No. 728,565. PATENTED MAY 19, 1903.

H. GEISENHÖNER.

BRUSH HOLDER.

APPLICATION FILED DEC. 20, 1900.

NO MODEL.

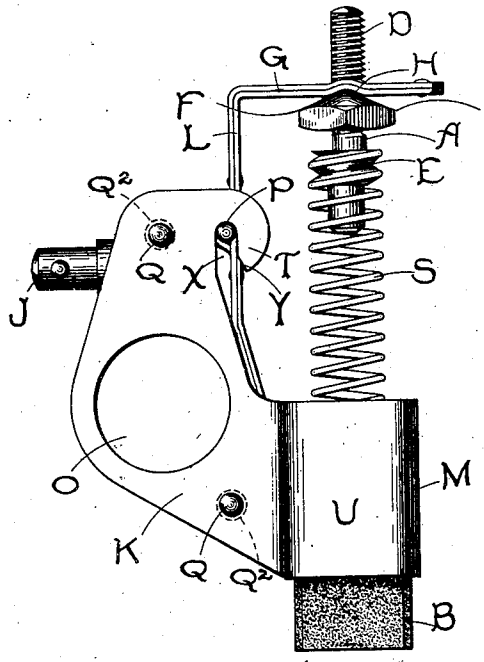


Fig.1.

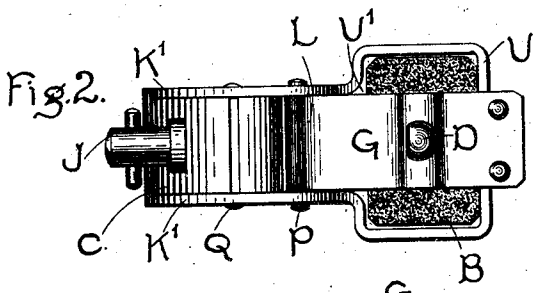


Fig.2.

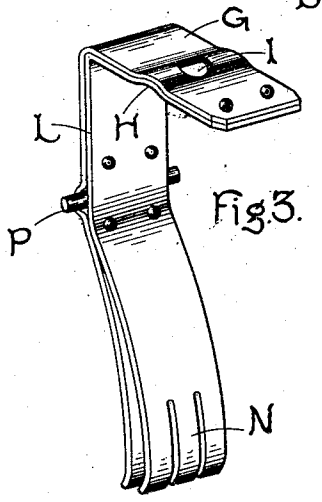


Fig.3.

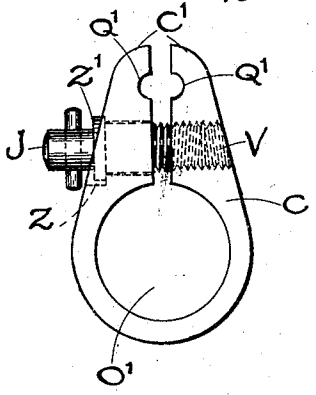


Fig.4.

Witnesses.

Wm. H. Jones.

Benjamin B. Hull.

Inventor:

Henry Geisenhöner.

by Albert G. Davis

Atty.

No. 728,565. Patented May 19, 1903.

UNITED STATES PATENT OFFICE.

HENRY GEISENHÖNER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

BRUSH-HOLDER.

SPECIFICATION forming part of Letters Patent No. 728,565, dated May 19, 1903.

Application filed December 20, 1900. Serial No. 40,510. (No model.)

To all whom it may concern:

Be it known that I, HENRY GEISENHÖNER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Brush-Holders, of which the following is a specification.

This invention relates to improvements in brush-holders for electric machines, whereby not only a cheap and efficient structure is provided, but also means for furnishing a path for the current from the brush independently of its spring, which dispenses, when desired, with the flexible connection generally attached to the brush.

Of the drawings, Figure 1 is a side elevation of the brush-holder and attachments embodying the invention. Fig. 2 is a plan view of the same. Fig. 3 is a detail perspective view of a part, and Fig. 4 is a side elevation of a part of the brush-holder structure.

U represents a guide-box for the brush, and S is a helical spring which bears on the top of the brush to force it against the commutator of the machine. The turns of the upper end of the helical spring S are retained by a screw-threaded portion E of an adjusting device A. The upper portion of the device A is screw-threaded and passes freely through the hole I, Fig. 3, in an angular portion G of a leaf-spring or resilient arm L. This spring L is provided with a pivot-pin P, which engages in an opening X, formed by a hook T, which extends downwardly from the holder K. A nut W works on the screw-threaded portion D of the adjusting device A and is located beneath the angular portion G of the leaf-spring L. The helical spring S is adjusted as desired by turning the nut W. A lower depression H is formed in the angular portion G of the leaf-spring L and is adapted for the reception of a projection F of the nut W in order to retain the nut in a position to which it has been turned and prevent it being jarred loose by the vibration of the machine. The lower and serrated portion N of the leaf-spring L bears against the brush B to force it into intimate contact with the side M of the box U, thereby affording a good conducting path for the current from the brush directly to the holder K without passing through the spring S, the resiliency of which would be seriously affected if a considerable part of the current passed through it. When the nut W is turned so that the spring S presses the brush B suitably against the commutator, the spring S will exert also an upward pressure against the angular portion G of the spring L, and as the spring L is pivoted at P its lower portion will press the brush B against the side M of the box U, as described above. It is evident that the angular portion G will coöperate with the spring S to press the brush against the commutator, and this feature is of especial importance in forcing the brush quickly back against the commutator in case it is forced upward by a high commutator-bar. In such a case the helical spring S is compressed, and the angular portion G is moved upward, so that as soon as the high bar passes from beneath the brush the portion G forces the brush down hard upon the normal surface of the commutator. It will be seen that the arrangement of parts is such that the pressure of the pivot-spring L, while sufficiently great to provide good contact from the brush to the side of the box U, is not sufficient to interfere with the downward pressure on the brush, so that as the brush wears away by the action of the commutator it can move down readily to be kept in constant contact with the latter. So far as the pressure of the brush against the side U of the holder is concerned the spring L might be replaced by a rigid structure; but the resiliency of the part L not only aids the spring S, but permits the lower portion N of part L, which engages the side of the brush, to be independently movable. The entire arrangement is such as to equalize all strains to which it is subjected. On the other hand, the angular portion G might be adapted to alone press the brush against the commutator and yet be within the limits of the invention.

A further important feature of the invention is the arrangement whereby the brush can be removed from the holder without altering the tension of the spring S, which feature is extremely desirable, as unskilled persons are required to frequently replace the brushes, and it is important that the tension

of the spring be kept constant. This is accomplished in the following manner: The upper portion of the spring L (shown in Fig. 1) is grasped by the hand of the operator and forced downwardly, so that the spring S is compressed, and the pivot-pin P is forced out of the hole X under the hook T and along the edge Y of the hook, which makes the device free, so that it can be entirely removed from the holder. The brush B is now free and can be readily removed from the box U. Furthermore, as the screw D fits loosely in the hole I in the angular portion G of the spring L these separate parts can be easily replaced by new ones.

A further important improvement is the construction of the holder K, the main portion of which is formed of a single strip of sheet metal, as shown in Fig. 2, punched to the required shape from a sheet of metal, and then bent into the final shape. This punched strip comprises two connected parts like that shown in elevation in Fig. 1 and provided with the holes O, by means of which the holder is mounted upon a suitable standard or stud, and the hook T for the pivot-pin P. The strip is bent in the proper shape to form the box or guide U and the two sides K'. These sides are connected by pins or rivets Q and interposed sleeves Q^2, mounted on the pins. It should be noted that a space U', Fig. 2, is formed between the guide U and the holder. In this space is located the device L. The clamping-piece C, by which the holder K is mounted on the stud, is shown in detail in Fig. 4 and comprises a split ring of a width equal to the distance of the sides K' of the holder K. A hole O' is formed in the clamp C, of the same diameter as the hole O of the holder K, for the reception of the support or stud. Projections C' extend from the clamp C and are provided with screw-threaded openings V and a countersunk portion Z for the reception of the clamping-screw J and its shoulder Z'. Grooves Q' are also formed in the extension C' and are adapted to embrace the sleeve Q^2, which surrounds the pin Q, joining the sides K' of the holder K.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with a holder provided with a brush-box, and an opening from the box to a space between the sides of the holder, said opening being narrower than the box, of a device extending through the opening to press the brush against the box.

2. The combination with a holder, of a spring which presses the brush against the commutator, and a spring which presses the brush against the holder and the commutator.

3. The combination with a holder, of an angular spring, one end of which engages the brush to press it against the holder and the other end of which operates to force the brush against the commutator.

4. The combination with a holder, of a spring which engages the brush to press it against the commutator, and a device which carries the spring and which is forced by the spring to press the brush against the holder.

5. The combination with a holder, of a spring which engages the brush to press it against the commutator, and a resilient spring-carrying device, which is forced by the spring to press the brush against the holder, and which coöperates with the spring to press the brush against the commutator.

6. The combination with a holder, of a spring which presses the brush against the commutator, a spring which presses the brush against the holder, and a device for adjusting both springs simultaneously.

7. The combination with a holder, of two interacting springs, which press the brush against the commutator and the holder respectively.

8. The combination with a holder, of a leaf-spring mounted thereon to press the brush against the holder, and a helical spring supported by the leaf-spring, to press the brush against the commutator, and to press the leaf-spring against the brush.

9. The combination with a holder, of a leaf-spring pivoted to the holder, to press the brush against the holder, and a helical spring supported by the leaf-spring to press the brush against the commutator and the leaf-spring against the brush.

10. The combination with a holder, of an angular spring pivoted therein so that one end presses the brush against the holder, its other end being adapted to press the brush against the commutator, and means for varying the tension of the spring.

11. The combination with a holder, of a spring removably mounted in the holder to press the brush against the holder, and a second spring supported by said spring to press the brush against the commutator, and to press said spring against the brush.

12. The combination with a holder provided with a downwardly-extending hook, of a spring removably pivoted in the hook, to press the brush against the holder, and a second spring which presses the brush against the commutator, which second spring also presses said spring against the brush.

13. The combination with a holder, of a spring pivoted thereto to press the brush against the holder, said spring having an angular portion; and a spring acting between the brush and said angular portion.

14. The combination with a holder, of a spring pivoted thereto, to press the brush against the holder, said spring being provided with an angular portion; a screw freely movable through a perforation in said angular portion, a spring mounted on the screw to press the brush against the commutator, and a nut engaging the screw and the lower side of the angular portion of the first spring, for adjusting said springs.

15. The combination with a holder, of a spring-carrying device mounted thereon, a screw freely extending through a perforation in said device, a spring mounted on the screw, and a nut engaging the screw and the lower side of said device, to vary the tension of the spring.

16. The combination with a holder, of a spring independent of the holder, which presses the brush against the commutator, and a device which is pressed against the brush by the spring, to press the brush against the holder.

17. The combination with a holder, of a spring which engages the brush to press it against the commutator, and a device which is pressed against the brush by the spring, to press the brush against the holder.

18. The combination with a holder, of a spring which continuously presses the brush against the commutator, and a second spring which coöperates therewith, to quickly force the brush back against the commutator when the brush is raised by a high commutator-bar.

19. The combination with a holder, of a helical spring the lower end of which engages the brush to press it against the commutator, and a device which is pivoted to the holder, the upper end of which device operates to retain the upper end of said spring, to force the lower end of the device against the brush, to press the brush against the holder.

20. A brush-holder, which comprises two relatively thin sides provided with perforations whereby the holder is adapted to be mounted on a suitable support; and located between these sides, a clamp to lend rigidity to the sides and to secure the holder to the support.

21. A brush-holder, which comprises a main portion or holder consisting of a single sheet-metal punching which has been bent into shape to form the box and two sides of the holder, and located between these sides, a clamp to lend rigidity to the sides and to secure the holder to a suitable support.

22. A brush-holder, which comprises the main portion or holder consisting of a single sheet of metal, which has been punched with holes, whereby it can be mounted on a suitable support, and with two hooks, and bent into shape to form the box and two sides, each side having a hole and a hook in alinement, and located between these sides a clamp to lend rigidity to the sides and secure the holder to the support.

23. A brush-holder, which comprises two relatively thin sides perforated to be mounted on a suitable support and connected together by strengthening-rods; and, arranged between the sides, a clamp which embraces the support and one strengthening-rod.

24. The combination with a holder, of a spring, one end of which engages the brush to press it against the commutator, and a device which is forced by the other end of the spring to press the brush against the holder.

25. A holder for brushes, which comprises a single sheet-metal punching which has been bent into shape to form the brush-box and two sides of the holder, with a free opening between the interior of the box and the sides of the holder.

26. The combination with a holder, of a spring which bears on the top of the brush to press it against the commutator, and a device which is pivoted to the holder, and is forced by the spring against the side of the brush, to press the brush against the holder.

27. The combination with a holder, of a helical spring which bears on the brush, and a leaf-spring which coöperates with the helical spring and bears on the brush.

28. The combination with a holder, of two springs, each of which operates to force the brush against the commutator and the holder.

29. The combination with a holder, of a spring which bears on the brush to press it against the commutator, and a spring which bears against the brush to press it against the holder, said springs coöperating so that either assists the other.

30. The combination with a holder of a helical spring which engages the brush to press it against the commutator, and a device which is forced by said helical spring to press the brush against the holder.

31. The combination with a holder, of a device for pressing the brush against the commutator, a separate device for pressing the brush against the holder, and means for simultaneously varying the pressure exerted upon the brush by said devices.

In witness whereof I have hereunto set my hand this 15th day of December, 1900.

HENRY GEISENHÖNER.

Witnesses:

BENJAMIN B. HULL,

MARGARET E. WOOLLEY.