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BRUSH MOUNTING ARRANGEMENT FOR DYNAMOELECTRIC MACHINES

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2 Sheets-Sheet 1

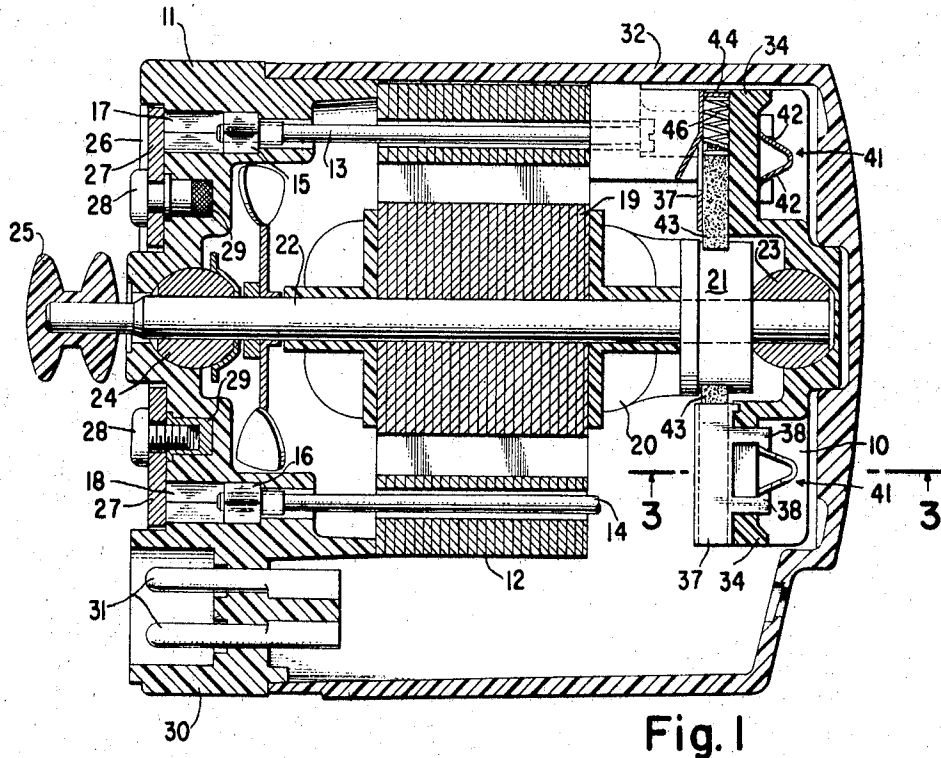


Fig. 1

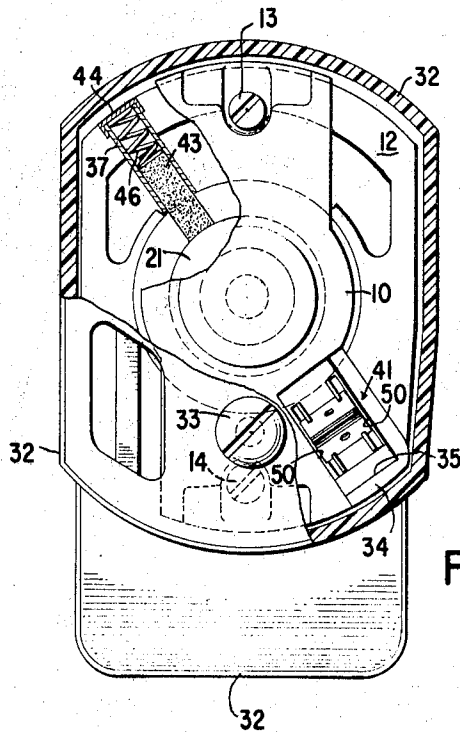


Fig. 2

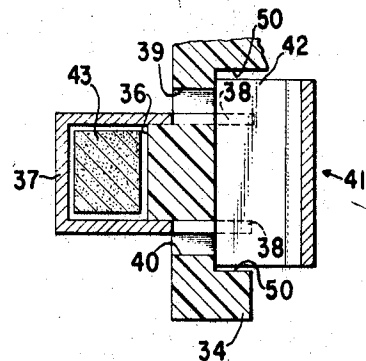


Fig. 3

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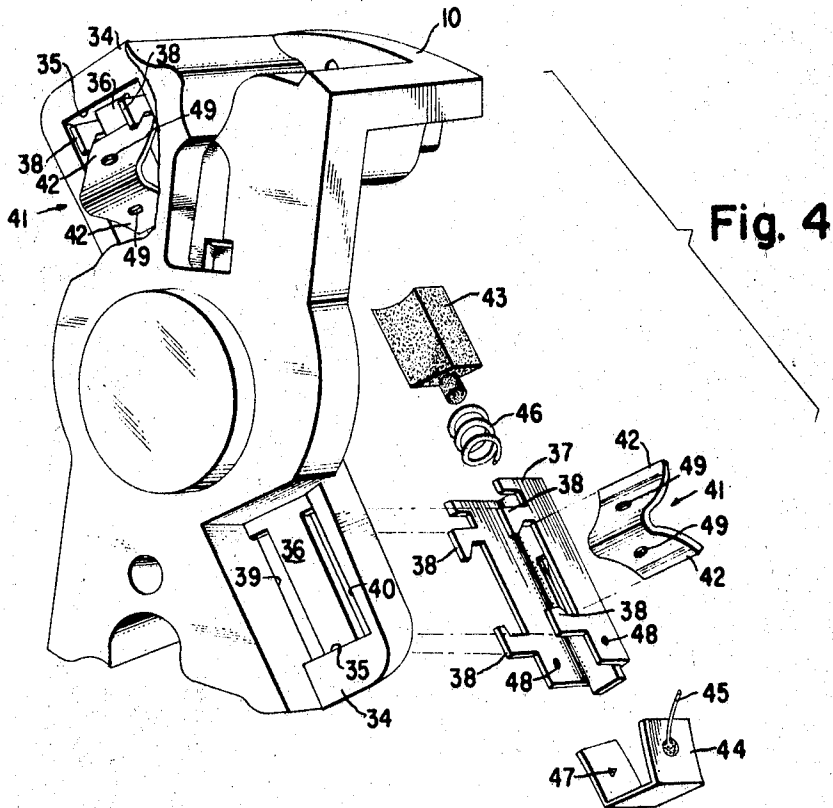
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**BRUSH MOUNTING ARRANGEMENT FOR DYNAMOELECTRIC MACHINES**

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3 Claims

**ABSTRACT OF THE DISCLOSURE**

A brush mounting arrangement has an open-sided metallic brush holder mounted on an insulated bearing bracket of an electric motor. A seat formed in the bracket has a positioning rib defining a brush axis, which rib projects into the open side of the brush holder and forms with the brush holder a brush-guiding channel. Lateral extensions of the brush holder project through openings in the bracket on both sides of the rib and a spring clip retainer engages the extensions on the side of the rib remote from the brush holder to secure the brush holder to the bracket and in alignment with the rib.

**BACKGROUND OF THE INVENTION**

Many arrangements have been suggested by the prior art for mounting brushes in dynamoelectric machines. The essential requirements are ease of assembly, insulation from external metallic parts, accuracy of alignment with the proper brush axis and facility for changing brushes. Where insulated bearing brackets have been used for the brush holder support, it has been common practice to secure a U-shaped metallic brush holder against a flat wall of the bracket with simple prongs pushed through openings in the wall and bent over on the other side of the wall for securement. With this prior art structure it has been found that the alignment of the brush holder with the proper brush axis is a critical function of the fit of the prongs in the openings, which fit cannot, with facility be held to close tolerances, with the result that variations in assembly are reflected adversely in variations in performance.

Another deficiency of the prior art bent-over prong type of securement is the tendency of the brush holder to work loose in normal operation, thus creating undesirable noise and adversely affecting the useful life of the brushes.

**SUMMARY OF THE INVENTION**

A structural feature of the present invention is the use of a positioning rib formed on and part of the wall of the bearing bracket, which rib projects into the open side of a sectionally U-shaped brush holder for positioning the brush holder substantially throughout its entire length in a predetermined radial position with respect to the bearing axis. This establishes a permanent brush axis which cannot be disturbed during long periods of operation. The rib also serves as an insulating side closure for the open side of the brush holder providing therewith a brush-guiding channel.

A further feature resides in the use of a removable spring clip retainer which may be applied without special tools, which retainer supplies a continuous camming force urging the brush holder into secure engagement with the positioning rib.

It is therefore an object of this invention to provide a brush holding structure located on an end bearing bracket of an electric motor, which structure overcomes the above-mentioned deficiencies of the prior art structures.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof will be best understood from the following description when read in connection with the accompanying drawings, wherein:

FIG. 1 is a longitudinal sectional view taken through an electric motor having a brush mounting arrangement and illustrating an embodiment of this invention.

FIG. 2 is a right hand end view of the motor of FIG. 1 with parts partially cut away to better show the details of the brush mounting structure of this embodiment.

FIG. 3 is a cross-sectional view taken substantially on line 3—3 of FIG. 1.

FIG. 4 is a perspective, partly exploded view illustrating the parts of the embodiment of FIGS. 1, 2 and 3.

**DESCRIPTION OF THE INVENTION**

Referring now to the drawings and more particularly to FIG. 1, an electric motor includes insulated end bearing brackets 10 and 11 between which a stator field core 12 is held in clamped relation by means of diametrically positioned through-bolts 13 and 14 which are threaded into hexagonal nuts 15 and 16 seated within recesses 17 and 18 in the bracket 11.

An armature core 19 with winding 20 and commutator 21 is secured to rotor shaft 22 journaled at each end in bearing bushings 23, 24 carried respectively by brackets 10 and 11. A pulley 25 secured to shaft 22 provides power take-off means in conventional manner.

The bracket 11 is formed with a recess 26 for receiving a support bracket 27 secured thereto by means of screws 28 threaded into inserts 29.

Also formed on bracket 11 is a receptacle portion 30 within which is received terminals 31 which provide electrical connection to internal motor leads (not shown).

An insulated cover 32 secured by screw 33 threaded into bracket 10 slides on and is seated against bracket 11 as shown to provide a removable closure for the motor. Removal of the cover 32 provides full access to the motor interior for brush renewal and assembly of the parts as will be described.

Referring now more especially to FIG. 4, the bracket 10 is formed with diametrically extending wall portions 34.

As seen best in FIG. 4, the wall portion 34 is formed with a recessed opening 35 spanned by a radially extending rib member 36. The rib member 36 is part of the surface of the wall 34 on the side opposite to that shown in FIG. 4 and provides a seat for receiving the open side of a metallic brush holder 37.

The brush holder 37 is U-shaped in cross section and is formed with lateral extensions 38 which project through openings 39 and 40 on each side of the rib member 36.

A spring clip retainer 41 having retractable limb portions 42 may be held in compressed condition by a pair of long-nose pliers and inserting between the lateral extensions 38 which project through openings 39 and 40, and, when released, the limb portions 42 will expand to exert a camming force on the extensions 38 which urges the brush holder 37 into secure engagement with the rib member 36. The bracket 10 is a moulded part and the rib member 36 can be very accurately formed thereon to be radial with respect to the axis of the bearing 23 and to define the exactly-desired brush axis. The rib member 36, by its close straddling engagement with the open side of the brush holder 37 throughout substantially its entire length provides the accurate positioning

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of the brush holder on the brush axis which is a structural feature of this invention.

It will be noted that the recessed opening 35 provides peripheral edge portions 50, and lateral movement of the spring clip retainer 41 is restrained by engagement with said edge portions 50 as clearly seen in FIG. 3.

The brush holder 37, in assembled condition, forms with the rib member 36 a brush guiding channel in which is received a carbon brush 43 in conventional manner. A spring cap 44 with a brush lead 45 secured thereto may be pushed on over the end of the brush holder 37 and serves as a seat for a compression spring 46 which urges the brush into contact with the surface of the commutator 21.

Tangs 47 formed on the brush cap 44 may engage apertures 48 in the brush holder 37 to provide further securement. Apertures 49 formed in the spring clip retainer 41 may be used to facilitate the holding thereof by the long-nose pliers during assembly.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of this invention which is for the purpose of illustration and is not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

Having thus set forth the nature of this invention, what we claim herein is:

1. A brush holder assembly for an electric motor comprising, in combination; an insulated bearing bracket, a metallic brush holder having an open side mounted on said bracket, said bracket having a seat for supporting said brush holder, said seat including a positioning rib

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extending into the side and forming with said brush holder a brush-guiding channel, openings in said bracket on both sides of said rib, lateral extensions of said brush holder projecting through said openings, and a spring clip retainer having retractable portions in camming engagement with said lateral extensions or the side of the rib remote from the brush holder to secure said brush holder to said bracket and in alignment with said rib.

2. A brush holder assembly for an electric motor comprising, in combination; an insulated bearing bracket having diametrically extending wall portions, each wall portion having a first surface formed with a projecting rib member and an opposed surface recessed below a peripheral edge portion, a metallic brush holder having an open side in straddling engagement with said rib member, openings through said wall portion on both sides of said rib member, lateral extensions of said brush holder projecting through said openings, and a spring clip retainer seated on said recessed surface and in camming engagement with said lateral extension to secure said brush holder to said bracket and in alignment with said rib.

3. A brush holder assembly as set forth in claim 2, wherein lateral displacement of the spring clip retainer is restrained by engagement thereof with said peripheral edge portion.

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