

No. 712,591.

Patented Nov. 4, 1902.

W. B. POTTER.
COMMUTATOR BRUSH.
(Application filed Sept. 9, 1901.)

(No Model.)

Fig. 1.

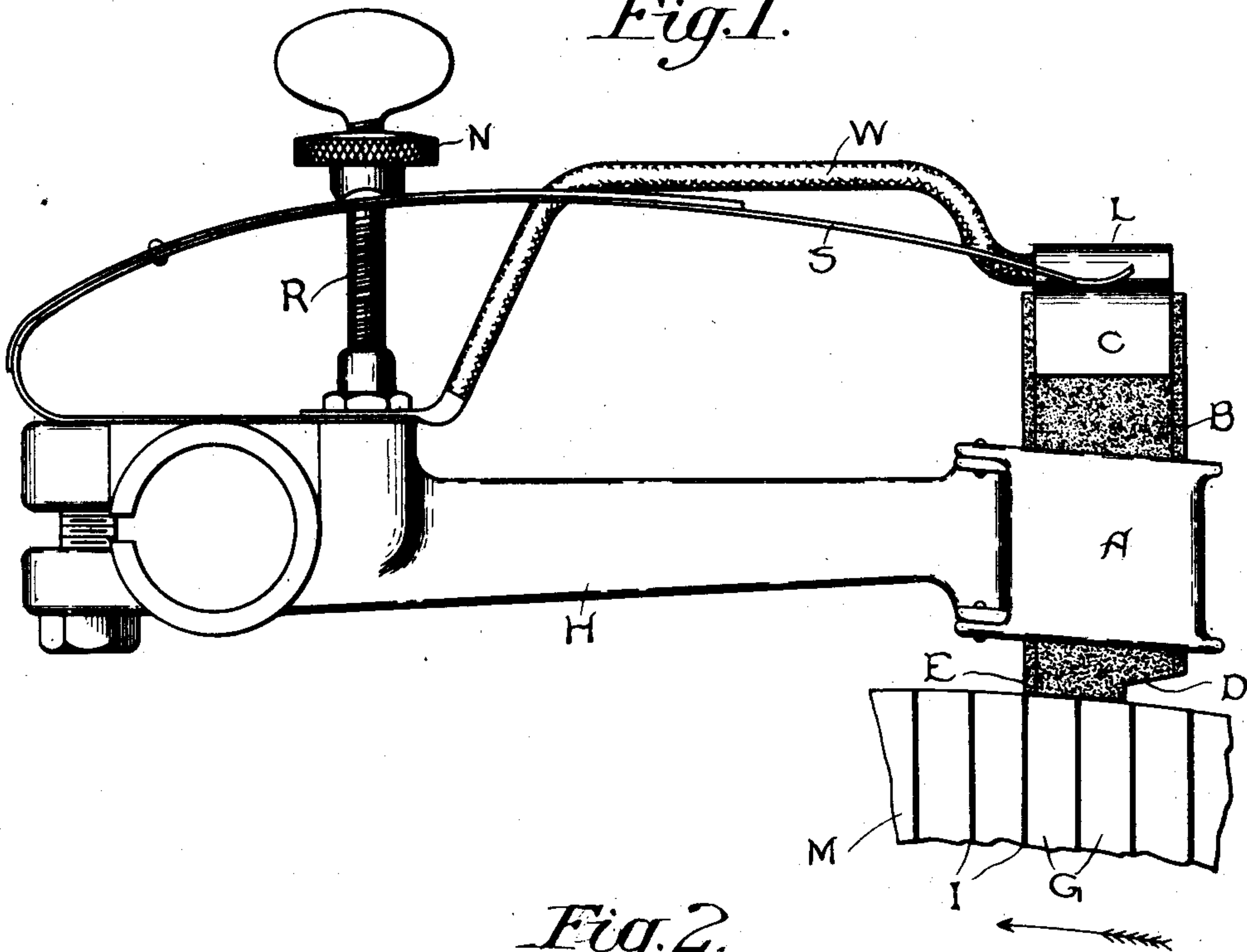
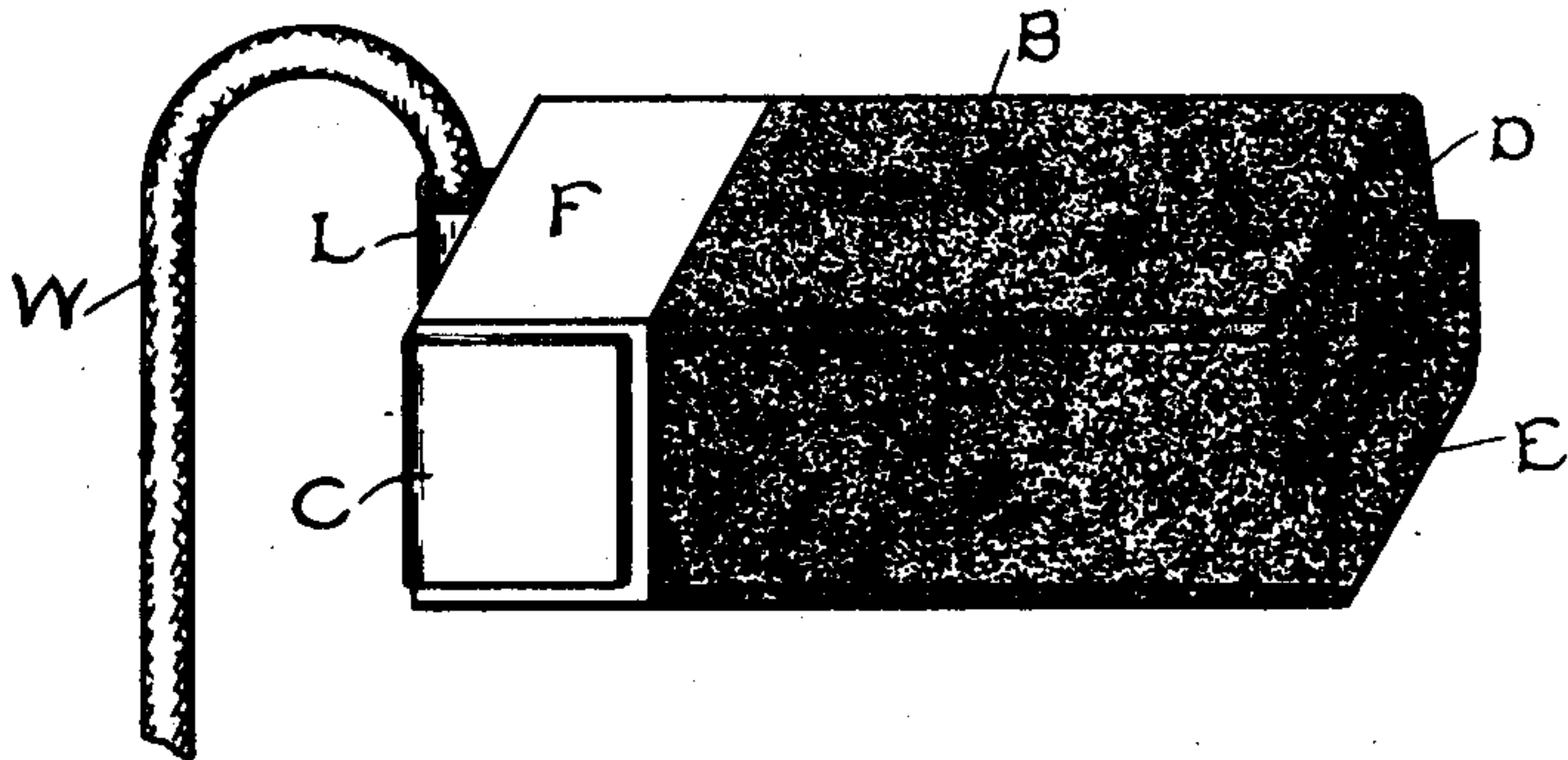


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM B. POTTER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

COMMUTATOR-BRUSH.

SPECIFICATION forming part of Letters Patent No. 712,591, dated November 4, 1902.

Application filed September 9, 1901. Serial No. 74,729. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. POTTER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Commutator-Brushes, (Case No. 1,476,) of which the following is a specification.

This invention has for its object the prevention of sparking at the commutators of electrical machines.

Of the drawings, Figure 1 is an elevation of a brush constructed in one of the various forms in which my invention can be embodied, the brush being mounted in a holder; and Fig. 2 is a perspective view of the same brush, showing a flexible-wire conductor connected to the brush.

Brushes constructed in accordance with my present invention provide a path of ample conductivity for the largest currents that may be taken and at the same time require only a slight lead, with correspondingly small decrease of capacity of the machine in order that sufficient electromotive force will be developed to overcome the self-induction or opposing electromotive forces in the short-circuited coils to reduce the current flowing through the commutator-segments, so that at the time the segments leave the brushes no sparking will occur. When my brushes are once fixed in position, they will not require to be shifted, which is obviously of great importance.

The brush, as represented in the drawings by B, is suitably mounted in a carrier A of the brush-holder H. As shown at D, a part of the lower portion of the brush is cut away, so that only the portion E engages with the surface of the commutator M. The segments G of the latter are separated in the usual manner by suitable strips of insulation I. The commutator-engaging portion or "toe" E of the brush is of such thickness in the direction of rotation of the commutator (indicated by the arrow) that it can bridge only three segments, and therefore short-circuit only a small portion of the armature-coils at any one time. However, it is thick enough to allow sufficient time for the setting up of the reversed electromotive forces to counteract the self-induction when the short-circuited

coils are in the act of commutation. From another point of view it may be said that a thin brush having the thickness of the toe E is reinforced at the heel, so that it is thicker above than at the commutator.

Although the toe of the brush has only sufficient thickness at the commutator to short-circuit one or two portions of the armature-coil at one time, nevertheless, owing to the large cross-section of the heel portion which does not engage the commutator-surface, it has sufficient capacity to take care of the large currents which flow to or from the machine, and therefore will not be heated to excess.

When the lower projection E wears away, a new portion D may be cut or filed away to provide a new projection, and the slight labor required, even on machines employing a large number of brushes, is very small in comparison with the increase in the output of the machine and with the preservation of the commutator which results from the decrease or abolition of arcing.

It is considered that the invention is generic in character, as other forms of brushes having similar efficiency to a greater or less degree can readily be conceived when the essential idea of the invention is known.

The upper copper-plated end F of the brush is provided in the usual manner with a metallic clip C, which is electroplated or otherwise secured in good conducting relation to the copper plate. One end of the flexible braided-wire conductor W is secured in good conducting relation within the loop L of the clip C. This conductor W serves to carry off the major portion of the current flowing through the brush, and the spring-follower S serves merely to force the brush against the commutator through the carrier A.

A screw R holds the spring S and the conductor W in place on the holder H, and a nut N operates on the screw R to regulate the following-spring S. It will be clear that the screw R can be loosened to permit the removal of the brush from the carrier A without disturbing the adjustment of the nut.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A commutator-brush for dynamo-elec-

tric machines, consisting of a prism of conducting material having one end cut away so as to reduce one of its lateral dimensions without reducing the other.

5 2. A commutator-brush for dynamo-electric machines, consisting of a rectangular prism of conducting material having one end cut away so as to reduce one lateral dimension but not the other.

10 3. A commutator-brush for dynamo-electric machines, consisting of a rectangular

prism of conducting material with one end cut away so as to reduce the area of the end without reducing one of the lateral dimensions of the prism.

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In witness whereof I have hereunto set my hand this 4th day of September, 1901.

WILLIAM B. POTTER.

Witnesses:

M. H. EMERSON,
G. C. HOLLISTER.