No. 732,235. PATENTED JUNE 30, 1903.

P. SWAN.

ELECTRIC MOTOR.

APPLICATION FILED JAN. 13, 1903.

NO MODEL.

FIG. 3

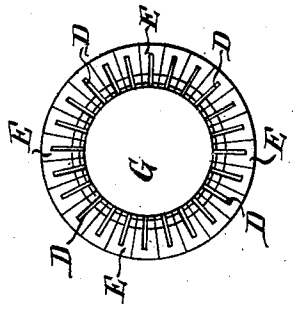


FIG. 1.

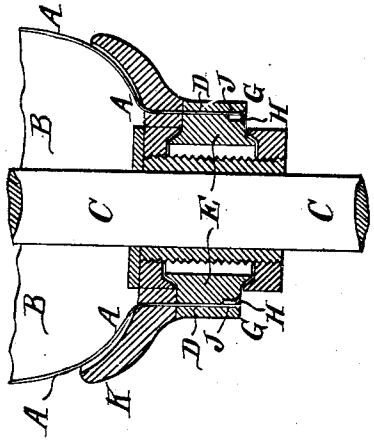
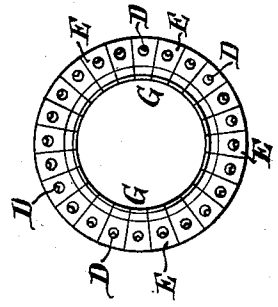


FIG. 2.



WITNESSES:
F. W. Wright.
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BY
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 732,235 Patented June 30, 1903.

UNITED STATES PATENT OFFICE.

PETER SWAN, OF CALCUTTA, INDIA.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 732,235, dated June 30, 1903.

Application filed January 13, 1903. Serial No. 138,868. (No model.)

To all whom it may concern:

Be it known that I, PETER SWAN, a subject of the King of Great Britain and Ireland, Emperor of India, and a resident of Calcutta, India, (whose postal address is 52/3 Park street, Calcutta, India,) have invented certain new and useful Improvements in Electric Motors, (for which I have applied for British Patent No. 16,072, dated July 19, 1902,) of which the following is a specification.

My said invention relates to electric motors, especially to those driving ceiling-fans; and it has for its object to improve the method of attaching the armature-wires to the commutator and also to provide improved means for protecting the armature-wires.

According to the arrangement at present in use for attaching the armature-wires to the commutator the wires are generally soldered to the ends of the commutator-bars which are nearest to the armature-windings; but in addition to and before being soldered the wires are fixed into slots cut in the outer corners of the bars. This arrangement, however, always causes the armature to be too distant from the spindle-bearing on the commutator side, as a considerable space has to be left between the armature and commutator to allow of the wires being fixed and soldered. This is a decided disadvantage, as in all electric motors, but especially in small motors running vertically on one lower bearing and forming the subject-matter of my two concurrent applications for patents, Serial Nos. 138,866 and 138,867, filed January 13, 1903, it is desirable to have the armature as near to the bearing as possible. My improved wire-attaching arrangement, however, is such that the armature can be brought quite close up to the commutator, so that the distance between the armature and the bearing is thereby reduced to the lowest possible extent, as required.

The invention is represented in the accompanying drawings, in which the same references are used to mark the same or like parts.

Figure 1 is a vertical section of a small portion of a vertically-running motor of the drum-armature type and showing my improvements applied thereto. Fig. 2 is a plan of the commutator. Fig. 3 is a plan of a commutator and illustrating a slightly-different method of attaching the armature-wires.

As shown in Fig. 1, each wire A of the drum-armature B, which is mounted on a vertical shaft C, is passed down through a hole or opening D, formed for it in each section E of the commutator G, which is arranged immediately below the armature, the hole being slightly enlarged for a short distance inward from the bottom end so as to fit a small copper pin H, provided for each wire. The end of the wire A is inserted in a groove J, formed in the side of the pin H, and the pin, with the wire attached, is then hammered or driven into the hole and riveted over, so that the armature-wire is thus firmly connected to the commutator-section E as required, or, if preferred, each wire A may simply be pulled through the hole D in the commutator-section E and then fixed to the said section by soldering. A cup-shaped washer K, composed of hard fiber or similar insulating material, is fitted between the lower end of the armature B and the commutator G, so as to more effectively protect the armature-wires A, holes being formed through the washer for the passage of the wires to the commutator.

A slightly-different method of attaching the armature-wires A to the commutator G is shown in Fig. 3. In this case the end of each wire A is inserted in a slot or opening D, formed on the inside of each commutator-section E. Solder is then applied to the parts, so as thereby to firmly fix the wire A to the commutator-section E, as required.

What I claim as my invention is—

1. In electric motors of the drum-armature type a commutator mounted on the armature-shaft, a hole or opening for the armature-wire formed through each commutator-section with an enlarged part at its outer end, a pin to fit such enlarged part, a groove in the side of the pin to fit the armature-wire, a cup-shaped washer of insulating material fitted between the end of the armature and the commutator, holes formed through the washer to correspond with the holes in the commutator the armature-wires having their ends threaded through the holes in the washer and commutator and inserted in the grooves in the pins,

and fixed to the commutator-sections by riveting the pins with attached wires into the enlarged ends of the holes in the said sections, substantially as and for the purposes herein set forth.

2. In electric motors of the drum-armature type, a commutator mounted on the armature-shaft, an opening formed through each commutator-section, a cup-shaped washer of insulating material fitted between the end of the armature and the commutator, holes formed in the washer to correspond with the openings in the commutator, the armature-wires having their ends threaded through the holes and openings in the washer and commutator-sections and fixed in the openings in the said sections, substantially as and for the purposes herein set forth.

3. In electric motors of the drum-armature type, a commutator mounted on the armature-shaft, a hole or opening for the armature-wire formed through each commutator-section with an enlarged part at its outer end, a pin to fit such enlarged part, a groove in the pin to fit the end of the armature-wire, the armature-wires having their ends threaded through the holes in the commutator-sections and inserted in the grooves in the pins, and fixed to the said sections by riveting the pins with attached wires into the enlarged parts of the holes in the sections, substantially as and for the purposes herein set forth.

4. An electric motor having a shaft, a drum-armature directly secured to said shaft, a commutator mounted on the armature-shaft, an opening formed through each commutator-section, the armature-wires having their ends fixed in said sections at the end away from the armature and an insulating-washer separating the commutator and armature and of a shape to conform to the end of the armature on one side and to the commutator on the other, by which wire connection the washer is tightly held against the commutator, substantially as and for the purposes herein set forth.

5. In electric motors of the drum-armature type, a cup-shaped washer of insulating material fitted to the end of the armature, substantially as and for the purposes herein set forth.

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

PETER SWAN.

Witnesses:

IAGESH CHUNDER BOSE,

JATISH CHANDER DASS.