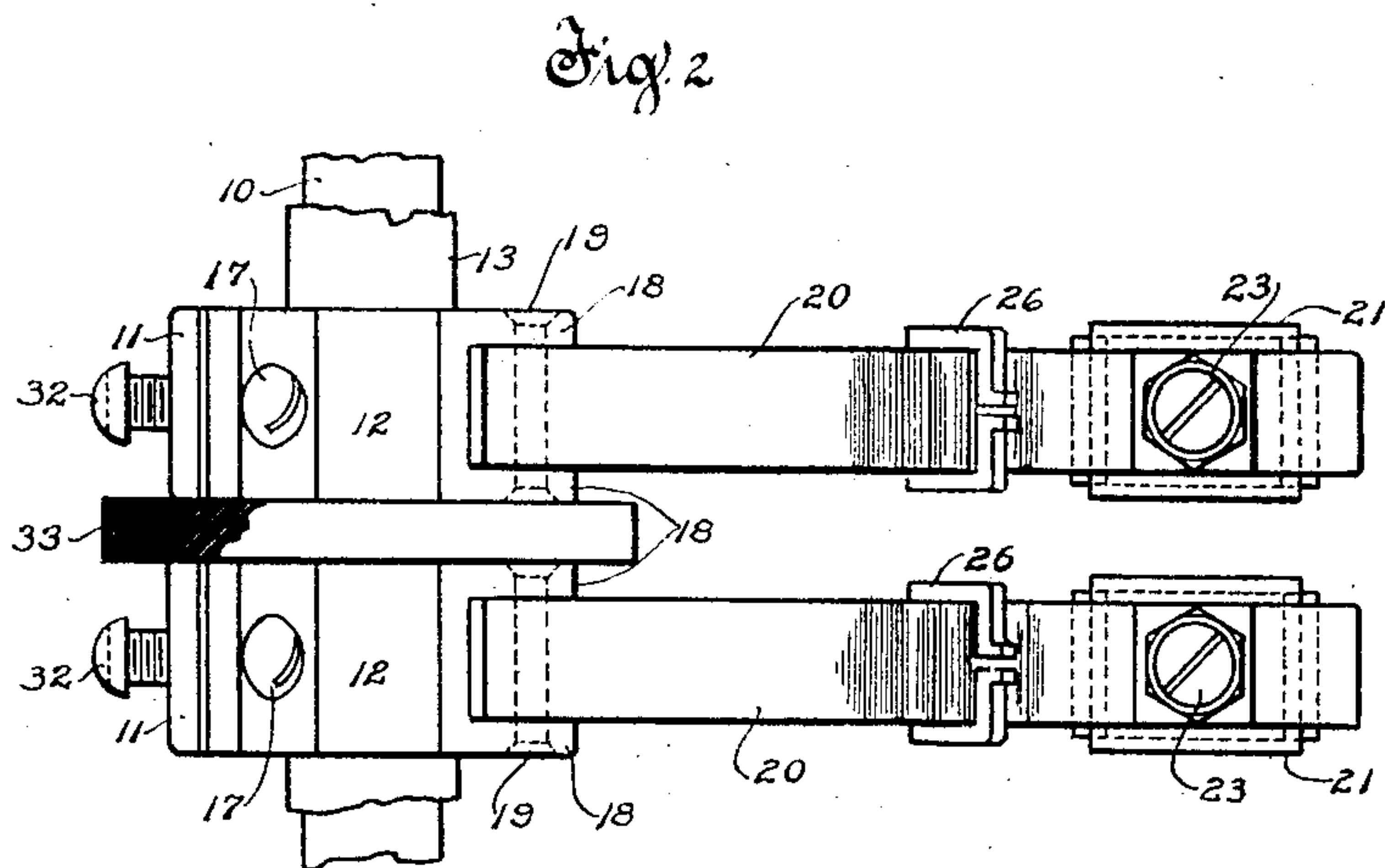
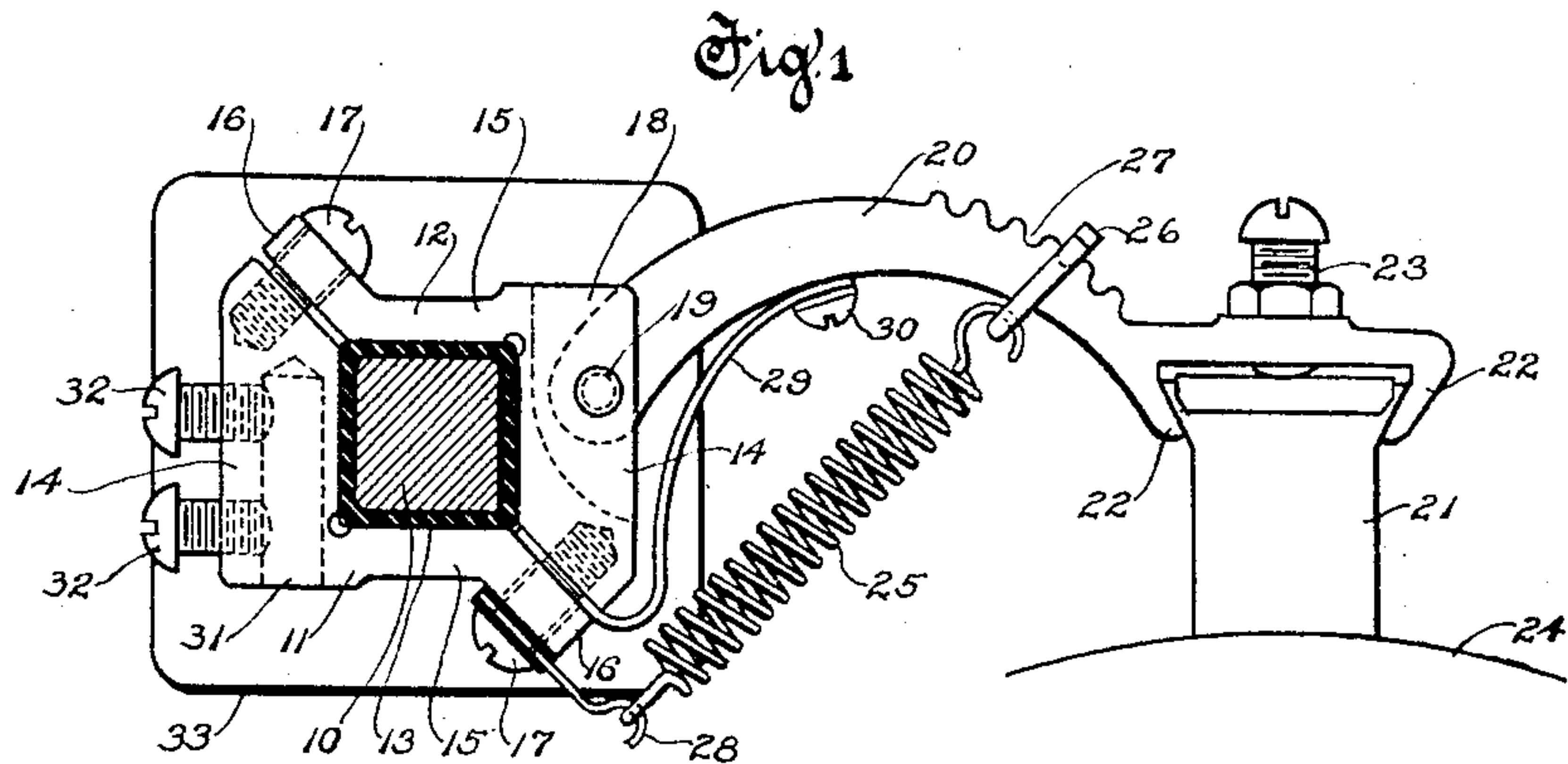


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BRUSH HOLDER.  
APPLICATION FILED OCT. 6, 1909.

967,474.

Patented Aug. 16, 1910.



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# UNITED STATES PATENT OFFICE.

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## BRUSH-HOLDER.

967,474.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed October 6, 1909. Serial No. 521,385.

*To all whom it may concern:*

Be it known that I, ROBERT B. WILLIAMSON, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Brush-Holders, of which the following is a full, clear, and exact specification.

This invention relates to improvements in brush holders for dynamo-electric machines, and has for its object the provision of a brush holder which is simple in construction and consists of few parts which are compactly arranged, which is economical in the amount of metal required in its construction and inexpensive to manufacture, and which is especially adapted for use on high speed machines.

The invention may be briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

On the accompanying sheet of drawings, wherein I have shown the preferred embodiment of my invention, Figure 1 is a side elevation of a brush holder constructed in accordance with my invention and mounted upon a supporting stud which is shown in section. Fig. 2 is a plan view of a pair of brush holders mounted side by side on the stud.

Referring now to the figures of the drawings, 10 represents a supporting stud on which the brush holders are mounted and which is in this case rectangular in cross section. Each brush holder is secured to the stud 10 by a two-part clamp which forms part of the brush holder structure and consists of two V-shaped clamping members 11 and 12 each of which embraces two sides of the stud and which have their end portions secured together at diagonally opposite corners of the stud, suitable insulation 13 being interposed between the clamp and the stud. These members 11 and 12 of the clamp are similar in shape, and, except for certain detail openings for screws, a slot and socket which are machined therein and are to be referred to presently, are duplicate or counterpart members. As is shown clearly in Fig. 1 each of the parts 11 and 12 of the clamp is provided with a side 14

which is formed of more metal or is thicker than the other side 15 for reasons to be explained presently. The two sides 14 are located on opposite sides of the stud 10, and the free end of each is inclined with respect to said side, in this case at an angle of forty-five degrees, while each of the sides 15, is provided with an ear 16 which is also inclined at an angle of forty-five degrees with respect thereto and is parallel to the inclined end of the adjacent side 14, so that the adjacent faces of the end portions of the members 11 and 12 of the clamp are substantially in a plane extending diagonally through the stud. The two members of the clamp are secured together by a pair of diagonally arranged screws 17 which extend at right angles to the adjacent parallel end faces, through the inclined ears 16 of the sides 15 and into threaded sockets at the ends of the sides 14. This arrangement of the adjacent end faces of the two clamping members and of the screws is not only convenient for tightening or removing the screws, but with this arrangement the screw sockets do not interfere with certain other parts to be next referred to, and also the particular arrangement permits other members of the brush holder to be secured to the clamp by means of one of the screws 17.

One of the sides 14 of the clamp adjacent the commutator, as shown in Fig. 1, is provided with a slot forming a pair of parallel ears 18, and pivotally mounted between these ears by means of a rivet or similar device 19, is a brush carrying arm 20 provided at its free end with a brush 21 which is held tightly between a pair of inclined jaws 22 by means of a screw 23 mounted in the end of the arm 20. The brush is held yieldingly onto the face of the commutator or slip ring 24 by means of a coil spring 25 one end of which is connected to a loop 26 which engages any one of a series of notches 27 in the outer face of the arm 20, and the other end of which is connected to a hooked finger 28 which is clamped by means of one of the screws 17 onto the inclined face of the ear 16 of the clamping member 11, the finger 28 being insulated from the ear 16 and from the screw 17. The inclination of the ear and the location of the latter as well as of the screw 17 is such that the finger projects outwardly at the proper and desired angle with



respect to the spring 25. To provide good conductivity between the arm 20 and the clamp, these parts are connected together by a flexible shunt conductor 29 one end of which is secured by a screw 30 to the arm 20 and the other end of which is clamped between the adjacent ends of the members 11 and 12 of the clamp. The opposite side 14 of the clamp is provided with a socket 31 which extends upwardly substantially parallel to the adjacent face of the stud 10 nearly to the threaded socket which receives the adjacent clamping screw 17, and in this socket 31 is adapted to be inserted the end of a conductor for conveying the current to or from the brush holder, the end of the conductor being adapted to be secured in place by screws 32.

As many of the brush holders above described as desired may be mounted on the stud 10, but in Fig. 2 I have shown two brush holders arranged side by side on the stud and separated by a barrier 33 of insulating material.

Thus it will be seen that the particular arrangement of the parts of the clamp and the manner of securing the same together leaves the two opposite sides 14 thereof unobstructed and free so that they can be provided respectively with a slot to receive the pivoted arm 20 and with the socket 31 for a current carrying conductor, as well as the sockets for the clamping screws, and as stated before the arrangement above referred to provides convenient means for securing to the clamp the flexible shunt conductor and the finger which supports the spring 25. In this manner there is provided a compact brush holder consisting of comparatively few parts.

The brush holder is inexpensive to manufacture, inasmuch as it is so designed that the main parts thereof can be cut from extruded metal bars of the proper cross sections. For example the parts of the clamp can be cut from a bar having a cross section the same as the cross section of either of the clamping members which, except for the slot for the pivoted arm 20, the socket 31, and the screw holes and sockets, are of identical shape and construction. Also the arm 20 of brush holders may be cut from extruded metal bars each being in cross section similar to the arm 20.

I do not desire to be confined to the exact details shown but aim in my claims to cover all modifications which do not involve a departure from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent is:—

1. In combination, a brush stud rectangular in cross section, a brush holder comprising a clamp having two parts which embrace the stud and are secured together at diagonally opposite corners of the stud, a pivoted arm secured to the side of one of said parts, and a brush carried by said arm.

2. In combination with a brush stud rectangular in cross section, a brush holder comprising a clamp having two parts, each substantially V-shaped in cross section, screws diagonally arranged with respect to the sides of the parts and securing the adjacent ends thereof together at diagonally opposite corners of the stud, a pivoted arm secured to the side of one of the clamping members, and a brush carried by the free end of said arm.

3. In combination with a brush stud rectangular in cross section, a clamp comprising two substantially V-shaped clamping members, means securing the adjacent ends of said clamping members together at diagonally opposite corners of the stud and substantially on a plane and extending diagonally through the stud, the side of one of the clamping members having a slot, an arm pivotally mounted in said slot and provided at its free end with a brush, and a flexible conductor connecting said arm and clamp and having one end thereof secured between the clamping members.

4. In combination with a brush stud rectangular in cross section, a clamp comprising two members similar in shape and extending about the stud and having adjacent end portions with parallel faces substantially in a plane passing diagonally through the stud, diagonally arranged clamping screws securing said end portions together, an arm pivoted to one of the clamping members, a brush carried by said arm, a flexible conductor having one end secured to the arm and having its other end clamped between adjacent end portions of the two clamping members, and a coil spring having one end connected to the pivoted arm and at its other end being connected to a member secured to the clamp by one of said clamping screws.

5. In combination with a brush stud rectangular in cross section, a clamp comprising two substantially V-shaped members similar in contour and each embracing two sides of the stud, said members having adjacent end faces at diagonally opposite corners of the stud inclined with respect to the sides of the stud, screws securing said members together, and extending into the same at right angles to said faces, the side of one of the clamping members having a slot, an arm pivotally mounted in said slot and carrying a brush at its free end, and the corresponding side of the other clamping member having a socket for receiving the end of a current-carrying conductor.

6. In combination with a brush stud, a two part clamp embracing the stud and having adjacent end portions, a screw securing said end portions together, an arm pivoted



to said clamp, a brush at the free end of said arm, and a shunt conductor having one end connected to the arm and having its other end secured between the end portions of the 5 clamp.

7. In combination with a brush stud, a two part clamp embracing the stud and having adjacent end portions, a clamping screw securing said end portions together, an arm 0 pivoted to said clamp, a brush at the free end of said arm, a flexible shunt conductor having one end connected to the arm and having its other end secured between the end por-

tions of the clamp, and a coil spring adjustably connected at one end to said arm, 15 and a finger connected to the opposite end of the spring and secured to the clamp by said clamping screw.

Milwaukee, Wis., Sept. 13, 1909.

In testimony whereof I affix my signature, 20 in the presence of two witnesses.

ROBERT B. WILLIAMSON.

Witnesses:

CHAS. L. BYRON,

ROB. E. STOLL.