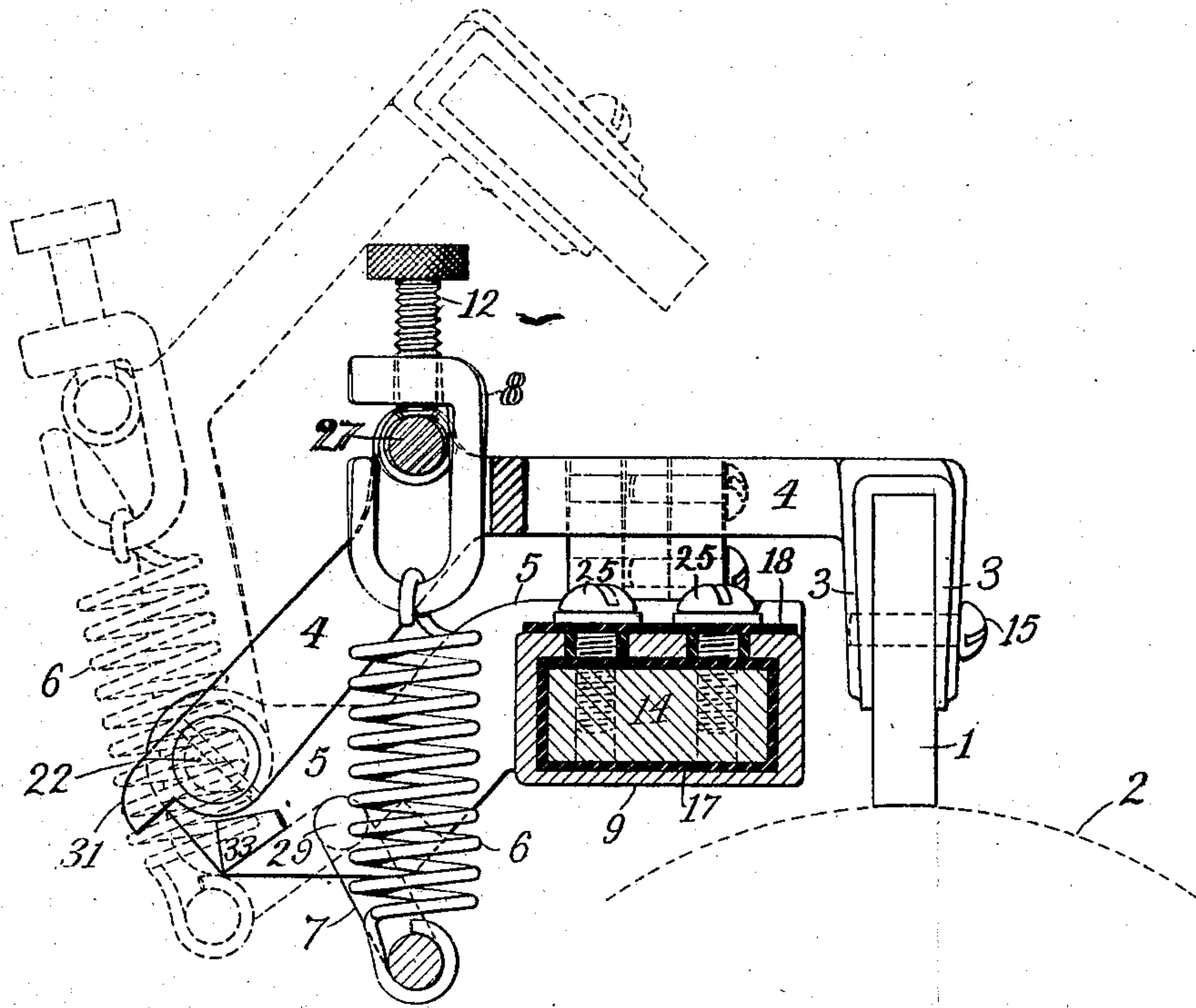
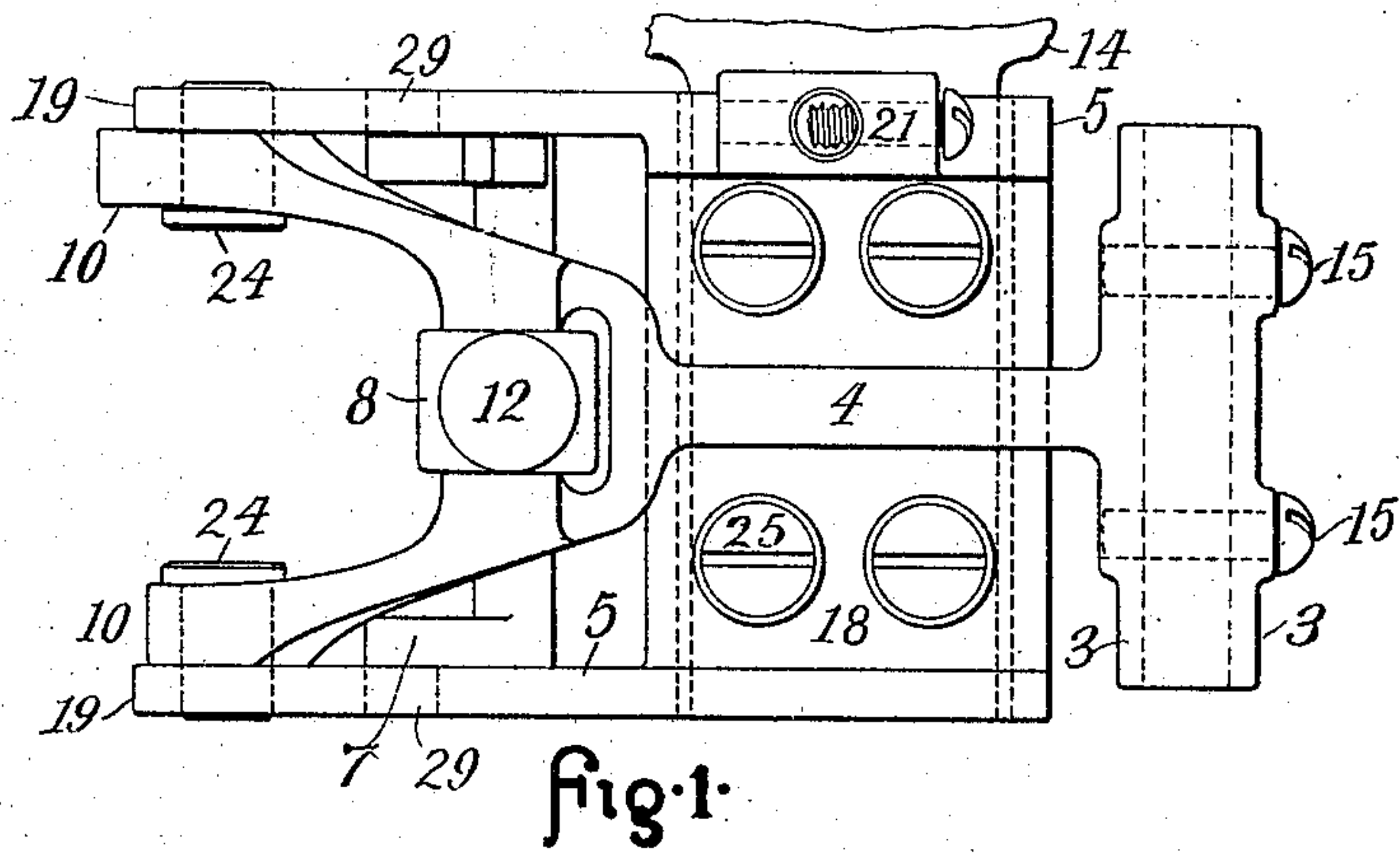


J. F. McELROY.
BRUSH HOLDER.
APPLICATION FILED NOV. 22, 1904.

912,974.

Patented Feb. 16, 1909.



Witnesses.

L. S. Shaw
M. A. Moder.

Fig. 2.

by

Inventor.

James F. McElroy

Brentley & Pierson

Attys.

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR HEATING COMPANY, A CORPORATION OF WEST VIRGINIA.

BRUSH-HOLDER.

No. 912,974.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed November 22, 1904. Serial No. 233,788.

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, county of Albany, State of New York, have invented certain new and useful Improvements in Brush-Holders, of which the following specification and accompanying drawing illustrate one form of the invention which I now regard as the best out of the various forms in which the invention may be embodied.

I now proceed to describe my invention, reference being had to the accompanying drawing:

Figure 1 is a plan view of my device, Fig. 2 is a side elevation thereof partly in section.

In brush holders for dynamo electric machines and motors designed to carry a carbon brush, difficulty has been encountered in making the necessary electrical connection with the brush, while at the same time giving it the needful motion involved in its spring bearing on the commutator. In most cases the brush is so arranged as to slide freely in a tubular holder under the influence of its operating spring, while the electrical connection with the brush is made by means of a flexible conductor secured to the brush at one end and attached at its opposite end to the holder or its supporting stud. Without such flexible conductor the necessary looseness of the brush within its tubular holder prevents the maintenance of a good electrical connection between such holder and the brush. These flexible conductors however are also open to objection and it is my purpose to eliminate them and at the same time provide for the electrical connection and for the necessary movement of the brush to and from the commutator in a permanent and reliable manner. In brief, I provide a pivoted lever which at one end has jaws adapted to grip the brush permanently and securely, so as to maintain a good electrical connection therewith, while at its outer end it is pivoted to a conducting support in such manner as to be in good electrical connection therewith. The lever is arched so as to bring its forward end approximately on a level with the upper edge of the brush, while its rear and lower end is pivoted to the support about on the level of the bearing surface of the brush. The stud which carries the holder is located between the brush and

the pivotal point of the lever and the support to which the lever is pivoted is sleeved upon and insulated from the stud and is provided with a rearward and downward projection, at the extremity of which the lever aforesaid is pivoted. I also fork both the support and the lever, so as to secure a broad and substantial pivotal base for the lever and also insure the proper electrical connection between the lever and the support. I operate the brush holder by means of a spring connected at its upper end to a link hooked to the lever and at its lower end anchored to a knuckle arranged to be thrown over a dead center to either apply the force of the spring to the lever or to release it for permitting the lever to be raised, so as to form a break-down anchorage or abutment for the spring substantially as shown in my Patent No. 747,890 of December 22, 1903. The spring gives an even pressure of the brush against the commutator in all positions since as the brush wears away and the spring tends to lose its tension, its leverage on the brush is correspondingly increased by the movement of its point of application to the lever further away from the pivotal point of the lever.

Turning to the drawing, 1 is the carbon brush designed to bear upon the cylindrical surface of a commutator, indicated at 2.

4 is the lever of the brush holder provided at one end with jaws 3, 3 between which the brush 1 may be firmly clamped by means of screws 15, which extend between the jaws, passing directly through the brush itself, and draw the jaws together to grip the brush and establish a permanent and reliable electrical connection therewith. Moreover the jaws will receive the upper half of the brush and a little more, so that they will clamp the brush below its middle. This permits the brush to be removed from the jaws when its lower end has been worn away near to the edges of the jaws and then reversed end for end so that the upper half previously received in the holder may be used in turn upon the commutator. The rear end of the lever is forked as shown in Fig. 1 into the two branches 10, 10 at the extremities of which the lever is pivoted with the axis of the pivot at the point 22, approximately on a level with the bearing surface of the brush where it rests upon the commutator. The

upholding stud 14 projects from a stationary part of the machine in the usual manner and is rectangular in cross section as seen in Fig. 2.

5 The support upon which the lever 4 is pivoted is indicated at 5 and is provided with a sleeve 9 which encircles the stud 14, but is insulated therefrom by the insulating sleeve 17. The support is secured in position on the stud by means of screws 25 which are passed down through the sleeve into the stud but are insulated by means of bushings and by the strip of insulating material 18 which lies upon the upper side of the sleeve. From the said sleeve the support 5 projects rearwardly and downwardly being forked into two branches 19, 19 as shown in Fig. 1. The sleeve is provided with a binding post 21 to which the leading-in wire is connected. The respective branches 10 of the lever 4 are pivoted to the extremities of the branches 19 of the support 5 by means of pivots 24 which are about on the level of the bearing surface of the brush. By this means a good electrical connection is maintained between the lever and its support while a free movement of the former upon the latter is permitted.

30 The operating spring 6 is connected at its upper end to a link 8 which straddles a cross rod 27 between the two branches 10, 10 of the lever 4, being provided with a screw 12 which passes through the upper side of the link and has a grooved end which bears upon the upper side of the cross rod 27 thereby serving to adjust the tension of the spring. The lower end of the spring is connected to a knuckle 7 pivoted at 29 on the respective branches 19 of the support 5 and adapted to be turned from its full line position, Fig. 2, to its dotted line position, to release the tension of the spring upon the lever. The tension of the spring being thus relieved the lever, together with the brush carried at its outer end, may be turned back into the position shown in dotted lines, Fig. 2, where it will be held by the spring 6, which now acts upon the opposite side of the pivotal point 22, a projection 31 on the lever coming against a stop 33 on the support 5.

By this arrangement a compact form of brush holder is provided, the stud 14 being close to the commutator 2 and the brush 1, and intervening between the brush and the pivotal point 22 of the lever 4. This enables the lever to be of a sufficient length to avoid any deflection of the brush 21 from its normal position on the commutator as it wears down, this being also facilitated by the location of the pivotal point 22 approximately on a level with the bearing surface of the brush. I also have a reliable electrical connection from the brush 1 through to the

binding post 21 to which the leading-in wire is attached. Moreover, as the brush wears down the pressure of the spring tends to increase by reason of a gain in leverage as the lever swings down around its point. 70

What I claim as new and desire to secure by Letters Patent is:

1. A brush holder consisting of a lever having jaws rigid therewith at one end adapted to grip the brush and make a good electrical connection therewith and pivoted at its opposite end to a support of conducting material, which support is provided with a binding post for the leading-in wire and projects rearwardly from a stud located between the brush and the pivotal point of the said lever. 75

2. A brush holder consisting of an arched lever having jaws at one end adapted to grip the brush and make a good electrical connection therewith and pivoted at its opposite end to the rear extremity of a support, which support extends rearwardly and downwardly from a stud located between the brush and the pivotal point of the said lever. 80

3. A brush holder consisting of a lever having jaws at one end which are radial to the commutator and adapted to grip the brush and make a good electrical connection therewith and pivoted at its opposite end to a forked support, which support projects rearwardly from a stud located at a point between the brush and the pivotal point of the said lever, combined with an operating spring acting on an increasing leverage as the brush wears away. 85

4. A brush holder consisting of a lever having jaws at one end which are radial to the commutator and adequate to grip the brush and make a good electrical connection therewith and pivoted at its opposite end to a support, which support is sleeved on a stud located between the brush and the pivotal point of the lever and projects rearwardly therefrom, combined with an operating spring acting on an increasing leverage as the brush wears away. 90

5. A brush holder consisting of an arched lever having jaws at one end adapted to grip the brush and make a good electrical connection therewith and pivoted at its opposite end to a support, which support is sleeved upon and insulated from a stud located between the brush and the pivotal point of the said lever and projects rearwardly from the said stud. 95

6. A brush holder consisting of a lever having jaws at one end adapted to grip the brush and make a good electrical connection therewith and pivoted at its rear end to a support of conducting material having a binding post for the leading-in wire, the axis of the pivot being approximately on a level with the bearing surface of the brush, 100

and the said support being carried by a bearing between the said axis and the said bearing surface.

5 7. A brush holder consisting of an arched lever having jaws at one end adapted to grip the brush and make a good electrical connection therewith, combined with an up-
holding stud located within the arch of the lever and provided with a support extend-
10 ing rearwardly and downwardly to a point approximately on a level with the bearing surface of the brush, at which point the said lever is pivoted to the said support.

15 8. A brush holder consisting of a lever having jaws at one end adapted to grip the brush and make a good electrical connection therewith and pivoted at its opposite end to a support, the axis of the pivot being ap-
20 proximately on a level with the bearing surface of the brush, combined with a spring

connected at one end to the said lever and provided with a dead-centered breakdown anchorage or abutment.

9. A brush holder consisting of an arched lever having jaws at one end adapted to grip 25 the brush and make a good electrical connection therewith, combined with a support projecting rearwardly and downwardly from a stud located in the arch of the lever and having the lever pivoted to its rear and 30 lower extremities, and an operating spring for the lever provided with a breakdown anchorage or abutment.

In witness whereof I have hereunto set my hand before two subscribing witnesses, this 35 18th day of November, 1904.

JAMES F. McELROY.

Witnesses:

WILLIAM A. MORRILL, Jr.,
BEULAH CARLE.