G. H. CURTISS.

FLYING BOAT CRUISER.

APPLICATION FILED MAR. 31, 1916.

1,283,684.

Patented Nov. 5, 1918.

2 SHEETS—SHEET 1.

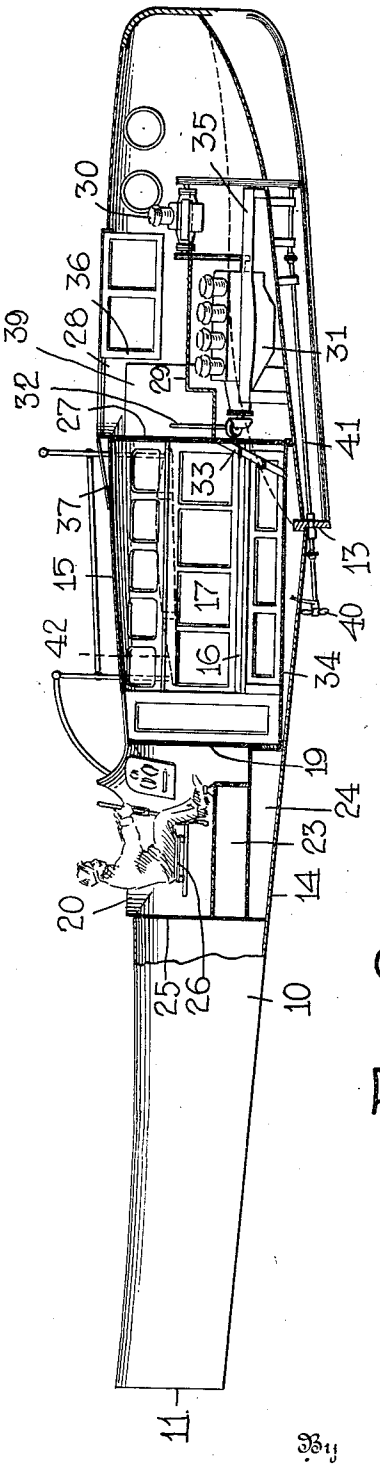


FIG. 1.

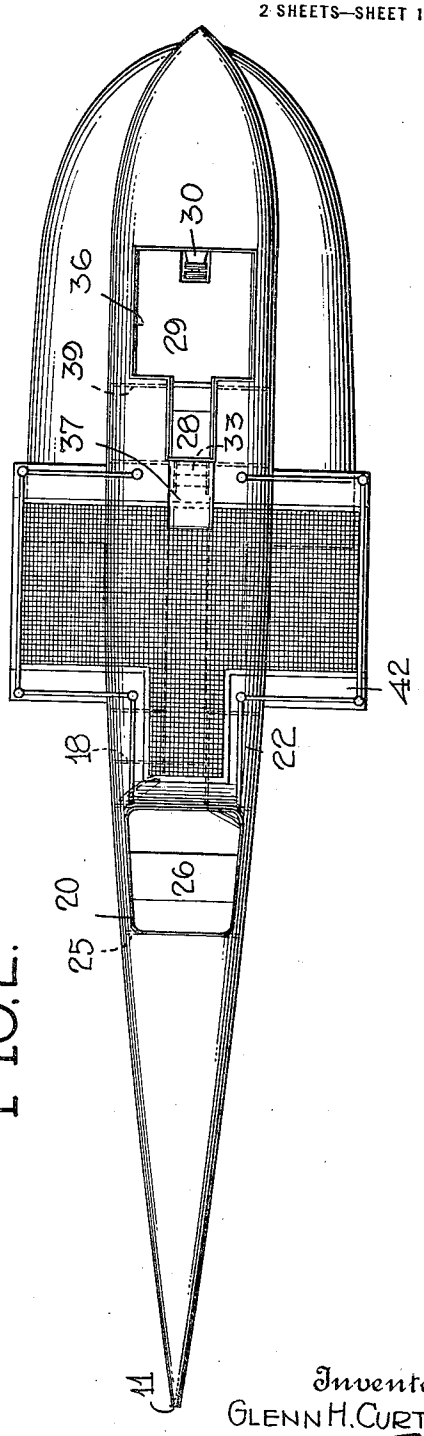


FIG. 2.

Inventor

GLENN H. CURTISS.

By

Attorney

G. H. CURTISS.

FLYING BOAT CRUISER.

APPLICATION FILED MAR. 31, 1916.

1,283,684.

Patented Nov. 5, 1918.

2 SHEETS—SHEET 2.

FIG. 3.

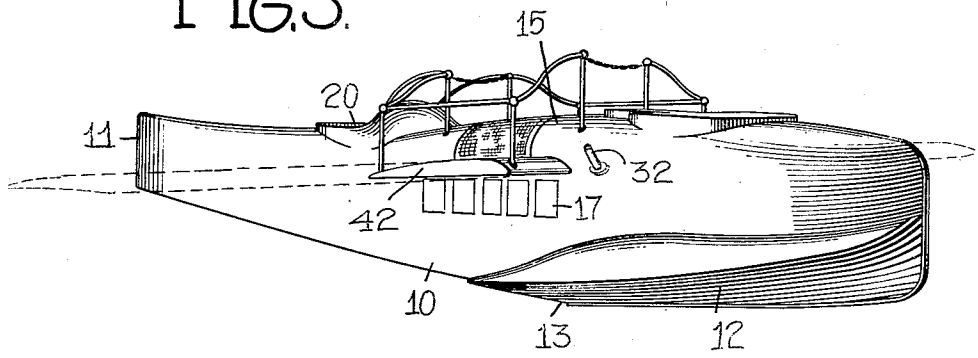
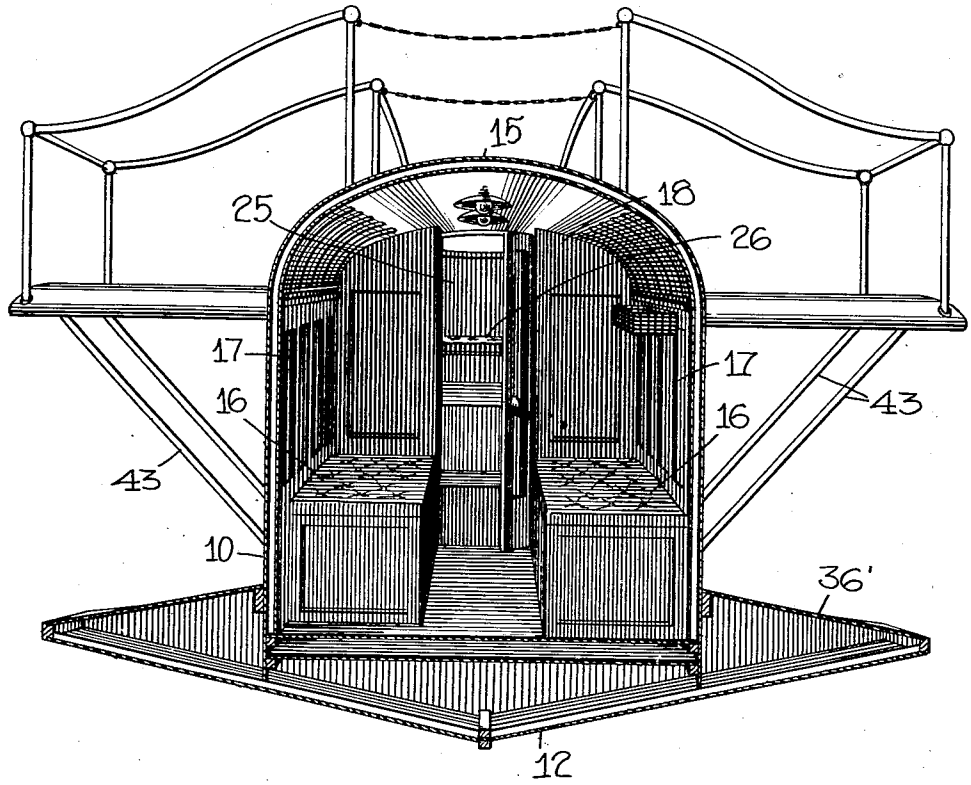


FIG. 4.



Inventor

GLENN H. CURTISS.

By

Attorney

UNITED STATES PATENT OFFICE.

GLENN H. CURTISS, OF BUFFALO, NEW YORK, ASSIGNOR TO THE CURTISS AEROPLANE AND MOTOR CORPORATION, A CORPORATION OF NEW YORK.

FLYING-BOAT CRUISER.

1,283,684. Specification of Letters Patent. Patented Nov. 5, 1918.

Application filed March 31, 1916. Serial No. 88,090.

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 Cruisers, of which the following is a specification.

My invention relates to boat hulls of that description commonly used in connection with the type of flying machine called hydroaeroplanes. This type is characterized by the support of the tail controls upon and the passengers within the body of the boat hull which also carries a beam of itself the supporting planes. However, as will appear hereinafter, my invention is applicable to hulls of hydroplanes and to all types of flying boat.

While attempts have heretofore been made to construct successful cruising hydroaeroplanes or flying boats, such attempts, in so far as I am aware, have utterly failed both in purpose and design owing to the limited useful space in the body of the hull and the requisite symmetrical disposition of weight as regards the center of gravity of the machine. It is not only essential that due regard be given the disposition of fixed and variable load but equally important that as near perfect streamline form be maintained as is practicable.

In cruising over a wide or extended area of water and land, it is quite often desirable and in fact necessary that a means be provided whereby the occupant or occupants of the machine may retire and sleep with comfort and ease and without regard to weather conditions. It is further desirable that bunkers, lockers and other conveniences be provided. With the foregoing in view, the primary object of the present invention is to provide what I shall hereinafter term a pleasure or sportsman's craft—*i. e.*, a hydroaeroplane or flying boat of the cruising type having its hull portion constructed to symmetrically inclose a cabin, bunkers, propelling power plant, fuel storage space, auxiliary motor and other conveniences, appliances or apparatus deemed essential to long continued although interrupted flight.

I further contemplate an arrangement of parts whereby, in emergency, the craft may be propelled through the driving action of a water propeller ordinarily inactive and removed from view.

In the accompanying drawings, I have shown in detail the embodiment of my invention which I consider preferred, but desire it to be understood that other embodiments involving the same principles and having the same basic characteristics are intended to be comprehended in the generic spirit of the invention as originally conceived.

Of the drawings:

Figure 1 is a longitudinal sectional view of my improved flying boat hull stripped of the means utilized to obtain and control aerial flight;

Fig. 2 is a top plan view of the hull;

Fig. 3 is a perspective view, and

Fig. 4 is a much enlarged transverse sectional view illustrating the interior cabin structure looking aft.

The body proper of the hull is designated 10. It is essentially of streamline form having a rather blunt and bulged-out head portion which commences to taper rearwardly slightly in advance of its center to a terminus at the vertical rudder post section 11. The bottom 12 forms a V-shaped hydroplaning surface in cross-section of a width equaling the beam of the boat, and is inclined from front to rear on a curve, as illustrated in Fig. 1, the inclination being suitably downward at the bow and then continued at a gradually lessening degree of curvature rearwardly until its path is very nearly a straight line. This bottom 14 of the tail portion of the boat inclines upwardly from the step 13 and lies in a plane making a salient angle with the bottom 12 of the forward portion. The surface 14 does not act as a hydroplaning surface in conjunction with the surface 12.

While the flying boat or hydroaeroplane herein illustrated is devoid of supporting planes and control surfaces, it is to be understood that such parts are absolutely essential if used in a capacity other than purely a hydroplane.

In the approximate vertical plane of the center of gravity, a cabin structure designated as an entirety by the numeral 15 is provided, the mentioned structure having a length overall sufficient to accommodate bunkers 16 which extend longitudinally thereof at opposite sides of the cabin to accordingly provide an aisle or passage way therebetween. Windows 17 are formed in the cabin sides to admit of light and ventila-

tion. At the aft end of and within the cabin, a locker 18 is constructed, the locker being of a size admitting of inward swinging movement of a door 19 located in the cabin to permit entrance and exit respectively thereinto and therefrom from the aft cockpit 20 located immediately at the rear of the door 19. At the opposite side of the center aisle in the cabin and directly opposite the locker 18 a lavatory 22 is located.

Storage compartments 23 and 24 are located interiorly of the aft cockpit 20 in superimposed relation as illustrated in Fig. 1, the top walls of the mentioned compartments jointly serving as the flooring for the cockpit 20. A bulkhead 25 divides the aft cockpit 20 from the tail portion 11 of the hull.

The operator's seat, denoted 26, is mounted in the rear or aft cockpit 20 to thus obviate the necessity of extending the various control leads (not shown) interiorly of the cabin 15.

A door 27, designed to swing outwardly is mounted at the forward end of the cabin 15 to permit of entrance thereinto from the forward cockpit 28. The flooring 29 for the forward cockpit 28 is stepped as illustrated. The raised portion at its forward end supports an auxiliary motor 30 conjunctively utilizable as a propelling power plant for the craft in an emergency and as a starter, under ordinary conditions, for the main propelling power plant 31. The main propelling power plant 31 is located forwardly of the cabin 15 and beneath the flooring 29 of the cockpit 28. An engine bed of suitable construction is mounted directly above the hydroplaning surface of the craft that the weight of the engine mounted on the bed may be borne primarily at a point where the craft is transversely braced by bilge fins 36' of a construction common to many hydroplanes and hydroaeroplanes of the "Curtiss" type. Power is transmitted from the power plant or engine 31 to the aerial propellers (not shown) by the gear and shaft arrangement designated generally 32. The fuel supply tanks for the power plant 31 are preferably located interiorly of the cabin and beneath the bunkers 16 formed therein. All variable load is thus located in the approximate vertical plane of the center of gravity. Steps 33 lead from the forward cockpit 28 to the cabin 15 since the flooring 29 for the cockpit 28 is disposed in a horizontal plane considerably above the horizontal plane of the flooring 34 of the cabin.

The forward cockpit 28 may be closed to preclude the admission of water thereinto while hydroplaning, opposed inwardly swinging doors 36, and a single outwardly swinging door 37 being utilized for that purpose. Lockers 39 are located interiorly of the forward cockpit at opposite sides of the longitudinal center thereof as illustrated in Fig. 2.

To admit of travel in an emergency, a water propeller 40 is provided aft of the step 13. Motion is transmitted from the auxiliary motor 30 to the propeller 40 by a suitable transmission mechanism including a propeller shaft 41. If desired, the propeller and a portion of the propeller shaft may be bodily swung into a position interiorly of the hull when not in use.

Wing panel sections 42 extend abeam of the hull and constitute in reality an integral part thereof, the opposed sections forming with that portion of the hull directly over the cabin, a deck. The wing panels are braced to the hull as indicated at 43.

The bulkhead 25 together with bulkheads 44 and 45 located respectively at the rear end of and at the forward end of the cabin structure, subdivide the boat hull into a plurality of non-communicating water-tight compartments whereby in the event of an accident, water may be admitted to but one of said compartments.

It is evident from the foregoing that the fixed load constituting the hull equipment is arranged symmetrically as regards the center of gravity since the weight of the pilot or operator will to a large extent counterbalance the weight of the power plant 31; and that a continuous passage way is formed through the cabin admitting of movement, interiorly of the hull, from one to the other of the cockpits formed therein.

It is quite evident from the foregoing that a number of modifications and changes may be made in the actual practice of the invention without departing from the generic spirit thereof. For instance, the relative arrangement of the pilot's cockpit, now aft of the cabin, may be located forwardly thereof and the propelling power plant located aft, or, if desired, the relative arrangement of the storage compartments may be varied without restriction providing it is borne in mind that the various weights are to be distributed symmetrically with regard to the center of gravity of the machine. I therefore do not wish to limit myself except in so far as the appended claims require.

What I claim is:

1. A hydro-aircraft including a hull having an interiorly located cabin space for occupancy by the flying crew, a hull bottom characterized by fore and aft convexity, the lowermost point in the hull bottom lying beneath the cabin structure and substantially beneath the center of gravity of the craft, a step formed in the hull bottom, the relation of the step to the cabin being such that the cabin floor reinforces the step by bridging it, and aeroplane wings extending out laterally from the sides of the hull opposite the cabin.

2. A hydro-aircraft, including a hull hav-

ing an interiorly located cabin space for occupancy by the flying crew, a hull bottom characterized by fore and aft convexity, the lowermost point in the hull bottom lying beneath said space whereby the cabin structure in its entirety constitutes an interior longitudinally extending brace for said bottom at its lowermost point, and aeroplane wings extending out laterally from the hull sides, an interconnection between the opposed wings, the interconnection being such that the roof of the cabin constitutes a structural element thereof.

3. A hydro-aircraft including a hull having an interiorly located cabin space for occupancy by the flying crew, fin excrescencies formed upon the hull sides opposite the cabin, a motor located interiorly of the hull between the fin excrescencies, a cockpit opening to the cabin and from which the motor is accessible, and aeroplane wings extending out laterally from the hull sides above the fins.

4. A hydro-aircraft including a hull having an interiorly located cabin space for occupany by the flying crew, cockpits, located respectively in advance of and to the rear of the cabin, steps leading into the cabin from both cockpits, aeroplane wings extending out laterally from the hull sides opposite the cabin, and transparencies formed in the cabin sides below the aeroplane wings and above the normal water line of the hull when it rests on the surface of the water.

5. A hydro-aircraft including a hull having an interiorly located cabin space for occupancy by the flying crew, fin excrescencies formed upon the sides of the hull opposite the cabin space and nearer the chines than gunwales of the hull, and aeroplane wings extending out laterally from the hull sides above the fins but below the longitudinal horizontal plane of the cabin roof.

6. A hydro-aircraft including a hull having an interior cabin space for the flying crew located in the transverse vertical plane of the center of gravity, fin excrescencies formed upon the sides of the hull opposite the cabin space in the vicinity of the chines of the hull, aeroplane wings extending out laterally from the hull sides above the fins but below the longitudinal horizontal plane of the cabin roof, and an interconnection between the opposed wings arranged to extend transversely across the hull without intersecting the interior space of the cabin.

7. A hydroaircraft including a hull body having a forwardly located hydroplaning bottom surface terminating rearwardly in a transverse edge, the hull body being further provided with cabin space for occupancy by the flying crew, flooring for the cabin space extended forwardly beyond the transverse edge to overlie the hydroplaning bottom surface, a motor mounted interiorly of the hull directly above said bottom surface but without the confines of the cabin, and a cockpit open to the cabin, the cockpit flooring constituting a covering for the motor.

8. A hydro-aircraft including a hull having an interiorly located cabin space for occupancy by the flying crew, cockpits located respectively in advance of and to the rear of the cabin, steps leading from the respective cockpits into the cabin, a motor located beneath the flooring of one of said cockpits, and fin excrescencies flanking that portion of the hull housing the motor as well as a portion of the cabin.

9. A hull for flying boats including a cabin structure, cockpits located respectively fore and aft of the cabin, a propelling power plant mounted beneath the flooring of one cockpit, and storage compartments formed beneath the flooring of the other cockpit, said last mentioned cockpit further providing accommodation for the pilot during flight.

10. A hull for flying boats including cockpits located respectively fore and aft of the transverse vertical plane of the center of gravity of the machine, a cabin structure located wholly interiorly of the hull between the respective cockpits to permit unobstructed inter-travel therebetween, and supporting surfaces arranged to extend out laterally from opposite sides of said cabin.

11. In a hull for flying boats, a cabin structure symmetrical about the vertical plane of the center of gravity, a propelling power plant in advance of said center, a pilot's cockpit aft thereof, a forward cockpit in the vicinity of said power plant, the cabin affording a passage between said cockpits, and supporting surfaces arranged to extend out laterally from the hull body at opposite sides of the cabin.

12. In combination, a hydroaircraft, airplane wings, a flotation body including interior cabin space for occupancy by the flying crew, the side walls of the cabin space affording a rigid support for the airplane wings, cockpits located respectively fore and aft of the cabin, an aerial propeller, and a motor inclosed in the hull body for driving the propeller, the flooring of one of the cockpits affording a covering for the motor.

13. The combination, in a hydroaircraft, of airplane wings, a hull body having interior cabin space for occupancy by the flying crew, the side walls of the cabin affording a support for the airplane wings, an aerial propeller, a motor inclosed in the hull body without the cabin space, storage compartments likewise inclosed in the hull body without the cabin, cockpits located respectively fore and aft of the body, the cabin space affording an unobstructed passageway between the cockpits, and cockpit floors ele-

vated above the hull bottom to respectively provide covers for the storage compartments and for the motor.

14. A hull for flying boats including a cabin structure open at its opposite ends to cockpits located respectively fore and aft thereof and fore and aft of a line in the transverse vertical plane in the center of gravity of the machine, built-in supporting surfaces extending laterally of the hull body in the transverse plane of the cabin structure to form therewith a deck intermediate the ends of the hull, and a propelling power plant located interiorly of the hull and beneath the flooring of the forward cockpit to counterbalance the weight of the aviator located aft of the cabin and in the rear cockpit of the hull.

In testimony whereof I affix my signature.

GLENN H. CURTISS.