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H. BISHOP.

COMMUTATOR BRUSH HOLDER.

(Application filed July 3, 1900.)

(No Model.)

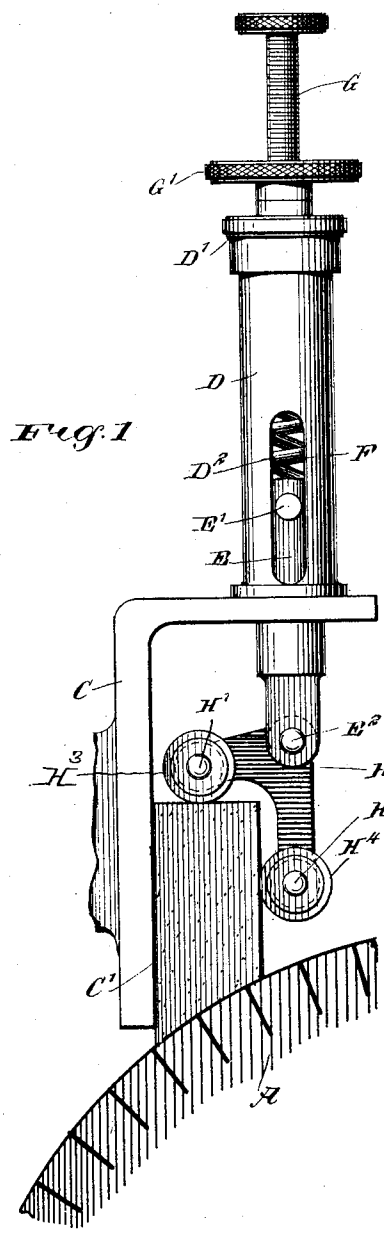


Fig. 1

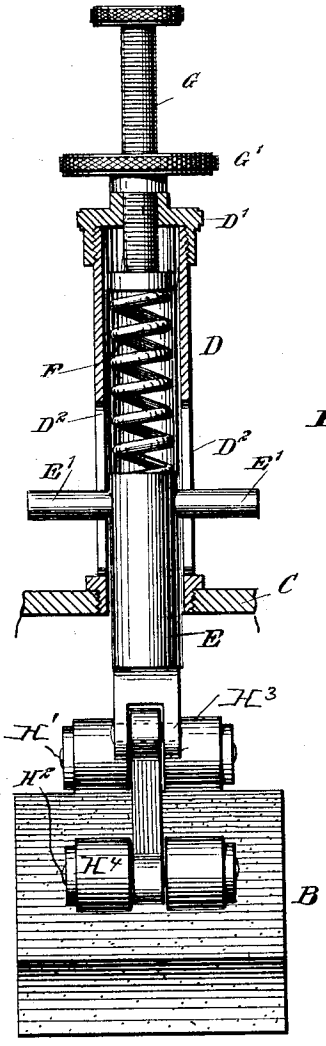


Fig. 2

WITNESSES:

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COMMUTATOR-BRUSH HOLDER.

SPECIFICATION forming part of Letters Patent No. 662,758, dated November 27, 1900.

Application filed July 3, 1900. Serial No. 22,453. (No model.)

To all whom it may concern:

Be it known that I, HARRY BISHOP, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Commutator-Brush Holder, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved commutator-brush holder arranged to insure at all times a firm contact between the conducting-block and the commutator and the seat of said block and to allow a free sliding movement of the conducting-block without danger of the block leaving its seat.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a side elevation of the improvement as applied and with the commutator shown in section, and Fig. 2 is a cross-section of the same.

In commutator-brush holders heretofore constructed—for instance, such as shown and described in the Letters Patent of the United States No. 504,901, granted to R. N. Bayles on September 12, 1893—serious defects exist, of which the most notable is that on the slightest roughness appearing on the commutator the brush is lifted slightly from its seat, thus allowing the current to arc from the brush to the holder and cause the brush and holder to burn in spots, and when the brush falls back into position it rides on these burned spots, thereby making a bad contact with its seat, causing overheating of the parts affected and in a short time rendering the brush useless for further service, besides heating the dynamo generally, burning the brush-holder and commutator, and requiring constant sandpapering and turning down at least three times as often as should be necessary. These defects naturally curtail the life and usefulness of the entire machine. When the contact between the brush and its seat becomes bad, then the pivot-lever now employed and engaging the brush for pushing the same in contact with the commutator becomes a conductor, and by carrying an excessive current the part in contact with the brush burns into the side of the brush, rendering the take-up for wear on the brush inoperative. In order to overcome these defects, I provide a take-up or follower arranged to cause the brush to be at all times in firm contact with its seat and with the commutator and at the same time allow a free sliding of the brush on its seat, but holding the brush against movement from its seat.

As shown in Fig. 1, the commutator A is engaged by a conductor or brush in the form of a block B, of carbon or other electric conductor, and having a beveled end lying against said commutator. The block B is seated on the seat C′ of a holder C, secured by suitable means to the frame of the machine, and said holder carries a cylinder D, in which is mounted to slide the slide or cross-head E, pressed toward the brush and conductor by a spring F, the tension of which can be regulated by a screw-rod G, screwing in the cap D′ of the cylinder and locked in place against accidental movement after adjustment is made by a jam-nut G′. The slide E is provided with projecting lugs E′, extending through guide-slots D^2 in the cylinder D to hold the slide from turning and to allow the operator to take hold of the projecting ends of the lugs E′ and force the slide outward against the tension of the spring F whenever it is desired to replace a worn-out brush B by a new one. The free end of the slide E is forked, and a pivot-pin E^2 is held in the fork members, and on this pivot-pin is fulcrumed a follower consisting, essentially, of an angular or bell-crank lever H, having transverse pins H′ H^2 on opposite sides of its fulcrum, friction-rollers H^3 H^4 being journaled on said pins and preferably in pairs, the friction-rollers being located on opposite sides of the follower H, as plainly shown in Fig. 2. The friction-roller H^3 engages the upper end of the block B, while the other friction-roller H^4 engages the free face of the said block. As the spring F presses the slide E inward in a line parallel to the seat C′ and as the friction-rollers H^3 H^4 engage the brush-block B at adjacent faces, it

is evident that the follower presses the block B toward the commutator A by the action of the rollers H^3 H^4, and as the rollers have a fixed relation to each other it is evident that when one recedes the other follows, and consequently a free sliding movement of the block B is had on the seat C′, and at the same time the block is prevented from moving from the seat C′.

By the construction described the two members of the follower bear on the adjacent faces of the block B with approximately equal pressure, thereby rendering arcing between the brush and holder impossible and at the same time remedying all the defects above mentioned, giving longer life to the brush and commutator, and requiring less labor to operate the dynamo and less power to drive it, owing to the saving in the amount of heating now going to waste. By the operator adjusting the screw-rod G the tension of the spring F is regulated to insure a uniform pressing of the brush-block against the commutator and its seat C′.

The sets of rollers H^3 and H^4 make line-contact with the outer end and face of the brush, and thereby insure at all times a good contact even if such end and face is more than ordinarily rough, and as the rollers have rolling contact with the ends and face referred to it is evident that even the slightest vibration of the brush causes turning of the rollers on the brush-surfaces without, however, breaking the contact, as a movement of the brush against one roller will cause the other roller to bear with a force against its brush-surface equal to that which the brush exerts against the other roller. By the arrangement described a minute movement of the rollers on the brush-surfaces is caused by the vibrating motion of the brush; but a perfect contact is at all times maintained to prevent even the slightest break in the current.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A commutator-brush holder having a follower pressing the conductor and consisting of an angular lever, and rollers on the ends of the lever on opposite sides of the lever's fulcrum, the rollers being arranged to engage one end and the outer face of the conductor to hold the latter against its seat and against the commutator, and at the same time prevent movement of the conductor from its seat.

2. A commutator-brush holder having a follower, and a spring-pressed support on which the follower is fulcrumed, the follower comprising an angular lever and rollers on the ends of the lever, the rollers engaging one end and the outer face of the brush or conductor, as set forth.

3. A commutator-brush having a spring-pressed movable support, an angular lever fulcrumed on said support, and rollers journaled on the ends of the lever on opposite sides of the fulcrum, one of the rollers engaging one end of the conductor and the other the outer face thereof, as set forth.

4. A commutator-brush holder, comprising a holder having a seat for the brush or conductor, a cylinder on said holder, a slide movable in said cylinder and arranged to move approximately parallel to said seat, a spring for pressing said slide, means for adjusting the tension of said spring, and a follower pivoted on said slide and having a plurality of members for engaging and pressing adjacent faces of the brush, as set forth.

5. A commutator-brush holder, comprising a holder having a seat for the brush or conductor, a cylinder on said holder, a slide movable in said cylinder and arranged to move approximately parallel to said seat, a spring for pressing said slide, means for adjusting the tension of said spring, a follower pivoted on said slide and having a plurality of members for engaging and pressing adjacent faces of the brush, and lugs projecting from the slide and extending through slots in said cylinder, to hold the slide against turning and to permit of manually moving the slide, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY BISHOP.

Witnesses:

JOEL S. DE SELDING,

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