

Dec. 18, 1928.

1,695,865

H. C. SPECHT

BRUSH HOLDER

Filed March 10, 1927

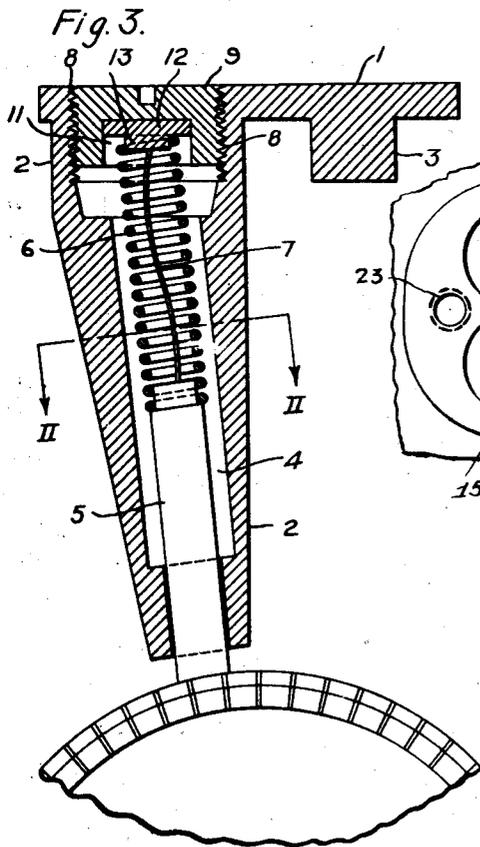
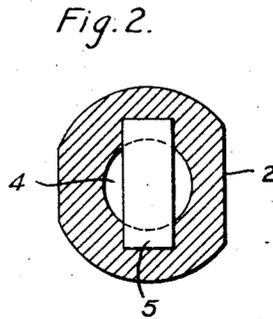
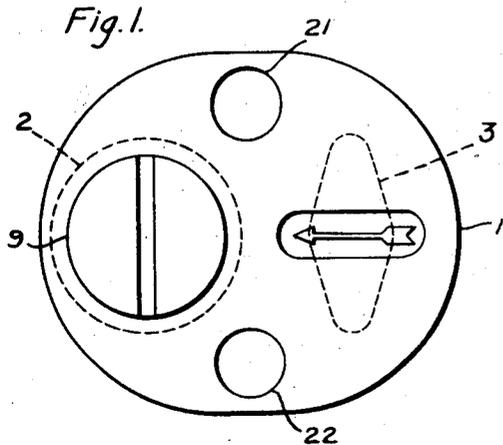
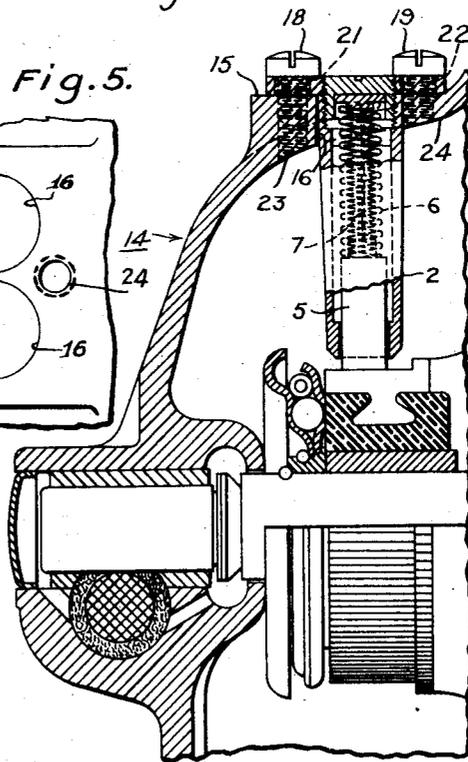


Fig. 5.



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BRUSH HOLDER.

Application filed March 10, 1927. Serial No. 174,107.

My invention relates to brush-holding devices and particularly to brush-holding devices for electric motors of the repulsion-induction type.

5 In electric motors of the repulsion-induction type, it is frequently desirable to vary the position of the brushes relative to the commutator. This is necessary when it is desired to change the direction of rotation of a motor of the type specified by changing the brush lead.

10 In prior devices of this character, it has been customary to utilize a brush-holding device having an eccentrically disposed brush and to position the brush on either side of the neutral axis by rotating the brush-holding device in a circular hole provided in the motor frame. As the size of such circular hole was limited by the available space, this construction necessitated the disposition of the brush at an angle, in order to obtain the desired angle or lead with respect to the neutral axis. Various means for locking the brush-holding device in this position have been provided, but have been unsatisfactory, either because they did not provide a positive locking arrangement or because they were so complicated that they easily became inoperative or were too expensive to manufacture.

15 By my invention, I provide a brush-holding device which is simple in construction and easy to manufacture, and which is provided with means for positively locking it in position.

20 One of the objects of my invention is to provide a brush-holding device which comprises means for positioning the brush of a repulsion-induction motor on either side of the neutral position.

25 Another object of my invention is to provide a device of the above character of such shape and design that the angle of contact between the brush and the commutator may readily be varied by simple changes in the design without effecting the position of lead of the brush.

30 A further object of my invention is to provide a device of the above character which comprises simple means for positively securing the device against displacement in any direction except radially outward.

In the accompanying drawing,

Fig. 1 is a plan view of my invention,

35 Fig. 2 is a horizontal sectional view of the device taken along the line II—II of Fig. 3,

Fig. 3 is a vertical sectional view of the device,

Fig. 4 is a fragmentary view, in elevation, of a motor embodying my invention, and

Fig. 5 is a plan view of a portion of the motor frame embodying my invention.

60 An approximately circular disk 1 is provided with a large, eccentrically disposed, tubular, depending portion 2, and a small auxiliary depending portion 3, both of which extend substantially perpendicularly to the plane of the face of the disk. The large projecting portion 2 is provided with a perforation or chamber 4 extending longitudinally therethrough, constituting a brush cartridge in which is disposed a carbon brush 5, a spring 6 for positioning the brush 5, and a flexible conductor member 7 for shunting current around the spring 6. The brush 5 is slidably positioned in the chamber and is disposed in the lower portion thereof. The spring 6 is arranged to cooperate with the brush and tends to expel the brush from the chamber. It will be understood that two brushes 5 are utilized in a repulsion motor.

75 The upper portion of the chamber is enlarged and is provided with screw threads 8 to receive a cap screw 9 for closing the end of the chamber 2 and maintaining the spring 6 in position. The cap screw 9 is provided with a longitudinal cavity 11 extending into the lower portion thereof. A metallic terminal 12, arranged to fit the cavity 11 and having a cylindrical, downwardly projecting boss 13 is provided for making connection between the flexible shunt 7 and the frame of the motor. The projecting boss 13 of the terminal 12 is inserted in the upper end of the spring, thereby positioning the same and grounding the brushes 5 on the frame.

80 The smaller projecting portion 3 of the brush-holding device has a cross section of substantially diamond shape, as shown in dotted lines in Fig. 1, and is disposed diametrically opposite the larger projecting portion 2. The extreme length of the cross section of the smaller projecting portion is made the same as the diameter of the larger projecting portion for purposes which will be subsequently disclosed.

85 Referring to Figs. 4 and 5, a portion of an electric motor 14 is shown. A flat boss 15, provided with two circular openings 16 is disposed in the motor frame at the commutator end. The openings 16 are of the proper size

and spacing to accommodate the two projecting portions 2 and 3 of the brush-holding device which is secured in place by means of two machine screws 18 and 19 extending through small holes 21 and 22, in the disk-shaped portion 1 and screwed into the tapped holes 23 and 24, in the motor frame 16. It is noted that the cover plate 1 is symmetrical with respect to two axes, one passing through the centers of the two large holes 16, and the other at right angles thereto and midway between the said holes. The fastening screws 18 and 19 are symmetrical with respect to both axes, whereby the brushholder may be reversed through 180°.

It will be understood that two brushes are provided for repulsion motor operation. When it is desired to reverse the rotation of the motor by shifting the brushes from one side of the neutral position to the other, the screws 18 and 19 are removed and the brush holder is lifted from its position in the boss 15. The larger projecting portion 2 is inserted in the opening in the boss, formerly occupied by the small projecting portion 3, and the smaller projecting portion 3 is inserted in the other opening in the boss, thereby bringing the brush-holding device 17 into a position in which it is rotated substantially 180° around the axis of the disk.

A raised arrow is provided in the upper face of the disk which indicates the direction of rotation of the motor.

In manufacturing this device, I am able to vary the angle of contact between the brush and the commutator without varying the distance of the point of contact from neutral position, and vice versa. This is accomplished by varying the distance between the two projecting portions 2 and 3 of the brushholder.

It will be apparent, from the above description, that my device is extremely simple and easy to manufacture and has relatively few parts, thereby making it dependable in operation and inexpensive to construct.

In addition, it is apparent that the above-described arrangement of parts causes the device to be firmly secured in position and maintained against accidental displacement. In addition, it is very easy to reverse the angle of lead of the brush relative to the neutral point, since it is necessary merely to remove two screws.

By utilizing a diamond-shape cross-section for the smaller projecting portion 3, I am able to make the device more compact in design, as will be readily seen, without sacrificing any strength or rigidity in the device. It is apparent, however, that it would be possible to utilize various other shapes in the construction of this device.

While I have described my invention, setting forth a specific example of the construction thereof, it is apparent that my invention is not limited to the details shown and described, and I desire that the appended claims shall be given the broadest interpretation consistent with their wording and the prior art.

I claim as my invention:

1. In a dynamo-electric machine, a machine frame having a plurality of openings therein, and a brush-holding device removably mounted in the said frame and having a plurality of projections arranged to fit in the said openings, whereby the device is maintained in any one of a plurality of positions.

2. In a dynamo-electric machine, a machine frame having a plurality of openings therein, a brush-holding device having a plurality of projecting portions arranged to fit the said openings, one of said projecting portions being hollow, and a brush slidably supported in the said hollow projecting portion of the device.

3. A motor having a frame, brushholders and a commutator cylinder, characterized by means for reversing the angle of lead of each brush with respect to an axis of the motor, said means comprising a portion of the frame having two holes therein on opposite sides of said axis, the brushholder comprising a cover plate extending over both of said holes and having a downwardly extending brush cartridge extending through either one of said holes, according to the position of the brush.

4. A brushholder comprising a cover plate which is symmetrical with respect to two axes, retaining means symmetrically disposed with respect to both of said axes, whereby said brushholder may be reversed through 180°, and an eccentrically disposed downwardly projecting brush cartridge.

In testimony whereof, I have hereunto subscribed my name this 5th day of March, 1927.

HANS C. SPECHT.