Jan. 26, 1932. G. LOENING 1,842,791

FLYING BOAT HULL AND THE LIKE

Filed Oct. 16, 1931

Fig.1.

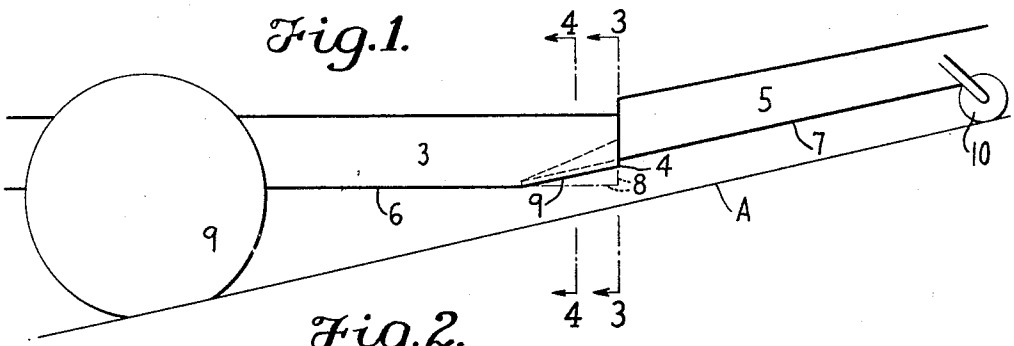


Fig.2.

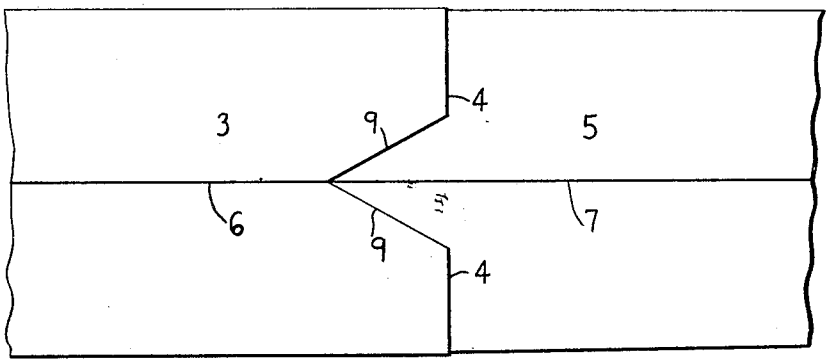


Fig.3.

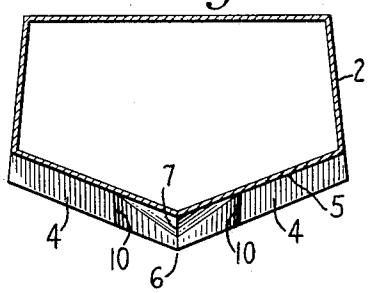


Fig.4.

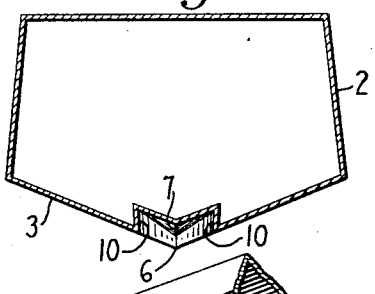
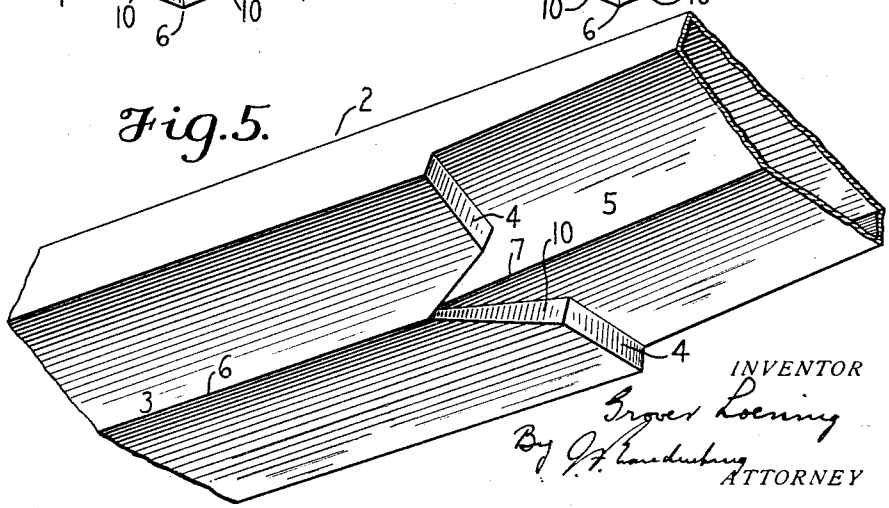


Fig.5.



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Patented Jan. 26, 1932 1,842,791

UNITED STATES PATENT OFFICE

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FLYING BOAT HULL AND THE LIKE

Application filed October 16, 1931. Serial No. 569,182.

This invention relates to heavier-than-air aircraft having flotation supports such as boat bodies, floats or pontoons, enabling them to alight on and rise from water, and more especially to amphibian flying-boats or seaplanes, which are provided, also, with land landing-gears. The customary V-bottom hull with the well-known transverse step provides but little clearance at the step when making landings with the landing-gear, and deflection of the gear may cause the step to strike with possible injury to the hull.

To overcome this difficulty, it is known to cut off the main bottom at and just forward of the step, producing a flat surface. By this expedient added clearance is obtained, but the ability of the plane to take off from water is seriously impaired. An object of this invention is to secure the desired increased clearance without sacrificing ease of water take-off. This is accomplished by providing the hull or float with a notched formation which secures the advantage of the cut-off for landings and still gives the full step effect to the hull bottom for the purpose for which the step is intended. Whereas with the plain cut-off the water follows the bottom on back to the tail, with my invention the water breaks away at the notch. This lowers the drag of the whole hull, and even in some cases makes the difference between a hull that will get off the water and one that will not.

Another object is to secure adequate or improved step effect with a novel construction applicable to aircraft hulls and floats generally. The novelty may be described as consisting in cutting the main bottom in front of the usual line of step and in recessing this region so as to create a forwardly displaced step element.

In the accompanying drawings, forming part hereof:

Fig. 1 is a somewhat diagrammatic side elevation of the lower portion of part of a flying-boat hull or the like embodying the invention, the landing-gear being indicated in relation to a surface to show the increase clearance which is gained;

Fig. 2 is a bottom plan view, the front and rear portions of the flotation body being broken away;

Figs. 3 and 4 are cross-sections taken on the lines 3—3 and 4—4, respectively, of Fig. 1, no attempt being made to show irrelevant structure; and

Fig. 5 is a bottom perspective view.

The flying-boat hull 2, a sufficient portion of which is shown to illustrate the invention, has the main V-bottom 3 extending from the front to the transverse step 4, which will be understood as being in the usual location, and the tail part 5, also V-bottom, starting at a higher elevation at the step. The keel lines are marked 6, 7.

The dot-and-dash lines 8 in Fig. 1 indicate how in ordinary hulls and floats the keel line 6 of the main bottom extends straight to the step, resulting in a deep step which allows small clearance when the aircraft comes down on its landing gear 9 (usually retractable) and its tail skid or wheel 10. The ground line A is drawn at an inclination in this view because the hull is represented in the position it would occupy on water.

In my invention, the middle third, more or less, of the transverse step is cut away, and the main V-bottom 3 is cut away forwardly from the step a comparable distance, or for a distance sufficient to secure materially increased clearance, as will appear from the line 9 in Fig. 1, the plane of this line forming a wide obtuse angle with the keel line 6. If this line represented the edge of a flattened area, the water would not break properly at the step when the machine sought to "get on step" preparatory to quitting the water for the air.

What is involved in my invention is a recessing of the main bottom forwardly from the step. The precipitous walls 10 of this recess form an extension of the step, and, notwithstanding the reduction in the depth of step, the effect in take-off from water is comparable with that of a normal step. The recess is preferably a tapering or triangular notch. As shown, the walls 10 converge from the inner ends of the two transverse portions of the step to the keel line 6 of the main bottom. The lines and planes of the tail

bottom 5 are preferably continued into the notch, in consequence of which the supplementary or forwardly extended step walls 10 may, and preferably do, diminish in depth from back to front.

It will be appreciated that the invention may be applied in modified forms.

What I claim as new is:

1. In an aircraft hull or float of the V-bottom type with transverse step, the combination of a cut at an angle to the main line of the step, with a recess giving step effect around the cut.

2. An aircraft hull or float of the V-bottom type having a main bottom and a tail bottom, and a step forwardly recessed in the main bottom.

3. An aircraft hull or float of the V-bottom type with transverse step, characterized by a notched step formation which extends into the main bottom from the main line of the step.

4. A hull or float for aircraft as set forth in claim 3, further characterized in that the precipitous side walls of the notch converge.

5. A hull or float for aircraft as set forth in claim 3, further characterized in that the notch is triangular.

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