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BRUSH HOLDER FOR ELECTRICAL MACHINES

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Fig. 1

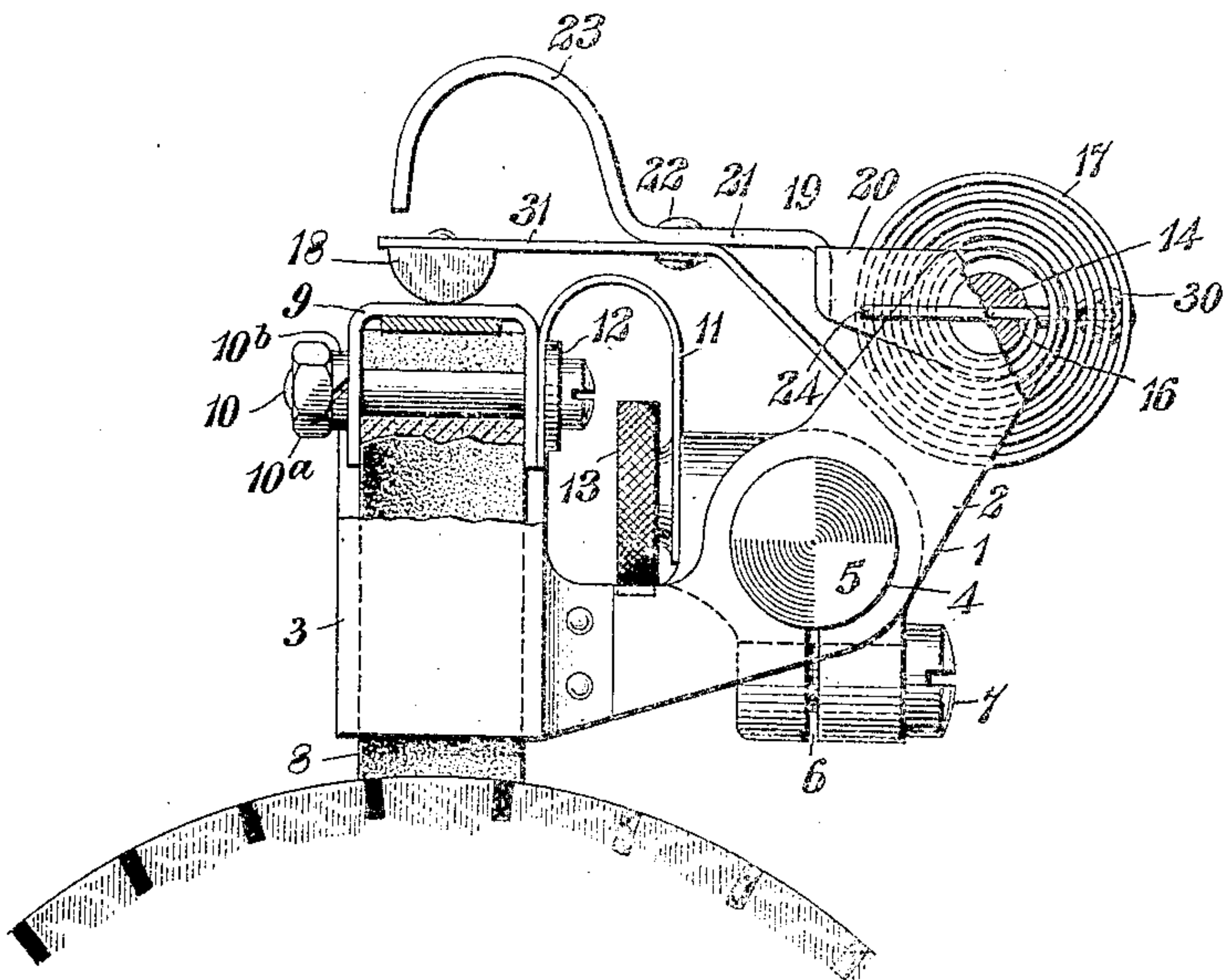
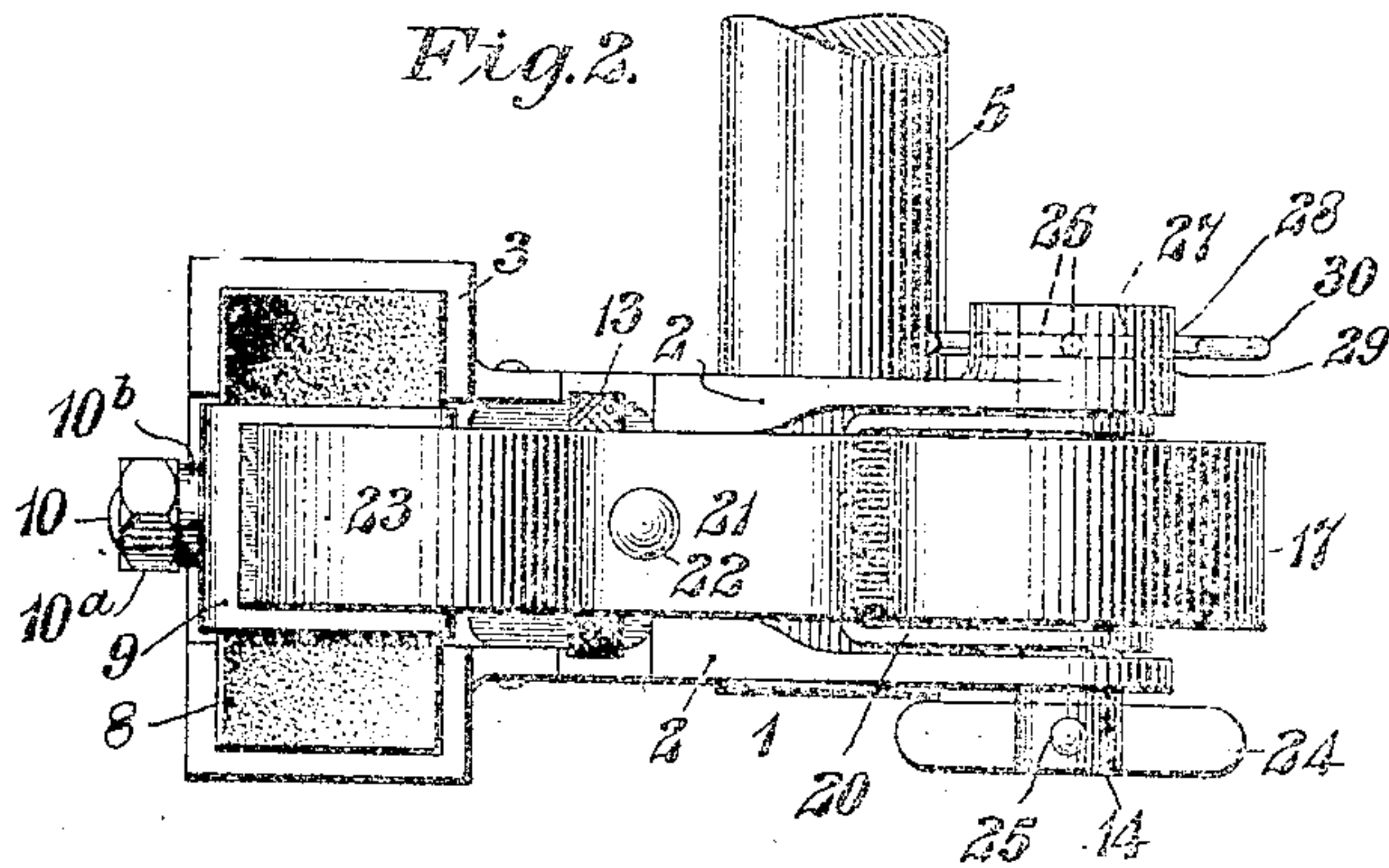


Fig. 2.



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ROBERT SIEGFRIED AND NORMAN W. STORER, OF PITTSBURG, PENNSYLVANIA, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

BRUSH-HOLDER FOR ELECTRICAL MACHINES.

No. 824,213.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, ROBERT SIEGFRIED and NORMAN W. STORER, citizens of the United States, and residents of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Brush-Holders for Electrical Machines, of which the following is a specification.

Our invention relates to brush-holders for electrical machines; and it has for its object to provide a device of this character which shall be adapted for use in connection with carbon-brushes; which shall be of simple, compact, and inexpensive construction, and which shall so operate as to obviate any heel-and-toe movement of the brush upon the commutator-cylinder.

In the accompanying drawings, Figure 1 is a side elevation of a brush-holder embodying our invention, certain portions being broken away; and Fig. 2 is a plan view of the holder.

As here shown and as preferably constructed, the frame 1 of the brush-holder comprises a casting 2 and a rolled-metal socket portion 3, which is riveted to the casting. The casting is provided with a cylindrical opening 4 to receive a supporting-stud 5 and is also provided with a slot 6, the two parts at the sides of the slot 6 being drawn together to clamp the casting to the stud by means of a screw 7. A carbon brush 8 is located and makes a loose sliding fit in the socket portion 3 and is provided at its outer end with a metal yoke 9, the said yoke being clamped to the brush by means of a bolt 10, its nut 10^a, and a split washer 10^b. A strap-metal shunt 11 is connected at one end to the yoke 9 by means of the bolt 10 and a washer 12, and its other end is clamped to the casting 2 by means of a thumb-nut 13.

Rotatably mounted in the upper end of the casting 2 is a rod 14, the cylindrical portion of which is provided with a slot 16 to receive the inner end of a coil-spring 17. The outer end of the spring 17 projects to a point above the brush 8 and has riveted to it a block 18, which bears upon the upper side of the yoke 9.

In order to prevent back-and-forth movement of the block 18 by reason of the action of the commutator-cylinder upon the brush

or by reason of vibrations of the machine, which are imparted to the spring, we provide an arm 19, comprising a U-shaped portion 20, the free ends of which are journaled upon the rod 14, and a portion 21, which is riveted at an intermediate point to the spring 17, as indicated at 22. Beyond the rivet 22 the strip is bent to form a hook or handle 23, which may be grasped by an attendant to raise the block 18 from the yoke 9 when desired.

In order to provide for adjustment of the tension of the spring and for locking it in its adjusted position, we provide a thumb-wrench in the form of a metal strip or bar 24, which is fastened in the slot 16 at the extended end of the rod 14 by means of a rivet 25. The unslotted end 27 of the rod 14 is provided with holes 26 at right angles to each other, and a corresponding hole 28 is provided in a boss 29, which is located on one side of the bracket 2, said holes being adapted to receive a cotter-pin 30 in order to prevent the rod 14 from turning during normal operation of the brush and its holder. The tension of the spring 17 may be adjusted manually by means of the thumb-wrench 24 when the cotter-pin 30 is removed, and when the desired adjustment has been effected the pin may be inserted in the hole 28 and the one or the other of the holes 26 in order to lock the spring in its adjusted position. If the spring has a relatively large number of convolutions, the tension adjustment will be satisfactorily graduated, even though a quarter-turn of the rod 14 is made for each degree of adjustment.

If the shunt 11 should at any time become broken or if its electrical connections to the brush or to the bracket should become defective, the portion 31 of the spring might conduct sufficient current to heat it excessively, and thus reduce its stiffness. If such condition should at any time be brought about, the end of the hook 23 would move into engagement with the end of the portion 31 of the spring, and thus insure uninterrupted operation of the brush-holder.

It will be observed that the brush-holder casting is of simple construction, that the rolled portion 3 may be readily and cheaply formed and as readily and cheaply riveted to the casting and that the entire combination

is extremely simple, that the tension of the spring may be quickly adjusted and the spring securely locked in its adjusted relation and that there is no possibility of any movement of the free end of the spring and its block 18 except circumferentially with the axis of the rod 14 as a center, and consequently that the tendency to heel-and-toe action between the face of the brush and the commutator-cylinder, which tends to produce sparking, is avoided.

We claim as our invention—

1. A brush-holder for electrical machines comprising a frame, a brush loosely supported therein, a rod provided with a plurality of transverse holes rotatably mounted in bearings in said frame, one of which has a transverse hole, a spring having one end attached to said rod and its other end resting upon the brush, a steadying-arm loosely supported by said rod and rigidly attached to said spring and a locking-pin that may be removably inserted in the hole in the bearing and in either of the holes in the rod to lock the rod to the frame in each position to which it is rotatively adjusted.
2. In a brush-holder, the combination with a frame having a socket and a brush having a sliding fit in said socket, of a spiral spring having one end supported by said frame and having its other end resting upon said brush and a steadying-arm rigidly fastened to the spring and having one end pivotally attached to the frame.
3. In a brush-holder, the combination with a frame and a brush mounted to slide therein, of a spring, one end of which rests upon said brush and the other end of which is attached to said frame, and a steadying-arm rigidly fastened to said spring and pivotally attached to the frame.
4. In a brush-holder, the combination with a frame and a brush loosely supported therein, of a rod rotatably mounted in bearings in said frame, one of which has a transverse hole, said rod being provided with a thumb-wrench and with a plurality of transverse holes each of which may be caused to register with the hole in the bearing, a spring having one end attached to said rod and its other end resting upon the brush, a pivoted steadying-arm attached to said spring and a removable locking-pin adapted to be inserted in either of the holes in the rod and in the hole in the frame.

5. In a brush-holder, the combination with a frame and a brush loosely mounted therein, of a rod rotatably mounted in the frame, a spiral spring having one end attached to said rod and the other end resting upon the brush, and a steadying-arm connecting said rod with an intermediate point in the spring.

6. In a brush-holder, the combination with a frame and a brush loosely mounted therein, of a rod journaled in said frame, a removable locking device between the rod and the frame, a spiral spring one end of which is fastened to said rod and the other end of which rests upon the brush and a steadying-arm having one end loosely mounted upon said rod and rigidly fastened to the spring between the rod and the brush.

7. In a brush-holder, the combination with a frame and a brush loosely mounted therein, of a rod journaled in said frame, a removable locking device between the rod and the frame, a spring having one end attached to the rod and having a block at its other end that rests upon the brush and a steadying-arm for the spring.

8. In a brush-holder, the combination with a frame comprising a casting and a sheet-metal socket for the brush, of a rotatable rod mounted in the casting, a removable locking device between the rod and the casting, a spiral spring attached to one end of the rod and a steadying-arm loosely mounted upon the rod and rigidly fastened to the free end of the spring.

9. In a brush-holder, the combination with a frame comprising a casting and a rolled-metal socket, of a brush loosely mounted in said socket, a rod rotatably mounted in the casting, a removable locking device between the rod and the casting, a spiral spring surrounding and fastened to said rod and having a projecting end provided with a block to rest upon the brush and a steadying-arm loosely connected at one end to said rod and rigidly fastened to the projecting portion of the spring.

In testimony whereof we have hereunto subscribed our names this 5th day of February, 1904.

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Witnesses:

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