Nov. 21, 1961

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3,009,436

WATER JET POWERED BOAT

Filed Feb. 12, 1959

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Fig. 1

Fig. 2

Fig. 4

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The present invention generally relates to an improved and novel boat construction in which a stream of flow of water is employed to propel the boat rather than the conventional screw propeller.

The primary object of the present invention is to provide a water jet powered boat which pumps water in from in front of the boat and discharges the same rearwardly of the boat by virtue of controlled passages for propelling the boat in a novel, efficient and effective manner and eliminating numerous of the objections provided by conventional propellers.

By eliminating the present screw propeller, the present invention employs the maneuverability of a rudder yet retains a high degree of maneuverability and also eliminates the necessity of a tug to bring a ship into a harbor or otherwise dock the ship. The present device may be used on all types of sea going vessels or missiles including submarines in that the device may be used to assist in diving and surfacing. This device also eliminates the possibility of a propeller being fouled in shallow water. The boat of the present invention may be driven in either direction and is stable in water and pitch and roll is minimized with resultant improvement in steering and maneuverability.

Another important feature of the present invention is to provide a water jet powered boat which is simple in construction, easy and efficient in operation, well adapted for its intended purposes and generally inexpensive to manufacture and maintain.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying diagrams, forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

**FIGURE 1** is a side elevation of the boat of the present invention with portions broken away;

**FIGURE 2** is a plan sectional view taken substantially upon a plane passing along section line 2—2 of **FIGURE 1** illustrating the construction of the water control baffles;

**FIGURE 3** is a transverse, vertical sectional view taken substantially upon a plane passing along section line 3—3 of **FIGURE 1** illustrating the construction of the mechanism for propelling the boat;

**FIGURE 4** is a detailed sectional view of the propelling mechanism illustrating the flow of water there-through;

**FIGURE 5** is a front view of a modified form of the present invention; and

**FIGURE 6** is a sectional view taken substantially upon a plane passing along section line 6—6 of **FIGURE 5**. Referring now specifically to the drawings, the numeral 10 generally designates the water jet powered boat of the present invention which includes a bottom plate 12, side plates 14 and end plates 16 all rigidly joined to the bottom 12 in water tight relation to provide a compartment which may be a passenger compartment, cargo carrying area or the like and which may be of any suitable size and shape. As exemplified in the drawings, the boat is of relatively small construction and is provided with a pair of transverse inverted channel shaped members forming seats 18 which extend between the side plates 14. Around the periphery of the plates 14 and 16 is a hand rail 20 or the like.

Disposed below and in spaced parallel relation to the bottom plate 12 is a second bottom plate 22 which extends outwardly beyond the periphery of the bottom plate 12. A hollow V-shaped member 24 extends longitudinally of the center of the second bottom plate 22 and a hollow triangular shaped member 26 extends longitudinally adjacent each edge of the second bottom plate 22. Each triangular hollow member 26 includes a vertical wall 28 parallel to the second bottom plate 22 which is disposed inwardly of the outer edge thereof with the inclined wall 30 extending to and connecting with the outer edge of the second bottom plate 22 whereby this inclined edge will be instrumental in providing a smoother ride due to the impingement of waves thereon which cause several different forces to be exerted on the boat.

Extending vertically between the bottom plate 12 and the second bottom plate 22 is a plurality of baffles with there being a pair of longitudinal baffles 32, a pair of transverse baffles 34, and two pairs of diagonal baffles 36 and 38 intermediate the longitudinal and transverse baffles. All of the baffles terminate adjacent the outer periphery of the bottom plate 12 and slightly inwardly of the second bottom plate 22 and all of the baffles terminate at their inner ends adjacent to the confines of a cylindrical casing 40 connected with an opening 42 in the bottom plate 12. The casing 40 receives a cylindrical housing 44 which has a bottom plate 46 disposed therein through which a propeller shaft 48 extends. A top flange 50 is provided on the housing 44 and supports a motor bracket 52 which has an outboard motor 54 or the like mounted thereon for driving the propeller shaft 48 and the propeller shaft 48 is received within a propeller shaft housing 56. The propeller 58 is disposed below the bottom plate 46 and upwardly and above a second bottom plate 60 in the housing 44. Disposed horizontally between the plate 48 and 50 is a baffle 62 having an opening 64 therein in which is received the propeller 58. The housing 44 is provided with an extension 66 forwardly of and above the baffle 62 thus closing the top forward area above the baffle 62. The area between the forward edge of the baffle 62 and the bottom plate 60 is open thus permitting water to enter from the forward side of the housing and generally from the areas defined by the baffle plates arranged forwardly of the transverse baffles 34 when in normal operating position. An upwardly curved closure plate 68 is provided for the area between the bottom plate 60 and the baffle plate 62 rearwardly of the opening 54 thus preventing passage of water in this direction thus necessitating that all the water propelled by the propeller 58 will pass through the opening 64 and be discharged rearwardly of the housing 44 inasmuch as the baffle plate 62 extends downwardly in inclined relation as designated by the numeral 70 with the area between the bottom plate 60 and the partition plate 62 being free of obstruction thus permitting discharge of water between the baffle plates located rearwardly of the transverse baffle plate 34.

The flange 50 extends outwardly beyond the housing 44 and rests on a flange 72 on the upper end of the casing 40 whereby the motor 54 and housing 44 may be rotated about a vertical axis for taking in water from between selective baffle plates and discharging the same in opposition thereto so that the boat may be propelled in any direction and may, by proper position, be caused to turn about generally a vertical axis formed by the fore and aft portion of the water being drawn in and discharged by the propeller 58.

As the water is drawn in from the front of the boat and pushed out from the rear of the boat, then a water propulsion of the boat occurs so that the same may be propelled through water and due to the particular orientation of the inclined members and due to the fact that a substantial amount of the surface water is pulled through between the bottom plate 12 and the second bottom plate 22, the
vessel will maintain a substantially smooth and even condition.

FIGURES 5 and 6 illustrate a structure including a hollow parallelepiped hull 89 having a motor 82 supported therein and having a bottom plate 84 through which an output shaft 86 extends. A second bottom plate 88 is provided in spaced parallel relation to the bottom plate 84 and is spaced therefrom by baffles 90. Disposed beneath the bottom plate 88 is a plurality of hollow rectangular passageways 92 each of which receives a propeller 96 mounted therein with the propeller being driven from the output shaft 86 by a transfer mechanism 98. The front of each passageway 92 is inclined upwardly and forwardly as designated by the numeral 100 and this area includes a plurality of apertures 102 in the portion of the tubular member defining passageway 92 disposed forwardly of the plate 88 is provided with a series of apertures 104 for admitting water from in front of and above the tubular member defining the passageway 92. At either side of the bottom plate 88, there is provided a depending plate 106 having a third plate 108 interconnecting the lower ends thereof. Also, the bottom plate 88 is provided with a horizontal extending 110 which is joined with the bottom edge of the depending extension 106 by an inclined plate 112 thus defining an angular outer surface for the area of the boat below the bottom plate 88.

Disposed alongside of the hull 80 above the bottom plate 84 is a pair of tubular members 114 defining a pair of longitudinal passageways having openings 116 therein and a propeller 118 which is driven from the motor 82 by a suitable drive mechanism for further pumping water from in front of the boat and forcing the same out from the rear of the boat thus propelling the boat at the same time the drag against the front end of the boat is reduced.

In each instance, the object of the invention is to reduce the volume of water which has to be displaced by the bow of the boat by pumping this water through confined passageways and discharging the same in a diametric opposition to the intake thereof thus effectively propelling the boat. It is pointed out that the inward and downward incline in the front and rear end plates provides somewhat of a funnelling effect for the water entering the passageways and thus eliminating the eddy currents that would build up against the front of a flat bow end. The propeller 58 may be replaced with a centrifugal type impeller with only a slight variation in the partition 62 for conveying water through opening 65 in generally the same manner as the screw propeller. In each form of the invention, the vessel may be stopped by a braking effect caused by reversing the propellers 96 in FIGURES 5 and 6 and reversing the orientation of housing 44 in FIGURES 1-4. In the device of FIGURES 5 and 6, steering control of the boat is accomplished by varying the relative speed of the propellers disposed alongside of the hull which will control the direction of the boat. Also, the structure of FIGURES 1-4 may be incorporated into the device of FIGURES 5 and 6 for slow speed control and also for additional propulsion.

The stability advantages provided by the present invention eliminates the necessity of a seagoing vessel using ballast in the usual manner since the vessel can be easily controlled with the present invention and will ride smoothly even in rough water.

The foregoing is considered to be illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A boat construction comprising a hollow hull, said hull including a bottom plate, a second bottom plate disposed in spaced parallel relation to the bottom plate of the hull, a plurality of forwardly and rearwardly extending vertically disposed baffles extending between said bottom plates and defining a plurality of radially extending passageways communicating with the area between the peripheral edges of the bottom plate, and means for pumping water in from one side of the plates and discharging the same from the opposite side for propelling the boat, said means including a cylindrical housing extending into the area between the bottom plates, said cylindrical housing having a bottom compartment provided by a horizontal partition, the area of the compartment below and forwardly of the partition being open to the forward portion of the boat with the area behind and above the partition being open to the rear of the boat, said partition having an opening therein, and a propeller disposed in said opening for propelling water therefrom.

2. The structure as defined in claim 1 wherein said second bottom plate is provided with a plurality of depending hollow elements extending longitudinally of the boat, each of said hollow elements having at least one inclined wall surface for stabilizing the position of the boat in the water.

3. The structure as defined in claim 1 wherein said cylindrical housing is adjustable about a vertical axis for providing steering control of the boat.

4. A boat construction comprising a hollow hull including a bottom plate, a second bottom plate disposed in spaced parallel relation to the hull bottom plate, a plurality of baffles extending vertically between said bottom plates, said baffles extending radially from the central portion of the space between said bottom plates thereby defining a plurality of radial passageways, said baffles having the inner ends disposed in spaced relation thereby defining a central empty space, and water propelling means extending into said empty space, said water propelling means including an adjustable means to control the intake and outlet for said means for selective registry with certain groups of passageways for controlling the direction of propulsion of the boat.

5. The structure as defined in claim 4 wherein said water propelling means includes a propeller disposed in the central space, means disposed in the boat hull engaged with a motor and a propeller for causing rotation of the propeller of the cylindrical housing disposed in the bottom plate of the boat hull and having the lower end extending into the central space and partially enclosing the propeller, said cylindrical housing having an inlet and an outlet disposed at diametrically opposed places thereon for admitting water to the propeller and discharging water from the propeller, said housing terminating at its upper end interiorly of the boat hull whereby it may be rotated about a vertical axis for forming the adjustable means to control the intake and outlet for said propeller thereby controlling the movement of water from one portion of the boat hull to the other for enabling the boat hull to be effectively steered.

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