March 30, 1926. 1,579,097

H. H. ERDMAN

COMMUTATOR AND SLIP RING BRUSH SHUNT CONNECTION

Filed April 14, 1925

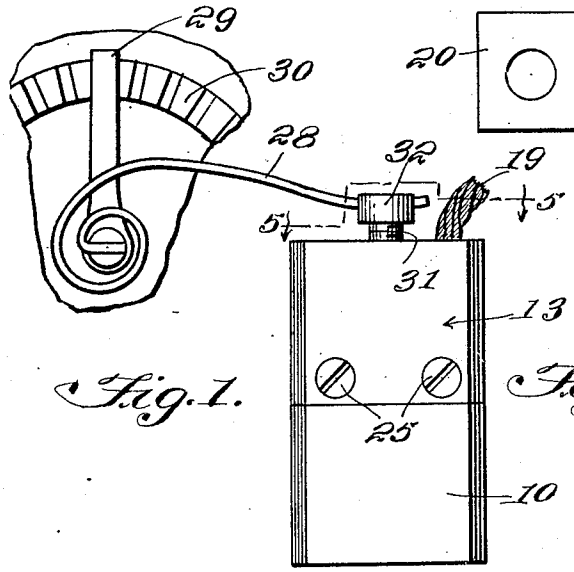


Fig. 1.

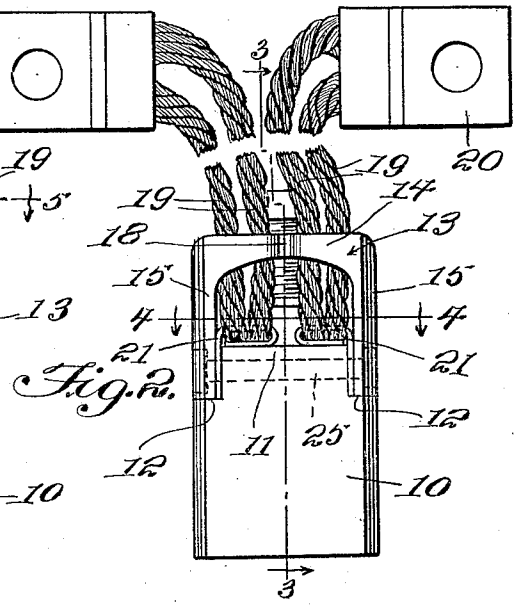


Fig. 2.

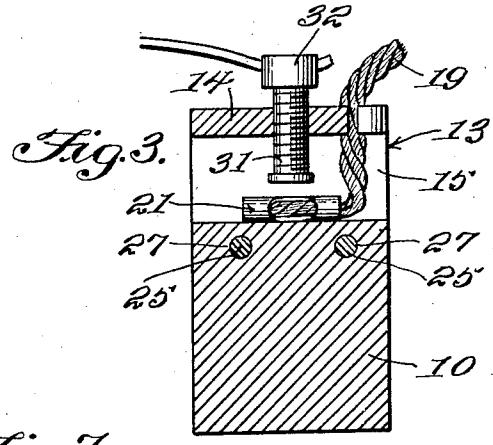


Fig. 3.

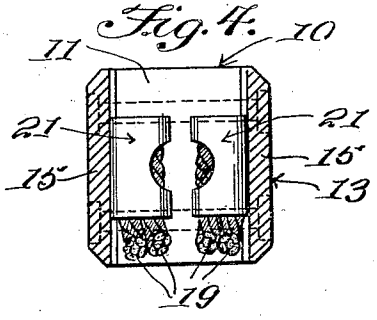


Fig. 4.

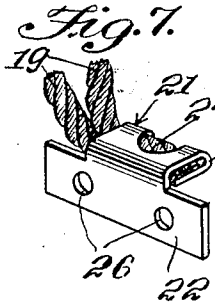


Fig. 7.

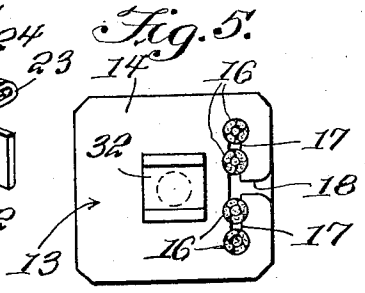


Fig. 5.

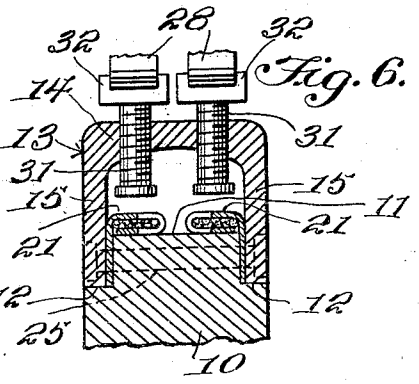


Fig. 6.

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UNITED STATES PATENT OFFICE.

HARRY H. ERDMAN, OF RIDGWAY, PENNSYLVANIA.

COMMUTATOR AND SLIP-RING BRUSH SHUNT CONNECTION.

Application filed April 14, 1925. Serial No. 23,155.

To all whom it may concern:

Be it known that I, HARRY H. ERDMAN, a citizen of the United States, residing at Ridgway, in the county of Elk and State of Pennsylvania, have invented new and useful Improvements in Commutator and Slip-Ring Brush Shunt Connections, of which the following is a specification.

This invention relates to electric machinery and parts thereof, particularly commutator and slip ring brushes, and has for its object the provision of a novel cable or shunt construction whereby several advantages are attained.

It is well known that the ordinary type of brush consists of a metallic metal-graphite or carbon composition body having a portion at one end thereof formed to engage and hold the cables or shunts for conducting the current to or from the brush, as the case may be. These ordinary brushes generally consist of two parts of dissimilar metals or compositions with cables or shunts permanently attached thereto, hence when the commutator or ring engaging portion has worn one half its length it is discarded, together with all cable or shunt connections. Likewise, in the ordinary construction, when a disturbance in the electrical system, such as a short circuit, causes a "flash-over", it destroys the cables or shunts, making it necessary to discard the entire brush.

It is with the above facts in view that I have designed the present invention which has for a more specific object the provision of a brush including a commutator or ring engaging member, a cap member or holder therefor and cable terminal members which are detachably mounted so as to be easily capable of replacement, the commutator or ring engaging member being likewise replaceable when excessively worn without it being necessary to discard any of the other portions of the device.

A further object is to provide a device of this character in which the cap member is so formed as to engage and hold the conducting cables properly and not only strengthen them but prevent twisting off at their connections with the terminal elements.

Still another object is the provision of screw means engageable by the usual retaining spring of the brush construction whereby the tension of the spring may be delicately adjusted to obtain the best results and whereby the tension, in the case of two or more springs, may be made the same.

An additional object is the provision of a structure of this character which will be simple and inexpensive in manufacture, easy to assemble and disassemble, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention may consist in the details of construction and the arrangement of parts to be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of the complete device showing it engaged by a spring arrangement,

Figure 2 is an elevation at right angles to Figure 1,

Figure 3 is a vertical section on the line 3—3 of Figure 2,

Figure 4 is a cross section on the line 4—4 of Figure 2,

Figure 5 is a section on the line 5—5 of Figure 1,

Figure 6 is a detail section illustrating a slight modification,

Figure 7 is a detail perspective view of one of the cable terminal clips.

Referring more particularly to the drawings I have shown my brush as comprising a body member 10 formed as a solid block of the usual material employed for the purpose, which block or body is cut away at opposite sides as shown to provide or define a reduced portion 11 and shoulders 12. This body may of course be of any size and shape depending upon the machine in which it is to be used. Used in conjunction with this body is a cap 13 which is of open frame formation including a top portion 14 and arms 15 located within the cut away portions at the opposite sides of the body 10. Near one edge the solid top of this cap is formed with a plurality of circular openings 16 connected by slots 17, the innermost one of which has communicating therewith a slot 18 leading out to the edge.

The numeral 19 designates the conducting cables which may be of any desired number of strands. A plurality of cables is preferable inasmuch as there will be a greater degree of flexibility than if a single

larger one were to be used. These cables are shown as arranged in pairs and at one end each pair is connected with the usual terminal 20. The other end of each pair of cables is connected with a clip designated broadly by the numeral 21 and shown most clearly in Figure 7. While the actual construction of this clip might be varied, it may conveniently be formed from a single piece of sheet metal including an elongated body portion 22 and a tongue 23 formed on one edge thereof, the tongue being crimped or clasped about the ends of the cables, the holding action being increased by the provision of an opening 24 in the tongue which will allow the cable to bulge out at this point. The body portions 22 of the clips are intended to be located within the cut away portions at opposite sides of the reduced portion 11 of the body 10 and to be engaged by the arms 15 of the cap. These elements are secured together by transverse bolts, rivets or the like 25 which pass through suitable holes in the arms 15, through holes 26 in the clips 21 and through registering holes 27 in the reduced extension or portion 11.

The bracing and holding action of the cap 13 is accomplished by forcing the cables through the slot 18 and through the slots 17 until they engage within the openings 16, the cables being then held in spaced relation and prevented from moving and being twisted or bent back and forth at their points of connection with the clips 21.

Obviously, in the case of excessive wear of the body 10 the bolts 25 may be removed and a new body placed in position. Similarly, if the cap 13 should become damaged from any cause it may be replaced and if the cables 19 or the clips 21 thereof should become broken or burnt out they may be replaced. In either event it is unnecessary to discard the entire device as only the useless part need be replaced.

In practice a spring 28 is provided for urging the brush into engagement with the commutator or ring of the machine in which it is used and ordinarily means is provided for regulating the tension of the spring, the adjusting means generally consisting of a pivoted arm 29 connected with the spring and movable over a notched or toothed segment 30. However, the adjustment is not sufficiently delicate to insure maximum efficiency of the brush and to overcome this difficulty I have found it expedient to use a screw 31 which is threaded through the solid top 14 of the cap and which has a channeled head 32 within which the spring 28 is engaged. In case a finer adjustment is needed than can be obtained by moving the arm 29 one notch, the spring 28 may be disengaged from the screw head 32 and the screw turned in one direction or the other, subsequent to which the spring is again engaged with the head. In this way a very close adjustment is possible.

In some instances use is made of two springs as shown in Figure 6, in which event two screws are used and it is quite clear that these screws may be separately turned so as to obtain the same tension by both springs.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed sectional commutator or slip ring brush attachment which possesses many advantages as compared with the ordinary type especially in point of ease of replacement and economy.

While I have shown and described the preferred embodiment of the invention, it should be understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a device of the character described, a block-like body having one end portion cut away to define an extension, a cap having arm portions straddling said extension, conducting cables, clips secured upon the ends of said cables and having portions located at opposite sides of said extension and clamped thereagainst by the cap, and securing means passing through the cap, the clips and the extension, each clip being formed from a single piece of sheet metal including a body portion and a tongue, the tongue being coiled and compressed about the cables.

2. In a commutator and slip ring brush structure, a block-like body having one end portion cut away to define an extension, a cap having arm portions straddling said extension, conducting cables, clips secured upon the ends of said cables and having portions located at opposite sides of said extension and clamped thereagainst by the cap, and securing means passing through the cap, the clips and the extension, the cap being provided with means engaged by and holding the cables separated.

3. In a commutator and slip ring brush construction a block-like body having one end portion cut away to define an extension, a cap having arm portions straddling said extension, conducting cables, clips secured upon the ends of said cables and having portions located at opposite sides of said extension and clamped thereagainst by the cap, and securing means passing through the cap, the clips and the extension, the cap being formed with a plurality of openings for the reception of the cables and being further provided with slots connecting the openings and an additional slot extending to one edge of the cap.

4. In a commutator and slip ring brush assembly including a brush and a spring element engageable therewith, a threaded adjusting member on the brush engaged by the spring.

5. In a commutator and slip ring brush assembly including a brush and a spring element engageable therewith, a threaded adjusting member on the brush engaged by the spring formed as a screw having a channeled head receiving the spring.

In testimony whereof I affix my signature.

HARRY H. ERDMAN.