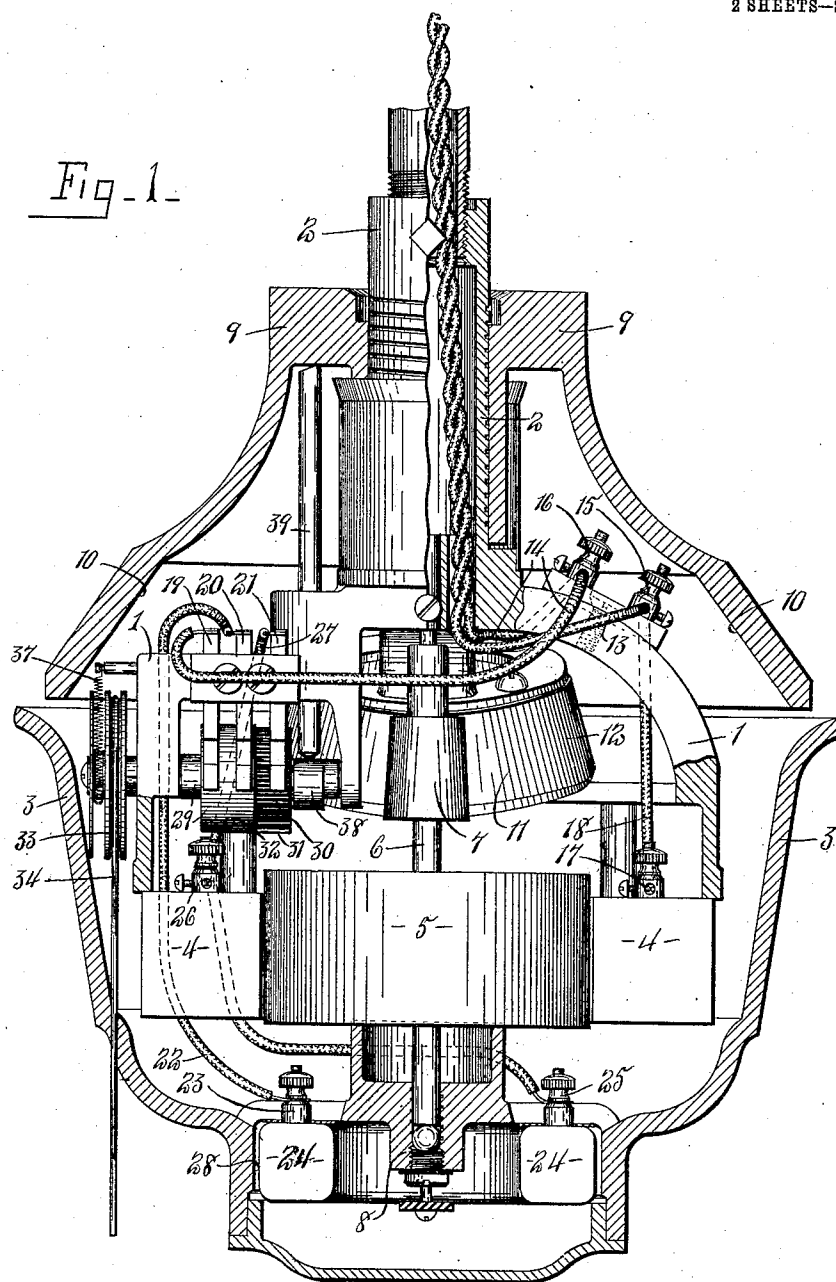


N. A. LOCKE.
ELECTRIC MOTOR FAN.
APPLICATION FILED JAN. 27, 1908.

939,723.

Patented Nov. 9, 1909.

2 SHEETS—SHEET 1.



WITNESSES:

Chas. Young,
J. Davis.

INVENTOR

Nathan A. Locke

BY

Arthur E. Parsons

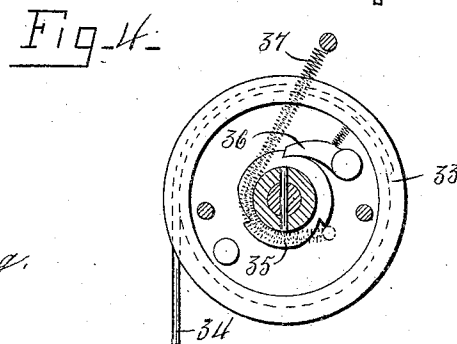
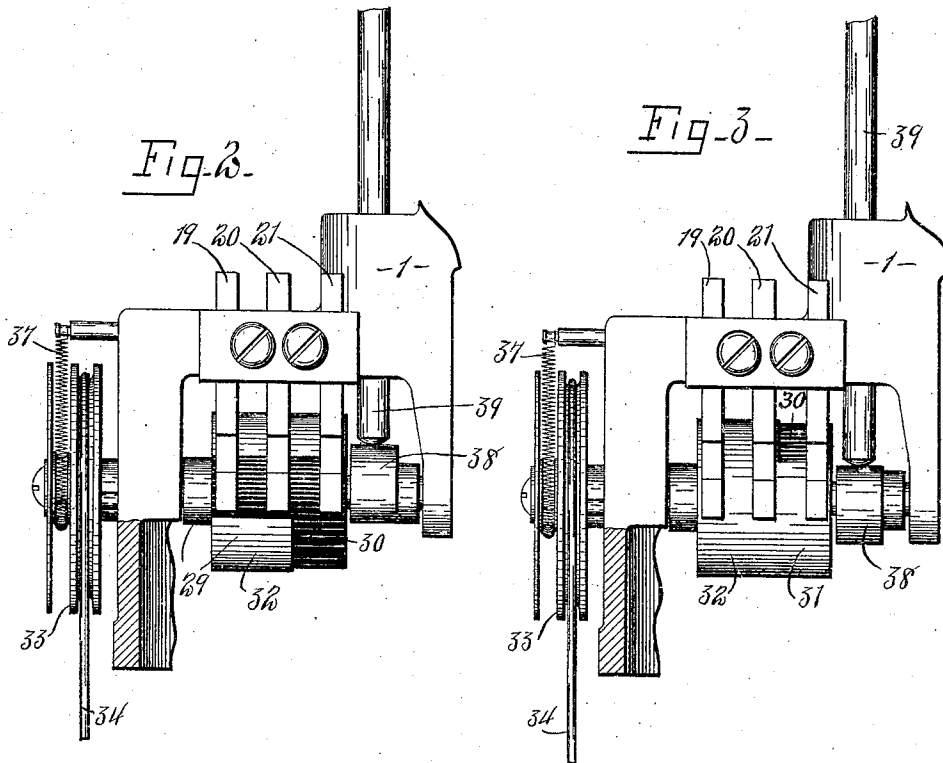
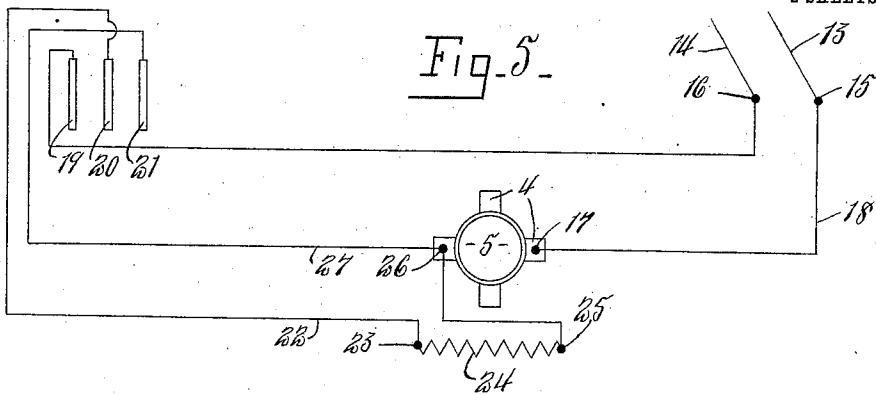
ATTORNEY

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UNITED STATES PATENT OFFICE.

NATHEN A. LOCKE, OF FULTON, NEW YORK, ASSIGNOR TO HUNTER FAN & MOTOR COMPANY, OF FULTON, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRIC-MOTOR FAN.

939,723.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed January 27, 1908. Serial No. 412,835.

To all whom it may concern:

Be it known that I, NATHEN A. LOCKE, of Fulton, in the county of Oswego and State of New York, have invented a certain new and useful Electric-Motor Fan, of which the following is a specification.

My invention relates to electric motor fans and particularly to means for controlling the speed of the motor; and to this end it consists in the combinations, constructions and arrangements hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is a longitudinal sectional view of my fan. Figs. 2 and 3 are detail views of the switch for controlling the operation of the motor and contiguous parts, the switch and parts operated thereby being shown in different positions. Fig. 4 is a detail view of the operating member. Fig. 5 is a diagram of the electric connections of the motor.

1 is the frame of the motor-fan. Said frame may be of any desirable form, size and construction and is here shown as provided with a central tubular part 2 by which the fan is suspended from the ceiling.

3 is a casing secured to the end of the frame 1 and inclosing the lower end of the frame, and mechanism supported thereby. The upper end of this casing 3 is open.

4 are the windings of the motor; and 5 is the rotary armature carried by a vertical shaft 6 having a driving wheel 7 thereon above the armature. The lower end of this shaft is arranged in a step 8 formed in the casing, and the upper end thereof is suitably journaled in a bearing in the frame 1.

9 is the hub of a vane-wheel rotatable about the tubular part 2 and movable axially thereon, said hub being bell-shaped and forming a closure for the open end of the casing 3, and being provided with an internal annular engaging face 10 at its lower end.

11 is an intermediary power-transmitting wheel engaging the driving wheel 7 and said face 10, this intermediary being carried by the frame 1 and provided with a leather or fibrous friction-band 12. Said intermediary bears the strain of the vane-wheel when the fan is in operation, and to avoid burning of

this band by the wheel 7, which is liable to become hot after continued use, relative movement of the vane-wheel and frame 1 is provided for. As here illustrated, the vane-wheel is shown as movable axially to relieve the intermediary of the strain thereof by means hereinafter described.

13 and 14 are electric wires or conductors connected to the windings of the motor, the wires extending through the hollow central part 2 of the frame 1. Said wires are connected, respectively, to binding-posts 15 and 16 carried by the frame 1, and one of these binding-posts, as 15, is connected to one binding post 17 of the motor by the wire 18. The other binding-post 16 is connected to one of a plurality of terminals 19, 20 and 21, as the terminal 19. The second terminal 20 of the plurality of terminals is connected by a wire 22 to one binding-post 23 of a resistance coil 24, the other binding-post 25 of the resistance coil being connected to the other terminal 26 of the motor. The third terminal 21 of the plurality of terminals is connected by a wire 27 to said other binding-post 26 of the motor. The resistance coil 24 is here shown as located in a recess 28 formed in the lower end of the casing 3. The terminals 19, 20 and 21 are here shown as flexible strips or brushes arranged in a row.

The means for controlling the operation of the motor comprises a switch rotatable successively in one direction. Said switch is supported by the frame 1 and consists of a rotatable element 29 journaled in the frame, and conductors carried by, and insulated from, said element, the conductors being of different lengths in the direction of the axis of said element, and the longest conductor being designed to make contact with all of the plurality of terminals, and the short conductor to make contact with one less than the longest. In the illustrated embodiment of my invention, as there are but three terminals the longest conductor of the switch is designed to make contact with the first and third, while the shortest to make contact with but the first and second, cutting out the third. As here shown, a drum 30 of insulating material is fixed on the element 29, and the conductors of the switch are preferably made integral and formed of a plate extending circumferentially partly around the drum, the ends of the plate being spaced

apart, and said plate having portions thereof, as 31 and 32 of different widths, these portions constituting the conductors of the switch.

5 An oscillating operating member 33 is mounted on the element 29, said member being here shown as a pulley operated by a cord 34 and connected to the element by a suitable clutch mechanism comprising a
10 ratchet wheel 35 carried by the rotary element, and a pawl 36 carried by the pulley. A spring 37 returns the operating member to its starting position after each operation thereof, by the cord. Said rotary element
15 29 is also provided with a cam 38 which actuates a vertically slidable rod 39, the lower end of which rides on the cam 38, and the upper end of which engages the hub of the vane-wheel near the axis thereof, this cam
20 being so arranged relatively to the conductors of the switch that it will raise the vane-wheel off the intermediary 11 when the conductors of the switch and terminals of the circuit are in position to break the circuit.
25 Said cam and rod form means between the switch and vane-wheel for moving the vane-wheel toward and from the frame 1.

In operation, when the switch is in position so that the terminals 19, 20 and 21 do
30 not engage the conductors 31 and 32, the circuit is broken and the vane-wheel raised by the cam. Upon the first pull of the cord the longest conductor 32 is brought into contact with all of the terminals 19, 20 and 21,
35 and to those skilled in the art it will be understood that the current passes directly through the motor, and the vane-wheel is rotated at full speed. A second pull of the cord will bring the shorter terminal 19 in
40 contact with the terminals 19 and 20, cutting out the terminal 21 so that the current passes through the resistance coil, and a lower speed of the vane-wheel obtained. A third pull of the cord brings the drum into such
45 a position that the terminals rest on the drum between the conductors 31 and 32. When the drum is approaching the last-mentioned position, the vane-wheel is being raised by the cam 38.

50 What I claim is:—

1. In a motor-fan, a frame, a vane-wheel, one of said parts being movable toward and from the other, a motor, and power transmitting means supported by the frame and
55 interposed between the motor and the vane-wheel, a switch for controlling the operation of the motor, and means movable with the switch for moving one of said parts toward and from the other, substantially as
60 and for the purpose described.

2. In a motor-fan, a frame, a vane-wheel, one of said parts being movable toward and from the other, a motor, power transmitting means supported by the frame and inter-
65 posed between the motor and the vane-wheel,

a switch for controlling the operation of the motor, and means movable with the switch for moving one of said parts toward and from the other, the latter means comprising a rotatable cam, substantially as and
70 for the purpose specified.

3. In a motor-fan, a frame, a vane-wheel, one of said parts being movable toward and from the other, a motor, and power transmitting means supported by the frame and
75 interposed between the motor and the vane-wheel, a switch for controlling the operation of the motor, and means movable with the switch for moving one of said parts toward and from the other, the latter means
80 comprising a rotatable cam and a rod having one end engaging the cam and the other end engaging the relatively movable part, substantially as and for the purpose set forth.

4. In a motor-fan, a frame, a vane-wheel, one of said parts being movable toward and from the other, a motor, and power-transmitting means supported by the frame and
90 interposed between the motor and vane-wheel, a switch for controlling the operation of the motor, and means operated by the switch for moving one of said parts toward and from the other, substantially as
95 and for the purpose set forth.

5. In a motor-fan, a frame, a vane-wheel, one of said parts being movable toward and from the other, a motor and power-transmitting means supported by the frame and
100 interposed between the motor and vane-wheel, a rotatable switch for controlling the operation of the motor, and means operated by the switch for moving one of said parts toward and from the other, comprising a
105 cam rotatable with the switch, substantially as and for the purpose specified.

6. In a motor-fan, a frame, a vane-wheel, one of said parts being movable toward and from the other, a motor and power-transmitting means supported by the frame and
110 interposed between the motor and vane-wheel, a rotatable switch for controlling the operation of the motor, and means operated by the switch for moving one of said parts relatively to the other, said means comprising
115 a cam rotatable with the switch, and a rod having one end engaging the cam and the other end engaging the relatively movable part, substantially as and for the purpose described.

7. In a motor-fan, a frame, a vane-wheel, one of said parts being movable relatively to the other, a motor and power-transmitting connections supported by the frame and
125 interposed between the motor and the vane-wheel, two terminals in circuit with the windings of the motor, a switch comprising a rotatable element, a conductor carried by, and insulated from, the rotatable element and designed to be moved into and out of
130

contact with said two terminals, and a cam mounted on the rotatable element for moving the relatively movable part, substantially as and for the purpose set forth.

5 In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Fulton, in the county

of Oswego, in the State of New York, this 3d day of April, 1907.

NATHEN A. LOCKE.

Witnesses:

J. C. HUNTER,
FRED. E. CHUBB.