C. B. AUEL.

BRUSH HOLDER FOR DYNAMO ELECTRIC MACHINES.

APPLICATION FILED JULY 9, 1906.

956,666. **Patented May 3, 1910.**

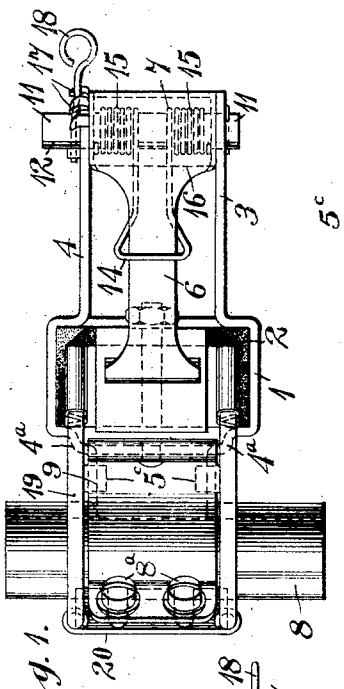

Fig. 1.

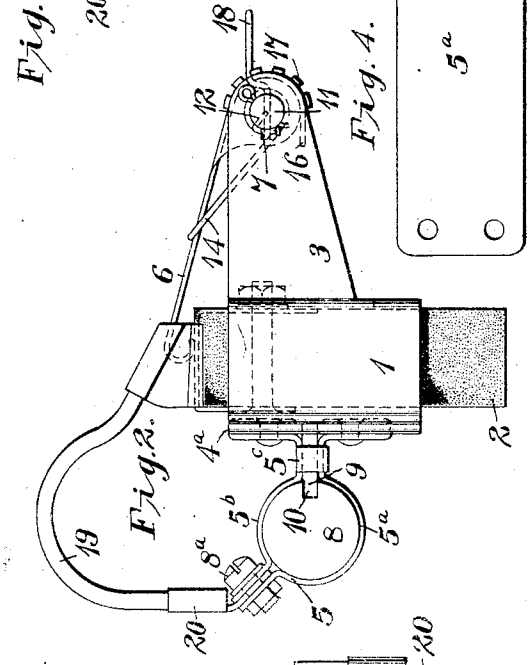

Fig. 2.

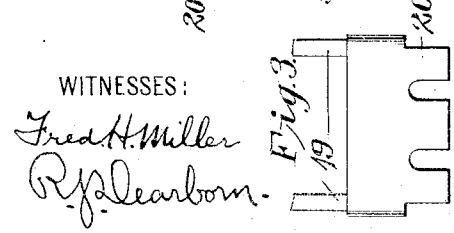

Fig. 3.

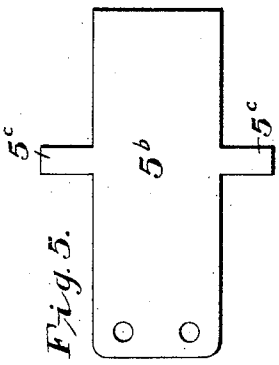

Fig. 5.

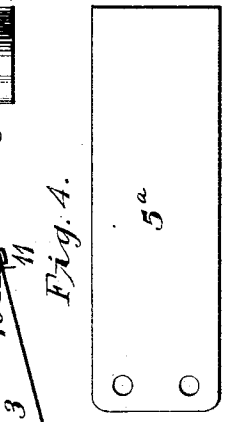

Fig. 4.

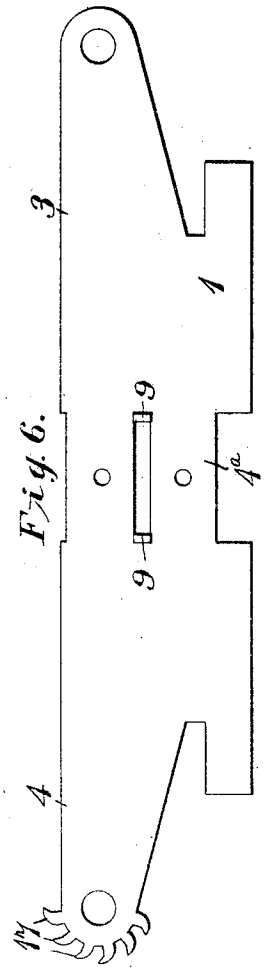

Fig. 6.

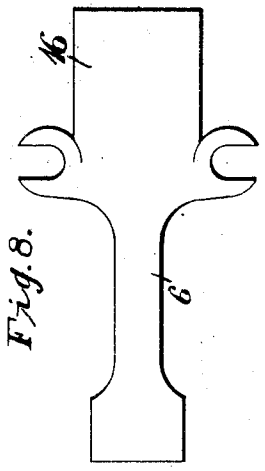

Fig. 8.

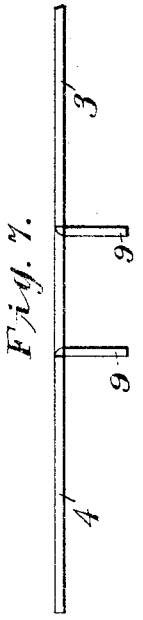

Fig. 7.

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BRUSH-HOLDER FOR DYNAMO-ELECTRIC MACHINES.

956,666. Specification of Letters Patent. Patented May 3, 1910.

Application filed July 9, 1906. Serial No. 325,293.

To all whom it may concern:

Be it known that I, CARL B. AUEL, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Brush-Holders for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to brush holders for dynamo-electric machines and it has for its object to provide a brush holder that shall be simple in construction and so designed that the several parts of which it is composed may readily be punched from sheet metal.

The brush holder construction of my present invention is such that the brush and the pressure finger may readily be removed; that a substantially constant pressure may be applied to the brush and that the pressure spring may be protected from the destructive effects of electric arcs which may be formed between the brush and the moving contact surface with which it is adapted to engage.

A further advantage of my brush holder lies in the fact that the pressure exerted by the finger upon the brush may be regulated and varied by a greater number of steps than there are notches or teeth actually provided on the stationary part of the holder.

My invention is illustrated in the accompanying drawing, in which—

Figures 1 and 2 are, respectively, a plan view and a side elevation of a brush holder constructed in accordance therewith, and Figs. 3, 4, 5, 6, 7 and 8 are views of the several parts of which the brush holder illustrated in Figs. 1 and 2 is constructed, as they appear after the first punching process and before they are bent into final form.

Referring to the drawing, the brush holder comprises a rectangular box 1 for the brush 2, having arms 3 and 4 projecting therefrom at one side and a bulging portion 4^a at the opposite side; a socket clamp 5 for supporting the box 1, a pressure finger 6 and a spring 7. The socket clamp 5 comprises two complementary parts 5^a and 5^b, the blanks for which are shown in Figs. 4 and 5. The parts 5^a and 5^b are bent around a supporting stud or rod 8 and are fastened together at the side adjacent to the box 1 by means of lips 5^c with which the blank 5^b is provided. The parts 5^a and 5^b are clamped together at the side of the stud opposite the box 1 by screws 8^a and are attached to the box 1 by bending their inner ends around the ends of the bulging portion 4^a. These parts are then riveted together, the bulging portion being of such depth that the ends of the parts 5^a and 5^b and the rivets do not in any way interfere with the free movement of the brush 2 in the box 1.

In order to prevent the box from rotating about the stud or rod 8 upon which it is mounted, projections 9 from the bulging portion 4^a are clamped between the two complementary parts 5^a and 5^b of the socket clamp and extend into the cylindrical opening of the socket to constitute a key which may engage a complementary slot or keyway 10 in the supporting rod 8.

A pin shaft 11 is rotatably mounted between the arms 3 and 4, its center line being substantially perpendicular to the side planes of the box 1. The pin shaft 11 is provided with a slot or keyway 12 and is encircled by a portion of the spring 7 which has a central loop 14 and two similar groups of convolutions 15. The ends of the spring are in engagement with the slot 12 in the pin shaft. The pressure finger 6 is provided with a loop 16 at one end which partially surrounds the pin shaft 11 and the portions 15 of the spring 7, while its other extremity projects through the loop 14 of the spring and engages the top of the brush 2.

The arm 4 is provided with projecting teeth 17, on the outside near its extremity, which are disposed in the arc of a circle that is concentric with the shaft 11 when it is assembled in position. The end of the shaft which projects through the end of the arm 4 is provided with a pin 18 which is bent into the form of a crank and which may engage the projecting teeth 17.

Since the ends of the spring 7 engage the slot 12 in the shaft 11, a downward pressure may be exerted upon the brush 2 by the pressure finger 6 by suitably rotating the shaft, and this pressure may be maintained by bringing the pin 18 into engagement with one of the teeth 17. The spring pressure thus obtained may be adjusted by mov-

ing the pin into engagement with any one of the other teeth, and another series of adjustments may be effected by means of the said parts if the pin 18 is turned 180 degrees upon its own axis.

The brush 2 may be electrically connected to the brush holder by any convenient means, such as flexible shunts 19 and a connector 20, which is attached to the socket clamp 5.

Referring now particularly to Figs. 4, 5, 6, 7 and 8, the box 1 and the arms 3 and 4 projecting therefrom may be formed from a single piece of sheet metal having substantially the form shown in Figs. 6 and 7. The pressure finger may be formed from a piece of sheet metal, shaped like Fig. 8, and the socket clamp 5 may easily be formed from the plates shown in Figs. 4 and 5.

It will be understood that the brush holder may be formed from a less number of sheet metal parts than those illustrated in the drawings, the box and the socket clamp being formed from a single punching, and that the parts themselves may be of different form, but the design illustrated is considered a preferred form since the dies required for punching the several parts are comparatively simple and may be constructed at relatively small expense.

I desire that my invention shall not be restricted to the arrangement illustrated and described and that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. A brush holder for dynamo-electric machines comprising a sheet metal box having a bulging portion at one side and projecting arms at the other side, a brush in said box, a socket clamp attached to the bulging portion, a shaft supported near the ends of the arms, a spring coiled about the shaft and having an intermediate loop, a pressure finger one end of which is bent partially around the shaft, and the other end of which projects through the loop in the spring to engage one end of the brush.

2. A brush holder for dynamo-electric machines comprising a sheet metal box having top and bottom openings and projecting arms at one side provided with holes, a pin shaft supported in said holes, a sheet metal finger one end of which is bent partially around said pin shaft and the other end of which extends over the top opening in the box to engage a brush located therein, and a spring acting upon said finger.

3. A brush holder for dynamo-electric machines comprising a sheet metal box having projecting arms at one side, supporting means for the box, a pin shaft supported by the arms near their ends, a spring coiled about the shaft and having two groups of convolutions and a loop between said groups, and a sheet metal pressure finger having curved ends, one of which is free and the other of which partially surrounds the shaft and substantially the middle portion of which is engaged by the spring loop to press the free end against a brush located in said box.

4. A brush holder for dynamo-electric machines comprising a sheet metal box having projecting arms at one side, projecting teeth located near the end of one of said arms and disposed in the arc of a circle, a pin shaft supported by the arms in concentric relation to the arc of said teeth, a spring coiled about the shaft and having two groups of convolutions and a projecting loop between said groups, a sheet metal pressure finger one end of which partially surrounds the shaft and substantially the middle portion of which is engaged by the loop, and a crank-shaped pressure-regulating pin which is attached to one end of the shaft and is adapted to engage the teeth.

5. A brush holder for dynamo-electric machines comprising a sheet metal box having laterally projecting arms at one side, a two-part sheet metal socket clamp at the opposite side, a sheet metal finger pivotally supported between said arms and having a free end, and a spring for pressing the free end of said finger against a brush located in the box.

6. A brush holder for dynamo-electric machines comprising a substantially rectangular box having laterally projecting arms, a pressure finger, and a socket clamp, all of which are formed of sheet metal, a pin shaft mounted in the box arms and serving to support one end of said pressure finger, and a pressure spring coiled about said shaft and having a projecting portion which engages said pressure finger.

7. A brush holder for dynamo-electric machines comprising a sheet metal box having top and bottom openings and projecting arms at one side and key projections at the other side, a pin shaft mounted in said arms, a sheet metal finger bent around the shaft and having a free end that extends over the top opening in the box, a sheet metal socket supporting clamp attached to the box and engaged by its key projections, and a spring for pressing the free end of the sheet metal finger against a brush located in the box.

8. A brush holder for dynamo-electric machines comprising a sheet metal box having integral key projections at one side to engage a recess in a supporting stud, and a socket clamp fastened to said box between said key projections and adapted to surround said supporting stud.

9. A brush holder comprising a box having integral spring and pressure finger supporting arms, a two-part socket clamp and a pressure finger, all formed of sheet metal,

in combination with a brush and a spring for holding one end of the pressure finger in engagement therewith.

10. A brush holder for dynamo-electric machines comprising a brush-receiving box having arms provided with a series of notches, a pressure finger, a spring therefor, a rotatable shaft to which the spring is attached, and a crank pin for turning said shaft, said pin being rotatable 180 degrees upon its axis to provide two series of adjustments for the spring in coöperation with the series of notches.

In testimony whereof, I have hereunto subscribed my name this 30th day of June, 1906.

CARL B. AUEL.

Witnesses:
R. J. DEARBORN,
BIRNEY HINES.