J. D. KARLE.

BRUSH HOLDER.

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1,405,596. Patented Feb. 7, 1922.

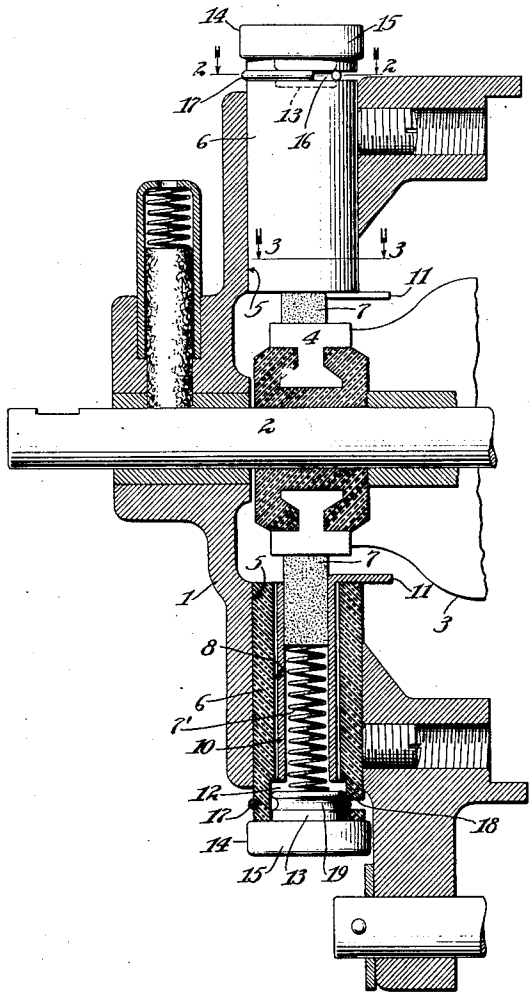


Fig. 1

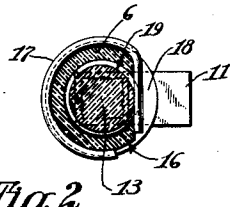


Fig. 2

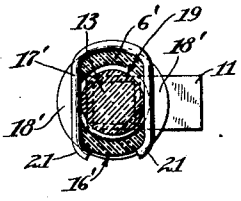


Fig. 4

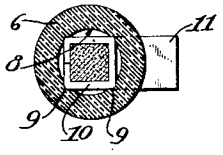


Fig. 3

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BRUSH HOLDER.

1,405,596. Specification of Letters Patent. Patented Feb. 7, 1922.

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To all whom it may concern:

Be it known that I, JOHN D. KARLE, a citizen of the United States, residing at Roselle Park, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Brush Holders, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to brush-holders, more particularly of the tubular type commonly used in small electric motors or generators, and has for an object to provide an inexpensive brush-holder of simplified construction embodying a readily removable and replaceable breech-plug or cap facilitating access to the brush for purposes of cleaning or renewal.

The present brush-holder, in its preferred embodiment, comprises a tube of insulating material open at both ends and having a metallic lining adapted to receive the usual carbon-brush. The tube is formed adjacent one end with an external circumferential groove for reception of a relatively stout spring wire clip; the groove being cut entirely through the wall of the tube, at one side, to permit the wire to press through the cut and into a similar groove in a plug-member adapted to be inserted in the end of said tube. The plug-member serves its usual function as an abutment for the brush-spring.

In the accompanying drawings, Fig. 1 is a sectional view of the end cover of an electric motor in which are fitted a pair of brush-holders embodying the invention; one of said brush-holders being shown in section and the other in elevation. Fig. 2 is a cross-sectional view of one of the brush-holders on the line 2—2 of Fig. 1. Fig. 3 is a similar view on the line 3—3, Fig. 1. Fig. 4 is a view similar to Fig. 2 but showing a modification of the invention.

In the preferred embodiment of the invention as illustrated in Figs. 1 to 3, inclusive, 1 represents the end cover of a common form of motor-frame in which is journaled the motor-shaft 2 carrying the armature 3 and commutator 4. The end cover 1 is apertured as usual at 5—5 for reception of the oppositely disposed similar brush-holder tubes 6 carrying the carbon-brushes 7 which bear upon the commutator 4.

In the particular embodiments of the invention illustrated, the brush-holder tube 6 is formed of insulating material, such as fibre, and is provided with an internal bore 8 broached or grooved at 9—9, Fig. 3, to receive the corners of the square metallic tubing or lining 10 which is forced into the tube 6. The metallic lining 10 is formed with a laterally projecting lip 11 to which one of the usual conductors for the armature circuit may be soldered.

At its outer end the bore 8 is enlarged at 12 to slidingly receive the cylindrical shank 13 of the breech-plug or abutment 14 having an enlarged head 15 adapted to fit against the end of the tube 6.

The tube 6 is formed at its outer end with an external circumferential groove 16 in which is embedded the spring-clip 17 which circumferentially embraces the tube 6. The groove 16 is cut entirely through the wall of the tube 6 at 18 to permit the spring-clip 17 to snap into the circumferential groove 19 in the shank 13 of the plug-member 14 and effectively hold said plug in operative position, wherein it resists the pressure of the brush-spring 7'. It is preferred to use a round wire in making up the spring-clip 17. The groove 19 is preferably semi-circular in cross-section so that the plug 14 may, when desired, be forcibly withdrawn from the tube 6 by a simple outward pull upon the head of the plug.

In Fig. 4 I have illustrated a modification of the invention wherein the circumferential groove 16' is cut entirely through the walls of the tube 6' at two places 18', 18', opposed to each other to permit both limbs of a U-shaped wire-clip 17' to snap into the groove 19 in the plug-member 13. In this modification, the extremities of the wire-clip 17' are bent over at 21 to retain the clip in operative position in the groove 16'.

Having thus set forth the nature of the invention, what I claim herein is—

1. In a brush-holder, in combination, an open-ended brush-tube adapted to receive a commutator-brush and spring, a breech-plug entering said tube and forming an abutment for said spring, said plug having a recess in that portion which enters said tube, and a spring device circumferentially embracing said tube and adapted to snap into said recess to hold the plug in operative position against the thrust of the brush-spring.

2. In a brush-holder, in combination, an open-ended brush-tube adapted to receive a commutator-brush and spring, a cylindrical breech-plug entering said tube and forming an abutment for said spring, said plug having a circumferential groove in that portion which enters said tube, and a spring device embedded in said tube and adapted to snap into said groove to hold the plug in operative position against the thrust of the brush-spring.

3. In a brush-holder, in combination, an open-ended brush-tube adapted to receive a commutator-brush and spring and formed adjacent one end with a lateral aperture passing entirely through the wall of said tube, a breech-plug entering said tube and forming an abutment for said spring, and a spring catch carried by said tube and extending through said aperture for cooperation with said plug within the tube to hold the latter in operative position.

4. In a brush-holder, in combination, an open-ended brush-tube adapted to receive a commutator-brush and spring and formed adjacent one end with an external circumferential groove deepened at one side to form a slot passing entirely through the wall of said tube, a breech-plug entering said tube and forming an abutment for said spring, said plug having a circumferential groove in that portion which enters said tube, and a holding spring fitted to the groove in said tube and pressing through said slot into the groove in said plug.

In testimony whereof, I have signed my name to this specification.

JOHN D. KARLE.