

(No Model.)

R. P. AMBLER.
PROPELLER.

No. 502,061.

Patented July 25, 1893.

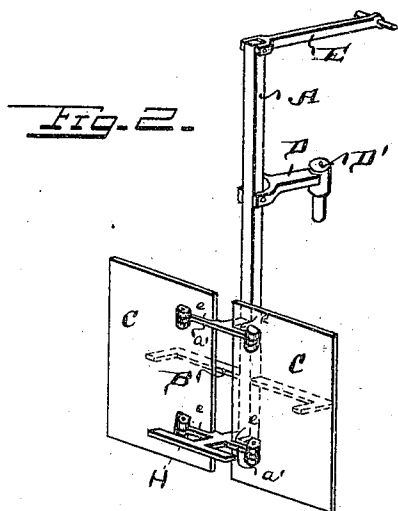
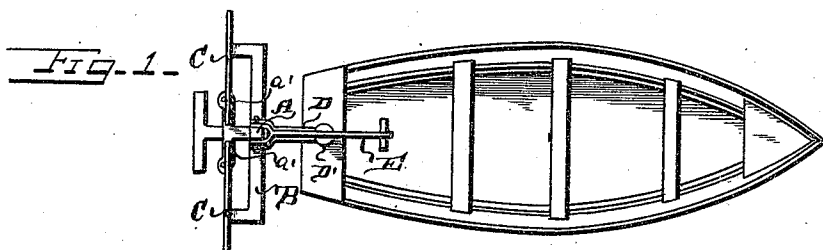


FIG. 3.

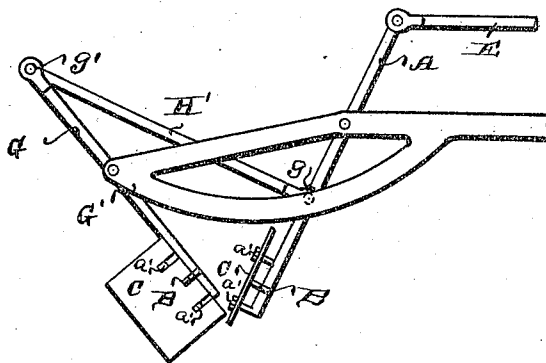
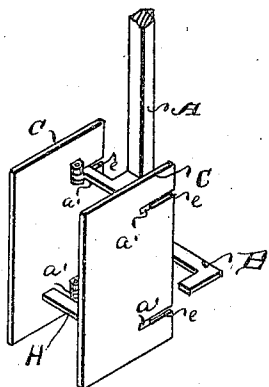


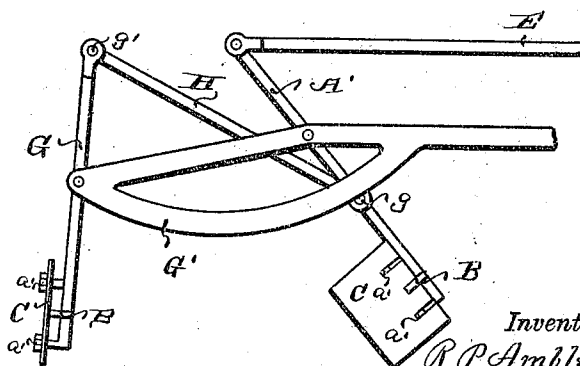
FIG. 5.

FIG. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

RUSSELL P. AMBLER, OF DE FUNIAK SPRINGS, FLORIDA.

PROPELLER.

SPECIFICATION forming part of Letters Patent No. 502,061, dated July 25, 1893.

Application filed October 1, 1892. Serial No. 447,492. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL P. AMBLER, a citizen of the United States, and a resident of De Funiak Springs, in the county of Walton and State of Florida, have invented certain new and useful Improvements in Propelling and Steering Devices for Vessels; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a plan view of boat and mechanism. Fig. 2 is a perspective of propeller open. Fig. 3 is a side view of modification. Fig. 4 is a side view of same in a different position. Fig. 5 is a perspective of propeller open same as Fig. 2 in different position.

This invention has relation to certain new and useful improvements in means for the propulsion of boats; and it consists in the novel construction and combination of parts, all as hereinafter described and pointed out in the claims.

Referring to the accompanying drawings illustrating the invention, the letter A designates an upright shaft, having secured thereto, near its lower portion, a transversé arm or bar B, extending at right angles to said shaft and forming therewith an inverted cross. Located one above, and one below said transverse arm, are two shorter arms or bars a' , a' , which project equally each side of the shaft.

C, C, designate two movable plates preferably of thin metal, which are hinged or pivoted one on each side of the shaft to the said arms a' , a' , said plates being so arranged as to swing backward and forward under the movement of the shaft, as hereinafter described.

D designates an arm or lever, which as shown in Fig. 2 is hung on a swivel plate D' in the stern of the boat, and at its rear end is pivoted to the shaft A at a suitable point above the plates C, C. To the upper portion of the shaft is attached an arm or lever E, by means of which the said shaft is operated. Said lever is pivoted to the upper portion of the shaft at any suitable point, according to the length of stroke desired, and may be op-

erated by the hands, or by steam or other power. The part of the shaft above the point where it is pivoted, constitutes the arm of a lever, which, being moved, causes the lower end of the shaft, with the plates attached, to move in the opposite direction. Said plates, pivoted on the short arms a' , a' , are provided with slotted or cut-away portions e , to receive the said arms, so that when the plates are extended outwardly parallel with the said arms, the latter will lie within and fill the slots or spaces, and allow the inner edges of the plates to come nearly into contact with the shaft, as shown in Fig. 2. When however, the shaft is moved to bring the plates forward into positions at right angles to the said arms, the inner edges of the plates are carried from the shaft, and held by said arms, so that a considerable opening is formed between the shaft and plates, as shown in Fig. 5, said opening permitting the water to pass freely through. The lower portion of the shaft and the bar B, should be constructed from strong metal, and should be made as thin as the requisite strength will allow. These parts should also be beveled on the side opposite the plates, in order to present a thin cutting edge to the water when the plates are drawn backward, and thereby make the least possible resistance.

The operation is as follows:—The device being placed in position, with the plates immersed in the water a little below the surface, the motive power is applied, moving the lever end of the shaft A forward, bringing the lower end with the attached plates backward. By this movement, the plates, acted upon by the water, are thrown into parallel position, shown in Fig. 5, at right angles to the arms a , a , and B, and are held in this position so long as the shaft is moved in the same direction, by a stop H, which prevents them from coming together. As in this position, they present their inner edges to the water, and being separated from each other by a space equal to the length of the arms a' , a' , they offer comparatively little resistance to their movement. When however, the return or propelling movement of the lever is made, the plates, meeting the resistance of the water, are extended outwardly, parallel with the arms a' , a' , into line with the shaft, and are prevented

going beyond this line by the arm or bar B. Bracing against this arm or bar, the plates exert a continuous pressure on the water, so long as the lever is moved in a backward direction, and by means of this pressure, the boat is moved forward. It will thus be seen that propulsion is effected by the alternate movement of the lever, forward and backward, the forward movement drawing the plates through the water without sufficient resistance to impede the momentum of the boat, and the backward movement causing them to exert a pressure on the water, and consequently a propelling force, in proportion to their size and the power employed. In case it is desired to change the course of the boat from a straight line, the horizontal arm D being swiveled on a bed plate, as hereinbefore described, can be turned from the center to either side, causing the plates to press the water obliquely with reference to the boat, and in this manner change the direction as may be desired.

As applied to small boats, usually propelled by oars, the device above described has several advantages. On account of the large leverage obtained, it will propel the boat with greater ease and with less expenditure of strength than with oars, and the working of it does not require any previous practice or skill; it may be operated with both hands or with one hand at a time, giving rest to the other; and it also has a special hygienic value in affording exercise to the muscles evenly without causing an undue strain upon any one set. As applied to larger boats, it has an advantage over paddle wheels and screws in simplicity of mechanism, cheapness of construction, and economy of power.

As will be seen from the above description, the propelling force communicated by the mechanism herein specified is exerted intermittently, the momentum of the boat being relied upon to continue the motion when the stroke of propulsion ceases. In view of the fact that the high rate of speed required by vessels of the larger class can be obtained only by making the propelling force continuous, I have provided means of accomplishing this result by multiplying and combining certain essential parts hereinbefore described, as follows:—

An upright shaft G, with plates attached in the manner above described is placed at a convenient distance to the rear of the shaft A, both said shafts being hung or pivoted to a suitable framework G'. A connection is made between these two shafts by an arm or lever H', which extends obliquely from one to the other, one end of said arm being pivoted to the shaft A, at the point *g* below the fulcrum of said shaft, and the other end to the shaft

G at the point *g'* above its fulcrum. This connection between the two shafts gives the two sets of plates a reverse motion, so that each in its turn performs the act of propulsion so soon as the other ceases to do so. As the arm E which operates the rear shaft is moved forward, the plates attached to this shaft are drawn backward in a parallel position, while at the same movement, the front shaft, by means of the connecting arm, is moved in the opposite direction, causing the plates attached to it to extend laterally and make their propelling stroke. The arm E being moved backward, the plates attached to the rear shaft open to press upon the water, and so continue the act of propulsion, while the plates of the front shaft, being moved in the other direction, present a cutting edge to the water.

Fig. 3 shows the position of the parts when the front shaft is moved forward, and Fig. 4 shows their position when it is drawn backward.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the upright shaft A, the transverse bar B secured thereto and forming therewith an inverted cross, the short arms or bars *a'*, *a'*, one above and one below the said bar B, the plates C, C, hinged to said arms or bars *a'*, *a'*, the arm D designed to be swiveled to a boat, and pivoted to the shaft and the operating arm or lever E, connected to the upper portion of said shaft, substantially as specified.

2. The combination of the upright shaft A, the transverse bar B secured to the forward face of said shaft toward the lower end thereof, the arms *a'*, *a'* secured transversely to said shaft on the rear face thereof, one above and one below the bar B, the plates C, C, having slots therein to receive said arms *a'*, *a'*, and hinged to said arms, the stop H secured to the rear lower portion of said shaft, and the swiveled arm D to which said shaft is pivotally connected, substantially as specified.

3. The combination with the shaft A, its operating lever, bar B, arms *a'*, *a'*, and plates C, C, hinged to said arms, of the shaft G to the rear of shaft A, said shaft G also having a bar B, arms *a'*, *a'*, and plates C, C, the frame to which said shafts A and G are fulcrumed, and the arm or lever H' connected at its rear end to the shaft G above its fulcrum, and at its forward end to the shaft A below its fulcrum, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

RUSSELL P. AMBLER.

Witnesses:

DANIEL MCLEOD,
JAMES A. MCLEAN.