

W. M. & L. E. MEACHAM.
HYDROPLANE BOAT.
APPLICATION FILED JAN. 29, 1906.

955,343.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

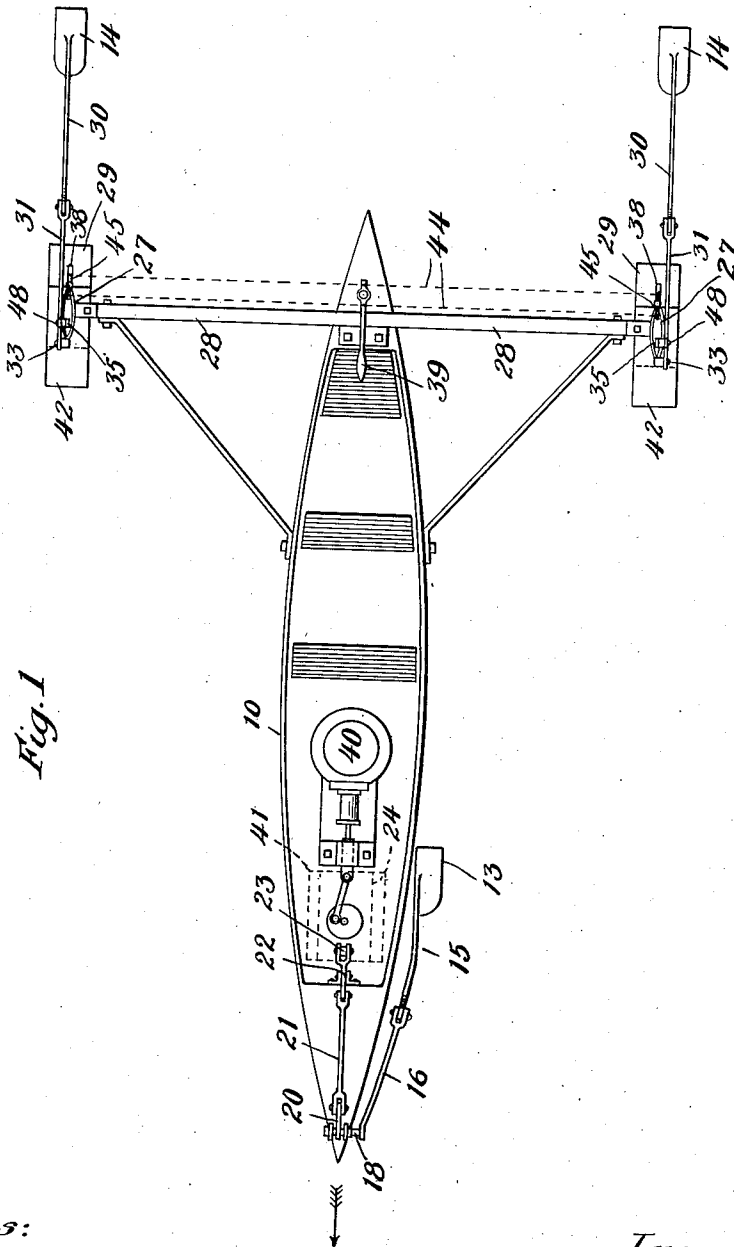


Fig. 1

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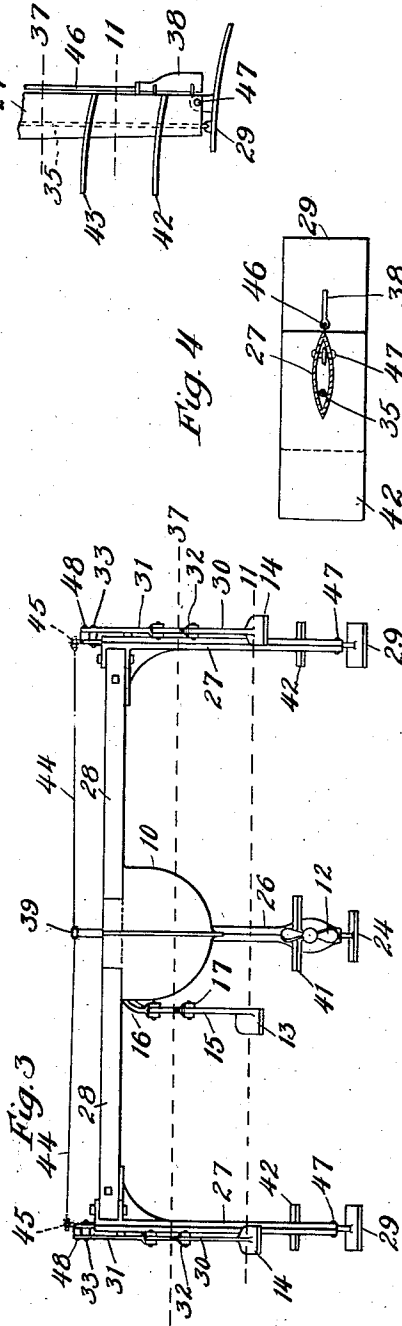
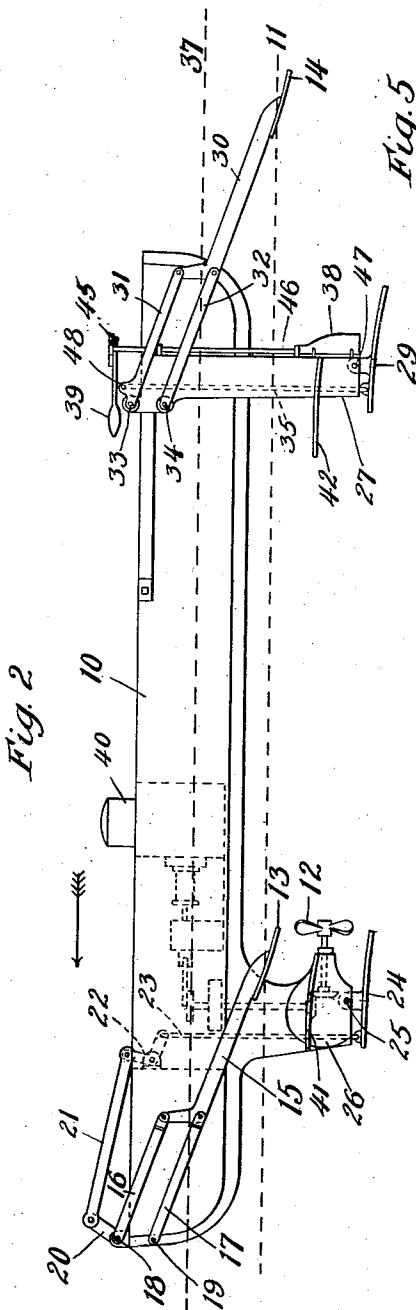
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UNITED STATES PATENT OFFICE.

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HYDROPLANE BOAT.

955,343.

Specification of Letters Patent. Patented Apr. 19, 1910.

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To all whom it may concern:

Be it known that we, WILLIAM M. MEACHAM and LARNED E. MEACHAM, citizens of the United States, residing in Oak Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Hydroplane Boats, of which the following is a specification.

This invention relates to boats provided with means whereby their hulls may be raised while in motion, above the surface of the water and whereby they are permitted to be moved at a higher rate of speed than is practically attainable in vessels of the ordinary construction supported by displacement.

The nature of the invention will be fully understood from the description given below and from the accompanying drawings forming a part of this specification.

In said drawings, Figure 1 is a plan view of a boat equipped with our invention; Fig. 2 is a side elevation, and Fig. 3 a rear elevation of the same, the rudders being omitted for clearness; Fig. 4 is a detail section, and Fig. 5 illustrates a modified construction.

Like numerals refer to like parts in the several figures.

The body of the boat 10 when at rest is supported by displacement at the water line 37. When the boat is put in motion by the propeller 12 or other propelling means, the regulating plates 13 and 14, of which there is preferably one at the side of the boat and two at the rear, are caused by their angle to the line of motion through the water to rise and remain at the surface. The plate 13 is attached to an arm 15 connected to the boat by the parallel links 16 and 17 pivoted stationarily at 18 and 19. Link 16 is keyed to its pivot 18, as is also the arm 20. The parallel links are preferably employed so that the angle of the plate 13 may remain constant with respect to the water at any position. The lifting of the plate 13 causes the arm 20 to rock with the pivot 18, which is turned by the rising movement of the plate, and the arm 20 through the link 21 actuates an elbow lever 22 to lift the rod 23. This rod 23 is joined to the end of a submerged supporting plate 24 pivoted at 25 to the leg 26 depending from the boat and supporting the propeller. The plate 24 is located under the center line of the boat and its inclination

relative to the horizontal is controlled by the plate 13 as will be understood from the description given.

At each side of the rear of the boat is a depending leg 27 joined to each other and to the boat by a cross beam 28, and pivoted to each of these legs at 47 is a supporting plate 29, such plates being regulated as to their inclination by the plates 14 already mentioned. The plates 14 are mounted upon arms 30, similar to the arm 15, and such arms 30 are each connected by parallel links 31 and 32 stationarily pivoted at 33 and 34 to the leg 27. A rod 35 passes downward through each of the depending legs 27 and is joined to the supporting plate 29 under said leg and is also joined at 48 to the upper parallel link 31 so that when plate 14 is raised it will operate the corresponding plate 29. The position of plates 24 and 29 when the boat is at rest and until their position is changed by the regulating plates 13 and 14 is nearly horizontal, but as soon as the boat is put in motion and the front edges of said plates are raised by the regulating plates as explained, a lifting force by said plates 24 and 29 is produced which, when the speed is sufficient, causes the boat to rise and it continues steadily to rise until it has attained the maximum speed, at which time the body of the boat will be entirely above the surface of the water and be maintained at that level by the supporting plates 24 and 29. As the boat rises, the regulating plates 13 and 14, which ride on the surface of the water, will gradually become lower relatively to the boat and thus lessen the angle of the supporting plates which at the maximum speed come to their position of highest efficiency. As the speed may thereafter vary, any tendency to sink, because of lessened speed, is immediately overcome by the lifting effect of the automatically increased angle of the supporting plates 24 and 29, the said angle being immediately diminished as the speed is again increased. The boat is balanced at all times by the automatic and immediate action of the supporting plates in accordance as one point or another may become relatively higher or lower than the normal level, the action of the higher plate being such as to bring it down to the normal level and of the lower plate being such as to bring it up to said

level. When the speed is slackened in stopping the boat, the boat gradually sinks to its normal level at rest and the regulating plates also fall and return the supporting plates to their horizontal positions. The water line 11 in Figs. 2, 3 and 5 indicates the position of the boat when at full speed and maximum height. The depending legs 27 are preferably hollow and elliptical as shown at Fig. 4.

The rudders are shown at 38 and their operating lever at 39, said lever being connected thereto by the cable 44 attached at the cross heads 45 to upper ends of rods 46.

The depending leg 26 contains in addition to the rod 23 the necessary shaft and gearing, etc., for the operation of the propeller. The motor by which the propeller is actuated is shown at 40.

The supporting plates 24 and 29, it will be noted, have their pivots located in front of their centers, so that the upward pressure on the plates while the boat is in motion tends to press the plates to a more nearly horizontal position and thereby operates as an unfailing spring against the pressure exerted by the regulating plates 13 and 14.

At 41 we show an auxiliary supporting plate rigidly attached to the leg 26 and at 42 are similar plates attached to the legs 27. These plates are slightly inclined from the horizontal so that as they move through the water they will supplement the lifting force of the adjustable plates 24 and 29.

In Fig. 5 we have shown an additional auxiliary plate at 43. Like the plates 41 and 42, it is rigidly attached to the depending leg 27 above the first auxiliary plate 42. This plate 43 aids in lifting the boat and its operation in connection therewith is as follows: At initial speed the surface of the plate 43 gives added force in lifting and, being constantly at one angle, it exerts a continuous upward force until it comes to the surface of the water. At this point the attained speed has become sufficient so that the remaining plates exert the necessary supporting force to continue to rise until said plate 43 is lifted clear of the water, and there held as long as boat is under way at full speed.

In practice the regulating plate may be made in the form of an elongated float, so as to equalize wave action.

When necessary a hydraulic or other relay may be used in connection with regulating mechanism for the purpose of furnishing sufficient power to swing the supporting plates.

A boat constructed according to our invention is not hindered or affected by such waves as would materially affect an ordinary power boat.

As will be understood only a single submerged plate may be employed instead of

a plurality of plates, if accompanied by suitable balancing means.

We claim:—

1. In a hydroplane boat, a body provided with an adjustable supporting plate, a surface following device for regulating the angle of such supporting plate and means for maintaining constant the angle of the surface following device to a longitudinal horizontal line.

2. The hydroplane boat having a depending standard, two supporting plates attached to said standard in different horizontal planes, one of said plates being permanently rigid in relation to the standard and one being movable, and automatic means operable by contact with the surface of the water for adjusting the angle of the movable plate.

3. In a hydroplane boat, a body provided with a plurality of adjustable supporting plates and independent automatic means for each adjustable plate for regulating its angle relative to a longitudinal horizontal line.

4. In a hydroplane boat, a body provided with a standard depending therefrom, a supporting plate adjustably secured to said standard and automatic means operable by contact with the surface of the water for moving said plate independently of said standard.

5. In a hydroplane boat, the combination of a body 10 and a standard 27, said standard depending at one side of said hull and carrying a supporting plate 29 and a rudder 38.

6. In a hydroplane boat, of that class having a body adapted to be raised and supported, while in motion, entirely above the surface of the water, and having means for maintaining its balance while the body is so raised, the combination, with said body, of a plurality of inclined supporting surfaces rigidly disposed in relation to said body, a supporting surface adjustably disposed in relation to said body at a lower level than said rigid supporting surfaces, and means operable by contact with the surface of the water for changing the inclination of said adjustable supporting surface while boat is under way.

7. In a hydroplane boat, of that class having a body adapted to be raised and supported, while in motion, entirely above the surface of the water, and having means for maintaining its balance while the body is so raised, the combination of a supporting plate pivoted to a rigid standard and automatic means operable by contact with the surface of the water for maintaining the submergence of said supporting plate.

8. In a hydroplane boat, of that class having a body adapted to be raised and supported, while in motion, entirely above the surface of the water, and having means for maintaining its balance while the body is so

raised, and means operable by contact with the surface of the water for maintaining the submergence of its supporting plates, the combination, with said body, of a standard 5 26 rigidly depending therefrom, a pivoted supporting plate 24 and a member 23 for regulating the angle of said supporting plate.

10 9. In a hydroplane boat, of that class having a body adapted to be raised and supported while in motion, entirely above the surface of the water, and having means for maintaining its balance while the body is so raised, and means for maintaining the sub- 15 mergence of its supporting plates, the combination, with said body, of a standard, a supporting plate and means operable by contact with the surface of the water for securing the perpendicular adjustment of one

edge of said supporting plate, while boat is 20 under way, independently of its standard.

10. In a hydroplane boat, of that class having a body adapted to be raised and supported, while in motion, entirely above the surface of the water, and having means for 25 maintaining its balance while so raised, and means for maintaining the submergence of its supporting plates, the combination, with said body, of a standard, a supporting plate and means operable by contact with the sur- 30 face of the water for moving said supporting plate, while boat is under way, independently of said standard.

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