(No Model.)

C. J. VAN DEPOELE.

COMMUTATOR BRUSH.

No. 352,074. Patented Nov. 2, 1886.

Fig. 2.

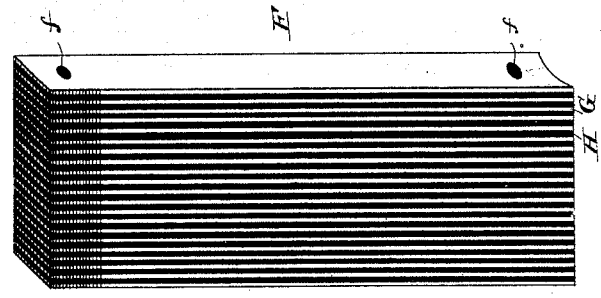


Fig. 3.

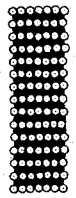
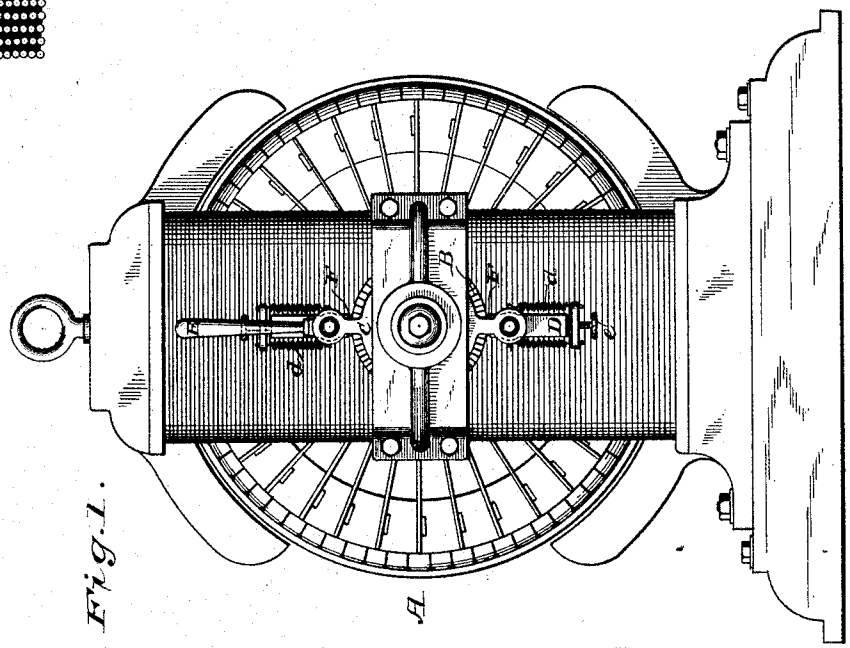


Fig. 1.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

COMMUTATOR-BRUSH.

SPECIFICATION forming part of Letters Patent No. 352,074, dated November 2, 1886.

Application filed February 20, 1886. Serial No. 192,680. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DEPOELE, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Commutator-Brushes for Dynamo-Electric Machines, of which the following is a description.

The present invention relates to improvements in commutator-brushes for electric generators or motors, and is an improvement on the brush shown and described in Letters Patent No. 291,650, granted to me January 8, 1884, the details whereof will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a view in elevation of a motor provided with my improved commutator-brush. Fig. 2 is a perspective view of the brush. Fig. 3 illustrates a modification thereof.

Similar letters denote like parts throughout.

The brushes previously used by me in holders mounted and moving at right angles to the axis of the commutator upon which they bear are either formed of a bunch of copper wires or of a number of leaves or layers of thin sheet-copper, soldered together at their outer end only, and spring-pressed against the face of the commutator. I find that with continued use it frequently happens that portions of the strips or wires become fused together by the sparks between the surfaces in moving contact, forming solid and comparatively hard places, which wear the surface of the commutator unevenly.

As indicated in Fig. 2, my improved commutator-brush is constructed of alternate layers of thin sheet-copper and paper, the upper end of the copper strips being united by soldering, riveting, or in any other suitable manner.

In the drawings, A is a motor, of which B is the commutator.

C is a movable yoke, rotating upon the same axis as the commutator, and carrying the metallic box-shaped brush-holders D. The yoke is also provided with a handle, E, by means of which it can be readily moved upon its axis to any desired position.

F F represent the commutator-brushes, which are placed within the boxes D and pressed endwise against the commutator by adjustable springs *d*, acting upon a follower, *e*, bearing against the outer ends of the brushes, and by means of which the wear of the brushes is compensated for, or their pressure upon the commutator adjusted. The brushes themselves are composed of thin copper strips G, alternating with strips of paper H, which are assembled upon removable pins *f*, and then permanently secured together by soldering the upper ends of all the copper strips, as indicated at I, or by the retention of one or more of the pins or rivets *f*.

The brush, as shown, is formed of laminæ of paper and copper placed, preferably, transversely of the axis of the commutator, although it will be obvious that for some purposes it might be convenient to arrange the laminæ in the opposite direction. I may also construct the brush of a number of straight wires soldered or otherwise secured at their upper ends, this form being shown in cross-section in Fig. 3. In this case, also, the paper may be used and put between the layers of wire, although, if preferred, it may be dissolved and in the form of pulp intermingled with the wires in a mold or form of the desired shape. The insulating effect of paper is no objection to its use in this connection, because the ends bearing upon the commutator will usually be so covered with metallic powder as not to materially increase the resistance, and the comparatively refractory nature of the paper itself enables it to resist the destructive effects of the sparks and not burn away in advance of the wear of the metal.

The paper or other material interposed between strips should not be shellacked nor contain any gummy matter. Blotting-paper can be moistened and then covered with ground soapstone. The soapstone will keep the commutator and brushes clean and polished, and said soapstone acts as a lubricant to the commutator and brushes, and, being dry and an insulator, does not stick between the sections, as oil or other greasy matter does, and on that account I find it extremely valuable and useful for the present purpose.

The herein-described brush need not always be at right angles to the commutator, as herein shown and described, for when the commuta-

tor rotates in one direction only, whether in a motor or a generator, it can be mounted in an inclined position, as in ordinary dynamo-electric generators.

I do not desire to limit myself to the use of paper to prevent the adhesion of the metallic portions of a commutator-brush, as there are many other substances that will answer the purpose—as, for instance, mica, vulcanized fiber, asbestus cloth, and, in fact, almost any non-metallic and comparatively refractory material.

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

1. A commutator-brush consisting of alternate layers or strips of copper and a non-metallic substance, said layers being all arranged transversely of the axis of the commutator-cylinder, and thereby interposing their minimum resistance to the passage of the current as collected, substantially as shown and described.

2. A commutator-brush consisting of alternate layers or strips of thin sheet-copper or its described equivalent, and a comparatively refractory non-metallic substance, said layers being all arranged transversely of the axis of the commutator-cylinder, and thereby interposing their minimum resistance to the passage of the current as collected, substantially as shown and described.

3. A commutator-brush consisting of alternate layers of thin sheet-copper and paper, said layers being all arranged transversely of the axis of the commutator-cylinder, and thereby interposing their minimum resistance to the passage of the current as collected, substantially as shown and described.

4. A commutator-brush consisting of alternate layers of thin copper or its described equivalent, and a comparatively refractory non-metallic substance coated with powdered soapstone, substantially as described.

5. A commutator-brush consisting of alternate layers of thin sheet-copper and paper coated with powdered soapstone, substantially as described.

6. The combination, with an electric motor or generator having suitable armature and rotating commutator-cylinder, of a commutator-brush therefor consisting of alternate layers or strips of thin sheet-copper and a comparatively refractory non-metallic substance, said layers being all arranged transversely of the axis of the commutator-cylinder, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

CHARLES J. VAN DEPOELE.

Witnesses:
LUCIUS CLARK,
EVERELL D. STILES.