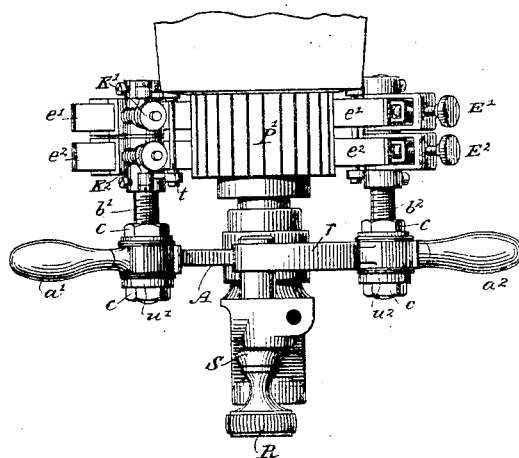


3 Sheets—Sheet 1.

BRUSH HOLDER FOR ELECTRIC MACHINES.

Patented July 31, 1888.

Fig. 1.



Inventor,

Albert Schmid.

By his Attorneys
Pope Edgcomb & Terry.

(No Model.)

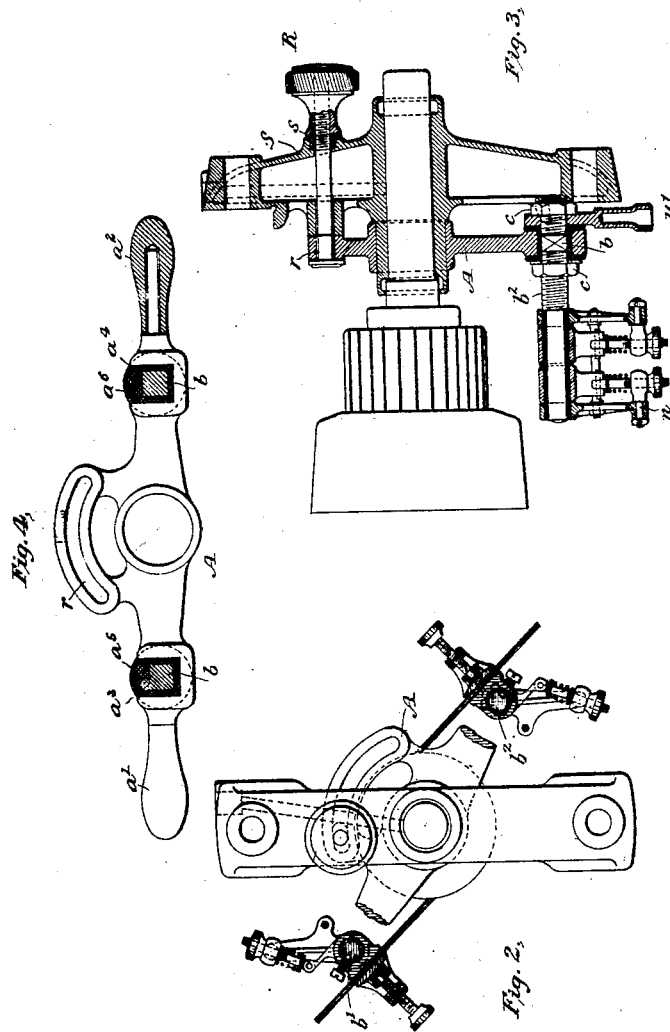
3 Sheets—Sheet 2.

A. SCHMID.

BRUSH HOLDER FOR ELECTRIC MACHINES.

No. 387,010.

Patented July 31, 1888.



WITNESSES:

Caroline E. Davidson.
Eugene J. Kelly.

INVENTOR,

Albert Schmid.

BY

Pope Edgcomb & Terry.
his ATTORNEYS.

(No Model.)

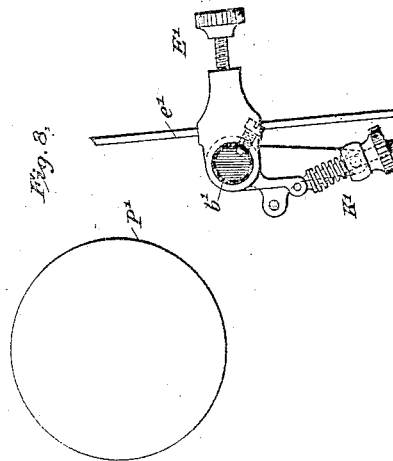
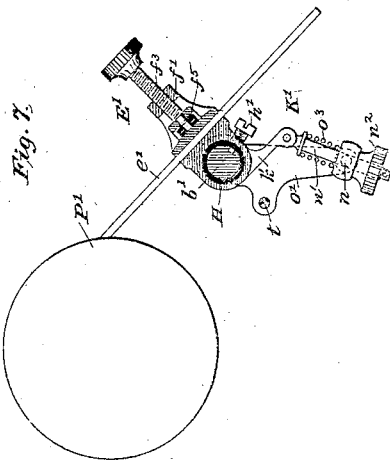
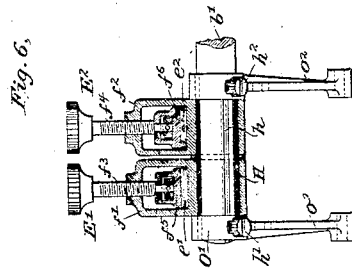
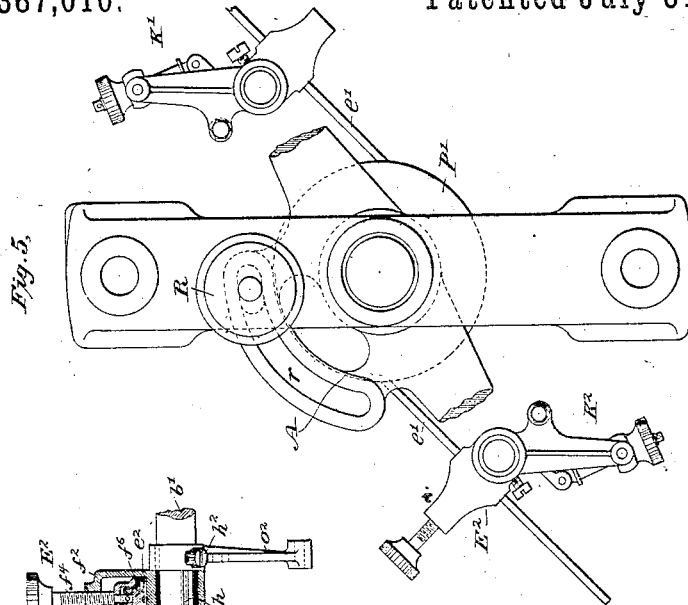
3 Sheets—Sheet 3.

A. SCHMID.

BRUSH HOLDER FOR ELECTRIC MACHINES.

No. 387,010.

Patented July 31, 1888.



WITNESSES:

Caroline E. Davidson
Eugene J. Reilly

INVENTOR.

Albert Schmid.

BY

Pope, Edgcomb & Terry,
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALBERT SCHMID, OF ALLEGHENY, ASSIGNOR TO THE WESTINGHOUSE
ELECTRIC COMPANY, OF PITTSBURG, PENNSYLVANIA.

BRUSH-HOLDER FOR ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 387,010, dated July 31, 1888.

Application filed September 1, 1887. Serial No. 348,480. (No model.)

To all whom it may concern:

Be it known that I, ALBERT SCHMID, a citizen of the Republic of Switzerland, residing in Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Brush-Holders for Electric Machines, of which the following is a specification.

The invention relates to the construction of brush-holders for the collectors and commutators of electric machines.

The invention consists in certain novel constructions and arrangements of parts, whereby the brushes may be easily adjusted and replaced during the operation of the machine.

The invention will be described in detail in connection with the accompanying drawings, in which—

Figure 1 is plan view of the brush-holder as applied to a collector. Figs. 2 and 5 are end views, partly in section. Fig. 3 is a side view, partly in section. Fig. 4 is a view of the adjustable bracket carrying the brushes. Fig. 6 is a transverse section showing clamps holding the brushes, and Figs. 7 and 8 illustrate the operation of the device employed for raising the brushes from the collector-rings.

Referring to the figures, A represents a bracket for supporting the various parts of the device. This bracket may be cast in a single piece, and it is designed to turn about the armature shaft. It is provided with handles a' a'' of non-conducting material. Rectangular openings a' a'' are formed, in which are set non-conducting blocks or bushes a^3 a^4 . These receive the squared ends b (see Fig. 3) of the clamp-carrying rods or bolts b' b'' . The rods or bolts are fastened in position by nuts c c' , but these nuts are insulated from the frame or support A by insulating bushings, as indicated. The rods b' and b'' each carry two collector-brushes, and, as they are similar to each other, only one set need be described. The brushes c' c'' , carried upon the rod b' , (see Figs. 1 and 6,) are held in clamps l' and l'' of convenient construction. Those here shown consist of boxes f' f'' , having adjustable screws f^3 f^4 , carrying clamping plates f^5 and f^6 . These plates hold the brushes against the lower portions of the boxes, but either may be raised for the purpose of removing the correspond-

ing brush at will. The boxes are carried upon a thimble or bush, H, which slips over the rod b' , and it is fastened in position by set-screws h' and h'' , passing through washers O' and O'' . These enter the groove h , formed in the rod b' . The boxes f' and f'' are capable of being turned upon the sleeve or bush H; but their positions are governed by the devices K' and K'' , now to be described. These devices are similar and one only need be described in detail. An arm, k' , projects from the lower portion of the box f' , and it is pivoted to the end of an adjustable threaded bar, n' , which in turn is carried upon a rod, n , supported in the arm o' , extending from the washer O' . A spring, o'' , is compressed between the bar n and the end of the rod n' . A nut, n'' , upon the end of the rod adjusts the same and determines the pressure with which the spring o'' shall force the brush c' , carried by the corresponding clamp, against the commutator or ring l' . (See Fig. 7.)

When it is desired to raise either brush from the collector ring or commutator, the box carrying the same is turned backward, as shown in Fig. 8, and the link-connection between the box and the rod n' permits the parts to assume the position shown in Fig. 8, holding the brush away from the collector ring or commutator. As there are two brushes for each collector-ring or commutator, either brush may be thus temporarily removed without interrupting the operation of the machine. A rod, t , extends from one arm, o' , to the corresponding arm, o'' , carried upon the bushing H, and this serves to bind the parts together, and at the same time as a limiting-stop for the arm k' when the brushes are thrown back from the commutator or collector-rings.

For the purpose of adjusting the position of the brushes upon the rings or upon the commutator, the bracket A is provided with a curved slot, r , through which there extends a set-screw, R, by means of which it is bound to a portion, S, of the frame of the machine. By loosening the set-screw the entire brush-holder may therefore be turned into any required position. The spring s exerts sufficient tension to prevent any accidental slipping of the brush-holder during the adjustment.

When it is desired to reverse the direction

of the motion of the machine, the brushes may be removed by simply loosening the set-screws k' and k'' and slipping off from the rod b' or b'' the entire device carried upon the bushing H and replacing it in an inverted position. This will bring the brushes which are upon the upper side upon the under side, and vice versa. Connections are made with the respective rods b' and b'' through binding-plates u' and u'' , fastened between the nuts c and the corresponding insulating washer.

I claim as my invention—

1. The combination of a supporting-frame for commutator or collector brushes, an insulated bar carried thereby, two brush-clamps, a symmetrically-formed straight sleeve surrounding the rod upon which the clamps are carried and from either end of which they may be removed, a tension device for each clamp normally pressing the corresponding brush against its commutator, and detachable holding devices for permitting the removal of said sleeve from said bar for reversing its position thereon, thereby bringing the brushes upon the opposite sides of the commutator, substantially as described.

2. The combination of a supporting-frame for commutator or collector brushes, an insulated rod carried thereby, two brush-clamps, a sleeve carrying the same supported upon said rod, a tension device for each clamp normally pressing the corresponding brush against its commutator, and a spring pressing the brush toward or from the ring, accordingly as it is moved to one side or the other of the center of support of the brush.

3. A brush-holding clamp for electric machines, consisting of two movable boxes, an arm extending therefrom, a pivoted yielding rod, to which said arm is pivoted, permitting

the turning of said rod upon one side or the other of the line joining the centers of the support of the clamp and of said pivoted rod, and a spring pressing said rod against said arm.

4. The combination of the clamps E' and E'' , the bush H, carrying the same, the rod o' , carried upon the bush and connected therewith, the pivoted bar n' , and the extension k' , coupled therewith, and the yielding spring o'' , surrounding the bar n' , substantially as and for the purpose described.

5. The combination, with a brush-holder for electric machines, of a spring compressed between the clamp and its support and exerting its force in a direction oblique to the support of the clamp, and means for carrying the spring into a second position upon the opposite side of the support.

6. The combination, with an electric generator or motor and its revolving commutator or collector, of a movable brush-holder, and an eccentric-spring exerting stress upon the brush-holder in one direction, or the opposite accordingly as the spring is moved from one side to the other of the center of support of the brush-holder.

7. In a brush-holder for electric machines, the combination of a brush-holding clamp, an axis upon which it is movable, an arm extending from the clamp, an arm extending from the axis, and a yielding knee-joint between the clamp and said arm, whereby the position of the clamp may be controlled.

In testimony whereof I have hereunto subscribed my name this 23d day of August, A. D. 1887.

ALBERT SCHMID.

Witnesses:

W. D. UPTGRAFF,

DANL. W. EDGECOMB.