

March 8, 1927.

W. A. HICKMAN

1,620,349

BOAT

Filed Jan. 10, 1923

2 Sheets-Sheet 1

Fig. 1.

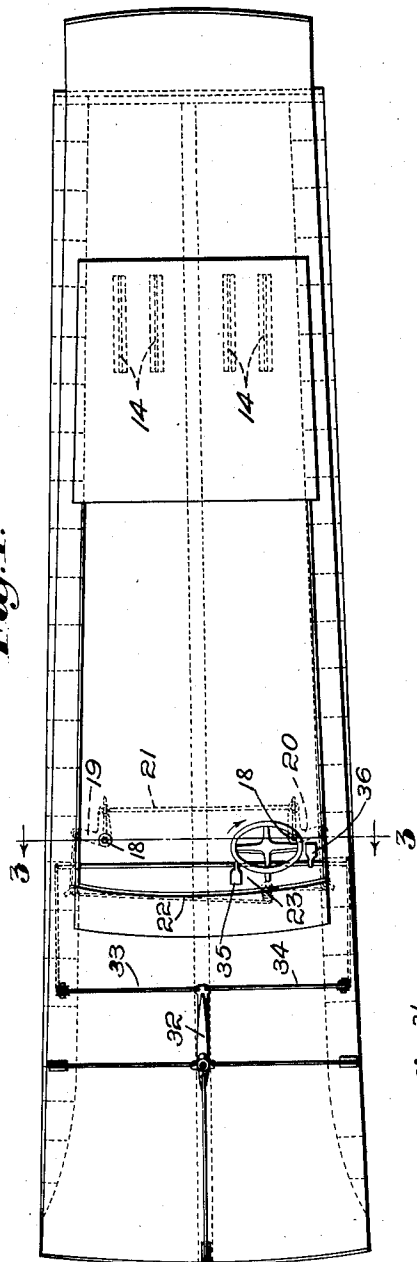
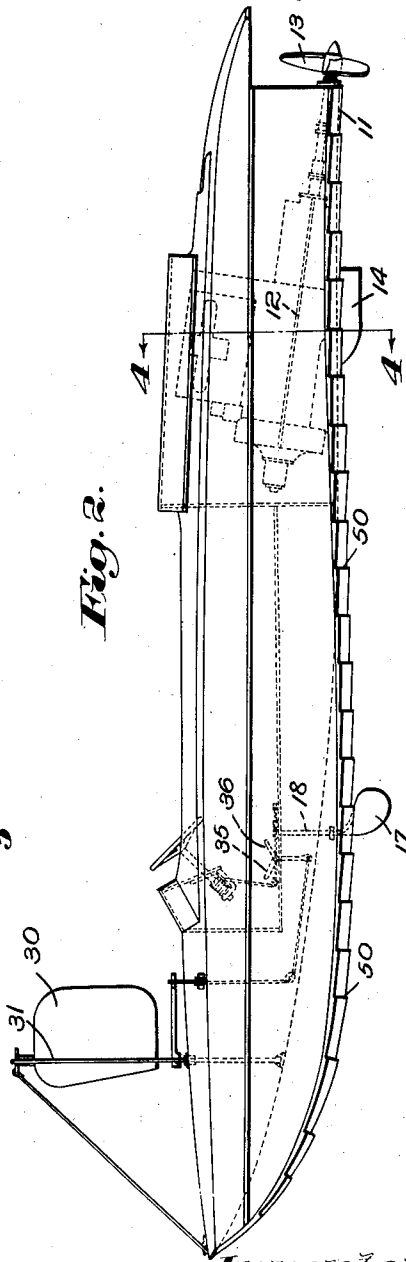


Fig. 2.



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Fig. 4.

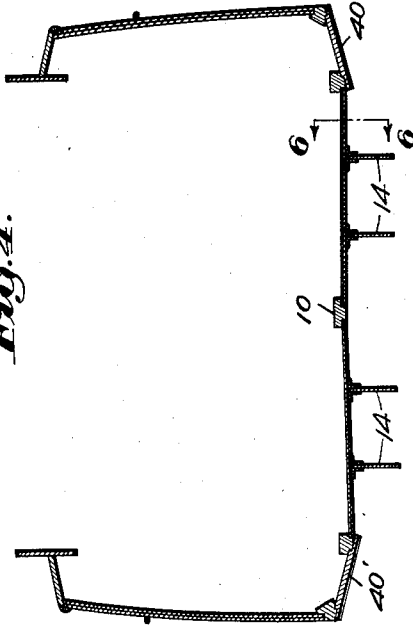


Fig. 2.

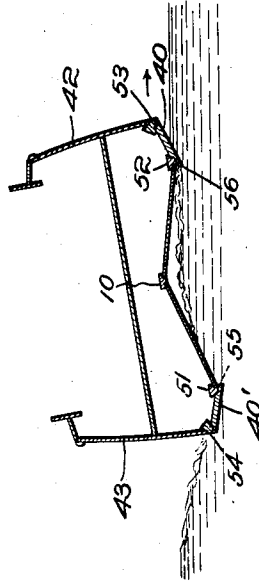


Fig. 3.

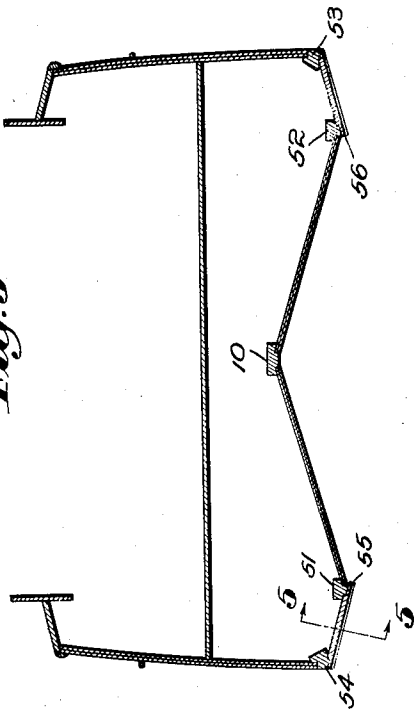


Fig. 5.



Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM ALBERT HICKMAN, OF WEST MYSTIC, CONNECTICUT.

BOAT.

Application filed January 10, 1923. Serial No. 611,888.

This invention pertains to improvements in boats. It is among the objects of the invention to provide a boat capable of great speed and of superior turning or maneuvering ability.

In the drawings, which show a preferred form of one embodiment of my invention:—

Figure 1 is a plan of a hull;

Fig. 2 is a side elevation thereof;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Fig. 6 is a section on the line 6—6 of Fig. 4, being partly in elevation; and

Fig. 7 is a section similar to Fig. 3, but showing the action of the hull when skidding to make a quick turn.

Referring to the drawings and to the preferred form of my invention selected for illustrative purposes, I have shown a hull of the inverted V-bottom type having the keel 10, throughout at least the greater part of the boat, above the level of the bottom of the boat adjacent the sides, the central portion of the bottom presenting an inverted V-section gradually decreasing as the stern is approached and preferably terminating in a straight or substantially straight bottom adjacent the stern where the general line of the bottom may even be gradually lowered at 11 to provide an increasing angle of incidence aft. The preferred form of my invention illustrated is provided with a surface propulsion system herein shown as including a single motor 12 driving a single surface propeller 13. Certain features of my invention are, however, of use in boats having plural surface propellers or even having one or more submerged propellers.

In the preferred form of my invention illustrated, the engine 12 is located very near the stern of the boat to provide a center of weights well aft and preferably adjacent that portion of the bottom of the hull presenting the increasing angle of incidence. Adjacent the stern of the boat and preferably below the center of weights, I have provided keel means herein shown as including four fins 14, the primary purpose of which is to oppose skidding of the stern of the boat during a quick turn, while at speed. The

hull illustrated is provided with bow rudder means herein shown as including a pair of bow rudders 17, each attached to a rudder stock 18 connected together for coordinate operation by suitable means typified by the bell cranks 19, 20 connected by the rod 21 and actuated by suitable means typified by the cable 22 passing around the drum 23 on the steering post of the boat.

Cooperating with the bow rudders 17, I have shown an aerial rudder 30 pivoted at 31 and controllable by a tiller 32 which may be connected by suitable cables 33 and 34 to controlling means within reach of the operator of the boat, such controlling means being typified by the foot pedals 35 and 36.

To provide against tripping the boat when turning at speed, I have shown that portion of the bottom thereof adjacent the chines to be angled outwardly and upwardly from the center of the boat so that, as the boat moves sidewise through the water on a turn, that side thereof toward which the boat is skidding will be elevated and the opposite side depressed, thus for instance, (as shown in Fig. 7) when the boat is skidding toward the right, as indicated by the arrow, the side of the boat will in a sense become the bow thereof and the surface 40, presenting an angle of incidence to the water developing a substantial component of force in an upward direction, will raise the side of the boat 42 while the opposite side of the boat 43 will be depressed by that resolution of forces which normally depresses the stern of an ordinary V-bottom boat when travelling at speed. Thus the boat will always be banked in the proper direction for the turn, that side of the boat adjacent the inside of the turn being depressed and the other side of the boat, adjacent the outside of the turn, being elevated.

In the preferred form of the invention the boat is made with its greatest beam forward and the outer chines 53 and 54 as well as the inner chines 51 and 52 converge toward the stern as illustrated in Fig. 1. Thus when the boat is at speed the most forward portion engaging the water will be of greater width than the parts aft and the water streaming aft from this portion will define a trough adjacent either side of the boat and the angled surfaces 40 and 40' will

be disposed in this trough and not in contact with the water when the boat is running straight ahead. To prevent the water from adhering to these surfaces after the boat has made a turn and been straightened out on her course again or when by any accident water has come in contact with these surfaces I preferably provide a series of small water breaks 50 (see Figs. 2 and 5) which will break the adhesion of the water to these surfaces of the boat permitting air to enter behind the sheet of water. Thus, the water will not be sucked up against these surfaces to retard the forward motion of the boat while she is running straight ahead but on the contrary they will lie in the trough of the water.

In the normal movement of a boat of the inverted V-bottom type shown at speed the boat rides on the trapped air and water in the inverted V-bottom, the water line being at some distance from the apex of the V. To prevent water being sucked up into the V under the surfaces 40 and 40' when the boat is turned I provide overhanging portions 55 and 56 at the edges of these surfaces to provide water breaks at that point so that the water will not follow along the bottom surfaces of the boat and fill the inverted V section.

Where bow rudder means are utilized in combination with the keel means 14 located beneath the center of weights, the boat may be very quickly turned even when travelling at great speed, and such skidding action as takes place will assist in turning the boat, without danger of tripping the side of the boat with the possibility of capsizing.

The aerial rudder 30 is controlled entirely independently of the bow steering means acting on the water and typified by the rudder 17, but, if the operator of the boat so desires, may be used to assist the action of the rudder means acting on the water not only in steering the boat, but, under some conditions, to assist the banking of the boat in the desired direction making a quick turn. The preferred form of aerial rudder illustrated is so constructed that it may be left free to swing under the influence of the air passing by it, so that, when not utilized for steering, comparatively little retardation of the boat will be effected by reason of the resistance of this rudder to movement through the air. Similarly, when wind conditions are such as to render the use of the rudder undesirable, it may be left free, in which case it will swing to neutral position under the action of the wind and of the motion of the boat through the air.

While I have shown and described a preferred embodiment of my invention, it will be understood that major changes involving omission, alteration, reversal and substitu-

tion of parts, and even changes in the mode of operation, may be made without departing from the scope of my invention, which is best defined in the following claims.

Claims.

1. A boat having sides and a bottom, said bottom presenting an inverted V section adjacent the longitudinal center line thereof and bottom surfaces adjacent the sides of said V section sloping upwardly and outwardly at angles such that on lateral movement of the boat through the water a substantial component of force in an upward direction is produced.

2. A boat having sides and a bottom, said bottom presenting an inverted V section adjacent the longitudinal center line thereof and bottom sections adjacent the sides of said V section sloping upwardly and outwardly at angles such that on lateral movement of the boat through the water a substantial component of force in an upward direction is produced, said flaring bottom sections having steps to prevent the adherence of water thereto.

3. A motor boat having a hull, the bottom of which presents inverted V sections broadening aft, a water propeller and an aerial rudder adjacent the bow contributing when operated to a banking of the bow of the boat to provide a lengthened water line along the V-bottom on the inside of the turn while minimizing skidding of the stern.

4. A motor boat having a hull, the bottom of which presents inverted V sections broadening aft, a single screw propeller adapted to operate when the boat is at speed with its hub out of water and an aerial rudder adjacent the bow contributing when operated to a banking of the bow of the boat to provide a lengthened water line along the V-bottom on the inside of the turn while minimizing skidding of the stern.

5. A boat having a semi-submerged propeller and a rudder adjacent the bow, said hull gradually flattening as the stern is approached and presenting a center of weights adjacent the stern and, adjacent the center of weights, relatively short keel means opposing skidding of the stern of the boat.

6. A boat of the inverted-V-bottom type having a substantial freeboard and having adjacent its sides near the water line relatively long surfaces flaring upwardly and outwardly at angles such that on lateral movement of the boat through the water a substantial component of force in an upward direction is produced.

7. A boat of the inverted-V-bottom type having a substantial freeboard and having adjacent its sides near the water line relatively long surfaces flaring upwardly and outwardly at angles such that on lateral movement of the boat through the water a substantial component of force in an up-

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ward direction is produced, such surfaces presenting a plurality of small steps to prevent adherence of the water thereto.

8. A boat presenting bow rudder means, a center of weights adjacent the stern, and relatively short keel means adjacent said center of weights.

9. A boat presenting twin bow rudder means, a center of weights adjacent the stern, and relatively short keel means adjacent said center of weights.

10. A motor boat having a hull, the bottom of which presents inverted V sections broadening aft, a water propeller, an aerial rudder adjacent the bow contributing when operated to a banking of the bow of the boat to provide a lengthened water line along the V-bottom on the inside of the turn while minimizing skidding of the stern and an independently controllable water rudder aft.

11. A motor boat having a hull, the bottom of which presents inverted V sections broadening aft, a single screw propeller adapted to operate when the boat is at speed with its hub out of water, an aerial rudder adjacent the bow contributing when operated to a banking of the bow of the boat to provide a lengthened water line along the V-bottom on the inside of the turn while minimizing skidding of the stern and an independently controllable water rudder aft.

12. A boat of the gliding or semi-gliding type having a tapering after body and a bottom including lateral surfaces and a central inverted V surface, the sides of which gradually draw together toward the stern.

13. A boat of the gliding or semi-gliding type having a tapering after body and a bottom including lateral surfaces and a central inverted V surface progressively flattening toward the stern and the sides of which gradually draw together toward the stern.

14. A boat of the gliding or semi-gliding type having a bottom including lateral surfaces and a central inverted V surface, the sides of which gradually draw together toward the stern.

15. A boat of the gliding or semi-gliding type having a bottom including lateral surfaces and a central inverted V surface progressively flattening toward the stern and the sides of which gradually draw together toward the stern.

16. A boat having a hull with a maximum beam forward and chines which converge

aft from the location of maximum beam and surfaces adjacent said chines presenting an acute angle to the water, said surfaces normally lying out of water in the trough defined by the hull when the boat is running straight ahead.

17. A boat having a hull with a maximum beam forward and chines which converge aft from the location of maximum beam and surfaces adjacent said chines presenting an acute angle to the water, said surfaces normally lying out of water in the trough defined by the hull when the boat is running straight ahead, said surfaces being provided with transverse breaks to prevent adhesion of water thereto.

18. A boat having an inverted V-bottom and having the greatest breadth of the hull well forward and having chines converging aft from the point of greatest breadth, and presenting outwardly of the V of the bottom narrow surfaces at an acute angle to the water, which surfaces lie normally in the trough of the water defined by the hull when the boat is running straight ahead, but adapted to contact with the water to provide a substantial upward component of force on the outside of the turn when the boat is turned.

19. A boat having an inverted V-bottom and having the greatest breadth of the hull well forward and having chines converging aft from the point of greatest breadth, and presenting adjacent said chines outwardly of the inverted V of the bottom narrow surfaces at an acute angle to the water, which surfaces lie normally in the trough of the water defined by the hull when the boat is running straight ahead, but adapted to contact with the water to provide a substantial upward component of force on the outside of the turn when the boat is turned, said surfaces being provided with breaks to prevent the adhesion of water thereto when the boat resumes a straight course.

20. A boat having a hull, the bottom of which presents inverted V sections broadening aft and surfaces adjacent the sides sloping upwardly and outwardly at markedly acute angles with the water and projecting water breaks at the junction of said surfaces with those surfaces defining the V sections to prevent water passing from one surface into adhesion with the other.

In testimony whereof, I have signed my name to this specification.

WILLIAM ALBERT HICKMAN.

CERTIFICATE OF CORRECTION.

Patent No. 1,620,349.

Granted March 8, 1927, to

WILLIAM ALBERT HICKMAN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 78, claim 18, for the words "outwardly of the V" read "adjacent said chines outwardly of the inverted V"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of March, A. D. 1927.

M. J. Moore,
Acting Commissioner of Patents.

Seal.