

J. A. WILLIAMS.
AEROPLANE.

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1,027,954.

Patented May 28, 1912.

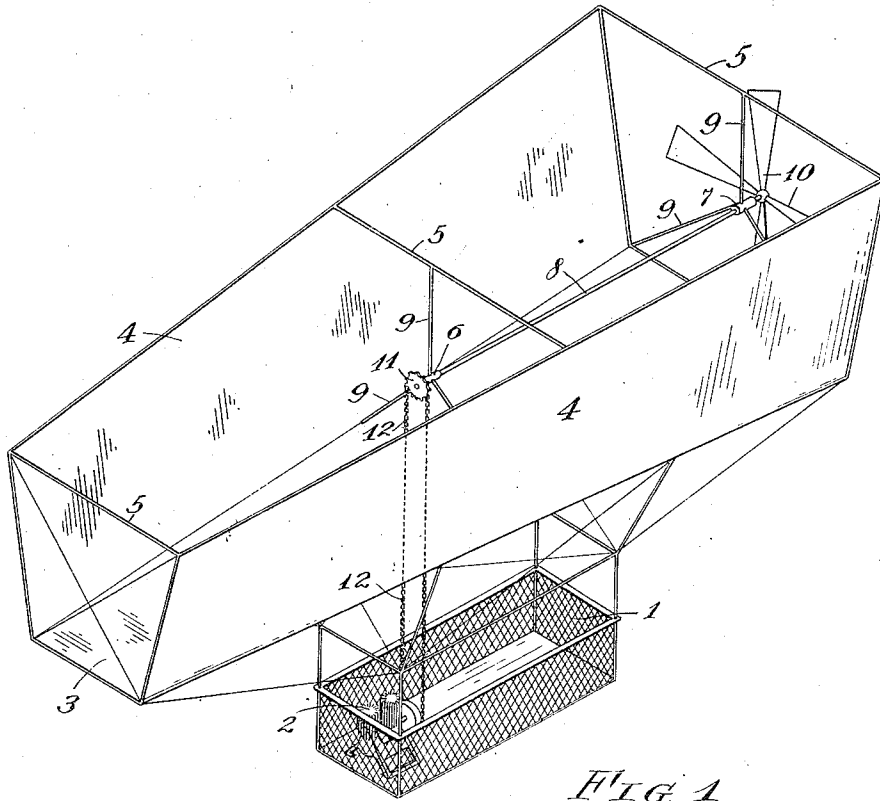


FIG. 1

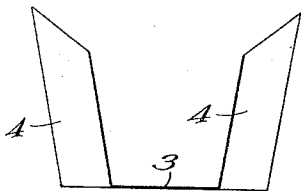


FIG. 2

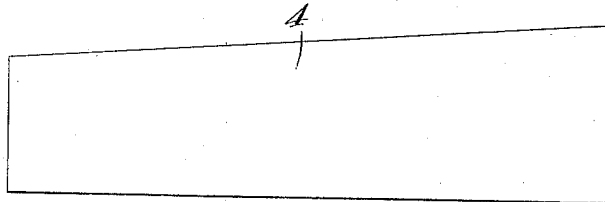


FIG. 3

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To all whom it may concern:

Be it known that I, JOSEPH A. WILLIAMS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Aeroplanes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates generally to air ships of the aeroplane type, and it has special reference to the shape of the plane used in such ships.

Heretofore, designers and builders of aeroplanes have generally proceeded on the theory of beating one or more inclined planes against the air, relying upon the vertical component of the resisting force encountered for lifting the air ship. In my invention, I may utilize to some extent the same principle, but I secure the main part of the lifting and sustaining action by so shaping the plane as to create a partial vacuum over the upper surface of the plane whereby the atmospheric pressure from beneath buoys up the ship.

The object of my invention, therefore, is the production of a plane that is so shaped that the movement of the plane through the air, or the movement of the air past the plane, results in creating a difference in pressure above and below the plane, whereby the ship is lifted and sustained. More specifically stated, I form the plane in the general shape of a trough having an open top and having the front end narrowed, so that the air entering the front end of the trough is rarefied as it expands to fill the wider parts of the trough. Of course, the air rushes in to establish equilibrium of pressure, and the variation in pressure diminishes toward the rear end of the plane. To retard the influx of the air as much as practicable, I provide the trough with considerable depth even at its front end, and gradually increase the depth toward the rear end.

In the drawings forming a part of this application, Figure 1 is a general perspective view showing an air ship provided with my form of plane, and Figs. 2 and 3 are front and side elevations respectively of the plane.

In the drawings, I have shown all the parts of the air ship, with the exception of the plane, conventionally, and the particu-

lar formation of all of such parts may be variously modified.

Taking up a description of the invention by the use of reference characters, 1 represents any suitable form of car or basket, in which the motor 2 and the passenger or passengers are carried. This motor may be of any practicable type, such as an internal combustion engine.

The car 1 is suspended by suitable cables from the plane of the air ship, said plane, as illustrated, consisting of a flat central or bottom portion 3 and side portions 4, the said side portions being shown as inclined somewhat from the perpendicular to the bottom, such construction forming an open-topped trough. The bottom portion 3 of the trough has its narrowest width at the front end, the drawings showing such portion as gradually widening from the front to the rear, whereby a wedge-shaped trough is produced. The side portions 4 may also increase in depth from the front to the rear; for a purpose hereinafter set forth. The parts of the plane should be rigid with respect to one another and, for this purpose, bars or braces 5 are extended at intervals across from the upper edges of the side portions 4 of the plane. By suspending the car below the plane, stability of the ship is secured, which stability is increased by inclining the side portions outwardly, it being obvious that if the ship in descending should tilt toward one side, that side presents an increasing resistance which has the tendency of righting the ship again.

Journaled in suitable bearings 6 and 7 is the propeller shaft 8, the bearings for the shaft being supported in any suitable manner, as by braces 9 extending from the angles of the trough inwardly and from certain of the cross bars 5 downwardly. The shaft carries a propeller 10 at its rear end, and a sprocket wheel 11 at its front end, said wheel being driven by a chain 12 from the motor 2.

Suitable rudders, not shown, may be provided for directing the course of the ship.

The operation of the device just described is as follows: Any suitable means known in the art may be employed for securing the initial movement of the ship through the air, such means of course being supplemented by the operation of the propeller 10, which is so positioned as to draw the air backwardly out of the trough. When the ship

is once in motion, or even when the ship is poised in the air and the wind is blowing past the same, the air enters the small end of the trough and, passing rearwardly in the same, expands more and more to fill the wider portions of the trough, thus becoming rarefied, whereupon the pressure of the air below the bottom portion of the plane lifts the latter and ship. Of course, the air rushes into the trough from the sides and tends to establish equilibrium of pressure with the outside air. To prevent this inrush of air as much as practicable, the sides 4 are made of considerable depth, and may be gradually increased in depth from the front to the rear. If the relative movement between the ship and the air is very high, any plane of air which is cut by the front end of the aeroplane will have passed beyond the rear end of the plane before the in-rushing air can have established equilibrium. In such a case, the lifting action due to the rarefaction of the air is much greater than when a slow relative movement between the air and the plane is maintained. To assist in rarefying the air within the trough, the propeller is placed at the rear end of the latter so as to draw the air from the trough.

While the drawings show the side portions 4 of the trough as slightly inclined from the perpendicular to the bottom portion 3, this angle may be varied. The drawings also show the angle of these side portions as constant from the front to the rear. This is not a necessary feature of construction, as the angle of inclination from the perpendicular may increase from the front to the rear so that the sides become twisted planes.

In this application I have intended merely to set forth the principle upon which my plane operates and to show a form of plane which is capable of realizing that principle. I wish it to be understood, therefore, that the device shown and described is not intended to show the only form, or perhaps even the best form in which experience may show that the plane should be shaped, and the accompanying claims are not intended

to be limited to such form any further than is rendered necessary by the specific terms therein employed.

Having thus described my invention, what I claim is:

1. A plane for an air ship formed in the shape of an open-topped, open-ended trough that is narrowed at its front end.
2. A plane for an air ship formed in the shape of an open-topped, open-ended wedge-shaped trough.
3. A plane for an air ship formed in the shape of an open-topped wedge-shaped trough, the depth and width of said trough increasing from the front toward the rear, said trough being open-ended.
4. In an air ship, the combination with a plane that is formed in the shape of an open-topped, open-ended trough that is narrowed at its front end, of a propeller at the rear end of said trough, and means for driving said propeller.
5. In an air ship, the combination with a plane that is formed in the shape of an open-topped wedge-shaped trough, of braces for holding the sides of said trough rigidly, a propeller at the rear of the trough, and means for driving said propeller.
6. In an air ship, the combination with a plane formed in the shape of an open-topped, open-ended wedge-shaped trough, a propeller at the rear of the trough, a car suspended from the plane, and a motor for driving said propeller.
7. A plane for an air ship formed in the shape of an open-topped, open-ended wedge-shaped trough, the sides of which diverge outwardly from the bottom.
8. A plane for an air ship formed in the shape of an open-topped, open-ended wedge-shaped trough, the sides of which diverge outwardly from the bottom and increase in depth from the front to the rear.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

JOSEPH A. WILLIAMS.

Witnesses:

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BRENNAN B. WEST.