BOAT WITH HORIZONTAL BOW DIVIDER

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The present invention generally relates to a boat hull construction having novel structural features including a horizontally disposed bow divider or prow as compared with the normally vertically disposed bow divider and further including certain improvements on co-pending application Serial No. 74,276 for Boat With Adjustable Longitudinal Planing Device, filed December 8, 1960 now Patent Number 3,120,210, issued February 4, 1964.

The boat hull of the present invention includes longitudinal planing devices and laterally projecting pivotable struts members together with a novel propulsion means for propelling the boat.

An object of the present invention is to provide a boat hull having a horizontal bow divider for facilitating movement of the bow through the waves with the surfaces of the bow being inclined rearwardly in relation to the horizontal divider with the divider being disposed closer to the bottom of the boat hull than to the top.

A further object of the present invention is to provide a boat hull having an elongated inclined bow surface extending transversely of the hull with the upper portion thereof being pivotal from a position forming a continuation of the inclined surface to an inverted position with there being a relatively small bow divider of a vertical nature thereon for dividing any water that proceeds up the inclined surface of the bow so that a person operating the boat may more easily observe his direction and external conditions.

Another object of the present invention is to provide a boat hull having longitudinal planing devices together with means for adjusting the same and also novel propulsion means for propelling the boat from both the front and the rear with the propulsion means being in the form of propellers driven by suitable power sources for removing water from the bottom surface of the boat and discharging it either longitudinally rearwardly or laterally and rearwardly at the same time for propelling the boat and also reducing the frictional drag of the boat as it proceeds through the water.

Still another object of the present invention is to provide a boat hull construction which is relatively simple in construction, effective for its particular purposes and relatively 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 drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the boat of the present invention illustrating the external structural features thereof;

FIGURE 2 is a bottom plane view of the boat of the present invention;

FIGURE 3 is a front end view of the boat illustrating the construction of the bow;

FIGURE 4 is a longitudinal, sectional view taken substantially upon a plane passing along section line 4—4 of FIGURE 1 illustrating the internal structural details of the boat;

FIGURE 5 is a longitudinal, plan sectional view taken substantially upon a plane passing along section line 5—5 of FIGURE 4 illustrating further structural details of the invention including propulsion means therefor;

FIGURE 6 is a detailed sectional view taken substantially upon a plane passing along section line 6—6 of FIGURE 4 illustrating further structural details of the rear propulsion means for the boat hull; and

FIGURE 7 is a fragmental sectional view illustrating a brake structure incorporated into the invention.

Referring now specifically to the drawings, the boat 10 of the present invention includes an elongated hollow hull 12 having a closed cockpit area 14 with an entrance way 16 at the rear thereof and suitable port 18 therein including a windshield 20 at the forward end thereof which is inclined vertically. Forwardly from the windshield 20 is a horizontal forward deck portion 22 which is connected with an elongated downwardly inclined bow 24 which is transversely flat as illustrated in FIGURE 1 and which extends downwardly to a horizontal divider 26 that merges with and joins to a bottom member 28 which extends between 30 and 32 the hull 12. Thus, the horizontal divider 26 combined with the inclined surface 24 forms a bow so that the boat may cut through the crest of waves rather than passing over top of the waves and the cut through effect on the waves will be more efficient than a conventional wedge-shaped vertical bow which requires that the water be wedged outwardly. In this situation, the water runs up or passes over the inclined surface and does not have to be wedged outwardly against the surrounding water.

Mounted at the juncture between the horizontal forward deck portion 22 and the inclined bow 24 is a bow extension plate 32 which is mounted by a suitable hinge 34 which may conveniently be a piano-type hinge coincident with the juncture between the front deck portion 22 and the bow 24. The plate 32 forms a continuation of the inclined bow 24 when in a position illustrated in dotted lines in FIGURE 4. However, the plate 32 is normally in the position of FIGURE 1 unless rough weather and rough seas are encountered. When the plate 32 is in the position illustrated in FIGURE 1, a partial vertical bow structure 36 forms a vertical portion extending upwardly from the inclined bow 24 and the diverging side surfaces 38 serve to split and divide any water proceeding up the inclined bow 24 so that the windshield 22 will be maintained clear. Also, the partial bow 34 has a horizontal portion 40 which forms a continuation of the forward deck 22 when in the normal position illustrated in FIGURE 1.

The plate 32 is provided with a worm gear 42 rigid therewith which extends through a suitable sealed opening in the hull and is engaged with a worm pinion gear 44 carried by an elongated shaft 46 rotatably suspended from the hull in any suitable manner such as by brackets 48 and the like. The inner end of the shaft 46 is disposed within the cabin or cockpit 14 and is provided with a hand wheel 50 for enabling rotation thereof thereby enabling the partial bow or bow plate 32 to be pivoted from the position illustrated in FIGURE 1 which is its normal position and also the position illustrated in solid line in FIGURE 4 and from the position illustrated in dotted line in FIGURE 4 for enabling the partial bow 32 to be orientated in the desired position from the cabin or cockpit of the boat.

Disposed below the bottom member 28 is a series of longitudinally extending hollow beams or the like 52 which form longitudinal channels 54 from the bow to the stern of the boat hull. Extending across the hollow beams 52 is a plurality of bottom connector plates 56 each of which has a barded forward edge 58 for cutting through the water. Disposed in the two outer channels 54 is a pair of foreword longitudinal planing members 60 and a pair of rear planing members 62 each of which are pivotally mounted on pivot axles 64 at their forward end and at their rearward ends, an operating arm 66 is
attached thereto and extends upwardly through the hull bottom 28 for connection with a suitable power source 68 for varying the position of the planing devices 60 and 62 upon actuation of a suitable control from the control cabin or cockpit. The power source 68 includes an electric motor 70 centrally disposed within the hull and including a shaft 72 extending outwardly therefrom with each end of the shaft 72 including a laterally offset arm 74 connected to the operating rod 66 for the pair of planing members 60 with the rod 66 being secured where they extend through the bottom 28 of the hull.

Disposed laterally of the hull adjacent the forward end thereof is a pair of pivotal stabilizers 76 mounted on the outer end of a transverse shaft 78 and provided with opposite downwardly inclined surfaces 80 as illustrated in FIGURE 1. The shaft 78 extends through a gear box 82 driven by a suitable electric motor 84 thus forming a power source for pivoting the shaft 78 thus pivoting the stabilizers 76 about the central axle formed by the transverse shaft or axle 78.

Also disposed laterally of the side walls 30 of the hull is a pair of longitudinal hollow floatation members 86 which have a bottom 88 flush with the bottom of the longitudinal beams 52 and which have an inclined forward end wall 90 generally paralleling the inclined bow 24. The top wall of the float 86 is generally perpendicular with an inclined bottom or deck 92 which forms a housing for the various control machinery. Included under the inner deck 92 is a suitable internal combustion engine 94 having a drive shaft 96 driving a pair of pumps or impellers 98 through a gear box 100. Each of the pumps or impellers 98 is provided with an intake conduit 102 extending laterally and forwardly thereof with the inlet end 104 thereof orientated to scoop water from the center longitudinal hollow beam 54 by virtue of a curved deflector 106. The discharge side of the pump is communicated directly with the hollow tubular beams 52 for discharge of the water rearwardly from the beams past the stern 108 and over a pair of vertical rudders 110 which are orientated in alignment with the discharge end of the hollow beams or channels 52 and which are controlled by a suitable connecting drag link 112 connected to offset arms thereon and a suitable power mechanism 114 which may be either manually or remotely controlled from the cabin or cockpit. Thus, the water will be pumped from the channel members 52 or hollow beams, through the pump 98 and discharged rearwardly through the same beams thus pumping water from in front of the beams or boat in view of the opens thereof to reduce the frictional drag of the boat as it passes over the water surface.

Adjacent laterally of the boat, there is provided a pair of pumps 116 which have discharge conduits 118 extending laterally outwardly and discharging just below the forward end of the float 86. The pumps are preferably of the cylindrical type and have an inlet through the bottom 28 directly into the water area formed by the longitudinal channels 54 or by openings 120 in the beams 52 thus forming two inlets for water in the beams, either at the front end thereof or at the openings 120.

By adjusting the longitudinal planing devices as well as the stabilizing members, the characteristics of movement of the boat through and over the water may be varied depending upon the conditions of the water and the speed of the boat. By varying the speed of the pumps, the speed of the boat may be varied and, the rudders may be employed for controlling the direction of movement and the direction of movement may also be varied by varying the attitudes of the planing devices and the stabilizing fins or members. The frontal characteristics of the bow of the boat may be varied by pivoting the bow plate or partial bow from the position illustrated in FIGURE 1 to the dotted line position illustrated in FIGURE 4.

Conventional construction procedures may be followed in constructing the boat and sufficient rigidity may be built into the hull to withstand the various stresses and strains encountered during normal operation of the boat. For example, the hull may be constructed of sheet metal construction that is of welded or riveted construction with the various components thereof being of conventional structural shapes for rigidity of the hull as is necessary. Also, access hatches, passages and the like are provided where necessary.

FIGURE 7 illustrates a brake or retarding mechanism 122 which includes a transverse plate 123 hinged at its rear edge to the deck 126 by a hinge assembly 128. An arm 130 is attached to the plate at the hinge for connection with the output piston rod of a fluid motor 132 whereby the plate 124 may be pivoted from a retracted position flush with the deck 126 to a position inclined downwardly and forwardly therefrom as illustrated in FIGURE 7 for scooping into the water for slowing the boat. The rudder 134 is mounted forwardly of the plate 124 in order to control the direction of movement of the boat in a conventional manner.

The foregoing is considered as 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 accordingly all such 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 hull construction including a bow comprising a flat plate extending laterally between side wall portions of the hull and inclined from a forward edge adjacent the bottom of the hull to a rearward position thereby defining a flat inclined bow and a horizontal divider at the bottom of the bow, a horizontally disposed forward deck portion at the upper end of the inclined bow, a windshiel assembly disposed at the rear edge of the forward deck portion, and means for propelling said hull, an extension pivotally attached to the upper end of the inclined bow for orientation as a continuation thereof when in one position for orientation against the outer surface of the upper portion of the inclined bow in its other position, and a partial bow including a vertical dividing wall mounted on said extension and exposed upwardly when the extension is lying against the surface of the upper hull, said partial bow including a horizontal top wall forming a continuation of the forward deck portion, said partial bow being received above the forward deck portion and forwardly of the windshield to protect the windshield when oriented with the extension forming the continuation on the windshield preventing water from engaging the windshield when encountering rough seas.

2. A boat hull construction including a bow comprising a flat plate extending laterally between side wall portions of the hull and inclined from the forward edge adjacent the bottom of the hull to a rearward position thereby defining a flat inclined bow and a horizontal divider at the bottom of the bow, a horizontally disposed forward deck portion at the upper end of the inclined bow, a windshield assembly disposed at the rear edge of the forward deck portion, and means for propelling said hull, said hull including a bottom, a plurality of longitudinally extending hollow beams connected with said bottom and forming water passageways, pump means communicating with the water passageways at a point forwardly and rearwardly for intake of water from the passageways at a forward position and discharging it at a rearward position and constituting the means for propelling the boat, and rudder means disposed rearwardly of the hollow beam and passageways formed thereby for controlling the direction of movement of the boat, said rudder means including a pair of pumps adjacent the forward end of the hull and a pair of pumps adjacent the rear of the hull.
thereby providing forward and rear propulsion means, the spaces between the hollow beams forming longitudinal channels below the bottom of the boat, and forward and rearward longitudinally disposed planing devices pivotally attached at their forward ends to the boat hull for varying the planing characteristics of the boat, and means connected to the rearward ends of the planing members for varying the angular attitude thereof.

3. A boat hull comprising a bottom member, a retarding member pivotally attached to said bottom member, said retarding member including a plate having the rear edge attached to the bottom member, said retarding member including a plate having the rear edge attached to the bottom member and means swinging the plate from a position alongside the bottom member to downwardly and forwardly inclined positions for scooping into the water, said hull also including a bow comprising a flat plate extending laterally between side wall portions of the hull and inclined from a forward edge adjacent the bottom of the hull to a rearward position thereby defining a flat inclined bow and a horizontal divider at the bottom of the bow, a horizontally disposed forward deck portion at the upper end of the inclined bow, a windshield assembly disposed at the rear edge of the forward deck portions, and means for propelling said hull, an extension pivotally attached to the upper end of the inclined bow for orientation as a continuation thereof when in one position and for orientation against the outer surface of the upper portion of the inclined bow in its other position, and a partial bow including a vertical dividing wall mounted on said extension and exposed upwardly when the extension is lying against the surface of the upper portion of the inclined bow, said partial bow including a horizontal top wall forming a continuation of the forward end portion, said partial bow being received above the forward deck portion and forwardly of the windshield to protect the windshield when oriented with the extensions forming a continuation of the inclined bow thereby preventing water from engaging the windshield when encountering rough seas.

4. In a boat hull having an elongated inclined bow surface extending transversely of the hull, the improvement comprising an extension pivotally attached to the upper end of the elongated inclined bow surface with the extension being pivotal to a position forming a continuation of the inclined bow surface and to an inverted position wherein said extension is oriented against the outer surface of the inclined bow surface, said extension having a relatively small bow divider of a vertical nature thereon for dividing any water that proceeds up the inclined bow surface.

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