

E. F. GALLAUDET.

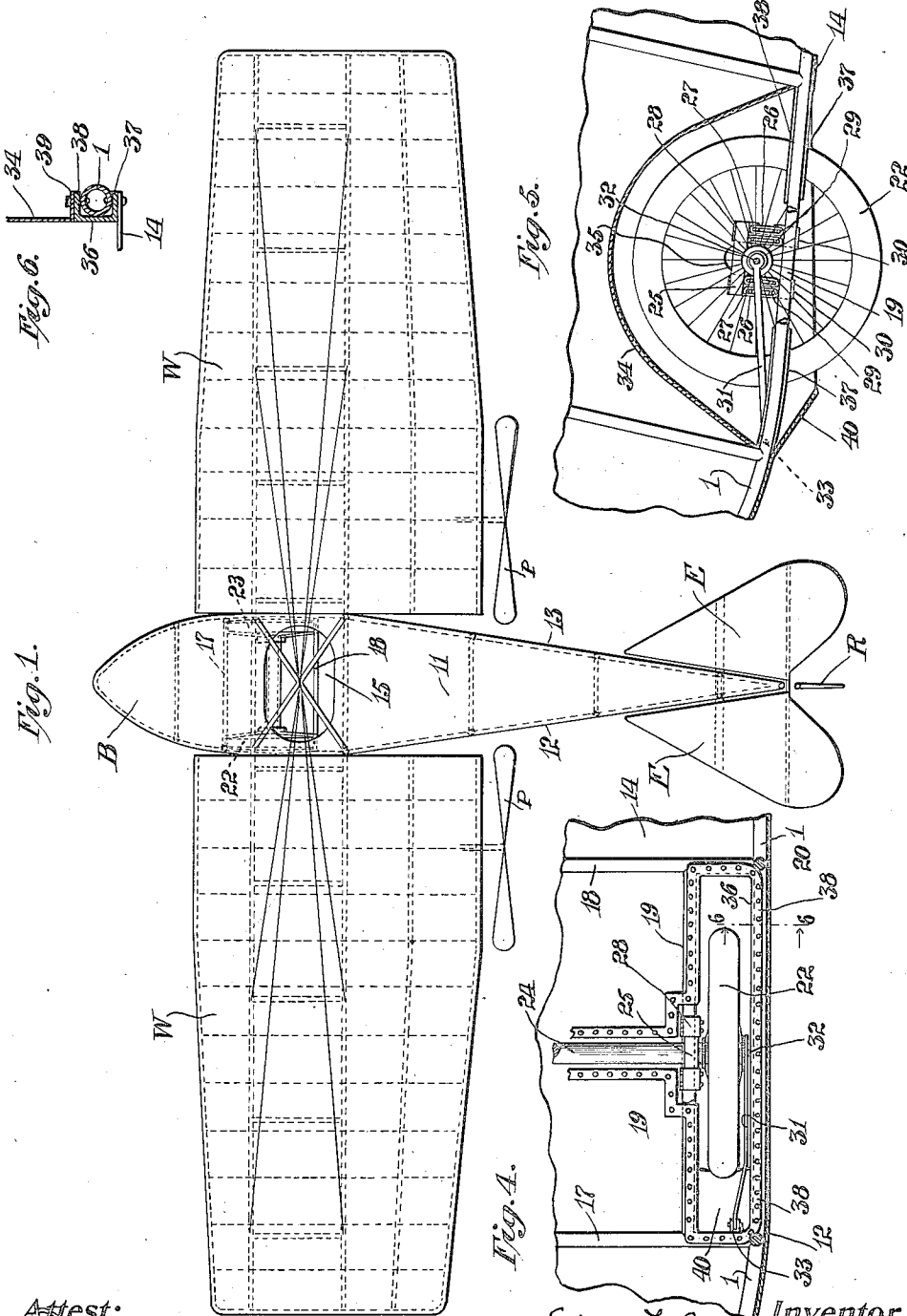
AEROPLANE.

APPLICATION FILED APR. 25, 1913.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 1.

1,214,536.



Attest:
E. Mitchell
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by

Edson F. Gallaudet
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1,214,536.

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2 SHEETS—SHEET 2.

Fig. 2.

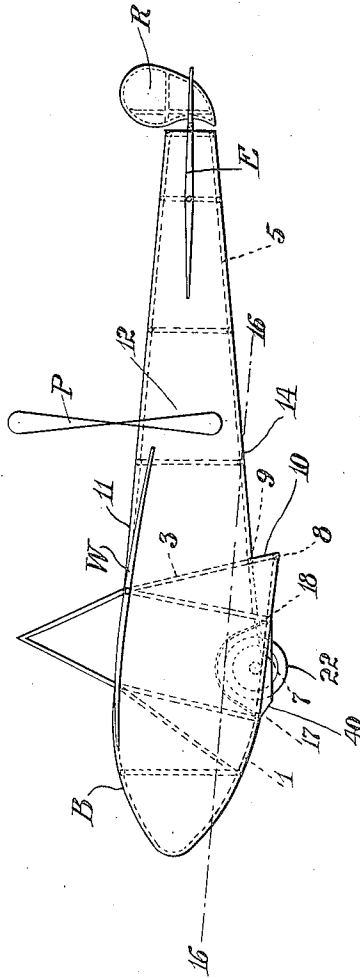
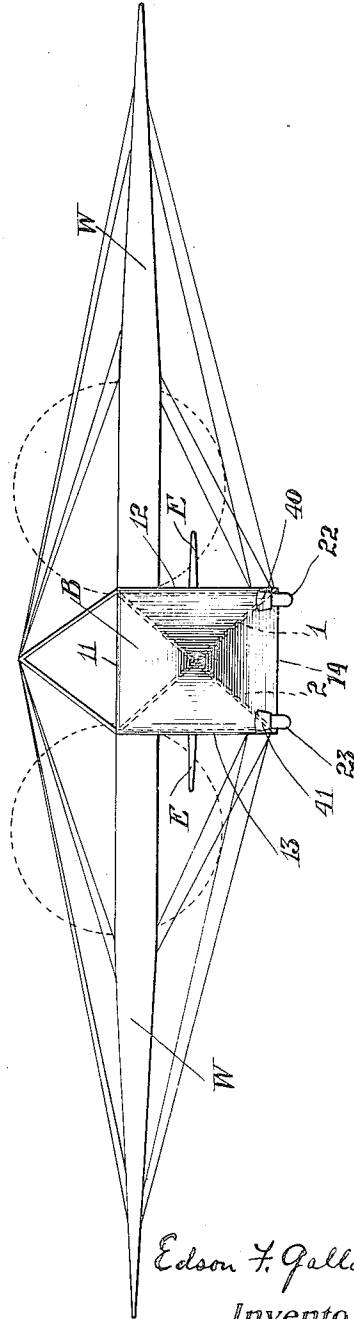


Fig. 3.



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UNITED STATES PATENT OFFICE.

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AEROPLANE.

Specification of Letters Patent.

Patented Feb. 6, 1917.

1,214,536.

Application filed April 25, 1913. Serial No. 763,486.

To all whom it may concern:

Be it known that I, EDSON F. GALLAUDET, a citizen of the United States, and a resident of the town of Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

My present invention relates to flying machines of the aeroplane type, and more particularly to the construction of the body of such machines.

One object of the invention is to provide a body for a flying machine, of the usual monoplane or biplane type, which is of such shape and in which the operator as well as such parts of the operating mechanism and running gear as would if left exposed offer serious head resistance are both housed and sheltered so as to permit the flying machine to pass through the air with a minimum resistance.

A second object of the invention is to provide a body for a flying machine which will serve both as a fuselage, to support and inclose the operator and the operating mechanism, and as a hydroplane boat.

With these objects in view one feature of my invention consists in providing a pisciform or torpedo-shaped fuselage which carries and supports the wings, the elevating and steering planes, the seat for the operator, and the operating mechanism and which, except for a cock-pit opening in its upper side, is completely sheathed so as to inclose the body of the operator, the engine, tanks, and other operating and controlling mechanism, thereby protecting the same and reducing to a minimum the head resistance of the machine.

Another feature consists in giving to the body a flat bottom which is tilted or curved up to the nose in front and is carried straight back to a point near the center of gravity of the machine where it is turned sharply upward to form a transverse setoff or step, such portion forming a hydroplane terminating clean and flat at its rear end, from the upper side of which step the bottom, flat or curved, extends back on an upward incline to the end of the tail. And still another feature consists in mounting the running gear upon the fuselage so that only the lower part of the wheels project below the body, and, when the machine is

intended for use as a hydroplane boat, in housing the upper part of the running gear in watertight trunks set into the flat hydroplane section of the bottom of the body.

The invention also comprises such other novel features of construction, arrangement, and combination of parts as are hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings, which form a part of this specification and wherein I have illustrated a combined monoplane and hydroplane boat embodying the several features of my invention, Figure 1 is a plan view of the complete machine; Fig. 2, a view of the same in side elevation; Fig. 3, a front end view of the same; Figs. 4 and 5, broken details, on an enlarged scale and partly in section, showing in plan and side elevation, respectively, one specific way of mounting and housing the running gear within the bottom of the body; and Fig. 6, a sectional detail on the line 6 6 of Fig. 4.

Referring to the drawings, the machine comprises, as its principal parts, the body B, and, suitably mounted thereon, the wings W W, elevating planes E, rudder R, and propellers P.

The framework of the body B, of any suitable material but preferably steel tubing brazed at the joints, comprises suitable longitudinal tubes joined at intervals by vertical and horizontal transverse tubes to form a fuselage of pisciform or torpedo shape in its general outline. Instead, however, of following the curve of a strictly torpedo-shaped body the longitudinal bottom frame tubes 1 and 2, after curving downwardly and rearwardly from the nose, are carried straight back for a short distance and terminate at a point near the longitudinal center of gravity of the machine, where their rear ends are respectively joined by the vertical side frame tubes 3 and 4 to other longitudinal bottom frame tubes 5 and 6 (4 and 6 not shown) which, for greater strength, are extended forwardly and joined to the front sections at 7. The two sections of longitudinal tubes on one side are joined to the corresponding sections on the other side of the bottom, the forward sections at their rear ends and the rear sections at the point of intersection with the vertical tubes 3 and 4, by transverse bottom frame tubes indicated at 8 and 9. The sharp cutoff or

"step" 10 thus formed in the bottom divides the body into what may be called a front hydroplane and a rear tail section.

The framework or fuselage is sheathed 5 or otherwise suitably covered along the top 11, sides 12 and 13, and stepped bottom 14, thus inclosing the body except for a cock-pit opening 15 left in the top sheathing. Galvanized iron is preferably used for sheathing the hydroplane front section of the bot- 10 tom and the sides up to and slightly above the water-line, indicated by the broken line 16 16 in Fig. 2, to give the covering of these parts the strength necessary to withstand 15 the impact and pressure of the water upon alighting and when traveling thereon. The bottom sheathing is cut away between the transverse bottom frame tubes 17 and 18, which are joined on each side of the body 20 by an inner longitudinal tube 19, to form two longitudinal side openings 20 (only one shown). Within these openings two suitable wheels 22 and 23 carried at the op- 25 posite ends of an axle 24 are mounted upon the fuselage. The mountings for the axle, which are alike on both sides of the machine, comprise a block 25, which bears against the upper side of the axle and is yieldingly se- 30 cured to the inner longitudinal frame tube 19 underneath by rubber-band springs 26 passing around pins 27 set across the lower open ends of inverted U-shaped straps or saddles 28 secured to the block and pins 29 set across the open upper ends of similar 35 straps or saddles 30 secured to the frame tube (see Fig. 5), and a link-bar 31, which is journaled at its rear end 32 upon the end of the axle outside the wheel and at its front end is pivoted in a lug 33 secured to the 40 transverse bottom frame tube 17 and by which the wheel on each side is held in proper alinement. Each wheel and its mountings are covered by a trunk 34 and the axle by a transverse connecting tunnel 45 35 of inverted U-shape in cross section, and these trunks and tunnel, preferably of galvanized sheet iron, are secured to the bottom sheathing by means of a channel-piece 36, which, fitted around the edges of the open- 50 ings therein and embracing parts of the longitudinal and transverse frame tubes 1, 2, 17, 18, and 19, has its lower flange 37 riveted or otherwise secured with suitable gasket joint to the bottom sheathing and its 55 upper flange 38 bolted to a corresponding flange 39 around the lower edge of the trunks and tunnel, and unite to form over the running gear a single inverted water- 60 tight casing which in effect is a part of and constitutes an offset in the bottom sheathing of the body. The wheels are further pro- 65 tected and their resistance to passage through the water reduced by plow-shaped shields or deflectors 40 and 41 which, ex- tending around the front and back along

the sides of each of the openings in which the wheels are mounted, are secured to and project downwardly from the bottom sheathing.

The advantages of a flying machine con- 70 structed according to my invention as here illustrated and described will readily be ap- 75preciated. The engine, tanks, and substan- 80tially all of the operating and controlling mechanism and the running gear, as well as 75 the operator, are located within the body and thereby both protected from and pre- 80vented from offering resistance to the air, while the body itself is so shaped as to pass through the air with a minimum resistance. 85The machine, by reason of the running gear provided, can be used on land as an ordinary flying machine. The body also serves as a 85boat and its forward hydroplane section, when the machine is at rest, will float in the 85water submerged only to the water-line in- 90dicated while its tail section will remain clear of the water; and, when its engine is started, the bottom of the body will rise to 90and skim along the surface of the water with little resistance, particularly as the air 95confined within the inverted casing over the running gear will form a cushion and keep the water from rising to any appreciable ex- 95tent within the casing and the outside shields will deflect the water from the wheels. The machine can thus with ordinary power 100be driven upon the water with great rapidity and easily made to rise therefrom whenever desired. 100

While in the machine shown and de- 105scribed by way of illustration I have united the several features of my invention in a single structure, it will be understood that such features may, if desired, be used sepa- 105rately. For example, when the machine is to be used only over land, the step in the bottom and the casing over the running gear can be omitted, and in a machine designed 110solely as a hydroaeroplane it is obvious that no running gear is necessary. The features of the invention can also be modified in their various details, within the scope of the appended claims, without departing from 115the spirit or sacrificing the advantages thereof. It is also to be understood that the term "pisciform" as used in the forego- 120ing specification and in the following claims is used to define a fuselage or body, shaped substantially as shown in the drawings, in 120which a relatively short and thick body portion tapers both forward and back on 125more or less curved lines, regularly and rapidly in front to form a short nose and at its rear end more gradually to form an elongated tail, bringing the center of grav- 125ity well forward of its longitudinal center.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a flying machine, a framed body of 130

stream line form which is inclosed throughout except for a cock-pit opening for the operator in its upper side and within which the engine, fuel-tank, and substantially all of the operating and control mechanism are mounted, a single pair of transversely extended wings mounted on opposite sides of the body between the upper side and the center of gravity thereof, control planes mounted at the tail, and running gear comprising wheels yieldingly mounted upon the framework within the body forward of its center of gravity and projecting downwardly through openings in its bottom less than half their diameter.

2. In a flying machine, a combined body and hydroplane boat of stream line form which is inclosed throughout except for a cock-pit opening for the operator in its upper side and has a flat bottom curving downwardly from the nose and extending rearwardly and downwardly to a point well forward of its longitudinal center where it terminates in a transverse rearwardly facing step and from the top of the step a bottom extending rearwardly on an upward incline to the tail, and which carries an engine, fuel tank, and other operating and control mechanism mounted therein so as to bring the center of gravity within the body nearly above the transverse step in its bottom, and a single pair of wings mounted on opposite sides thereof between its upper side and center of gravity.

3. In a flying machine, a combined body and hydroplane boat which is inclosed throughout except for a cock-pit opening for the operator in its upper side, which is so shaped and carries wings so mounted thereon and an engine, fuel tank, and other operating and control mechanism so mounted therein as to bring the center of gravity of the machine within the body well forward of its longitudinal center, and which has a flat bottom curving downwardly from the nose and extending rearwardly and downwardly to a point nearly below the center of gravity where it terminates in a transverse rearwardly facing step, providing a hydroplane surface beneath a relatively short body portion of the body, and from the top of the step a bottom extending rearwardly and on an upward incline beneath an elongated tail portion.

4. In a flying machine, a hydroplane boat body of stream line form which is sheathed and inclosed throughout except for a cock-pit opening for the operator in its upper side and has a flat bottom curving downwardly from the nose and extending rearwardly and downwardly to a point well forward of its longitudinal center where it terminates in a transverse rearwardly facing step, providing a hydroplane surface beneath its relatively short body portion,

and from the top of the step a bottom extending rearwardly and on an upward incline to the tail, and an engine, fuel tank, and other operating and control mechanism mounted within the body so as to bring the center of gravity of the machine within the body substantially above the transverse step in its bottom, and wings mounted upon the body on opposite sides thereof with their centers of pressure substantially above the center of gravity of the machine.

5. In a flying machine, a combined body and stepped bottomed hydroplane boat which is provided with running gear comprising one or more wheels yieldingly mounted upon the framework within the body forward of the step so that less than half the wheel projects below the bottom through an opening formed therein and covered with an inverted water-tight casing joined to the bottom.

6. In a flying machine, a framed pisciform boat body, adapted to carry wings and propelling and control mechanism, which near its longitudinal center of gravity has a transverse rearwardly facing step dividing its bottom into a flat forwardly and upwardly extending front portion and a rearwardly and upwardly extending rear portion and which is provided with running gear comprising wheels mounted upon the framework of the body in front of the transverse step and extending downwardly through openings formed in the bottom and covered with an inverted water-tight casing joined to the bottom.

7. In a flying machine, a pisciform framed body which is sheathed on its bottom and sides, the bottom curving downwardly from the nose and extending flat with a downward and rearward inclination to a point near the longitudinal center of gravity of the machine where it is deflected sharply upward to form a transverse rearwardly facing step from the top of which it extends rearwardly with an upward incline to the end of the tail, and which is provided with a running gear comprising wheels mounted upon the framework in front of the transverse step and projecting downwardly substantially to the level of the lower edge of the step through openings provided therefor in the bottom sheathing and closed by water-tight inverted trunks covering the upper portions of the wheels.

8. In a flying machine, a combined body and boat which is provided with running gear comprising one or more wheels, each mounted within an open-bottomed water-tight recess formed in the bottom of the body and guarded by a downwardly projecting plow-shaped deflector.

9. In a flying machine, a pisciform framed body which is sheathed on its bottom and sides, the bottom being curved downwardly and rearwardly from the nose and then car-

ried flat and straight to a point near the longitudinal center of gravity of the machine where it is deflected sharply upward to form a transverse step from the top of which it extends back on an upward incline to the end of the tail, and is provided with two wheels mounted upon the framework in front of the transverse step and projecting downwardly through openings formed therefor in the bottom sheathing, the said open-

ings being closed by watertight inverted trunks covering the upper portions of the wheels and guarded in front and at the sides by downwardly projecting plow-shaped deflectors.

EDSON F. GALLAUDET.

In presence of—

MAY FREVERT,

WM. B. WHITNEY.