No. 728,256. PATENTED MAY 19, 1903.

W. D. LITCHFIELD.

BRUSH FOR DYNAMO ELECTRIC MACHINES.

APPLICATION FILED NOV. 23, 1900.

NO MODEL.

Fig. 1.

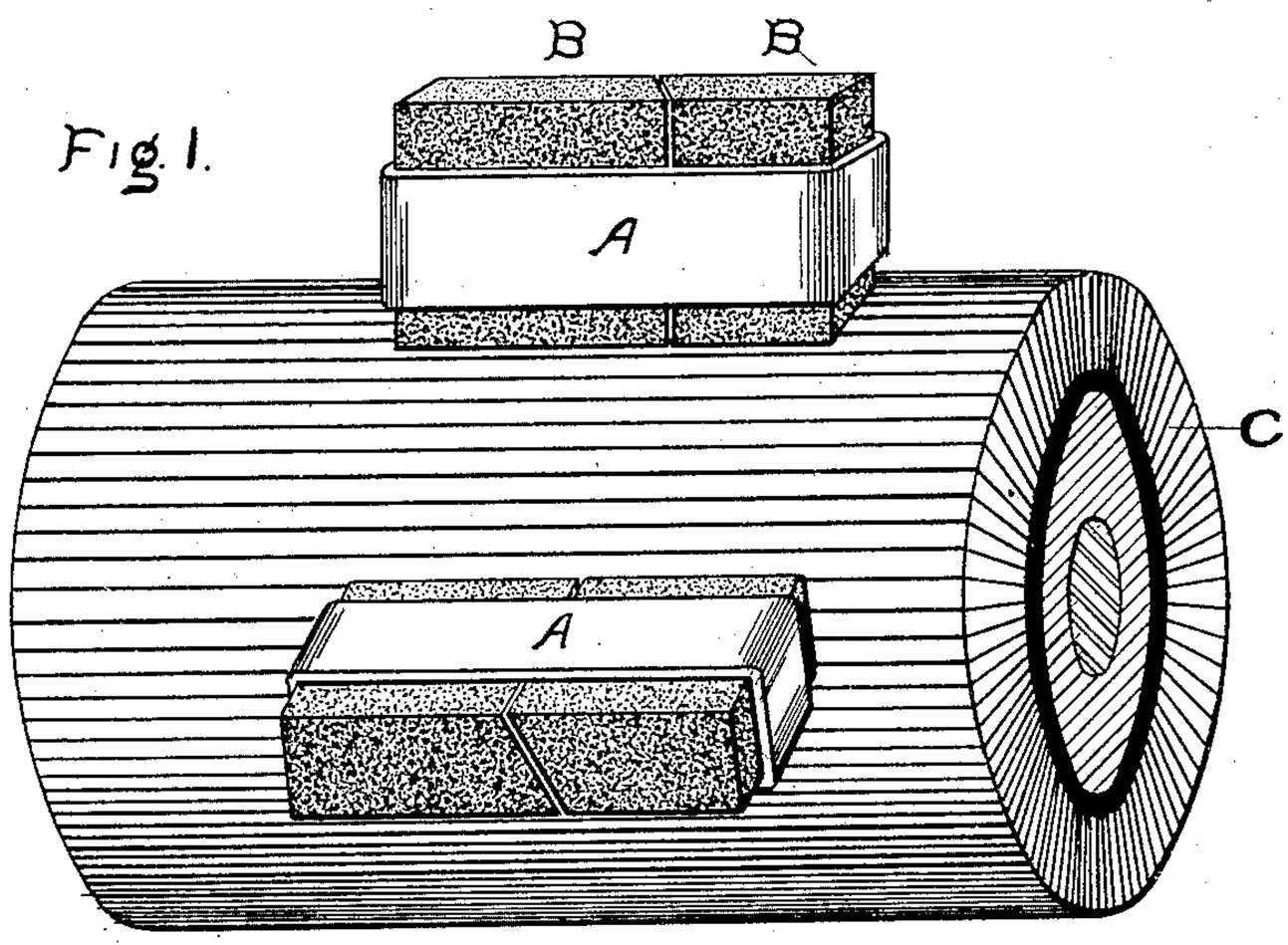
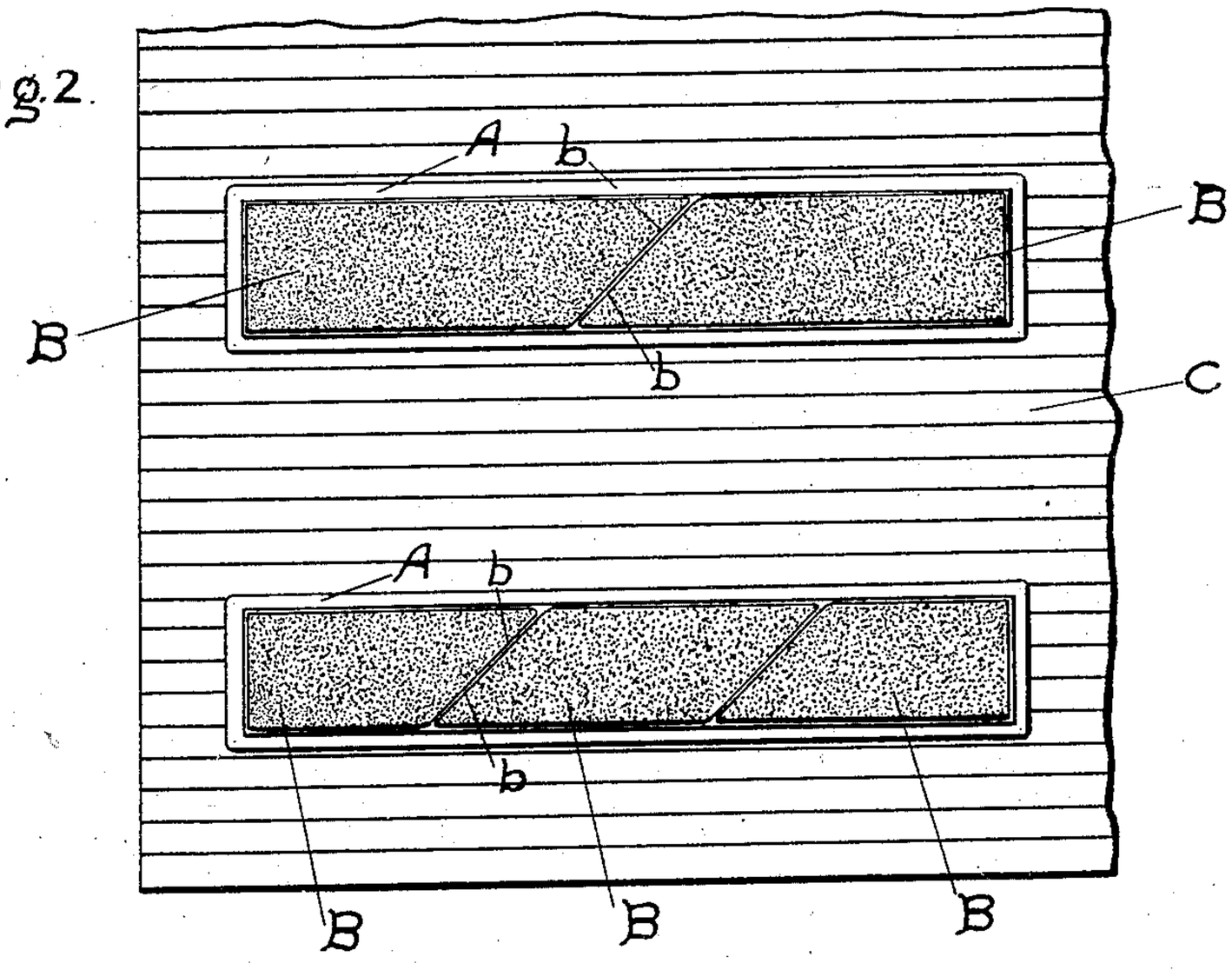


Fig. 2.



Witnesses.
A. B. Chapman.
Benjamin B. Hull

Inventor.
Walter D. Litchfield.
by Albert G. Davis
Atty.

No. 728,256. Patented May 19, 1903.

UNITED STATES PATENT OFFICE.

WALTER D. LITCHFIELD, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

BRUSH FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 728,256, dated May 19, 1903.

Application filed November 23, 1900. Serial No. 37,419. (No model.)

To all whom it may concern:

Be it known that I, WALTER D. LITCHFIELD, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Brushes for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to dynamo-electric machines; and its object is to avoid the formation of ridges on the commutators of machines in which two or more separate carbon-brushes are used in the brush-holder. Such brushes are set edge to edge along the commutator, the result being that that portion of the commutator which runs under the narrow space between adjacent brushes is not worn down to the same extent as the rest of the commutator, so that a narrow ridge is left just between the brushes the height of which varies with the length of time the commutator has been running. As the armature plays back and forth axially in the bearings the brushes are tipped up every time they strike one of these ridges. This causes the tilted brush to spark and for the instant greatly overloads the other brushes. It has been attempted to avoid this difficulty in a multipolar machine by staggering the several sets of brushes; but this only results in doubling the ridges. Each ridge will be not so high as the single ridges, owing to the fact that it receives a certain amount of wear; but if there is any ridge at all the troublesome tipping of the brushes occurs. It is therefore very desirable to prevent entirely the formation of ridges, and my invention accomplishes the result by making the joint between adjacent brushes of such shape that no part of it is perpendicular to the sides of the brush. By this construction each portion of the commutator is subjected to the same amount of wear and no ridging can take place.

In the accompanying drawings, Figure 1 is a perspective view of a commutator and two brush-holders set one hundred and twenty degrees apart. Fig. 2 is a plan view of part of the surface of the commutator and two brush-holders having different arrangements of brushes.

Each brush-holder A contains two or more separate brushes B, placed edge to edge parallel with the axis of the commutator C. The outside ends of the brushes (or of the end brushes, if more than two are used) are at right angles to the sides, as usual. The meeting edges *b* of the brushes overlap and are so shaped that every portion of the commutator traversed by one of said edges is also traversed by the adjacent edge of the next brush. In the drawings they are shown as beveled off on a line oblique to the parallel sides of the brush and the axis of the commutator. From this construction it results that the turning of the commutator acts to press the brushes closely together, so that there is no portion of the commutator passing under the brushes which is not worn equally with every other portion. This not only prevents any ridging, but also obviates the necessity of staggering the brushes, and therefore permits the use of brushes extending over the full length of the commutator. For any given machine this gives a larger number of square inches of brush contact, and consequently lower brush density.

This invention, simple as it is, nevertheless has practical and commercial value, since it cures difficulties heretofore not overcome despite many ingenious endeavors.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a current-collector, a plurality of independently-movable brushes having their adjacent contacting edges overlapped.

2. In a current-collector, a plurality of independently-movable, parallel-sided brushes having their adjacent contacting edges overlapped.

3. The combination of a holder provided with a brush-box and a plurality of independently-movable brushes located in said box and having their adjacent edges overlapped.

4. The combination of a brush-holder and two or more independently-movable brushes placed edge to edge therein, the adjacent edges of the said brushes being so shaped as to overlap relatively to the plane of rotation of the commutator.

In witness whereof I have hereunto set my hand this 21st day of November, 1900.

WALTER D. LITCHFIELD.

Witnesses:
BENJAMIN B. HULL,
FRED RUSS.