(No Model.)

J. A. DALZELL.

COMMUTATOR.

No. 416,720. Patented Dec. 10, 1889.

Fig. 1.

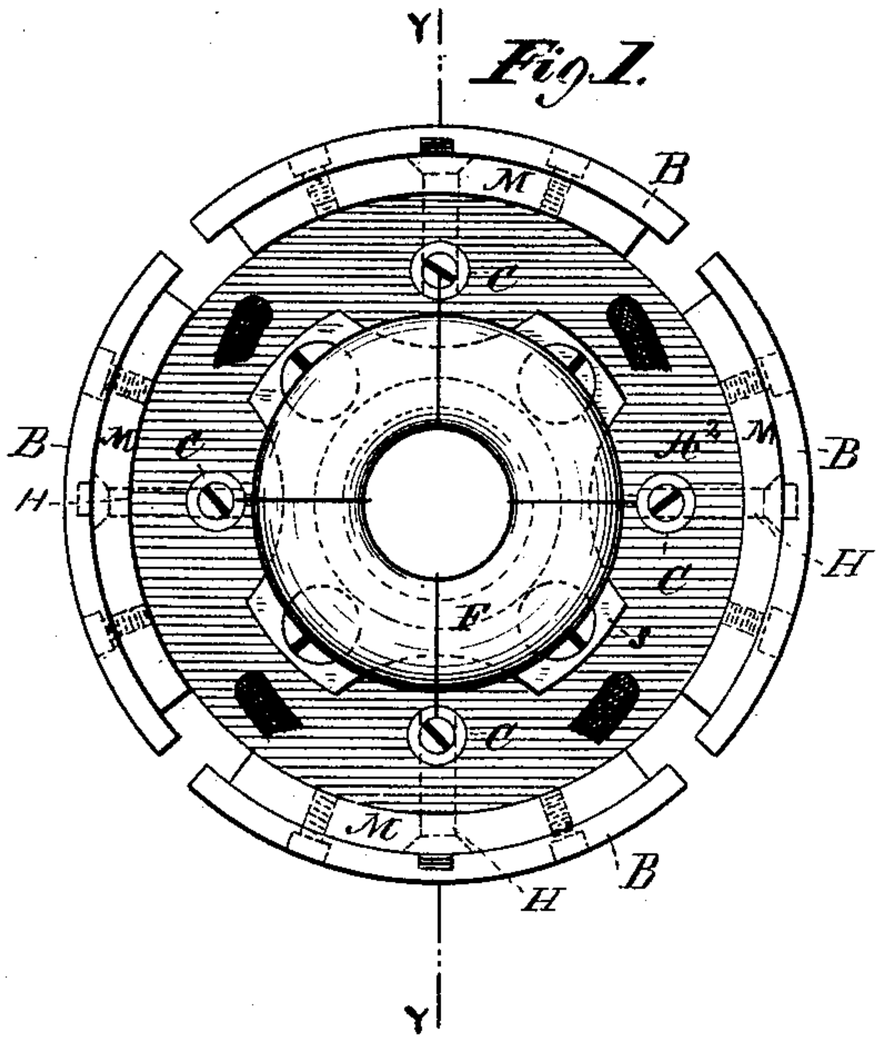


Fig. 2.

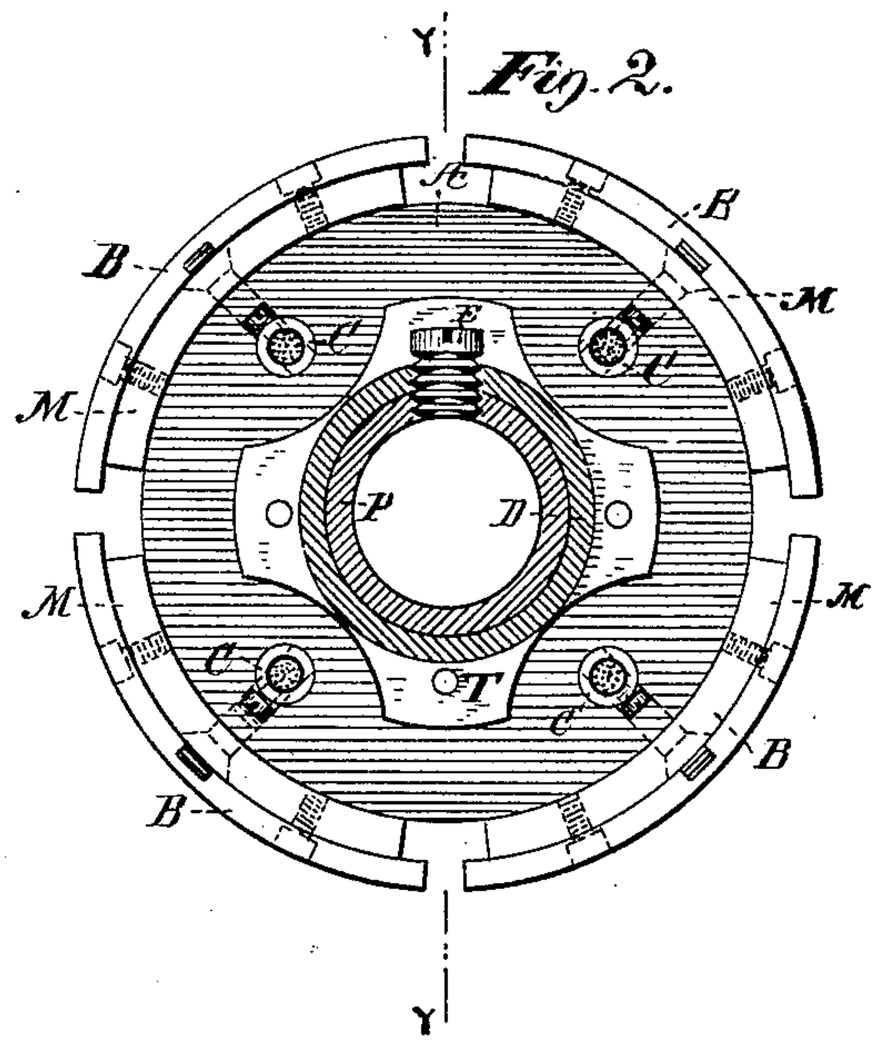


Fig. 3

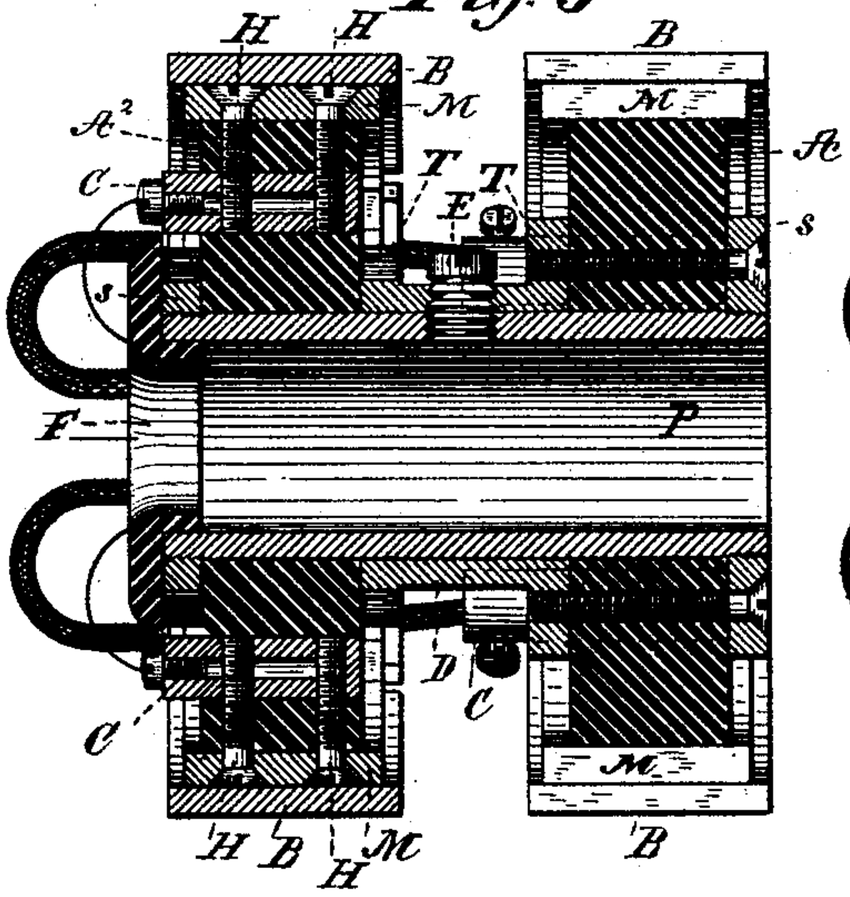
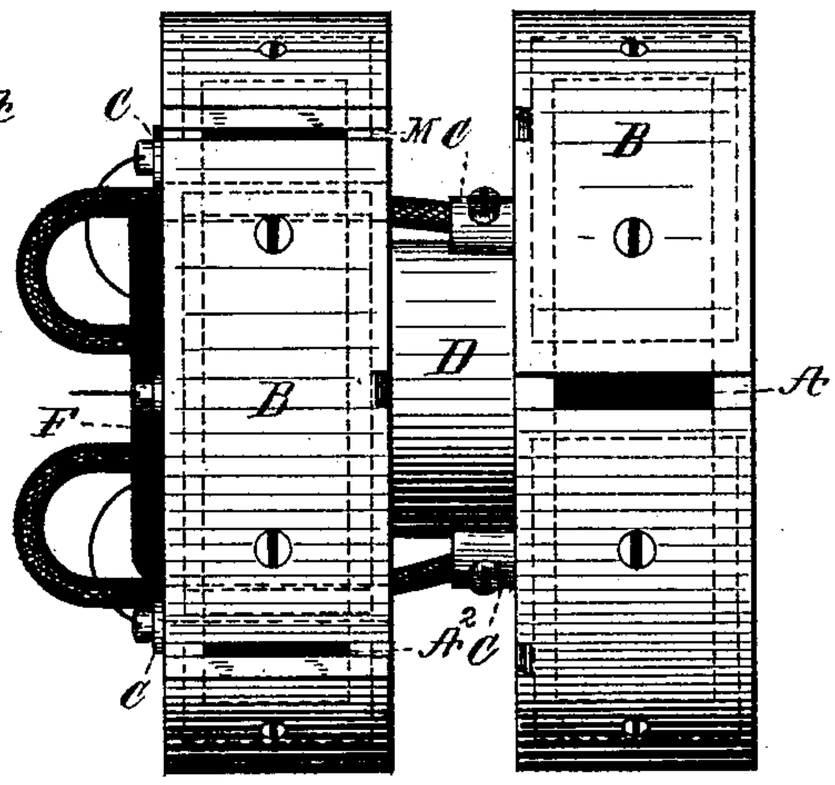


Fig. 4



WITNESSES:

Gabriel L. W. Galster.

Wm. H. Capel.

INVENTOR

J. A. Dalzell.

BY

F. C. Townsend

ATTORNEY

UNITED STATES PATENT OFFICE.

J. ALLAN DALZELL, OF HARTFORD, ASSIGNOR TO THE SCHUYLER ELECTRIC COMPANY, OF MIDDLETOWN, CONNECTICUT.

COMMUTATOR.

SPECIFICATION forming part of Letters Patent No. 416,720, dated December 10, 1889.

Application filed October 26, 1885. Renewed June 11, 1889. Serial No. 313,928. (No model.)

To all whom it may concern:

Be it known that I, J. ALLAN DALZELL, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Commutators, of which the following is a specification.

My invention relates to the construction of commutators designed more especially for use with electric generators or motors.

The invention has more especially to do with that class of commutators in which there is a revolving hub or cylinder carrying a series of conducting plates or segments. I have discovered by practical tests that an efficient, durable, and strong commutator may be obtained by the employment of a hub, disk, or cylinder of slate having the conducting-segments secured to its periphery. No difficulty is found to exist from any tendency of the disk to break under the centrifugal action of the commutator segments upon the periphery thereof, no matter how high the speed of revolution; but there results a commutator in which the highest degree of insulation is combined with great rigidity and strength.

My invention consists in certain novel combinations and details, that will be more specifically defined in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is an end elevation of the commutator. Fig. 2 is an elevation of the inner of the two commutator-cylinders that are united and made to revolve together, being designed more especially for employment with dynamo-machines in which there are two sets of coils upon the armature, each set connected to the segments of an independent cylinder or to independent sets of segments. Fig. 3 is a longitudinal central section through the two commutator-cylinders. Fig. 4 is a plan of the same.

A indicates a disk of slate for one commutator-cylinder, and A^2 another disk of substantially the same construction or having its commutator-segments secured in substantially the same way, but provided with perforations, through which the conductors from the armature-coils may be carried to the segments of the inner disk A after being brought out through the end of the hollow armature-shaft.

Each of the commutator-segments is made in two parts, indicated, respectively, at B M. The part B is the wearing-surface, and is adapted to be replaced. The part M is itself attached to the periphery of the disk. This attachment is made by means of screws H H, which pass radially into the body of the disk and into blocks or studs of metal C, that are let into the disk sidewise. I prefer to make the connection to the commutator-segments through these devices, and for this purpose provide the ends of the metallic blocks or segments C with clamping devices for the ends of the armature-conductors.

The segments B are secured to the base-plates M by means of screws indicated, or in other suitable manner, so as to adapt the segments for removal. It will be noticed that the base segments or pieces M are somewhat shorter than the wearing-surfaces B, thus leaving an enlarged opening at points beneath the slots between the wearing-surfaces M. The space thus provided constitutes a clearing-opening and avoids to great extent the danger of collection of foreign material at such points, and consequent false or accidental connections.

A sleeve or tube, preferably of metal and indicated at P, carries the two commutator-cylinders. A set-screw E is employed to attach the cylinder P to a suitable hollow shaft, through which the conductors pass outwardly, as indicated, at the end of the sleeve provided with the insulating-bushing F. The screw E serves also to fasten upon the tube B a collar provided with two flanges T T, located between the disks or plates of slate A A^2. At the exterior of each disk is a collar S, that is preferably made to screw upon the end of the tube P, and which furnishes a flange for holding the disk in place. Screws are employed to still further hold the parts firmly together. Said screws pass through the disk and into the two flanges or collars at each side thereof, as clearly shown in Fig. 3.

One of the cylinders, with its segments, serves for one of the sets of coils upon the

armature, the connections to said cylinder and segments being made by conductors carried outward through the shaft and clamped to the conducting studs or pin C. The connections for the second set are carried in the same way out through the end of the shaft, and from this point are bent around and brought through perforations in the slate disk A^2 to the disk A, where they are connected with the clamping devices on the ends of the studs or blocks C for that disk.

I do not limit myself to the form or number of the conducting-segments. The four-segment commutator shown is especially adapted for use with that class of machines in which there are two sets of coils, each set having four free ends connected severally to the commutator-segments, while the remaining ends of said set are connected in a common joint.

What I claim as my invention is—

1. As a new article of manufacture, a commutator consisting of a disk of slate secured between hubs or flanges of metal upon a shaft and provided with metallic segments or plates removably fastened to its outer periphery and in metallic connection with studs or pieces of metal secured in openings drilled in the material of the disk, as and for the purpose described.

2. In a commutator, the combination of the replaceable wearing segments or plates and the separate metallic under or base plates, of reduced length, so as to leave enlarged clearing-openings beneath the slots between the wearing-segments.

3. In a commutator, the combination of a non-conducting base, conducting plates or blocks secured thereto, connecting studs or posts inserted in the non-conducting base and held therein by conducting-screws that pass through the said plates or blocks, and replaceable wearing segments or surfaces secured to said blocks or plates.

4. In a cylindrical commutator, the combination, with the metal cylinder having the collars or flanges, of a disk of insulating material fitting said cylinder, and screws or bolts passing through the disk, as and for the purpose described.

5. The combination, with the slate disk or annulus carrying commutator plates or segments, of the metal cylinder P, having collar T, the collar S, and the fastening bolts or screws, as and for the purpose described.

6. The combination, in a commutator, with the two disks or non-conducting hubs, of the supporting-cylinder of metal provided with a collar having double flanges between the hubs, and the fastening screws or bolts passing laterally through the hubs, as and for the purpose described.

Signed at Hartford, in the county of Hartford and State of Connecticut, this 12th day of October, A. D. 1885.

J. ALLAN DALZELL.

Witnesses:
CHAS. E. DUSTIN,
W. H. NEWELL.