

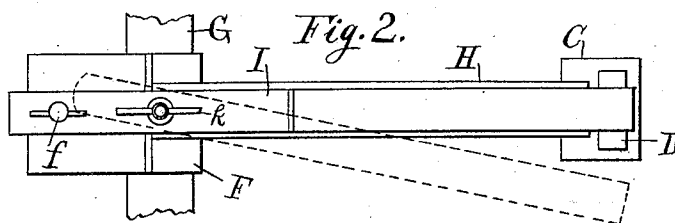
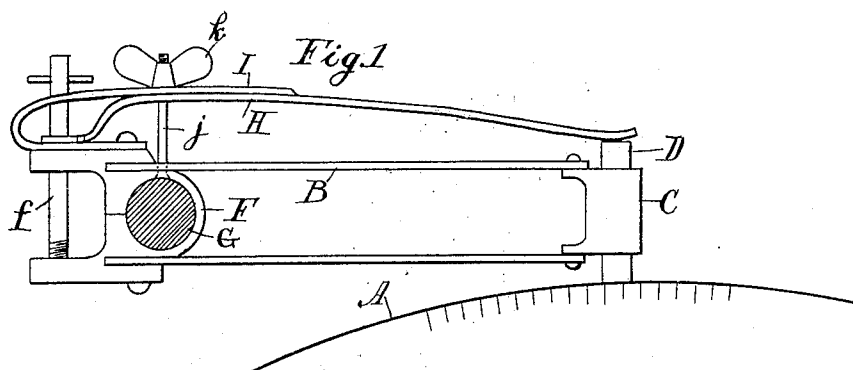
(No Model.)

W. E. KNOWLTON.

CARBON BRUSH HOLDER FOR ELECTRIC MACHINES.

No. 558,184.

Patented Apr. 14, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM E. KNOWLTON, OF PORTLAND, MAINE.

CARBON-BRUSH HOLDER FOR ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 558,184, dated April 14, 1896.

Application filed February 19, 1896. Serial No. 579,872. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. KNOWLTON, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Carbon-Brush Holders for Electric Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved form of carbon-brush holder for electric generators, dynamos, &c., where a commutator is used, and it particularly relates to an improved construction of a carbon-brush holder now in common use on generators of large size.

In the brush-holder referred to there is a clamp mounted on the brush-holder stud so held that it may be loosened and turned on said stud. The brush is held on end against the commutator by a socket, which is connected to the clamp by parallel flat rods. The brush extends entirely through said socket, and its outer end is acted on by a flat spring, one end of which is rigidly secured to the clamp. When it is desired to remove the brush from its socket for the purpose of renewing it or of cleaning its contact-surface, the entire brush-holder is rotated on the stud until the brush is free from the commutator and the brush is then slipped out from the under side of the socket. The principal difficulty which has been experienced with this brush-holder is that if the socket is tilted back, the brush removed, and the contact-surface of the carbon cleaned, as must frequently be done when the machine is running, if the socket is not replaced in exactly the same position with relation to the commutator that it was before, the contact of the brush with the commutator will not be perfect. The friction of the end of the brush with the surface of the commutator wears it in the form of a cylindrical surface having the same curve as the surface of the commutator, and if any dirt gets in between the end of the brush and the commutator it is necessary to remove the former and clean it, and this operation is usually done while the machine is running. As already stated, if the position of the socket when the carbon is replaced is nearer or farther

away from the commutator the end of the carbon will not fit the surface of the commutator and a new surface will have to be worn before the contact will be perfect. Another difficulty with this brush-holder is that in large generators, where the brush-holders are out of easy reach, it is difficult to remove the brushes when the machine is in motion, and the operation is always a dangerous one.

My improvement on the brush-holder described consists in pivoting the end of the spring which is connected with the clamp so that the opposite end can be swung aside from the outer end of the carbon brush, permitting the brush to be removed through the outer end of the socket and without disturbing the position of the latter with relation to the surface of the commutator.

In the accompanying drawings I have illustrated a brush-holder embodying my invention, in which—

Figure 1 is a side view, and Fig. 2 a plan or top view.

A represents the surface of the commutator, and G is the brush-holder stud. (Shown in section in Fig. 1.) The carbon brush D is held in contact with the commutator by the socket C, which has an opening extending entirely through it, so that the outer end of the brush extends above the outer end of the socket. The socket is supported by and connected to a clamp F, which is clamped on the stud G by means, as herein shown, of parallel supporting bars or rods B, which are secured rigidly by one end to the socket and by the other end to the clamp. The friction of the clamp on the stud is regulated by means of the binding-screw *f*, which allows the clamp to be loosened so that it will turn on the stud.

According to my present invention the brush D is pressed inward against the surface of the commutator by means of the spring H, which is pivoted to the clamp F by one end, the opposite end bearing against the outer end of the brush. As herein shown, the spring H is pivoted a short distance from its end by a bolt *j*, which passes through it and into the clamp F, the spring being held down by a thumb-nut on the outer end on the bolt. The extreme end of the spring H is bent down onto the upper surface of the clamp F to form a bearing or fulcrum.

In the form of my invention which I have here shown I make use of a reinforcing-spring I, the free end of which bears on the top of the spring H near its inner end, while the
5 other end is secured firmly to the clamp back of the end of the spring H.

When it is desired to remove the brush for the purpose of cleaning or renewing it, it is only necessary to swing the spring to one side
10 without loosening the clamp on the stud and without disturbing the position of the socket with relation to the surface of the commutator, as is clearly shown in the dotted lines of Fig. 2.

15 By the use of my improved brush-holder the brushes can be readily changed quickly and easily at any part of the commutator where they can be reached, and when the brush is put back in position it is absolutely
20 certain that the contact will be perfect and the efficiency of its work assured.

I claim—

1. The herein - described carbon - brush holder for electric machines consisting of a

socket for holding the brush on end against 25 the commutator, a clamp secured to the brush-holder stud, bars or rods B connecting said socket with said clamp and a spring H pivoted by one end to said clamp, the opposite end bearing on the outer end of said brush to press 30 the same against the commutator.

2. The herein - described carbon - brush holder for electric machines consisting of a socket for holding the brush on end against 35 the commutator, a clamp secured to the brush-holder stud, bars or rods B connecting said socket with said clamp, a spring H one end of which bears on the outer end of said brush, the opposite end being pivoted to the clamp by a bolt near its end, the extreme end being 40 bent down to bear on said clamp and an auxiliary spring I secured by one end to the said clamp and having its free end bearing on the top of said spring H to reinforce the same.

WILLIAM E. KNOWLTON.

Witnesses:

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