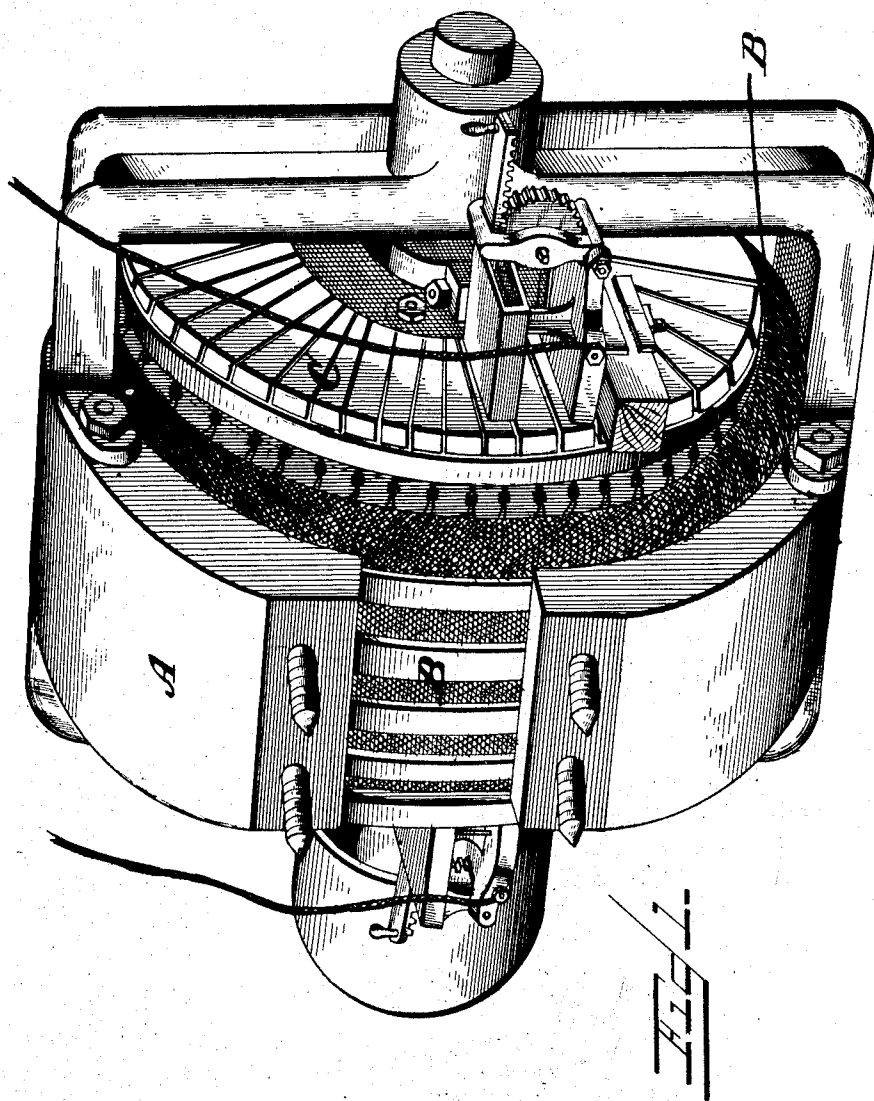


(No Model.)

2 Sheets—Sheet 1.

H. GROSWITH & R. ASHLEY.
COMMUTATOR FOR DYNAMOS AND ELECTRIC MOTORS.
No. 489,000. Patented Jan. 3, 1893.



WITNESSES:
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

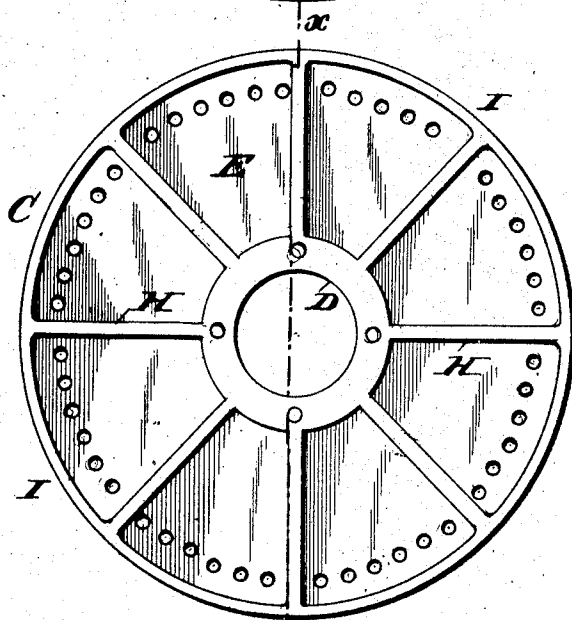
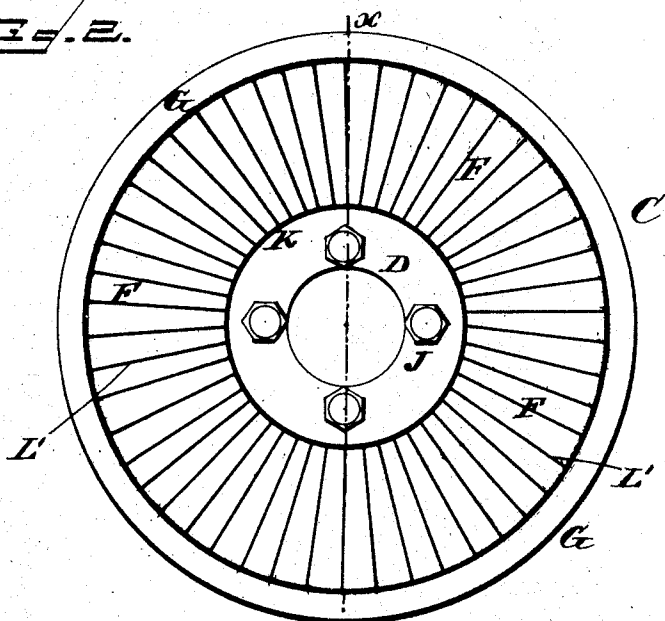
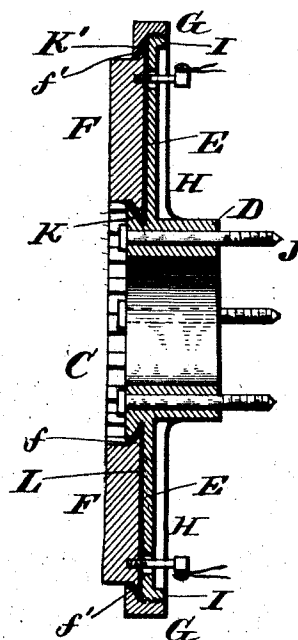


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY GROSWITH AND RALPH ASHLEY, OF PHILADELPHIA, PENNSYLVANIA,
ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE UNITED COLUMBIAN ELECTRIC COMPANY, OF NEW JERSEY.

COMMUTATOR FOR DYNAMOS AND ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 489,000, dated January 3, 1893.

Application filed February 18, 1892. Serial No. 421,929. (No model.)

To all whom it may concern:

Be it known that we, HENRY GROSWITH and RALPH ASHLEY, citizens of the United States, and residents of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Commutators for Dynamos and Electric Motors; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of the armature of an electric-motor equipped with our improved commutator; Fig. 2 is a front or face view of our improved disk commutator; Fig. 3 is a rear view of the same, showing the iron hub, frame, and its reinforcing-spokes or ribs; and Fig. 4 is a sectional view on the broken line marked $x-x$ in Figs. 2 and 3.

Like letters of reference denote corresponding parts in all the figures.

Our invention relates to commutators, for dynamos or electric motors, of the type known as "disk" commutators; that is to say, commutators in the nature of a flat circular disk affixed to the end (or ends) of the armature at right angles to the shaft thereof, so as to revolve in a vertical plane; the face of the disk comprising a series of metallic sectors separated from one another by insulating material and adapted to be placed in frictional contact with the brushes. In commutators of this type, it is desirable to so construct the sectors, which form the brush-contacts, that any one or all of them may be easily removed from their bearing or seat on the armature; that they shall present, at all times, a perfectly smooth and plane surface to the brushes, so as to avoid "sparking" and undue friction (involving both loss of power and undue waste of brush material); and so that the weight of the commutator (or commutators) shall be reduced to a minimum.

With these several objects in view, our invention consists in the improved construction and combination of parts of a disk commu-

tator as will be hereinafter more fully described and claimed.

Referring to the accompanying two sheets of drawings, the letter A designates an electric motor of any approved type, the armature B of which is provided with disk commutators, one of which is shown at C. This commutator comprises an iron hub D, cast in one piece with a flat circular disk E; a series of brass sectors or contact-plates F; and a steel clamping-ring G.

In order to give the proper strength and rigidity to the cast-iron disk E without making it too heavy, the flat back of this disk is cast with reinforcing-ribs or webs, H, extending radially from the hub D to the flanged rim I. The hub itself is bored through around its central aperture for the insertion of bolts or screws J, whereby it is firmly fastened to the adjacent end of the armature core (not shown).

The face of disk E is cut out around the hub so as to form an undercut or V-shaped annular recess, K, encircling the hub on its front side, and the flanged rim I is screw-threaded to receive an interiorly threaded steel ring or annulus G, the overlapping front side of which is also undercut to form a V-shaped recess K', corresponding to the undercut recess, K, around the hub.

The contact-plates F, of brass or other suitable metal, are in the nature of sectors, truncated at their inner ends where they abut against the undercut rim of the hub. Each of these plates has top and bottom projections, f' and f , of such size and shape that they will fit, respectively, into the V-shaped undercut recesses K' and K as shown in Fig. 4. A packing, L, of vulcanized fiber, rubber, or other suitable insulating material, is placed within the seat formed in the face of disk E in conjunction with ring G, for the two-fold purpose of securing complete insulation between the contact-plates and the hub, disk and ring, which, together, form the seat or bearings of said plates, and also provide a firm seat for the plates by the elasticity of the packing, which is compressed by the screwing home of the clamping-ring, G, whereby the plates are firmly clamped in their seat adjacent to one

another. Strips of this insulated packing are also placed between the contact plates F, as shown at L' in Fig. 2, for the purpose of separating and insulating said plates from one another. When the plates have all been properly inserted into their seat in the cast-iron disk and firmly fastened therein by placing in position over the rim, and screwing home, the clamping-ring G, the projecting faces of the plates which overlap both the ring and the hub are planed off and ground with emery so as to present a perfectly smooth and plane surface to the brushes, after which the commutator is ready to be bolted to the armature and have its sectors F connected electrically with the wires of the armature windings or bobbins.

This connection may be made in any of the various well-known ways; but we prefer to use an improved connection, which offers many advantages, but which—as it may be used advantageously with armatures and commutators of many different constructions, and is not confined or limited for use with our improved commutator—will form the subject of a separate application of even date herewith Serial No. 421,928.

It will be observed that we dispense entirely with the use of screws or other fastenings for attaching the commutator sectors to their backings, so that there are no projecting screw-heads, or countersinks, to mar the smoothness of the disk and cause "sparking;" and it will further be seen that by simply unscrewing the annulus or clamping-ring G and removing it from the disk, any one of the sectors may be removed or replaced at will without disturbing the rest. Owing to the interposition of the insulated packing L between the sectors or contact-plates F and the disk E and ring G, there is also a certain amount of elasticity which operates beneficially in conjunction with the pressure of the brushes against the smooth face of the commutator.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States:

1. A disk commutator comprising, in combination, a circular disk or backing-plate having an undercut hub and screw-threaded rim; a screw-threaded clamping-ring having an undercut projecting annulus; a series of sectors or contact-plates having projections fitting into the recesses formed by the undercut hub and undercut annulus; and insulating packing separating the sectors and their projections from their seat in the disk and from one another, substantially as and for the purpose set forth.

2. In disk commutators, the circular disk or backing-plate having an undercut projecting hub bored through around its central aperture to receive bolts for its attachment to the armature core, and provided with a screw-threaded flanged rim and radial reinforcing-ribs, substantially as and for the purpose set forth.

3. The combination, in disk commutators, with the backing-plate having a projecting hub undercut with a V-shaped groove or recess and a screw-threaded flanged rim, of the interiorly threaded clamping-ring having a projecting undercut annulus overlapping the circular rim of the disk and adapted to clamp the contact-plates or sectors against an insulated packing interposed between said sectors, the face of the backing-disk, and the undercut annulus, substantially as and for the purpose set forth.

4. In disk commutators, the sector-shaped contact-plates having V-shaped projections at top and bottom, in combination with the circular screw-threaded and undercut backing-disk and threaded annulus or clamping-ring; substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our own we have hereunto affixed our signatures in presence of two witnesses.

HENRY GROSWITH.
RALPH ASHLEY.

Witnesses:

THEO. H. MCCALLA,
C. W. KENNEDY.