Nov. 7, 1939. W. A. BRECHT 2,179,279

BRUSH HOLDER

Filed April 28, 1938 2 Sheets-Sheet 1

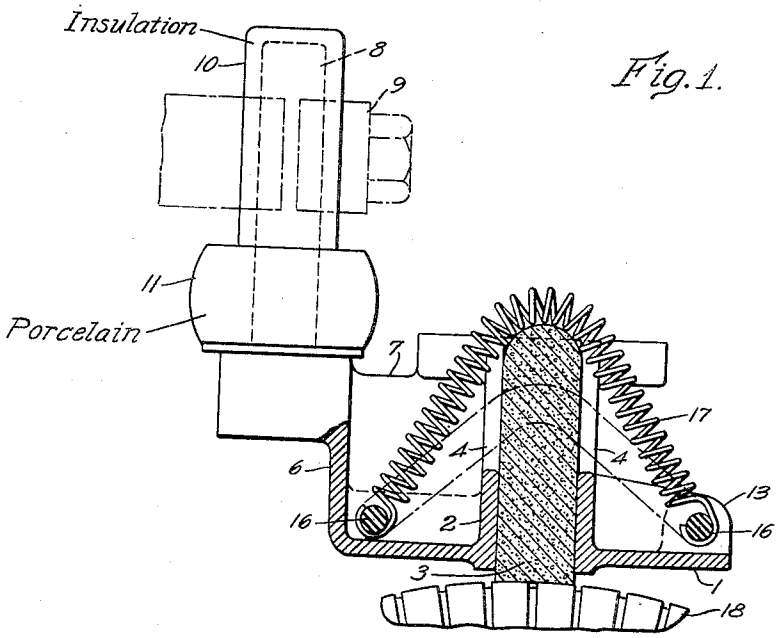



Fig. 1.

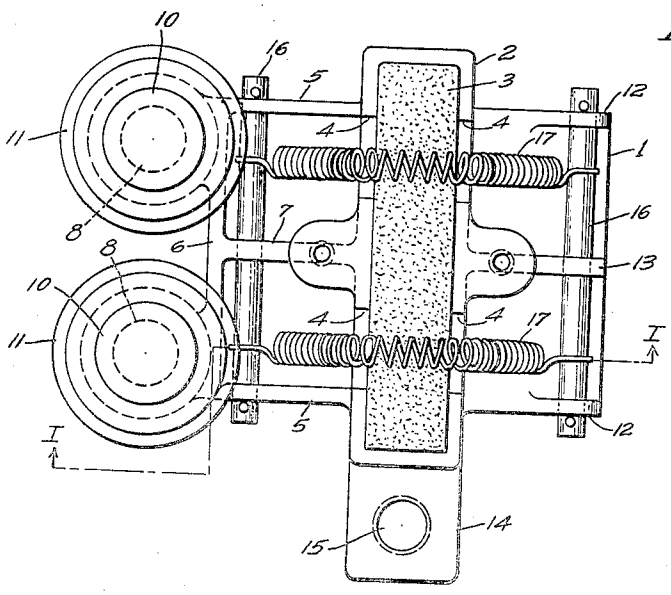



Fig. 2.

WITNESSES:

C. J. Weller.

F. P. Lyle

INVENTOR

Winston A. Brecht.

BY O. B. Buchanan

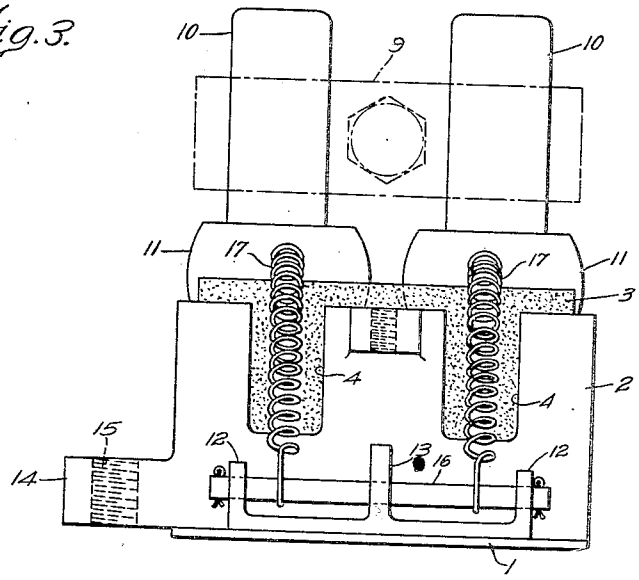
ATTORNEY

Nov. 7, 1939. W. A. BRECHT 2,179,279

BRUSH HOLDER

Filed April 28, 1938 2 Sheets-Sheet 2

Fig. 3.



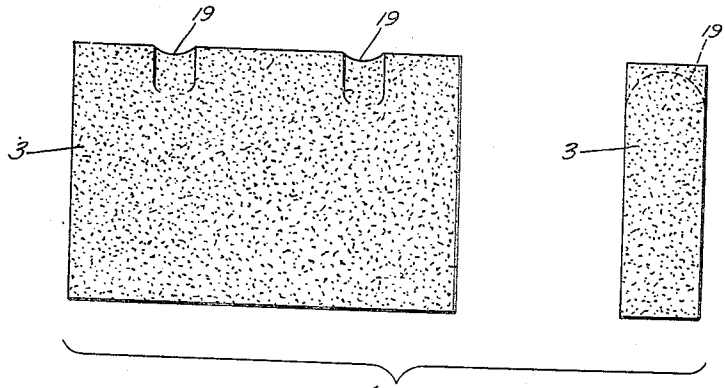




Fig. 4.

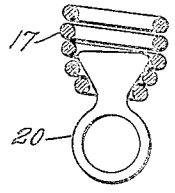



Fig. 5.

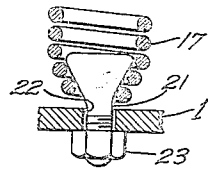



Fig. 6.

WITNESSES:
C. J. Weller.
T. O. Lyle

INVENTOR
Winston A. Brecht
BY O. B. Buchanan
ATTORNEY

Patented Nov. 7, 1939 2,179,279

# UNITED STATES PATENT OFFICE

2,179,279

## BRUSH HOLDER

Winston A. Brecht, Forest Hills, Pa., assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application April 28, 1938, Serial No. 204,730

7 Claims. (Cl. 171—324)

The present invention relates to brush holders for dynamo-electric machines, and, more particularly, to an improved means for maintaining a brush in position in the brush holder and exerting a substantially radial pressure on it.

It is necessary in the design of brush holders for dynamo-electric machines to provide some means for applying pressure to the brush to hold it against the commutator, and to maintain this pressure as the brush wears down in service. The pressure should be applied to the brush in a direction substantially radial of the commutator and its direction should remain unchanged as the brush wears down. This is usually done by means of a spring or springs bearing on the top of the brush, and it is desirable to arrange the springs in such a manner that the brush can be easily removed for inspection or replacement. It is also desirable to use springs which are not easily clogged by dirt which will cause them to stick to the brush, thus making it difficult to change the brushes. This last requirement is especially important in brush holders intended for motors which are to be used in exposed locations, such as railway motors.

The object of the present invention is to provide a brush holder of simple and inexpensive construction which will combine the requirements and desirable features mentioned above.

Further objects and advantages will be apparent from the following detailed description of a preferred embodiment of the invention, taken in connection with the accompanying drawings, in which:

Figure 1 is an end view of a brush holder, partly in section on the line I—I of Fig. 2;

Fig. 2 is a plan view of the brush holder shown in Fig. 1;

Fig. 3 is a front elevation as seen from the right of Figs. 1 and 2;

Fig. 4 is a side and end view of a brush which may be used with the brush holder of the present invention; and

Figs. 5 and 6 show modified arrangements for securing a tension member to the brush holder.

The brush holder of the present invention is particularly well adapted for use with railway motors, although its usefulness is not limited to any particular type of motor. The brush holder consists of a body 1 of bronze or other suitable material having a central boxlike portion 2 formed by vertical walls extending up from the body and providing an elongated opening for the reception of a brush or brushes 3. Only one brush has been shown on the drawing, but it will be understood that two or more brushes may be used if desired. The boxlike portion 2 has a plurality of slots 4 arranged in corresponding positions in the opposite side walls. The body 1 is formed at the rear of the box like portion 2 with end walls 5 and a rear wall 6 and has a central flange or web 7 to strengthen it. Two pins 8 are formed integral with the rear wall 6 by means of which the brush holder may be clamped to the brush arm of a motor by clamping means of any suitable kind, indicated generally at 9. The pins 8 are preferably covered by sleeves 10 of insulating material to insulate the brush holder from the motor frame and, if desired, these sleves may be protected by tubes of brass or other suitable material. The sleeves 10 rest on porcelain rings 11 which surround the pins 8. At the front of the body 1 an ear 12 is formed at each end and a strengthening web 13 in the center. The body 1 may be extended at one end as indicated at 14, and a tapped hole 15 provided for the reception of a stud for connecting a brush lead.

Anchoring rods 16 are located on each side of the boxlike portion 2 extending parallel to the brush and are supported in the ears 12 and end walls 5, respectively. A plurality of tension members 17, which are preferably in the form of helical springs, are fastened at their ends to the rods 16 and extend transversely across the boxlike portion 2, passing through the slots 4, so that they bear on the top of the brush and exert a pressure thereon which is substantially radial of the commutator 18. Any desired or necessary number of tension members may be used and there should be at least one for each brush if more than one brush is used. The number of slots 4 in each side of the body portion 2 will, of course, be the same as the number of tension members. The rods 16 may be of any desired material, but are preferably made of insulating material so as to prevent the flow of current in the tension members 17, although this result may also be obtained by the use of an insulating cap on the brushes.

It will be seen that, by using tension members extending transversely across the brush and anchored at each end, the pressure on the brush will be maintained substantially constant and in a radial direction as the brush wears down, as shown by the dotted lines in Fig. 1. This arrangement also makes it possible to change the brushes very easily by lifting the springs 17 and hooking them over the ends of the box 2 so that

they are held out of the way while the brush is lifted out and replaced.

The brush used with this brushholder may be of any suitable shape. Thus it may have a rounded top, as in Fig. 1, conforming generally to the curve assumed by the spring, or, if desired, a brush may be used having a square top, as shown in Fig. 4, with rounded grooves 19 formed in it for the reception of the springs. As another alternative, spring seats might be provided in separate pieces clipped to the top of the brush.

The ends of the springs 17 have been shown in Figs. 1 to 3 as simply hooked around the rods 16, but it will be apparent that other means of anchoring the springs to the body of the brush holder might be used. Thus, as shown in Fig. 5, the end of the spring may be secured to a ring member 20 which is slipped over the rod 16 to anchor the spring thereto. Another form of anchoring means is shown in Fig. 6, consisting of a threaded stud 21 to which the end of the spring is secured and which passes through a hole 22 in the body 1 and is held by a nut 23. This modification eliminates the necessity for the rods 16.

It will be seen that a brush holder has been provided which is of very simple and inexpensive construction and can be made of very light weight. The use of the tension members 17 insures a constant and substantially radial pressure on the brush throughout its life, and the arrangement is such that the brushes can be easily removed by hooking the springs over the ends of the box 2, so that they are out of the way and need not be held while the brush is being removed. The springs are also of a type which will not easily become clogged with dirt and cannot stick to the brush to interfere with changing it.

It should be apparent, therefore, that a very simple, but very desirable, type of brush holder has been provided, and it is to be understood that, although a specific embodiment of the invention has been illustrated and described, it is not limited to the exact details of construction shown, but includes all equivalent embodiments and modifications which come within the scope of the appended claims.

I claim as my invention:

1. In a brush holder having a boxlike body portion, a brush supported in the body portion and a resilient tension member secured at each end to the body portion and extending across the brush to exert pressure thereon.

2. In a brush holder having a boxlike body portion, a brush supported in the body portion and at least one elongated resilient tension member secured at its ends on opposite sides of the body portion and extending across the brush to exert pressure thereon.

3. In a brush holder having a boxlike body portion, a brush supported in the body portion, and a helical spring secured at its ends on opposite sides of the body portion and extending across the brush to exert pressure thereon.

4. A brush holder comprising a body having a boxlike portion providing an elongated opening adapted to receive a brush therein, and at least one unitary tension member secured at its ends to the body and extending transversely across said box-like portion.

5. A brush holder comprising a body having a boxlike portion providing an elongated opening adapted to receive brushes therein, and a plurality of unitary tension members extending tranversely across said box-like portion and secured to the body at their ends.

6. A brush holder comprising a body having a box like portion providing an elongated opening adapted to receive brushes therein, rods mounted on the body on each side of the boxlike portion and extending parallel thereto, and a plurality of resilient tension members extending transversely across said boxlike portion and secured to the rods at their ends.

7. A brush holder comprising a body having a boxlike portion providing an elongated opening adapted to receive brushes therein, rods mounted on the body on each side of the box-like portion and extending parallel thereto, and a plurality of helical springs extending transversely across said boxlike portion and having their ends slidably anchored on the rods.

WINSTON A. BRECHT.