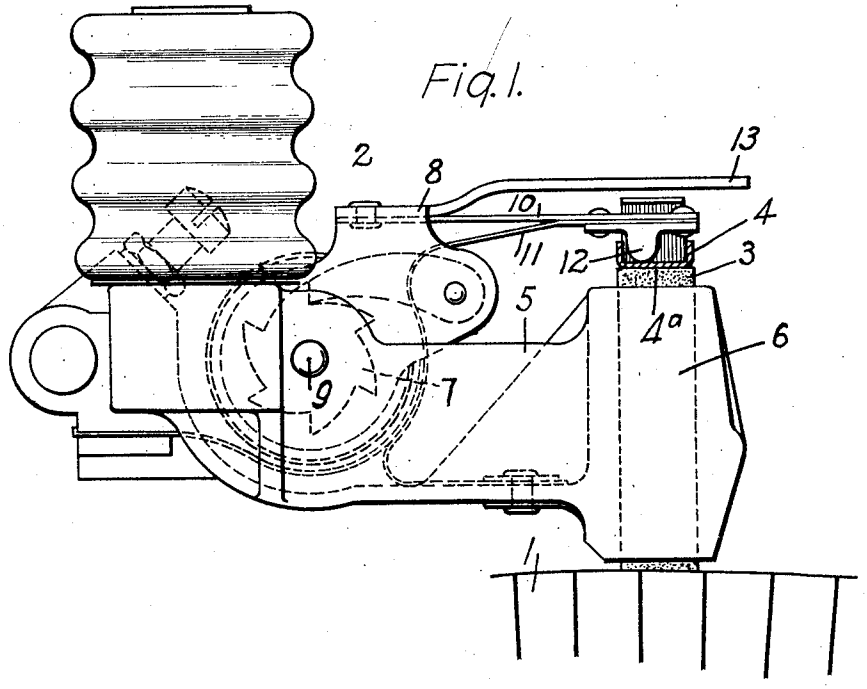
L. W. TURNBULL.

BRUSH HOLDING DEVICE.

APPLICATION FILED SEPT. 15, 1914.

1,312,769. Patented Aug. 12, 1919.

Fig. 1.



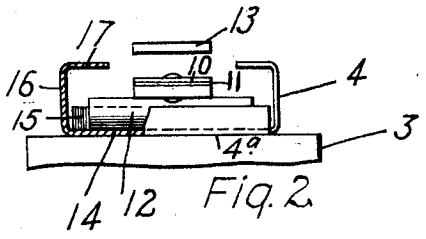


Fig. 2.

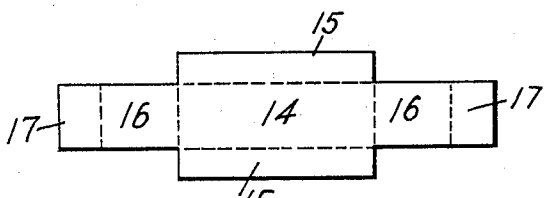


Fig. 3.

WITNESSES:

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BRUSH-HOLDING DEVICE.

1,312,769. Specification of Letters Patent. Patented Aug. 12, 1919.

Application filed September 15, 1914. Serial No. 861,804.

To all whom it may concern:

Be it known that I, LAWRENCE W. TURNBULL, a subject of the King of England, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Brush-Holding Devices, of which the following is a specification.

My invention relates to dynamo-electric machines, and it has special reference to brush-holding devices that are adapted for use in such machines.

The object of my invention is to provide a simple and inexpensive accessory for brush-holding devices which shall reliably and effectively prevent certain operating troubles that have heretofore been experienced.

In the prior art, the spring-actuated arms that are usually provided in brush-holding devices for biasing the slidably-mounted brushes to engage the commutator cylinders of dynamo-electric machines, have, in practically all cases, borne upon the free end of the brushes with a rounded or relatively narrow surface. The result has been that pitting and digging of end recesses or hollows has occurred, thereby impairing the operation of the brush, both as regards current traversals through, and heating of, the brush and the biasing arm and flexible shunt that are connected thereto, and the freedom of mechanical movement of the brush.

According to my present invention, therefore, I provide means for overcoming the above-mentioned operating difficulties. The said means comprises a box-like member of conducting material that is adapted to loosely inclose the free end of the brush-biasing arm and has a substantially flat surface of relatively large area to bear upon the free end of the brush throughout the range of operation thereof. A relatively large flat conducting surface thus remains in contact with the end of the brush at all times, and the pitting and digging of the end recesses is entirely obviated.

In the accompanying drawing, Figure 1 is a view, chiefly in elevation but partially in section, of a brush-holding device constructed in accordance with my invention; Fig. 2 is a view in end elevation, with parts broken away for clearness, of a portion of the structure shown in Fig. 1; and Fig. 3 is a developed view of an accessory device that is illustrated in Figs. 1 and 2.

Referring to the drawing, the apparatus here shown comprises a portion of a commutator cylinder 1 of ordinary construction, a brush holder 2 which is suitably mounted adjacent thereto, a brush 3 that is slidably mounted in the brush-holding device 2 for engagement with the cylinder 1, and my accessory device 4, which is adapted to bear upon the free end of the brush 3 through a flat surface 4^a of relatively large area, as hereinafter more fully set forth.

The brush-holding device 2 may be of any suitable construction and is here shown as comprising a skeleton body portion 5 having an end portion 6 through which the brush 3 is adapted to slidably engage the commutator cylinder 1; a biasing means, such as a spring and coöperating pawl and ratchet mechanism 7 of familiar construction, which is adapted to actuate a carriage 8 that is pivotally mounted within the body portion 5 at a point 9; a resilient brush-biasing arm 10 that is suitably secured to the carriage 8; a flexible conducting member or shunt 11, one end of which is secured to the body portion 5 in any suitable manner and the other end of which is secured between the free end of the arm 10 and a contact head 12; and a suitable shield or protecting member 13 that is suitably secured to the carriage 8.

Referring particularly to Figs. 2 and 3, it will be seen that my brush holder accessory device 4, which is interposed between the contact head 12 and the free end of the brush 3, comprises a substantially flat body portion 14 of relatively large area that is adapted to present the surface 4^a to the brush 3, when mounted in operating positions; a pair of side projections 15 and a pair of end projections 16, the portions 15 and 16 being bent at substantially right angles to the body portion 14 and the end portions 16 having their outer ends 17 bent inwardly substantially parallel to the body portion 14. The accessory device 4 is thus disposed to loosely inclose the head 12 on the free end of the biasing arm 10 and it will be impossible for the device 4 to slide off the brush because the upwardly extending portions 15 and 16 will engage the contact head 12.

The operation of my device will be obvious from the drawings. As the brush wears and slides in the brush-holding frame, or moves laterally because the surface of the commutator cylinder is not true, or for any

other reason, the accessory device 4 maintains its bearing surface 4ª in constant close engagement with the free end surface of the brush 3. Good electrical contact is thus maintained, and the pitting and digging of end recesses is entirely prevented.

I do not wish to be restricted to the specific structural details or arrangement of parts herein set forth, but desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. The combination with a brush holding member, a brush slidably disposed therein and a spring-actuated arm having one end pivotally mounted on said member for biasing said brush to a predetermined position, of a contact device comprising a box-like structure partially inclosing the free end of said arm and provided with a flat surface adapted to bear loosely on said brush.

2. The combination with a brush-holding member, a brush slidably disposed therein and a spring-actuated arm having one end pivotally mounted on said member for biasing said brush to a predetermined position, of a contact device loosely positioned between the free end of said arm and said brush and comprising a substantially flat surface bearing upon said brush and upwardly extending portions bounding said surface on four sides for limiting the movement of said surface with respect to said brush.

3. The combination with a brush-holding member, a brush slidably disposed therein and a spring-actuated arm having one end pivotally mounted on said member and the other end provided with a contact head, of a contact device loosely positioned between the said contact head and said brush and comprising upwardly extending portions substantially inclosing said contact head.

4. The combination with a brush holding member, a brush slidably disposed therein and a spring-actuated arm having one end pivotally mounted on said member for biasing said brush to a predetermined position, of a contact device loosely mounted on the free end of said arm by means of projections substantially inclosing the same and adapted to loosely engage said brush when actuated by said arm, and comprising a substantially flat bearing surface for engaging said brush.

5. The combination with a brush-holding device, and a brush slidably disposed therein, of a spring actuated arm having one end pivotally mounted on said device for biasing said brush to a predetermined position, and a box-like member comprising a substantially flat surface loosely bearing upon said brush and upwardly extending portions partially bounding said surface and partially inclosing the free end of said arm.

6. In a dynamo-electric machine having a commutator cylinder, the combination with a brush-holding device, a brush slidably disposed therein, and a spring-actuated arm having one end pivotally mounted on said device for biasing said brush to engagement with said commutator cylinder, of a box-like member of conducting material comprising upwardly extending portions partially inclosing the free end of said arm and partially bounding a substantially flat surface of relatively large area adapted to loosely bear upon the free end of said brush throughout the range of operation thereof to prevent the formation of end recesses therein.

7. The combination with a brush holding member, a brush slidably disposed therein and a spring-actuated arm having one end pivotally mounted on said member for biasing said brush to a predetermined position, of a contact device comprising a pressed-metal box-like structure provided with a flat surface adapted to bear loosely on said brush, and upwardly extending portions bounding four sides of said flat surface, two of said portions inclosing the free end of said arm on two sides and partially on top and the remaining two side portions inclosing said arm on the sides only.

In testimony whereof, I have hereunto subscribed my name this 10th day of Sept., 1914.

LAWRENCE W. TURNBULL.

Witnesses:
I. B. STIEFEL,
B. B. HINES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."