

No. 771,858

PATENTED OCT. 11, 1904.

J. H. BROWN.
COMMUTATOR.

APPLICATION FILED JAN. 7, 1904.

NO MODEL.

Fig. 2.

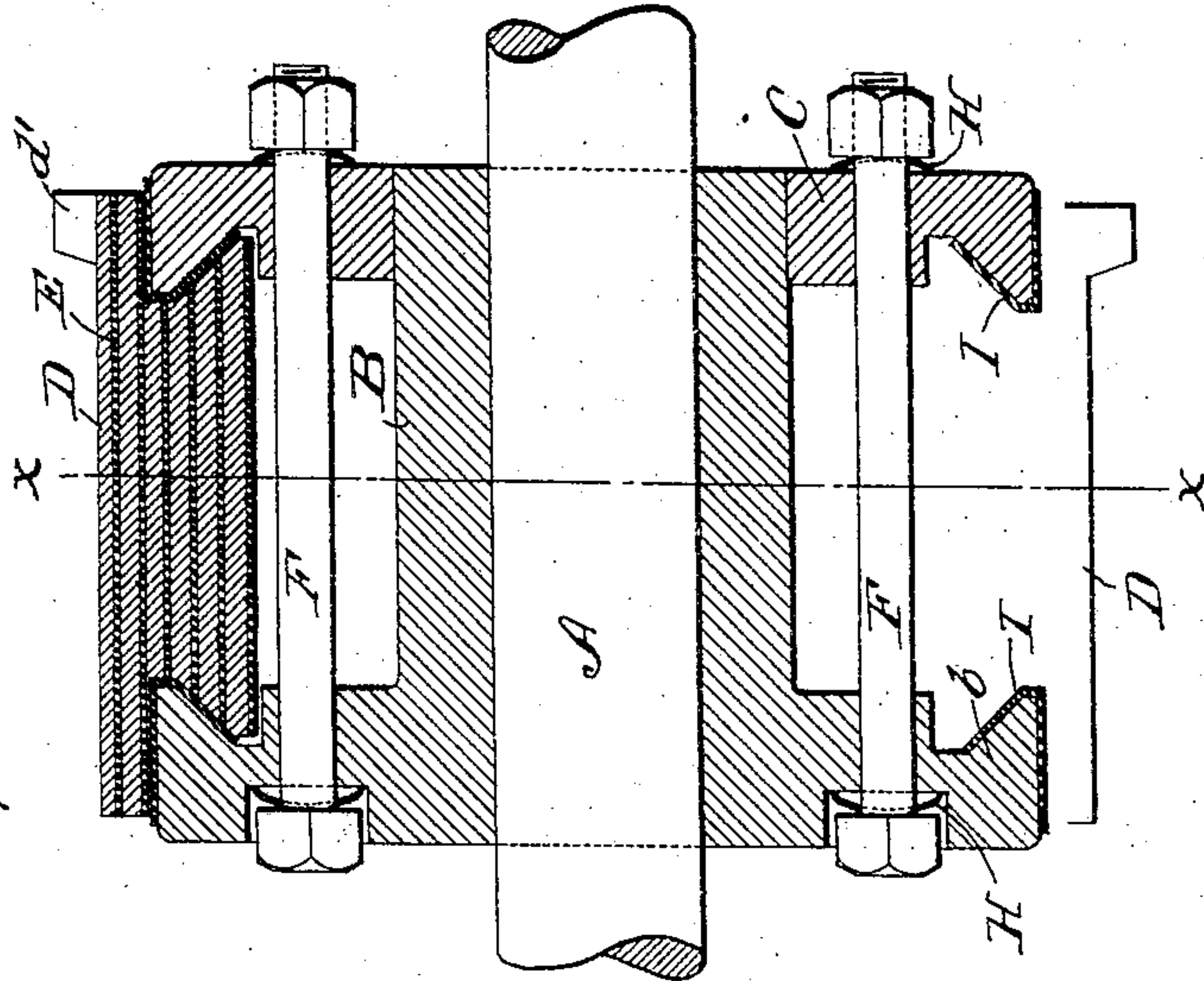
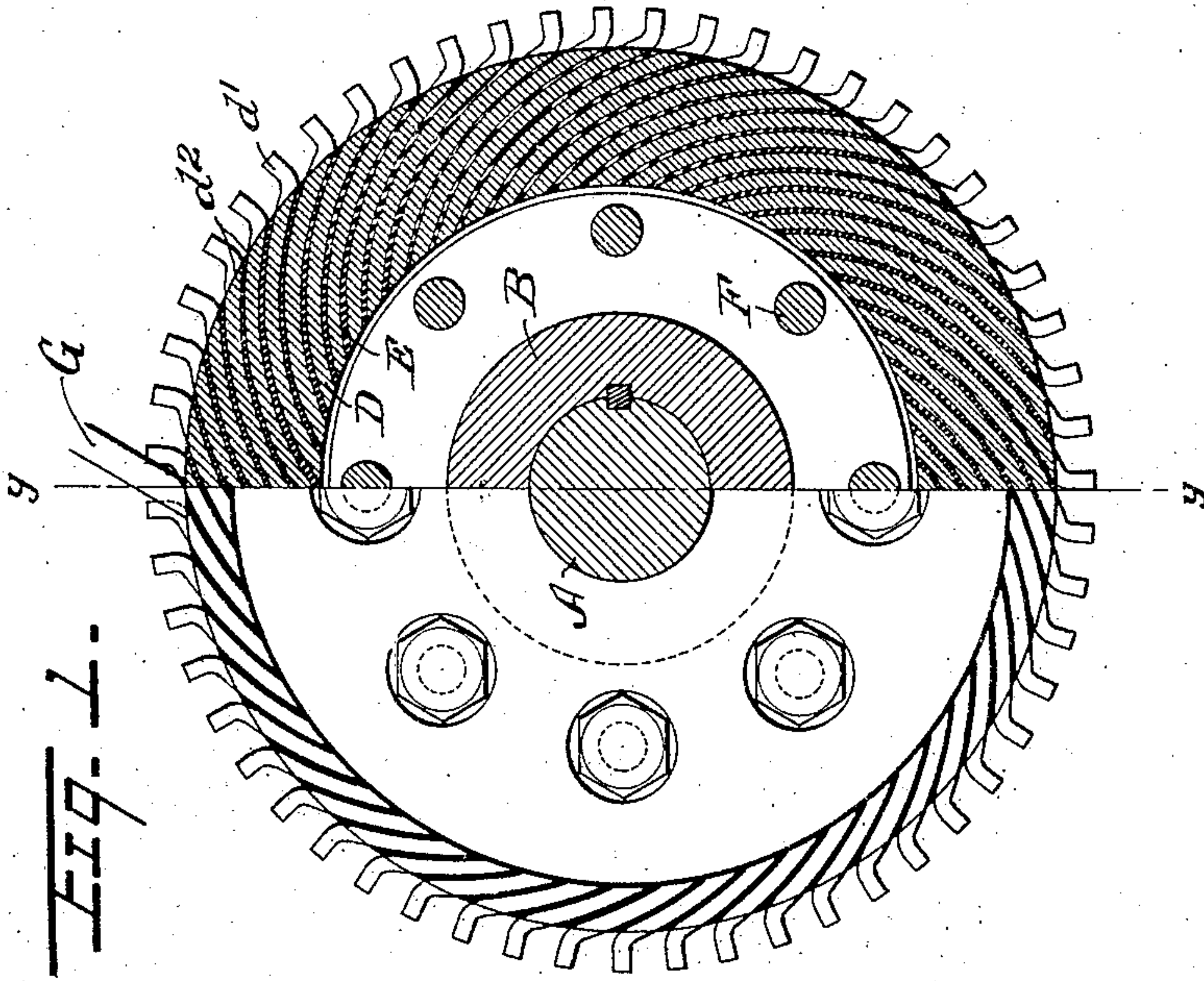


Fig. 1.



Witnesses

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JOHN H. BROWN, OF READING, PENNSYLVANIA.

COMMUTATOR.

SPECIFICATION forming part of Letters Patent No. 771,858, dated October 11, 1904.

Application filed January 7, 1904. Serial No. 188,062. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. BROWN, a citizen of the United States, residing in the city of Reading, county of Berks, State of Pennsylvania, have invented certain new and useful Improvements in Commutators, of which the following is a specification.

My invention relates to commutators for electrical generators and motors, and particularly to that class in which a number of commutator-bars are grouped radially around an insulating-hub, so that the edges form a brush-contacting surface. These radially-arranged bars require to be of tapering cross-section, the thickness of the metal increasing from the inner to the outer edge in proportion to the radial distance. This tapering formation not only involves considerable expense and care in manufacture, but renders it difficult to secure uniformity of contact and insulation and proper solidity of the assembled structure, while in addition the slightest displacement of a bar radially will tend to loosen the whole series and impair the efficiency and satisfactoriness of the commutator. Such displacement or other slight distortion of the structure is apt to be caused by the unequal expansion of parts due to heat developed in service.

The main object of my invention is to overcome these difficulties and provide a solidly-built-up structure composed of hard rolled plates of uniform thickness throughout and so arranged as to secure uniformity of contact with the interposed insulation, and to maintain such contact and solidity of structure under all conditions.

The invention is fully described in connection with the accompanying drawings, and the novel features are specifically pointed out in the claims.

Figure 1 is a sectional elevation on the line $x x$ of Fig. 2 of a commutator embodying my improvements in preferred form. Fig. 2 is a cross-sectional view on the line $y y$ of Fig. 1.

A represents the shaft, and B a sleeve secured thereto and provided, as shown, with a fixed clamping-flange b and an adjustable clamping-collar C for the commutator bars or plates D and interposed insulator-slips E.

In my improved construction commutator-

plates D are employed, which are of uniform thickness throughout instead of being gradually increased in thickness toward their outer edges, said plates being readily cut in the required shape from hard rolled sheet-copper. In order that these plates of uniform thickness may be made to closely occupy, in connection with the usual interposed insulating-slips D, the whole annular space commonly filled by the tapered radial bars, they are curved laterally to proper involute form, so as to lie parallel with each other as they extend outward across the radial lines of the commutator. These curved commutator-plates and interposed insulating-slips may be clamped together in a solid structure by means of ordinary endwise-clamping means comprising, as shown, the conically-ribbed clamping-flange b and adjustable collar C on sleeve B, arranged to engage the correspondingly-beveled ends d of the plate D, and longitudinal clamping-bolts F, passing through bolt-holes in said fixed flange b and sliding collar C and serving to draw the latter toward said fixed flange to force the plates D and the interposed insulating-strips into firm contact with each other throughout, so as to form a practically solid structure. Suitable insulation I is provided, as usual, between the plates D and the contacting parts.

The plates D are formed, as usual, with connecting extensions d' . In my improved commutator these also are of uniform thickness with the plates and project from an outer corner of each of the latter, as shown, beyond the outer edges d^2 thereof, which edges are turned off on a lathe, as usual, to form a smooth contacting surface for the brushes G. These connecting extensions d' , which are formed integral with and of uniform thickness with the plates D, are bent at an angle to the latter, so as to extend in a radial direction beyond the cylindrical brush-contacting surface, being thus spaced a considerable distance apart, as shown.

Owing to the heating of the plates during operation, there is a resulting expansion which puts an undue strain upon the structure, tending to distort the same. In my improved construction as described no loosening of the structure or impactment of the contact be-

tween the plates will result from the accidental relative movement of one or more plates, such as will result from similar displacement of the usual radial plates, owing to the uniformity of thickness of my plates D. In any case, however, it is desirable to provide for this heat expansion of the plates, and to that end I preferably provide a stiff spring-washer H under the bolt head or nut, or both, which permits of a limited yielding under undue expansion-pressure, such yielding being promptly taken up again upon a return to the normal.

The specific construction shown and described may of course be modified within the spirit of my invention.

What I claim is—

1. A commutator composed of cylindrically-grouped parallel commutator-plates of uniform thickness and involute curvature and interposed insulating-slips, all held in solid contact and with the edges of said plates forming a brush-engaging surface.

2. A commutator composed of cylindrically-grouped parallel commutator-plates of uniform thickness and involute curvature and interposed insulating-slips, all held in solid contact by means of clamping-collars engaging the ends of said plates, and the outer edges of the latter forming a cylindrical brush-contacting surface.

3. A commutator composed of cylindrically-grouped parallel commutator-plates of uniform thickness and involute curvature and interposed insulating-slips, all held in solid contact, said plates being formed with radially-bent connecting extensions beyond the brush-contacting edge thereof.

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

JOHN H. BROWN.

Witnesses:

D. M. STEWART,
C. E. LANG.