March 3, 1931. W. J. VON MILLER 1,794,474

PONTOON FOR AIRCRAFT

Filed Dec. 9, 1929

Fig. 1

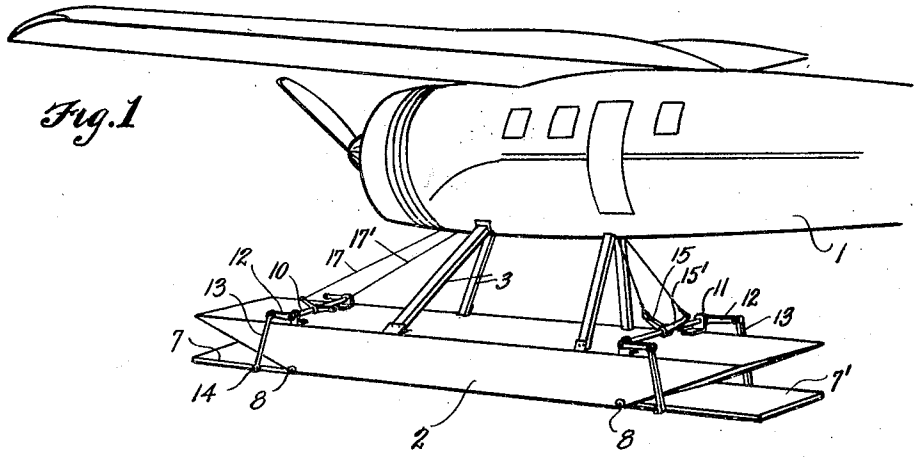
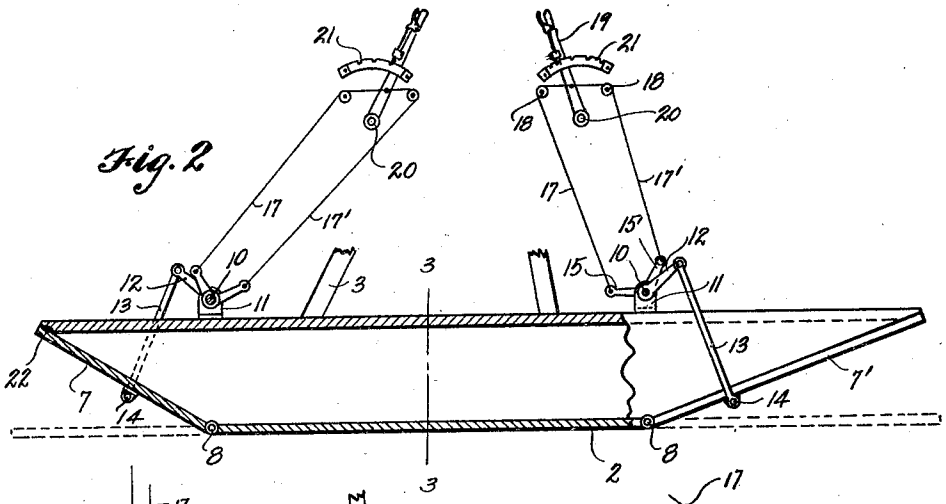


Fig. 2



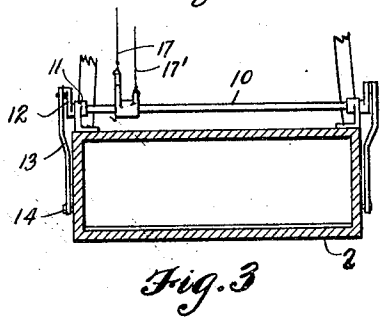


Fig. 3

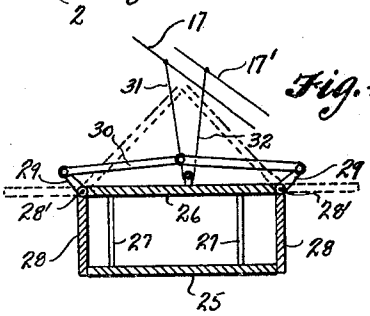


Fig. 4

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UNITED STATES PATENT OFFICE

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PONTOON FOR AIRCRAFT

Application filed December 9, 1929. Serial No. 412,726.

This invention relates to pontoons for aircraft, and it has for its principal object to provide a pontoon construction to which air affords practically no resistance while the craft to which it is attached is in flight, but which affords the desired buoyancy for supporting the craft upon water.

More specifically stated, the object of the present invention is to provide a hollow pontoon with closure members at its forward and rearward ends which may be opened while the craft is in flight and thus permit a direct flow of air through the pontoon for the purpose of reducing air resistance to a minimum, and to provide for utilizing the pontoon to a certain extent as a lifting medium supplementing the wings of the airplane.

It is also an object of the invention to provide pontoons of the above stated character with means easily accessible to the pilot of the airplane whereby the end closure members of the portion may be opened or closed at will, as a means for braking to slow up the speed of the plane for landing.

Other objects of the invention reside in the details of construction and combination of the various parts of the pontoon, and in their mode of operation as will hereinafter be described.

In accomplishing these and other objects of the invention, I have provided the details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of a portion of an airplane which is equipped with a pontoon embodying the present invention.

Figure 2 is a longitudinal section of the pontoon.

Figure 3 is a cross sectional view of the same on line 3—3 in Figure 2.

Figure 4 is a cross sectional detail of a pontoon of an alternative form of construction.

It will here be stated that it has been proven that the speed to be obtained by an airplane when equipped with pontoons, is greatly lessened by reason of the resistance of air to the pontoon. While the ordinary pontoon is not of much weight, it does present considerable resistance area. Heretofore pontoons in general have been of a boat-like construction, tightly and permanently closed so as to serve properly to sustain the craft on water. The present invention makes possible the elimination of practically all air resisting surfaces while the plane is in flight and, by this elimination gives the air access to or contact with surfaces of the pontoon which will then serve to supplement the wings as additional lifting area.

Referring more in detail to the drawings—

1 designates the fuselage of what may be an airplane of the ordinary type of construction, and 2 designates a pontoon embodied by this invention, which is designed to support the airplane on water. The pontoon would be of suitable dimensions to provide the necessary displacement to satisfactorily support the plane. As illustrated, the pontoon extends lengthwise of and directly below the fuselage and is connected with the latter through the medium of a plurality of braces or struts 3, which may be attached thereto and to the fuselage of the plane in any suitable manner.

In its preferred form of construction, the pontoon consists of an elongated housing, of sheet metal, wood or other desirable material. The top wall is substantially flat, the bottom wall in a plane parallel therewith and the side walls are substantially vertical, so that the pontoon is rectangular in cross section. The opposite ends of the pontoon are equipped with doors or closure members 7—7', which are attached to the forward and rearward edges of the bottom wall by water tight hinges 8 which permit the closure members to be moved between open and closed positions. These doors, or closures are mounted in such manner that, when in closed position, the pontoon may function after the fashion of a sled runner. It is preferred that the rearward end be sloped at an angle substantially less than the forward end, so as to reduce the water resistance when taking off and to give the most satisfactory results for landing.

The means provided for opening and closing the end members or doors of the pontoon

consist of cross rods 10 rotatably mounted on the top wall of the pontoon in bearing members 11. At the ends of the cross rods are lateral arms 12 pivotally connected by links 13 with pins or studs 14 fixed in the side edges of the doors. Diverging lever arms 15—15′ are fixed to the cross rods and cables 17—17′ extend from these over suitable guides 18 to hand levers 19 within the plane. The hand levers are pivotally mounted, as at 20, and may be adjusted along holding means of any suitable type indicated at 21 to retain them at different positions to which they may be adjusted. The construction provided is such that forward and rearward movement of the hand levers will cause the closure members 7—7′ to be moved hingedly between open and closed positions. To insure a tight connection between the edges of the closure members and the pontoon, it is preferred to have rubber gaskets, as at 22, inset along the edges of the pontoon against which the doors may be tightly closed.

Assuming that the pontoon is so constructed and attached to the plane, it is readily apparent that while the plane is in flight, the pontoon ends may be opened downwardly to the positions shown in dotted lines in Figure 2, and will thereby permit of a direct flow of air through the pontoon. This reduces the resistance of air to the pontoon to a minimum. It is also apparent that by properly suspending the pontoon, the top and bottom wall surfaces thereof may be utilized as lifting medium. When it is desired to land the plane, the rearward closure member 7′ may be partly or entirely closed, and thereby afford resistance to the passage of air through the pontoon and effect a braking action to slow up the speed of the plane for landing. Before the plane lands on the water, both end members may be tightly closed and the pontoon is then in condition to support the plane in water.

It is readily apparent that various details in the construction of the pontoon and the closure members, and also in the manner and means whereby the latter may be opened and closed, may be changed without departing from the spirit of the invention, and for this reason it is not desired that the claims be limited only to details shown, but that they broadly cover the device commensurate with the scope of the invention.

In Figure 4, I have illustrated an alternative construction in which the bottom wall 25 of the pontoon is rigidly spaced from the top wall 26 by struts 27. The side walls 28 are hinged as at 28′ to open outwardly, and levers 29 are attached to the hinge or sides for opening the side outwardly to be in a plane parallel with the top wall, as indicated in dotted lines. These levers are joined by a toggle mechanism 30 and thus is attached by cables 31 and 32 to the cables 17—17′ in such manner that manipulation of the hand lever to open and close the ends 7—7′ simultaneously opens and closes the sides. This construction makes possible the use of the sides as lifting surfaces for supplementing the wings.

Having thus described my invention what I claim as new therein and desire to secure by Letters Patent, is:

1. A pontoon for aircraft having closure means at its ends adapted to be moved from closed to open position to relieve resistance to air while the craft is in flight.

2. A pontoon for aircraft having closure means at its ends adapted to be moved from closed to open position to relieve resistance to air while the craft is in flight, and means operable from within the craft for moving said closure means between closed and open positions.

3. A pontoon of the character described comprising a substantially hollow body with closure means at its opposite ends movable to open position to permit flow of air through the pontoon.

4. A pontoon of the character described comprising a substantially hollow body with closure members at its forward and rearward ends movable between open and closed positions, and means for moving the said closure members to open positions to permit flow of air through the pontoon and for returning them to closed positions.

5. A pontoon of the character described comprising a hollow, elongated body, closure members hingedly attached to the body at the forward and rearward ends thereof, and means for individually moving the closures between open and closed positions.

6. A pontoon of the character described comprising a hollow, elongated body, closure members at the forward and rearward ends of the body hingedly attached to and inclined upwardly from the bottom wall, and means for moving the closure members from closed to open position to permit of a direct passage of air lengthwise through the pontoon.

7. A pontoon of the character described comprising an elongated, hollow body with horizontal top and bottom wall surfaces, closure members at the ends of the pontoon hingedly attached and adapted to be opened to provide a direct passage of air through the pontoon and to permit lifting contact of air with the said top and bottom surfaces.

8. A pontoon of the character described comprising an elongated, hollow body of rectangular cross section with hingedly attached closure members at its forward and rearward ends, and means for moving the closure members between open and closed positions, comprising cross shafts mounted on the pontoon, arms fixed to the cross shafts, links connecting the arms with the closures, and means for rotating the shafts to move

the closures between open and closed positions.

9. A pontoon comprising a hollow body with side and end walls adapted to be moved from closed positions to open positions to serve as airfoils.

10. A pontoon comprising a hollow body, having hinged end and side walls, and means operable to adjust the said side and end walls from closed positions to open positions substantially horizontal, to relieve air resistance and to serve as airfoils.

Signed at Seattle, Washington, this 25th day of November, 1929.

WILLIAM J. VON MILLER.