Oct. 21, 1941. C. DORNIER 2,259,625

FLYING BOAT

Filed July 29, 1939

Fig. 1.

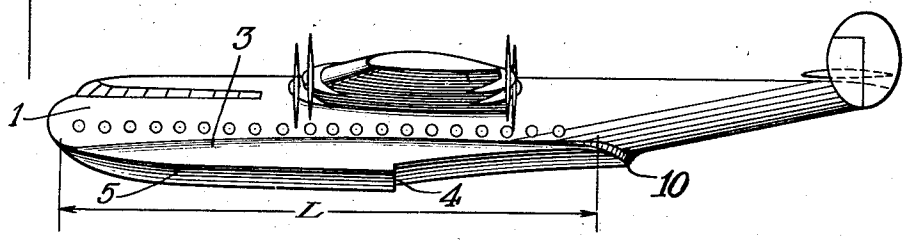


Fig. 2.

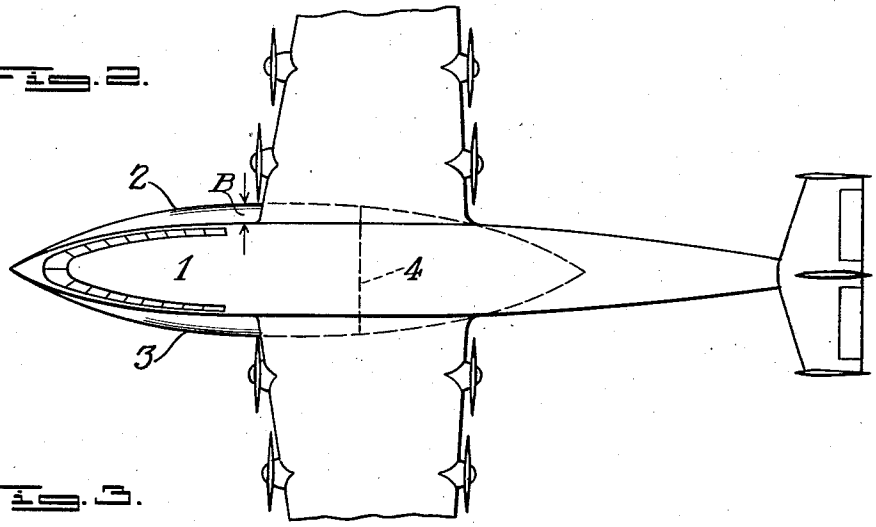


Fig. 3.

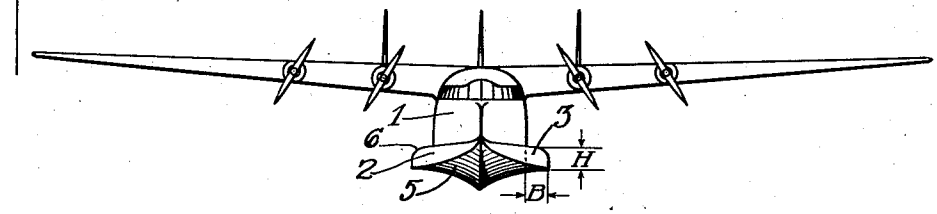
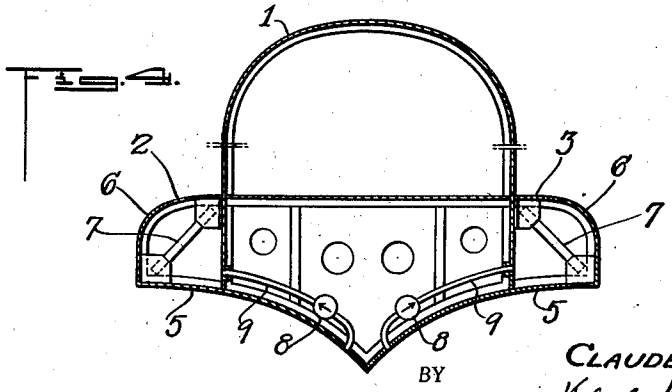


Fig. 4.



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FLYING BOAT

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In Germany August 24, 1938

4 Claims. (Cl. 244—106)

The present invention relates to a stable and rigid flying boat having longitudinal lateral bulges of improved hydrodynamic and aerodynamic configuration and which are stiff in themselves and increase the lateral stability of the boat when it floats on the water.

Flying boats are known in the art the fuselage or boat body of which is provided with longitudinal pressure resisting members extending on the sides of the boat body approximately at the water line. These conventional stabilizers consist of yielding material which is stiffened by interior pressure and made, for example, or rubberized sailcloth or the like and which stabilizers are therefore fundamentally different from the bulge stabilizers which are, according to the present invention, themselves stiff and rigid.

Lateral stabilizers of the bulge type are known which contain sufficient space to accommodate a person therein. Such stabilizers are, in proportion to the length of the boat, of excessive width and considerably increase air and water resistance. The stabilizing effect of bulge members which accommodate a person is not very great because the major part of their volume is above the water line. The object of the present invention is to provide lateral stabilizers which are highly efficient because they are disposed directly above the bilge of the boat so that their entire volume produces buoyancy.

The stabilizers according to the present invention have a comparatively small volume and are of slender configuration and do not impair the streamlined outside configuration of the boat and do not materially increase air or water resistance.

It has further been proposed to arrange fuel tanks alongside the fuselage or boat body which tanks are fared off with sheet metal which reduces resistance of the bulges formed by said fuel tanks. This construction necessitates holding strips which together with the gaps left for wing struts in between the individual tanks produce undesired eddy currents which increase resistance and reduce the speed of the boat.

Cylindrical tanks have the further disadvantage that, when the boat takes off from the water, the water does not readily separate from the cylindrical tanks but adheres to and tends to climb up on said tanks which have no longitudinal edge preventing climbing up of the water. According to the persent invention a bilge edge is provided which is formed at the line of intersection of the undersurface of the bulge or float member with the side surface of the boat. The bottom surface of the float according to the invention smoothly and directly runs into the bottom surface of the boat and forms an uninterrupted surface therewith.

A further object of the present invention is to provide a stabilizing body around the fuselage of a flying boat and adjacent to the waterline which has all the advantages and none of the disadvantages of float stumps which have been used hitherto and which may be of the removable or retractable type. The bulge stabilizer according to the present invention does not produce undesired tipping moments or hydraulic moments particularly at heavy sea and has very little water resistance. It is highly resistant against knocks and shocks and greatly increases the manoeuvering capacity of the boat. According to the present invention the center of gravity of the propelling plant is arranged much lower than in conventional constructions. Hitherto the distance between the metacenter and center of gravity of the flying boat was increased by increasing the buoyancy producing volume and its distance from the longitudinal center plane i. e. by increasing the propping up moment. In the flying boat according to the present invention the metacenter is low, but its distance from the center of gravity of the boat is increased by arranging the propelling plant in 8 flat units which are situated low in the boat. High lateral stability in spite of low location of the metacenter is made possible by the extraordinary large dimension of the 100 ton flying boat according to the present invention whereby the propeller circle is always above the water surface even when the motors are built into wings which form a very flat V.

A further object of the present invention is to provide a flying boat having a bulge float around and integral with the fuselage and in which the center of gravity can be displaced while the boat is in motion. At small load of the boat the lateral bulges may be far above the water line. The floats or bulges according to the present invention can be flooded, i. e., filled with water

whereby the draught of the boat and its lateral stability are increased.

Further and other objects and advantages of the present invention will be apparent from the accompanying specification and claims and shown in the drawing which, by way of illustration, show what I now consider to be preferred embodiments of my invention.

In the drawing:

Figure 1 is a side view of a flying boat according to the present invention.

Figure 2 is a top view of the boat shown in Figure 1 with the wings partly cut away.

Figure 3 is a front view of a flying boat according to the present invention.

Figure 4 is a diagrammatic cross sectional view of a fuselage and bulge float according to the present invention.

Like parts are designated by like numerals and letters in all figures of the drawing.

Figure 1 shows the bulge bodies or members 2 and 3 which are stiff in themselves and are situated alongside of the fuselage 1; the bulges 2 and 3 extend from near the bow of the boat to at least one third to one fifth of their total length L beyond the main step 4 to the rear of the boat. The proportion of the length of the bulges according to the present invention to their width B is 10:1 to 20:1.

Figure 3 shows the proportion of the width of the bulges B to their height H which proportion is approximately one to one.

As shown in Figure 2 the lateral configuration of the bulge is such that it gradually converges into the side of the boat near the bow and that it passes in a continuous sheer into the borderline of the stern step 10.

With a construction as set forth above an aerodynamically particularly favorable configuration of the lateral stabilizing apparatus is produced. The head resistance as compared with the total resistance of the flying boat according to the present invention is extraordinarily small as has been proven by thorough model tests.

Figure 3 shows the smooth and direct transition of the bottom surface of the bulge member into the hydroplane type bottom of the boat which surfaces form a unified continuous and slightly curved surface. The bottom surface 5 intersects with the side surface 6 of the bulge member at an angle of approximately 90° whereby separation of the water from the surface of the boat is greatly facilitated.

Figure 4 shows the interior structure of a bulge which comprises diagonal stay members 7 which assure stiffness of the bulge. Bulkheads may be provided in addition or instead of the stays 7. The bulges form watertight compartments which can be filled with water to increase the draught of the boat. For the latter purpose a flooding pump 8 may be provided which pumps water through conduit 9 from the intake near the keel of the boat into the bulge.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A flying boat including a fuselage having a hydroplane type bottom, a hollow, rigid and watertight bulge means laterally projecting from said fuselage substantially at the waterline, and flooding means connected with said bulge means for temporarily flooding said means and having an intake portion connected with said bottom.

2. A flying boat including a fuselage having a hydroplane type bottom, a hollow rigid bulge member projecting from said fuselage substantially at the waterline, flooding means connected with said bulge member for flooding said bulge means and comprising an intake conduit connected with a low point of said bottom and a discharge conduit communicating with the interior of said bulge member.

3. A flying boat including a fuselage having a hydroplane type bottom, a hollow, rigid and watertight bulge means laterally projecting from said fuselage substantially at the waterline, and a flooding conduit connected with the interior of said bulge means and having a water intake and connected with said bottom for conducting water into said bulge means when said flying boat rides on the water.

4. A flying boat as set forth in claim 3, comprising a pump means inserted in said conduit for forcibly flooding said bulge means.

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