

A. D. WILLIAMSON.
 ROTATING COMMUTATOR.
 APPLICATION FILED OCT. 28, 1910.

1,003,843.

Patented Sept. 19, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

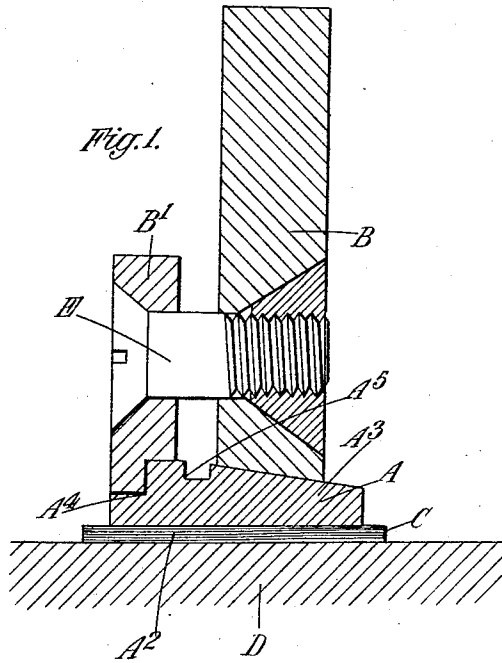


Fig. 2.

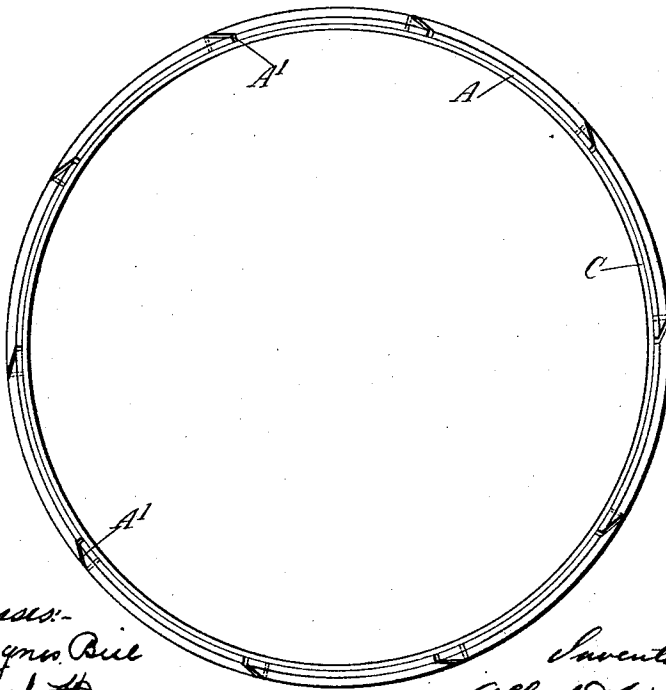
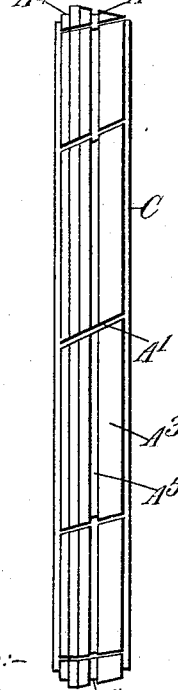


Fig. 3.



Witnesses:
 M. Agnes Rice
 Charles H. Himesy -

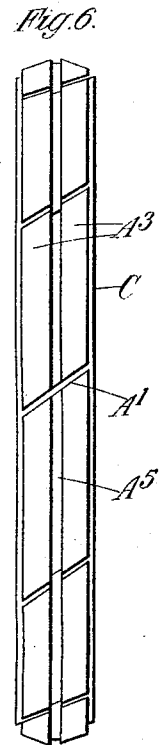
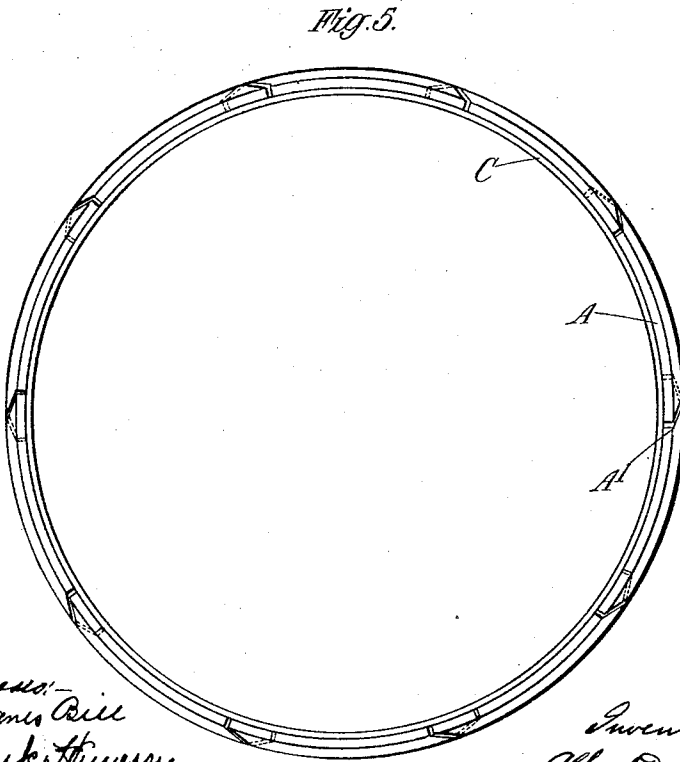
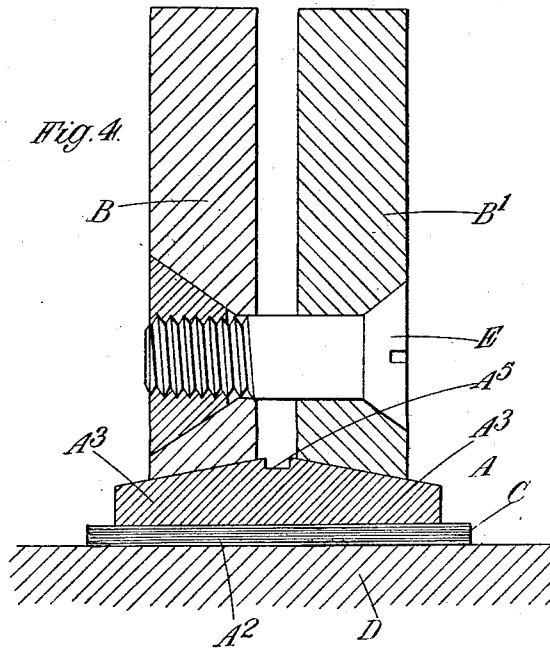
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 Alfred D. Williamson
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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

ALFRED DAVID WILLIAMSON, OF SHEFFIELD, ENGLAND, ASSIGNOR TO VICKERS SONS & MAXIM, LIMITED, OF SHEFFIELD, ENGLAND.

ROTATING COMMUTATOR.

1,003,843.

Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed October 28, 1910. Serial No. 589,597.

To all whom it may concern:

Be it known that I, ALFRED DAVID WILLIAMSON, a subject of the King of Great Britain, residing at River Don Works, Sheffield, in the county of York, England, have invented certain new and useful Improvements in or Relating to Rotating Commutators or Similar Structures, of which the following is a specification.

10 This invention relates to rotating commutators or similar structures that have to be firmly secured to a rotating member in such a way as to resist the action of centrifugal force.

15 It has particular reference to devices of the kind comprising a divided ring, encircling the component parts of the commutator or similar structure and formed with an outer conical surface for engagement with the correspondingly shaped inner surface of one or more collars or the like, which, by axial adjustment with respect to the divided ring, cause a mechanical pressure to be exerted inwardly upon this ring and consequently upon the component parts of the structure.

20 According to the present invention the divided ring comprises a plurality of segmental pieces the abutting ends of which have their lines of abutment inclined to the plane of the ring so that no single part of the structure encircled by the ring can escape the pressure exerted by it. To assist in holding the segmental pieces in place when assembling them, a small peripheral groove is formed on the segmental pieces for the reception of a string or wire.

25 In order that the invention may be clearly understood and readily carried into effect, the same will now be more fully described with reference to the accompanying drawings which show by way of example the application of the invention to the commutator of a continuous current turbo-generator.

30 Figure 1 is a cross section showing one arrangement of my improved device. Figs. 2 and 3 are a face view and side view respectively of the complete ring on a smaller scale. Figs. 4, 5 and 6 are views similar to Figs. 1, 2 and 3 but illustrate a modified construction.

Referring first to Figs. 1 to 3, A is the segmental ring, B and B' are two collars, C represents a band of mica or other suit-

able insulating material, and D represents 55 part of one of the commutator bars.

The ring A has a series of gaps, such as shown at A', dividing it up into numerous segmental pieces. The line of abutment of the ends of the segmental pieces of the ring is not at right angles to the plane of the ring but inclined to that position as shown in Figs. 2 and 3. The ring is cylindrical upon its inner surface A² and conical upon its outer surface or periphery A³. The collar B is conical upon its inner surface to correspond to the conical surface A³ of the ring A. The collar B' fits upon a stepped portion A⁴ of the ring A, and the taper of the conical surface A³ of the ring is directed 60 away from the said stepped portion A⁴.

In assembling the parts, the collar B' is slipped over the commutator and over the band C of mica or the like, which has been previously placed in position, this band being of sufficient thickness to serve as an effective insulation. The segmental pieces of the ring A are then arranged upon the band C; the holding of these pieces in place while assembling them is effected by applying a string or wire in a small peripheral groove A⁵ in the said segmental pieces. The collar B is then passed over the commutator, and the two collars B and B' are placed in their proper position on the outer surface of the ring A. The collar B is then drawn toward the collar B' by suitable means. A uniform inward pressure is thus exerted by the collar B upon the ring by reason of the abutting conical surfaces of the ring and the collar. The gap or gaps A' between the segments of the ring allow the same to contract under the influence of this pressure.

The drawing of the collar B toward the collar B' may conveniently be effected by means of strong temporary bolts passed through some or all of suitably spaced bolt holes in the two collars, and when the necessary pressure has been attained, the temporary bolts may be replaced one by one by bolts, such as E, for permanent use, which bolts are sunk into the collars and, when in place, have their heads slightly burred so as to prevent them from turning.

In the construction shown in Figs. 4 to 6, the stepped portion of the ring A is dispensed with, and the outer face A³ of the said ring is tapered or sloped in opposite 105

directions, thus making the ring wedge-shaped on its outer surface or periphery when viewed in cross section; both collars B and B' are of course in this case made conical upon their inner surface to correspond to the two conical portions of the face A³ on which they bear.

Several devices of the kind above described may of course be used if necessary on any one commutator or the like.

It will be understood that the degree of pressure exerted by the ring or rings and their collars is not limited by any consideration of temperature as is the case with shrinking rings, and that the pressure can at any time be adjusted, or the rings removed without damage to other parts.

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

1. The combination with a rotatable device comprising circularly arranged component parts, of a plurality of segmental pieces constituting a ring for encircling the device and having their lines of abutment inclined to the plane of the ring, and mechanical means for exerting a uniform inward pressure upon the said ring.

2. The combination with a rotatable device comprising circularly arranged component parts, of a plurality of tapered segmental pieces constituting a ring with a cylindrical inner surface and a conical outer surface, the lines of abutment of the segmental pieces being inclined to the plane of the ring, a collar surrounding the ring and having a corresponding conical inner surface, and means for causing axial movement of the collar upon the said ring.

3. The combination with a rotatable device comprising circularly arranged component parts, of a plurality of peripherally grooved segmental pieces constituting a

grooved ring for encircling the device, and mechanical means for exerting a uniform inward pressure upon the said ring.

4. The combination with a rotatable device comprising circularly arranged component parts, of a plurality of wedge shaped peripherally grooved segmental pieces, constituting a grooved ring with a cylindrical inner surface and a conical outer surface, a collar surrounding the ring and having a corresponding conical inner surface, and means for imparting axial movement of the collar upon the said ring.

5. The combination with a rotatable device comprising circularly arranged component parts, of a plurality of peripherally grooved segmental pieces constituting a grooved ring for encircling the device and having their lines of abutment inclined to the plane of the ring, and mechanical means for exerting a uniform inward pressure upon the said ring.

6. The combination with a rotatable device comprising circularly arranged component parts, of a plurality of peripherally grooved wedge-shaped segmental pieces constituting a ring with a cylindrical inner surface and an outer surface comprising two conical portions, the lines of abutment of the segmental pieces being inclined to the plane of the ring, two collars surrounding and bearing upon the ring, one collar on each of the aforesaid two conical portions, and bolts for drawing together the two collars.

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

ALFRED DAVID WILLIAMSON.

Witnesses:

WILLIAM GLOVER MANN,
ALFRED HOGG.