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(No Model.)

C. J. HIRLIMANN.

COMBINED ELECTRIC MOTOR AND BLOWER.

No. 411,030. Patented Sept. 17, 1889.

Fig. 1.

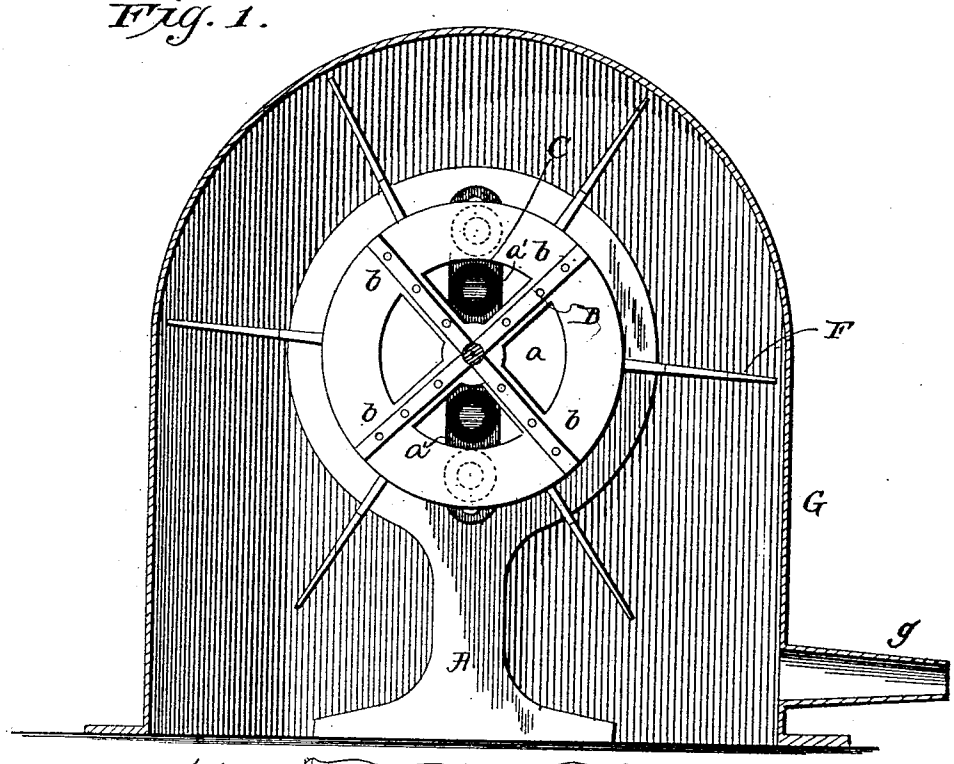


Fig. 2.

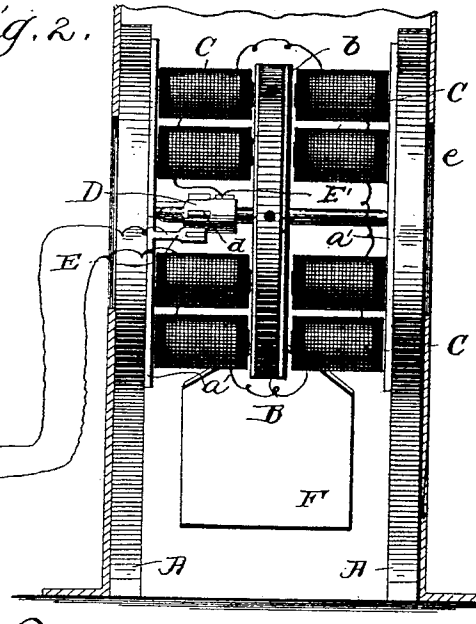


Fig. 3.

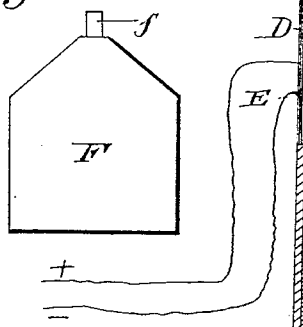
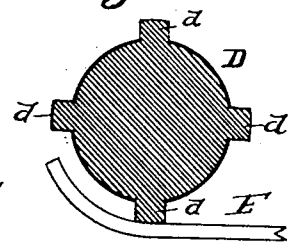


Fig. 4



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES J. HIRLIMANN, OF FORT LEE, NEW JERSEY.

COMBINED ELECTRIC MOTOR AND BLOWER.

SPECIFICATION forming part of Letters Patent No. 411,030, dated September 17, 1889.

Application filed May 6, 1889. Serial No. 309,696. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. HIRLIMANN, a citizen of the United States, residing in Fort Lee, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in a Combined Electric Motor and Blower, of which the following is a specification.

My invention relates to the application of an electric motor to a blower, the two machines being combined in a single structure.

My object is to provide an apparatus of this kind which shall be very cheap as an article of manufacture and sufficiently efficient in operation for all practical purposes.

In my improved apparatus the armature of the motor is formed of a wooden wheel having attached to each side of it a number of soft-iron strips constituting the armature or armatures proper. In the periphery of the wooden wheel the fans or blades of the blower are placed. The field-magnets of the motor are four in number, although I do not limit myself to this number, and they are located two each side of the armature. The whole structure is placed within the blower-casing, and is thus protected from injury through external agents or causes.

The particular construction will now be described with reference to the accompanying drawings, in which—

Figure 1 represents a section taken at right angles to the motor-shaft and at one side of the armature. Fig. 2 represents a section of the casing, showing an elevation of the machine; and Fig. 3, a detailed view of one of the fan-blades. Fig. 4 is a detail sectional view taken through one end of the commutator.

The whole apparatus is mounted upon two standards A A, which may be formed of wood or other suitable material. The upper part of the standards is circular in shape and provided with a central opening *a*, through which air may pass to the interior. Upon the adjacent faces of the standards an iron strip *a'* is secured. The strips are in length about equal to the diameter of the circular portion of the standards, and they extend across the opening in said standards, as shown. The shaft of the armature has its bearings in the two strips *a'*, and is concentric with the circular portion of the standards.

The armature consists of the wheel B, made of wood, brass, or any non-magnetic material. I prefer, however, to make it of brass. Upon each side of the wheel I attach strips of soft iron *b b*. These strips serve as the armature.

The field-magnets of the motor are represented by C C. I have shown four, but it is obvious that I could use eight or any other number, and place them in radial lines around the armature-shaft with their pole-pieces next to the armature.

The commutator is represented by D. It is a solid hub of metal and is provided with a number of teeth *d*. One of the brushes E bears upon these teeth, while the brush E' bears upon the smooth portion of the commutator. The number of teeth corresponds with the number of armature sections or strips. The field-magnets are wound in direct series. One terminal of the circuit, after passing around the magnets, goes to one brush while the other terminal goes directly to the other brush. When the current is turned on, each of the iron strips *b* on the armature is attracted by the poles of the field-magnets. When the armature is rotated to a point where the strip of the armature coincides with the pole-piece of the magnets, the brush E drops off of one of the teeth on the commutator, thus breaking the circuit and allowing the momentum of the wheel to carry it on until the circuit is again completed by the brush striking the next tooth. This is a simple and well-known form of motor. It is, however, particularly adapted for my purposes, because it admits of an easy attachment or adjustment of the fan-blades F. These blades I make of wood or other suitable material and provide them with pins *f*, which fit into sockets in the periphery of the armature-wheel.

I have thus described a very simple form of electric motor and blower combined, and it will be seen that the principal object of the invention, that of cheapness of manufacture, is attained. The blower box or casing (represented by G) is made of sheet metal and it fits down over the whole apparatus, thus pro-

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tecting it from injury. The sides of the casing are formed with openings which coincide with the openings in the standards A A, and the blast is driven through outlet *g*, which may be connected with a line of tubing, a whistle, or any other similar apparatus in usual manner.

I have designed this apparatus particularly for use in subways to prevent the accumulation of gases therein. I contemplate locating the blowers at intervals in the subway and connecting them electrically with a supply-conductor and keeping them running constantly. This will maintain a circulation in the subway and prevent explosions, &c. The ordinary construction of the blower is too expensive to be used in this way.

Having thus described my invention, I claim—

1. In a combined electric motor and blower, the armature of the motor formed of a non-magnetic wheel having iron strips or armatures placed on each side thereof, in combination with the fan-blades attached direct to the periphery of the wheel.

2. The combination, with an electric motor and blower combined, of two standards, as A A, in which said motor and blower are mounted, air-passages through said standards, and a blower-casing inclosing the whole structure and provided with air-passages corresponding with the air-passages in the standards, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES J. HIRLIMANN.

Witnesses:

WM. A. ROSENBAUM,

F. C. GRUERY.