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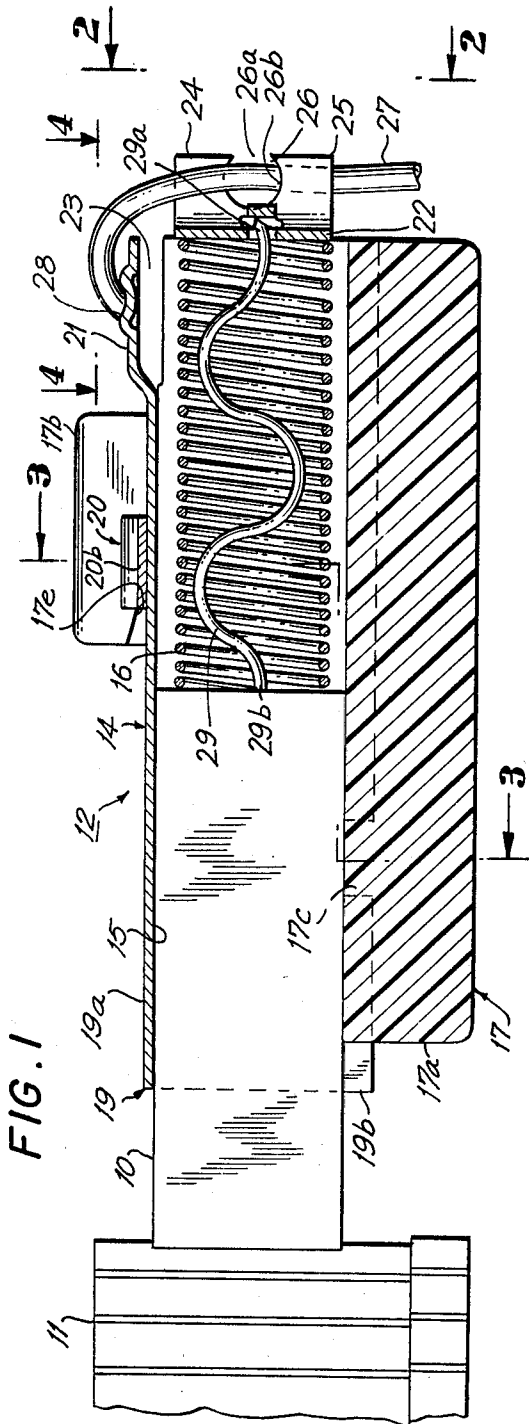
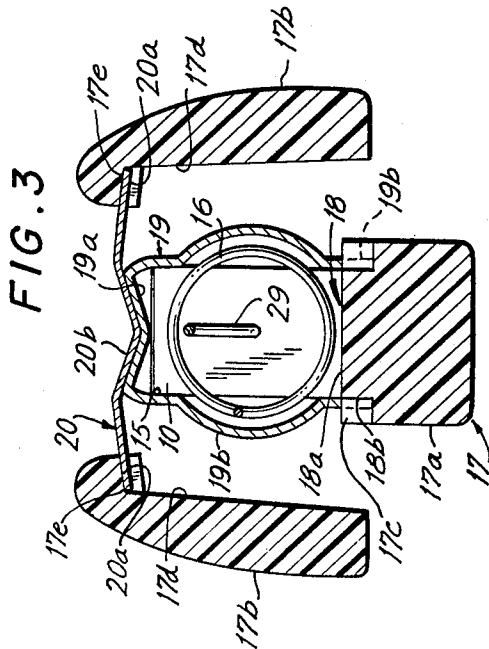
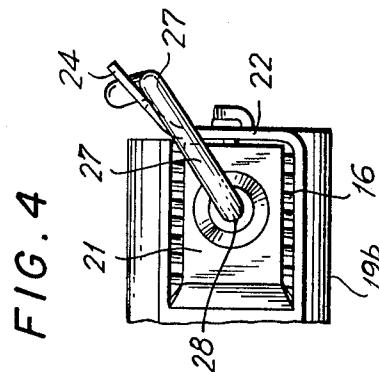
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BRUSH HOLDER

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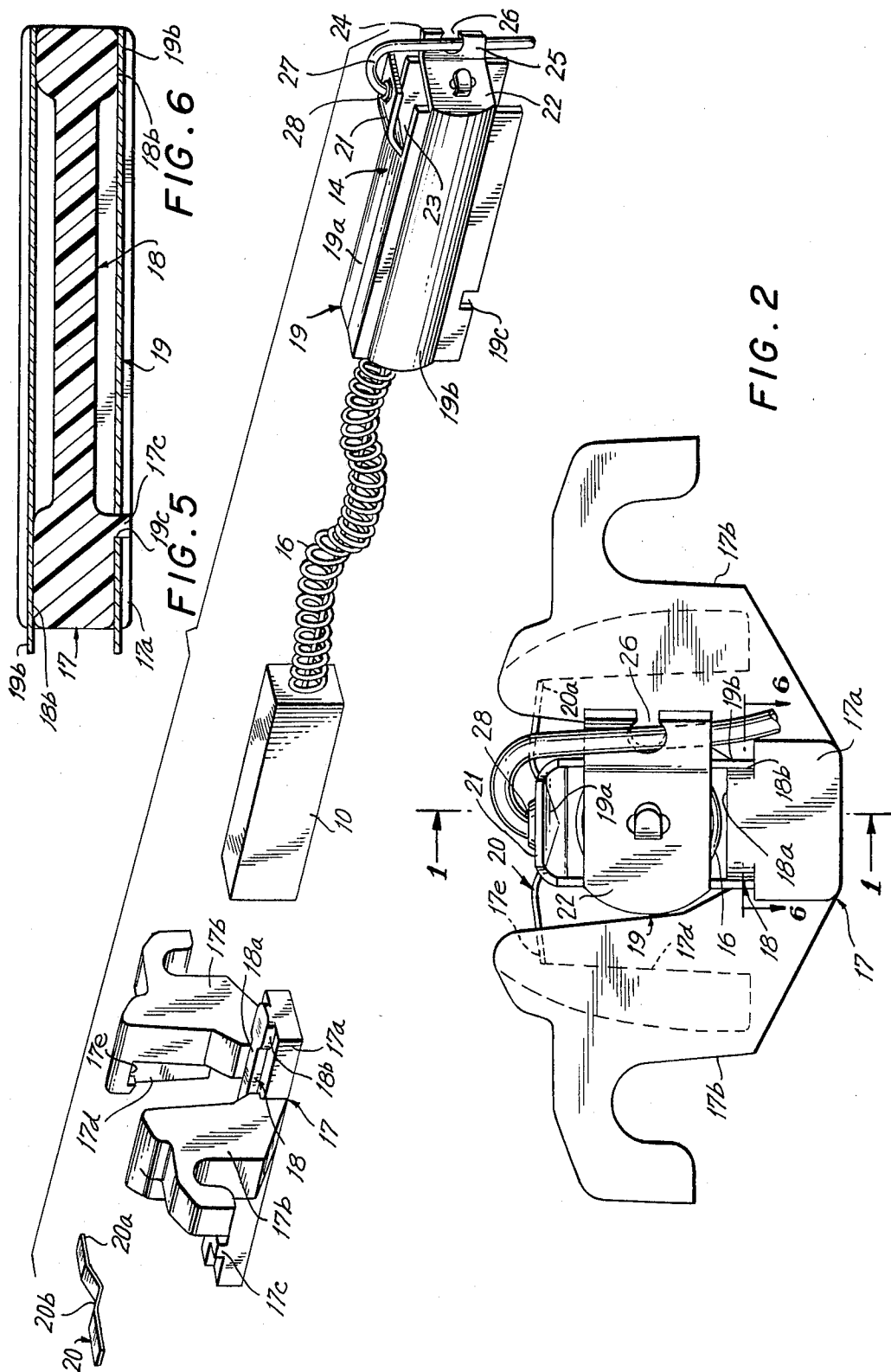
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BRUSH HOLDER

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10 Claims

ABSTRACT OF THE DISCLOSURE

A guideway for a brush of an electrical machine which has at least one wall of the guideway formed by an elongated part of a body of insulating material and the other walls of the guideway formed by an elongated metallic member which is U-shaped in transverse section and has a closed end and spaced walls extending therefrom whose outer free ends are held against the elongated part.

Brief summary of the invention

In accordance with this invention an improvement is provided for guiding a brush of an electrical machine in a brush holder having a body formed of insulating material and structure including metallic guide means which provides a guideway for the brush and is carried by the insulating body and a spring for transmitting force to the brush. This is accomplished by providing a body of insulating material having an elongated part defining at least one wall of the guideway and metallic guide means comprising an elongated member which is U-shaped in transverse section and has a closed end and spaced sides extending therefrom which define other walls of the guideway, and mounting the elongated member on the body with the spaced sides of the member coacting with the part to form the guideway.

Brief description of the several views of the drawing

In the drawing, FIG. 1 is a longitudinal sectional view of a brush holder embodying the invention, taken at line 1-1 of FIG. 2, in its relation to a current collecting device of an electrical machine;

FIG. 2 is an end elevation taken at line 2-2 of FIG. 1; FIG. 3 is a transverse section taken at line 3-3 of FIG. 1;

FIG. 4 is a fragmentary top plan view taken at line 4-4 of FIG. 1;

FIG. 5 is an exploded perspective view of the structure shown in FIGS. 1 to 4 and

FIG. 6 is a horizontal fragmentary sectional view taken at line 6-6 of FIG. 2.

Detailed description

Referring to the drawing, a brush 10 of an electrical machine is supported in contact with a current collecting device 11 thereof by a brush holder 12 embodying the invention. The brush holder 12 comprises a body 14 having a guideway 15 for the brush, and a helical coil spring 16 for urging the brush against the current collecting device.

In accordance with the invention, the body 14 comprises a U-shaped frame 17 which is formed of suitable insulating material and includes a closed end or base 17a and upstanding spaced arms 17b. The closed end 17a of the frame 17 includes an integrally formed ridge or raised strip 18 having a top face 18a and spaced lateral sides 18b. The top face 18a of the strip 18 forms at least one wall of the guideway 15, the other walls or sides of

which are formed by an elongated member 19 which is formed of metal and is U-shaped in transverse section and has a top closed end 19a and spaced lateral sides 19b extending therefrom, the outer free ends of which bear against the base 17a and hug the lateral sides 18b of the raised strip 18, as shown in FIG. 2.

The base 17a of the frame 17 at one side of the ridge 18 is formed with an upright lug or boss 17c which fits into a recessed region 19c in a lateral side 19b of the elongated member 19, thereby holding the member 19 and preventing lengthwise movement thereof with respect to the frame 17. As best seen in FIGS. 2, 3 and 5, the upstanding arms 17b of the frame 17, at their ends nearer to the current collecting device 11, are notched or undercut to form inner faces 17d having shoulders or recessed portions 17e which receive and hold the opposing ends 20a of a leaf spring 20. The intermediate region 20b of the leaf spring 20 is V-shaped and snugly fits against the top closed end 19a of the elongated member 19 which is also V-shaped and conforms to the shape of the leaf spring 20, whereby the latter functions to hold the metallic member 19 resiliently against the base 17a of the frame 17 with the lateral sides 19b thereof bearing against the lateral sides 18b of the ridge 18.

The U-shaped member 19 at its end removed from the current collecting device 11 is formed with two lugs or tabs 21 and 22, respectively. The horizontally disposed tab 21 is formed at the end of the closed end 19a of the member 19 and positioned at a slightly higher level than the closed end 19a, so that a gap 23 will be formed between the top edges of the lateral sides 19a of the member 19 and the tab 21.

The tab 22 is disposed in a vertical plane substantially perpendicular to the horizontal plane of the tab 21 and extends crosswise of the member 19 from the end of one lateral side 19b to the other lateral side 19b, as best shown in FIG. 5. The helical coil spring 16 is disposed in the guideway 15 between the brush 10 and vertically disposed tab 22 and functions to urge the brush 10 against the current collecting device.

The vertically disposed tab 22 at its outer free end is formed with a pair of flanges or tongues 24 and 25 which are at an acute angle of about 45° to the main body portion of the tab 22, as best shown in FIG. 4. A slot 26 is provided between the tongues 24 and 25 which is narrower at 26a at the extreme outer edges of the tongues than at a region 26b at a region spaced inwardly from the outer free edges of the tongues.

The tongues 24 and 25 and slot 26 therebetween function to hold an insulated electrical conductor 27, the conductor passing through the slot 26 and having portions above and below the slot bearing against opposing sides of the tongues 24 and 25, as shown in FIGS. 1 and 5. With this construction the tongues 24 and 25 of the tab 22 provide strain relief in the event the conductor 27 is subjected to excessive vibration or a pull of large magnitude, thereby protecting the connection of the conductor 27 at 28 to the tab or tongue 21. The conductor 27 extends upward from the tab 22 and its extreme end portion, from which the insulated cover is removed, is fixed at 28 to the tab 21. The electrical connection of the conductor 27 to the brush 10 is completed from the tab 21 through the metallic member 19 and a flexible conductor 29 connected at one end thereof at 29a to the tab 22 and at the other end thereof at 29b to the brush.

In this construction it is not necessary to employ a metallic hollow sleeve which provides a guideway for a brush and about which is enveloped a brush holder which is formed of insulating material and within which the hollow sleeve is detachably positioned. Moreover, it is not necessary to connect the electrical conductor in a

resilient manner directly to the brush which often is not satisfactory when the connection is subjected to excessive vibration or pull and breaks the connection.

It will thus be seen that an improved brush holder has been provided in which both a brush holder of insulating material and an elongated metallic member are effectively utilized to form the walls of a guideway for a brush. As best seen in FIG. 3, the elongated part 18 of the body 17 of insulating material, which defines one wall of the guideway 15, provides an inner surface 18a for the guideway. The elongated closed end 19a and elongated spaced sides 19b of the metallic member 19, which define other walls of the guideway 15, also provide inner surfaces for the guideway. As seen in FIG. 1, the aforementioned inner surfaces of the walls 18, 19a and 19b are substantially coextensive at least within that portion of the guideway 15 within which the brush 10 is movable and all of these inner surfaces function to act upon the brush 10 movable therein. Further, a simple fabricated construction is obtained in which the metallic member may be detachably connected to and removed from the brush holder, and the conductor can be connected to the metallic member which also is formed to provide strain relief for the conductor connection. This produces an inexpensive and easily manufactured construction.

What is claimed is:

1. In a brush holder of the class described having a body formed of insulating material and structure including metallic guide means providing a guideway for a brush which is carried by said body and a spring for transmitting force to the brush, the brush being movable lengthwise within said guideway, the improvement which comprises:

(a) providing such a body of insulating material having an elongated part defining at least one wall of said guideway,

(b) said guide means comprising an elongated metallic member which is U-shaped in transverse section and has an elongated closed end and elongated spaced sides extending from the closed end defining other walls of said guideway,

(c) the elongated part of said body of insulating material which defines at least one wall of said guideway providing an inner surface therefor and the elongated closed end and elongated spaced sides of said metallic member which define other walls of said guideway also providing inner surfaces therefor,

(d) said aforementioned inner surfaces of the walls being substantially coextensive at least within that portion of said guideway in which the brush is movable and all functioning to act upon the brush movable therein, and

(e) means for mounting said elongated metallic member on said body of insulating material with the elongated spaced sides of said metallic member co-acting with said elongated part of said body to form said guideway.

2. The improvement set forth in claim 1 in which said body of insulating material is formed with a ridge having a top face which defines at least said one wall of said guideway and spaced lateral sides, and said mounting means functioning to hold the outer free ends of the spaced sides of said U-shaped elongated member against said body with the spaced sides of said U-shaped member bearing against the spaced lateral sides of said ridge.

3. The improvement set forth in claim 1 in which said body of insulating material comprises a base and

spaced arms extending therefrom, said part being disposed at said base and said means for mounting said member on said body comprising an element which acts against the closed end of said U-shaped member and bridges the gap between said arms, and said arms being formed to receive and hold the ends of said element for detachably mounting said U-shaped member on said body.

4. The improvement set forth in claim 3, in which said element comprises a leaf spring.

5. The improvement set forth in claim 4 in which the closed end of said U-shaped member and said leaf spring intermediate its ends are shaped to position and hold said leaf spring at a particular region of the closed end of said U-shaped member.

6. The improvement set forth in claim 1 in which said body and at least one spaced side of said U-shaped member have cooperating parts which interlock and function to prevent lengthwise movement of said member with respect to said part.

7. The improvement set forth in claim 1 in which an end of said U-shaped member is provided with an element extending across said guideway, and said spring comprising a helical coil spring disposed between the brush and said element.

8. The improvement set forth in claim 1 in which an end of said U-shaped member is provided with first and second tabs, said first tab being disposed at the vicinity of the closed end of the U-shaped member and said second tab extending across said guideway between the spaced sides of said member, said second tab at its outer free edge portion having a slot or opening defining a pair of tongues at opposite sides thereof, a conductor which passes through the slot and has a first portion at a face of one tongue and a second portion at the opposite face of the other tongue, said tongues and slot therebetween functioning to provide strain relief for said conductor, and said conductor including an end portion which extends from said second tab to said first tab, and means for fixing the end portion of said conductor to said first tab.

9. The improvement set forth in claim 8 in which said spring comprises a helical coil spring which is disposed in said guideway between the brush and said second tab and a flexible conductor having one end thereof connected to the brush and the other end thereof connected to said second tab.

10. The improvement set forth in claim 8 in which said second tab is substantially perpendicular to the axis of said elongated U-shaped member and said tongues at the outer free edge portion of said second tab are at an acute angle thereto and extend from the end of said member.

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