

(No Model.)

W. HOCHHAUSEN.

COMMUTATOR FOR DYNAMO ELECTRIC MACHINES.

No. 261,712.

Patented July 25, 1882.

Fig. 1.

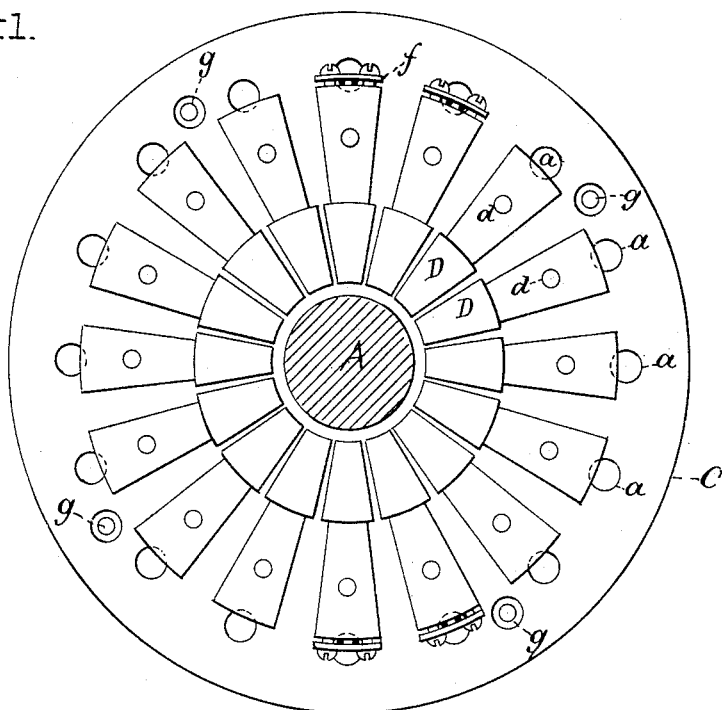
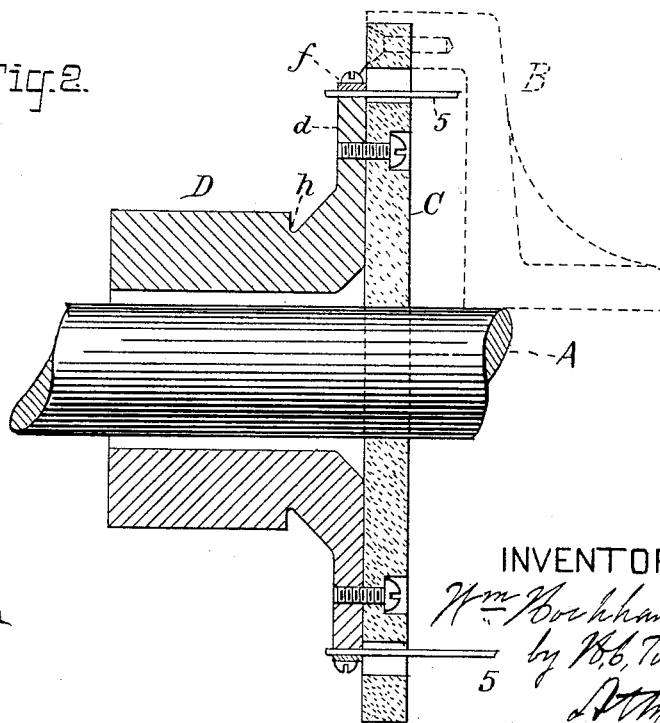


Fig. 2.



ATTEST:

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COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES.

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Application filed March 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, WM. HOCHHAUSEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Commutators for Dynamo-Electric Machines and Electric Motors, of which the following is a specification.

In commutators as ordinarily constructed it frequently happens that a cross-connection is formed between adjoining plates thereof, either from the presence of minute particles of conducting material in the non-conducting substance used for separating the plates or from the formation upon the surface of the non-conductor of a metallic film caused by wear of the commutator-brushes, or from the lodgment of particles of conducting material in the angles of the commutator. It also sometimes happens in those constructions of commutator in which the commutator-plates are held between two disks of hard rubber backed by disks of metal that a cross-connection is formed in the metallic disk at the points where the wires from the armature pass through it.

The object of my invention is to make a commutator that shall be free from the above difficulties, readily kept clean, and of simple, strong, and durable construction.

The object of my invention is also to do away with the backing of metal heretofore employed with those commutators in which disks of hard rubber or equivalent materials are used for holding the commutator-plates, which disk has heretofore been found necessary by reason of the tendency of the rubber to soften and warp or become displaced under the effects of heat.

To these ends I construct the commutator of a series of plates so constructed that their outer surface forms a cylindrical surface for the brushes, separated from one another and from the shaft of the machine by free air-spaces, and separately and directly attached to a disk of stone suitably connected to the shaft of the machine. I prefer in so constructing the commutator to attach the commutator-plates at one end only, leaving the other end free to facilitate cleaning and the brushing of dirt from the spaces between the plates. I also make use of a novel form of commutator-plate and of pe-

culiar devices for connecting the wires leading from the armature to the separate plates.

The nature of my invention will be readily understood from the accompanying drawings and description, and the features constituting the invention will be specified in the claims.

Figure 1 is an end view of the commutator. Fig. 2 is a longitudinal central section of the same on the line of the armature-shaft.

A represents the armature-shaft, and B one of the spider frames or arms to which the armature is secured. The arm B—four of which are here supposed to be employed—is shown as provided with a rectangular projection suitably recessed, into which projection passes a screw by which the disk C is held in place. The points at which the holding-screws pass through the disk C are indicated at *g*, Fig. 1. The disk is of stone. I have found slate-stone to answer exceedingly well, but other kinds may be employed, and directly to its face are secured the separate commutator-plates D. Each plate D is separated entirely from its neighbors and from the shaft of the machine, so that no opportunity is given for the lodgment of material that would tend to form a cross-connection. The plates D are here shown as angle-pieces, preferably cast in a single piece, and consisting of a longitudinal portion, D, curved upon the arc of the circle which is the outline of the commutator-cylinder, so as to form an even bearing-surface for the commutator-brushes, and of a rectangular portion, *d*, which is seated against the face of the disk C and forms a good bearing, and whose outer end constitutes a clamping-seat for the conductors from the armature. One of the armature-conductors is represented at *5*, while *f* is a plate between which and the end of the portion *d* the wires are clamped by means of screws, as shown. The inner ends of the angular portions *d* to the point *h* are somewhat narrower than the longitudinal portion D, as indicated. This facilitates brushing away any dirt that may have lodged on the disk C between the plates. The operation of brushing or cleaning the commutator is also facilitated by reason of the fact that the plates are free at the outer end of the commutator. The separate plates are preferably secured to the face of the disk by screws

passing from the rear through holes drilled in the body of said disk. Holes are drilled at *a*, &c., for the passage of the conductors leading from the armature.

5 My invention admits of many modifications in the devices employed for securing the commutator-plates to the stone disk, and many will readily occur to those skilled in the art. As the method of so attaching the plates may
10 be varied in many ways without departing from the spirit of the invention, I do not deem it necessary to describe any others. The stone disk C may also be connected to the armature-frame or to the revolving armature-shaft in
15 other ways. As the disk C is of stone, it can be attached directly to the metallic frame to which the armature is bolted or to any other metallic portion of the machine.

It is obvious that the plates may be attached
20 to the disk from the front in such a way that either plate can be removed without disturbing the others or removing the plate C.

Although the plates D are supported at one end only, so that the plate C is subjected to
25 considerable strain, they are nevertheless held immovably and permanently in place, owing to the rigid nature of the material and its insensibility to effects of heat communicated to it from any heated portion of the machine.
30 This would not be the case if hard rubber or such like material ordinarily employed were used, as I have found by actual experiment that the heat of the machine and the strain of the commutator-plates are sufficient to cause the
35 center of a disk of this material to bulge and cause the plates to be displaced. It would of course be possible to support the plates D at both ends; but for the sake of simplicity, cheapness, and facility of cleaning I prefer to
40 attach them at one end only.

What I claim as my invention is—

1. A commutator for a dynamo-electric ma-

chine or electric motor, constructed of a supporting plate or disk of stone, to the face of which are directly secured the commutator
45 plates or segments.

2. As a new article of manufacture, a commutator for a dynamo-electric machine or electric motor, constructed substantially in the manner described, of a disk of stone, E, and
50 commutator-plates D *d*, the angular portions *d* of which rest against the face of the disk with an extended bearing-surface and are secured directly thereto.

3. The combination of the spider-arms, the
55 insulating-disk of stone secured directly to said spider-arms, and the commutator-plates attached directly to the face of the disk.

4. The combination, substantially as shown and described, of the commutator angle-plates
60 D *d*, the clamping-seats formed upon the upper end of the portions *d*, clamping-plates *f*, a disk of stone supporting the commutator-plates, and conductors from the armature passing through perforations in the disk C.
65

5. The combination, substantially as described, of a supporting-disk of stone, the angle-plate D *d*, cast in one piece, the conductor-wire from the armature resting upon the end
70 of said plate, and clamping-plate *f*.

6. The combination, substantially as described, with a supporting-disk of stone, of commutator-plates, each consisting of a longitudinal portion forming a bearing for the commutator-brush, and a portion extending at right
75 angles from the first-named portion, with an extended flattened bearing-surface, as shown, and seated against the supporting-disk, and means, as described, for holding the latter portion against the disk.

WILLIAM HOCHHAUSEN.

Witnesses:

H. C. TOWNSEND,
THOS. TOOMEY.