Nov. 25, 1930. H. B. GREENING 1,782,893

BOAT HULL CONSTRUCTION

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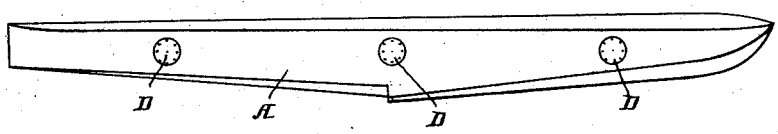


Fig. 1.

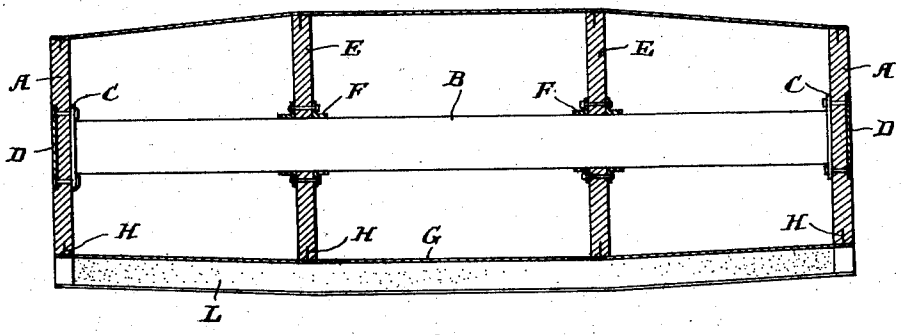


Fig. 2.

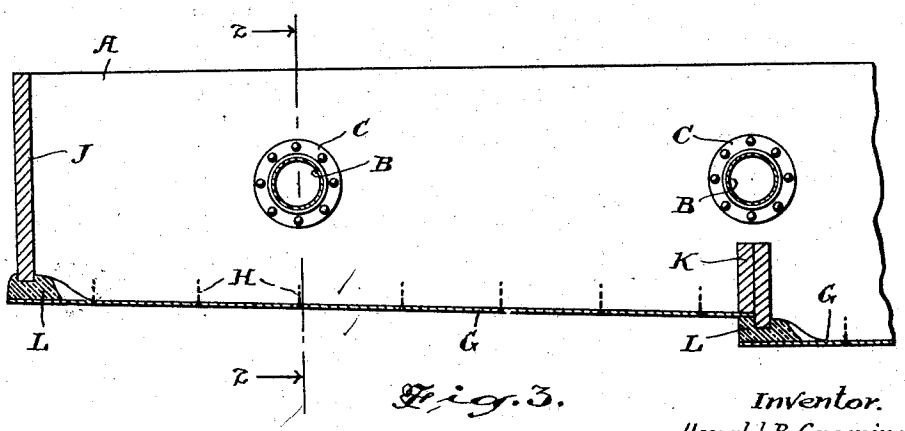


Fig. 3.

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UNITED STATES PATENT OFFICE

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BOAT-HULL CONSTRUCTION

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The principal objects of this invention are to obviate the very serious difficulties met with in small racing craft and aeroplane pontoons through the shearing of the bottoms at the transom, step or cross frames and to provide a hull construction which will be very light in weight yet extremely strong and rigid and which will enable the use of very thin bottoms with safety.

The principal features of the invention consist in the novel construction of the hull frame in which a plurality of rigid longitudinal members are spaced apart and rigidly connected by transverse members arranged intermediate of the depth thereof and a thin bottom is supported by said longitudinal members free from contact with said rigid transverse members.

In the accompanying drawings, Figure 1 is a side elevational view of a stepped type of pontoon or speed boat hull.

Figure 2 is an enlarged cross sectional view through a hull constructed in accordance with this invention, taken on the line 2—2 of Figure 3.

Figure 3 is a longitudinal sectional view of the rear end of the hull taken on the line 3—3 of Figure 2.

The history of the failure of racing boat hulls to withstand the tremendous stresses to which they are subjected has shown conclusively that the pounding of the boat, running at high speeds, against the water shears the bottom planking where it is supported by rigid cross frames where the bending stresses concentrate and if the bottom planking is made strong enough to effectively resist such stresses the weights are abnormal and detrimental for obtaining high speeds and are prohibitory for aeroplane hulls or floats.

On account of the conditions above recited laminated material of the ply-wood or cemented veneer type has never been successfully used for boat bottoms but the present invention enables such materials being utilized.

In the construction of a hull as herein shown the outside walls or chines A are formed of planks of a depth suitable for the craft designed and these may be comparatively thin. These outside walls are spaced apart and rigidly supported by a plurality of rigid tortional cross members B, here shown formed of metal tubing having flanged ends C which are firmly bolted to the side members A, with metal places D arranged on the outer face. The tubular cross members may be of a fairly light gauge metal but being of comparatively large diameter will be extremely rigid and the frame thus formed will effectively resist twisting strains.

One or more intermediate longitudinals E similar to the side walls A may be supported on the cross members B, the said cross members extending through holes bored in same and flange rings F mounted on the cross members and bolted through the members F may be used if desired.

In motor boat construction the central longitudinals F will form the engine bearings supports and the weight of the engine will be distributed over the entire frame structure.

The bottom G may be of any desirable thin ply-wood or cemented veneer type and extends between the side walls A and the longitudinals E and is secured to same by screws or rivets H which are spaced well apart to avoid, as much as possible, the fracturing of the fibre of the bottom material.

The cross members, in the form of the transom J, and step frame K are arranged with their bottom edges spaced above the line of the bottom edges of the longitudinal members and the bottom sheet G is sealed across the hull by strips L of soft rubber which are placed in position under sufficient compression to render the hull water-tight. The soft rubber contact members will permit the bottom sheet to flex without being subject to the shear resulting from the bottom being secured to a rigid cross member.

A hull contruction such as herein described may be built extremely light in weight but will be very rigid and strong and the bottom which is rigidly secured to the longitudinals is free to flex between said longitudinals to relieve and distribute the stresses in such a manner that shearing of the bottom sheet will be entirely avoided, the rubber cushions ar-

ranged between the rigid cross frames and the bottom presenting no shearing base against which the stresses may fracture the bottom sheet.

An important feature of the construction herein described is that the cost will be very materially reduced.

It will be readily apparent that a structure such as described will be very applicable to the contruction of aeroplanes pontoons, which require to be very light but are subjected to very heavy stresses in striking the water at a high rate of speed in landing and also in travelling over the water at very high speeds in taking off.

What I claim as my invention is:—

1. A boat hull comprising longitudinal members spaced apart, a flexible bottom supported by said longitudinal members, and transverse members arranged clear of the bottom and rigidly supporting said longitudinal members.

2. A boat hull comprising longitudinal members spaced apart, a flexible bottom secured to the bottom edges of said longitudinal members, and rigid transverse members arranged clear of the bottom and supporting said longitudinal members in their spaced relation.

3. A boat hull comprising longitudinal side members, rigid transverse tortional members extending between and rigidly secured to said side members intermediate of their depth, and a flexible bottom rigidly secured to the bottom edges of said side members.

4. A boat hull comprising longitudinal side members, rigid transverse tortional members extending between and rigidly secured to said side members intermediate of their depth, a flexible bottom rigidly secured to the bottom edges of said side members, closure members extending between said side members to complete the hull, and resilient sealing means arranged between the bottom and said closure members.

5. A boat hull, comprising longitudinal members spaced apart, rigid members secured to said longitudinal members and extending therebetween above the plane of their bottom edges, a bottom sheet rigidly secured to said longitudinal members, and resilient means interposed between the bottom sheet at its terminal edge and a rigid cross member of the hull.

6. A boat hull, comprising longitudinal members spaced apart, rigid members secured to said longitudinal members and extending therebetween above the plane of their bottom edges, a bottom sheet rigidly secured to said longitudinal members, and a strip of soft rubber sealing the bottom sheet at its transverse terminal edge.

7. A boat hull, comprising longitudinal members spaced apart forming the side walls of the hull, rigid brace members extending transversely of the hull and secured at their ends to said side walls above their bottom edges, a bottom extending between the longitudinal side walls and engaging only their bottom edges and secured thereto, transverse hull members extending between and secured to the side walls and spaced from the bottom, and resilient packing strips compressed between said bottom and said transverse members spaced therefrom.

8. A boat hull, comprising longitudinal members spaced apart, metal tubes arranged transversely between and rigidly connecting said longitudinal members above their bottom edges, a bottom secured to the bottom edges of said longitudinal members, transverse members closing the hull between the ends of said longitudinal members, and resilient sealing means interposed between said end closing members and said bottom.

9. A boat hull, comprising longitudinal members spaced apart, metal tubes flanged at the ends extending transversely between said longitudinal members and having the flanges thereof rigidly secured thereto, a flexible bottom sheet rigidly secured to the bottom edges of said longitudinals, transverse members closing the hull, and a resilient packing arranged between the bottom and the lower edges of said closing members.

10. A boat hull, comprising a bottom, a pair of thin flat side members having their bottom edges secured to said bottom and extending longitudinally thereof, a rigid transverse member secured between said thin flat members and closing the hull having the bottom spaced from the hull bottom, a resilient packing between said bottom and said closing member, rigid transverse members secured to said side members intermediate of their height, and longitudinal members supported by said rigid transverse members and secured to said bottom intermediate of its width.

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