(No Model.)

E. THOMSON.

COMMUTATOR FOR DYNAMO ELECTRIC MACHINES AND MOTORS.

No. 467,318. Patented Jan. 19, 1892.

FIG. 1.

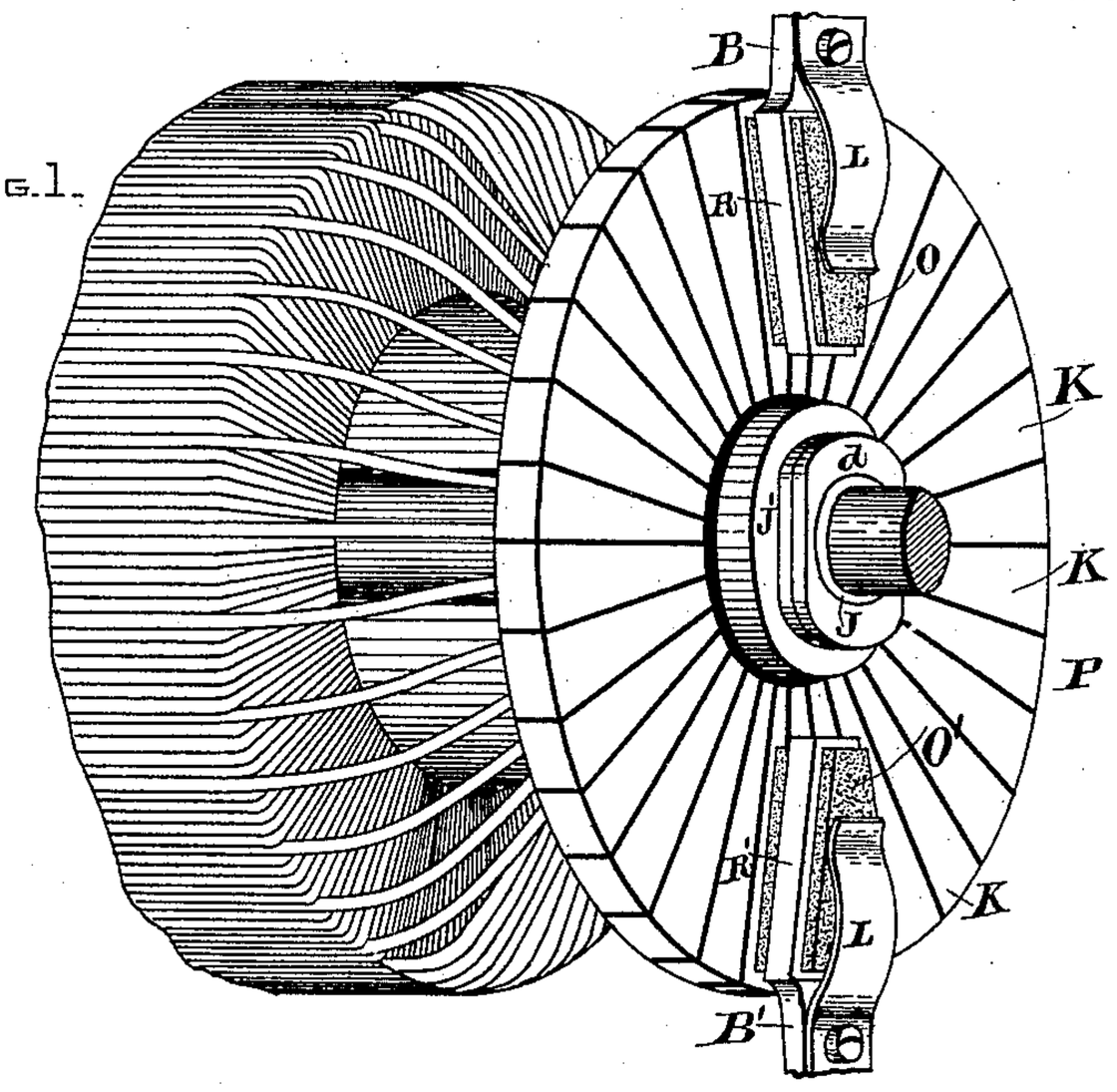


FIG. 3.

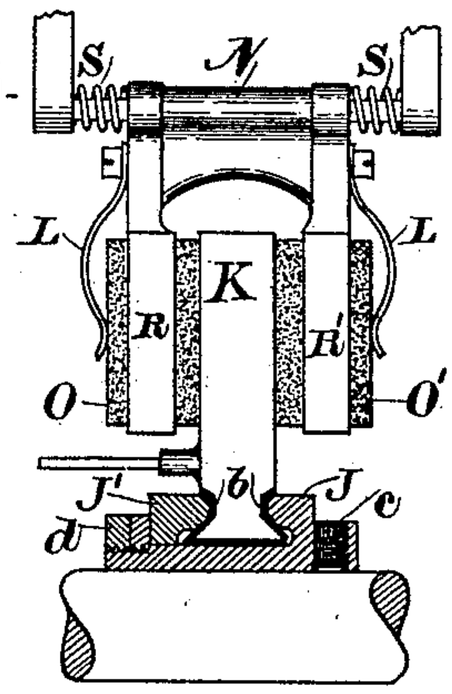


FIG. 2.

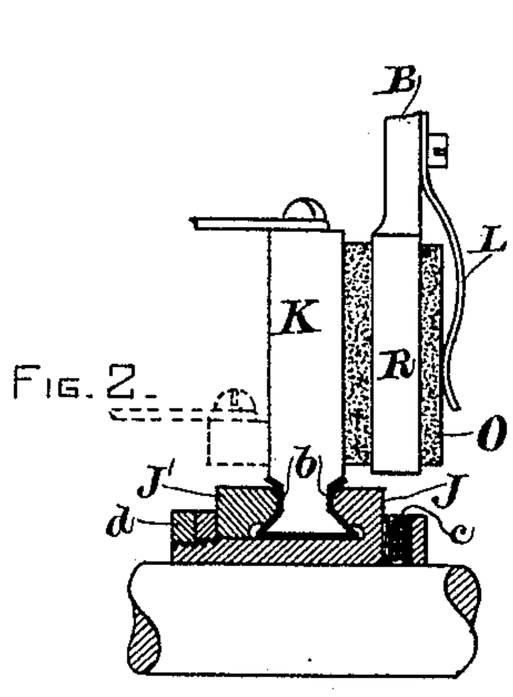


FIG. 5.

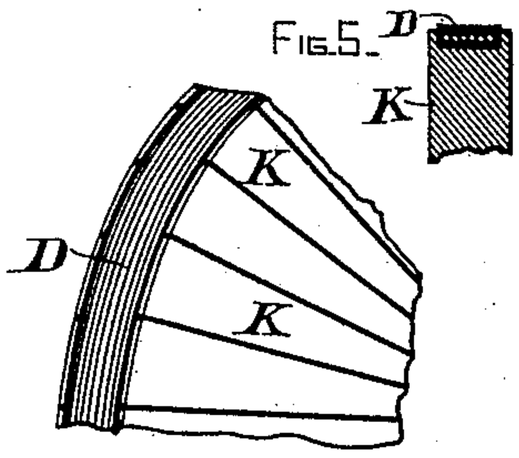
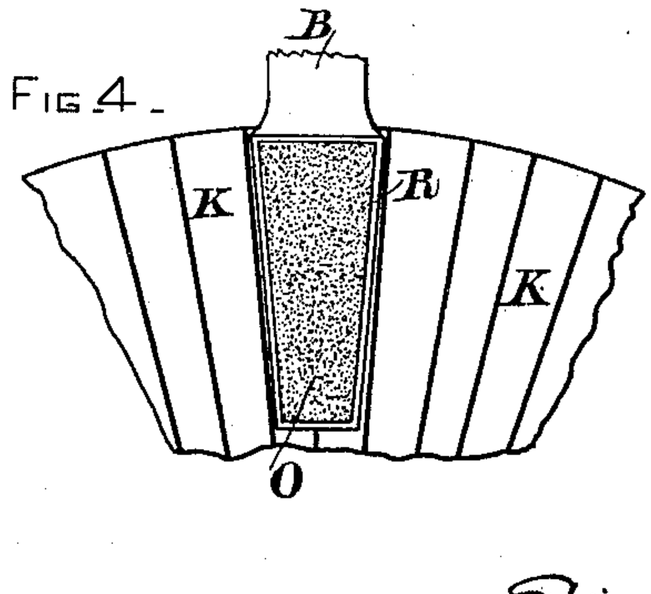


FIG. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS.

COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES AND MOTORS.

SPECIFICATION forming part of Letters Patent No. 467,318, dated January 19, 1892.

Application filed January 31, 1891. Serial No. 379,846. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Commutators for Dynamo-Electric Machines and Motors, of which the following is a specification.

My present invention relates to an improved commutator for dynamo-electric machines or motors which is of the disk variety, the brushes bearing upon the sides of the disk, and it covers improvements also in the allied features of construction, including armature connections, brushes, brush-holders, means for securing the commutator to the armature-shaft, &c., all aiming to secure a practicable disk-commutator, which, though not broadly new in itself, has not been perfected in matters of detail so as to bring it into successful use.

Referring to the accompanying drawings, Figure 1 is a perspective view of the commutator as attached to an armature-shaft. Figs. 2 and 3 are transverse sectional views through a portion of the commutator, showing different brush mechanisms. Fig. 4 is a detail side view showing particularly the commutator-brush and holder; and Fig. 5 illustrates the wrapping employed to help bind the sections of the commutator together.

The commutator P, referred to for the moment as a whole, has the form of a flat disk having plane contact-surfaces for the brushes on its opposite sides, and its transverse length is very considerably less than that of the ordinary cylindrical commutator, so that it takes up a proportionally less space on the armature-shaft, a matter which in certain kinds of installations not affording room for a lengthened shaft—as, for instance, railway-motors—is of considerable practical importance. Another advantage of this form of commutator lies in the fact that the inequality of expansion and contraction between the commutator-segments and tapered rings employed to secure the commutator to the armature-shaft is much less than heretofore, owing to the different dimensions of the commutator, and hence the segments will not readily work loose or impair the insulation.

The commutator is built up of sector-shaped sections K, fitted together with intervening insulation, and at their inner ends the sections are notched or recessed at *b* to receive clamping rings or sleeves J J′, which both hold the sections in place and furnish means for securing the disk to the armature-shaft, as by a set-screw *c*. The ring or follower J′ is secured by a nut or nuts *d*. Sometimes a wire tape or other like wrapping D, Fig. 5, is employed, which assists in binding the commutator together and resists the tendency to fly apart, due to centrifugal action. This wrapping is placed around the ends of the sections, so that the sides are left clear for the brushes. It is of course insulated from the metal of the commutator, as shown by the black lines, and will ordinarily be let into a groove in the disk, making its outer face substantially flush.

The brushes employed are preferably blocks of carbon or other partial conducting material. Each is supported in a holder B or B′, extending down beside the disk and is pressed tangentially against the disk by proper following-springs. These carbon blocks are made of as long range as possible, so as to compensate for wear, and are preferably tapered or wedge-shaped to correspond with the contact-surface of the individual commutator-sections, the width of the brushes being greater near the periphery of the disk than at its center. In Fig. 1 two brushes O O′ are shown, which bear upon the face of the disk away from the armatures, but the preferable arrangement is that of Fig. 3, where two sets or pairs of brushes will be employed, one pair O O only being shown. The brushes of each pair bear upon opposite faces of the disk and are mounted in a common holder N, which is acted upon by springs S S, tending to equalize the pressure of the brushes on the disk, this action being assisted by springs L L, attached to the holder, and bearing upon the brushes so as to press them inwardly through the frames R R′, which embrace them. This arrangement gives a large bearing-surface for conducting the current and at the same time uses up only a short length of armature-shaft.

The armature-wires are attached to the segments by screws or soldering at a point near their inner ends, as seen in Fig. 3, or in dotted lines, Fig. 2, so as not to interfere with the brushes. If the latter are arranged only

on one side of the disk the wires may, if desired, be connected to the ends of the segments, as in full lines, Fig. 2.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a disk commutator having sector-shaped contact-surfaces on the side of the disk, with a tapered or wedge-shaped brush engaging said surfaces, as described.

2. The combination of the disk commutator composed of sector-shaped insulated sections fitted and secured together, with brushes bearing on opposite sides of the disk, and oppositely-acting springs connected directly or indirectly with both brushes and thereby equalizing the pressure of the said brushes against the sides of the disk, as set forth.

3. The combination of a disk commutator with a pair of brushes bearing respectively on opposite sides of the disk, a holder with which both brushes are connected, and springs acting on said holder to equalize the pressure of the brushes, as set forth.

4. A disk consisting of sector-shaped sections fitted and secured together and an insulated wire, tape, or other like wrapping around the periphery of the disk binding the sections together.

5. A disk commutator consisting of sector-shaped sections fitted and secured together and a wrapping arranged in a recess around the periphery of the disk and insulated from the segments, as described.

In testimony whereof I have hereto set my hand this 23d day of January, 1891.

ELIHU THOMSON.

Witnesses:
JOHN W. GIBBONEY,
EDWARD M. BENTLEY.