

(No Model.)

J. JEFFREYS.
FAN.

No. 594,206.

Patented Nov. 23, 1897.

Fig. 1.

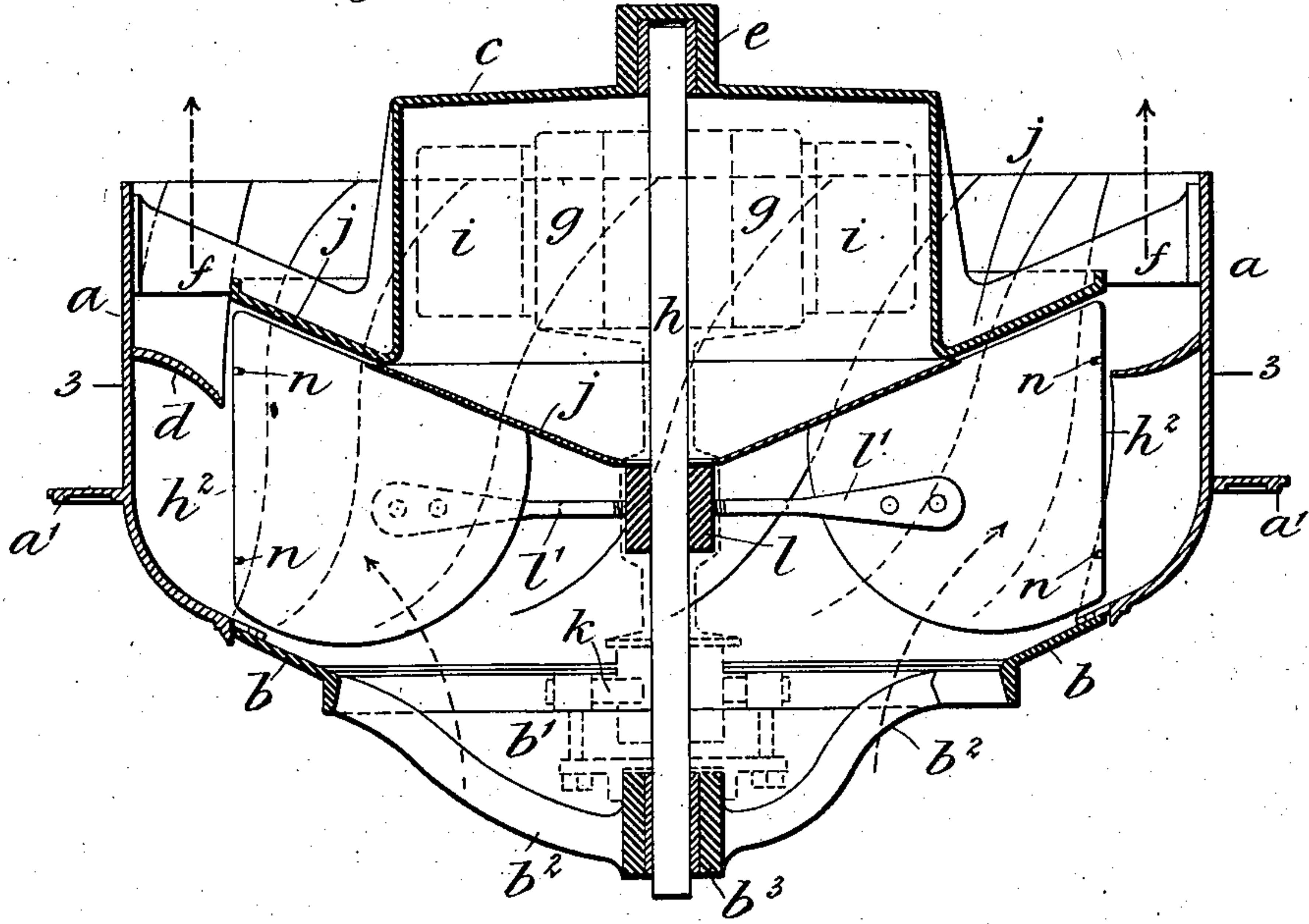


Fig. 3.

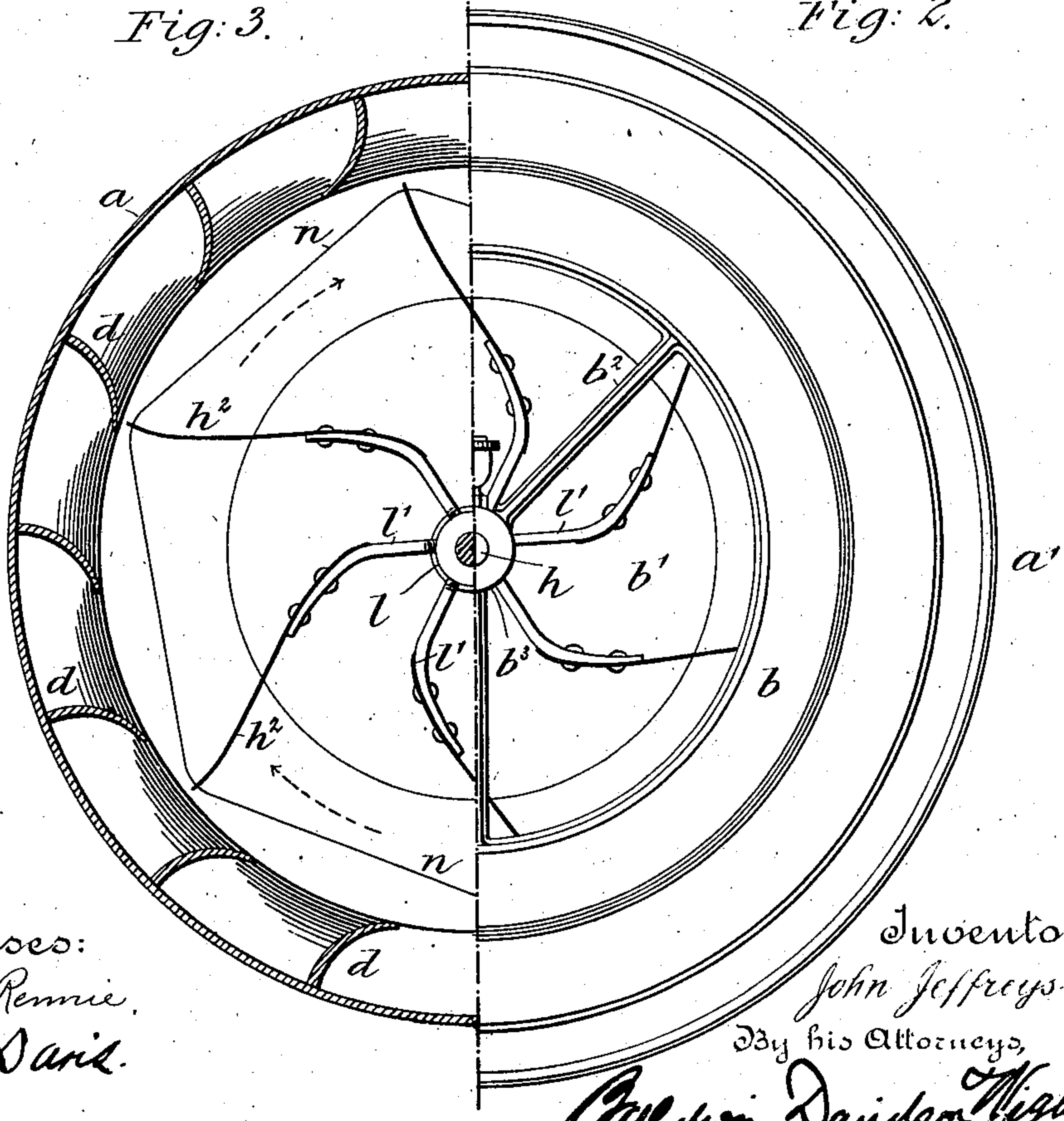


Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

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SPECIFICATION forming part of Letters Patent No. 594,206, dated November 23, 1897.

Application filed March 11, 1897. Serial No. 627,002. (No model.) Patented in England December 13, 1895, No. 23,921.

To all whom it may concern:

Be it known that I, JOHN JEFFREYS, heating and ventilating engineer, a subject of the Queen of Great Britain, residing at 11 Old Queen Street, Westminster, London, England, have invented certain new and useful Improvements in Fans, (for which I have received Letters Patent in Great Britain, No. 23,921, dated December 13, 1895,) of which the following is a specification.

This invention relates to a fan for forcing or exhausting air. It is especially suitable for use as a ventilating-fan. Within the case of the fan a number of spiral directing-blades are provided, surrounding the fly or revolving blades. The air enters around the axis of the fly and is driven by the fly into the channels formed for it by the stationary spiral blades. It is directed by these to an annular outlet, whence it issues in a direction parallel to the axis of the fly. When the fan is intended to be actuated by an electromotor, this motor is made an integral part of the fan, the armature being mounted upon the axis at the outlet end and being contained in a chamber formed in the cover of the fan-casing. Within this chamber the stationary or field magnets are also contained. The commutator is mounted upon the axis of the fan on the inlet side of the fly.

In the annexed drawings, Figure 1 is a section parallel to the axis, Fig. 2 is a half-elevation on the inlet side, and Fig. 3 is a half-section on the line 3 3, Fig. 1, of a fan in accordance with my invention.

The casing of the fan consists of three parts *a*, *b*, and *c*. The part *a* has a flange on it at *a'*, by which it is fixed to the wall of the chamber into which the air is to be forced or from which it is to be drawn. This portion of the casing carries the stationary spiral blades *d*. They pass partly around the interior of the casing, commencing near the inlet and terminating at the outlet. The part *b* of the casing is bolted to the part *a*, and in it is the inlet-aperture *b'*. It also has arms *b²*, which support the bearing *b³* of the fly-shaft. The part *c* of the casing forms a cover to the part *a*. It is connected to it by four or other number of arms, which are secured to the interior of the part *a* by bolts or otherwise. In this cover at *e* is a bearing for the other end of the fly-shaft. The cover, as will be seen, closes the central portion of the part *a* of the

casing, leaving only the annular outlet *f* for the exit of the air.

g is the armature of the electromotor for driving the fan. It is fast upon the shaft *h*.

i is the field-magnet fixed within the casing and together with the armature contained in a chamber provided in the cover *c*.

j is a diaphragm which incloses the chamber on the inner side.

k is the commutator of the electromotor. It also is fixed upon the fly-shaft, but on the inlet side thereof.

The fly consists of a boss *l*, fixed upon the shaft *h*, and arms *l'* on this boss carry blades *h²*, which are so formed as to leave an unobstructed inlet-chamber around the shaft at *m*, while their outer ends pass in close proximity to the inner edges of the stationary spiral directing-blades *d*.

n n are strained-wire connections between the blades which serve to stiffen the fly and support the blades the one from the other.

What I claim is—

1. The combination of the fly-blades, the casing within which the blades are mounted to rotate, the annular series of spiral directing-blades within the casing and surrounding the fly-blades, the central inlet for air on one side of the casing and the annular outlet on the other side, the arrangement being such that air entering at the inlet is driven by the fan-blades into the spiral directing-channels and is conducted by these to the annular outlet where it issues in a direction parallel to the fly-shaft.

2. The combination of the fly-blades, the casing around the blades, the spiral directing-blades, the central inlet and annular outlet, a chamber within the end cover of the casing on the outlet side, and an armature of an electric motor fixed upon the fly-shaft within said chamber.

3. The combination of the fly-shaft, the fly-blade secured thereto, a casing having a central inlet, and an annular outlet, fly-blades secured to the shaft and to the annular series of directing-blades surrounding the fly-blades and interposed between them and the annular outlet.

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