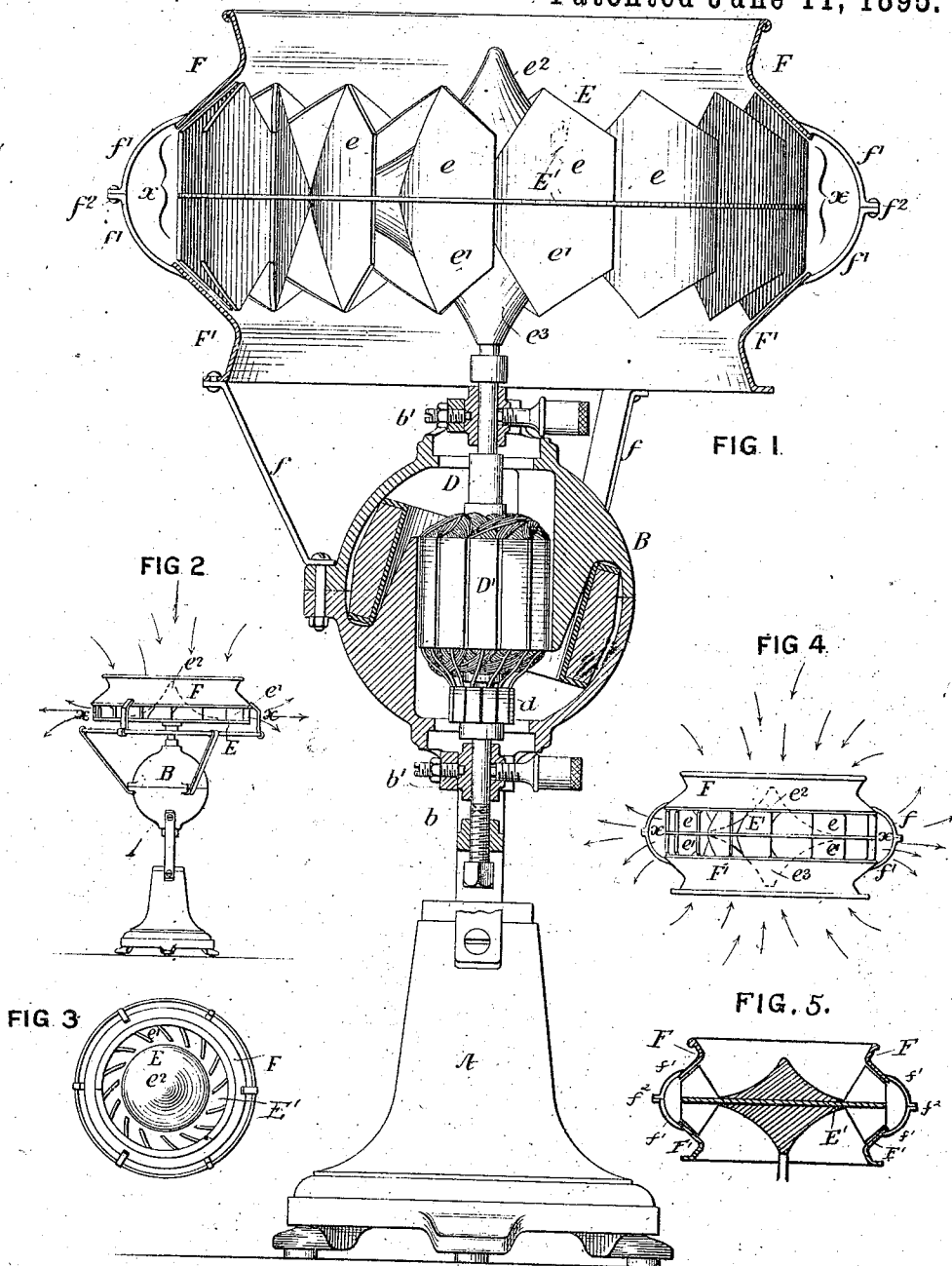


(No Model.)

H. G. MORRIS.
ELECTRICALLY DRIVEN FAN.

No. 540,999.

Patented June 11, 1895.



WITNESSES

F. D. Goodwin
William V. Carr

INVENTOR

Henry G. Morris

By his Attorneys

Mowson & Mowson

UNITED STATES PATENT OFFICE.

HENRY G. MORRIS, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICALLY-DRIVEN FAN.

SPECIFICATION forming part of Letters Patent No. 540,999, dated June 11, 1895.

Application filed February 9, 1894. Serial No. 499,867. (No model.)

To all whom it may concern:

Be it known that I, HENRY G. MORRIS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Electrically-Driven Fans, of which the following is a specification.

The object of my invention is to so construct a fan driven by an electric motor that circulation of air in a room will be more evenly maintained and the air will be distributed from the fan from all points of its circumference by centrifugal force.

In the accompanying drawings, Figure 1 is a vertical elevation of my improved electric fan, partly in section, this view illustrating a double fan. Fig. 2 is a side view, and Fig. 3 a plan view, illustrating a single fan. Fig. 4 is a diagram illustrating the action of the fan shown in Fig. 1; and Fig. 5 is a section on the line 5 5, Fig. 4.

Electric fans as usually constructed are mounted on a horizontal axis and a blast of air is thrown in one direction and within a limited space and when fans are mounted on vertical shafts the air is simply disturbed by an ordinary bladed fan and no distinct current is maintained, but by my invention I am enabled to form a distinct current of air to and from the fan at the same time distributing the air evenly throughout the room or apartment in which the fan is placed.

A is the base of the fan; B, the casing forming the field of the electric motor.

D is a vertical shaft mounted on a step *b* and in bearings *b'*.

D' is the armature.

c is the commutator.

It will be understood that any form of motor may be used which can be driven with the shaft upright and I have simply shown one form of motor in the drawings.

Mounted in the upper end of the shaft D is the centrifugal fan E consisting, in the present instance, of the central plate E' upon which are mounted the two sets of curved blades *e e'* one set above and the other set below the plate. Projecting above the plate is a central cone *e²* and projecting below the plate is a similar cone *e³*. Surrounding the upper portions of the blades *e* is a ring F and surrounding the lower portions of the blades *e'* is a ring F' this ring in the present instance

being mounted on brackets *f* secured to the body B of the motor and the ring F is secured to the ring F' by arms *f'* secured together by screws or bolts *f²*. Thus there is an annular outlet opening *x* between the rings F F' and the air is drawn into the fan through the rings so that the action of the fan is to draw the air into the center and throw it out by centrifugal force throughout the entire circumference of the fan, as clearly indicated in the diagram, Fig. 4.

A fan constructed as shown in Fig. 1, not only draws the air from the upper portion of the room and throws it out at the center, but will also draw the air from the lower portion of the room and throw it out at the center, causing the complete circulation of the air.

In Fig. 2, I have shown a single fan, that is, a fan only using the upper blades *e* and the upper cone *e²*, the action of this fan being to draw the air from the upper portion of the room only and throw it out by the centrifugal action of the fan.

It will thus be seen that if a number of persons are sitting at a table for instance each person will derive some benefit from the fan, whereas in a fan as ordinarily constructed the air is concentrated and thrown in one direction only.

I claim as my invention—

1. The combination in an electrically operated fan, of a base, an electric motor thereon, a vertical driving shaft, a disk on said shaft, a series of blades extending above and below the disk at its periphery, a ring inclosing a portion of each of the lower blades, and another ring inclosing a portion of each of the upper blades, said rings forming an annular space between them and the driven disk forming a deflector, substantially as described.

2. The combination in an electric fan, of the electric motor having a vertical shaft, a disk on said shaft, a series of blades on the disk, a tapered central hub, and a ring inclosing a portion of each blade and forming an annular space *x* between it and the disk so that the air will be drawn in at the center and distributed by centrifugal force through the said space *x*, substantially as set forth.

3. The combination in an electric fan, of the motor, its vertical shaft, a disk mounted on said shaft, curved blades on each side of said

disk, tapered hubs projecting at the center of the disk, a ring inclosing a portion of each of the upper blades, another ring inclosing a portion of each of the lower blades, said rings
5 forming an annular space between them so that the air will be drawn from each side of the fan and thrown out from the fan by centrifugal force, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY G. MORRIS.

Witnesses:

EDWIN C. FREEMAN,
WILLIAM A. BARR.