W. G. BUCK.

MEANS FOR PROPELLING AND STEERING BOATS.

APPLICATION FILED SEPT. 30, 1915.

1,197,181.

Patented Sept. 5, 1916.

2 SHEETS—SHEET 1.

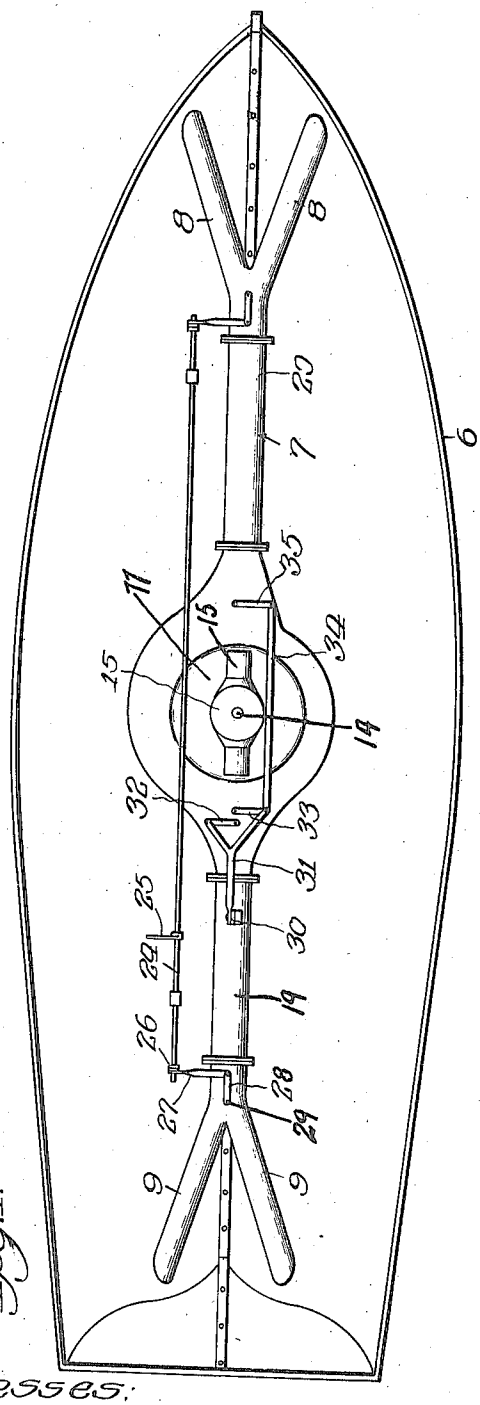


Fig. 1.

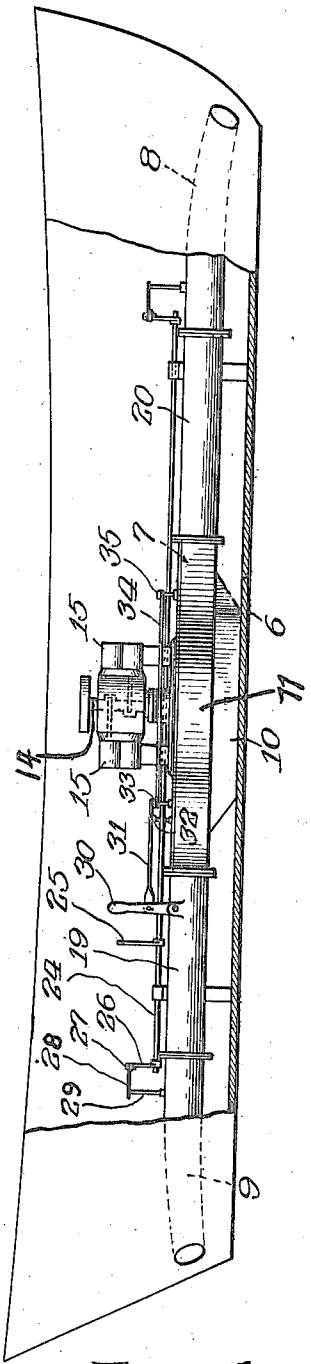


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

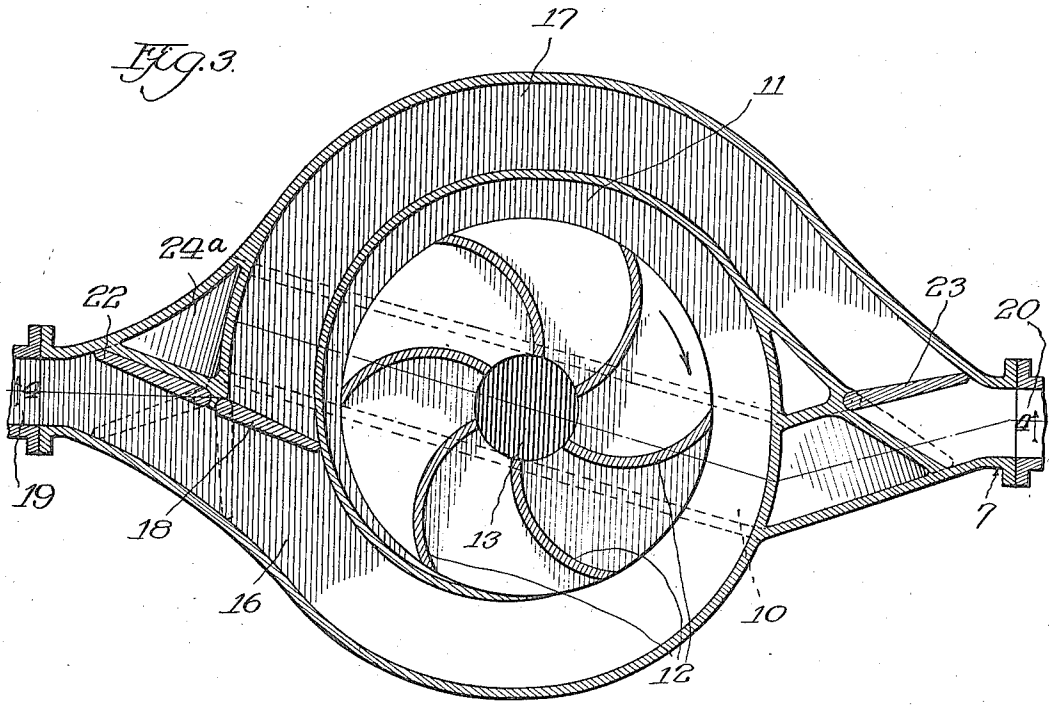


Fig. 4.

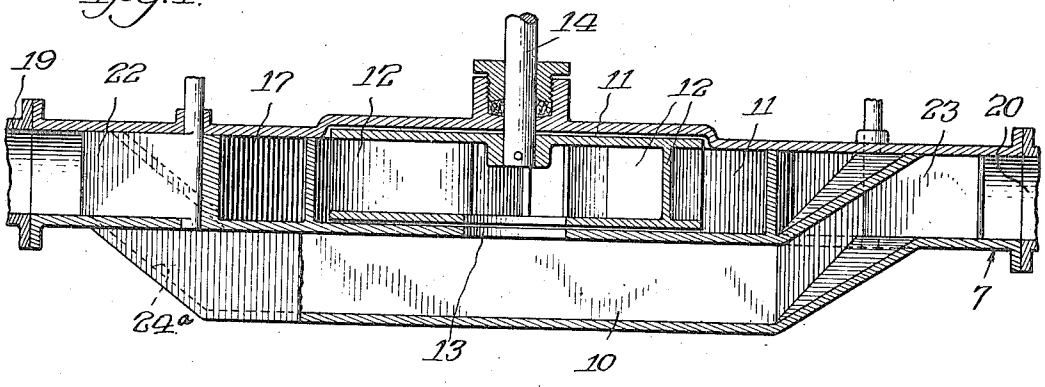
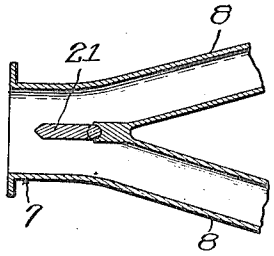


Fig. 5.



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UNITED STATES PATENT OFFICE.

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MEANS FOR PROPELLING AND STEERING BOATS.

1,197,181. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed September 30, 1915. Serial No. 53,266.

To all whom it may concern:

Be it known that I, WILMER G. BUCK, a citizen of the United States, residing at Fremont, in the county of Dodge and State of Nebraska, have invented certain new and useful Improvements in Means for Propelling and Steering Boats, of which the following is a specification.

The present invention relates to means for propelling and steering a boat without the use of either the well-known propeller or rudder which extends from the stern of the vessel.

The principal object of the invention is to take in water at one end of a conduit extending longitudinally of the boat and project it from the opposite end, thus propelling the boat in the opposite direction from the direction of movement of the water through the conduit.

A further object of the invention is to provide a centrifugal pump at the center of the boat, thus locating the power-driven means for propelling the boat at the center thereof, and serving to maintain a better equilibrium of the boat.

A further object of the invention is to provide a water chamber below the pump, out of which chamber water passes into the pump chamber, from whence it is projected into the water conduit in the direction desired.

A further object of the invention is to provide a series of valves so as to enable the water to pass from the pump chamber toward either end of the boat, whereby the boat is propelled forward or rearward, as may be desired.

A further object of the invention is to arrange the water conduit so that it terminates in a fork at either end, and to provide valvular means for deflecting the water through either branch of the fork, thus enabling the water to be projected to one side or the other of the boat, resulting in a steering operation.

Further objects of the invention are, to enable the boat to be of a light draft, so that it will readily clear sand bars and other obstacles; and to eliminate the propeller blades and rudders, which are liable to become entangled in matter when the boat is passing through waters obstructed by trees, rocks, etc.

The invention further consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings: Figure 1 is a plan view of the hull of a boat equipped with the device of the present invention; Fig. 2, a side view of the parts shown in Fig. 1 with the hull partly broken away; Fig. 3, a sectional plan view of the pump chamber and the passages leading therefrom, together with the valve control for the passages; Fig. 4, a section on line 4—4 of Fig. 3, looking in the direction of the arrow; and Fig. 5, a detail of the forked end of the water passage, showing the valvular control therefor.

In the art to which the present invention relates, boats are universally propelled by means of propeller screws or wheels projecting from the stern or the sides of the vessel, and are almost universally steered by means of a rudder also depending from the stern. Considerable difficulty is experienced by reason of the breaking of one of these parts, which, to all practical purposes, places the boat out of commission; and also in navigating certain waters, especially those where sand bars or trees and rocks are present, the steering and propelling means are very liable to be struck and broken. In the present invention these propeller screws or wheels and depending rudders are eliminated, and thus the above noted objections overcome.

Referring now to Figs. 1 and 2 of the drawings, the device is shown as applied to the hull 6 of a vessel, which may be of any suitable size and construction. The invention itself comprises a main water conduit 7, which is forked at each end, the arms of which forks provide divergently extending ducts 8 at the bow of the boat and divergently extending ducts 9 at the stern of the boat. The ducts 8 and 9 communicate with the main water conduit 7 and also extend to the outside of the hull. There is thus provided a water conduit extending longitudinally of the boat and from end to end thereof. The main water conduit communicates with a centrally located water chamber 10, which, as will be seen from Fig. 4, lies in a plane below that of the main water conduit; and communicating with this water chamber 10 is a pump chamber 11, in which is located a centrifugal pump 12. An opening 13 establishes communication between the water chamber 10 and the pump cham-

ber 11. Attached to the pump is a shaft 14, which is driven, in the construction shown, by means of oppositely disposed gas motors 15 (see Fig. 2), having the ordinary crank connection with the shaft 14, as will be apparent from the dotted lines in Fig. 2.

The walls of the pump chamber 11 continue outward from the periphery of the pump in the form of a spiral and merge into a passage 16, which is also of spiral formation. This passage in reality continues around and communicates with a passage 17; and communication between the passages 16 and 17 is controlled by a valve 18. When this valve is in the position shown in dotted lines in Fig. 3, the passages 16 and 17 are in communication, but when the valve is in the position shown in full lines in Fig. 3, the passage 16 is in communication with that portion of the main water conduit designated by the numeral 19, and which lies toward the stern of the boat and may be termed the rear water conduit.

With the parts arranged in the position shown in Fig. 3, water enters through the ducts 8 into the portion 20 of the main water conduit, which portion lies toward the bow of the boat and may be termed the forward water conduit. The water thence passes into the water chamber 10; and when it has reached sufficient height in this chamber, passes into the pump chamber 11, where the action of the pump, which moves in the direction of the arrow (see Fig. 3), projects the water outwardly and against the wall of the pump chamber, projecting it into the passage 16, from whence it passes into the rear portion 19 of the main water conduit and out through the ducts 9. As it passes out from said ducts, it naturally meets resistance from the body of water surrounding the boat, and the impact of the projecting water against this surrounding body of water will serve to propel the boat forward; and also the action of the pump exerts a pull against the water coming through the ducts 8 and the forward portion 20 of the main water conduit, and this pull, being in a rearward direction, will also assist in propelling the boat forward.

The impact of the water at the stern of the boat will serve to elevate the stern out of the main body of water, and, as is well known, the forward propulsion of the boat acts to lift the bow from the water. Hence, with the present arrangement, the propelling action tends to lift both the bow and stern out of the body of the water, thus decreasing the amount of draft and enabling the boat to clear obstructions.

Assuming that the boat is being propelled forward in the manner previously described, and it is desired to turn one way or the other, a valve 21, located at the juncture of the forks 9 (see Fig. 5), is actuated, deflecting the water into either of the ducts 9 desired, which deflection obviously causes the force of the projected water to be concentrated on one side or the other of the vessel, which force will act to turn the vessel in accordance with the direction in which the force is exerted. At the same time, a valve at the juncture of the forks 8 is operated, which valve is similar to the valve 21 previously described. This permits the incoming water to enter into only one of the ducts 8, which duct is the one on the same side of the boat as the duct 9, through which the water is being expelled. Thus, there is a pull exerted on one side of the bow of the boat and a push exerted on the same side of the stern, whereby a quick turning of the vessel is produced. If it is desired to turn the vessel in the opposite direction, the valves 21 are manipulated so as to open the other set of ducts, producing a pressure and pull to turn the boat in an opposite direction. The foregoing constitutes a means for controlling the course of the boat without the use of the ordinary depending rudder.

Up to the present time the description has been confined to the operation of propelling the boat in a forward direction. When it is desired to reverse the movement of the boat, a valve 22, located at the juncture of the passage 16 and rear water conduit 19, is moved into the dotted position shown in Fig. 3. The valve 18, between the passages 16 and 17, is also moved into the dotted position; and likewise a valve 23, located at the juncture of the passage 17 and forward water conduit 20, is moved into the dotted position shown in Fig. 3. By moving the valve 22 into the dotted position of Fig. 3, the water comes into the water chamber 10 from the rear end thereof, designated in the drawings by the numeral 24^a, and flows down and into this chamber; and, owing to the position of the valve 23, the forward end of the water chamber is closed, and thus the water is caused to pass upward into the pump chamber. It is then acted upon by the pump, deflected to the walls of the pump chamber, and guided into the passage 16, and from there, owing to the position of the valve 18, into the passage 17, from whence it passes into the forward portion 20 of the main water conduit. It will be seen from the foregoing that the water is now drawn in from the stern of the boat, that is, through the ducts 9, and expelled at the forward end through the ducts 8, so that a pressure is exerted at the bow and a pull exerted at the stern, causing the boat to move backward. The steering operation in this instance is performed, as previously described, by operation of the valves 21. It is to be noted that in reversing the movement of the boat, no reversal of direction of movement of the pump is necessary.

In order to move the valves 21 in unison, I employ a rock-shaft 24, secured to which is an operating handle 25. This rock-shaft, at either end, has an arm 26 extending therefrom, which arm is connected to a link 27, to which is connected a link 28 connected to a rod 29, which, in turn, is connected to the valve 21. When the rod 24 is rocked, by manipulation of the controlling member 25, it pulls the arm 26, moving the link 27 and the link 28 in the direction of movement of the arm. This turns the rod 29 and actuates the valve 21 back and forth, as desired. Both valves 21 are provided with a similar connection to the rock-shaft 24 and both are moved in unison. To manipulate the valves 22, 18, and 23, I employ a controlling member in the form of a lever 30, to which is connected a link 31 forked at its end. To one of the branches of the fork is joined a link 32 connected to the valve 22. The other arm of the fork is joined to a link 33 connected to the valve 18; and a link 34 extends from the link 33 and is in turn connected to a link 35, which is joined to the valve 23. Thus, by the movement of this single actuating member, these valves are shifted to place them in position to move the boat forward or backward, as desired. By moving valves 18, 22 and 23 to neutral position, the boat will be at rest, while the pump continues to operate.

I claim:

1. In combination with a boat hull, a water conduit extending longitudinally from end to end thereof, and terminating at each end in a fork, means located medially of the conduit for forcing the water therethrough, a valve for each fork for deflecting the water into a selected branch of the fork, whereby the water is taken in and expelled from the same side of the boat and a steering operation effected, and a single shiftable member for actuating said valves, substantially as described.

2. In combination with a boat hull, a water conduit extending longitudinally from end to end thereof, a pump chamber in communication with the water conduit, a pump in the pump chamber, means operatively connected for actuating the pump, said pump operating at all times in the same plane and in the same direction, and means operatively connected for directing the flow of water from the pump chamber to either end of the boat desired, substantially as described.

3. In combination with a boat hull, a water conduit extending longitudinally from end to end thereof, a horizontally disposed pump chamber, a centrifugal pump in said chamber, means operatively connected for actuating the pump, the wall of said pump chamber extending outwardly in spiral formation from the periphery of the pump, a water chamber below the pump chamber in communication with said conduit, means for establishing communication between the water chamber and pump chamber, means for establishing communication between the pump chamber and water conduit, and means for directing the flow of water from the pump chamber to either end of the boat desired, substantially as described.

4. In combination with a boat hull, a centrally located water chamber, water conduits leading from each end of the boat and communicating with the water chamber, a pump chamber in communication with the water chamber, a pump in the pump chamber, means operatively connected for actuating the pump, one wall of one conduit continuing in spiral formation to constitute the wall of the pump chamber and to provide a passage from the pump chamber to this conduit, one wall of the other conduit continuing concentrically to a portion of the wall of the pump chamber to provide a passage from the pump chamber to this conduit, and valvular means for directing the water from the pump chamber into either of said passages desired, substantially as described.

5. In combination with a boat hull, water conduits extending longitudinally from the center of the boat to each end thereof, a water chamber in communication with said conduits and in a level below the conduits, a pump chamber for the water chamber and in communication therewith, and said pump chamber being in substantially the same plane with the conduits, a horizontally disposed pump in the pump chamber, means operatively connected for actuating the pump, valvular means at each end of the water chamber for controlling communication between the water chamber and conduits, and valvular means for controlling the direction of flow of water from the pump chamber to the conduits, substantially as described.

6. In combination with a boat hull, water conduits extending longitudinally from the center of the boat to each end thereof, a water chamber in communication with said conduits, a pump chamber, said water chamber lying below the pump chamber and extending diagonally thereacross, said pump chamber lying in substantially the same plane with the conduits, a pump in the pump chamber, means operatively connected for actuating the pump, and valvular means controlling communication between the conduits and water chamber and between the pump chamber and conduits, substantially as described.

7. In combination with a boat hull, water conduits extending longitudinally from the center of the boat to each end thereof, a water chamber in communication with said conduits and in a level below the conduits, a

pump chamber above the water chamber and in communication therewith, said pump chamber being in substantially the same plane with the conduits, a horizontally disposed pump in the pump chamber, means operatively connected for actuating the pump, one wall of one conduit continuing in spiral formation to constitute the wall of the pump chamber and provide a passage from the pump chamber to this conduit, one wall of the other conduit continuing concentrically to a portion of the wall of the pump chamber to provide a passage from the pump chamber to this conduit, and valvular means controlling communication between the conduits and water chamber and between the conduits and pump chamber, substantially as described.

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