel, into which it may be moved or forced with less expenditure of power than when the vessel is moved into water in its ordinary condition.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a view showing the application of my device to the bow of the vessel, with the front end of the projecting shaft unsupported. Fig. 2 shows the device with the front end supported at a distance beyond the bow of the vessel. Fig. 3 is a horizontal section.

The object of this device is to relieve a vessel from the resistance and pressure of the water against its bow, this resistance being so great that the power necessary to overcome it in ordinary modes of propulsion is in proportion as the cube of the velocity of the vessel through the water. In order to overcome this resistance I employ a shaft A, which projects outwardly through the stem of the vessel B to a considerable distance in front. This shaft passes through suitable stuffing boxes and collars, which serve to make a tight joint, and is driven at a high velocity by means of an electric motor or engine of any suitable or desired construction. In small vessels, while the shaft A does not extend to a great distance to the front, the support of the journals within the vessel

will be sufficient; but in larger vessels, where the shaft is of considerable length, the supporting-standard C extends downward and has a journal-box at its lower end, within which the forward end of the shaft rotates and is steadied. The standards may be made with narrow or sharp front edges, so as to afford as little resistance as possible to the water through which the vessel is passing, the whole being suitably braced from the vessel. Upon this shaft A and outside of the vessel's bow are fixed radial vanes or blades D, which, commencing at a point at the outer end of the shaft, gradually increase in diameter to a point near the stem, where a circular disk is fitted to the shaft, so as to approximate to the form of the bow at this point. The outer edges of these blades may be straight lines, so as to form with the base, which is attached to the shaft, a triangular blade; or they may be curved so as to present a concave edge outwardly, or may be of other suitable or desirable shape. These blades do not act in any sense as propellers; but, the shaft being rotated at a very high rate of speed, they throw the water outwardly by centrifugal action, and thus produce a space or partial vacuum in front of the vessel, into which experiments have shown it will move without any propulsion whatever. When, however, a propeller is applied at the stern to drive the vessel forward, the vessel is forced into this space very rapidly, and, this space being constantly renewed and made continuous by the action of the rotary blades, the power necessary to overcome the resistance in front of the vessel is greatly decreased and its speed may be correspondingly increased, thus greatly increasing the effective power of the propeller.

This device may be applied to ordinary vessels or to those which are entirely submerged, the shaft projecting horizontally in front of the vessel and in line with its direction of travel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The device herein described for lessening the frictional resistance to the movement of a

vessel moving through the water, consisting of a shaft projecting from the bow of the boat and adapted to have a rotary motion, radial wings of gradually-increasing width from front to rear on said shaft, and having their exterior edges concavely curved from point to base, whereby a partial vacuum is produced in front of the bow by the centrifugal action of the wings, substantially as herein described. 10

In witness whereof I have hereunto set my hand.

ROBERT STEVENSON.

Witnesses:

S. H. NOURSE,  
H. C. LEE.