L. BAZAINE.

CONSTRUCTION OF HULLS FOR HYDROPLANES.

APPLICATION FILED JUNE 3, 1914.

1,265,035.

Patented May 7, 1918.

2 SHEETS—SHEET 1.

Fig. 1

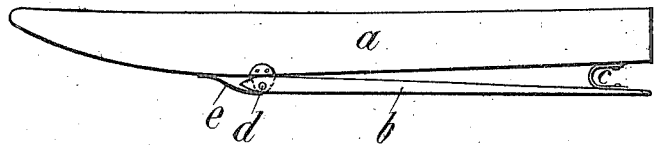


Fig. 2

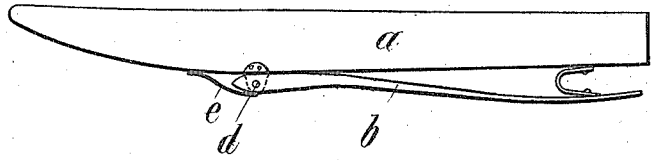


Fig. 7.

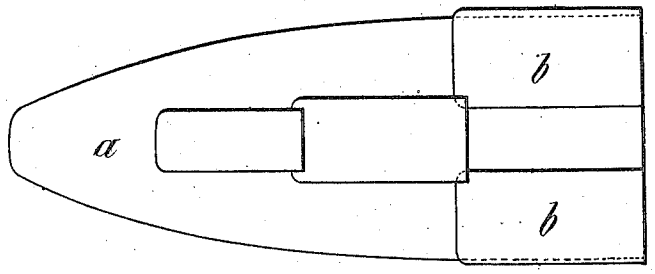
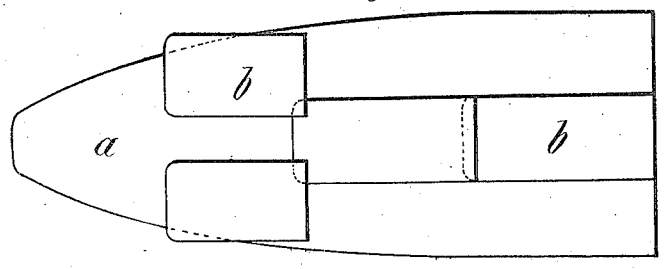


Fig. 8



Witnesses:
E. J. Whittaker
G. H. Hulst

Inventor:
Léon Bazaine
per
L. W. Waghorn
Attorney.

L. BAZAINE.

CONSTRUCTION OF HULLS FOR HYDROPLANES.

APPLICATION FILED JUNE 3, 1914.

1,265,035.

Patented May 7, 1918.

2 SHEETS—SHEET 2.

Fig. 4.

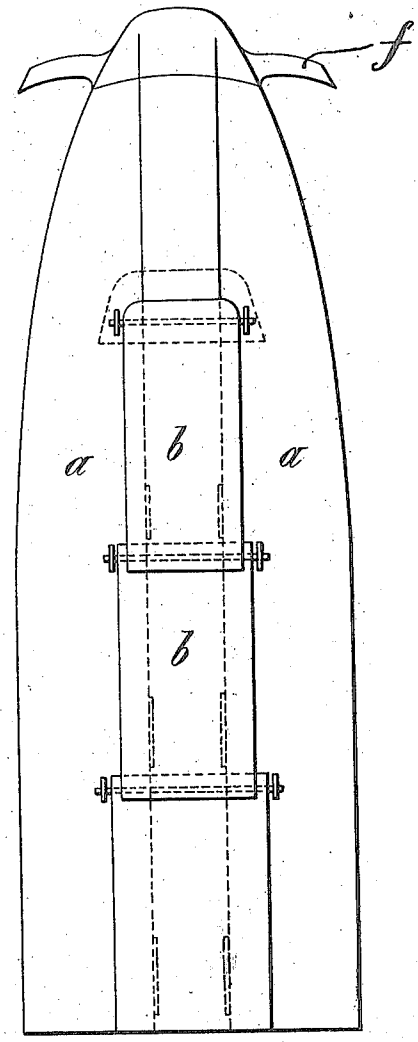


Fig. 3.

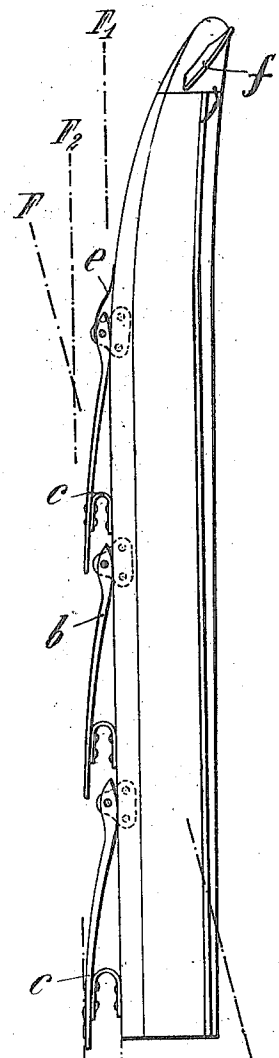


Fig. 5.

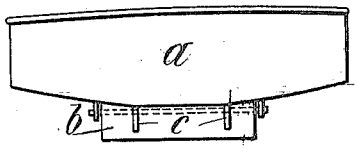
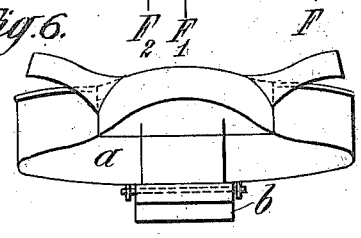


Fig. 6.



Witnesses:
M. J. Whittaker
G. W. Hulst

Inventor:
Léon Bazaine
per
W. W. Waghorn
Attorney.

UNITED STATES PATENT OFFICE.

LÉON BAZAINE, OF ISSY-LES-MOULINEAUX, FRANCE, ASSIGNOR TO SOCIÉTÉ ANONYME DES ETABLISSEMENTS NIEUPORT, OF ISSY-LES-MOULINEAUX, FRANCE.

CONSTRUCTION OF HULLS FOR HYDROPLANES.

1,265,035. Specification of Letters Patent. Patented May 7, 1918.

Application filed June 3, 1914. Serial No. 842,770.

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 the Construction of Hulls for Hydroplanes, of which the following is a specification.

This invention chiefly consists in providing the floats, hulls or submerged surfaces, with devices playing the part of shock absorbers between the said hulls, floats or surfaces and the liquid medium in which or on the surface of which they travel. This invention consists more particularly in designing the said shock absorbing system by adding to the hull, float or submerged surface constructed in the usual manner emerging planes or surfaces with variable incidence, which can move at an angle relatively to the latter, and are exposed to an elastic or other antagonistic force acting between the hulls, floats or submerged surfaces and the adjustable planes or surfaces supported by the latter.

The plane or surface with variable incidence, which is pivoted to the hull, float or the submerged surface, can limit an auxiliary volume, that is to say, move between lateral walls belonging to the main body, so as to increase its volume. In any case, whether the lateral walls are provided or not, the adjustable planes or surfaces exposed to the antagonistic action of the force acting between them and the main body, are the seat of dynamic reactions on the whole of the apparatus.

In the accompanying drawings given by way of example,

Figure 1 is a side elevation illustrating one embodiment of my invention.

Fig. 2 is a similar view illustrating a modification.

Fig. 3 is a side elevation illustrating the use of a series of shock absorbing elements.

Fig. 4 is a bottom plan view of Fig. 3.

Fig. 5 is a stern elevation of Fig. 3.

Fig. 6 is a bow elevation of Fig. 3.

Fig. 7 is a bottom plan view illustrating the application of the present invention to the hull of a hydroaeroplane.

Fig. 8 is a similar view illustrating the application of the present invention to the hull of a hydroplane.

As shown, the arrangements according to this invention chiefly consist in constituting the wall by means of which the float *a* comes into contact with the liquid surface, by one or more planes or surfaces *b* pivoted to the float. A shock absorbing means is interposed between the body of the float *a* and the said planes or surfaces *b* with variable incidence.

In the simplest construction, of a float having a flat bottom such as shown in (Fig. 1) is added a simple plane *b* arranged below the bottom and pivoted to a cross pin *d*. The said cross pin *d* which is arranged on the bottom of the float *a* is normal to the direction of the advance. A leather bellows *e* brings about, in front, continuity of the hull *a* and of the plane *b*, and conceals the pin *d* and the fixing and erecting devices. Springs *c* are inserted at the back between the body of the float *a* and the adjustable planes *b*. It is obvious that any other system of shock absorber can be utilized in the place of the springs *c*.

Vertical walls disposed on the sides of the body of the float *a* and extending downward lower than the float could be of course provided, between which would move in an angle the adjustable plane or surface *b*. For the same purpose, the adjustable plane or surface *b* could be connected to the body of the float *a* by means of expanding walls such as bellows or others, so that the variation of incidence of the plane or surface *b* relatively to the bottom of the float *a*, would bring about an increase of volume of the latter.

Instead of one plane, it is obvious that for the same purpose could be used a surface *b* of suitable curvature (Fig. 2) similar to the wing surfaces of an aeroplane. In any case, the said surface *b* pivoted to the float *a*, forms relatively to the bottom of

the latter, a wedge, the apex of which is facing forward in the direction of advance of the system, the back terminating in a portion which is parallel to the bottom of the said float *a*.

The solution hereinbefore indicated would be suitable for a short and narrow float. But a single plane would be seldom used, and it would be preferable to use a certain number of pivoted surfaces or planes, the arrangement and the combination of which would vary in accordance with the dimension of the float *a* and the special utilization of the latter.

In the case of a ricochet type, of hull, whether provided with a flat or stepped bottom, it is possible for instance to add a pivoted plane exposed to the action of shock-absorbing systems, to each of the surfaces constituting the offsets. The offsets themselves could be also obtained by a suitable arrangement, in steps, of surfaces *b* pivoted to the flat bottom of the float *a*.

Figs. 3–5 show a float designed in accordance with the above mentioned means and provided with three planes *b* pivoted respectively to the longitudinal walls or girder of the body. Springs *c*, the tensions of which can be different for the three planes *b*, are inserted between the latter and the bottom. In plan, it is possible to see that the width of the planes *b* is also different, and increases from the front of the float *a* toward the rear. The planes *b* slightly overlap each other.

In front of the float *a* could be arranged ribs or planes *f* as shown, with a great angle of incidencee so as to produce a strong emergence in the case where the apparatus goes into the water nose downward.

With a float of such construction, the water-line in the position of rest is F F, when traveling at a certain speed it would be F′ F′ and then F^2 F^2. It is at that moment that the springs *c* or other shock-absorbing parts inserted between the body of the float *a* and the pivoted planes *b*, will play all their part. They will absorb the shocks in the manner of a pneumatic tire, without any strain on the body of the apparatus, and more particularly without braking or tending to stop it. In plunging into the sea, even in case of a gale or strong movement, the shocks will be absorbed by the shock absorbers *c* arranged between the pivoted planes *b* and the bottom of the float *a* owing to the fact that the first contact will be on a narrow surface. An excellent shock absorbing will be therefore obtained, without the position of the floats *a* relatively to the aeroplane being modified, as is for instance the case when shock absorbers are placed between the body of the apparatus and its system of floats.

Nevertheless, the use of shock absorbers such as those described, arranged between the float *a* and the liquid surface constituting the road, completely modifies the problem of suspension of the aeroplane relatively to its alighting gear so that it is possible to provide a combination of these devices with special elastic suspensions inserted between the said floats *a* and the aeroplane, in the same way is in a vehicle, the spring inserted between the frame of the vehicle and the wheel, coöperates, from the point of view of absorbing shocks and oscillations, with the elastic tires arranged between the rolling train and the road.

It will be seen that the device forming the subject of this invention completely protects the rigid or deformable bottom of the float *a* (which is the weak point of the construction) from shocks. If the pivoted planes *b* are broken, no danger results for the apparatus, as the buoyancy of the system is not affected. Moreover, repairs can be quickly done, as it is question of independent surfaces which are secured to the float *a*. The bottom proper is moreover protected by the planes *b* thus constituted, from quick wear and from the shock of floating bodies.

When applied to a flat bottom ship, this system renders harmless any stranding, which is of great value for hydroplanes with air propellers, intended for river or colonial navigation.

It will be seen from the examples illustrated, that the relative arrangement and the combination of the pivoted planes *b* vary according to the special qualities to be given to the float *a*. Thus, in the case of Fig. 7, the rear offset is constituted by two pivotal planes *b* arranged at either side of the longitudinal plane of symmetry of the float *a*, and by stepped planes, either fixed or movable, which constitute the first two offsets arranged centrally. In that way, a greater buoyancy is obtained at the back (case of a hydro-aeroplane). In the case of a hydroplane, it is on the contrary preferable to make the front offset by means of two pivoted planes (Fig. 6) arranged laterally so as to coöperate with the centrally arranged rear offsets.

The said planes *b* which produce a perfect shock-absorber, make it possible at the same time, by their energetic buoyancy, to give to any hull the water lines desired for a given speed. It is sufficient to choose accordingly the extent and the relative arrangements of the planes *b* as well as the tension of the shock absorbing parts *c* interposed, which determine the incidence, in order to create a

resultant emergence, the point of application and the size of which determine the floating position.

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

1. A hull, a series of resiliently supported and pivotally mounted overlapping planes thereon, said planes increasing in size from bow to stern of said hull.

2. A hull having on the bottom thereof a plurality of longitudinally-extending planes, said planes being pivotally connected to and resiliently mounted on said hull, and a pair of planes connected to said hull and offset with reference to said first-mentioned planes.

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.

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