May 15, 1945. M. F. PETERS 2,375,818

COMMUTATOR BRUSH

Filed April 15, 1943

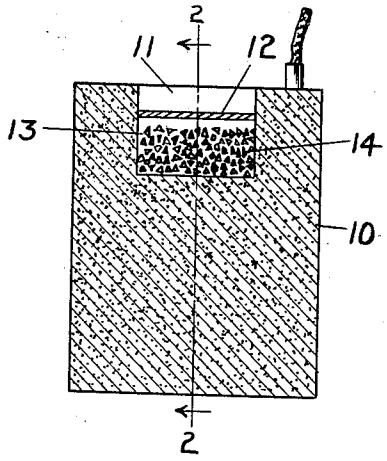


FIG. 1

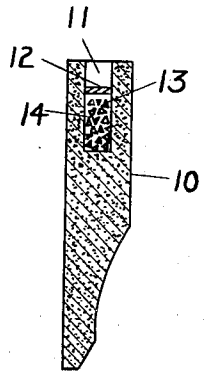


FIG. 2

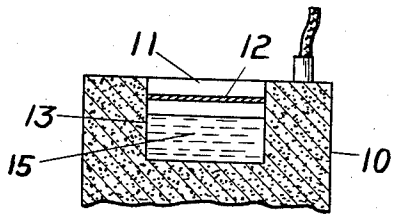


FIG. 3

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COMMUTATOR BRUSH

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Application April 15, 1943, Serial No. 483,104

1 Claim. (Cl. 171—325)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to improvements in brushes for the commutator of rotary electrical machines such as generators, motors, converters, or like devices, and has particular reference to the construction of such brushes for use with devices of the character described when installed in places subject to severe vibration such as on aircraft engines.

A considerable amount of trouble has been experienced with the use of aircraft generator brushes of known construction because of engine vibration. Such vibration causes the brush to bounce away from the commutator surface thus producing an arc which damages the commutator and results in undue brush wear. Accelerations ranging upwardly to 50 g. acting on the generators and brushes are not uncommon.

It is therefore the general object of my invention to provide an improved brush construction which also includes means for inhibiting vibration or bouncing of the brush.

A more specific object is to provide an improved commutator brush construction wherein the principles of friction damping are utilized to inhibit vibration of the brush.

These and other objects of my invention will become more apparent in the detailed description to follow and from the accompanying drawing in which:

Fig. 1 is a vertical sectional view of a commutator brush embodying my invention;

Fig. 2 is a sectional view taken on lines 2—2 of Fig. 1; and

Fig. 3 illustrates a modified construction.

Referring now to Figs. 1 and 2 of the drawing, a commutator brush which may be made of carbon or any other suitable electrically conductive material is shown at 10. A cavity 11 is formed in the upper part of the body of the brush 10 and said cavity is provided with a top closure member 12 to form a sealed chamber 13.

Within the chamber 13, but not completely filling the same, are a plurality of loose and relatively heavy inertia particles 14 such as sand, shot, marbles, powdered heavy metal, or other similar loose material, all of which will offer frictional resistance to vibration.

These inertia particles function to inhibit vibration of the brush 10 in the following manner:

When motion of the brush 10 is in one direction, the inertia particles 14 follow as a mass until the extreme position of the brush in such direction of motion is reached at which time the particles will, however, tend to continue to move in such direction. Since, however, the particles are restrained by the walls forming the closed chamber 13, they will be caused to move frictionally against each other thus packing together. Because of this frictional contact with each other and with the walls forming the chamber 13, energy will be absorbed. This action effectively reduces the tendency of the brush 10 to bounce from the surface of the commutator associated therewith and thereby functions to decrease materially any arcing between brush and commutator.

Further, because of the use of the heavy particles for vibration damping, the overall weight or average density of the brush as a whole is increased which serves to improve its commutation qualities.

Fig. 3 shows a modified construction wherein the chamber 13 is partly filled with a relatively heavy fluid such as mercury 15, which produces similar damping effects.

In conclusion, I wish it to be understood that while the embodiment of my invention as illustrated in the drawing is a preferred one, many changes and modifications may be made by those skilled in the art without departing from the spirit and scope of my invention as defined in the appended claim. For example, the same desired result might be effected by locating the chamber 13 at the top of the brush body 10 instead of being recessed therein as shown.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

Thus having fully described my invention, I claim:

A commutator brush comprising a carbon body, said body having a centrally located cavity extending into the brush body from the top side thereof, closure means for said cavity to form a closed chamber, and movable mass particles partly filling said chamber to constitute vibration damping means for said brush.

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