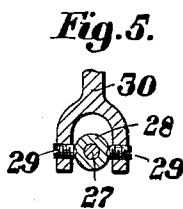
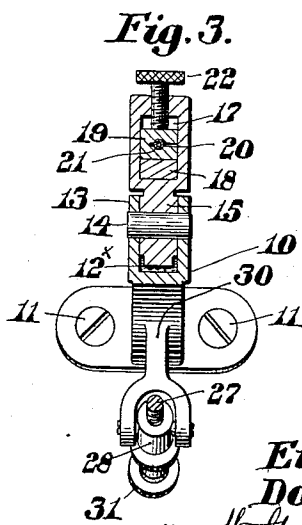
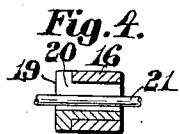
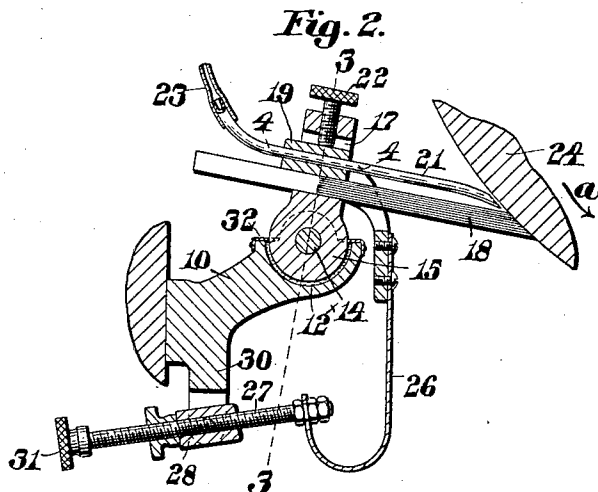
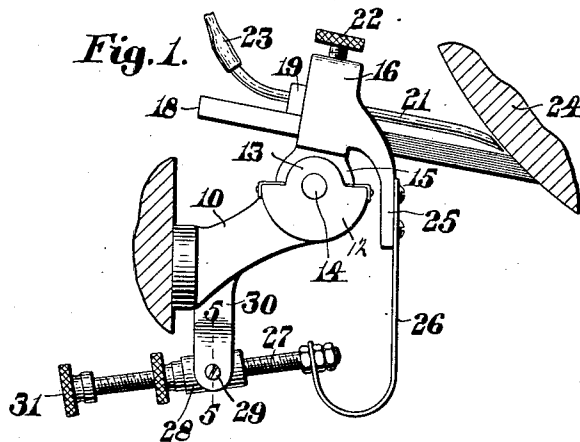


E. C. KETCHUM & D. H. ANDREWS.
 ADJUSTABLE BRUSH SUPPORT.
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1,031,071.

Patented July 2, 1912.



Witnesses:

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UNITED STATES PATENT OFFICE.

ERNEST C. KETCHUM, OF BOSTON, AND DAVID H. ANDREWS, OF NEWTON CENTER,
MASSACHUSETTS.

ADJUSTABLE BRUSH-SUPPORT.

1,031,071.

Specification of Letters Patent.

Patented July 2, 1912.

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To all whom it may concern:

Be it known that we, ERNEST C. KETCHUM, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, and DAVID H. ANDREWS, a citizen of the United States of America, and a resident of Newton Center, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Adjustable Brush-Supports, of which the following is a specification.

This invention relates to brush holders for dynamo electric machines and has for its object the production of a brush holder which may be adjusted to secure the proper contact of the brush with the periphery of the armature disk.

The invention consists in providing a suitable support, to which is pivoted a brush holder in which the brush is adjustably mounted, and positioning within said pivoted member a block through which passes a tube adapted to deliver amalgam of mercury to the periphery of the disk at the point of contact with the brush.

The invention further consists in securing to said pivoted member a yielding member having at its outer end a means for adjusting the position of said pivoted member about its pivot to obtain the requisite contact between the brush and the armature disk.

The invention further consists in providing the support with a receptacle adapted to contain a bath of mercury in which a portion of the pivoted member is immersed, thereby insuring the proper electrical connection between the support and said pivoted member in whatever position the latter may assume.

The invention further consists in certain novel features of construction and arrangement of parts which will be fully understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents a side elevation of a brush holder embodying the features of the present invention. Fig. 2 represents a vertical section of the same. Fig. 3 represents a transverse section of the same, the cutting plane being on line 3—3 on Fig. 2. Fig. 4 represents a horizontal

sectional detail, the cutting plane being on line 4—4 on Fig. 2, and Fig. 5 represents a vertical transverse sectional detail, the cutting plane being on line 5—5 on Fig. 1.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a suitable support secured to any fixed member by means of screws 11 or other similar fastening means. This support 10 is provided with a receptacle 12 having side walls 13 in which is mounted the pivot member 14 extending through the disk extension 15 formed upon and extending downwardly from the brush holder 16. This brush holder has a slot 17 therethrough, in which is mounted the usual brush 18, and a split block 19 resting upon the said brush 18. The block 19 is provided with a cylindrical passage therethrough communicating with a longitudinal slot 20 therein. The tube 21 is positioned in this block and is retained in position by means of the clamping screw 22. To the outer end of the tube 21 is secured a flexible tubular member 23 leading to a supply of amalgam of mercury. The delivery end of the tube 21 is immediately above and adjacent to the disk contacting end of the brush 18, so that, as the disk 24 of the armature revolves in the direction of the arrow *a*, any mercury delivered from the tube 21 to the periphery of the disk 24 will be carried across the end of the brush 18 and spread over the disk in such a manner as to leave a thin film over its entire periphery substantially in the same manner as was shown and described in a previous patent issued to E. C. Ketchum, August 9, 1910, and numbered 966,840.

Considerable difficulty has been found in maintaining the proper contact between the disks 24 and the brushes 18, owing to the great rapidity of rotation of the armature. It has been found, therefore, that some adjustability of the brush must be provided so that its operating end will have the proper degree of contact and will be retained in contact with the periphery of the armature by just the proper amount of tension, while at the same time, when meeting any obstacle such as irregularities in the periphery of the disk, the brush will be permitted to yield while these inequalities pass its end. These

objections are overcome by providing the brush holder 16 with an arm 25 to which is secured a yielding member 26, the opposite end of which has secured thereto a threaded member 27. This threaded member 27 is threaded to a nut 28 pivoted at 29 to the extension 30 of the support 10. The threaded member 27 is provided with a knurled head 31 by which it may be rotated to cause, through the medium of the yielding member 26, the brush holder 16 to be adjusted about its pivot 14. It is quite obvious that by turning the head 31 and the threaded member 27 in the above manner, any degree of tension may be secured for the brush 18. While normally retaining the proper degree of tension, the yielding member 26 will permit an additional movement of the brush holder 16 about its pivot 14 when such movement is necessary. In a construction of this kind, where the brush holder is pivoted to a support and movable about its pivot, it is quite essential that a suitable electric contact be maintained between the pivoted member and the support at any and all times, so that the electric current may be free to pass between the support and its pivoted member in whatever position the latter may assume. It has been found in practice that reliance cannot be placed upon the pivot as a conductor of the electrical current in order to secure this connection, and it has been found desirable that the brush holder should be provided with an extension extending downwardly into a bath of amalgam of mercury 12* contained within the receptacle 12 formed in the support 10. Preferably the pivotal extension of the brush holder 16 is made concentric with the pivot 14, so that, as the brush holder is moved about its pivot, there is never any displacement of the amalgam of mercury 12* within the receptacle 12. The receptacle is provided with a cap or cover 32 which prevents the mercury from being accidentally displaced. The interposition of this amalgam of mercury 12* between the periphery of the extension 15 and the wall of the receptacle 12 in the support 10 insure the free passage of the electric current from one member to the other, the amalgam of mercury 12* being a liquid of high conductivity.

In ordinary brush holders, where there is a brush holder pivoted to a support, it has heretofore been necessary to connect the pivoted member with the support by means of a wire connection, but in machines of the class for which the present brush holder is designed, the cable required to form an electrical connection between the pivoted member and the support would be so large and stiff that all flexibility would be lacking, and the pivoted member would, as a consequence, be so rigid as to prevent movement of the

pivoted member about its pivot. By the use of the present construction, the wire or cable connection is wholly omitted and the current passes from the pivoted member through the film of amalgam of mercury 12* interposed between the two members, thus simplifying the construction and making the entire device operable under all conditions.

It is believed that the operation and many advantages of this invention will be thoroughly understood without any further description.

Having thus described our invention, we claim:

1. In a device of the class described, the combination of a support; a member pivoted thereto; a brush mounted therein; a tube adjustably mounted in said pivoted member with its delivery end adjacent the working end of said brush.

2. In a device of the class described, the combination of a support; a member pivoted thereto; a brush mounted therein; a block positioned in a slot in said pivoted member; and a tube adjustably mounted in said block with its delivery end adjacent the working end of said brush.

3. In a device of the class described, the combination of a support; a member pivoted thereto; a brush mounted therein; a split block positioned in a slot in said pivoted member; a tube adjustably mounted in said block with its delivery end adjacent the working end of said brush; and a clamping member coacting with said split block.

4. In a device of the class described, the combination of a support having a liquid retaining receptacle; a brush holder pivoted thereto and having a portion thereof immersed in the liquid in said receptacle; a brush in said holder; and means for adjusting said pivoted member about its pivot.

5. In a device of the class described, the combination of a support having a liquid retaining receptacle; a brush holder pivoted thereto and having a portion thereof immersed in the liquid in said receptacle; means for preventing the displacement of the liquid in said receptacle; a brush in said holder; and means for adjusting said pivoted member about its pivot.

6. In a device of the class described, the combination of a support having a liquid retaining receptacle; a brush holder pivoted thereto and having a portion thereof immersed in the liquid in said receptacle; a cap for preventing the displacement of the liquid in said receptacle; a brush in said holder; and means for adjusting said pivoted member about its pivot.

7. In a device of the class described, the combination of a support having a liquid retaining receptacle; a brush holder pivoted thereto and having a portion thereof concen-

tric to said pivot immersed in the liquid in said receptacle; a brush in said holder; and means for adjusting said pivoted member about its pivot.

5 8. In a device of the class described, the combination of a support; a member pivoted thereto; a brush mounted therein; means for adjusting said pivoted member about its pivot; and means for making an electric connection between said support and pivoted member with a liquid of high conductivity.

10 9. In a device of the class described, the combination of a support; a member pivoted thereto; a brush therein; and a liquid of

high conductivity between said support and 15 pivoted member.

10. In a device of the class described, the combination of a support; a member pivoted thereto; a brush therein; and a bath of mercury in said support constantly contacting 20 with said pivoted member.

Signed by us at 4 Post Office Sq., Boston, Mass., this 21st day of June, 1911.

ERNEST C. KETCHUM.

DAVID H. ANDREWS.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."