Nov. 25, 1930. R. DEETJEN 1,782,868

HIGH SPEED VESSEL

Filed Jan. 4, 1929

Fig. 1

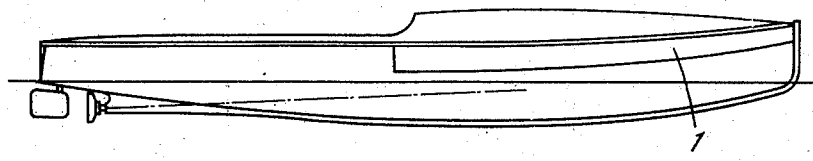


Fig. 2

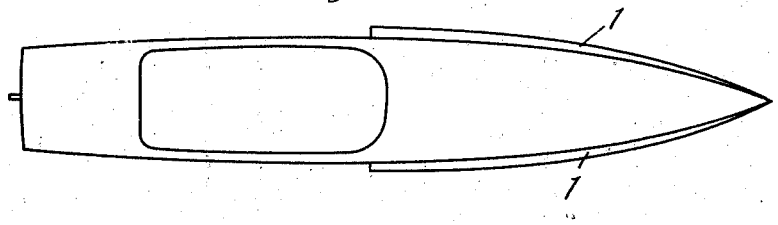


Fig. 5

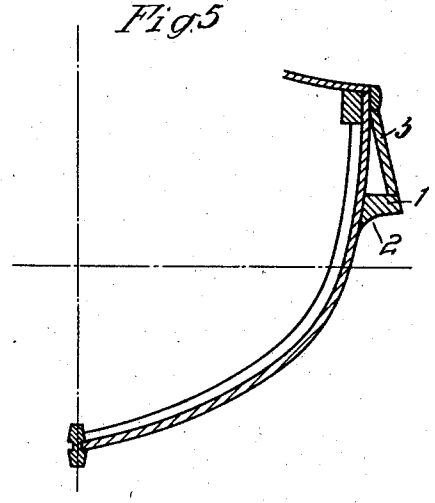


Fig. 3

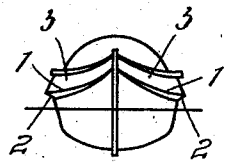


Fig. 4

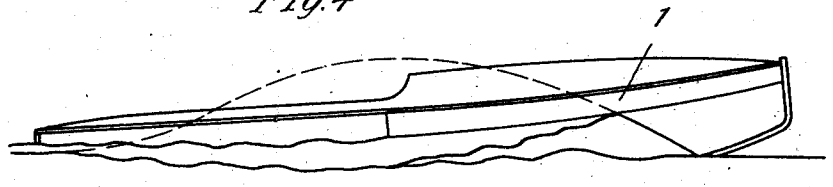
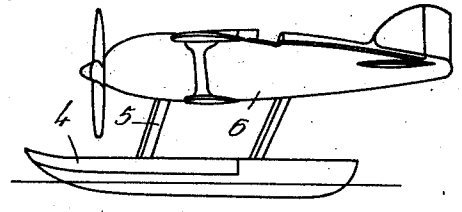


Fig. 6



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UNITED STATES PATENT OFFICE

RICHARD DEETJEN, OF BERLIN-WILMERSDORF, GERMANY, ASSIGNOR TO SIEMENS-SCHUCKERTWERKE AKTIENGESELLSCHAFT, OF BERLIN-SIEMENSSTADT, GERMANY, A CORPORATION OF GERMANY

HIGH-SPEED VESSEL

Application filed January 4, 1929, Serial No. 330,353, and in Germany August 2, 1926.

My invention relates to improvements in high-speed vessels and its object is to reduce the friction losses and to increase the stability of the vessel, so that its speed is considerably increased and its sea-worthiness greatly improved.

It has already been suggested to provide the bow or fore-body of boats with extensions, bulges or swellings, which when the boat dips into big waves increase the immersed ship's hold, and thus exert a statically stabilizing action, which reduces the pitching of the boat. It is, furthermore usual to provide adjacent to the edge of the ship's side ledges or borders, which merely serve to catch the sprays and reduce the scouring of the outside planking. It has also been proposed to provide ledges, which extend comparatively steeply from the bow of the boat to the bottom and which are intended to lift the bow of the boat out of the water when travelling along.

My invention consists of an equipment for high-speed boats, which consists of ledges, borders or protrusions mounted at both sides of the outside planking above the water line in such a manner that they are within the reach of the bow-waves.

These ledges have a thin leading edge or are wedge-shaped and preferably rounded on the underside where they abut against the outside planking. By these ledges the dynamic forces of the bow wave are utilized for stabilizing the boat and at the same time the friction losses are greatly reduced, so that the speed of the boat increases considerably.

In the drawing affixed hereto and forming part of my specification an embodiment of my invention is illustrated by way of example.

The drawings show in

Fig. 1, a keel boat equipped with my improved improvement in side-elevation,

Fig. 2, a plan view of Fig. 1,

Fig. 3, a front elevation of Fig. 1,

Fig. 4, a boat travelling at full speed,

Fig. 5, a fractional cross-section on an enlarged scale, and in

Fig. 6, a hydroplane the floats of which are equipped with the ledges or borders according to my invention.

Like parts are indicated by like letters of reference in the various figures of the drawings.

Referring to the drawing ledges or borders 1 are mounted on the fore-body or bow of the boat above the water line and extending up to the middle of the length of the boat or beyond it. The mode of operation of these ledges will be understood from Fig. 4. When the boat is travelling at high speed ahead a bow-wave usually develops of the shape indicated by the broken line. This causes considerable friction along the ship's body. Since the bow-wave rises beyond the upper edge of the boat sprays are driven into the boat even when it is not particularly windy. Owing to the friction between the bow-wave and the body of the boat the speed of the boat is considerably reduced, the crew is greatly molested by the sprays blown into the boat and the steering of the vessel rendered difficult.

By means of the ledges, borders or the like according to my invention the bow-wave is caught, its crests are deflected sideways and kept away from the boat. This results in an increase of the speed of the boat due to the reduction of the friction losses and sprays can no longer enter the boat.

To promote the tearing off of the bow-wave the outer edges of the ledges are bevelled, while the inner sides are rounded off and preferably join the body of the boat in a parabolic curve. The rear edges of the borders likewise terminate in sharp edges to facilitate the tearing off of the bow-wave here also.

To avoid unnecessary friction losses the ledges are not made broader than necessary for deflecting the bow-wave laterally, for instance 1/12 to 1/15 of the width of the boat. The lower edges of the borders at the lowest point are preferably located 10 inches above the water line.

The ledges may under certain circumstances be subject to considerable strains by the bow-wave. To increase its strength and to prevent water from pressing on the ledges from the top while the boat is stationary or

travelling at a slow speed, the ledges are preferably covered up by boards 3 extending up to the gunwale.

These novel ledges may easily be applied to existing boats. In the case of new boats they may be combined with the hull into one unitary structure.

The ledges increase the stability of the boat considerably. Although they are located above the water line, the bow-wave forms a cushion of water upon which the ledges rest securely. In this way the boat is prevented from rocking, and when the bow of the boat dips into a wave the bow is raised and flooding of the deck avoided. The ledges prove particularly effective when negotiating curves of small radii at full speed, because they prevent the boat tipping toward the outside and capsizing. The speed and sea-worthiness of the boat is thus considerably increased and it may be used under conditions under which it would otherwise be unable to cope with the waves.

My invention is of particular value when applied to the floats of hydro-airplanes. This application is illustrated in Fig. 6 in which such a float 4 is connected with the body of a hydro-airplane by stays 5. It is well known that when starting and landing hydro-airplanes glide on the water and attain a speed which may exceed 50 nautical miles per hour. If such a plane equipped with floats of the hitherto customary construction is obliged to make an emergency landing on a rough sea it frequently happens that the floats are excessively retarded in consequence of the large friction losses, so that the hydroplane is overturned.

This danger is avoided by equipping the floats of hydroplanes with side ledges or borders according to my invention, which deflect the bow-wave sideways. By this provision the friction losses of the floats are considerably decreased and the floats at the same time are supported in a way which counteracts the tipping tendency of the plane. It is furthermore possible to attain the necessary starting speed in a shorter time.

Various modifications and changes may be made without departing from the spirit and the scope of the invention, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art.

I claim as my invention:

1. In a high-speed vessel with convex hull, ledges with sharp outer edges, concave at the undersides and covered up at the top extending along the sides from near the middle of the vessel to the bow and so spaced from the water line that they are within reach of the bow-wave developed when going full speed ahead.

2. A hydro-airplane float comprising a vessel with convex hull, ledges with sharp outer edges, concave at the undersides and covered up at the top extending along the sides from near the middle of the vessel to the bow and so spaced from the water line that they are within reach of the bow-wave developed when going full speed ahead.

3. In a high-speed vessel with convex hull, a ledge concave at its underside and extending along each side of the vessel from near the middle of the hull to the bow, said ledges being so spaced above the water line that they are within reach of the bow-wave developed when going full speed ahead.

In testimony whereof I affix my signature.

RICHARD DEETJEN.