C. H. FOWLER.

BOAT.

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1,163,076. Patented Dec. 7, 1915.

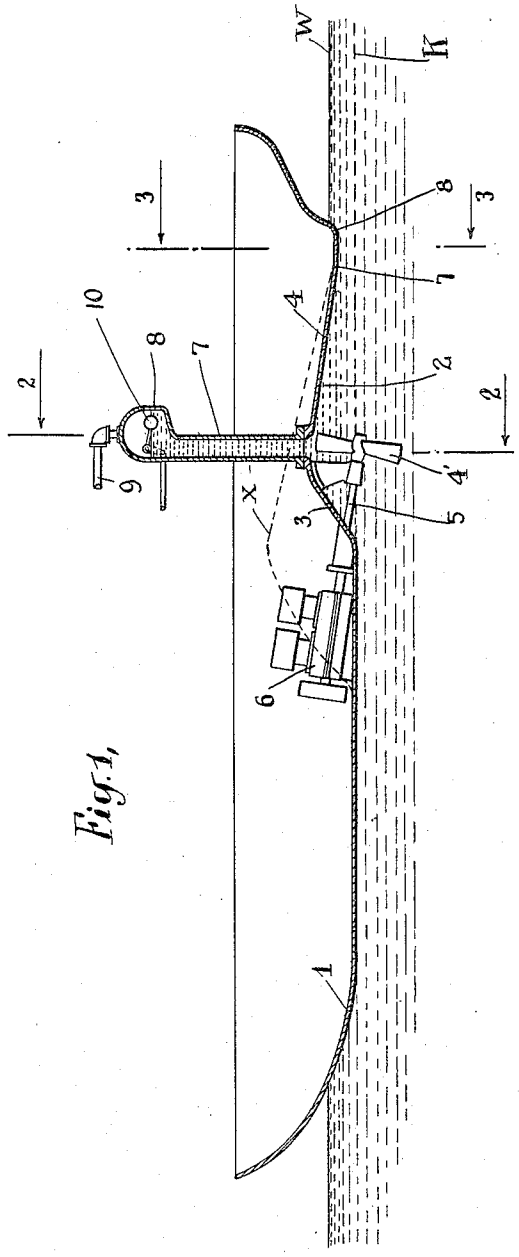


Fig. 1.

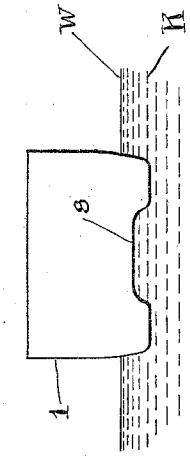


Fig. 3.

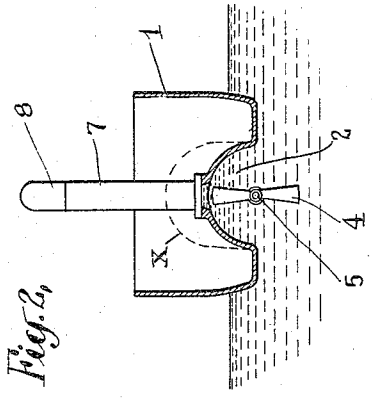


Fig. 2.

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BOAT.

1,163,076. Specification of Letters Patent. Patented Dec. 7, 1915.

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To all whom it may concern:

Be it known that I, CARL H. FOWLER, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Boats, of which the following is a specification.

My invention relates to improvements in boats, especially those which are designed to secure high speed and which as heretofore generally constructed could only be operated in comparatively deep water.

In many racing boats as commonly constructed the propeller is projected at the end of a long shaft, several feet obliquely beneath and to the stern of the boat, so as to operate several feet beneath the surface of the water and thus procure comparatively solid water in which to operate. It has been found necessary or desirable in such boats to place the propeller a considerable distance beneath the surface of the water in order to secure a sufficiently compact resisting medium in which to operate the propeller at high speed and with high power without slip and without racing the propeller in the light surface waters. Another disadvantage of these high power boats and of the position in which the propeller is operated is that the water is forced or sucked out from under the stern by the propeller so that the boat "squats" at the stern. This compels a boat to practically constantly run up a hill of water, reducing its speed thereby.

The objects of the invention are, to improve the construction of racing boats so as to give them solid compact water in which to operate their propellers, even when operated in comparatively shallow waters where the present type of deeply submerged propeller is impossible.

A further object of the invention is to so construct boats as to prevent the "squatting" of the stern of the boat when propelled at high speed or with high power.

By my invention the propeller is situated partly within a chamber formed in the bottom of the boat and partly beneath the bottom of the boat itself. By making the propeller chamber or tunnel of a height less than the diameter of the propeller, preferably being approximately one-half thereof, the size of the tunnel in both height and length is greatly reduced and the consequent amount of dead weight of water carried by said boat is accordingly reduced. Furthermore by this construction the propeller chamber is of much less height than if the type of tunnel boat were used wherein the propeller is entirely contained within the lines of the hull. This type of construction permits the placing of the propeller on a shaft that is either absolutely horizontal or approximately so, thereby obtaining the efficiency of all the power possessed by the boat as the water thrust from the propeller is backward and not downward. Furthermore, owing to this form of construction the water displaced by the propeller and thrust backward from it is thrown directly under the stern of the boat and not sucked out from beneath the stern as is the case where the propeller is located to the rear of the stern itself. This difference in position of the propeller prevents the stern from "squatting" and in fact has a slight tendency to raise the stern instead of depressing it. At the same time, since the propeller is located partly within the body of the boat, it is possible for the boat to travel through much shallower water than is possible in the case of the usual hydroplane or racing boat construction. At the same time a solid body of water of the same character can always be maintained in the propeller chamber in which the propeller is operating that the propeller would have if placed the same number of feet beneath the surface.

In order that my invention may be more clearly understood attention is hereby directed to the accompanying drawings forming part of the specification and illustrating the preferred embodiment of my invention.

In the drawings, Figure 1 represents a vertical longitudinal section through the center of a boat. Fig. 2 represents a cross-section taken on the line 2—2 of Fig. 1, and Fig. 3 represents a cross-section at the stern of the boat on line 3—3 of Fig. 1.

Referring to the drawings, the boat 1 may be of a substantially flat bottom construction and provided with a propeller chamber 2 formed in the rear portion of the bottom of the boat. This propeller chamber or tunnel is formed with a forward wall or roof portion 3 which rises from the bottom of the boat at a gradual angle to a sufficient height to inclose the propeller 4′ mounted upon propeller shaft 5 extending through

the forward wall 3 of the propeller chamber and connected with any suitable engine 6 within the boat. The rear wall 4 of the chamber 2 slopes rearwardly and downwardly from the highest point of chamber 2 to the point 7, a short distance forward of the orifice or opening of the propeller chamber or tunnel at the stern of the boat. In the preferred construction, the roof of the tunnel is approximately horizontal from the point 7 to the point 8 in the stern of the boat, and the wall of the tunnel slopes at a very slight angle to the horizontal from the highest point of the chamber to the point 7, the shape and direction of the rear part of the propeller chamber or tunnel being determined largely by the position of the minimum water line of the boat, the rear orifice of the propeller chamber being located below the minimum water line W of the boat and preferably above the keel line K of the boat as shown. The propeller chamber is of a height less than the diameter of the propeller 4 and preferably is about one-half thereof so that the propeller extends for approximately one-half of its diameter below the keel line of the boat whereby, as stated, the amount of dead water carried within the propeller chamber is very much less than if the propeller were entirely inclosed within the body of the boat. This is indicated by the drawing in which the dotted line x indicates the outline of a propeller chamber which would have to be formed if the propeller were to be entirely located within the body of the boat, the materially reduced space within the propeller chamber by my present construction being thus shown. The propeller shaft 5 is preferably inclined at the same slight angle to the horizontal as the rear wall 4 of the propeller chamber so as to result in a minimum of friction between the water displaced by the propeller and the rear wall 4 of the chamber.

A stand pipe 7 is attached to the top of propeller chamber 2 at the highest point thereof, preferably directly over the propeller. Stand pipe 7 communicates with the interior of chamber 2 and is preferably formed at its upper end with an enlarged portion or vacuum chamber 8, with which communicates a pipe 9 whereby the air may be partially exhausted from the vacuum chamber by a suitable vacuum pump.

The vacuum chamber may be provided with a suitable float 10 and connections for regulating the operation of the vacuum pump (not shown) in accordance with the height of the column of water in the stand pipe and vacuum chamber. This feature is not claimed herein, but is described and claimed in my copending application entitled improved shallow water boat, Serial No. 848,126, filed June 30, 1914. It is sufficient to state, however, that the operation of the vacuum pump serves to keep the propeller chamber and stand pipe constantly filled with water in a column of any desired height so that the propeller 4' operating at the minimum water level W or even partly above this water level may be operated in water of substantially the same solid resisting character as the propeller would have if it were submersed the same number of feet below the water level as the height of water in the stand pipe 7 above the propeller.

The position of the rear orifice 8 of the tunnel relative to the minimum water level W of the boat in my preferred construction is shown in Fig. 3. As stated, the rear wall of the propeller chamber extends at a substantially horizontal line between the points 7 and 8 for the purpose of preventing the boat from "squatting" when in operation at high speed, since the water displaced by the propeller and thrust backward from it in the operation of the boat causes upward water pressure to be exerted against the under side of the rear portion of the propeller chamber, this upward pressure being particularly effective against the horizontal portion 7—8 adjacent the stern orifice of the propeller chamber. The horizontal portion 7—8 of the roof of the propeller chamber should be so chosen as to be sufficiently long to largely overcome the tendency of the boat to squat and of not sufficient length to materially increase the friction of the water passing from the propeller.

Having now particularly described my invention, what I claim and desire to protect by Letters Patent is as follows:

1. In a speed boat, the combination of a hull having a propeller chamber formed in the bottom thereof and open at the bottom, said chamber having a forward wall sloping upwardly to the rear and a rear top wall sloping downwardly to the rear at a slight inclination to a point forward of the stern of the boat, the rear top wall of said chamber extending from said point through the stern of the boat in an approximately horizontal plane situated between the minimum water line of the boat and the keel line, said horizontal portion being of such a length and so situated with respect to the propeller that water displaced by the propeller thrust exerts a lifting action upon the said portion, to largely overcome squatting of the boat in operation, a shaft extending through the forward wall of the chamber at substantially the same inclination as that of the said rear top wall of the chamber forward of the substantially horizontal portion thereof, and a propeller thereon so situated that it revolves partly within said chamber and partly external to the lines of the hull, the maximum height of said chamber being less than the

diameter of said propeller, substantially as set forth.

2. In a speed boat, the combination of a hull having a propeller chamber formed in the bottom thereof and open at the bottom, said chamber having a forward wall sloping upwardly to the rear and a rear top wall sloping downwardly to the rear at a slight inclination to a point forward of the stern of the boat, the rear top wall of said chamber extending from said point through the stern of the boat in an approximately horizontal plane situated between the minimum water line of the boat and the keel line, said horizontal portion being of such a length and so situated with respect to the propeller that water displaced by the propeller thrust exerts a lifting action upon the said portion, to largely overcome squatting of the boat in operation, a shaft extending through the forward wall of the chamber, and a propeller thereon so situated that it revolves partly within said chamber and partly external to the lines of the hull, the maximum height of said chamber being less than the diameter of said propeller, substantially as set forth.

This specification signed and witnessed this 27th day of June, 1914.

CARL H. FOWLER.

Witnesses:
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CHARLES W. TIFFIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."