(No Model.)

W. H. MORGAN.

COMMUTATOR BRUSH.

No. 560,737. Patented May 26, 1896.

Fig. 1.

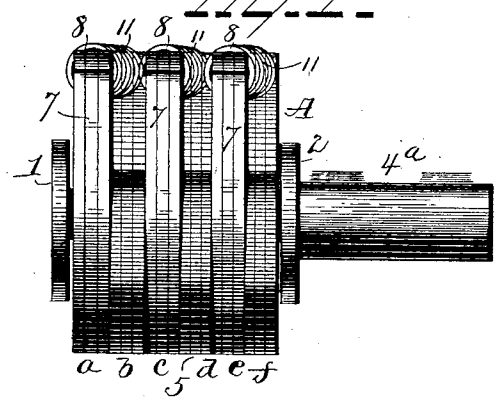


Fig. 3.

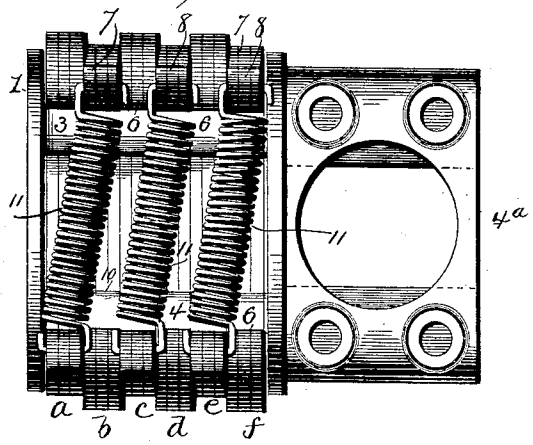
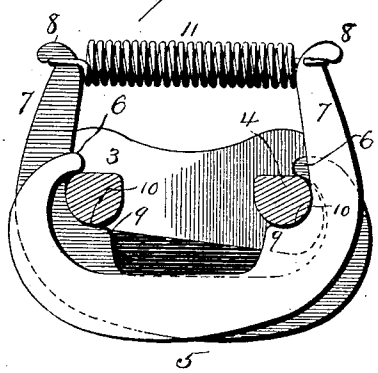


Fig. 2.



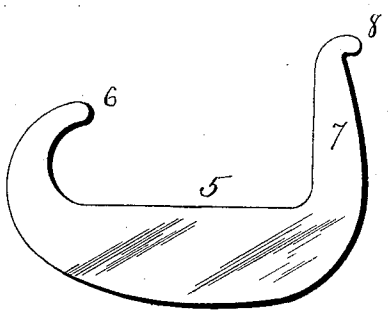


Fig. 4.

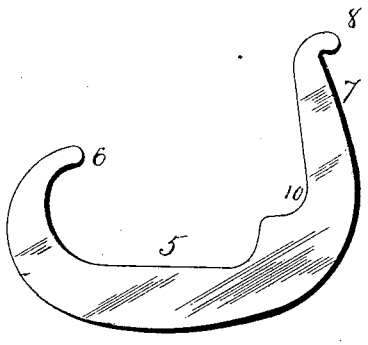


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM H. MORGAN, OF ALLIANCE, OHIO.

COMMUTATOR-BRUSH.

SPECIFICATION forming part of Letters Patent No. 560,737, dated May 26, 1896.

Application filed February 20, 1895. Serial No. 539,127. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MORGAN, a resident of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Commutator-Brushes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in commutator-brushes, and more particularly to such as are used as contact devices or shoes for electrical switches, the object of the invention being to so construct a commutator-brush that it will readily adjust itself to any irregularities in the commutator or contact plates and insure proper electrical connection therewith.

A further object is to so construct a commutator-brush that it shall have a multiplicity of yielding parts adapted to engage the contact-plates of a commutator or switch.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved commutator-brush. Fig. 2 is a sectional view. Fig. 3 is a plan view, and Figs. 4 and 5 are detail views.

A represents the frame of my improved brush or shoe, and comprises ends 1 2, connecting-bars 3 and 4, and a socket-piece 4^a, projecting from the end 2 of the frame and adapted to receive the switch-arm or other device by which it will be carried or supported. The brush or shoe *per se* comprises a series of contact-plates 5, having curved contact edges and disposed edgewise between the ends 1 2 of the frame, said contact-plates being arranged in several sets of three (more or less) plates each, six sets *a b c d e f* being shown in the drawings.

Each plate 5 is made at one end with a hook 6, adapted to engage one of the connecting-bars of the frame, and the other end of each contact-plate is made with an arm 7, having a hook 8 at its free end. The contact-plates, with the exception of those at the respective ends of the device, are made with shoulders 9 to form bearings 10 for said plates against one or the other of the connecting-bars of the frame, the bearing 10 of the end contact-plates being preferably formed by the junction of the arm 7 with the body of the plate.

The contact-plates are preferably arranged in sets of three, the plates of each set being parallel with each other; but the sets of plates are so disposed that the curved contact edges of one set will be non-coincident with the contact edges of the adjacent set or sets. When thus arranged, the arms 7 of the sets *a c e* of contact-plates will alternate with the hooked ends 6 of the sets *b d f* of contact-plates at one side of the device. At the other side of the device the hooked ends 6 of the sets *a c e* of contact-plates alternate with the arms 7 on the sets *b d f* of plates. The hooked ends of arms 7 of adjacent sets of plates are connected together by means of springs 11, as shown in Figs. 2 and 3.

From the construction and arrangement of parts above described it will be seen that one end of each set of plates is yieldingly connected with the frame of the device and that the curved contact edges of the various sets of plates are so disposed that those of one set will be non-coincident with those of the adjacent sets. Thus a shoe or brush is formed having a number of yielding contact-plates, the yielding portion of one set of plates projecting beyond the non-yielding portion of the adjacent set, so that the contact edges of one set of plates will not be coincident with the adjacent sets, and the brush made to accurately conform to any irregularities of the contact-plates of the switch or commutator and insure good electrical contact therewith.

My improvements are very simple in construction, easy to repair, if necessary, and effectual in all respects in the performance of their functions.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A commutator brush or shoe composed of a series of independently-yielding sections having curved non-coincident contact edges, substantially as set forth.

2. A commutator brush or shoe comprising a series of yielding sections so arranged that the contact edges of one section will be non-coincident with the contact edge of the adjacent section, substantially as set forth.

3. A commutator brush or shoe comprising a series of pivotally-supported sections, said sections being adapted to yield at one end, and said sections being so disposed that the yielding end of one section will be adjacent to the unyielding end of the next section, substantially as set forth.

4. A commutator brush or shoe comprising several sets of yielding contact-plates disposed side by side, the adjacent ends of two adjacent sets of plates being so disposed that contact faces or edges of adjacent plates will be non-coincident, substantially as set forth.

5. The combination with a frame, of a series of contact-plates pivotally connected at one end to the frame and yieldingly connected at the other end to said frame, substantially as set forth.

6. The combination with a frame, of several sets of contact-plates, one end of each set being pivotally connected to the frame, and the other end being yieldingly connected thereto, substantially as set forth.

7. The combination with a frame, of several sets of contact-plates pivotally connected at one end to said frame and yieldingly connected at the other end to said frame, the yielding ends of said sets of plates alternating with the pivoted ends, substantially as set forth.

8. The combination with a frame, of a contact-plate pivotally connected thereto at one end and bearing at the other end on said frame, and a spring for yieldingly retaining said contact-plate in its normal position, substantially as set forth.

9. The combination with a frame, of two contact-plates having arms, said plates having pivotal bearings at one end on the respective sides of the frame, and bearing on said frame at their other ends, and a spring connecting the arms of the respective plates, substantially as set forth.

10. In a commutator brush or shoe, the combination with a frame, of several sets of contact-plates, each plate having an arm at one end adapted to project beyond the frame and a hook at the other end to engage the frame, said sets of plates being so arranged that the arms of one set will alternate with the hooked ends of the adjacent set, and springs connecting the arms of one set of plates with the hooks of the adjacent set, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM H. MORGAN.

Witnesses:
E. WOOLGAR,
A. F. MORRIS.