

(No Model.)

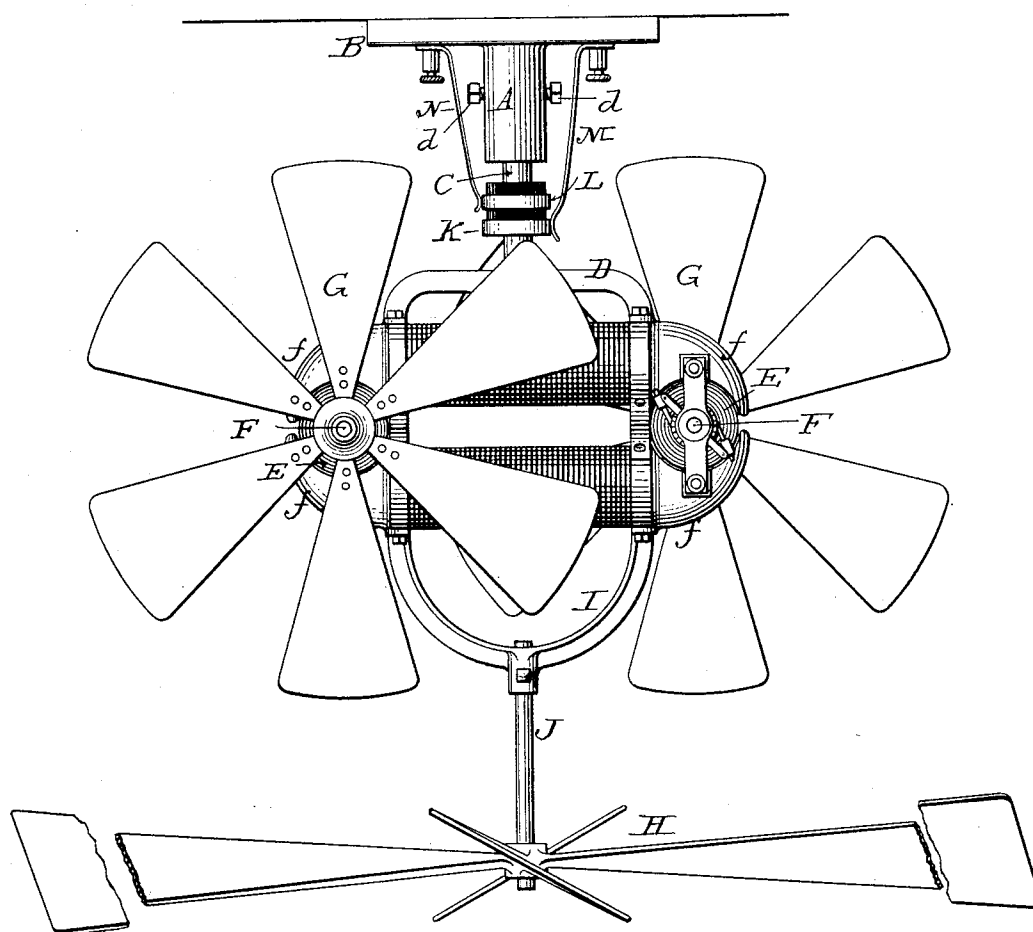
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J. L. KETCHER.
ELECTRIC FAN MOTOR.

No. 532,789.

Patented Jan. 22, 1895.

Fig. 1.



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Witnesses
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Fig. 2.

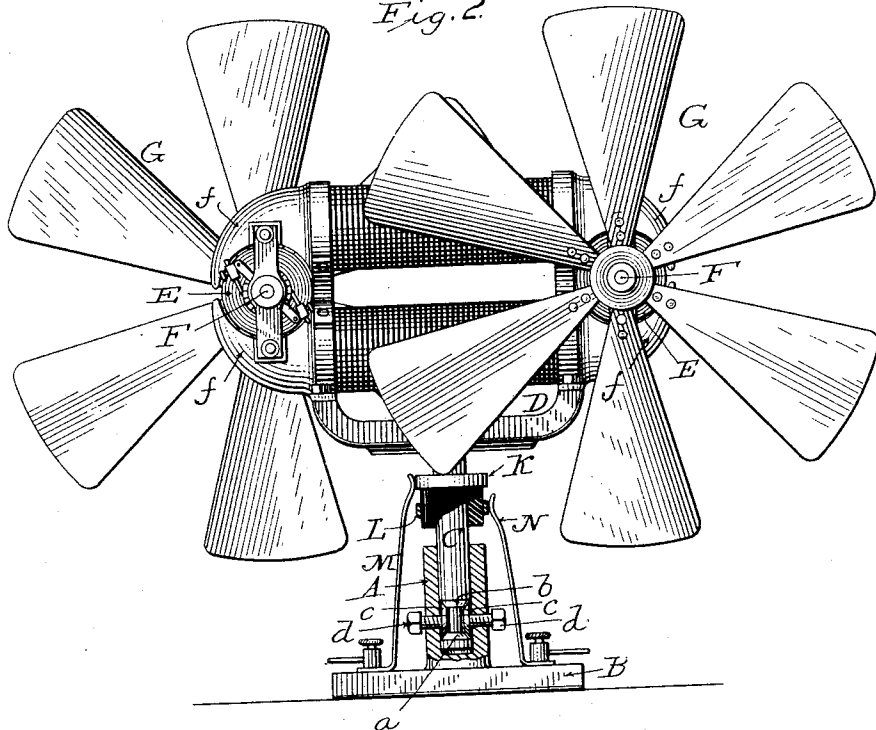
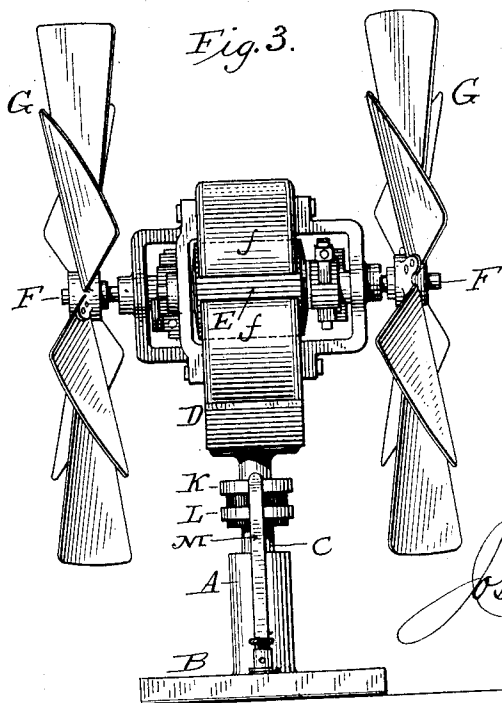


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH L. KETCHER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-THIRD TO
WILLIAM L. BEADNELL, OF SAME PLACE.

ELECTRIC-FAN MOTOR.

SPECIFICATION forming part of Letters Patent No. 532,789, dated January 22, 1895.

Application filed April 26, 1894. Serial No. 509,101. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. KETCHER, a subject of the King of Sweden and Norway, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric-Fan Motors, of which the following is a specification.

My invention relates to electric fans and fan motors, and consists in various novel features, details and combinations hereinafter set forth.

The accompanying drawings illustrate my invention and will facilitate an understanding of the description following.

Figure 1 is an elevation of a ceiling fan embodying the several features of novelty in which my invention resides. Fig. 2 is a face elevation, and Fig. 3 an end elevation of a table fan embodying certain of said novel features.

The primary object of my invention is to so construct and arrange a fan or fans as to effect a wide and general distribution of the air currents throughout the space surrounding the fan. This object is best attained by the use of a fan, the blades of which move in a horizontal path or plane, the blades of the fan being set more or less obliquely, as found expedient. Such a fan may be suspended from a ceiling, or carried upon a pedestal of suitable height, as found convenient in any given case,—both arrangements being common at the present time. Another efficient plan for effecting thorough distribution of the air currents is by employing a fan, the blades of which are arranged in a vertical plane, but which fan as a whole travels about a vertical stem or pivot, so as to face all points in the horizon in succession. So far as I am aware, no one has hitherto combined these two plans, and such combination is involved in and constitutes a prominent feature of my invention. By thus uniting the two fans or sets of fans I am enabled to effect rotation of one by utilizing force that would otherwise be wasted.

Referring again to the drawings, and first to Fig. 1, A indicates a tubular neck, projecting from a base plate B, which is adapted to

be secured to a ceiling, or to rest upon a table or other support, according as it is desired to suspend the fan, or to support it from below.

C indicates a stem or spindle, fitting nicely within the tubular neck A, and reduced in diameter at a point within said neck, to form shoulders *a* and *b*. Within the neck A, and with their edges in contact with one or the other of the shoulders *a*, *b*, are antifriction rollers, *c*, the axles for which are formed by the ends of screws *d* passing through the walls of neck A, as shown in Fig. 2. When the fan is suspended, the shoulder *a* rests and travels upon the rollers,—but when used as a table or pedestal fan, the shoulder *b* becomes the sustaining shoulder.

By the simple arrangement thus described I am enabled to use the fan in either position at will, and in both cases rotation of stem C is free and not impeded by undue friction.

Firmly secured to or formed integral with the stem C, is a frame D, constituting the field cores and pole pieces of an electro-motor, which is preferably made with two sets of pole pieces *f*, as shown in Figs. 1 and 2. The purpose of giving this form to frame D is to adapt it to receive two rotatable armatures E, E, one at either end of the frame.

It is of course understood that the frame D will consist in whole or in part of magnetic material,—advisably soft iron, as is usual in the construction of electric motors of this general type. The armatures are journaled in suitable bearings or supports, and furnished with the customary commutator cylinders, brushes, &c., which require no detailed description. When two armatures are employed it will be found advantageous to so construct the frame D that the portions lying on opposite sides of the plane of stem C shall be alike in form and dimensions, or that the frame shall at least be balanced, in order that there may be no tendency to tip and bind in the tubular neck. This balancing of the frame is quite important, in that it permits the entire structure to rotate freely and easily about the axis of stem C, upon the application of very little force.

While I have represented and prefer to em-

ploy two armatures, I do not mean to restrict or limit myself thereto, as it will be convenient in some cases to use only one,—or again, to employ several.

5 Upon the shaft F of each armature employed, I mount a fan G, with obliquely set blades, said fans being of any usual pattern and of dimensions suited to the particular use contemplated. Where two fans are to be
10 employed, I extend the two armature shafts F from opposite sides of frame D, and place the fans G upon such extensions, or upon opposite sides of said frame, as clearly illustrated in Figs. 1 and 2. This arrangement
15 of the fans will obviously cause the frame D as a whole to rotate about the axis of stem C, as the fans rotate about their axes, in essentially the same manner as is at present done by a single fan set to one side of the axis of
20 a pivot stem. It will be observed, however, that owing to the balancing of the motor and its fans, there is little or no lateral pressure of the stem C against the interior of tubular neck B, and the motor will travel far more
25 freely about its pivotal support than would otherwise be the case. This freedom of rotation is of particular importance in connection with the employment of a horizontal fan, H, to supplement the action of fans G, G, since
30 the fans G afford the only power employed to rotate the fan H.

As shown in Fig. 1, a yoke I is bolted or otherwise made fast to frame D, and this yoke is furnished with a rod or staff J, upon which
35 is secured the large horizontal fan H. The rod J is advisably made adjustable in yoke I, to enable the elevation of fan H to be varied as required.

It will be apparent from what has already
40 been said, that if the motor D be duly supplied with electric current suited to the winding thereof, its armatures will rotate rapidly, causing fans G, G, to turn with them, and said fans acting upon the air will drive it
45 forward or from them, producing strong currents and effecting a considerable agitation and circulation of the air. As the frame D is free to rotate about its axis, however, the reaction of the fans G will cause the entire
50 motor to turn about said axis, and in doing so, to impart like motion to fan H. By properly proportioning the various parts, the several fans can be given their appropriate speeds, and a high degree of efficiency will be
55 attained.

To enable the electric current to be delivered to the motor while the latter is bodily rotating I provide the insulated rings K, L, and contact brushes M, N, common to such
60 situations, the conductors being led from the rings to the field coils and armature brushes in the well known way.

As stated, the fan or structure represented in Fig. 1 may be employed either in the position indicated, or in an inverted position.
65

If desired, the fan H may be omitted, and

in many cases such omission will be desirable.

In the drawings I have represented one field common to both armatures. This construction is not only simple, but it insures like
70 action of the two armatures and of the two fans G, G, and is therefore quite desirable.

As above intimated, it is not essential to employ two fans G in all cases, though ordinarily preferable so to do; but whether the
75 motor be made with one or with two armatures, it is important that it be balanced upon its vertical pivot or support.

It is manifest that the pivot stem C may
80 be made tubular and the part A solid, or in other words that these parts may be reversed in construction,—but I prefer the plan shown.

Having thus described my invention, what I claim is—
85

1. The herein-described air-propelling apparatus, consisting of an electro-motor, a vertical pivot or support therefor, a horizontal fan connected and rotatable with the motor, and a vertical fan carried by the armature
90 shaft of the motor and serving to turn said motor and the horizontal fan bodily about the pivot axis of the motor.

2. In combination with an electro-motor having a horizontal armature shaft and a vertical pivot, a horizontal fan secured to and
95 rotatable with the motor frame, and a vertical fan mounted upon the armature shaft and serving to rotate the motor frame and the horizontal fan.

3. In combination with a suitable standard or support, an electro-motor pivotally mounted therein, and provided with two rotatable
100 armatures, a fan applied to the shaft of one armature and arranged to face outward from one side of the motor, and a second fan applied to the shaft of the other armature and arranged to face outward from the other side of the motor,—whereby the entire structure is
105 balanced upon its pivot and caused to rotate by the fans.

4. In combination with a tubular neck or stem A, a motor provided with a pivot-stem C to enter said neck, and antifriction rollers arranged between shoulders on said pivot
115 stem substantially as shown, whereby it is relieved of undue friction and retained in place.

5. In combination with an electro-motor having a pivotal stem, an invertible support
120 therefor, and an antifriction coupling or connection between the stem and the support substantially such as described, whereby the motor is adapted to be supported from below or suspended from above at will, and to rotate
125 freely about its stem in both positions.

In witness whereof I hereunto set my hand in the presence of two witnesses.

JOSEPH L. KETCHER.

Witnesses:

D. S. HOTALING,
GEO. W. SHORT.