

May 20, 1969

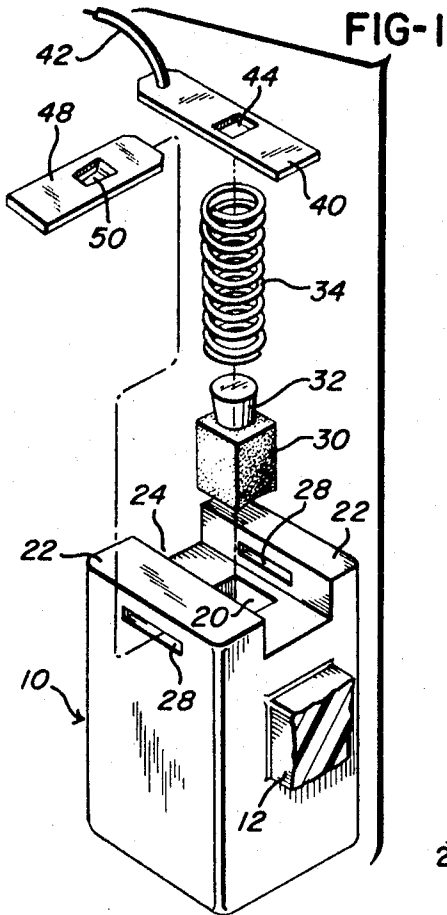
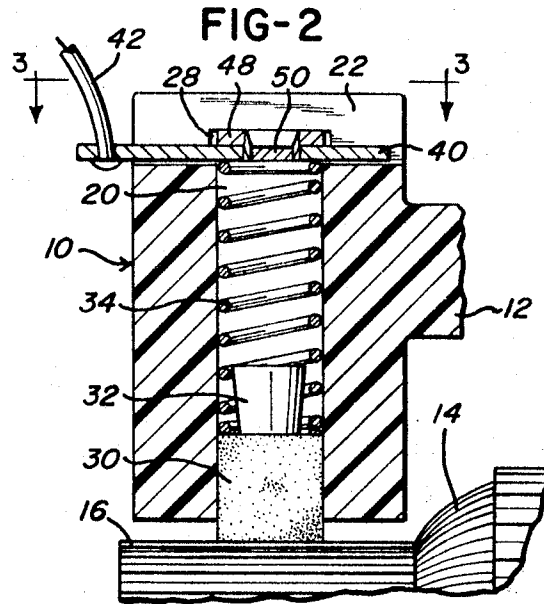
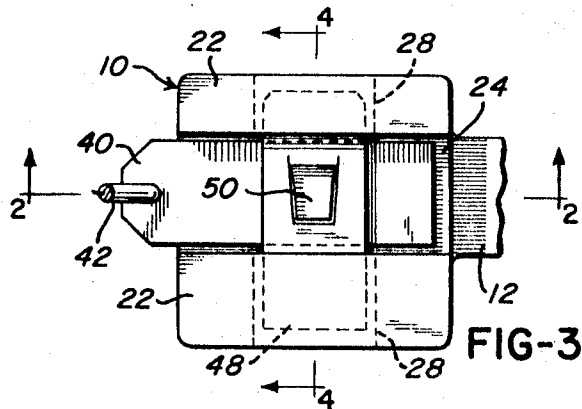
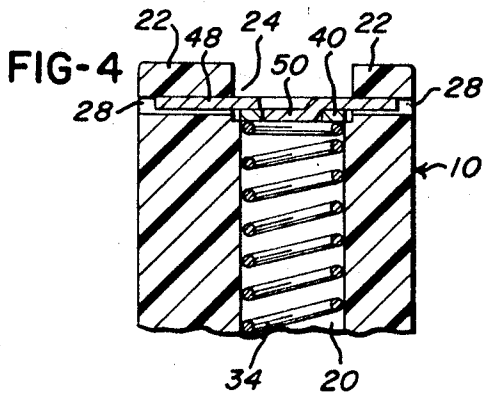
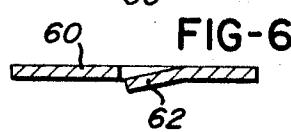
F. E. FULLER ET AL

3,445,705

BRUSH RETAINER ASSEMBLY

Filed Jan. 20, 1966

Sheet 1 of 2



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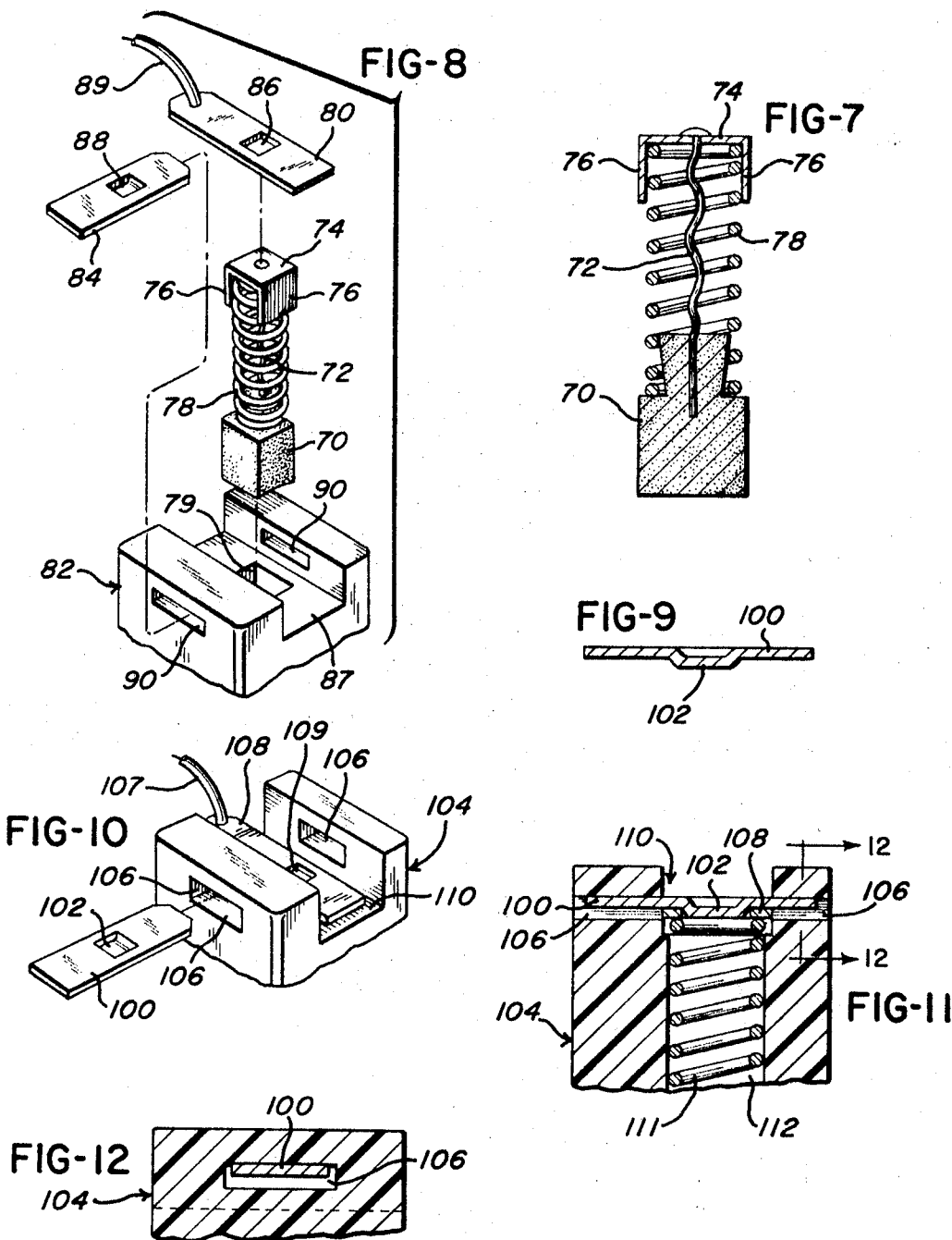
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Sheet 2 of 2



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3,445,705

BRUSH RETAINER ASSEMBLY

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6 Claims

ABSTRACT OF THE DISCLOSURE

The assembly includes a housing for retaining a brush. A pair of members are interlocked and are locked to the housing for retaining the brush in position with respect to the housing. One of the members includes conductor means for conducting electrical current to and from the brush.

This invention relates to a brush retainer or brush holder assembly.

Some types of rotary electrical machines include a rotary commutator member or the like. One or more brush members are maintained in engagement with the commutator for conduction of current. Each brush member is supported by a suitable retainer or holder assembly.

It is an object of this invention to provide a brush retainer assembly in which a brush member can be easily and readily placed into engagement with a commutator and connected to an external electrical conductor member.

Another object of this invention is to provide a brush retainer assembly by which a brush member can be easily and readily connected to a conductor lead or the like without the need for screw or bolt connections or the like.

It is another object of this invention to provide such a brush retainer assembly which can be produced and installed at relatively low costs.

Other objects and advantages reside in the construction of the invention, combinations thereof, the method of manufacture, and the mode of operation, as will become more apparent from the following description.

In the drawings:

FIGURE 1 is an exploded perspective view of a brush retainer assembly of this invention.

FIGURE 2 is a sectional view, drawn on a slightly larger scale than FIGURE 1, showing the brush retainer assembly. FIGURE 2 is also a sectional view taken substantially on line 2—2 of FIGURE 3.

FIGURE 3 is a sectional view taken substantially on line 3—3 of FIGURE 2.

FIGURE 4 is a sectional view taken substantially on line 4—4 of FIGURE 3.

FIGURE 5 is a side sectional view of a retainer member of the assembly.

FIGURE 6 is a side sectional view of a modification of the retainer member of FIGURE 5.

FIGURE 7 is an enlarged sectional view showing a modification in the brush unit of the assembly of this invention.

FIGURE 8 is a perspective exploded view, with parts broken away, of a brush retainer assembly of this invention which includes the brush unit of FIGURE 7.

FIGURE 9 is a sectional view of another retainer member of a brush retainer assembly of this invention.

FIGURE 10 is a fragmentary perspective exploded view of an assembly of this invention which includes the retainer member of FIGURE 9.

FIGURE 11 is a sectional view of the assembly of FIGURE 10.

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FIGURE 12 is a sectional view taken substantially on line 12—12 of FIGURE 11.

Referring to the drawings in detail, a brush retainer assembly of this invention comprises a housing 10 which may be attached to any suitable support structure. Herein the housing 10 is shown as having an attachment portion 12 which is adapted to be joined to any suitable support structure. However, the housing 10 may be connected to support structure in any suitable manner. FIGURE 2 shows the housing 10 disposed adjacent a rotor member 14 which has a commutator 16.

The housing 10 has a cavity or bore 20 which extends therethrough. The housing 10 is provided with a pair of opposed extending wall members 22 which form a transverse channel 24 which is in communication with the bore 20 at one end thereof. Each of the walls 22 is provided with a passage or slot 28 therethrough, the passages 28 being in substantial alignment and substantially normal to the channel 24.

A brush member 30 is disposed within the bore or cavity 20 at the end thereof opposite the wall members 22, as shown in FIGURE 2. The brush member 30 is shown as having a head portion 32. A helical electrically conductive spring 34 is within the cavity 20 and has an end portion which encompasses the head portion 32 of the brush member 30.

The spring 34 has an opposite end portion which is in engagement with a connector member or plate 40. The connector member or plate 40 is composed of electrically conductive material and is disposed within the channel 24 between the walls 22. An electric conductor member or lead 42 is attached to the connector plate 40. The connector plate 40 is provided with an opening 44 therein.

A retainer member or plate 48 secures or locks the position of the connector member 40. The retainer member or plate 48 has a protuberance in the form of a tab 50 partially severed therefrom and bent slightly from the plane thereof. The retainer plate 48 is inserted into the slots 28 so that the tab 50 is moved to a position directly above the opening 44 in the connector plate 40. In this manner, the tab 50 moves into the opening 44 of the connector plate 40. When the tab 50 is positioned within the opening 44 of the connector plate 40, each end portion of the retainer plate 48 is within one of the slots 28 of the walls 22.

The helical spring 34 is compressed between the brush member 30 and the connector member 40, as the helical spring 34 urges the connector member 40 and the retainer member 48 in a direction away from the brush 30. Therefore, the connector member 40 and the retainer member 48 are secured or locked one with respect to the other and with respect to the housing 10.

A retainer member 60 is shown in FIGURE 6 as having a protuberance in the form of a tab 62. The tab 62 is formed somewhat differently from the tab 50 of the retainer member 48. The retainer member 60 may be substituted for the retainer member 48 in an assembly of this invention.

FIGURES 7 and 8 show a brush 70 which has a conductor lead 72 embedded therein and extending therefrom. The lead 72 is attached to a contact plate 74 having side members 76. A helical spring 78 encompasses the lead 72 and is disposed between the brush 70 and the contact plate 74. The brush 70, the lead 72, and the spring 78 comprise a unit and are retained within a bore 79 of a housing 82.

Within the bore 79 of the housing 82 the spring 78 is compressed. The contact plate 74 is forced by the spring 78 into engagement with a connector member or plate 80 which is disposed within a channel 87 of the housing 82. The connector member 80 has an opening 86 therein and

may be similar to the connector member 40 of FIGURE 1. The connector member 80 is shown as having a lead 89 attached thereto and extending therefrom.

The connector plate 80 is retained in proper relationship with respect to the housing 82 by a retainer member or plate 84. The retainer member 84 is shown as having a protuberance 88 which is adapted to be disposed within the opening 86 of the connector member 80 as end portions of the retainer member 84 are disposed within slots 90 of the housing 82.

Both the lead 72 and the spring 78 may conduct current between the brush 70 and the contact plate 74. Thus, the unit shown in FIGURE 7 may be preferred for use in certain types of apparatus.

FIGURES 9-12 illustrate the use of a retainer member or plate 100 which has a protuberance 102 at the central portion thereof. The protuberance 102 may be substantially rigid and may be formed by forcing a portion of the retainer plate 100 out of the general plane thereof. A housing 104 has opposed slots 106 which are adapted to receive the retainer member 100 and through which the retainer member 100 may pass.

A connector member 108 is disposed within a channel 110 of the housing 104. The connector member 108 has a central opening 109 therethrough. The connector member 108 is shown as having a lead 107 attached thereto. The protuberance 102 of the retainer member 100 fits into the opening 109 of the connector member 108.

A spring 111 within a bore 112 of the housing 104 engages the connector member 108 and forces the connector member 108 against the retainer member 100. Thus, the connector member 108 is secured or locked with respect to the housing 104. Furthermore, the retainer member 100 and the connector member 108 are secured or locked one with respect to the other.

It is to be understood that a retainer member having any suitable shape and any suitable protuberance or tab may be used as desired in an assembly of this invention.

Therefore, a brush retainer assembly of this invention provides means by which a brush member is firmly maintained in contact with a rotary member. Furthermore, a circuit is provided for flow of electrical current between a rotary member and an external conductor lead.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

The invention having thus been described, the following is claimed:

1. In brush holder apparatus,
a housing provided with a channel, the housing having
a slot therein at opposite sides of the channel,
an electrically conductive connector member disposed
within the channel,
a retainer member disposed within the slots at the sides
of the channel and extending through the channel,
the member including means for locking the members
one with respect to the other and with respect to the
housing wherein said locking means includes a resilient
protuberance which is carried by one of the
members and which is engageable by the other member.

2. The apparatus of claim 1 in which one of the members has an opening therein and the other member has a resilient tab which is disposed within the opening.

3. The apparatus of claim 2 in which the connector member is provided with an opening therein and the retainer member has a resilient tab which is disposed within the opening of the connector member.

4. The apparatus of claim 1 in which the tab is a portion of said one of the members which is partially severed therefrom and which is bent laterally therefrom.

5. In brush retainer apparatus,
a housing provided with a channel, the housing having a slot therein at opposite sides of the channel, the housing having a bore therethrough which is in communication with the channel,
electrically conductive connector means disposed within the channel,

retainer means disposed within the slots at the sides of the channel and extending into the channel,
the retainer means and the connector means including means for locking thereof one with respect to the other and with respect to the housing,
the bore of the housing being adapted to receive an electrically conductive brush,
resilient means within the bore of the housing and engageable with a brush disposed therewithin and engageable with the connector means for urging the brush in a direction from the housing, the resilient means also serving to conduct electrical current between the brush and the connector means.

6. A brush retainer assembly of the type having
an electrically conductive brush adapted to engage a portion of a rotary member,
an electrically conductive lead connected to the brush and extending therefrom,
an electrically conductive contact member connected to the electrically conductive lead,
an electrically conductive resilient member carried by the brush, the resilient member being in engagement with the contact member and with the brush, the resilient member being compressible between the brush and the contact member for urging relative movement therebetween and for conducting current therebetween,

support means,
the improvement comprising electrically conductive connector means carried by the support means and engageable by the contact member for conducting electrical current between the contact member and the connector means,
retainer means removably carried by the support means and engageable with the connector means, the retainer means including means lockingly engageable with the connector means for locking the position of the connector means and the retainer means with respect to the support means.

References Cited

UNITED STATES PATENTS

2,986,666	5/1961	Tsutsumi	310-247
3,312,845	4/1967	Satkunas	310-247

FOREIGN PATENTS

741,328	11/1943	Germany.
1,238,113	6/1960	France.

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U.S. Cl. X.R.

310-249

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,445,705 Dated May 20, 1969

Inventor(s) F.E. Fuller and W.W. Irwin

It is certified that error appears in the above-identified patent
and that said Letters Patent are hereby corrected as shown below:

Column 3, line 61, "member" should read
---members---

SIGNED AND
SEALED
JAN 20 1970

(SEAL)

Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents