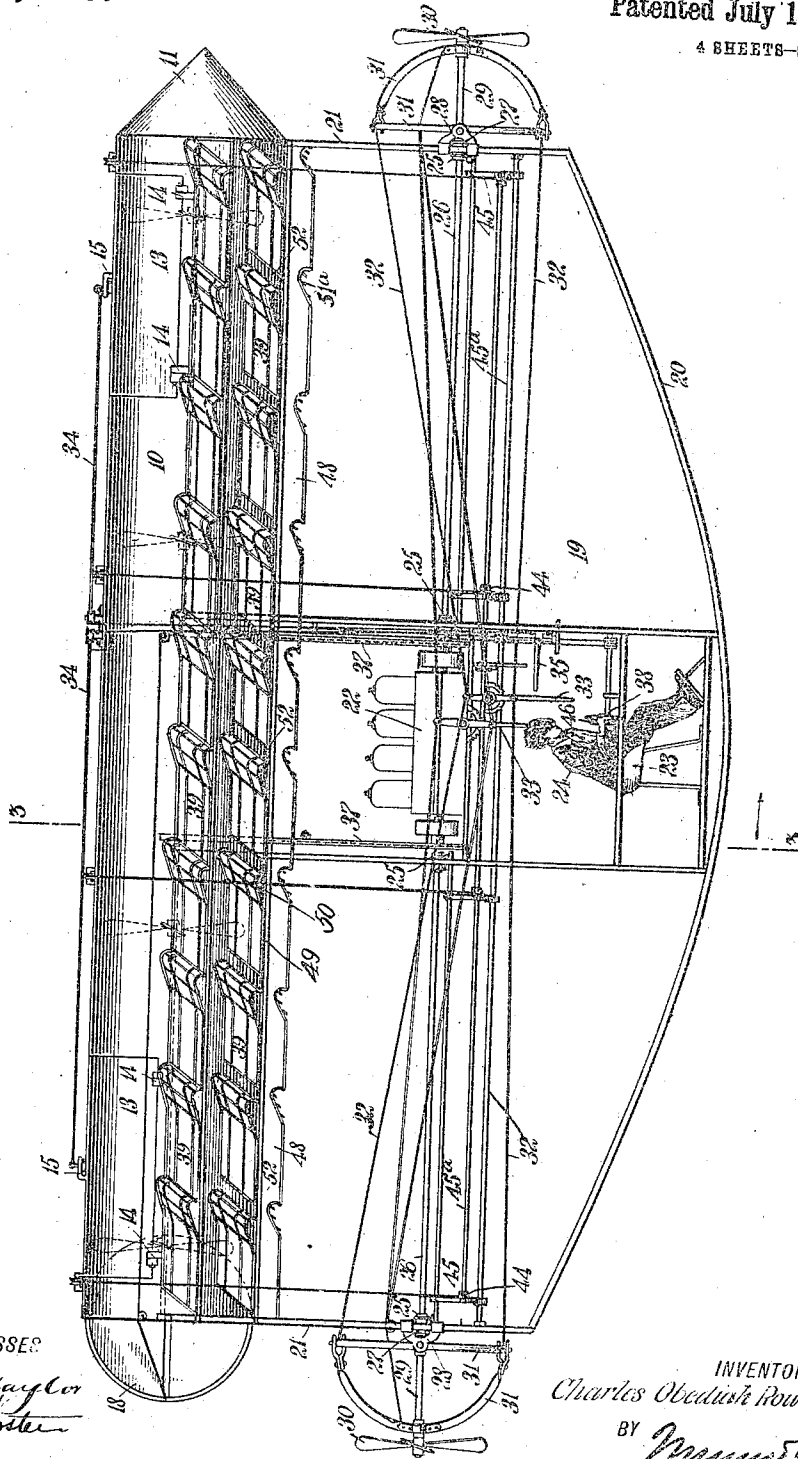


997,856.

C. O. ROWLAND.
AERIAL VESSEL.
APPLICATION FILED DEC. 27, 1909.

Patented July 11, 1911.
4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
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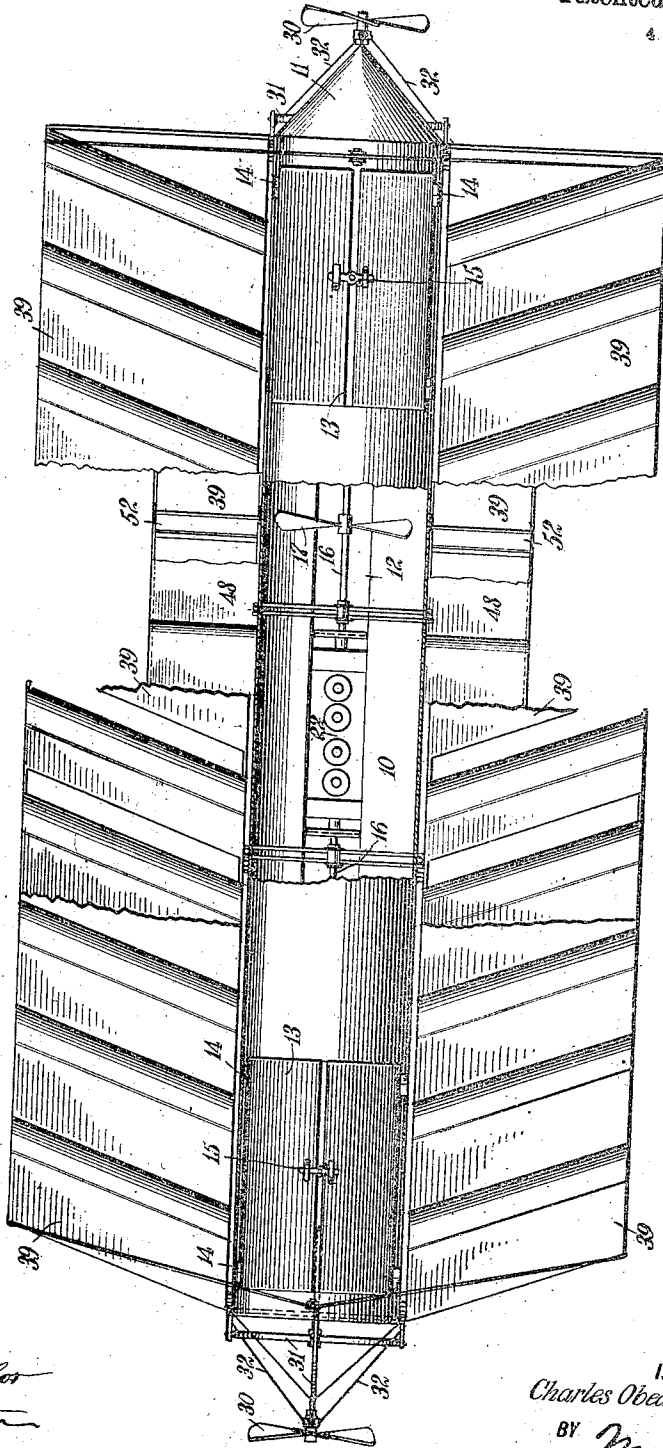
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4 SHEETS-SHEET 3.

Fig. 2.



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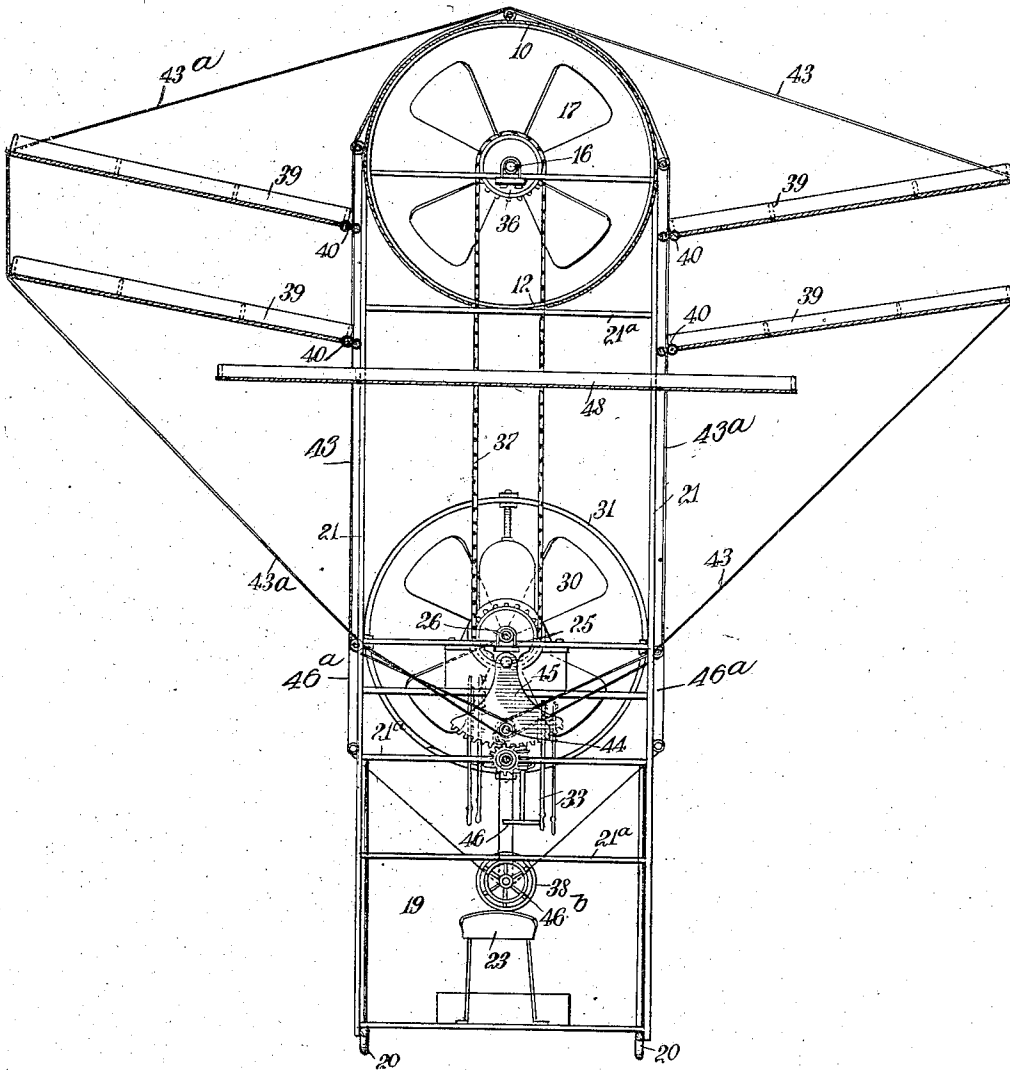
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4 SHEETS—SHEET 3.

Fig. 3.



WITNESSES:

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997,856.

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4 SHEETS-SHEET 4.

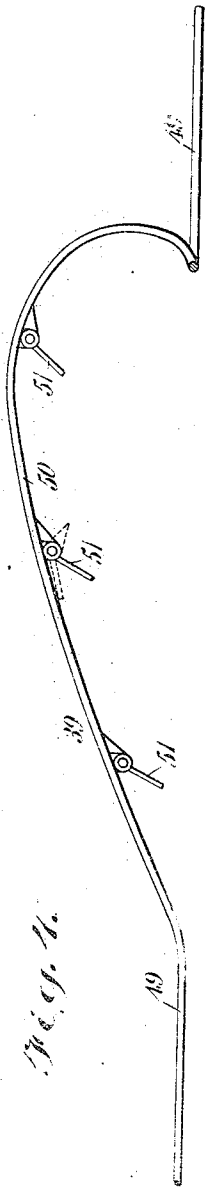


Fig. 4.

Fig. 6.

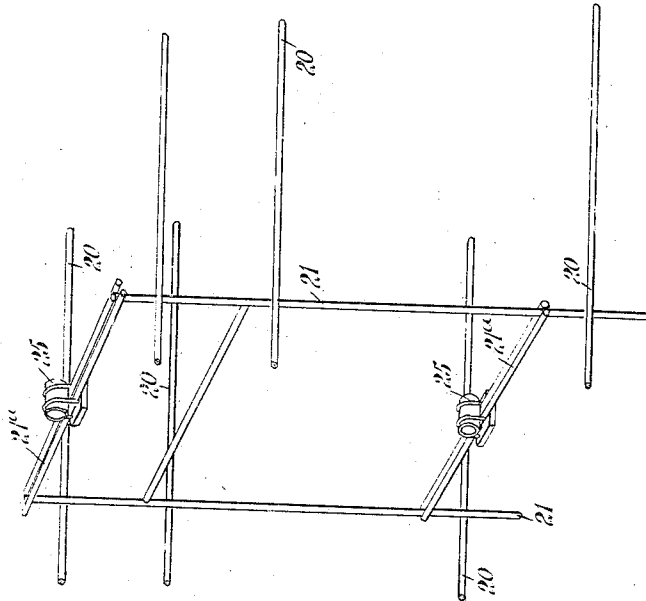
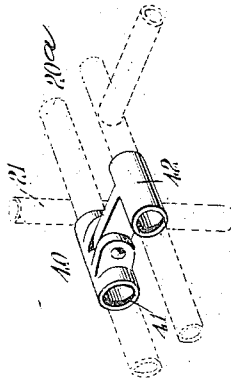


Fig. 5.

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UNITED STATES PATENT OFFICE.

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AERIAL VESSEL.

997,856.

Specification of Letters Patent. Patented July 11, 1911.

Application filed December 27, 1909. Serial No. 535,112.

To all whom it may concern:

Be it known that I, CHARLES OBEDIAH ROWLAND, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Aerial Vessel, of which the following is a full, clear, and exact description.

My invention relates to aerial vessels, more particularly to that type known as "heavier than air" machines, and provides a vessel adapted to navigate in the air, various air currents in the atmosphere being employed to control and propel the vessel in addition to driving means provided on the vessel to more easily direct the same.

My invention further relates to a machine for aerial navigation provided with various means for propelling the same and controlled by an operator seated in the frame of the vessel.

An embodiment of my invention resides in a body having a closed front end, an open rear end, a longitudinal opening in the under side of the body, and a framework suspended from the said body and means on the framework for operating the various parts of the vessel for guiding and propelling the same.

A further embodiment of my invention resides in a body having a closed front end, an open rear end and a longitudinal opening in the under side of the body, and exhaust means in the body, for drawing air into the same through the longitudinal opening and exhausting the said air rearwardly through the rear end of the body to give a forward motion to the body.

My invention still further embodies certain new and useful features as will be hereinafter more fully described and specified.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference denote corresponding parts in all the views in which,

Figure 1 is a side elevation of my invention, with underlying parts shown in dotted lines; Fig. 2 is a plan view of my invention, parts being broken away to show the underlying structure; Fig. 3 is a sectional view taken on the line 3-3 in Fig. 1, looking in the direction of the arrow; Fig. 4 is a sectional side elevation of one of the planes, forming a part of my invention, and show-

ing smaller planes hingedly connected thereto; Fig. 5 is a fragmentary perspective view of a portion of the framework, showing the bearing for the shafts; and Fig. 6 is a perspective view of one of the connecting members for securing the planes to the framework, a portion of the framework being shown in dotted lines.

Referring more particularly to the various figures, a cylindrical shaped body 10, is provided, having a conical shaped front end 11, adapted to completely close that end of the body, the rear end of the same being left open for the exit of air contained in the body. In the under side of the body 10 an opening 12, is provided, extending longitudinally the length of the body. On the upper side of the body 10 are disposed suitable exhaust valves 13, hingedly connected to the body 10 by hinge members 14, and the said valves 13 have thereon releasing members 15, for permitting of quickly opening the valves 13 when a pull is exerted on the releasing members 15. Centrally disposed in the body 10 and extending longitudinally therein, is a shaft 16, and secured at frequent intervals on the shaft are exhaust fans 17, having a convenient number of angularly shaped blades thereon for exciting the atmosphere when the fans are revolved. At the rear end of the body 10 a circular rudder 18, is pivotally mounted, and is adapted to removably close that end of the body.

Suspended from the body 10 is a framework 19 comprising longitudinal members 20, and suitable upright and cross braces 21. Centrally mounted in the framework 19 are suitable driving means 22, and beneath the same is disposed on the framework 19, a seat 23 adapted for the use of an operator 24.

Connected with the driving means 22 and journaled to the framework 19 by suitable bearings 25, are horizontally disposed shafts 26, with each of the said shafts having an end of the same connected to universal joints 27, mounted on the framework 19 by means of hangers 28. Connected to the universal joints 27 are propeller shafts 29, having secured thereon suitable propellers 30. Semi-circular supports or holding members 31 are secured to the propeller shafts 29, and attached to the end of these supports are ropes 32, for moving the propellers 30, which are controlled by hand levers 33, either vertically or horizontally, as will be easily seen

by referring to Fig. 1. Secured to the members 15 of the exhaust valves 13 are ropes 34, leading by means of pulleys to a lever 35, near the operator's seat. On the shaft 16 are secured suitable toothed wheels 36, over which are passed chains 37, connecting the said shafts 16 with the operating shafts 26, which also have toothed wheels over which the chains 37 are passed, and the rotation of the fans 17 on the shaft 16 is controlled by a hand-wheel 38, mounted on the framework 19.

At the upper part of the framework 19 on both sides of the body 10, similar planes 39, are slidably secured to the framework 19 by means of hinge members 40, comprising a sleeve 41, adapted to be fixedly held on braces 20^a and having hinged thereto a second sleeve 42, adapted to be fixedly secured to a bar on the planes 39. Thus it will be seen that the planes 39 can be relatively tilted at various angles and for the purpose of controlling the said planes a rope 43 is wound on a shaft 44, secured to a toothed segment 45, pivoted on the framework 19, and the said rope secured to the outer ends of the planes 39, on the right side of the body is passed over the body and extends downwardly to engage the shaft 44. A similar rope 43^a has its ends secured to the shaft 44 and engages the planes 39, in the left side of the body. Thus it will be seen that the outer ends of the planes can be conveniently moved upwardly or downwardly by operating a wheel 46, operatively connected with the segment 45. In order to move the inner ends of the planes 39 upwardly and downwardly, the braces 20^a on which the planes are mounted are adapted to move vertically on the framework and an endless rope 46^a is connected with the braces and secured to a wheel 46^b, so that by operating the wheel 46^b, the inner ends of the planes 39 can be conveniently raised or lowered.

It will be understood that owing to the connections between the planes 39 and the wheel 46, when the wheel is operated the planes on one side will incline upwardly while the planes on the other side will incline downwardly, and the same is true of the planes when the wheel 46^b is operated, except that when the wheel 46 is employed the outer ends of the planes move and when the wheel 46^b is employed the inner ends of the planes are moved. Beneath the opening 12 of the body 10 is a horizontally disposed plane 48, extending the entire length of the opening 12 and secured to the uprights 21 of the framework 19. By referring to Fig. 4 it will be seen that each of the planes 39 comprises straight portions 49 and a curved portion 50, and hingedly mounted on the curved portion 50 are several smaller planes 51, adapted to adjust themselves relatively

to the direction of the currents of air through which they pass when the aerial vessel is in operation. Smaller planes 51 are also mounted at frequent intervals on the horizontal plane 48, and in the lower set of planes 39 suitable openings 52, are provided, to allow the air striking the lower planes 39 to rush upwardly through the openings 52 and contact with the upper set of planes 39.

The operation of my aerial vessel is as follows: When it is desired to propel the vessel through space, the driving means 22 are set in motion by the operator 24 seated in the seat 23 on the framework 19. The fans 17 in the body 10 being connected to the shafts 26, revolve as do also the propellers 30 secured by means of the universal couplings to the ends of the shafts. The revolving of the propellers 30 causes the vessel to be propelled forwardly. In addition to this the fans 17 revolving at a high rate of speed draw air into the body 10 and exhaust the same rearwardly with great force through the open rear end of the body 10, and this operation adds greatly to the speed of the vessel. The circular rudder 18 in combination with the propellers 30, enables the vessel to be easily directed in any direction, while the planes 39 tilted to a desired angle cause the aerial vessel to rise upwardly. It will be noted that when the fans 17 revolve, the air drawn into the body 10 is drawn from the top of the horizontal plane 48. This reduces the air pressure on the upper side of the plane and the resulting movement is a rising of the aerial vessel, due to the heavier pressure below the plane 48. It will also be noted that the planes 51 on the larger planes 39 and 48, are self-adjusting, depending entirely upon the direction of the air currents which strike the said planes, thus adding materially to the stability of the vessel. When it is desired to descend, the rudder 18 is moved to close the rear end of the body 10, the exhaust valves are released, and the air drawn into the body 10 through the opening 12 is forced upwardly and out of the exhaust valves 13 and causes the vessel to gradually descend. If the driving means should unexpectedly cease to operate, the adjustable planes can be quickly inclined downwardly to form a parachute, and the vessel will descend gradually.

Although I have described my aerial vessel as shown in the drawings, it will be clearly understood that I do not limit myself to the precise construction as illustrated, the scope of my invention being defined in the appended claims.

Having thus described my invention I claim as new and desire to secure by Letters Patent:—

1. In an aerial vessel, the combination of a body provided with a closed front end, an

open rear end and a longitudinal opening in the under side of the body and a framework suspended from the body, adjustable planes mounted on the said framework on both sides of the said body, means for adjusting the said planes, a horizontally disposed plane secured to the said framework beneath the said body, exhaust fans in the said body, for drawing air into the body through the said opening and exhausting the said air rearwardly out of the said rear end of the said body, and means secured to the said framework for operating the said fans.

2. In an aerial vessel, the combination of a body provided with a closed front end, an open rear end and a longitudinal opening in the under side of the body in juxtaposition to the said longitudinal opening, a horizontally disposed plane rigidly secured beneath the body, and a framework suspended from the body, adjustable planes mounted on the said framework on both sides of the said body, means for adjusting the said planes, exhaust fans in the said body, for drawing air into the body through the said longitudinal opening and exhausting the said air rearwardly through the said rear end of the said body, and guiding means on the said body for guiding the said vessel.

3. In an aerial vessel, the combination of a body provided with a closed front end, an open rear end and a longitudinal opening in the under side of the body, and a framework suspended from the body, exhaust fans in the said body, for drawing air into the body through the said opening and exhausting the said air rearwardly through the said rear end of the body, means for actuating the said fans, exhaust valves on the upper side of the said body, means in the said framework for operating the said valves, adjustable planes mounted on the said framework on both sides of the said body, means for operating the said planes, a horizontally disposed plane secured to the said framework beneath the said body, and a circular rudder mounted in the said body for guiding the said vessel.

4. In an aerial vessel, the combination of a body provided with a closed front end, an open rear end and a longitudinal opening in the under side of the body, and a framework suspended from the said body, adjustable planes mounted on the said framework and disposed on both sides of the said body, a horizontal plane secured to the said framework beneath the said body, exhaust fans in the said body, for exhausting air from the upper side of the said planes, propellers mounted on both ends of the said framework and adapted to move vertically and horizontally, means for rotating the said propellers to propel the said vessel, and means on the said framework for operating the said adjustable planes.

5. In an aerial vessel, the combination of a body and a framework suspended from the body, a horizontally disposed plane rigidly secured beneath the body, exhaust fans in the body, for exhausting air from the body received therein through a longitudinal opening in the under side of the body, a circular rudder pivotally mounted at one end of the body, a vertical propeller disposed at each end of the said framework, the said propellers being adapted to move vertically and horizontally, means for controlling the degree of angularity of the said propellers, and driving means secured to the said framework for rotating the said propellers to propel the said vessel.

6. In an aerial vessel, the combination of a cylindrical body provided with a closed front end, an open rear end and a longitudinal opening in the under side of the body, exhaust fans in the said body, for drawing air into the body through the said longitudinal opening and exhausting said air rearwardly through the said rear end, exhaust valves disposed on the upper side of the said body, a circular rudder pivotally mounted at one end of the said body and adapted to removably close the open end of the said body, and a framework suspended from the said body, adjustable self-actuated planes mounted on the said framework on both sides of the said body, means for operating the said planes, a horizontally disposed self-actuated plane secured to the said framework beneath the said body, vertically disposed propellers on each end of the said framework, means for operating the said propellers to impart either a vertical or horizontal motion to the same, means for rotating the said propellers, and means for independently operating the said rudder secured to the said body and said adjustable planes secured to the said framework.

7. In an aerial vessel, the combination of a cylindrical body closed at the front end and open at the rear end and the said body having a longitudinal opening in the under side of the same, a horizontally disposed plane rigidly secured beneath the body, and a framework suspended from the body, planes mounted on the framework on both sides of the said body and the said planes comprising a straight portion and a curved portion, the said curved portion having smaller self-actuated planes hinged thereon, means on the framework for adjusting the said planes, and means on the said framework for operating the said vessel.

8. In an aerial vessel, the combination of a cylindrical body closed at the front end and open at the rear, and the said body having a longitudinal opening in the under side of the same, and a framework suspended from the said body, vertically disposed exhaust fans in the said body, for drawing air

into the body and exhausting the said air
rearwardly through the said rear end, man-
ually controlled means for operating the
said fans, a circular rudder pivotally
5 mounted at one end of the said body and
adapted to close the end of the cylinder,
manually controlled means secured to the
said framework for operating the said rudder,
10 exhaust valves disposed on the upper
side of the said body, manually controlled
means for operating the said valves, adjust-
able supporting planes hingedly mounted on
the said framework on both sides of the said
15 body, manually controlled means secured to
the said framework for adjusting the said
planes, a horizontally disposed plane secured
to the said framework beneath the said
body, self-adjusting means comprising

planes hingedly connected to the said ad-
justable planes and the said horizontally
disposed planes, propellers mounted to move
vertically and horizontally and disposed on
each end of the said framework, driving
means for driving the said propellers to
drive the said vessel, and manually con- 25
trolled means secured to the said framework
and the said propellers to move the same
vertically or horizontally. 30

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CHARLES OBEDIAH ROWLAND.

Witnesses:

THOMAS HENRY FEENEY,
FRANK LA ROY GOULD.