April 4, 1939. W. E. ECKER 2,153,177

BRUSH FRAME CONSTRUCTION

Filed April 22, 1936

FIG. 1

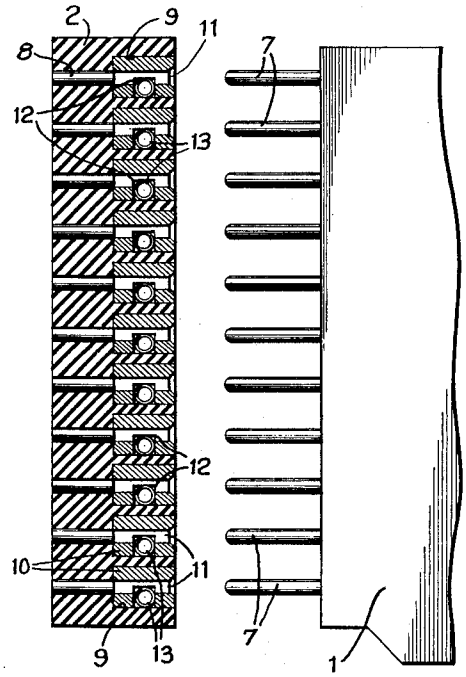



FIG. 2.

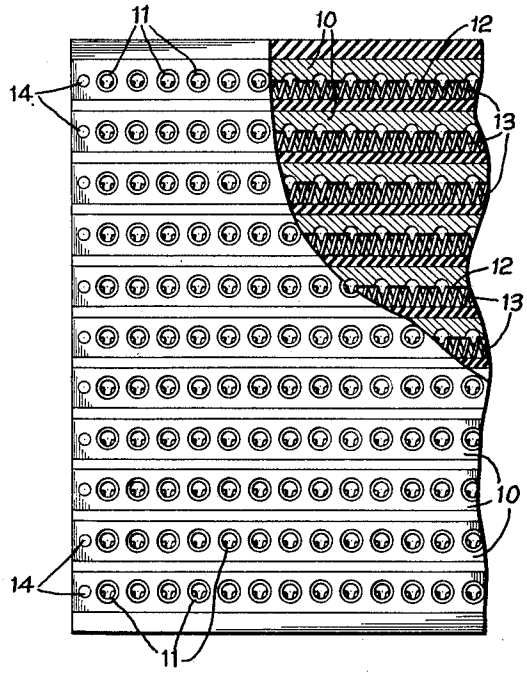



FIG. 3.

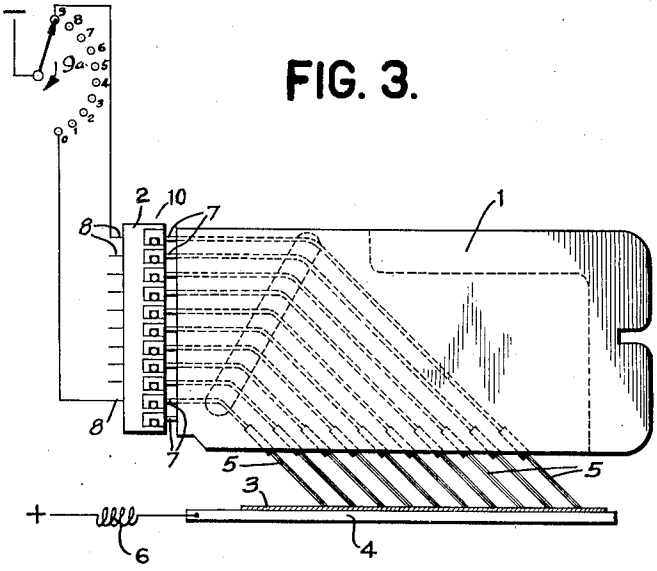
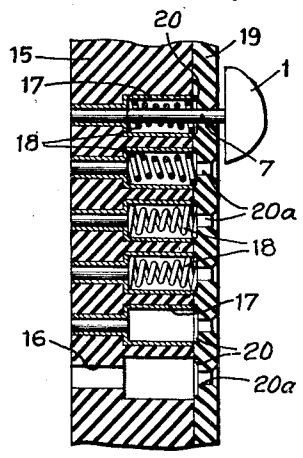



FIG. 4.




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## BRUSH FRAME CONSTRUCTION

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4 Claims. (Cl. 175—293)

This invention relates to brush frame constructions and more particularly to brush frame holders for removable brush units and especially applicable to electrical calculating or accounting machines.

An object of the present invention is to provide an improved brush holder for removable brushes, one which is simple in design, compact in form and positive in the provision thereof for good contact between the brushes and brush holder. To this end, one preferred form is to provide a plurality of common conducting bars provided with properly spaced openings for the brushes. Disposed within the bars and positioned in a certain relationship with the openings are continuous cylindrical springs which are adapted to provide a positive wiping contact for the insertible brush pins or plugs. Another form is to provide individual springs, spool or hour-glass springs referred to as conoidal springs disposed in conducting inserts which are adapted to receive the insertible pins or plugs and in this manner provide a constant positive and wiping contact.

Various other objects and advantages of the invention will be obvious from the following particular description of one form of mechanism embodying the invention or from an inspection of the accompanying drawing; and the invention also constitutes certain new and useful features of construction and combination of parts hereinafter set forth and claimed.

In the drawing:

Fig. 1 is a side view of the brush holder.

Fig. 2 is an elevation view of the brush holder.

Fig. 3 is a view showing the brushes in position in the holder.

Fig. 4 is a sectional view of a preferred modification.

Referring now to Figs. 1, 2 and 3 the invention is shown as applied to a preferred form of mechanism; namely, an electrical controlled accounting machine, which is shown diagrammatically. Briefly, the brush unit 1 inserted in the brush holder 2 is adapted to cooperate with an accounting machine control element shown in the form of a perforated card 3. A common conducting plate 4 is disposed beneath the card so that when a perforation is sensed by the individual brush 5, a circuit is established from positive battery through an accumulator clutch coil 6, brush plate 4, brush 5, and corresponding pin or plug 7 of the brush unit, corresponding socket or conducting insert 8 to the associated contact of an emitter 9a to negative battery. To those skilled in the art, it is well known how the emitter 9a is operated in synchronism with the accumulator so that a proper entry is made in the accumulator and in accordance with the perforation sensed on the card. It is deemed not necessary to explain in further detail the associated mechanism of an accounting machine since the machine per se forms no part of the present invention.

The brush holder 2 preferably is formed from suitable insulating material, and is provided with a plurality of oblong channels 9 in which are inserted common conducting bars 10 which may have integral sockets 8 depending therefrom. The bars 10 are provided with a plurality of evenly spaced openings 11 to permit the pins or plugs 7 to be inserted therein. The bars 10 are also provided with a longitudinal channel 12. The said channel is disposed to extend transversely from the edge of the conducting bar to the center line of the openings 11.

Disposed within each of the said channels is a continuous cylindrical spring 13 held in position by suitable pins 14. The purpose of the springs obviously is to provide a positive contact between the conducting bars 10 and insertible pins or plugs 7 and in addition thereto provide a wiping contact to insure a positive connection at all times. It is to be noted that the pressure of the spring exerted on the inserted pins or plugs increases as the number of pins inserted in the bars increase, that is, a number of brush units 1 may be inserted in the brush holder 2 at one time, and it is obvious that the spring tension is increased as more pins are inserted.

Another form of brush holder is shown in Fig. 4, in which the brush holder base 15 formed of suitable insulating material and recesses 16 are formed. Disposed in the said recesses are individual conducting inserts 17. Within the said inserts spool or hour glass springs 18 which will be referred to as conoidal shaped springs are disposed. Another insulating member 19 provided with suitable openings 20a for the insertible pins is adapted to be suitably attached to the base 15. It is to be noted that individual recesses 20 are formed in the member 19 to hold the springs 18 in position. The said springs are of such length so that when the member 19 is attached to the base 15 the individual springs are compressed thus insuring good contact between the conducting inserts 17 and the springs 18. Due to the shape of the spring the convolutions of smaller diameter thereof are adapted to engage firmly the pin or plug inserted through

the openings. In addition, to providing a positive contact the springs also act as wiping contacts as the pins or plugs are inserted.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A device of the character described comprising, in combination, an insulated member having individual recesses disposed therein, individual conducting segments inserted in said recesses, means inserted in said conducting segments comprising individual springs each having convolutions of varying diameters, the convolutions of the largest diameters arranged to engage the conducting segments, a second insulating member having a plurality of individual conducting pin openings smaller in diameter than the end diameter of the springs, said member secured to the first-mentioned member so as to confine the springs within the recesses of said first member, conducting pins insertible through the pin openings to engage the spring convolutions of less diameters, and means whereby, upon removal of the second member, the springs and conducting segments may be freely removed and replaced.

2. A device of the character described comprising, in combination, an insulated member having recesses disposed therein, conducting segments inserted in said recesses, means loosely inserted in said conducting segments comprising individual springs having convolutions of varying diameters, the convolutions of less diameter located in the central section of the spring, the convolutions of the largest diameters are located at the ends of the springs and arranged to engage the conducting segments, a second insulating member having a plurality of individual contact member openings being secured to the first-mentioned member to align with the recesses therein, contact members engaged by the spring convolutions of less diameters upon insertion of said contact members, and means whereby said second member may be removed so that the springs and segments may be freely removed and replaced.

3. A plugboard of the character described, including an individual opening lined with a hollow conductive bushing having a shoulder joining a reduced portion, a coil spring inside the bushing and abutting the shoulder at one end with convolutions of the spring engaging the bushing to substantially centralize the spring, and a separate insulating plate attached to the front of the plugboard having a hole alined with the interior of the spring and smaller than the adjacent end of the bushing to enable a plug to be inserted into the interior of the spring, the portions of said plate surrounding the hole therein engaging an end of the spring to confine the latter within the bushing between the plate and the bushing shoulder, said plate when removed enabling the spring and bushing to be freely removed and replaced.

4. A plugboard of the character described with multiple openings each of which is lined with a hollow conductive bushing having a shoulder joining a reduced portion which contains and firmly engages a conductive element inserted therein, a coil spring loosely inserted in each bushing having convolutions at the ends of the spring engaging the bushing and smaller convolutions at the central section thereof adapted to wedgingly grip an insertible conductive plug, an insulating panel attached to the front of the plugboard which is common to all the bushings and springs inserted in the holes in said plugboard and having openings smaller than the bushings but alined therewith to permit the insertion of conductive plugs into the interior of the springs, the portions of the common panel surrounding the holes therein engaging an end of each spring to confine each spring between the panel and the shoulder of the bushing in which it is contained, said panel when removed allowing the free removal and replacement of the springs and bushings.

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