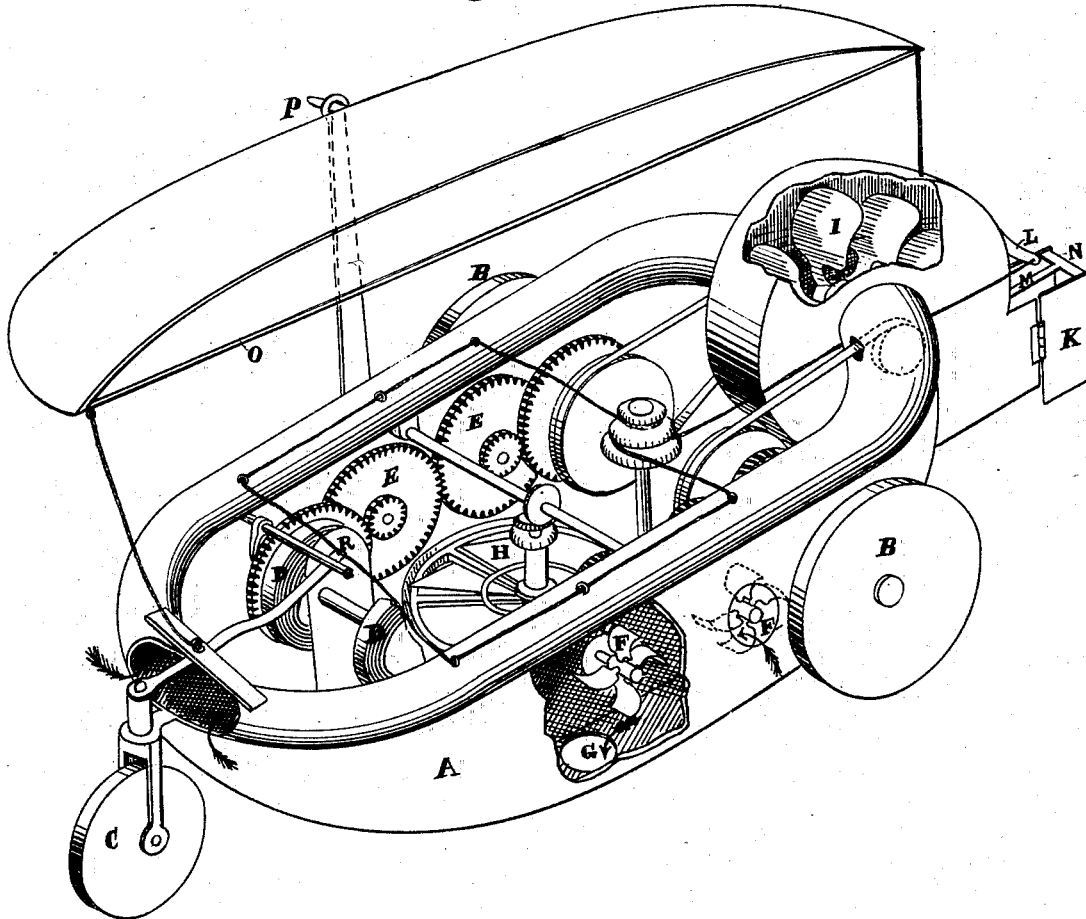


J. B. WARD.  
AERIAL MACHINE.

No. 185,465.

Patented Dec. 19, 1876.

Fig. 1.



Witnesses  
*John L. Boone*  
*Oliver T. Stacy*

Inventors.  
*John B. Ward*  
*Dewey & Co*  
*Attys*

# UNITED STATES PATENT OFFICE

JOHN B. WARD, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN AERIAL MACHINES.

Specification forming part of Letters Patent No. 185,465, dated December 19, 1876; application filed September 19, 1876.

### *To all whom it may concern:*

Be it known that I, JOHN B. WARD, of the city and county of San Francisco and State of California, have invented an Improved Aerial Machine; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to a novel aero-motor, in which I have provided a mechanism combining the application of downwardly and horizontally acting currents of air with suitable guiding and directing planes, so that the machine may be elevated or depressed, driven forward or turned in any direction, at will.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of the device.

A represents the body of my machine, which may be made of any suitable shape and material, so that it will be light and strong, such as thin metal properly braced, bamboo, or wood. In the present case I have shown this body of such a shape as to contain the mechanism necessary to operate it, and it is mounted upon the wheels B and the steering-wheels C. These wheels serve to support the machine while it is at rest, to receive it when it comes to the earth, and to support it when it starts upon the surface, until it has acquired a speed sufficient to allow the appliances to be brought into action which cause it to leave the surface and move through the air. The steering-wheel is connected with suitable devices, so that it can be readily turned from side to side to guide the machine while it is on the earth.

The operating mechanism consists of an engine, either steam, air, electricity, or any form which can be adapted, and for lightness it may be made of aluminum. This driving-power, in the present case, represented by springs D, and by means of gear or belt wheels E power is transmitted to the axles of the wheels B.

The power which I intend to employ to operate my machine in the air consists of a number of rotary fans suitably arranged to produce currents of air in a downward and horizontal direction, and I also employ a gyro-

scopic motion, by which the level of the machine is maintained when in the air. In order to elevate the machine, I employ a series of fan-blowers, F F, which are constructed in cases at the sides of the machine, and are made to receive air from openings at the sides about their shafts, while the discharged openings G open downward in a vertical direction. In the center of the machine, at the bottom, I have made a large circular opening, and within this opening the wheel H is made to revolve rapidly. This wheel has radial vanes within its circumference, and these vanes may be opened or closed, more or less, by suitable connections, so that it will serve both as a screw to assist in elevating the machine, and by its size and the velocity of its movement it acts like a gyroscope to prevent the machine from upsetting. The forward movement of my machine is attained by means of a fan-blower, I, which is placed at the rear end of the machine, as shown. Around the upper edge of the body A, at each side, are formed large tubular conveying-passages, which have openings at the front to receive the air, and they lead directly to the sides of the case of the blowers, so that the air from them will be received and discharged by the fan. This fan is connected with the operating mechanism by means of pulleys upon each end of the fan-shaft within the tube I', and holes may be made in the sides of the tubes to allow the belts to pass through. The discharge-openings J for this air-blast are provided with gates K, which are hinged, so as to move from side to side, and thus direct the blast as may be desired, and so assist in guiding the machine. To move these gates I employ a yoke, L, which is operated by cords from a drum or steering-wheel within the machine. The spindle or stem of this yoke has an arm, M, projecting at right angles, and this arm is connected with the bar N, which unites the two doors or gates.

In order to make use of the air to guide and sustain my machine when afloat, I have constructed a plane, O, which may be made quite large, and is hinged or suitably supported at P, so that its ends can be elevated or depressed by means of ropes Q, which lead to a mechanism at R, which is also a common cen-

ter for the ropes operating the steering-wheel C and the gates K.

The operation of my machine will be as follows: When the apparatus is set in motion upon a smooth space, the blast-fan I will drive it forward upon the wheels B C until a considerable speed is attained. The large plane surface O is then turned to such a position that its front inclines upward, and this, together with the effect of the downward blast from the fans F in the sides and the central screw H, will raise the machine from the earth. By the use of the plane O and the gates K, I am now enabled to turn the machine up or down, right or left, at will. When the machine is to be brought again to the earth, it must be done at some favorable place, where it can alight gradually and run along upon its wheels until it comes to a stop. The plane O is constructed with an arched top, as shown, so braced and strengthened with ribs as to give the greatest amount of stiffness.

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

1. In an aerial machine, the rotary fans or equivalent blast-engines, F F, constructed in pairs upon each side, and forcing the air down-

ward to assist in raising the machine, in combination with the gyroscopic wheel H, to maintain the equilibrium, substantially as herein described.

2. The wheel H, fitted to rotate in a central case and act as a gyroscope, said wheel being also provided with vanes, which are closed or opened at will, so that the wheel will act as a screw to assist in raising the machine, substantially as herein described.

3. The device I, for producing a horizontal blast, in combination with the hinged fans, vanes, or gates K, with a suitable apparatus for operating them, so as to steer the machine, substantially as herein described.

4. The plane O, so mounted and operated, by ropes Q and mechanism R, that its angle may be changed to elevate and depress the machine, in combination with elevating and propelling devices, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand and seal.

JOHN B. WARD. [L. s.]

Witnesses:

OLWYN T. STACY,  
FRANK A. BROOKS.