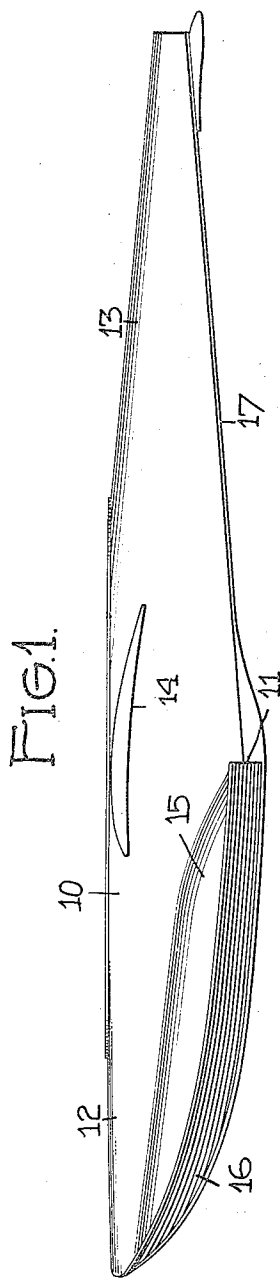
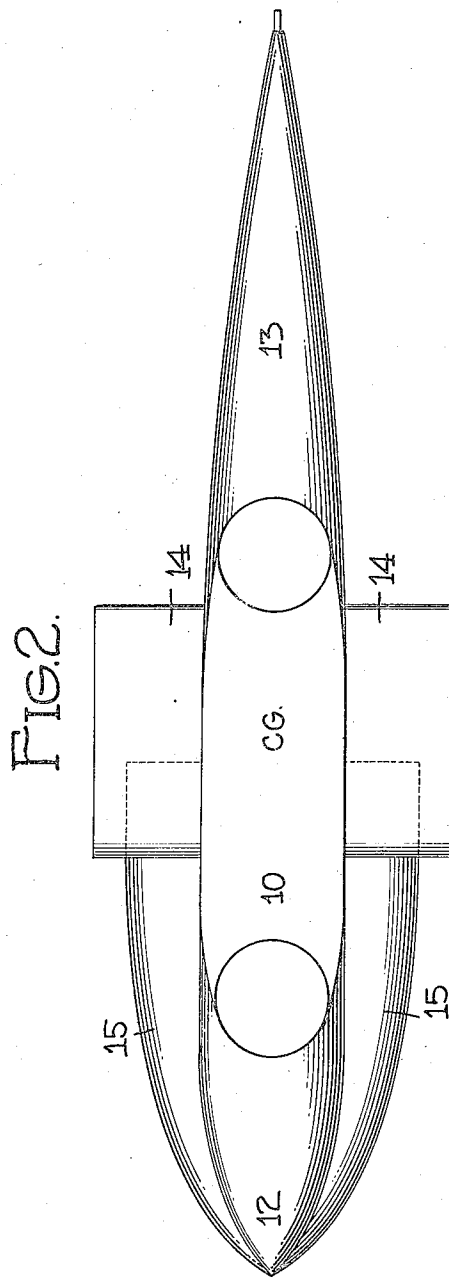
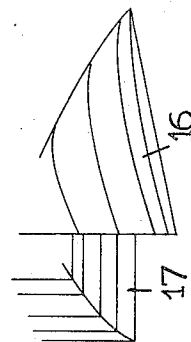


1,246,019.

Patented Nov. 6, 1917.



By

Inventor  
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# UNITED STATES PATENT OFFICE.

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## FLYING-BOAT HULL.

1,246,019.

Specification of Letters Patent.

Patented Nov. 6, 1917.

Application filed February 28, 1917. Serial No. 151,503

*To all whom it may concern:*

Be it known that I, GLENN H. CURTISS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Flying-Boat Hulls, of which the following is a specification.

My invention relates to hydroplane boats of the type commonly used in connection with hydroaeroplanes and flying boats. It has for its object the enabling of the craft to rise quickly from the water with maximum load aboard and having risen from the water to enable operation in the air with a minimum of head resistance due to the body of the boat. To these ends, and for the purpose of effectually shielding the propeller or propellers against flying spray or "wash," said body is equipped with fin excrescences which emanate from the extreme bow and at the bow have their edges or margins heavily overhung. Rearwardly from the bow the fins extend continuously outwardly to a point of maximum beam and thence rearwardly without substantial approach to the chines or gunwales of said body. By this arrangement the hydroplaning surface underlying the fore body of the hull or flotation body is greatly augmented or increased in the vicinity of the bow where flying spray is produced and increasingly augmented rearwardly to a point in the transverse vertical plane of a line projected vertically through the center of gravity.

Another and important characteristic of the invention is the bottom formation of the hull. The bottom of the fore body at the bow is acutely V-formed or convexed in transverse section, the angle of the V increasing gradually to extreme obtuseness at a rearwardly facing step located beneath the supporting surfaces of the craft. From the step rearwardly the bottom of the hull is substantially in the form of a straight angle with the keel as the vertex from which the sides of the angle are produced.

Of the drawings:

Figure 1 is a side elevation of the hull;

Fig. 2 a top plan view, and

Fig. 3 a diagrammatic view illustrating the hull bottom formation in transverse section.

In the embodiment of the invention selected for illustration, 10 designates the hull or flotation body in its entirety. The

bottom of the hull at a point substantially amidships is stepped as indicated at 11, the step affording a line of demarcation between the fore body 12 and the tail 13 of the hull.

Stub wings 14 (built in) extend out laterally considerably beyond the sides of the hull, the said stub wing providing anchorages for the main supporting surfaces of the craft (not shown). Said wings 14, and consequently the supporting surfaces (not shown), are located directly above the step 11, the entering edge of the wings extending well forward beyond the vertical plane of said step and the trailing edge an even greater distance aft. By this arrangement the step 11 and center of pressure on said wings may be described as lying in the transverse vertical plane of a line projected vertically through the center of gravity designated CG in Fig. 2.

The forebody 12 of the hull 10 is equipped with lateral fin excrescences 15 which emanate from the extreme bow and at the bow have their edges heavily overhung to appreciably increase the hydroplaning area of the hull at this point. Said hydroplaning area or planing bottom 15 extends downwardly and rearwardly rather sharply from the bow to a point in the vicinity of the center of hydroplane lift and thence rearwardly more horizontally to the step 11 where it is squarely or abruptly terminated. The fins 15 in both transverse and longitudinal section are given a stream line form. From the bow aft the margins of the fins may be described as extending continuously outwardly and rearwardly without approach to the chines or gunwales of the hull to a point of maximum beam underlying the stub wings 14 and in lateral continuation or alinement with the step. Said fins or excrescences thus increasingly augment the hydroplaning bottom continuously rearwardly from the bow.

The bottom of the tail portion 13 of the hull 10 is non-hydroplaning in form, commencing at the step 11 and extending slightly upwardly and rearwardly at a salient angle to the stern of the hull. In transverse section the bottom surface 17 of the tail 13 is substantially in the form of a straight angle with the keel or center line of the hull at the vertex from which the sides of the angle are produced. Underlying the bottom surface of the tail 13, the

hydroplaning bottom of the forebody 12 is acutely V-formed in transverse section in the vicinity of the bow, the angle of the V increasing to marked obtuseness at the step.

5 The lines of the bottom both underlying the tail and the fore body are continuous and uninterrupted from the keel laterally, in the one instance to the chines of the hull proper and in the other instance to the lateral margins of the fins 15.

10 By commencing the fins at the extreme bow of the hull, the hydroplaning area and the center of hydroplaning lift is brought forward with the result that in hydroplaning at speed the craft is enabled to come quickly to the surface of the water. To gain flight, however, after coming to the surface of the water, it is necessary that the craft be longitudinally rocked with the step 15 11, or a point in the vicinity thereof, acting as the axis of oscillation. In rocking, the nose end of the hull is lifted and the tail depressed with the result that the non-hydroplaning surface 17 is brought into contact with the water for an exceedingly limited period of time. By constructing the non-hydroplaning surface substantially flat, seaworthiness is increased and manufacturing cost reduced.

20 30 While in the foregoing there has been illustrated in the drawings and described in the specification such combination and arrangement of elements as constitute the preferred construction or embodiment of this invention, it is nevertheless desired to emphasize the fact that interpretation of the invention should only be conclusive when made in the light of the subjoined claims.

What is claimed is:

40 1. A hydro-aero-craft including a flotation body having its bottom area laterally increased from the extreme bow aft to a point substantially amidships.

2. A hydro-aero-craft including a flota-

tion body having its bottom area laterally increased by fin excrescences which emanate from the extreme bow, and at the bow have their edges heavily overhung.

3. A hydro-aero-craft including a flotation body having its bottom area laterally increased by fin excrescences which flare continuously outwardly from the bow to a point of maximum beam and thence extend rearwardly without substantial approach to the gunwales of the hull.

4. A flying boat including a hull having its bottom area laterally increased by heavily overhung fin excrescences which emanate from the extreme bow and extend continuously outwardly and rearwardly to a point of maximum beam and thence rearwardly substantially in parallelism for termination at a point in the transverse vertical plane of a line projected vertically through the center of gravity.

5. A flying boat including a hull having a bottom of acute V-form in transverse section at the bow, the angle of the V increasing gradually to extreme obtuseness substantially amidships, said bottom thence continuing rearwardly in non-hydroplaning form and in transverse section producing successive substantially straight angles considering the center line of said bottom as the vertex from which the sides of the angle are produced.

6. A flying boat including a hull having a hydroplaning bottom located principally ahead of the transverse vertical plane of a line projected vertically through the center of gravity and a non-hydroplaning bottom located principally aft of said line, the hydroplaning bottom being of variable V-form in transverse section and the non-hydroplaning bottom uniformly substantially flat.

In testimony whereof I affix my signature.

GLENN H. CURTISS.