

No. 886,559.

PATENTED MAY 5, 1908.

W. L. WATERS.  
BRUSH HOLDER.

APPLICATION FILED JUNE 3, 1905.

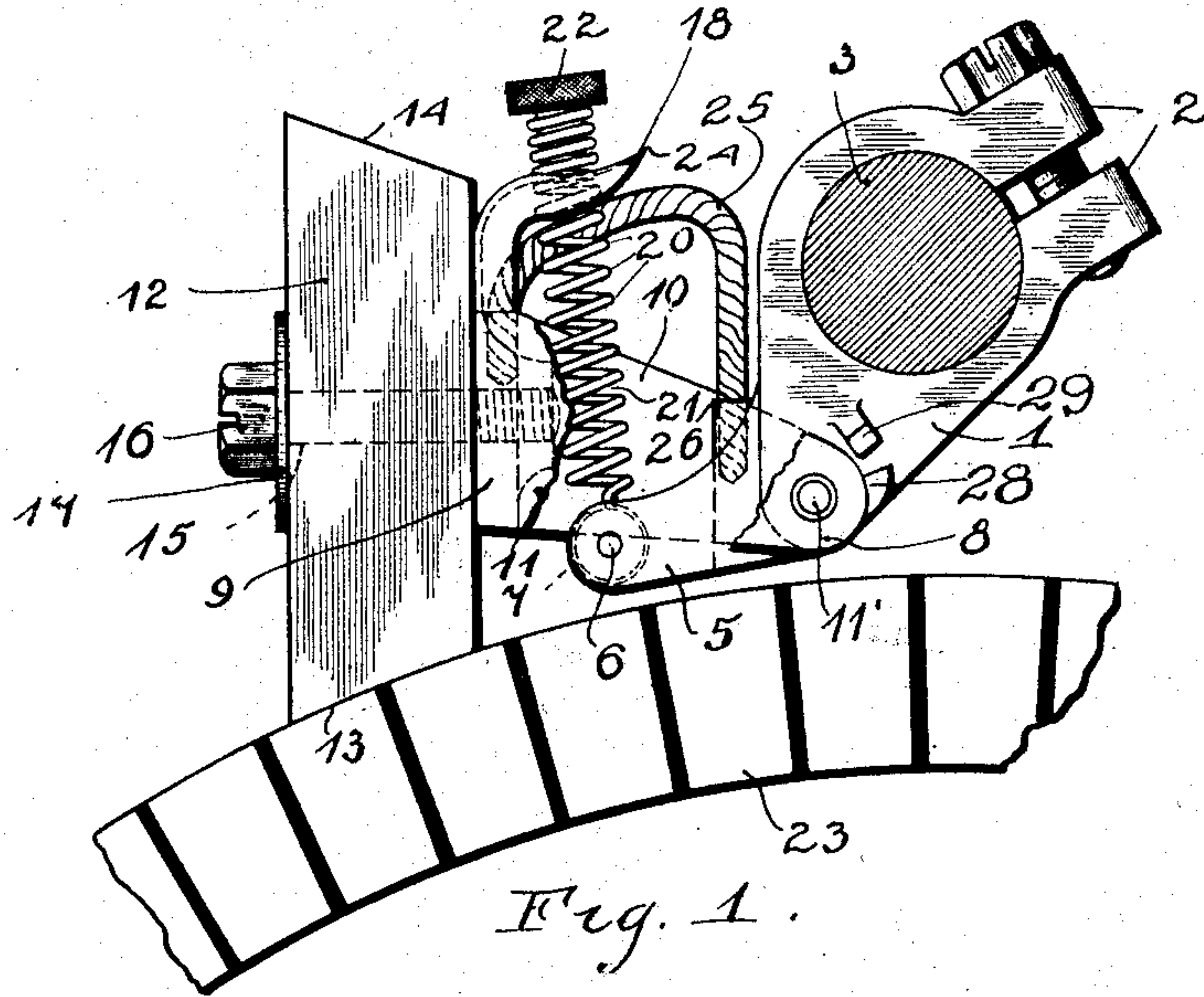


Fig. 1.

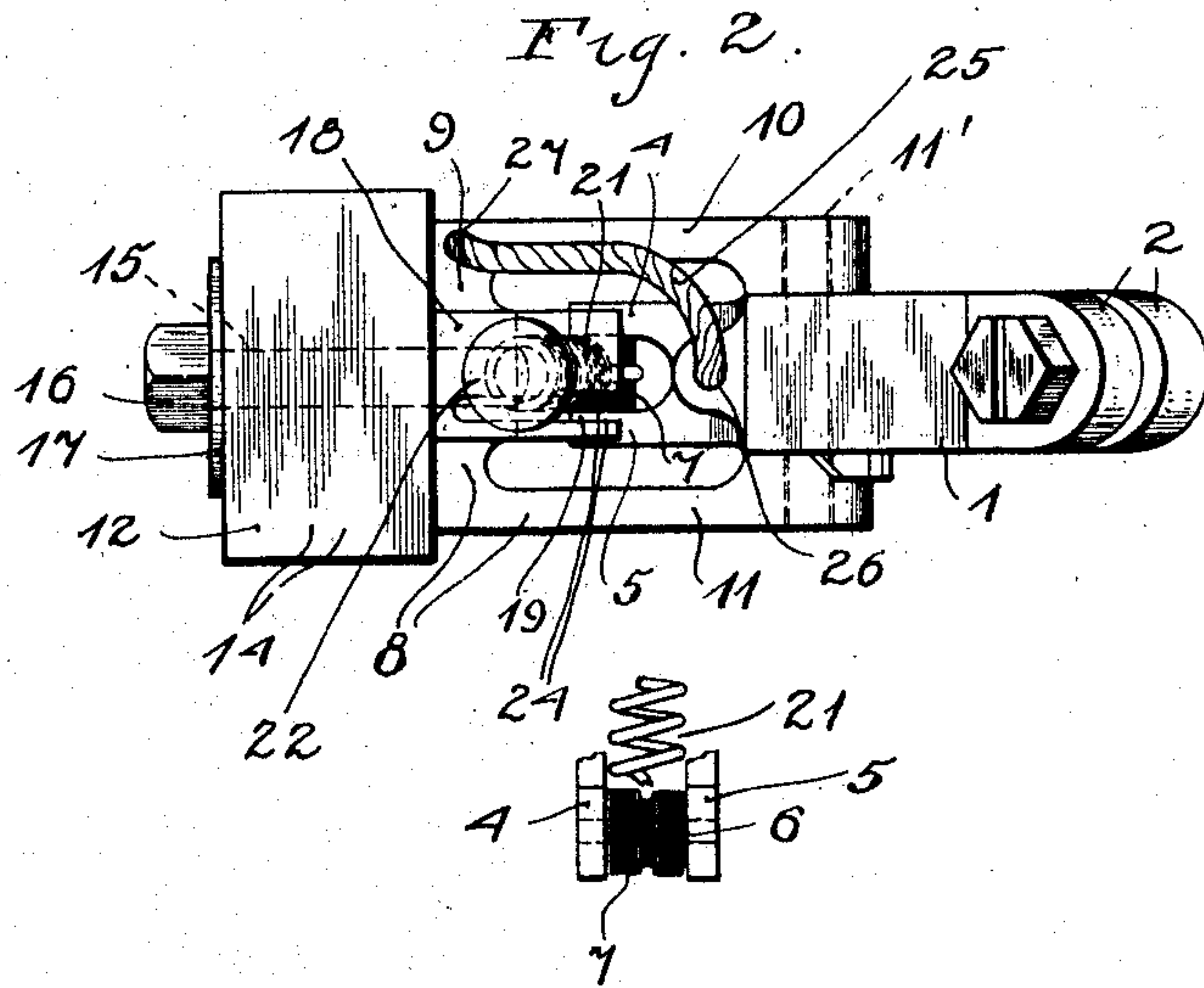


Fig. 3.

Witnesses:

Arthur H. Boettcher,  
Charles J. Schmidt,

Inventor

William L. Waters  
By Charles A. Brown  
Attorney-



# UNITED STATES PATENT OFFICE.

WILLIAM L. WATERS, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO NATIONAL BRAKE & ELECTRIC COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

## BRUSH-HOLDER.

No. 886,559.

Specification of Letters-Patent.

Patented May 5, 1908.

Application filed June 3, 1905. Serial No. 263,515.

*To all whom it may concern:*

Be it known that I, WILLIAM L. WATERS, citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Brush-Holders, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to brush holders, and its object is to provide an improved and more efficient construction and arrangement of the various parts thereof.

In the accompanying drawing is illustrated my improved brush holder, and Figure 1 is a side elevation thereof and a section of a commutator with which the holder is associated. Fig. 2 is a plan view of the holder, and Fig. 3 is a detached detail view of the holder showing the connection of a spring with a supporting frame.

The brush holder consists of the main stationary frame 1 provided with clamping means 2 for engaging the supporting stud 3. At the lower end of the frame 1 and extending forwardly are the arms 4 and 5 through the ends of which a pin 6 passes upon which is mounted a grooved roller 7 of insulating material. The brush supporting frame 8 consists of the vertical body part 9 from which extend the side arms 10 and 11 through the end of which and through the stationary frame 1 a hinge pin 11' passes, which pin is preferably of steel, and the brush supporting frame is thus rotatable with respect to the stationary frame 1. The brush 12 is frustum shape having two wearing ends 13 and 14 cut at an angle to fit the commutator upon which the brush is intended to ride. A hole 15 passes through the center of the brush, and by means of a bolt 16 having threaded engagement with the body wall 9 of the frame 10 the brush may be rigidly secured to this frame, a washer 17 being also used to afford better electrical conductivity between the brush and frame, and the brush may be copper plated.

Extending upwardly and rearwardly from the body part 9 of the swinging frame is a fork member 18 for engaging between any of the turns 20 of the helical spring 21, which spring at its lower end is secured to the insulating collar 7 and at its upper end pro-

vided with a thumb head 22 having screw threaded engagement therewith. This spring, extending between the stationary frame 1 and the swinging frame 10, serves to hold the brush securely and flexibly against the commutator 23, and the degree of tension may be regulated by including more or less of the spring turns between the rigid frame and the fork member 18, this fork member 18 being provided with sharp inner edges 24 whereby it may more readily engage between the spring turns. Electrical connection between the stationary and movable frames of the holder is provided by the flexible member 25 which may be soldered in openings 26 and 27 in the stationary and movable frames respectively.

The brush, being thus readily supported from the swinging frame, is free from chattering and other annoying noises, and as the swinging frame is pivoted to the stationary frame by means of a small steel pin 11', which offers very little resistance, the brush is quick to respond to changes in the commutator surface, being at the same time held in close relation therewith by virtue of the adjustable spring 21. Another very important feature is that the brush, when worn down on one edge, may be turned 180 degrees to present the other edge to the commutator and the life of the brush is thus increased two-fold. This changing of the brush to present another surface consumes very little time, it being necessary only to slightly loosen the bolt 16 to turn the brush the proper distance and then to again tighten the screw. To prevent contact of the lower edge of the body part 9 and arms 10 and 11 with the commutator bars as the brush becomes worn, a lug 28 extends from the arm 11, and a stop 29 extends from the stationary frame 1 to be engaged by the lug 28 to prevent further downward motion of the swinging frame, thereby preventing engagement of the swinging frame with the commutator.

A brush holder of this kind may be used with equal facility and advantage on any commutator or with any dynamo electric machine, and owing to the improved arrangement of the parts many objections existing in other brush holders are overcome.

I do not wish to be limited to the exact arrangement and construction of the parts



herein shown as changes may readily be made without departing from the spirit of the invention.

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

1. In a brush holder, the combination with a stationary arm secured to a supporting stud, of a movable brush supporting frame pivoted thereto, a bifurcated extension from the stationary frame, a roller of insulating material mounted between the ends of the bifurcated extension, a fork-shaped member extending from the brush supporting frame, a helical spring secured to said insulating roller and having adjustable engagement with said fork-shaped member whereby the brush may be securely and flexibly held against the commutator, a lug 28 on said movable brush frame and a stop 29 on said stationary arm forming means for limiting the motion of said movable frame toward the commutator.

2. In combination, a supporting stud, an arm securely clamped to said stud, a movable

brush supporting yoke pivoted to said arm, a bifurcated extension from said arm, a roller of insulating material mounted between the ends of said bifurcated extension, a fork-shaped member 18 extending from said movable yoke, a helical spring secured to said insulating roller, said fork-shaped member being adapted to engage any of the turns of said spring, a lug 28 on said movable yoke and a stop 29 on said arm for limiting the motion of said yoke toward the commutator, and a flexible conductor connecting said brush supporting yoke and said arm, the brush being secured to said yoke by means of a bolt passing through a central opening in said brush, whereby said brush may be reversed to present another wearing surface to the commutator.

In witness whereof, I hereunto subscribe my name this 26th day of May A. D., 1905.

WILLIAM L. WATERS.

Witnesses:

JOHN E. HUBEL,

J. F. DIXON, Jr.