H. FAEHRMANN.

AIRSHIP.

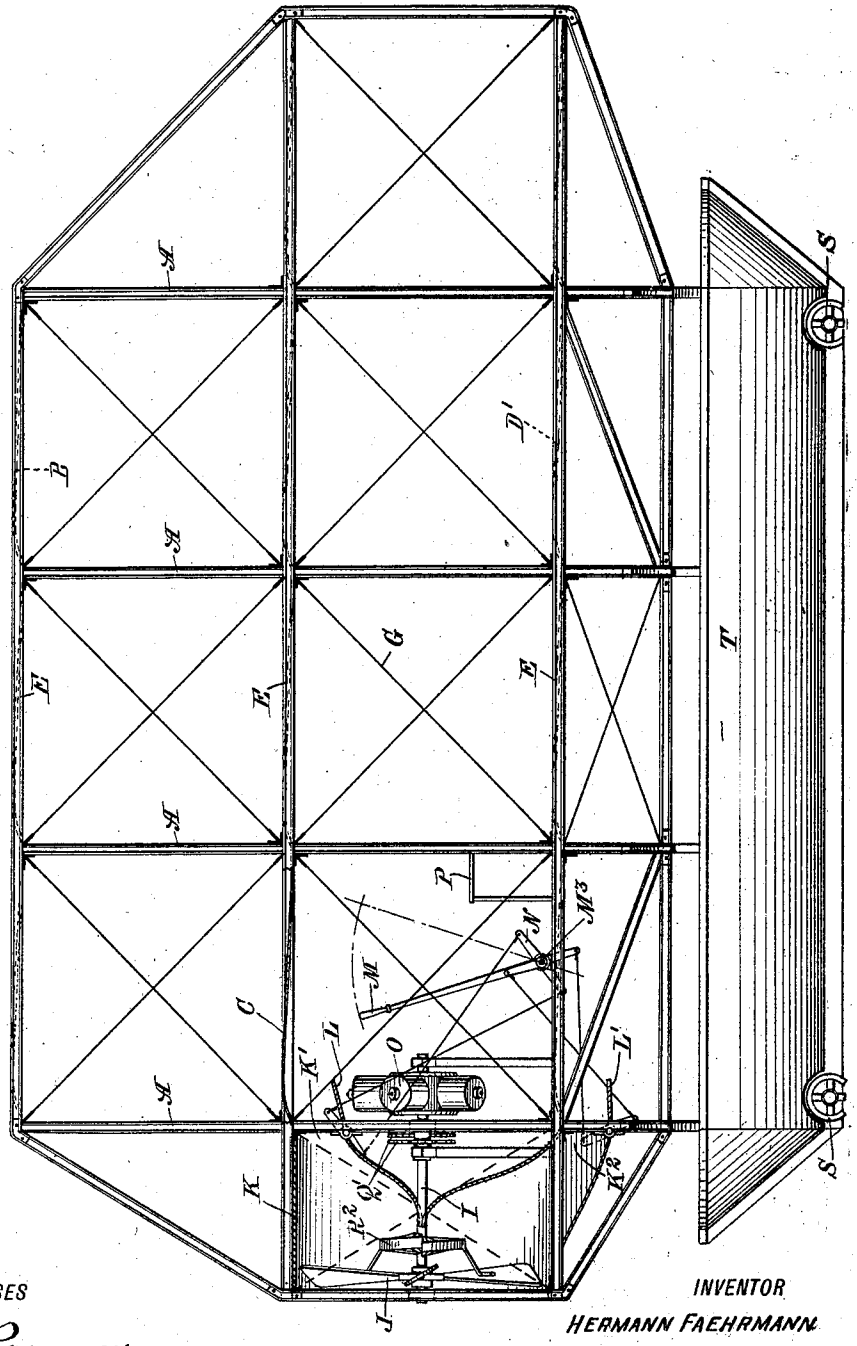
APPLICATION FILED OCT. 6, 1908.

1,023,367.

Patented Apr. 16, 1912.

3 SHEETS—SHEET 1.

FIG. 1.




WITNESSES

G. V. Rasmussen

John Lotka

INVENTOR

HERMANN FAEHRMANN

BY

Breese & Knauth

ATTORNEYS

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Fig. 4.

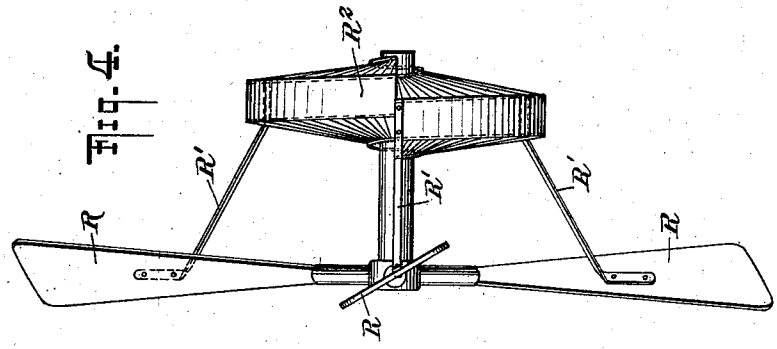
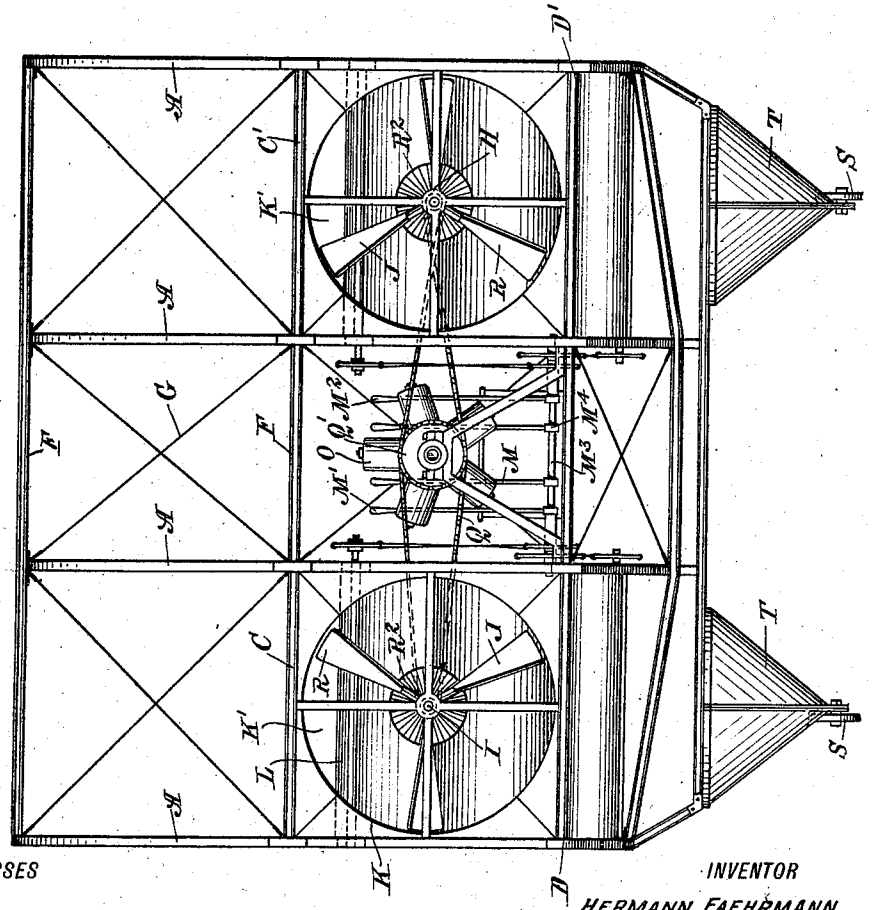



Fig. 2.

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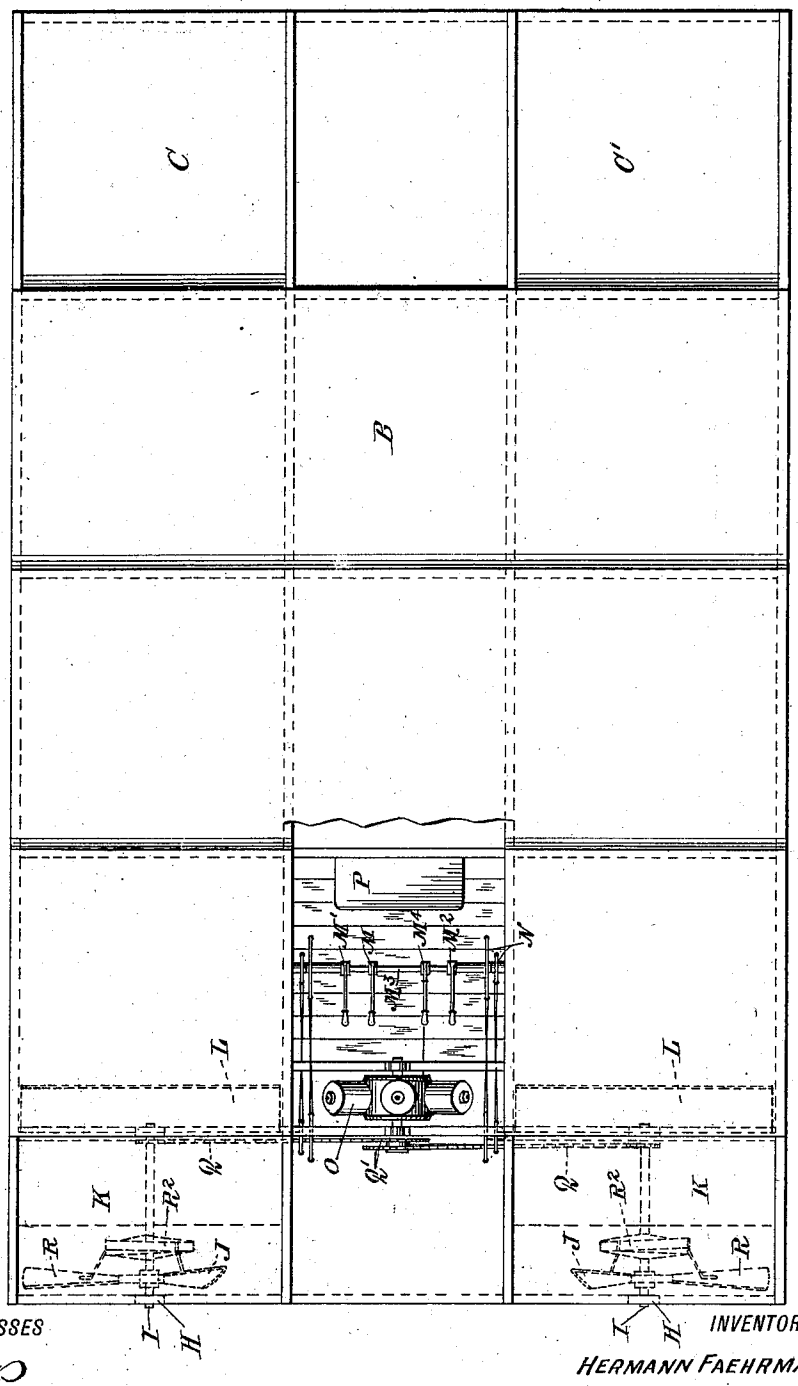


FIG. 3.

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ATTORNEYS

# UNITED STATES PATENT OFFICE.

HERMANN FAEHRMANN, OF NEW YORK, N. Y.

## AIRSHIP.

1,023,367. Specification of Letters Patent. Patented Apr. 16, 1912.

Application filed October 6, 1908. Serial No. 456,438.

*To all whom it may concern:*

Be it known that I, HERMANN FAEHRMANN, a citizen of the United States, and resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Airships, of which the following is a specification.

My invention relates to airships of the type in which aeroplanes are employed, and has for its object to provide a simple and very efficient construction for controlling all the movements of the airship and for steadying it in its travel. These results I obtain by means of a novel arrangement of propellers constructed to produce a current of air under the aeroplane or aeroplanes, to support the ship in the air, and by varying the velocity of these air-currents I may control the rising and falling of the ship. Similarly, by making the speed of the air currents on one side of the ship different from that on the other side, I may cause the ship to turn to one side or the other. I am thus enabled to dispense with rudders and to avoid the reduction in efficiency which would be caused by the resistance offered by rudders. The propeller or propellers create a very great pressure, which may be transformed into high velocity by allowing the air under pressure to escape through a comparatively small outlet and, as the size of the outlet is increased, the velocity of the air-current is reduced and vice versa.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side view of the air ship with parts in section; Fig. 2 is a front view thereof: Fig. 3 is a plan view portions of the aeroplane being broken away; and Fig. 4 is a detail of the propeller.

The improved air ship consists of a suitable frame work having a number of aeroplanes and provided with propellers at each side of the longitudinal axis of the ship. In the particular construction illustrated by the drawings there are four sets of uprights A, so that the ship is divided longitudinally into three compartments, one central compartment and two lateral compartments. I have shown three tiers of aeroplanes the top aeroplane B extending across the full width of the ship and substantially the entire length thereof, while the other aeroplanes C C′ D D′ extend only across the lateral compartments. Horizontal bars E extending lengthwise, and transverse horizontal bars F complete the framework of the machine in connection with diagonal braces G. At the front of the lateral compartments are located bearings H for the propeller shafts I. The propellers J are mounted on these shafts and are adapted to rotate in the said compartments. Adjacent to each propeller is located a cylindrical wall K, which is open toward the rear so as to form two channels, an upper channel K′ terminating below the corresponding aeroplane C C′ and a lower channel $K^2$ terminating below the lower aeroplanes D D′. The outlets from these channels are controlled by valves or dampers L L′ worked by suitable hand-levers. In the preferred construction a single hand-lever M controls both of the lower valves L′, but there is a separate lever M′ for the upper damper L of one side and another independent lever $M^2$ for the valve or damper L of the other side. All levers are fulcrumed at $M^3$ and they are connected with the valves by suitable lever mechanism indicated at N. The motor O is mounted in the central compartment which also contains the operator's seat or stand P, and the driving connection may be obtained by means of chains Q and sprockets Q′ so that the propellers will be rotated in opposite directions. I have shown both propellers of a special construction comprising blades R connected by braces or stays R′ with a hub $R^2$ which is given a spiral shape so that it will not retard the progress of the ship, but rather assist in the driving action of the propeller. At the bottom of the structure may be provided wheels S to facilitate running the machine on the ground at the start and when alighting. The uppermost aeroplane may be omitted if desired. The lever $M^4$ controls the throttle of the engine.

It will be understood that as the propellers are rotated by the motor they will compress the air in the chambers immediately in the rear of the propellers and currents of air will be discharged under the aeroplanes C C′, D D′. According as the valves or dampers L L′ are more or less open, the velocity of the current of air thus caused to stream under the aeroplanes will be smaller or greater, the pressure of air created by the propellers can therefore be transformed into a high velocity. The currents of air streaming under the aeroplanes will therefore have a supporting action

which will be sufficient to keep the ship afloat in the air and at the same time propel it forward partly by a reaction effect and partly by the propellers screwing themselves into the air. When it is desired to cause the ship to rise, the lower valves are closed more than the upper ones, so that the current under the lower aeroplanes will be of greater velocity than that under the upper aeroplanes. If it is desired to swing the ship toward the right, the upper valve on the left-hand side will be closed more than the one on the right-hand side so as to produce an air current of greater velocity on the left-hand side than on the right. It will be obvious that I may employ several propellers in each lateral compartment, either on the same shaft or on independent shafts.

The improved construction above described enables the ship to be steered both vertically and horizontally with great ease without interfering with its stability, and by the use of the high-velocity air-currents I obtain an air ship of great efficiency. The ship can rise from the ground at any point without any special starting apparatus; the motor would be operated at a constant speed which is best adapted for obtaining the maximum efficiency, all changes of speed and direction being obtained by a proper manipulation of the levers controlling the dampers or valves.

The propellers may be arranged to rotate about axes which are horizontal as shown, or placed in any other position, for instance inclined forward and upward; the axes may even be vertical, in which case the reaction alone would propel the ship. In each case, however, channels would be arranged to discharge currents of air under the aeroplanes. In some cases, a single aeroplane might be sufficient. A single propeller may be used, whether one or more aeroplanes be employed. Of course, steering gear of any approved construction may be used instead of, or in conjunction with, the particular steering device herein described.

To enable the ship to rise from and alight upon water as well as on land, I may provide it with floats T.

I claim:

1. An airship provided with an aeroplane, a rotatable propeller for propelling the ship and for creating a current of air directly under and against the aeroplane and a device separate from said propeller for varying the velocity of said current.

2. An airship provided with an aeroplane, a propeller and a pressure chamber into which said propeller is arranged to force the air, said chamber communicating with a channel having a reduced outlet for conducting air under the aeroplane.

3. An airship provided with an aeroplane, a propeller for moving said ship, a channel for conducting air from the propeller under the aeroplane, and a valve located in said channel.

4. An air ship provided with superposed aeroplanes, a chamber, channels having an outlet beneath each aeroplane and each communicating with said chamber and means in said chamber for discharging a current of air through each outlet of said channels.

5. An air ship provided with superposed aeroplanes, means for creating a current of air and means separate from said aeroplanes for dividing said current of air and conducting it respectively beneath each plane.

6. An air ship provided with superposed aeroplanes, a chamber having a reduced outlet beneath each aeroplane and a propeller in said chamber for discharging a current of air through each outlet.

7. An air ship provided with superposed aeroplanes. a chamber having an outlet beneath each aeroplane, a propeller in said chamber for discharging a current of air through each outlet and means for varying the velocity of said air currents without changing the speed of the propeller.

8. An air ship provided with superposed aeroplanes, separate chambers each having an outlet beneath each aeroplane, means in each chamber for discharging a current of air through each outlet and means for varying the velocity of said air currents without changing the speed of the propeller.

9. An air ship provided with superposed aeroplanes, separate chambers at each side of said ship, each having outlets beneath the upper and lower aeroplanes, means in each chamber for discharging an air current through each outlet, disconnected means for separately varying the velocity of the air currents through the upper outlets and connected means for simultaneously varying the velocity of the air currents through each lower outlet.

In testimony whereof I have hereunto set my hand this 26th day of September 1908.

HERMANN FAEHRMANN.

Witnesses:
JOHN LOTKA,
JOHN A. KEHLENBECK.