Jan. 17, 1950 J. W. SAMZELIUS 2,495,184

BRUSH HOLDER

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Fig. 1.

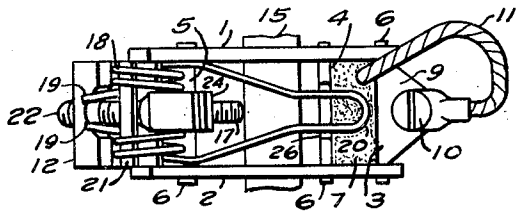


Fig. 2.

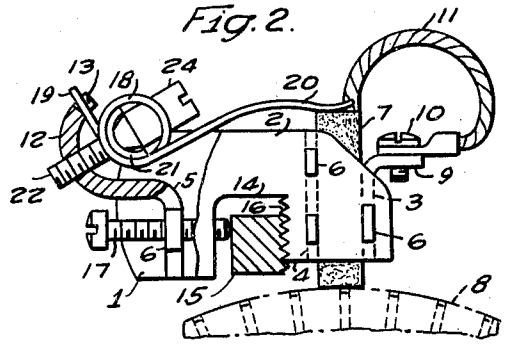
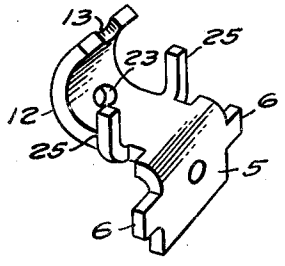


Fig. 3.



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BRUSH HOLDER

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The present invention relates to brushholders for dynamo-electric machines, and more particularly to a fabricated brushholder of simple and inexpensive construction.

The principal object of the invention is to provide a brushholder for dynamo-electric machines which can be manufactured at low cost, and which is simple and compact in construction and has no parts that are subject to material wear.

Another object of the invention is to provide a brushholder which is fabricated from simple, easily-produced parts, and which can readily be made in different sizes, for different-sized brushes, with a minimum of tooling.

A further object of the invention is to provide a brushholder having a spring for applying pressure to the brush which is entirely separate from the rest of the assembly so that it can readily be replaced, if necessary, and which can easily be adjusted to provide the desired pressure on the brush, and locked at the desired setting.

A still further object of the invention is to provide a brushholder in which the necessary pressure on the carbon brush is applied directly to the brush by the spring, in order to reduce detrimental inertia forces tending to vary the contact pressure between brush and commutator.

Other objects and advantages of the invention will be apparent from the following detailed description, taken in connection with the accompanying drawing, in which:

Figure 1 is a top plan view of a brushholder embodying the invention;

Fig. 2 is a view of the brushholder in side elevation, with one of the side plates partly broken away; and

Fig. 3 is a perspective view of a spacing plate, illustrating a slight modification of the invention.

The brushholder shown in the drawing includes two spaced, parallel side plates 1 and 2, preferably of identical shape, which may be made of steel, or other suitable material, and which can readily be produced by punching them from sheet material. The brushholder also includes three transverse plates or spacing plates 3, 4 and 5, which may also be made of steel and produced by punching. The spacing plates 3, 4 and 5 are disposed between the side plates 1 and 2 to space them apart and hold them in assembled relation. The spacing plates are provided with extending lugs 6 at each end which extend through holes in the side plates 1 and 2, and which are preferably staked, or headed over to hold the assembly together, thus forming a rugged and rigid assembly.

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The spacing plates 3 and 4 are located near one end of side plates 1 and 2, and are spaced apart to form a brush box with the side plates for receiving and holding a brush 7 for engagement with a commutator 8. The upper part of the spacing plate 3 may be bent over, as shown at 9, and carries a screw 10 for connecting a brush shunt 11. The third spacing plate 5, which may be of greater thickness, is located near the opposite end of the side plates 1 and 2, and the upper part 12 of the plate 5 is curved rearwardly and upwardly, as shown, and has a central notch 13 in its upper edge.

The side plates 1 and 2 are provided with openings or notches 14 for mounting the brushholder on a brush stud 15 of a dynamo-electric machine, and if desired, one side of the notches 14 may be formed with teeth 16 for engaging a serrated brush stud such as is frequently used for positive positioning of the brushholder. A clamping screw 17 is threaded in a hole in the spacing plate 5 in position to engage the brush stud 15 to clamp the brushholder in place with the brush 7 engaging the commutator 8.

The brush 7 is held against the commutator 8 with the desired pressure by means of a spring 18 which is positioned in the curved portion 12 of the plate 5. The spring 18 is a helical spring which has two aligned helical portions, with the ends 19 of the spring extending from the adjacent or inner ends of the helical portions, and with an elongated loop 20 joining the outer ends of the helical portions and extending in the opposite direction from the ends 19 of the spring. The loop 20 extends over the brush box to engage the top of the brush 7 and apply pressure directly thereto, and the oppositely-extending ends 19 of the spring engage in the notch 13 at the top of the rear spacing plate 5. A notch 26 may be provided in the plate 4 to permit the loop 20 to follow the brush as it wears down.

The spring is held in position by means of a clamping member 21. The clamping member 21 is a short piece of steel, or other suitable material, of generally semicircular cross-section, and it is disposed within the convolutions of the helical portions of the spring 18. The clamping member 21 is secured to the rear spacing plate 5 by means of an adjusting screw 22, which passes through a hole in the clamping member 21 and is threaded into a hole 23 in the rearwardly curved portion 12 of the plate 5. The screw 22 has a head 24, which may be square, as shown, or of other polygonal shape and which extends between the adjacent ends of the two aligned helical portions

of the spring 18 so that the flat sides of the head 24 are engaged by the adjacent convolutions of the spring. The clamping member 21 is proportioned so that it fits between the side plates 1 and 2 with a clearance which is small enough to prevent any possibility of the spring slipping over the ends of the clamping member.

It will be apparent that the spring 18 is held in position by the clamping piece 21 and by engegement of the ends 19 and the loop 20 with the spacing plate 5 and brush 7, respectively. It will also be apparent that the pressure applied by the spring to the brush 7 can be adjusted by turning the screw 22 to cause the clamping member 21 to move toward or away from the plate 5. The engagement of the helical portions of the spring 18 with the flat sides of the square head 24 of the screw 22 prevents the screw from turning easily and thus effectively locks it in position to maintain the desired setting of the spring. The spring pressure can easily be adjusted, however, because the spring will yield when a moderate turning force is applied to the screw and allow it to be turned to a new position. After the screw is adjusted, the spring grips the sides of the head 24 and locks it in position.

It will be seen that the brushholder is made entirely of parts which are simple in design and which can be readily and inexpensively produced and assembled. The brushholder is also readily adaptable to construction in different sizes to hold different-sized brushes, since brushholders for brushes of different widths can be made with the same side plates 1 and 2 merely by using different spacing plates 3, 4 and 5, while brushholders for brushes of different thicknesses can be made with the same spacing plates and different side plates. Thus, brushholders for a considerable range of brush sizes can be made with a minimum of expense for dies and other tools. In making brushholders for different brush widths, the rear spacing plates 5 may be provided with vertically-extending spacing lugs 25 (shown in Fig. 3) which have a fixed distance between them on all sizes of spacing plates. The lugs 25 are positioned to engage the ends of the clamping member 21 and the spring 18, and thus the same clamping member and spring can be used in different sizes of brushholders.

It should now be apparent that a brushholder has been provided which is of simple and inexpensive construction, and which can readily be produced in different sizes with little difficulty and at minimum cost. It is to be noted that there is substantially no wear in the brushholder, since the only member on which wear could occur is the clamping member 21, and the wear on this member is negligibly small. The spring 18 and clamping member 21 are separate from the rest of the assembly and can be removed and replaced, if necessary, merely by removing the screw 22, and this can readily be done without removing the brushholder from the machine in which it is used. As previously pointed out, the pressure applied to the brush 7 is easily adjustable by means of the screw 22, and the screw is automatically locked in place at the desired setting by engagement of the spring with the square head 24.

A preferred embodiment of the invention has been shown and described for the purpose of illustration, but it will be apparent that various modifications may be made, and it is to be understood that the invention in its broadest aspects is not limited to the specific details of construction shown but includes all equivalent embodiments and modifications which come within the scope of the appended claims.

I claim as my invention:

1. A brushholder for a dynamo-electric machine, said brushholder comprising two spaced, parallel side plates, three transverse plates disposed between said side plates and spacing the side plates apart, two of said transverse plates being adjacent one end of the side plates and being spaced apart to form a box for reception of a brush, the third of the transverse plates being adjacent the other end of the side plates, a spring member having a helical portion and a portion extending over said box to engage a brush therein, the spring member also having an oppositely extending end portion engaging the third transverse plate, a clamping member within the helical portion of the spring member, and adjustable means for securing the clamping member to the third transverse plate to adjustably retain the spring member in position.

2. A brushholder for a dynamo-electric machine, said brushholder comprising two spaced, parallel side plates, three transverse plates disposed between said side plates and spacing the side plates apart, two of said transverse plates being adjacent one end of the side plates and being spaced apart to form a box for reception of a brush, the third of the transverse plates being adjacent the other end of the side plates, a helical spring adjacent the third transverse plate, said spring having an extending loop portion extending over said box to engage a brush therein and having oppositely extending ends engaging the third transverse plate, a clamping member within the helical spring, and adjustable means for securing the clamping member to the third transverse plate to adjustably retain the spring member in position.

3. A brushholder for a dynamo-electric machine, said brushholder comprising two spaced, parallel side plates, three transverse plates disposed between said side plates and spacing the side plates apart, two of said transverse plates being adjacent one end of the side plates and being spaced apart to form a box for reception of a brush, the third of the transverse plates being adjacent the other end of the side plates, a helical spring adjacent the third transverse plate, said spring having an extending loop portion extending over said box to engage a brush therein and having oppositely extending ends engaging the third transverse plate, a clamping member within the helical spring, and a screw member extending through said clamping member and threaded into the third transverse plate for adjustably securing the clamping member and spring to the plate, said screw member having a polygonal head extending between adjacent convolutions of the helical spring to be engaged thereby.

4. A brushholder for a dynamo-electric machine, said brushholder comprising two spaced, parallel side plates, three transverse plates disposed between said side plates and spacing the side plates apart, two of said transverse plates being adjacent one end of the side plates and being spaced apart to form a box for reception of a brush, the third of the transverse plates being adjacent the other end of the side plates, a helical spring adjacent the third transverse plate, said spring having two aligned portions with the ends of the spring extending from the adjacent ends of said two portions and engaging the third transverse plate, the spring also having an ex-

tending loop portion joining the opposite ends of said aligned portions, the loop portion extending over said box to engage a brush therein, a clamping member within the helical spring, and a screw member extending through the clamping member and threaded into the third transverse plate for adjustably securing the clamping member and spring to the plate, said screw member extending between the two aligned portions of the spring and having a polygonal head adapted to be engaged by the adjacent convolutions of the spring.

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