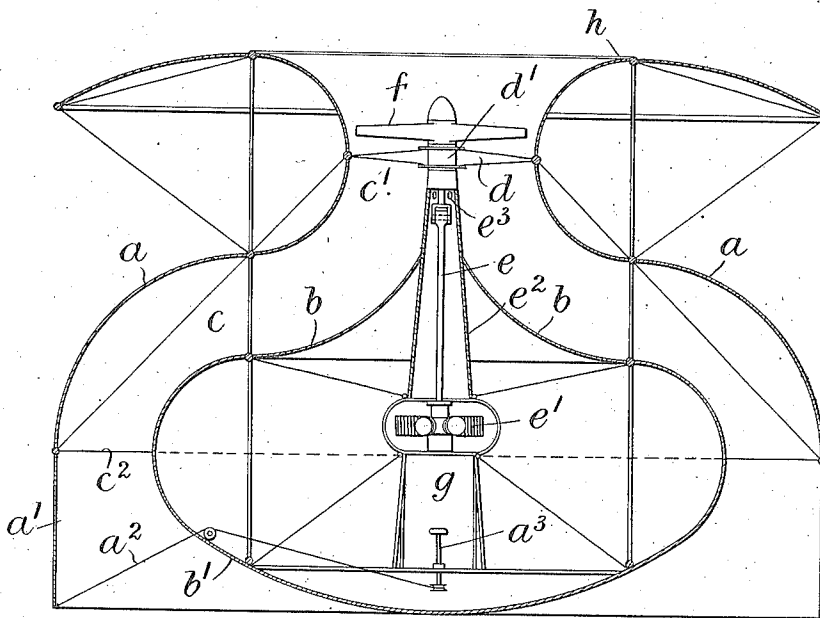


J. R. PORTER.
CONSTRUCTION OF AERONAUTICAL MACHINES.
APPLICATION FILED FEB. 27, 1914.

1,123,589.

Patented Jan. 5, 1915.



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES ROBERTSON PORTER, OF HOLBORN, LONDON, ENGLAND.

CONSTRUCTION OF AERONAUTICAL MACHINES.

1,123,589.

Specification of Letters Patent.

Patented Jan. 5, 1915.

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To all whom it may concern:

Be it known that I, JAMES ROBERTSON PORTER, a subject of the King of Great Britain, residing at 9 Gray's Inn Square, Holborn, in the county of London, England, civil engineer, have invented a new and useful Improvement in the Construction of Aeronautical Machines, of which the following is a specification.

10 This invention relates to aeronautical machines of the character described in the specification of my application filed 27th January, 1913, Serial No. 744458, such a machine comprising outer and inner walls
15 spaced apart to form a downwardly flaring annular passageway, and an upper intake annular passageway formed by a continuation of said outer wall and a conical continuation of said inner wall, there being provided means for drawing in and propelling
20 air through said flaring passageway.

According to my present improved construction the inner wall of the machine is curved inwardly at its lower end to form a
5 convex under surface, the complete structure forming a hollow body, which in cross-section is elliptical as to its lower portion and conical as to its upper portion. From this hollow body is spaced an outer wall
30 which is parallel with the upper portion of the hollow body and forms an annular downwardly flaring passageway. The lower edge of the outer wall terminates substantially in the plane of the major axis of the
35 lower portion of the hollow body, and from thence a downward extension is provided forming a curtain around the convex lower portion of the hollow body. The upper edge of the outer wall is extended and curved
40 outwardly to form an annular aeroplane surface.

The improved machine is capable of rising from and alighting upon land or water, the hollow body serving as a float to support the machine upon water. The engine
45 for driving the machine may be mounted within the hollow body and the exhaust gases may be permitted to escape into the latter to create buoyancy. During the
50 ascent of the machine the air drawn from above is forced below the machine and is guided directly downward by the convex under surface of the hollow body; and during the descent of the machine the said convex surface serves as a parachute to lead the

air gradually into the flaring passageway formed between the inner and outer walls.

The accompanying drawing illustrates in section and diagrammatically an aeronautical machine embodying my present invention. 60

In the drawing a is the outer annular wall and b the inner annular wall parallel therewith, both walls being curved so as to form between them an annular flaring passageway
65 c extending downwardly from an air intake c' to an outlet c'' . The lower edge of the inner wall b is curved inwardly to form a convex surface b' , thereby forming a central hollow body which in cross-section is elliptical as to its lower portion while the upper
70 portion is conical. The apex of the conical portion terminates in a circular frame d provided with a bearing d' to receive the upper end of a shaft e co-axial with the
75 hollow body and driven by an engine e' which in the construction illustrated is shown mounted within the hollow body.

Upon the upper end of the shaft e is mounted a propeller or fan f for drawing
80 in and propelling air through the intake c' whence the air flows through the annular flaring passage a . The shaft e is driven by the engine e' , which may be a rotary internal combustion engine, and the hot gases
85 thereupon may be employed to inflate the hollow body or they may escape by way of a conical tube e'' formed with perforations e''' at its upper end. Beneath the engine or in any other convenient position is a
90 housing g for the pilot.

The outer wall a is parallel with the inner wall b from the intake c' to about the major axis of the convex portion b' and from thence extends downwardly to form a flexible
95 curtain a' the edge of which is level with the crown of the convex surface b' . The curtain a' is provided at several points with cords or the like a'' each of which extends to and passes around a separate steering pillar
100 a''' whereby the cords are operated to control the movements of the machine. The upper edge of the outer wall a may be extended from the intake c' and be curved outwardly to form a shallow saucer shaped
105 surface h , the complete diameter of which is approximately equal to that of the outer wall a .

The forward travel of the machine is directed by manipulating the cords a'' at 110

tached to the curtain a' causing a horizontal motion by reason of the obstruction to the discharge of the air with the result that the machine tilts, whereupon the upper surface h acts an aeroplane and helps to support part of the load during the forward motion of the machine. During a vertical descent the surface h affords an additional parachute area, the air between the walls h and a being practically inclosed and drawn down with the machine.

With my improved construction of machine the propeller f during its rotation causes a current of air to flow at considerable velocity through the inlet c' , and owing to the gradually increasing area of the space c between the two surfaces a, b , the velocity of the air decreases, the result being that the energy in the air due to its velocity is gradually decreased while a gradually increasing pressure energy is obtained. This pressure acts over the whole face of the elliptical surface b' and causes the machine to rise; the whole of the air drawn from above at a high velocity passing beneath the machine at a low velocity and forming a column of compressed air which acts upon the underside of the machine to raise the latter. When descending vertically the machine forms an improved parachute, as the whole of the air beneath the machine is caused by the inner surfaces b, b' to pass through the machine with a gradually increasing velocity until it flows through the opening c' . A parachute as commonly constructed is inefficient by reason of the escape of air around the rim, whereas with my improved construction the air flows steadily through the channel in a similar way to that in a Venturi tube, and the increased static pressure on the underside of the surface b' insures a slow descent for the machine.

What I claim as my invention and desire to secure by Letters Patent, is:—

1. An aeronautical machine comprising an outer and an inner annular wall spaced apart to form a downwardly flaring annular passageway, said inner wall being curved inwardly at its lower end to present a convex under surface while its upper end is

continued to form a hollow cone, thereby forming a hollow body having an elliptical lower portion and a conical upper portion, an upper annular intake formed by a continuation of said outer wall and the said conical portion of the inner wall, and means for drawing in and propelling air through said passageway, substantially as described.

2. An aeronautical machine comprising an outer and inner wall constructed and spaced apart to provide an upper and lower reversely curved annular passageway and forming a continuous downwardly flaring passageway of ogee contour having unimpeded interior deflecting surfaces and provided with open ends terminating in planes at right angles to the vertical axis of said machine, an upper annular and curved wall forming an extension of the upper edge of said outer wall, a curtain forming a downward extension of said outer wall, a convex wall inclosing the underside of said inner wall, means for drawing air inwardly through said annular passageway and means for operating said curtain to control the discharge of air from said annular passageway.

3. An aeronautical machine comprising a central hollow body having a convex lower portion and a conical upper portion, an outer wall spaced from the upper portion of said hollow body and forming therewith a downwardly flaring annular passageway, an upwardly and outwardly curved extension of said outer wall forming an annular wall of a diameter approximately equal to the diameter of the largest portion of said outer wall, a downward extension from said outer wall surrounding the convex portion of said hollow body, an engine mounted within said hollow body, a shaft driven by said engine, and a propeller mounted above the apex of the conical portion of said hollow body.

In witness whereof I have hereunto set my hand in the presence of two witnesses:

JAMES ROBERTSON PORTER.

Witnesses:

O. J. WORTH,
CARL R. LOOP.