C. R. MESTON & H. I. FINCH.

BRUSH HOLDER FOR COMMUTATOR MECHANISMS.

APPLICATION FILED MAY 16, 1917.

1,275,458. Patented Aug. 13, 1918.

Fig. 1

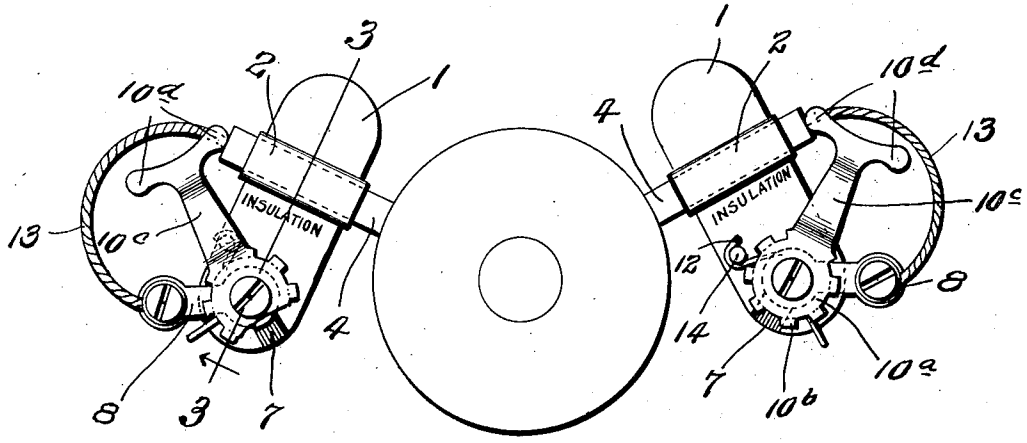


Fig. 2

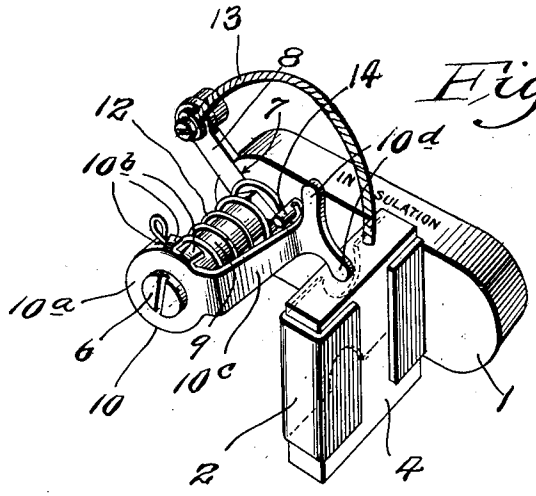


Fig. 3

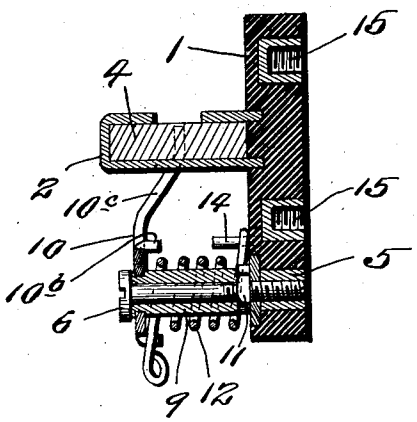
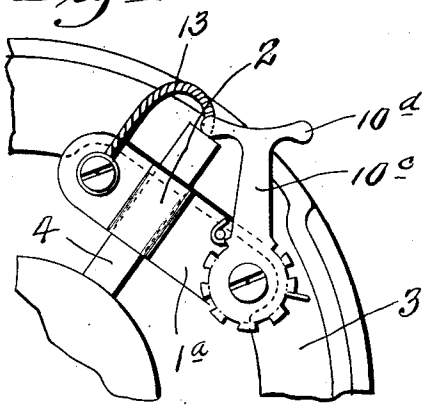


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES R. MESTON AND HERBERT I. FINCH, OF ST. LOUIS, MISSOURI, ASSIGNORS TO THE EMERSON ELECTRIC MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

BRUSH-HOLDER FOR COMMUTATOR MECHANISMS.

1,275,458. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed May 16, 1917. Serial No. 168,961.

To all whom it may concern:

Be it known that we, CHARLES R. MESTON and HERBERT I. FINCH, citizens of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Brush-Holders for Commutator Mechanisms, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates generally to electrical apparatus, and specifically to an improved construction of brush holder for commutator machines.

The broad object of our invention is to provide a commutator brush holder which contributes to economy both in manufacturing cost and in operating cost.

A more specific object of our invention is to provide a brush holder which with the substitution of a minor part, may be used interchageably on either side of the commutator wheel.

Another object is to provide a brush holder construction which may be advantageously employed in D. C. machines to prevent current losses through the frame of the machine, and to secure at the same time the proper radiation of the heat from the brush and the brush box.

A further object is to provide a brush holder which permits the quick and easy removal and insertion of the brushes from either side of the brush box, which permits the desired adjustments of the brushes, and which is simple and not subject to disorders.

Other and further objects will be obvious or pointed out hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a detail showing a front view of a commutator wheel and associated brushes;

Fig. 2 is a perspective of our improved brush holder;

Fig. 3 is a longitudinal section of the same such as would be taken on line 3—3 of Fig. 1;

Fig. 4 is a detail illustrating an arrangement of the device for certain classes of A. C. machines.

Referring to these illustrations by means of the reference numerals applied, let it be understood that 1 represents a base member of insulating material which may be of general oblong form, and which forms a support for a brush box 2. The latter may be in the form of a sheet metal member of general U or channel form having its extremities cast in the material forming the base member 1. The brush holder is of the proper size and form to suitably accommodate the brush 4 which may be of conventional design. At a point spaced apart from the brush holder 2, a threaded bushing 5 is cast in the base member 1, forming a seat for a screw 6. The base member 1 has a countersunk portion concentric with the bushing 5, from which countersunk portion extend countersunk slotways 7 extending radially of the bushing 5 in different directions. A connection link 8 is adapted to occupy the countersunk portion just referred to, and the radially extending arm of said link 8 is adapted to occupy either one of the countersunk slotways 7. The screw 6 carries a sleeve 9, at the outer extremity of which is mounted the pressure arm 10. This arm may be stamped from sheet metal and shaped to provide the hub portion 10^a, with peripheral shoulders or retaining members 10^b, and the arm portion 10^c extending laterally from the hub portion 10^a and terminating in contact members 10^d. It is preferable that the pressure member be bilaterally symmetrical so as to permit its being reversed relative to the brush box. The sleeve 9 and pressure member 10 are held on the screw 6 by the head of the latter and by a nut 11 which is threaded onto the screw. When the screw is seated in the bushing 5, the nut 11 operates also to retain the connection link 8 in one of the slots 7. A torsional spring 12 is disposed on the sleeve 9, one end thereof being retained by pin 14 on the base member 1, and the other end being adapted to coöperate selectively with the shoulders or retaining members 10^b of the pressure arm, whereby to hold the arm under the desired spring pressure. The pressure of the spring may be varied by adjustment of the end which engages the retaining

members 10^b. With the parts thus arranged, the pressure member is urged by the spring to move the brush 4, with which one of the contact members 10^d makes contact, toward the commutator, and thereby hold it for the proper electrical contact therewith. The brush may be instantly removed by swinging back the pressure member 10, and lifting out the brush.

In order to use the brush holder interchangeably on both sides of the commutator, it is necessary to provide two springs, the same being similar in construction but differentially wound, that is, one wound with a righthand helix and the other with a lefthand helix.

Bushings 15 are cast in the base member 1, opening at the rearward side thereof, and said bushings thereby form screw seats into which proper screws may be set to attach the brush holder to the machine frame. A given brush holder may be attached on either side of the commutator wheel as, by placing a proper spring upon sleeve 9 and arranging the respective ends of said spring in proper position on pin 14 and shoulders 10^b, the pressure arm will coöperate with the brush at either side of the brush box selectively, and the connection link 8 may be adjusted as between the slots 7, to the most advantageous position.

It will be seen, consequently, that this device affords a very economical brush holder by virtue of the small number of parts which may be employed in this construction and the fact that for the most part they may be formed as stampings or punchings from sheet metal. Moreover, the fact that the same device with the change of but a minor part, namely, a spring may be used either as a righthand or as a lefthand brush holder obviates much manufacture and handling cost. Furthermore, the device contributes to economy of operation by virtue of the fact that the brush is completely insulated from the machine frame, the insulating material of the base, in fact, forming one of the walls of the brush box. Likewise, the arrangement of the pressure spring protects it from injury by current from the brush.

In addition to the pressure member 10 being adjustable to either side of the brush box, the connection link 8 is also similarly adjustable from one slot to the other so that it may be disposed in the most convenient position for the attachment of the brush connection 13, and in either adjustment it is held in definite position by the slot walls of the base member.

A brush holder of this description has the distinct operating advantage of permitting proper heat radiation from the brush and brush box while at the same time providing the proper insulation of said parts from the machine frame, as the comparatively thin metallic member 2 allows the rapid dissipation of heat from the brush into the air.

In Fig. 4, we have shown a modification in which the device is intended for use in a machine in which the brushes are short-circuited through a frame part on which they are mounted, such as is desirable practice in certain alternating current machines. In this modification, the base member 1′ is formed as a portion of a ring member 3 which is arranged to be mounted on the motor frame, and which functions as a short-circuiting member between the brushes. It will be understood that the companion brush is mounted on a similar base member carried by the ring member 3 at the other side of the commutator wheel. In this form, the brush box is fixed in any suitable fashion to the base member 1′, the relationship being such that the base member 1′ forms one of the walls for retaining the brush. The same form of brush holder, pivot screw, pressure arm and spring may be employed on both of the base members 1′, said parts corresponding to those hereinbefore described. The connection link 8, however, may be dispensed with, the brush connection, if desired, being made directly to the base member 1′, or to the ring member 3; or the member 13 may be dispensed with and the brush connection may be secured solely through the pressure member 10, and the pivot screw 6 or link 8 used as a binding post for a lead connection.

We are aware that the device is susceptible of various modifications and adaptations not herein specifically illustrated or described, but comprehended nevertheless within the scope and spirit of the appended claims.

What we claim is:

1. A brush holder comprising a base member of insulating material, a brush box mounted thereon and coöperating therewith to form a container for the brush, an adjustable pressure member pivotally mounted on the base member to one side of the brush box, and separate means supported on the insulating base for urging the pressure member for coöperation with a brush retained by the box.

2. In a brush holder, the combination of a brush box, a pressure member pivotally and adjustably mounted adjacent thereto and having brush engaging members extending in opposite directions for coöperation with either end of a brush in said box, and adjustable means for urging the pressure member for coöperation with the brush.

3. In a brush holder, the combination of a base member, a brush box extending transversely thereof, a pivot member seated in the base member at one side of the box, a pressure member rotatably mounted on the pivot member, said pressure member including

contact portions extending to opposite sides thereof, and adjustable yielding pressure means coöperating with the pressure member to urge it for coöperation with a brush in the box.

4. A brush holder comprising a base member of insulating material, a brush box supported thereon and coöperating therewith to form a container for the brush, a pressure member pivotally and adjustably mounted on the base member, and attaching means for the brush holder coöperating with the base member and insulated from the brush box and the pressure member.

5. A brush holder comprising a base member, a box mounted thereon and coöperating therewith to form a brush container, a brush disposed within said container, a pivot screw mounted on said base member, a pressure member, means for mounting said pressure member on the pivot screw whereby said member may be swung from one end of the box to the other for engagement with the rear end of the brush in the container, a spring coiled about the pivot screw and adjustably coöperating with the pressure member to urge the same against the brush, and a connection member on the base member disposed for electrical connection with the brush.

6. A brush holder comprising a base member, a brush box mounted thereon, and an adjustable pressure member pivotally mounted on said base member and provided with a pair of oppositely disposed brush engaging portions.

7. A brush holder comprising a base member, a brush box mounted thereon and adapted for the reception of a brush, and a connection link adjustably secured to the base member and adjustable to selective positions for reception of electrical connections; said base member including portions for determining the selective locations of said link.

8. In a device of the class described, a base, a brush box carried thereby, and a spring-pressed member pivotally mounted on the base to one side of the brush box and adapted to be swung from one side of the base to the other so as to engage the rear end of the brush positioned in said brush box.

In testimony whereof we hereunto affix our signatures this 14th day of May, 1917.

CHARLES R. MESTON.
HERBERT I. FINCH.