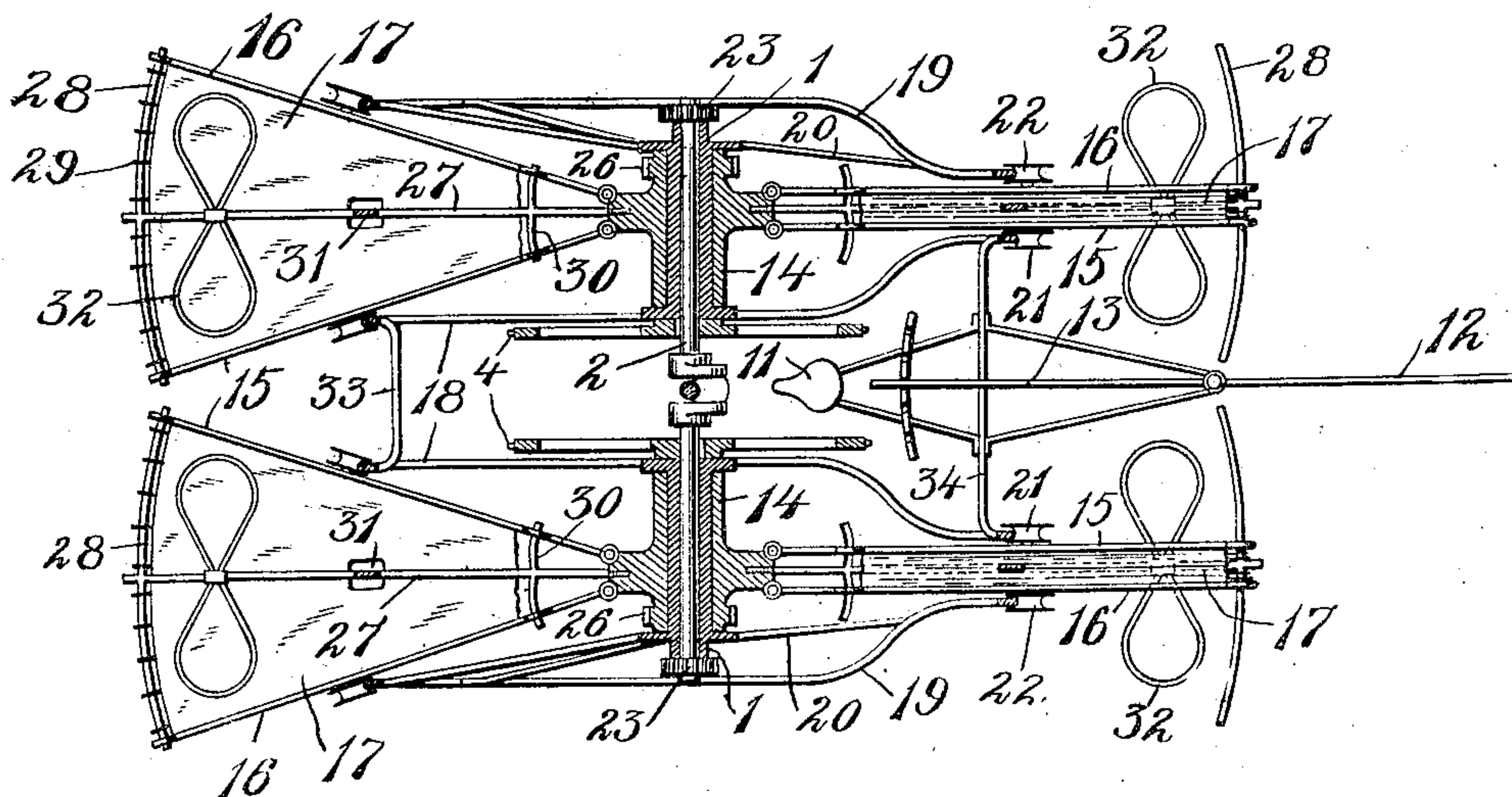
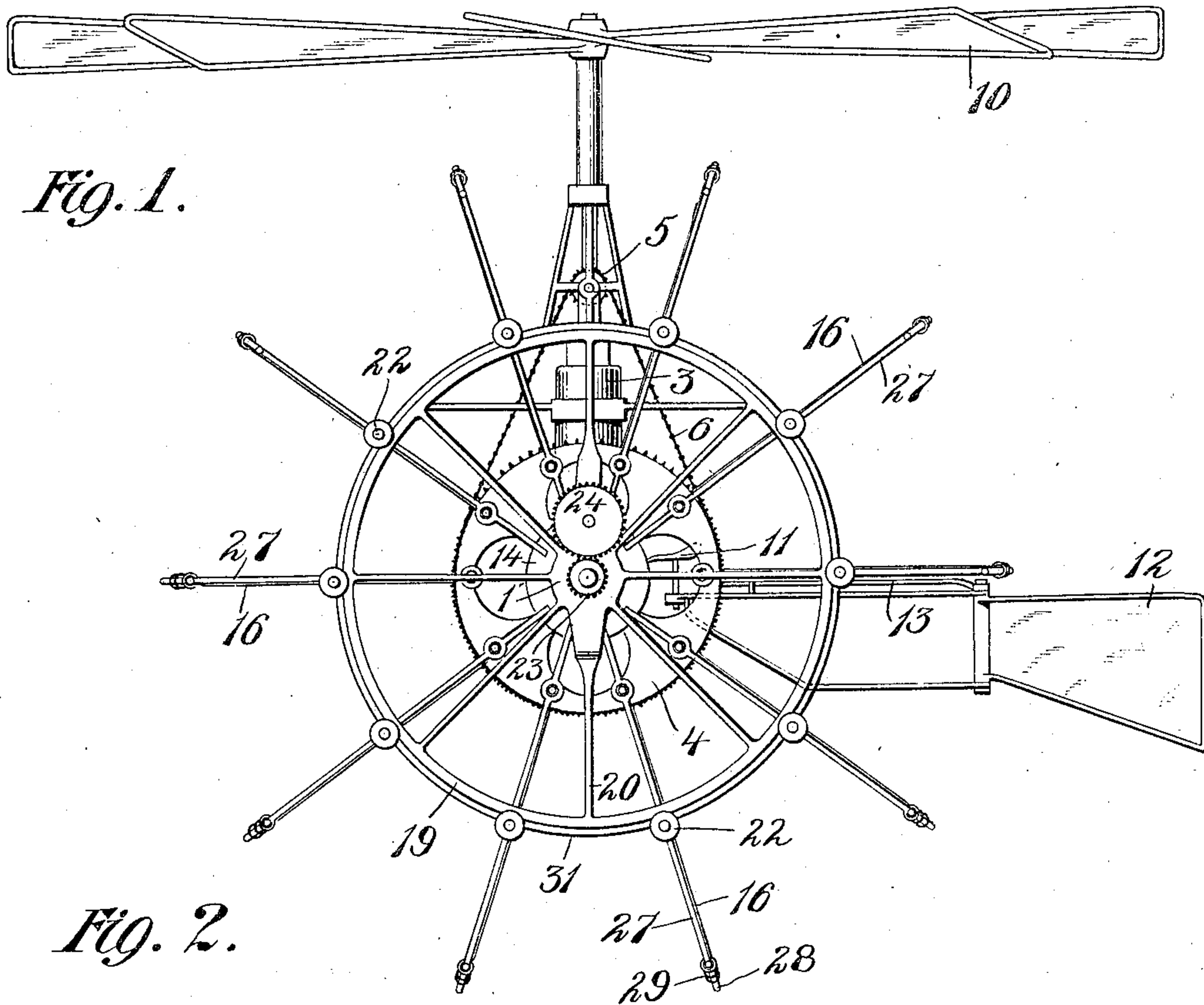


No. 844,172.

PATENTED FEB. 12, 1907.

A. McCARTHY.
AERONAUTICAL MACHINE.
APPLICATION FILED MAR. 17, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

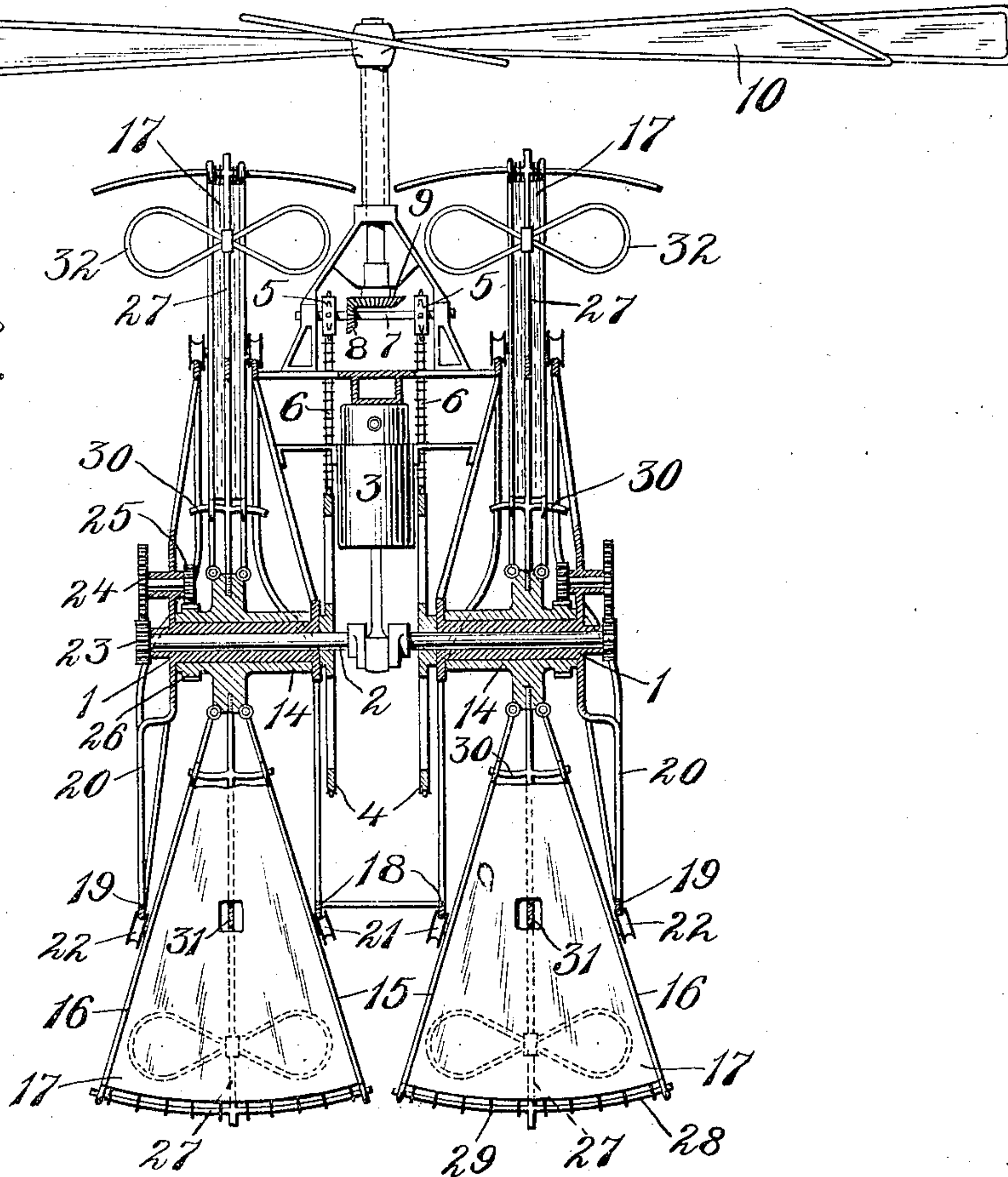
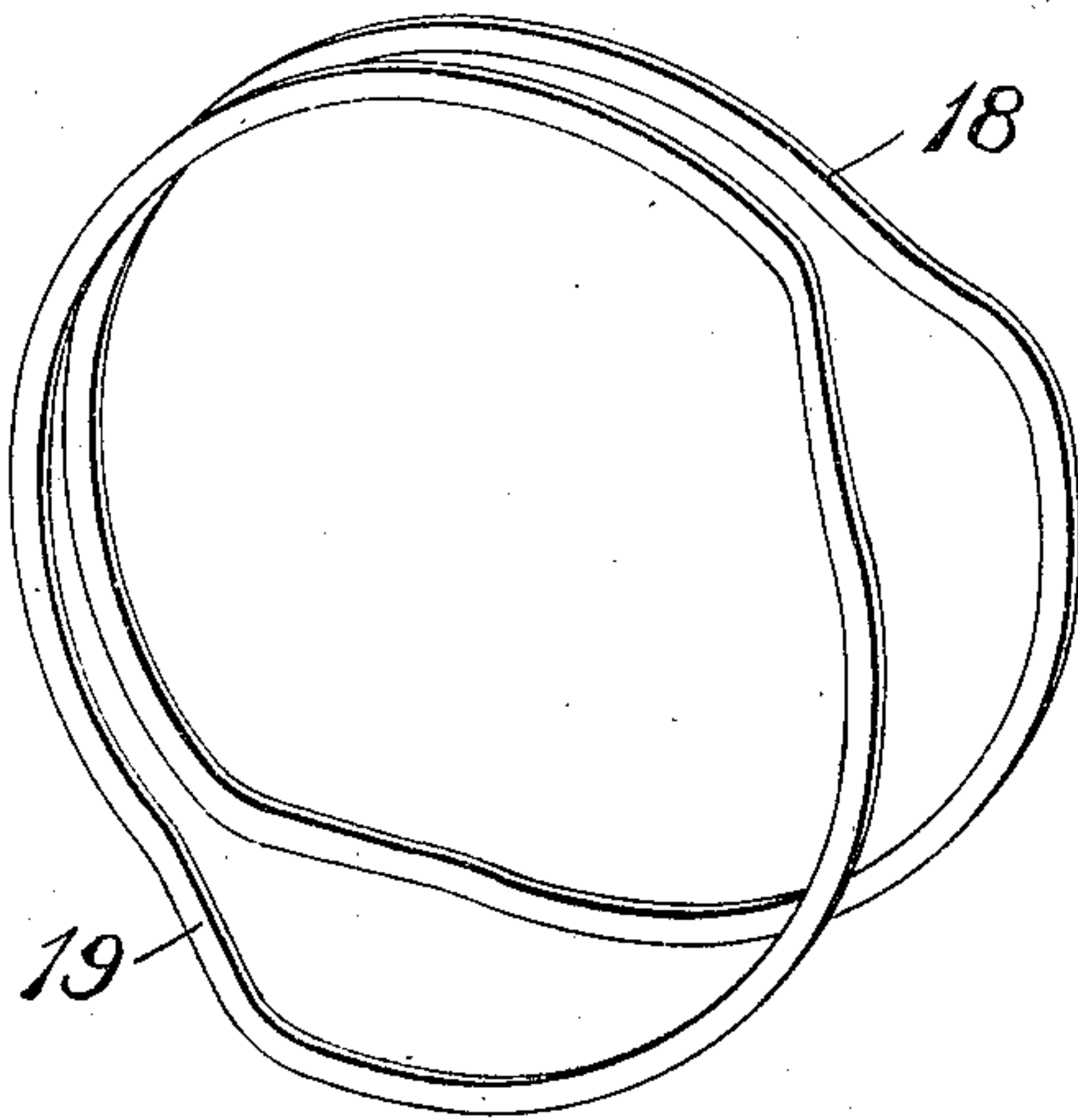


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER MCCARTHY, OF NEW YORK, N. Y.

AERONAUTICAL MACHINE.

No. 844,172.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed March 17, 1906. Serial No. 306,510.

To all whom it may concern:

Be it known that I, ALEXANDER MCCARTHY, a citizen of the United States, residing at the city, county, and State of New York, have invented certain new and useful Improvements in Aeronautical Machines, of which the following is a full, clear, and exact description.

My invention relates to apparatus for navigation of the air.

It is the object of my invention to provide a simple and compact apparatus which may be capable of the application of great power and be stable in equilibrium.

The operation of the machine is on the principle of power-driven rotating fans. The motor for supplying power may be of any suitable type.

The invention will be understood from an inspection of the accompanying two sheets of drawings in connection with the following specification.

Figure 1 is a side view of the machine embodying the principles of my invention. Fig. 2 is a horizontal section and plan view. Fig. 3 is a rear elevation and vertical section of the same. Fig. 4 is a detail diagrammatic view of a pair of cams for controlling one set of fans.

1 1 indicate sleeves, which constitute the main relatively stationary portions of the machine. All the parts are centered and supported by these sleeves.

2 indicates the main driving-shaft, having bearings in the sleeves 1 1 and which is rotated by any suitable motive power—as, for instance, the motor 3.

4 4 are large sprocket or gear wheels, carried by the shaft 2 and connected to the small sprockets or gears 5 5 in any suitable manner—as, for instance, by the chains 6 6.

7 is a shaft carrying the two sprockets 5 5 and also a small bevel-pinion 8.

9 is a second bevel-pinion meshing with pinion 8 and mounted on the lower end of the shaft of the lifting-propeller 10. The principal power for elevating the apparatus is obtained by the rotation of the propeller 10.

11 indicates a seat or platform for the operator.

12 indicates a rudder for controlling the direction of movement in a horizontal plane.

13 is a handle or tiller for the rudder, by means of which the operator may control it.

Upon the relatively stationary sleeves 1 1 are mounted rotating sets of fans for applying the power necessary to move the machine forwardly and at the same time assist in attaining and maintaining its elevation. 14 14 are the hubs of these fan-wheels, which are mounted directly on the sleeves 1 1.

15 and 16 indicate the side arms of a single fan, which are pivoted upon the hub 14, so that they may swing toward and away from each other in a plane passing through the axis of the hub, but will rotate with the hub.

17 indicates a suitable fabric—for instance, silk—which is carried by the side arms 15 and 16 and is capable of being folded up.

18 and 19 are stationary cams carried by the sleeve 1. These are supported by the sleeve in any suitable manner—for instance, by means of arms like the arm 20.

21 and 22 are grooved rollers carried by the side arms 15 and 16 of each fan, so that the side arms of the fan follow the periphery of the cams as the wheels are rotated.

23 is a pinion carried by the main shaft 2 and from which power is transmitted through the gears 24 and 25 to the gear 26 on the wheel-hub.

As the fan-wheels are rotated the fans are opened and closed in accordance with the shape of the cams 18 and 19. By this means great power may be applied through the medium of the surfaces of the fans for driving the machine, and since the fans are located on each side of the center of the machine its equilibrium is more readily maintained.

While the construction of the fans thus far described for some purposes may be satisfactory, I prefer to reinforce them.

27 27 indicate rods mounted in the manner of spokes in the hub 14 and immediately back of the fans.

28 28 indicate cross-bars at the end of the spokes 27 27, which provide guides for the ends of the fan-arms 15 and 16 and also for the rings 29, which are attached to the fabric of the fans.

30 30 indicate cross-bars also carried by the spokes 27 27, which guide and reinforce the side arms 15 and 16 of the fans adjacent their pivots.

31 31 indicate annular rings connecting the spokes 27 27 and reinforcing them, so that while the parts may be made light in weight they will withstand great pressure.

32 32 indicate light frames secured to spokes 27 27 for supporting the rear surfaces of the fans when they are in their extended and operative positions. The fabric of the fans may thus be made light in weight and yet withstand considerable pressure. The inner cams 18 18 serve in a certain sense as framework upon which parts of the mechanism may be supported. These cams may be connected by members, such as 33 and 34. (Shown in Fig. 2.) Any number of these connecting members may be employed, and the machine may be reinforced in other ways, if desired.

The dimensions of the machine may be varied, depending upon the load which it is designed to carry. For sustaining the weight of a single person the diameter of the fans should be approximately twelve feet. The points at which the fans open and close are controlled by the shape of the cams. In this manner a machine may be designed to have greater or less speed in the horizontal direction, depending upon the cam construction. Since the power of the machine in a vertical plane depends both upon the overhead propeller and the fan-wheels, the dimensions of the propeller and the shape of the cams are also in a sense interdependent. The location of the propeller causes the machine to be raised substantially in a straight vertical line, and the action of the fan-wheels is to move the machine forward in a substantially straight line. The rudder provides means for varying the horizontal direction, and the elevation may be controlled by the speed of the motor.

What I claim is—

1. In an aeronautical machine, an overhead propeller and two fan-wheels having folding blades, each blade provided with a rigid central rib.

2. In an aeronautical machine, an overhead propeller, two fan-wheels having folding blades, each blade provided with a rigid central rib and means for opening and closing the blades so as to simultaneously raise and advance the machine.

3. In an aeronautical machine, a pair of wheels on a horizontal axis and having folding fan-like blades, each blade provided with a rigid central rib.

4. In an aeronautical machine, a wheel mounted on a horizontal axis and having folding fan-like blades, each blade provided with a rigid central rib.

5. In an aeronautical machine, a wheel comprising a rotatable hub, a series of pairs of arms pivoted thereto, fabric carried between said arms and an arm secured to the said hub between each pair of pivoted arms.

6. In an aeronautical machine, a wheel

comprising a rotatable hub, a series of pairs of arms pivoted thereto, fabric carried between said arms, and spokes having cross-pieces reinforcing said arms.

7. In an aeronautical machine, a wheel comprising a rotatable hub, a series of pairs of arms pivoted thereto, fabric carried between said arms, spokes having cross-pieces reinforcing said arms, and frames carried by said spokes providing backing for said fabric.

8. In an aeronautical machine, a pair of relatively stationary sleeves, a main driving-shaft, fan-wheels mounted on said sleeves, carrying fan-blades, each blade provided with a rigid central rib, operative means for connecting said shaft and wheels, and cams carried by said sleeves for controlling the blades of said wheels.

9. In an aeronautical machine, a pair of rotatable wheels having folding fan-like blades, each blade provided with a rigid central rib and cams for opening and closing said blades.

10. In an aeronautical machine, an overhead propeller and two fan-wheels comprising hubs having folding blades, each blade comprising a pair of arms pivoted to the hub and a center arm rigidly secured to the hub, a cross-bar secured to the ends thereof, and a fabric secured to the pivoted arms and to the cross-bar.

11. In an aeronautical machine, an overhead propeller and two fan-wheels comprising hubs having folding blades, each blade comprising a pair of arms pivoted to the hub and a center arm rigidly secured to the hub, a guiding and supporting bar secured thereto engaging said pivoted arms, and a fabric secured to the pivoted arms.

12. In an aeronautical machine, an overhead propeller and two fan-wheels comprising hubs having fan-blades, each blade comprising a pair of arms pivoted on the hub, and a center arm rigidly secured to the hub, a plurality of guiding and supporting bars secured thereto engaging said pivoted arms, and a fabric secured to the pivoted arms.

13. In an aeronautical machine, an overhead propeller and two fan-wheels comprising hubs having fan-blades, each blade comprising a pair of arms pivoted on the hub, and a center arm rigidly secured to the hub, a plurality of guiding and supporting bars secured thereto engaging said pivoted arms, and a fabric secured to the pivoted arms and additional means carried by said rigid center arm for supporting the rear surface of said fabric.

ALEXANDER McCARTHY.

Witnesses:

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