

G. H. CURTISS.
HYDROAEROPLANE PONTON.
APPLICATION FILED NOV. 18, 1916.

1,269,397.

Patented June 11, 1918.

2 SHEETS—SHEET 1.

FIG. 1.

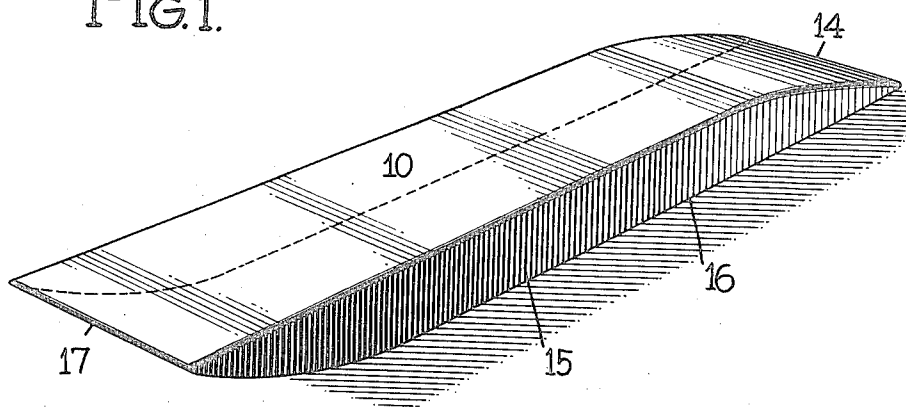
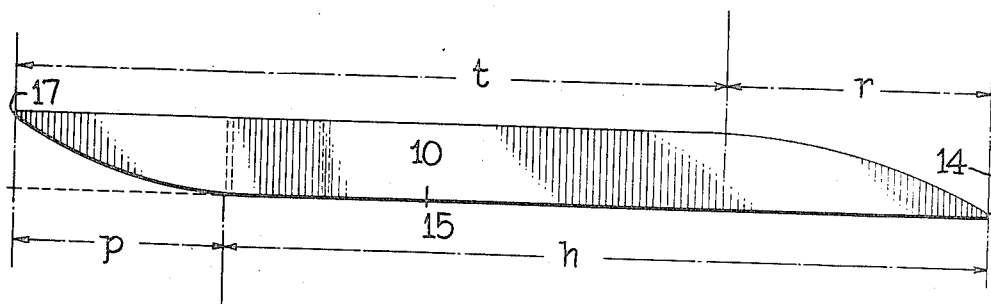


FIG. 2.



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2 SHEETS—SHEET 2,

FIG.3.

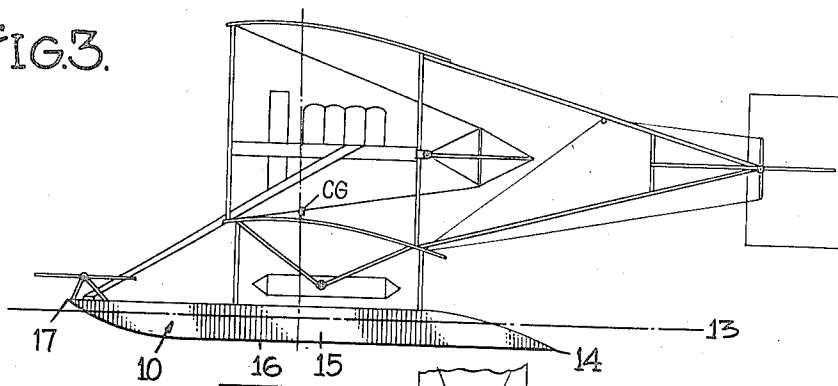
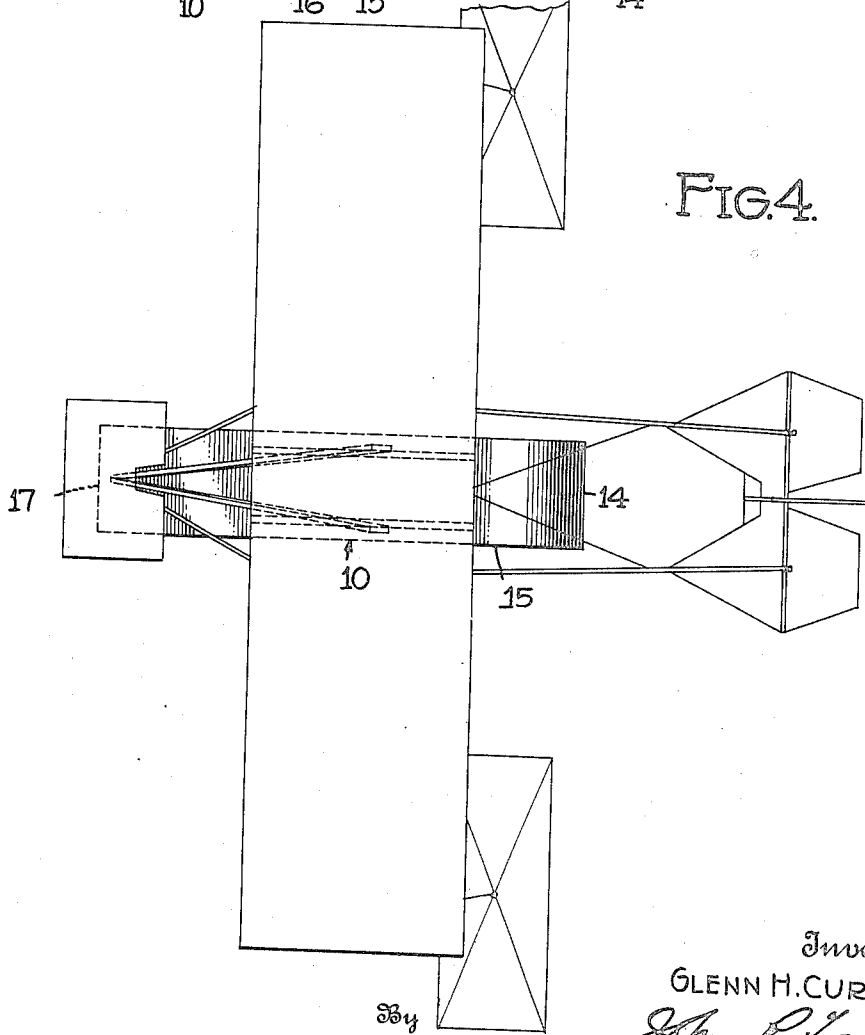


FIG.4.



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UNITED STATES PATENT OFFICE.

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HYDROAEROPLANE-PONTOON.

1,269,397.

Specification of Letters Patent. Patented June 11, 1918.

Original application filed August 22, 1911, Serial No. 645,340. Divided and this application filed November 18, 1916. Serial No. 132,105.

To all whom it may concern:

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

This application is a division of my co-pending application, Serial No. 645,340, filed August 22nd, 1911. The invention relates to that class of pontoons commonly used in connection with hydroaeroplanes. Pontoons used in this connection prior to my invention were in the form of cylindrical tanks, ordinary catboats, cigar-shaped, or like some of the many vessels of commerce.

This invention constitutes a distinct departure from all of these types of pontoons. This form resulted in the commercialization of the hydroaeroplane. A hydroaeroplane is also a hydroplane in that its supporting base has a hydroplaning function as well as a buoyant function. The hydroplaning function is secured through the provision of a hydroplane surface beneath the base and constituting the bottom of the base, as distinguished from the flotational types of bottom. The mere provision of a hydroplaning bottom, however, is not what constitutes the invention in the hydroplane base of this application since hydroplaning surfaces were utilized many years ago in connection with hydroaeroplanes. The substance of my invention resides in the shape of the pontoon and hydro-surface and the relative disposition of the hydro-surface.

The pontoon of my invention comprises a buoyant body having a hydroplaning under-surface at least substantially the full width of the body throughout its extent, a relatively wide downwardly and rearwardly extending landing prow and somewhat similar to a scow bow which merges uninterruptedly into said hydroplane surface and under certain conditions augments the same, the chine lines of said landing prow and said hydroplaning under-surface being longitudinally continuous, and a hermetically sealed deck or back which extends rearwardly from the frontal extremity of said prow to a point beyond the point of maximum displacement per unit of length without approaching said hydroplane surface,

and from that point gently sloping convexly downwardly and rearwardly to intersect the under-surface of the body.

The accompanying drawings are taken from the parent application, the pontoon being shown separately, all parts not intimately related with it being omitted for the sake of brevity and clarity.

Of the drawings,

Figure 1 is a $\frac{3}{4}$ front perspective view of the pontoon of my invention.

Fig. 2 is a side elevation of the same.

Fig. 3 is a side elevation of the hydroaeroplane in which the pontoon was originally used, and

Fig. 4 is a plan view of the same.

The pontoon as a whole is designated 10. In this embodiment it is of elongated form and rectangular in cross section. The proportions of width to length as well as the section, may of course be greatly varied. In connection with the hydroaeroplane shown this pontoon was made one foot deep, 2 feet wide, and 16 feet long. It was flat on top and bottom and upwardly inclined at its forward end surface and downwardly inclined at its rear upper surface. That portion of the bottom *h* extending from the upwardly inclined forward end surface to the rear extremity of the pontoon is a hydroplane surface. As is obvious, it is of considerable area. Also, it terminates at the rear extremity in an edge 14 extending transversely substantially the full width of the boat 10. The hydroplane surface *h* being substantially horizontal and the sides 15 of the pontoon substantially vertically extending, the chines 16 are sharp. The portion *p* of the under-surface extends from the frontal extremity 17 downwardly and rearwardly on a gentle or gradual curve uninterruptedly into the hydroplane surface *h*. This portion of the under-surface is of substantially the full beam (Fig. 2) of the boat, and constitutes a scow-like landing prow surface, which both takes the impact upon alighting and augments the hydroplaning action of the surface *h* during operation at speed over the surface of the water. The top or deck of the pontoon extends from the frontal extremity 17 rearwardly to a point considerably aft of the inclined portion *p* of the under-surface and coextensive for a distance with the hydroplane surface *h* without ap-

proaching the same. This portion of the surface is designated t . From this point aft, however, the top surface inclines uninterruptedly from the portion t downwardly and rearwardly on a gentle and gradual curve which intersects the edge 14. This rear portion of the deck is designated r . It will be observed that the aspect of the pontoon in side elevation is that of an elongated body whose extremities are oppositely chamfered or beveled, the frontal extremity on its under side and the rearward extremity on its upper side. The beveling, as clearly appears, is by longitudinal convex curves which merge uninterruptedly, the one, p , into the hydroplane-surface h , and the other, r , continuing uninterruptedly the top deck t , and intersecting the bottom in the transversely extending edge 14. The deck, throughout its main portion r , does not approach the bottom, extending to a point past the point of maximum displacement per unit of length.

The pontoon is used as indicated in Figs. 3 and 4. It constitutes the waterborne base of the aeroplane and is connected therewith by suitable struts in the attitude shown. Assuming the machine to be resting on the water, the engine is started, which will drive the machine through the water. The pontoon, by virtue of the hydroplaning action of its under-surface, lifts the machine progressively as the speed increases, the lift being augmented by the lift of the wings of the aeroplane. The inclined landing prow p , causes the machine to tilt upward somewhat, thereby giving the wings an angle of incidence sufficient to exert substantial lift, and the flat hydroplane under surface of the boat h and the edge 14 in which it terminates, augmented by surface p , gives a very large hydroplane lift without seriously disturbing the water through which the machine passes. Not only are heavy sprays and waves thus avoided, but the aeroplane is prevented from burying, either by the prow or by the stern, that is, tipping unduly downward at either extremity. In fact, if the pontoon is attached to the aeroplane in the proper attitude its action is such that it hydroplanes to the surface very rapidly and without adjustment or manipulation of its hydroplaning angle by means of the aeroplane controls. When the speed of the aeroplane over the water is sufficient to give an aeroplane lift at an attainable angle of incidence sufficient to support the weight of the machine, the operator may tilt the rudders of the aeroplane to direct the machine into the air whereupon it will rise out of the water. In alighting upon the water the inclined landing prow surface p first strikes

the water and serves to turn the aeroplane upwardly from its gliding course so that it may not dive, or nose under, as it is commonly expressed. The rear downwardly tapering deck surface 12 operates to shed all water which may be landed upon the deck of the pontoon in a most efficient manner, and to give the form efficiency in the streamline. The freer the deck can be kept of the water of waves encountered in rough seas the more easily will the machine arise from the surface.

Obviously many modifications may be made in the form of my invention without departing in any wise from its generic spirit. In fact, many such modifications have been made since my invention has been placed upon the market. It is the purport of the claims herein to cover all modifications not falling without the purview of the invention.

What I claim is:

1. A pontoon for hydroaeroplanes comprising a main body having a longitudinally extending hydroplaning surface on its bottom terminating rearwardly in a transverse edge, a broad longitudinally convexed downwardly and rearwardly inclined landing prow surface curving gradually from the frontal extremity of the pontoon to the aforesaid hydroplaning surface, substantially vertical sides the height of which is substantially equal to the maximum depth of the pontoon, a substantially horizontally flat top deck hermetically sealing the pontoon and extending straight back from its point of intersection with said landing prow surface, and a rear deck portion approaching the bottom of the pontoon.

2. A pontoon for hydroaeroplanes comprising a main body having a longitudinally extending hydroplaning bottom surface substantially horizontally flat throughout the greater portion of its length, substantially vertical sides, a top deck hermetically sealing the pontoon and substantially horizontally flat throughout the greater portion of its length, the flat hydroplaning bottom surface and the flat top deck being substantially parallel with the former extending rearwardly beyond the rear end of the horizontally flat deck portion and the latter extending forwardly beyond the forward end of the horizontally flat bottom hydroplaning surface, the deck at its rearward extremity sloping downwardly for intersection with the bottom and the bottom at its forward end sloping upwardly for intersection with the deck.

In testimony whereof I affix my signature.

GLENN H. CURTISS.