L. BAZAINE.

BOAT HULL.

APPLICATION FILED JUNE 3, 1914.

1,296,155. Patented Mar. 4, 1919.

Fig. 1

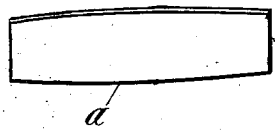


Fig. 2

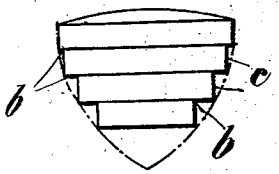


Fig. 3

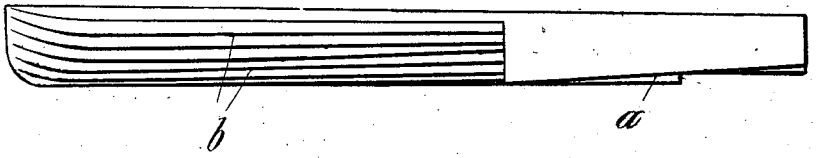


Fig. 4

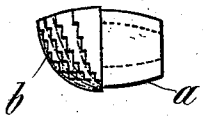


Fig. 5

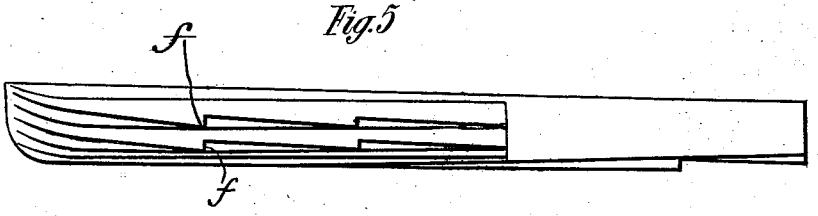
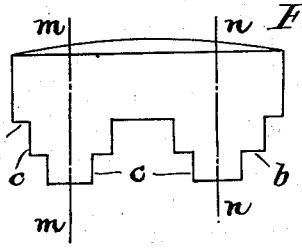


Fig. 6.



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UNITED STATES PATENT OFFICE.

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BOAT-HULL.

1,296,155. Specification of Letters Patent. Patented Mar. 4, 1919.

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To all whom it may concern:

Be it known that I, LÉON BAZAINE, a citizen of the French Republic, and residing in Issy-les-Moulineaux, France, have invented certain new and useful Improvements in Boat-Hulls, of which the following is a specification.

This invention relates to boat hulls, the construction of which has been more particularly studied with a view to its application to hydro-aeroplanes, although it can be utilized for building hulls of boats, hydroplanes, etc. This invention has for its object to combine in the same float the qualities of a sliding or ricocheting hull without deep draft, with those which belong properly to deep draft and consequently it has for its object to give to floats without deep draft, shapes playing the same part as the water line shapes of deep draft. In order to obtain the results in question, the float with a shallow draft provided as usual with inclined or offset surfaces bringing about gradual rising or alighting; is constructed so as to show in cross-section a series of offsets. In these conditions, the bottom of the float, instead of being a flat or curved surface, is constituted by a series of partial bottoms arranged at different levels and connected together so as to outline the shape of the hull. Generally speaking, the partial bottoms which may be considered as having been obtained by sections of a continuous bottom (or of a portion) of the float and by shifting the panels parallel to themselves, are arranged in twos relatively to one and the same vertical axis, symmetrically and in one and the same plane, so that the covers of the edges or ribs constituted by the said offsets, are flat or curved symmetrical surfaces similar to the shapes of a hull with deep draft; the float thus being limited by walls, the cross-section of which interprets, mathematically speaking by a polygonal outline, the outline of a deep draft frame.

The edges or ribs of the offsets produce so to speak water lines of a hull which, owing to the offsets provided in its wall, has the properties of a hydroplane.

In the accompanying drawing given by way of example,

Figure 1 shows diagrammatically a section of a float, of common type with rectangular section and curved bottom.

Fig. 2 shows in dotted lines a typical section of a hull with deep draft. The full line shows the hull built according to this invention by inscribing into the deep draft frame, stepped hollow elements built in accordance with the cross-section of the float in Fig. 1.

Fig. 3 shows by way of example a construction of a float, half with deep draft, and half hydroplane.

Fig. 4 shows the frames.

Fig. 5 is a modified construction, the bottoms of the transverse offsets forming longitudinal offsets for gradual rising and immersion.

Fig. 6 is a transverse section showing a modified forward construction having two bottoms each provided with transverse offsets.

As shown in Fig. 1 and also in full lines in Fig. 2, an ordinary float with flat bottom independently of the immerged surfaces with given incidence, or independently of projecting offsets which cause at the high speeds its gradual rise and its gradual and without shock immersion, has a rectangular section limited by flat or curved surfaces. On the contrary, the cross section of a usual ship of deep draft frame (Fig. 2 in dotted lines) has the shape of a curved triangle or of a V curve, the keel section of which occupies the apex.

According to this invention, and in order to obtain a float which has at the same time qualities of sliding or ricocheting hulls and of deep draft parts an ordinary flat or curved bottom *a* of the float with shallow draft (Fig. 1) has been partly or entirely replaced by a bottom with stepped surfaces *b* (Fig. 2) forming offsets in cross-section. By the term ricocheting is meant the phenomena produced when a body is launched upon the surface of the water at an angle to such surface. Owing to the inertia of the molecules of the water, the body receives therefrom a thrust from below in consequence of the resistance of the water, which thrust has the effect of repulsing the body launched upon the surface of the water and causing the body to skip on the surface of the water rather than to enter and be immersed.

It is obvious that the elementary bottoms *b* can be flat or curved and either parallel to each other or not. They can be entirely

or partly provided with offsets *f* (Fig. 5). The same applies to their relative dimensions and to the arrangement of planks *c* connecting them.

The transverse offsets can be arranged symmetrically relatively to parallel axes *m—m*, *n—n*, for instance so as to outline adjoining deep draft parts which leave between them longitudinal grooves for the discharge of the water.

It will be noted that only a portion of the bottom *a* of the float can be constituted by a combination of surfaces *b* situated at different levels and connected together by planks *c*, so that the float can be provided with deep draft parts in front (Figs. 3 and 4), and connected at the back to a body having a bottom comprising one or more flat surfaces. When the bottom of the aft portion or body of the hull comprises a plurality of flat surfaces, these are preferably stepped longitudinally of the hull as shown in Figs. 3 and 5. The hull thus has a general shape similar to that of a high speed motor boat.

It is obvious that by increasing, for one and the same float, the number of offsets, or in other words, by decreasing the surface of each of the elementary bottoms *b*, it is possible to obtain in cross-section polygonal outlines which get nearer and nearer to the outline cover limiting the planes of the deep draft parts. But the qualities of the float as a hydroplane, decrease at the same time, because the reaction surfaces *b* become smaller. It is therefore possible, by a suitable choice of perimeters and shapes, to obtain floats, the qualities of which due to the deep draft shape can be proportioned as desired to those produced by the sliding or offset surfaces enabling it to come out of water. If owing to the increase of the transverse offsets, there is a tendency to produce a deep draft hull, the possibility of navigation in heavy sea is increased. On the contrary, their decrease, by increasing the respective surface of the bottoms *b* outlined by the offsets, makes possible gradual immersion and rising without shocks.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A boat hull having a series of offsets, the said offsets being arranged in parallel pairs on the opposite sides of said hull and extending longitudinally from the bow aft to an intermediate point of the hull, the remaining aft portion having a bottom comprising a flat surface; a different pair of offsets being adapted to contact the surface of the water at different speeds of the said hull.

2. A boat hull provided with a plurality of offsets, the said offsets being symmetrically arranged in pairs on the opposite sides of the said hull, a different pair of offsets serving as the surface of flotation at different speeds of the said hull, said offsets extending longitudinally from the bow aft to an intermediate portion of the hull, the remaining aft portion having a bottom comprising a flat surface.

3. A boat hull comprising in combination a forward portion provided with a series of offsets arranged in symmetrical pairs on the opposite sides of the said hull, said forward portion merging at an intermediate point with a rearward portion, the bottom of which is provided with longitudinal stepped planes.

4. A boat hull comprising in combination a forward portion provided with a series of offsets arranged in symmetrical pairs on the opposite sides of the said hull, said forward portion merging at an intermediate point with a rear portion provided with planes stepped longitudinally of the hull.

5. A boat hull provided with a plurality of offsets arranged in pairs on opposite sides of the hull, a different pair of offsets serving as the surface of flotation at different speeds of the said hull, some of the offsets being divided into sections, each section having its bottom face inclined upwardly and forwardly.

6. A boat hull provided with a plurality of offsets arranged in pairs on opposite sides of the hull, a different pair of offsets serving as the surface of flotation at different speeds of the said hull, some of the offsets being divided into sections, each section having its bottom face inclined upwardly and forwardly, the forward end of each section being above the rear end of the next adjacent forward section.

7. A boat hull comprising in combination a forward portion V shaped and provided with a series of transverse offsets symmetrically arranged on the opposite sides of the said hull, with a rearward portion the bottom of which is provided with transverse steps.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LÉON BAZAINE.

Witnesses:
VICTOR DUPONT,
CHAS. P. PRESSLY.