3 Sheets—Sheet 1.

F. A. L. VON EHREN

Aerial Vessels.

No. 199,334. **Patented Jan. 15, 1878.**

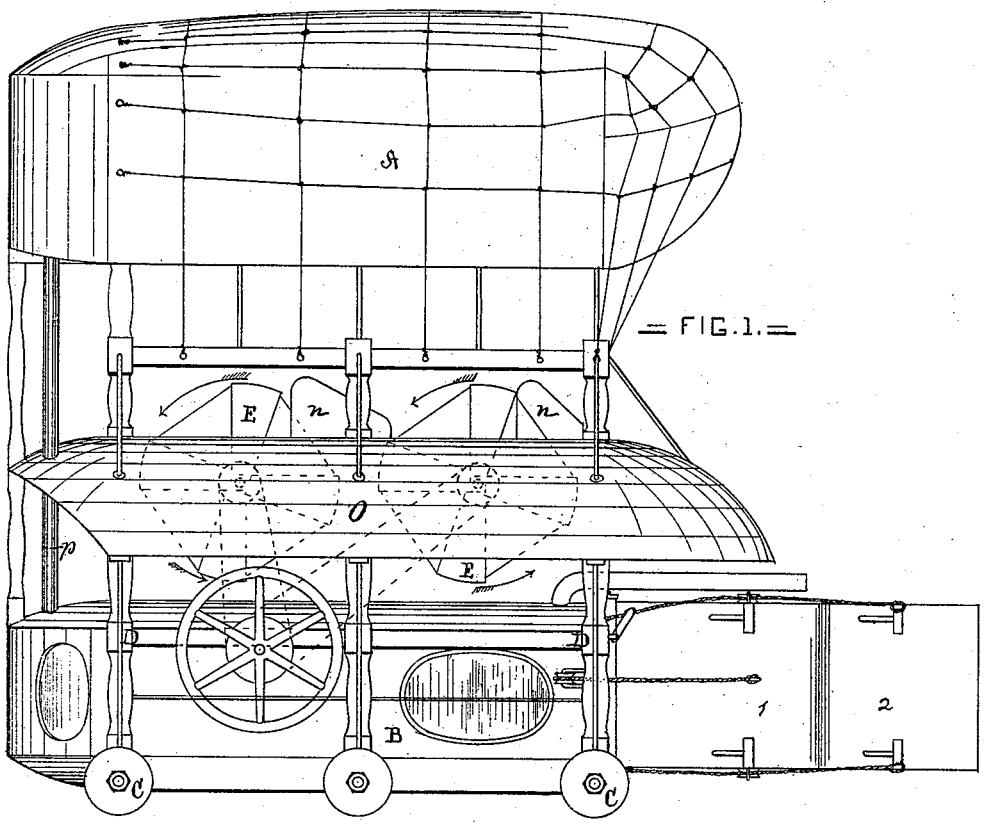

FIG. 1.

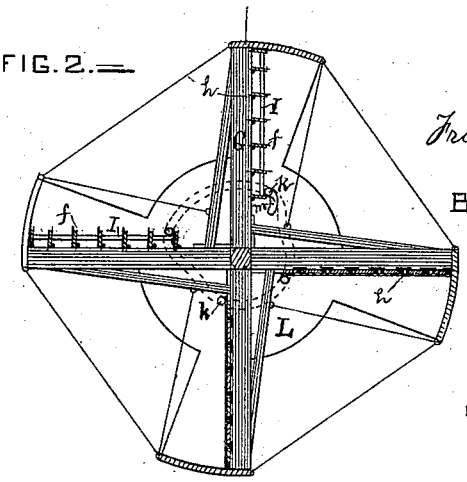

FIG. 2.

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FIG. 3.

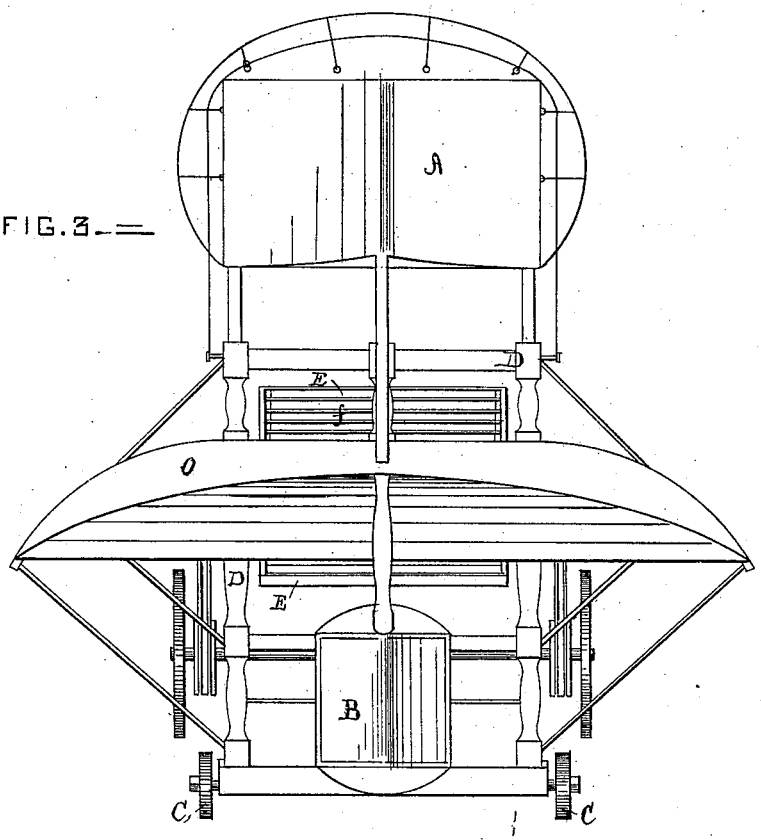
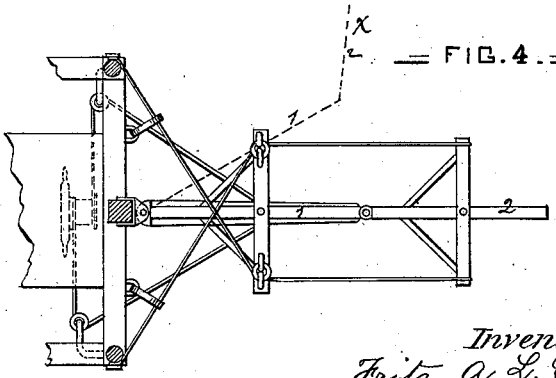


FIG. 4.



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3 Sheets—Sheet 3.

F. A. L. VON EHREN

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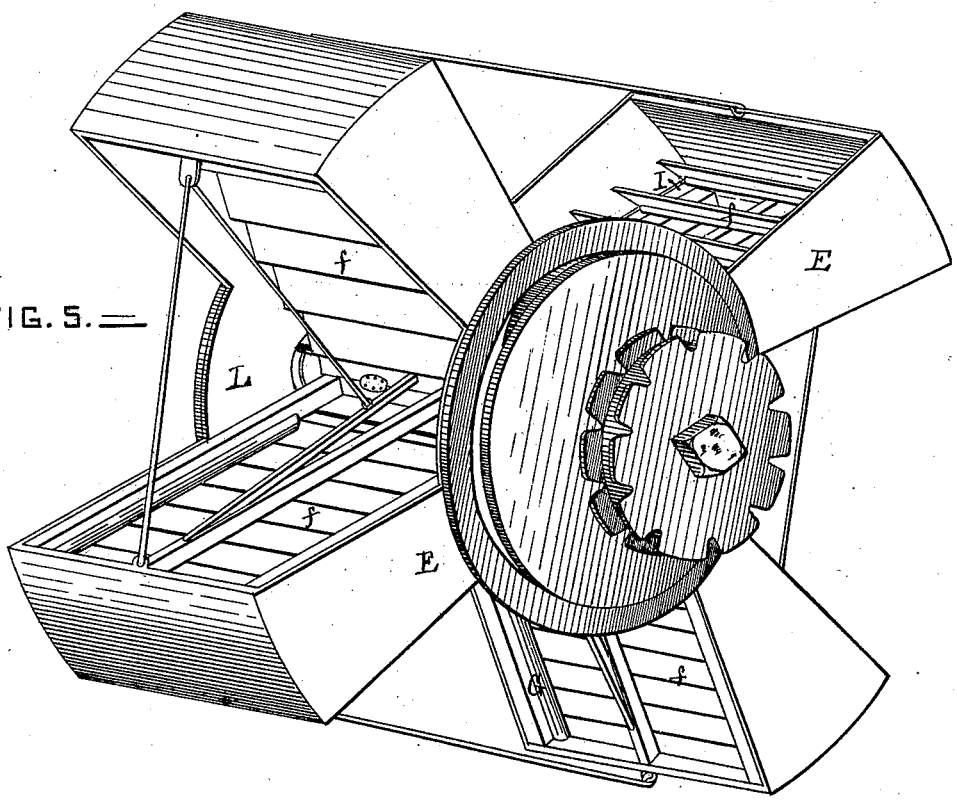
FIG. 5.



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UNITED STATES PATENT OFFICE.

FRITZ A. L. VON EHREN, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN AERIAL VESSELS.

Specification forming part of Letters Patent No. **199,334**, dated January 15, 1878; application filed July 16, 1877.

To all whom it may concern:

Be it known that I, FRITZ A. L. VON EHREN, a resident of the city of New Orleans, parish of Orleans, and State of Louisiana, have invented a certain new and useful Improvement in Aerial Vessels; and I do hereby declare the following to be a full, clear, and correct description of the same, reference being had to the annexed drawing, making a part of this specification.

In the accompanying drawing, Figure 1 represents a side elevation of my invention; Fig. 2, a sectional view of one of its propelling-wheels. Fig. 3 is a front elevation of the vessel; Fig. 4, a plan of its steering apparatus; and Fig. 5, an enlarged perspective view of one of the propelling-wheels.

A represents a balloon, from which is suspended a hull or cabin, B, mounted on rubber or other suitable wheels C.

Surrounding the cabin is a frame, D, in the upper portion of which are operated the propelling-wheels E, the latter so constructed as to present, when pressing downward on the air, an expanded solid flat surface, (in imitation of the wings of a bird,) which, when in motion, compresses the air beneath the same, causing it to act like a spring, hence creating a propelling-power for driving the vessel both upward and forward.

The wings of each wheel are formed of narrow blades *f*, which are each secured to the wheel-arms G by means of hinges *h*, and each set connected at its ends by rods I, so that it may be operated simultaneously by pins *k* traveling in cam-shaped grooves that are formed on the inner sides of the circular stationary plates L, as shown in dotted lines at Fig. 2, curved slots *m* being cut in the sides of the wheels for the passage of the said pins. By this arrangement the blades of each wing, in their upward or return movement, open, so as to present the least possible resistance to the air.

As will be seen by reference to the drawing, the sides and periphery of the buckets project somewhat forward of the blades, which admits of the air being compressed within the same whenever a flat surface is formed by the closing of the blades. The air thus compressed becomes a spring-like lever, and in endeavoring to regain its natural state by expanding itself—the air in front and surrounding the wheel and wings being of less density than the air beneath the flat surface of each wing of the wheel—causes the wheel to rotate forward.

The whole apparatus is, through the continued forward movement of the wheels, put into forward motion, and the more the momentum of the machine is thus increased the better will—taking into consideration that only about one-twentieth part of the whole surface of the apparatus is exposed to the opposing current of air, and that portion in a sharp and pointed form—the machine, as a whole, be able to overcome the current of air fronting the same. And, furthermore, as one wheel after the other retains and compresses the air received from the wheel before it by means of the elevated plane *n* placed between the different wheels, which said plane carries the air already compressed by the first wheel under the wings of the second; and, where there are more than two wheels used, that of the second is, by the same arrangement, delivered to the third, and so on *ad infinitum*. Thus all the air caught by the wings is kept in the interior of the apparatus until it finds its outlet in the rear portion of the machine, pushing and propelling the same forward with a greater pressure of air than that of the current opposing it. In this manner, the air-pressure in the machine being greater and more powerful than that opposing the apparatus, the machine is enabled to travel in the air regardless of the opposing current, and be guided by its steering apparatus in any direction desired, thus enabling the occupants to go from any given point on the face of the globe to that of any other point with certainty and precision at the will of the party in charge of the machine. Furthermore will the apparatus, when driven ahead by the wheels, force the opposing air-current to enter beneath the parachute or stationary wing O, attached to and surrounding the frame-work, so that the air, becoming compressed beneath the same, will assist in carrying the machine, thereby lessening, to some extent, the power necessary for driving the wheels, hence giving more propelling force to the wings of the apparatus. Furthermore will the parachute or stationary wing attach-

ment serve, in case of accident, (the air compressing beneath the same as the apparatus descends,) to gradually lower the machine and safely land its passengers on *terra firma*.

The lower portion of the apparatus is made perfectly water-tight, so as to be able to remain, for some time at least, on the surface of the water, in case by accident it should fall on the same.

The rudder, it will be observed, is made in two sections, 1 2, and operated by a windlass and chains or cords, as clearly shown at Fig. 4, so that when turned to one side, as shown in dotted lines at *x*, it will present a full flat surface to the current of air passing along the sides of the machine, and thus enable the man at the wheel to turn the vessel in any desired direction.

The bottom of the machine is furnished with wheels of rubber or other equivalent material, which prevent jarring when alighting, keep the machine in an upright position when on the ground, and, by rolling, assist the machine in its forward movement when ascending from the ground.

The balloon section can be filled with gas, manufactured in the cabin, and conveyed therefrom through a pipe, *p*, to the aforesaid section; or the said section may be made of a larger capacity, and filled with hot air, obtained and kept up from the combustible material used for heating the boiler, and conveyed from the said boiler, by means of a pipe, directly into the balloon.

I am of opinion that, by properly proportioning the wheels to the size of the cabin used, the balloon portion may be entirely dispensed with. In fact, I only employ the balloon-section for the relief of the machinery, as well as to guard against the latter becoming accidentally out of order, and to overcome public prejudice.

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

1. In an aerial machine, the cabin or hull B, mounted upon rubber or equivalent elastic wheels C C, substantially as described.

2. The propelling-wheels E, having the blades *f* hinged to the wheels, in combination with the rods J, pins K, and grooved plate I, substantially as described.

In testimony whereof I have hereunto signed my name.

FRITZ A. L. VON EHREN.

In presence of—
J. C. HUBBELL,
C. L. KOCK.