July 25, 1944. L. F. BEARD 2,354,569

HULL

Filed Dec. 12, 1941

FIG. 1

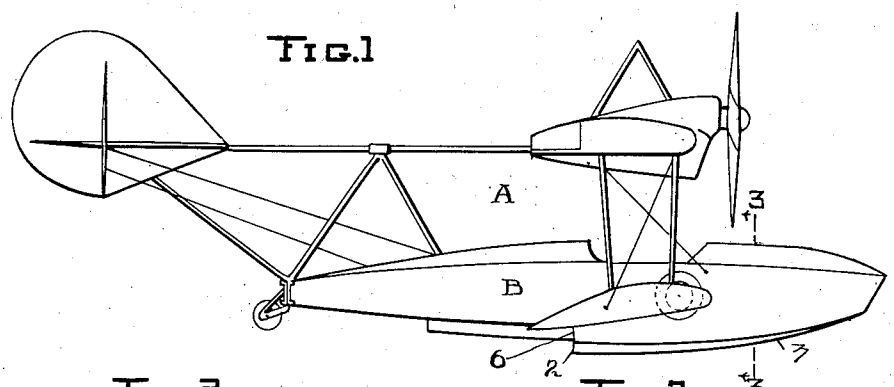


FIG. 2

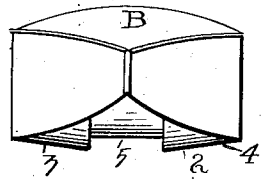


FIG. 3

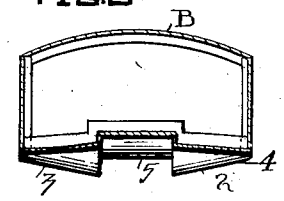


FIG. 4

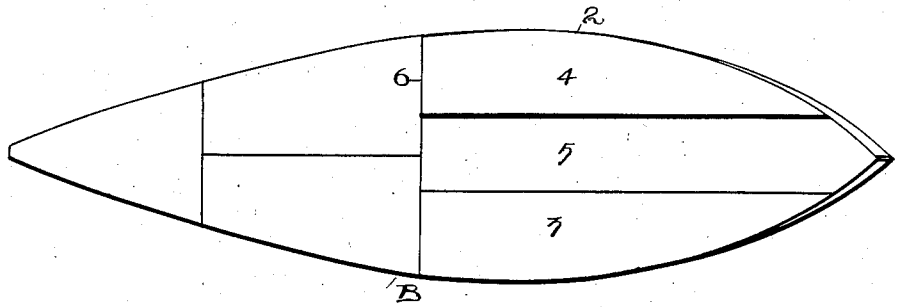
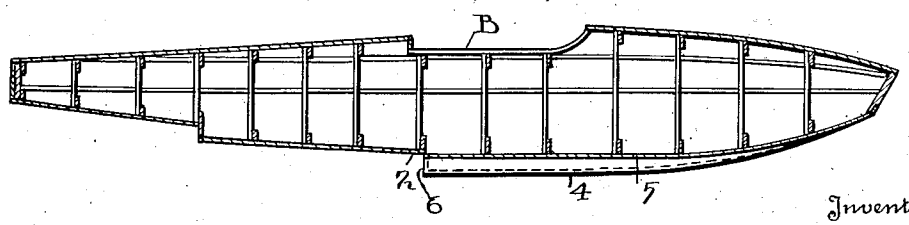


FIG. 5



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HULL

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2 Claims. (Cl. 114—66.5)

The invention relates to a hull construction, and more especially to a hull for amphibian aircraft.

The primary object of the invention is the provision of a hull of this character, wherein it is arranged with a step in the bottom thereof to effect forward planing surfaces, these presenting the least possible amount of skin or wetted surface resistance while in contact with water.

Another object of the invention is the provision of a hull of this character, wherein the bottom forward planing surfaces effect a forced ventilation forwardly of the step, thereby eliminating water resistance, caused by the flow at high speeds of the hull.

A further object of the invention is the provision of a hull of this character, wherein the bottom planing surfaces effect in a seaplane, flying boat or amphibian vehicle, a hull having greater directional stability while taxiing at normal speeds on the water, and the water flowing through a channel provided in such surfaces producing a water key-way flow action caused by such channel, which has vertical sides and a raised ceiling of uniform width throughout its length.

A still further object of the invention is the provision of a hull of this character, wherein the bottom forward planing surfaces arrangement to an aircraft permits the latter to arise from its maximum water line depth at rest, to its takeoff speeds without large changes of angle of incidences parallel to its longitudinal axis.

A still further object of the invention is the provision of a hull of this character, wherein the craft will enter the water on landing with a minimum amount of water displacement, and its ensuing skin frictional resistance and impact loads on making contact with waves or rough water.

A still further object of the invention is the provision of a hull of this character, wherein the bottom forward planing surfaces arrangement thereto assures better directional stability of the craft while in flight, due to the flow of air through the channel inwardly of such surfaces arrangement.

With these and other objects in view the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing, which discloses the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawing:

Figure 1 is a side elevation of an amphibian aircraft with its hull constructed in accordance with the invention.

Figure 2 is an end view looking toward the bow thereof.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1, the propulsion mechanism and rigging being not shown.

Figure 4 is a bottom plan view.

Figure 5 is a longitudinal vertical sectional view through the hull of the craft.

Similar reference characters indicate corresponding parts throughout the several views in the drawing.

The true nature of the craft in accordance with the invention will be best understood by a detail description of the form thereof shown in the drawing in an illustrative sense.

Now, referring more particularly to the drawing A designates generally an amphibian aircraft conventionally equipped with propulsion mechanism and rigging. Forming a part of the craft A is the hull construction denoted at B as constituting the present invention, comprising a suitably framed body having a bottom portion 2, its rear portion being conventionally created. As best seen in Figures 2, 3 and 4, of the drawing, which is the basis of the present invention, the explanation of the arrangement, and operation thereof, this bottom portion 2 has the forward planing surfaces 3 and 4, respectively, which effect two co-acting surfaces inclined upwardly and forwardly from a step 6, thereby forming two keel lines, these extending from the said step and ending on the chine, near the bow of the hull, the chine forming the outer beam width of the planing surfaces 3 and 4, and confined wholly under the forward area of the hull. The two keel lines of the forward planing surfaces, as best seen in Figure 4 of the drawing, extending from the step 6 forward to the end of the hull, form the bottom inner line of the area of the outer planing surfaces 3 and 4, respectively.

The planing surfaces are inclined inwardly and downwardly from the chine to the keel lines, as shown in Figure 4 of the drawing, the said keel lines being extended from 6, see Figures 4 and 5, upwardly and forwardly, and merging into the chine, near the forward end of the hull. This arrangement forms lateral and longitudinal contour lines usually referred to in nautical terms as dead rise, and constitutes the approximate angles of the forward outer bottom planing surfaces, these being heretofore denoted 3 and 4.

It should be noted that the two keel lines shown in Figure 2 of the drawing form the outer ver-

tical side walls of a channel 5, which has the ceiling of uniform width extending from the step 6, inclined upwardly and forwardly, and merges into and forms the chine, the said channel 5 being of maximum depth at the step 6 and decreasing in depth, while progressing forwardly and merging into the chine at the intersection thereof.

It should be noted that the hull has a step at its bottom, the latter rising forwardly of the step and also rising aft from the said step, the bottom being further provided with the channel located approximately at the longitudinal center thereof and opening through the forward rise of such bottom and also opening aft through the step, while the planing areas created along the rise at opposite sides of the channel effect a two point contact of the bottom with water only at high speed operation, and the said planing areas incline outwardly and upwardly from the said channel, with upright walls separating the channel and planing areas throughout the same.

What is claimed is:

1. A hull having a step at its bottom, the latter rising forwardly of said step and also rising aft from the step, the bottom being further provided with a channel located approximately at the longitudinal center thereof and opening through the forward rise of said bottom and also opening aft through the step, and planing areas created along the rise at opposite sides of the channel to effect a two point contact of the bottom with water only at high speed operation, the said planing areas being inclined outwardly and upwardly from the said channel.

2. A hull having a step at its bottom, the latter rising forwardly of said step and also rising aft from said step, the bottom being further provided with a channel located approximately at the longitudinal center thereof and opening through the forward rise of said bottom and also opening aft through the step, planing areas created along the rise at opposite sides of the channel to effect a two point contact of the bottom with water only at high speed operation, the said planing areas being inclined outwardly and upwardly from the said channel, and upright walls separating the channel and planing areas throughout the same.

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