Feb. 27, 1945. T. A. E. LAKE 2,370,318

DISPLACEMENT-HYDROPLANE BOAT

Filed Oct. 28, 1943 3 Sheets-Sheet 1

Fig. 1.

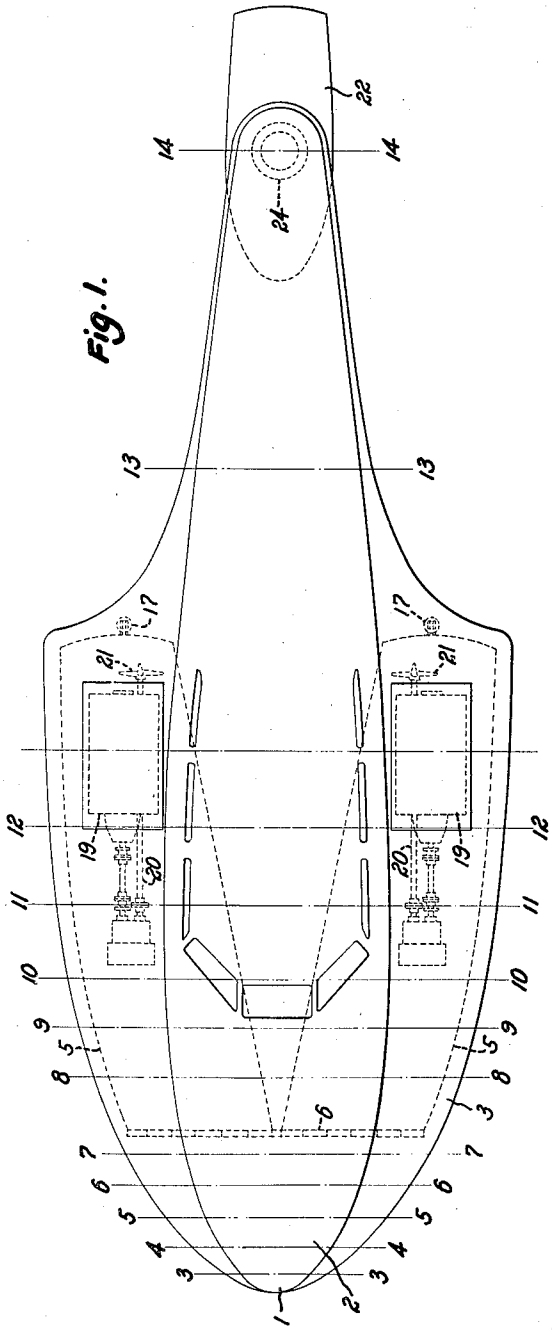
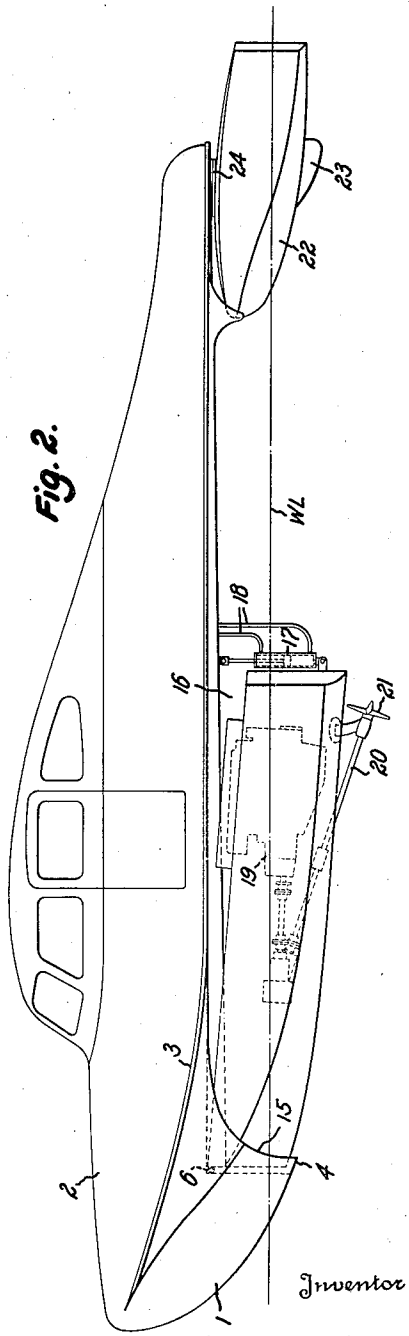


Fig. 2.



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Feb. 27, 1945. T. A. E. LAKE 2,370,318

DISPLACEMENT-HYDROPLANE BOAT

Filed Oct. 28, 1943 3 Sheets-Sheet 2

Fig. 3.

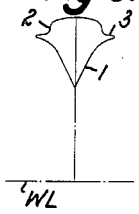


Fig. 4.

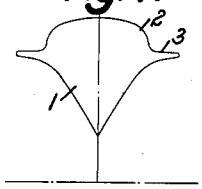


Fig. 5.

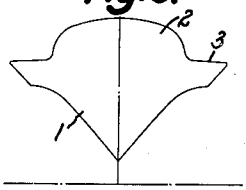


Fig. 6.

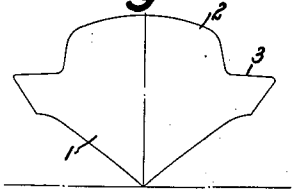


Fig. 7.

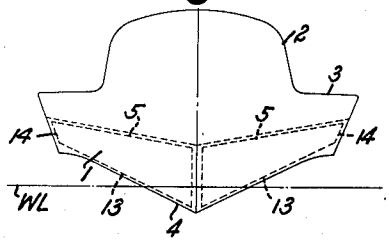


Fig. 8.

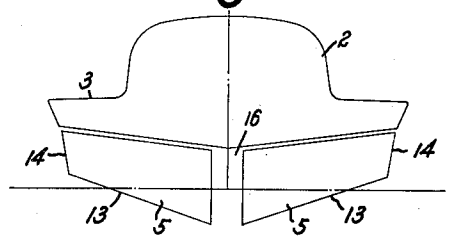


Fig. 9.

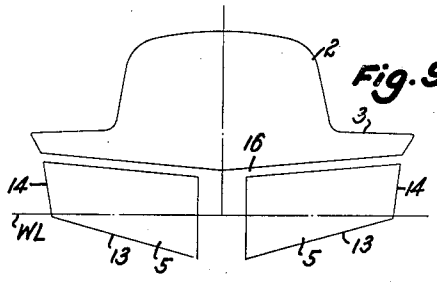


Fig. 10.

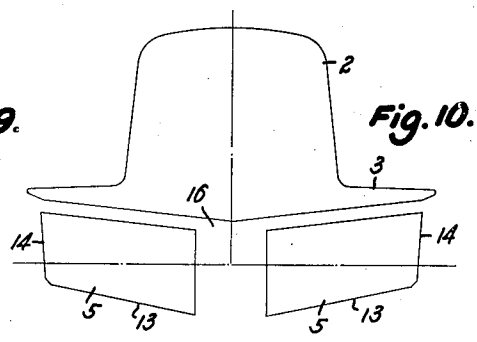


Fig. 11.

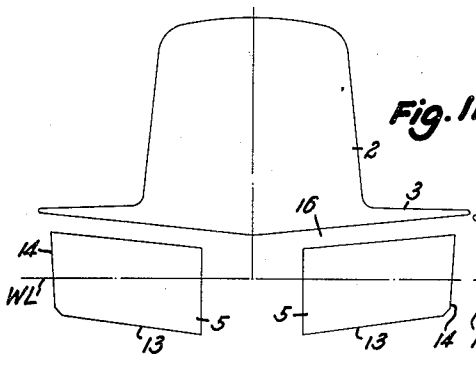
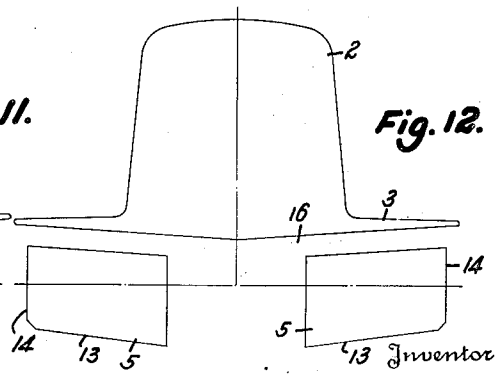


Fig. 12.



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Feb. 27, 1945. T. A. E. LAKE 2,370,318

DISPLACEMENT-HYDROPLANE BOAT

Filed Oct. 28, 1943 3 Sheets-Sheet 3

Fig. 13.

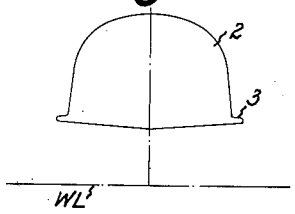


Fig. 14.

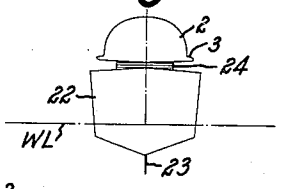


Fig. 15.

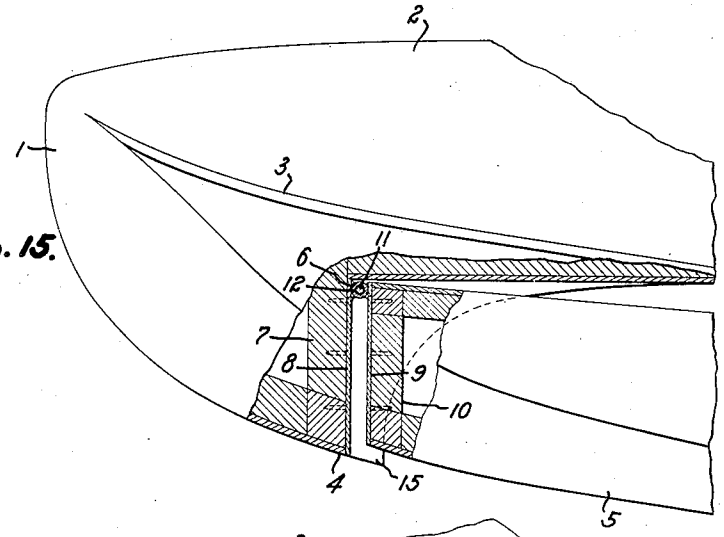
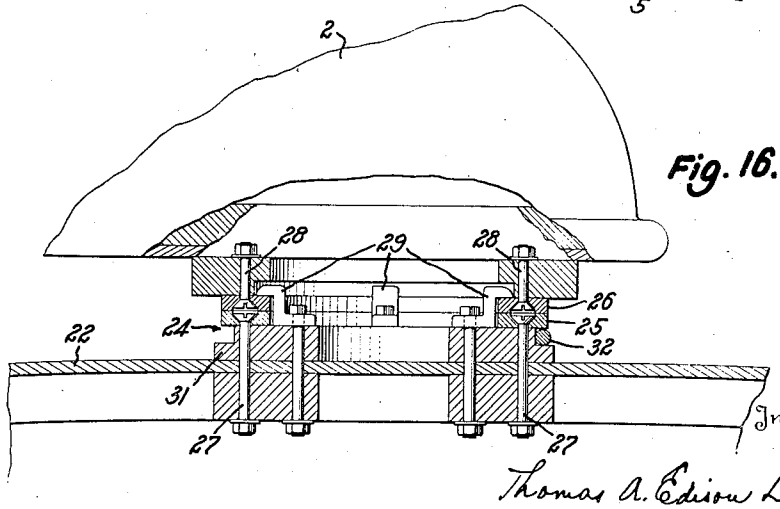


Fig. 16.



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UNITED STATES PATENT OFFICE

2,370,318

DISPLACEMENT-HYDROPLANE BOAT

Thomas A. Edison Lake, Milford, Conn., assignor to George B. Cluett, 2nd, Troy, N. Y.

Application October 28, 1943, Serial No. 507,985

6 Claims. (Cl. 114—66.5)

This invention relates to displacement-hydroplane boats such as that disclosed in my copending application of the same title filed February 15, 1940, Serial No. 319,062, now Patent No. 2,344,619, granted March 21, 1944, which include a body or fuselage normally supported above the surface of the water upon hydroplane hull members or pontoon floats, and which combine the rough-water navigability of the displacement type of boat with the high-speed performance of the hydroplane type of boat, at the same time providing for greater safety, riding comfort and maneuverability than is found in boats of either the ordinary displacement type or hydroplane type.

The present invention embodies modifications of boats constructed generally in accordance with the principles of the invention disclosed in my application hereinbefore referred to, whereby still greater safety, maneuverability, and seaworthiness are obtained, especially when operating in rough, or relatively rough, water.

The modifications and structural refinements to which this invention particularly relates comprise, essentially, a novel bow structure for the boat body or fuselage, and modifications of the means whereby the hydroplane hull members or pontoon floats are connected with such body or fuselage, all as will be explained hereinafter more fully and finally claimed.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated,

Fig. 1 is a schematic plan view of a boat embodying the principles of the invention.

Fig. 2 is a side elevation thereof.

Figs. 3 to 14 are diagrammatic profile views taken on the lines 3—3 to 14—14 of Fig. 1, respectively.

Fig. 15 is an enlarged fragmentary sectional detail of the bow portion of the boat, showing the hinge means for the forward hydroplane hull members, and

Fig. 16 is a still more enlarged fragmentary sectional detail of the stern portion of the boat, showing the swivel or steering connection of the stern hydroplane hull member or float with the body or fuselage.

As hereinbefore stated, one of the features of the present invention is the novel bow structure of the boat.

It was found in the operation of boats having divergent hydroplane hull members, as disclosed in my copending application referred to, that maneuverability and seaworthiness were impaired by rough or relatively rough water, and the bow structure of the present invention is designed to obviate this objection.

As will be apparent from an inspection of Figs. 1 to 7 and 15, the bow 1 of the boat shown is formed as a part of the body or fuselage 2 and is closed from the deck-line 3 to a point 4 extending below the normal water line WL.

Aft of the bow, but having their forward ends housed within the closed bow structure, are arranged the main hydroplane hull members or pontoon floats 5 which provide the main supporting or water-contacting hull of the boat. These hull members are hinged at 6 (Fig. 15) to the aft bulkhead 7 of the bow structure at their upper forward edges, the hinge means preferably being of a form similar to a piano hinge the mating eyes of which are secured to plates 8 and 9 attached, respectively, to the framing of the bulkhead 7 and to the forward end framing 10 of the hull members 5, the hinge pintle 11 preferably being cushioned in the eyes by a sheath 12 of rubber or other appropriate resilient or yielding material.

The longitudinal axes of the hull members 5 diverge respectively from bow to stern in V arrangement and in equal degree with respect to a median axis extending from bow to stern of the boat, and they have relatively flat bottoms 13 (see Figs. 7 to 12) to provide planing surfaces, and their sides 14 are also laterally divergent, all substantially in the manner of the similar hull members disclosed in my application referred to.

Although the bow ends of the hull members 5 are housed behind the after portion of the bow structure and by fairing 15 at the sides thereof, the major portion of their length lies in a free space 16 below the body or fuselage, and they are free therein for pivotal movement on their hinge connections 6 limited by shock absorbing or cushioning members 17 which may be in the form of fluid controlled cylinder and piston means having fluid conduits 18 leading to appropriate pressure control means, not shown, but of any suitable type. Thus, excessive pounding of the boat in rough water is alleviated and relatively smooth riding qualities are obtained.

The boat is preferably driven by power plants 19 housed within the hull members and having their propeller shafts 20 and propellers 21 on axes parallel to the median longitudinal axis of the boat.

The stern portion of the body or fuselage is supported upon a hydroplane hull member or

pontoon float 22 preferably having a fin 23, and this float or hull member is connected with the body or fuselage by a swivelling bearing 24 (Fig. 16) including, in the form shown, two similar metal bearing rings 25 and 26 secured to the framing of the hull member and body or fuselage, respectively, by bolts 27 and 28, and being held in operative rotative contact by clamping members 29 securely bolted either to the framing of the hull member, as shown, or to the framing of the body or fuselage.

Interposed between the bearing ring 25 and the deck 30 of the hull member 22 is a steering member or tiller ring 31 around which is passed the steering cable 32 in a well-known manner.

When the boat is at rest its normal water line will be as indicated at WL in Figs. 2 to 14, and this is true also when the boat is travelling at low speed. Thus, due to the novel bow structure, the water will be parted prior to exertion of its pressure upon the bow portions of the hull members 5, and this is of particular advantage in rough water by reason of the fact that it makes the boat steadier and more seaworthy, and reduces the pounding which normally occurs in operation of hydroplane boats in broken water. Also, at those speeds of the boat where planing action upon the hull members takes place, and the extension 3 of the bow may or will rise above the water, the closed bow will break up any appreciable wave formations with similarly resultant steadiness and seaworthiness and reduction of pounding of the boat.

Various changes and modifications are considered to be within the principle of the invention and the scope of the following claims.

What I claim is:

1. In a displacement-hydroplane boat, a body or fuselage, a pair of hydroplane hull members carried by said body in laterally spaced relation and providing a water passage between them, and a bow structure on the body in advance of the forward ends of said hull members and providing a water-diverting member in advance of said hull members normally closing said water passage, said hull members being connected to said body for vertical movement relatively thereto and providing a bearing for the body upon the water.

2. In a displacement-hydroplane boat, a body or fuselage, a pair of hydroplane hull members arranged in laterally spaced relation to the longitudinal axis of said body and providing a water passage between them, and a bow structure on the body in advance of the forward ends of said hull members and having a portion extending below the normal water line of the boat, said bow structure providing a water-diverting means in advance of said hull members normally closing said water passage, said hull members being connected to said bow structure for cushioned vertical movement relatively to said body and providing a cushioning bearing for the body upon the water.

3. In a displacement-hydroplane boat, a body or fuselage, a pair of hydroplane hull members hingedly connected at their bow ends to said body and providing a bearing therefor upon the water, said hull members being arranged laterally of the longitudinal axis of the body and in laterally spaced relation to each other providing a water passage between them axially of the boat, and a bow structure on said body in advance of the bow ends of said hull members and normally closing the forward end of said water passage.

4. In a displacement-hydroplane boat, a body or fuselage, a bow structure formed on said body and extending downwardly therefrom to below the normal water line of the boat, and a pair of hydroplane hull members in spaced arrangement laterally of the boat and providing a water passage between them, said hull members having their bow ends housed behind said bow structure and connected therewith for relative vertical movement, the bow structure being continuous across the bow of the boat and normally closing said water passage and the space between said hull members at the bow end thereof.

5. In a displacement-hydroplane boat, a body or fuselage, said body provided with an unbroken bow structure extending below the normal water line of the boat, and a pair of hydroplane hull members hingedly connected to said bow structure and housed by the after portion of same, said hull members being arranged in laterally spaced relation and providing a water passage between them, said bow structure normally closing said water passage at its bow end.

6. In a displacement-hydroplane boat, a body or fuselage, a bow structure on said body extending downwardly to below the normal water line of the boat, hull means comprising a pair of substantially similar float members each constituting substantially a half hull having their bow ends connected to said body aft of said bow structure and housed thereby, each of said float members having a relatively flat bottom providing a planing surface and having its longitudinal axis and therewith its two lateral water-contacting surfaces laterally divergent from bow to stern in V formation, the body or fuselage being normally supported above and out of contact with the surface of the water by said float members, and the bow structure normally providing a cutwater in advance of said floats.

THOMAS A. EDISON LAKE.