

E. P. & T. L. LEE.
BRUSH MOUNTING.
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1,240,738.

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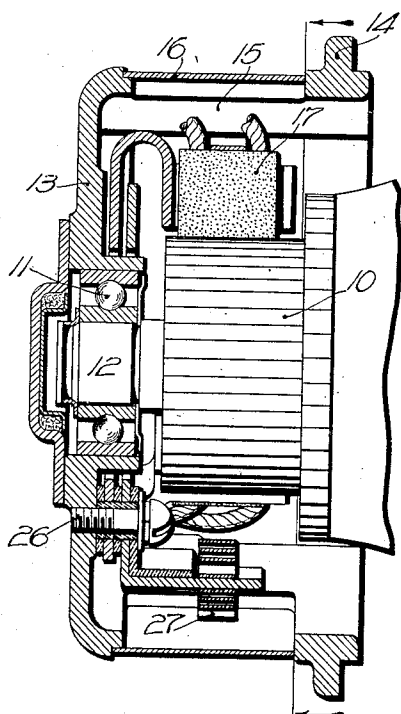


Fig. 2

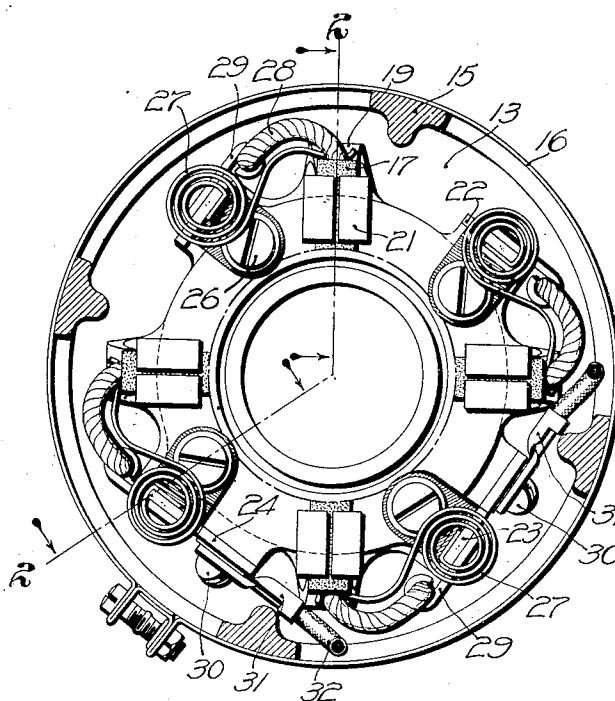


Fig. 1

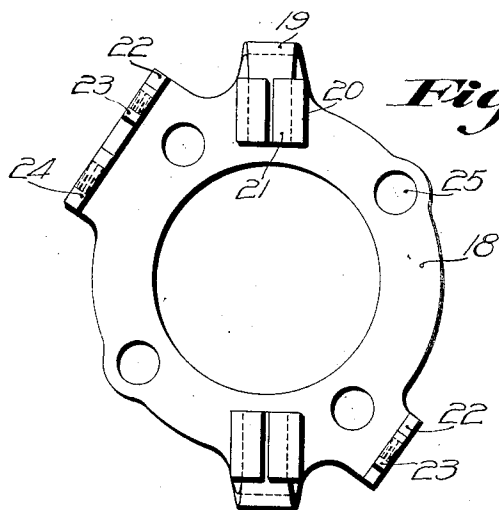


Fig. 3

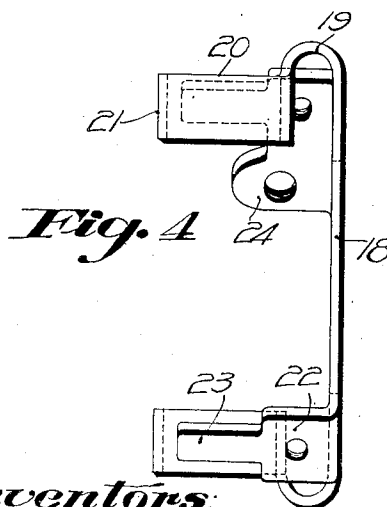


Fig. 4

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UNITED STATES PATENT OFFICE.

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BRUSH-MOUNTING.

1,240,738.

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To all whom it may concern:

Be it known that we, EARLE P. LEE and THOMAS L. LEE, citizens of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Brush-Mountings; and we 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.

This invention relates to means by which the brushes of an electric motor or generator are guided and supported in engagement with the commutator.

The object of the invention is to produce a structure, for the purpose in question, which shall be simple and inexpensive, and at the same time reliable in operation and easy to assemble and disassemble.

To the foregoing end the invention comprises a structure including one or more annular members, preferably formed of sheet-metal, which are provided with brush-guiding means, and also, preferably, with spring-supporting posts and connecting-lugs, extending from the edge of the annular member and preferably struck up integrally from the same sheet-metal. The annular members are arranged in superposed position, thus providing for the two or more brushes commonly employed in direct-current machines, but the members are preferably insulated from each other, so that they may be utilized as parts of the electric circuits of the machine.

Other objects of the invention, and the features of construction by which they are attained, will be set forth hereinafter, in connection with the description of the illustrated embodiment of the invention.

In the accompanying drawings Figure 1 is an elevation of a brush-mounting embodying the present invention, looking axially from the inside of the machine, the figure showing also a part of the frame or casing with which the brush-mounting is associated; Fig. 2 is a section on the broken line 2-2 in Fig. 1, and in this figure the

commutator, one end of the armature-shaft, and the cooperating ball-bearing, are also shown; and Figs. 3 and 4 are two elevations of one of the integral sheet-metal members of the brush-mounting.

The invention is illustrated as embodied in a four-pole electric motor of the inclosed type. Apart from the brush-mounting, the drawings show only the commutator 10, one end of the armature-shaft 12, the ball-bearing 11 in which this shaft-end is supported, and a portion of the frame or casing of the machine. This frame comprises an end-plate 13, in which the bearing 11 is mounted, a ring 14, which may be clamped against the field-ring (not shown) of the machine in the usual manner, arms 15 connecting the plate 13 and the ring 14, and a band 16 which constitutes a removable cover, of the well-known garter type, for the openings between the arms 15.

The machine is shown as provided with four carbon brushes 17, which are pressed radially against the commutator at four equidistant points. The principal and characteristic part of the brush-mounting resides in two sheet-metal members, of which one is shown in detail in Figs. 3 and 4. This member comprises an annular portion or flat ring 18, from the outer edge of which project, at diametrically opposite points, two curved arms 19. These arms are bent to a position parallel with and overhanging the annular portion 18, and from the lateral edges of each arm two plates 20 are bent into parallel position, these plates forming the sides of a box-like guide in which one of the brushes 17 slides. The back of the guide is formed by the metal of the arm 19, while the guide is closed in front by lugs 21 bent toward each other from the ends of the plates 20.

Alongside each arm 19 a lug 22 is struck up from the sheet-metal, this lug being perforated to receive an electric connection, as hereinafter described, and from the lug 22 the metal projects in the form of an arm 23, which constitutes a support for the spring which controls the brush in the adjacent brush-holder.

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In addition to the parts above enumerated, each of the above-described members of the brush-mounting is provided with a lug 24, struck up from its outer edge, which serves for the attachment of a terminal.

Two members are employed, which are in all substantial respects like that shown in Figs. 3 and 4, except that these members have a right and left-hand relation. They may be conveniently formed from sheet-metal blanks which are identical in form, but from which the lugs are bent in opposite directions. These two members are arranged with the annular portions 18 in superposed relation, as shown in Figs. 1 and 2, and with their various projections extending in the same direction, and they are fixed in that position within the inner surface of the plate 13, by means of screws 26 which pass through registering openings 25 in the annular portions. To bring the brush-guides or holders into the same plane, notwithstanding the fact that the parts 18 lie in different planes, the arms 19 on one member are given a somewhat deeper curve than those of the other member.

The brushes 17 slide radially into engagement with the commutator, and are maintained in operative position by springs 27, of coiled form. Each spring is mounted upon one of the spring-supports 23, with its outer end in engagement with the corresponding brush, and the spring is retained in proper correlative position with the brush and the support by reason of the fact that its end is embraced between two flexible conductors or pigtails 28, by which the brush is electrically connected with the circuits of the machine. Each pigtail is provided with a sheet-metal clip 29, which is screwed to one of the lugs 22, these lugs being provided with threaded openings for that purpose, as shown in Figs. 3 and 4.

The annular members 18 constitute conductive paths forming parts of the circuits by which current is conducted to and from the brushes and through the pigtails. Accordingly, the lugs 24 are utilized as the positive and negative terminals of the brush-mounting, and are shown as provided with binding-screws 30, which serve to attach the clips 31 on the ends of current-leads or wires 32, which extend to the field-windings or the main terminals of the machine in the usual manner.

It will be apparent that the brush-mounting above described comprises few members, which may be made inexpensively and easily assembled in a compact relation. The invention has been shown, particularly, as adapted to a multipolar motor or generator, the arrangement being such that each pair of diametrically-opposite brushes is interconnected by the annular member 18 on which they are mounted in common. It will be

obvious, however, that the invention is equally applicable to a bipolar machine, by a slight rearrangement of parts which need not be described, and that the invention, in general, is not limited to the embodiment thereof hereinbefore described, and illustrated in the accompanying drawings.

We claim:

1. A brush-mounting comprising a substantially flat sheet-metal ring; an arm projecting integrally from one edge of the ring and transverse to the plane thereof; and a brush-holder formed integrally upon said arm by bends in the sheet-metal thereof.

2. A brush-mounting comprising a substantially flat sheet-metal ring; a spring-support and an arm projecting integrally from the outer edge of the ring and transverse to the plane thereof; a brush-holder formed integrally upon said arm; and a spring coiled about said spring-support and adapted to engage a brush in the brush-holder.

3. In a dynamo-electric machine of the inclosed type, the combination, with a head of the casing thereof, of two brush-mounting devices each comprising a substantially flat sheet-metal ring and a brush-supporting member integrally connected with the ring at an edge thereof, said rings being superposed, but insulated from each other; and means fastening the rings to the casing-head coaxially with the armature-shaft of the machine.

4. A brush-mounting comprising a sheet-metal ring; and a brush-holder, a spring-support and a terminal-lug all struck up integrally from the sheet-metal of the ring at the outer edge thereof.

5. In a dynamo-electric machine, the combination of a ring; a brush-supporting member and a spring-support projecting laterally from the ring; a brush movably mounted on the brush-supporting member; a spring coiled about the spring-support and having one end in engagement with the brush; and a pair of pigtail connectors connecting the brush and the ring, said connectors being attached to the brush in position to embrace said end of the spring so as to prevent lateral displacement of the spring.

6. In a dynamo-electric machine, the combination, with the frame thereof, of two brush-mounting devices each comprising a sheet-metal ring and a plurality of brush-supporting members integrally connected with the ring at an edge thereof; said rings being superposed, but insulated from each other, with the brush-supporting members in angularly-spaced alternating positions; and means fastening the rings to the head of the frame co-axially with the armature shaft.

7. A brush-mounting comprising a substantially flat sheet-metal ring, perforated

to receive fastening-devices; an arm projecting integrally from one edge of the ring and transverse to the plane thereof; and means, carried by said arm, for supporting
5 and guiding a movable brush.

8. In a dynamo-electric machine, the combination of a sheet-metal ring; a brush-sup-

porting member projecting integrally from an edge of the ring; a brush movably mounted on said member; a flexible connector connecting the brush and the ring; and a main
10 conductor also connected to the ring.

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