

No. 804,606.

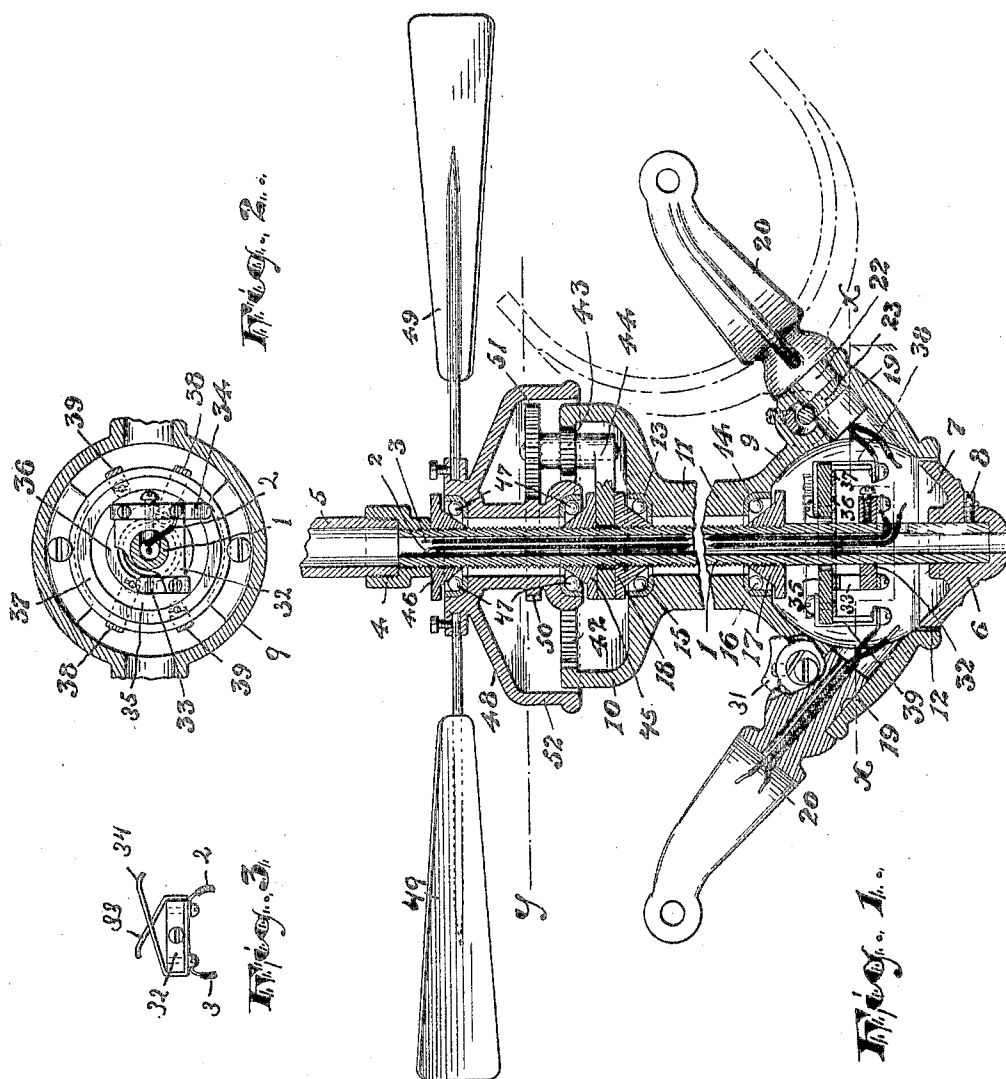
PATENTED NOV. 14, 1905.

G. E. JACOBSON.

MOTOR FAN.

APPLICATION FILED OCT. 24, 1904.

5 SHEETS—SHEET 1.



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5 SHEETS—SHEET 2.

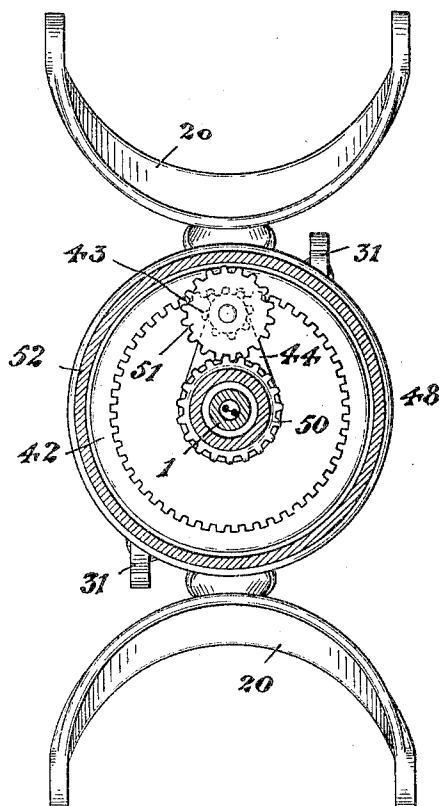


Fig. 4.

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5 SHEETS—SHEET 3.

Fig. 5.

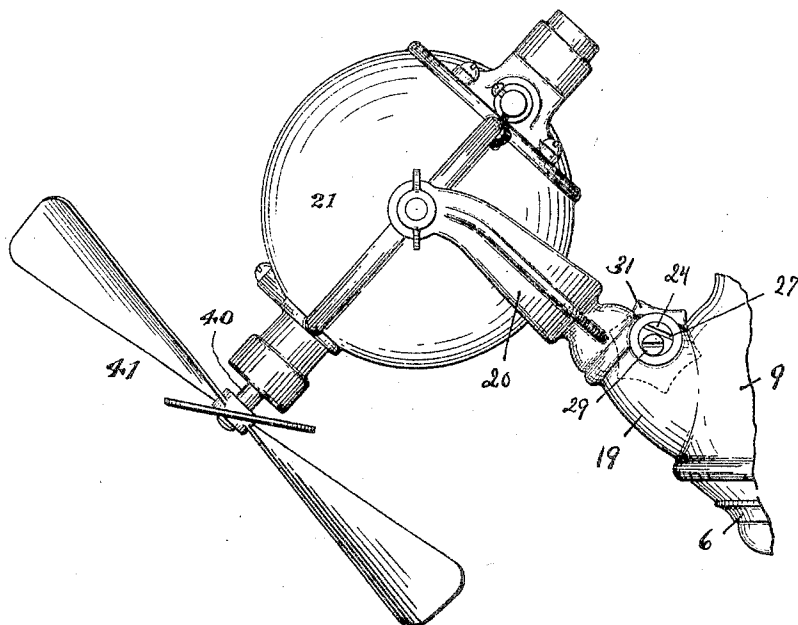


Fig. 6.

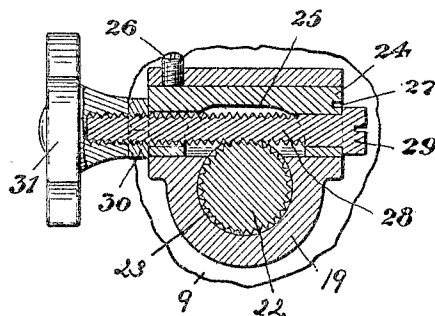
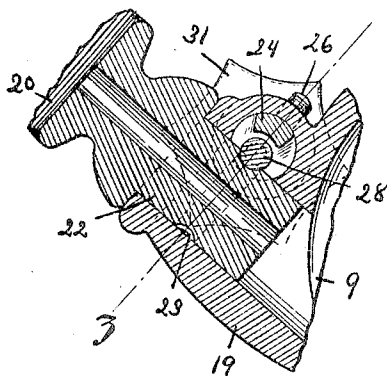


Fig. 7.

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5 SHEETS—SHEET 4.

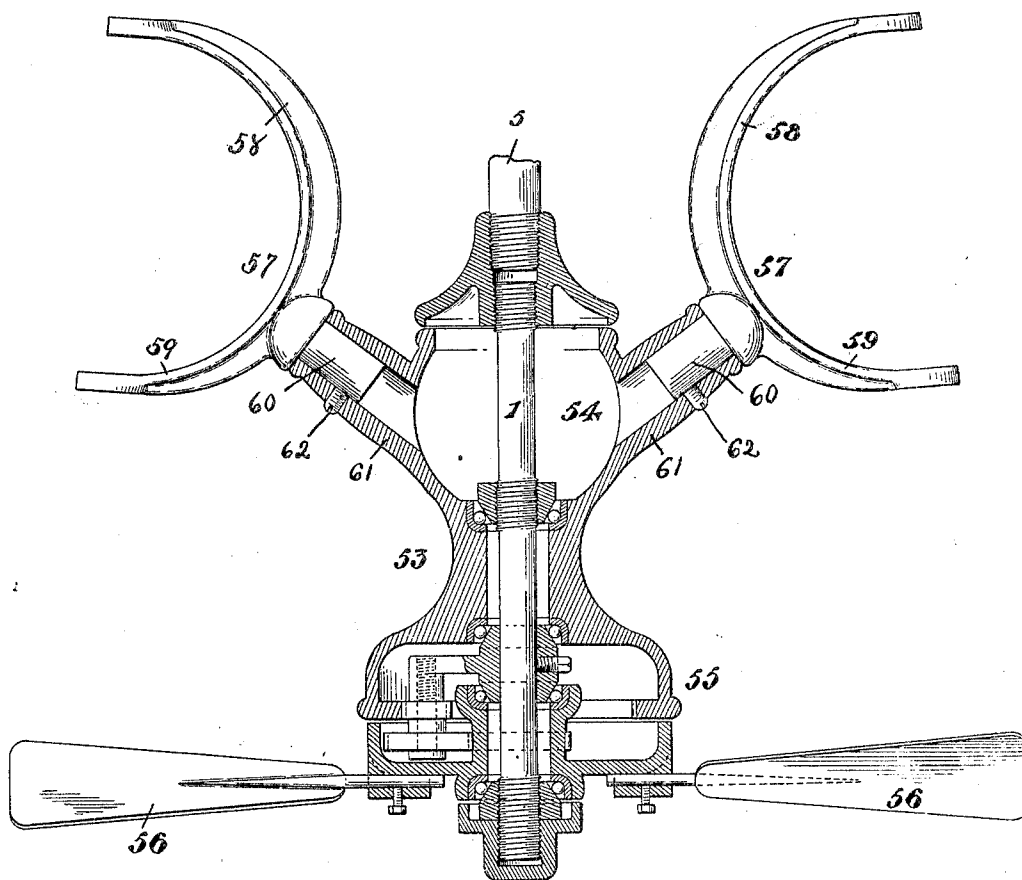


Fig. 8.

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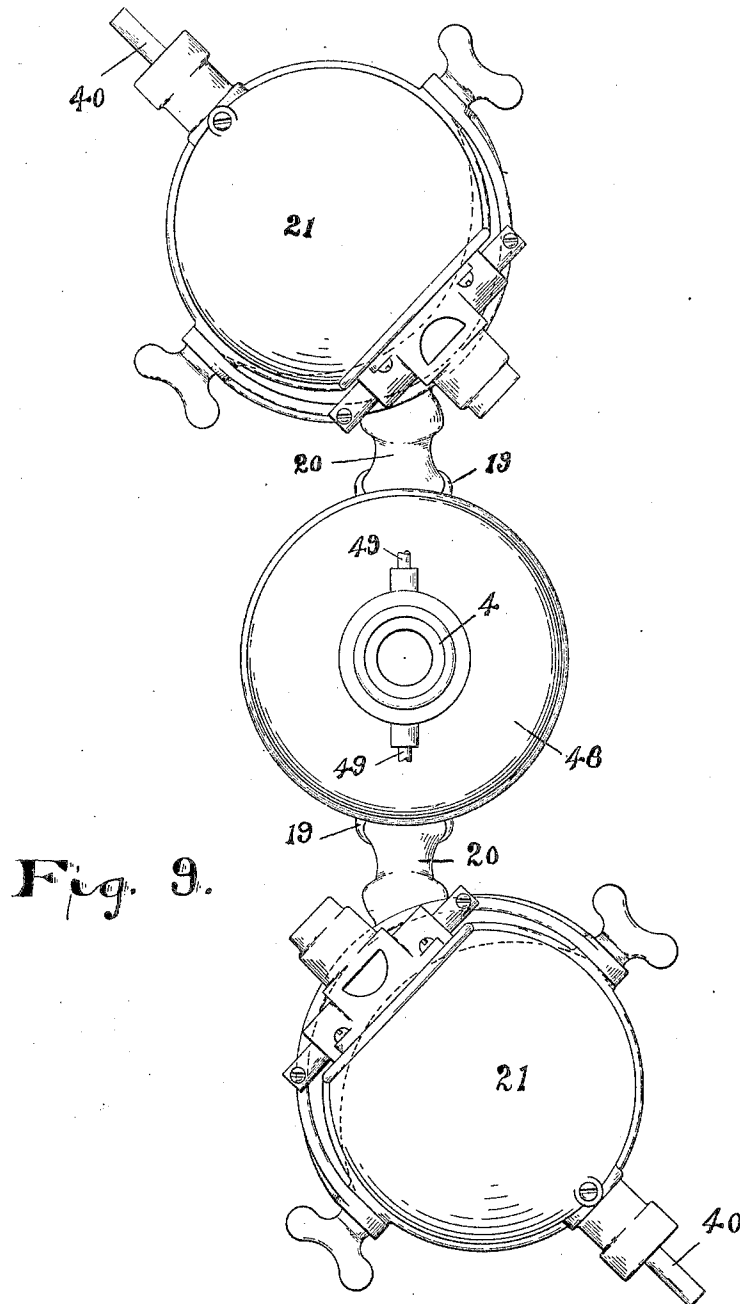
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5 SHEETS—SHEET 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

GUSTAV E. JACOBSON, OF NEWARK, NEW JERSEY, ASSIGNOR TO ESSEX ELECTRICAL COMPANY, A CORPORATION OF NEW JERSEY.

MOTOR-FAN.

No. 804,606.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed October 24, 1904. Serial No. 229,752.

To all whom it may concern:

Be it known that I, GUSTAV E. JACOBSON, a subject of the King of Sweden and Norway, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Motor-Fans; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of fans represented by my prior application, Serial No. 124,129, filed September 20, 1902, and allowed May 6, 1904, the objects of the present improvements being to secure better means for adjusting the individual fans and their motors, to provide improved brake-fans and mechanism for driving the same, to secure a simple and easy-running construction throughout, to obtain an improved manner of wiring, and to secure other advantages and results, some of which may be hereinafter referred to in connection with the description of the working parts.

The invention consists in the improved compound motor-fan and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like figures of reference indicate corresponding parts in each of the several figures, Figure 1 is a vertical central sectional view of my improved motor-fan. Fig. 2 is a horizontal section of the same upon line *x x*, Fig. 1, looking in the direction indicated by the arrow. Fig. 3 is a detail view, in side elevation, of certain brushes and their supports. Fig. 4 is a section upon line *y*, Fig. 1. Fig. 5 is a side elevation of one of the arms of my improved motor-fan, an individual motor being mounted therein with its fan. Fig. 6 is a central longitudinal section of one of the arms of my improved motor-fan, showing the means for adjusting the individual motor supported thereby. Fig. 7 is a transverse section of the same upon line *z*, Fig. 6. Fig. 8 illustrates in vertical central section a modified form of construction, the wiring, however, being the same, and therefore not shown.

Fig. 9 is a plan of my improved fan, illustrating the arrangement of the motors to secure rotation.

In said drawings, 1 indicates the axial supporting-rod of my improved fan, said rod being tubular to carry wires 2 3, through which suitable current is applied to the motor. At its upper end said rod 1 is connected, as by a coupling 4, with a support 5 of any suitable construction, from which the fan may depend. At its lower end the rod 1 carries an end piece 6, preferably forming at its upper side a cup 7 and being clamped in place by a set-screw 8. Upon the said rod 1 is mounted the body portion of my fan, comprising a hollow casting having an enlarged globular lower portion 9, an enlarged annular upper portion 10, and a constricted middle portion 11. The said globular lower portion is provided at its lower end with an aperture 12, adapted to receive the cap 6 upon the supporting-rod, and at the upper and lower ends of the constricted portion 11 are seats 13 14 for antifriction-balls 15 16, respectively. The supporting-rod 1 is for a portion of its length threaded and at the lower part of said threaded portion receives cones 17 18 to engage the said balls 15 16, so that the body portion is mounted to rotate with ease upon the supporting-rod.

The lower globular part 9 of the body portion provides at diametrically opposite points upwardly and outwardly inclined sockets 19 19, adapted to each receive and rotatably support an individual motor-carrying arm 20, which arm is bifurcated to receive a motor 21, said motor being preferably of the improved construction shown in a copending application, Serial No. 217,964, filed July 25, 1904, by Charles Anderson and myself. Any other motor adapted to the purposes could, however, be employed, if desired. The inner or lower end of each arm is reduced; as at 22, to enter the said socket 19 and turn therein, so that the motors can be brought into such position that the lines of their fan-shafts extended pass on opposite sides of the central supporting-rod 1, as is shown in Fig. 9 of the drawings and fully set forth in my prior application, Serial No. 124,129, above referred to. To effect such turning of each arm 20, its reduced portion 22 has an annular groove 23, threaded to form what is essentially a worm-wheel and being adapted to receive tangentially a transverse worm or screw shaft 28. Said screw-

shaft, for convenience in assembling the device, is preferably mounted eccentrically in a cylindrical carrying-piece 24, recessed at its middle portion 25 to expose the screw or worm 5 to its worm-wheel 23. Said carrier 24 is normally held in position to bring the worm and worm-wheel into engagement by means of set-screw 26, but, if desired, can be turned out of such position by means of a screw-driver 10 inserted into the slot 27 at its end, when the screw 28 can be readily removed. Preferably said screw is headed at one end, as at 29, and at the other end receives a nut 30 and turning handle 31 as a locking-nut in order 15 to secure simplicity of construction. By turning said handle, therefore, the arm 20 and its individual motor-fan are adjusted.

For conducting the electric current from the wires 23 to the respective motors I have arranged upon the center rod 1, within the globular part 9 of the body portion, a block of insulation 32, carrying brushes 33 34, one connected with each of the electric wires. Said brushes are of different length and adapted to 25 engage each at its extremity an annular contact-piece secured horizontally upon an insulating-block 35, supported on the body portion. One of the contact-rings, as 36, is connected, as by binding-posts 38 38, with wires 30 leading to the individual motors, while the other ring 37 is connected, as by binding-posts 39, with the other wires returning from said motors. Thus as the motor-fan revolves the individual motors are always in connection 35 with the electric current.

While I prefer the means above described, it is obvious that other well-known constructions adapted to subserve the same purpose could be employed if desired.

40 It will be understood that each individual motor 21 has its fan-shaft 40 at right angles to its line of journaling in the forked arm 20 and that the end of said shaft carries the buzz-fan 41, as set forth in my prior application, 45 Serial No. 124,129, above referred to.

The upper annular recessed part 10 of the body portion of my device provides an interior gear 42, adapted to engage a pinion 43, supported in the same plane therewith by 50 means of a bracket 44, projecting from the center rod 1. Said bracket is clamped between the upper cone 18 for the body portion and the lower cone 45 of an upper pair of cones 45 46, which provide bearings for the balls 47 47 of an auxiliary hub 48. Said hub 55 48 carries outwardly-projecting fan-blades 49, constituting a brake-fan, and at its lower portion provides an exterior gear 50, adapted to mesh with a second pinion 51, fast with respect to the pinion 43, described and on the 60 same shaft therewith. Preferably the said hub has a depending flange or skirt 52 to inclose the said gears and overreach the upper portion of the body part of the fan. It will 65 be thus understood that as the body portion

of the fan revolves it drives, by means of the gearing above described, the auxiliary hub 48 and rotates the fan carried thereby in an opposite direction. Furthermore, it will be noted that by the location of the brake-fans 70 above the individual motor-fans said brake-fans feed or supply air to the motor-fans beneath. Their own current is, however, broken up by the motor-fans, so that the space centrally below my entire device or the middle 75 of the cone marked out by the currents from the motor-fans is devoid of much agitation. For this reason I may sometimes employ the modified construction shown in Fig. 8, where a body portion 53 is shown mounted upon the 80 rod 1, carried by the support 5. This body 53 is of the same general formation as the one 11, before described, except that its upper and lower end portions are reversed in position—that is, the globular portion 54, which carries 85 the individual motor-fans, is uppermost and the annular enlargement 55 for the brake-fan gearing is at the bottom. The brake-fans 56 are thus located at the extreme lower part of the entire device, and thus the current of air 90 from them is directed straight downward axially of the cone outlined by the currents from the motor-fans and without any conflict therewith. In Fig. 8 I have also shown forks 57 for supporting the individual motor-fans, 95 which have one arm or branch, as 58, longer than the other, 59, so that a greater deflection of the shaft with respect to the axial supporting-rod of the fan as a whole can be secured. The reduced ends 60 of said forks are shown 100 rotatably seated in sockets 61 of the body portion and set-screws 62 provided to clamp them in any desired position.

Having thus described the invention, what I claim as new is— 105

1. In a motor-fan, the combination with a vertical supporting-rod, of a body portion rotatably mounted thereon and having enlarged top and bottom portions and a constricted middle part, individual fan-motors mounted 110 on one of said enlarged parts of the body portion, fans operated by said motors, an auxiliary hub rotatably mounted upon the said supporting-rod adjacent to the other enlarged part, brake-fans carried by said hub, and gear 115 means connecting said body portion and hub to rotate the latter.

2. In a compound motor-fan, the combination with a body portion providing opposite sockets, of individual fan-motor-carrying arms 120 rotatably mounted in said sockets and each having in said socket a worm-wheel, worms mounted transversely upon the body portion one to engage each worm-wheel, and means for turning said worms. 125

3. In a compound motor-fan, the combination with a body portion providing a socket, of an individual fan-motor-carrying arm having a reduced portion entering said socket and provided with a worm-wheel, a cylindrical 130

carrier mounted in the body portion transversely of said socket and being recessed at its side next said socket, a worm or screw mounted eccentrically in said carrier and adapted to engage the worm-wheel of the motor-arm, and means for turning both said carrier and worm or screw.

4. In a compound motor-fan, the combination of a supporting-rod, a body portion rotatably mounted on said rod, individual fan-motors and fans adjustably mounted on said body portion and adapted to rotate the same, brake-fans mounted upon said supporting-rod below said fan-motors, and means for transmitting motion from said body portion to said brake-fans.

5. In a compound motor-fan, the combination of a supporting-rod, a body portion rotatably mounted on said rod and having outwardly-branching sockets at one end part and an internal gear at its other end, individual fan-motors and fans adjustably mounted in said sockets of the body portion and adapted to rotate the body portion, a hub upon said

supporting-rod adjacent to the said geared end of the body portion and having an external gear, a pinion mounted on a fixed pivot between said gear of the body portion and said hub, brake-fans on said hub, and a skirt inclosing said gears and pinion.

6. In a compound motor-fan, the combination with a body portion providing a socket, of an individual fan-motor-carrying arm rotatably seated in said socket and provided therein with a worm-wheel, a screw adapted to engage said worm-wheel, means mounted on the body portion providing bearings for said screw and adapted to be turned to carry the screw out of engagement with the worm-wheel, means for turning said screw and a motor and fan mounted on said arm.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of October, 1904.

GUSTAV E. JACOBSON.

Witnesses:

CHARLES H. PELL,
RUSSELL M. EVERETT.