

(No Model.)

B. F. ORTON.

COMMUTATOR FOR DYNAMO ELECTRIC MACHINES.

No. 323,361.

Patented July 28, 1885.

Fig. 1.

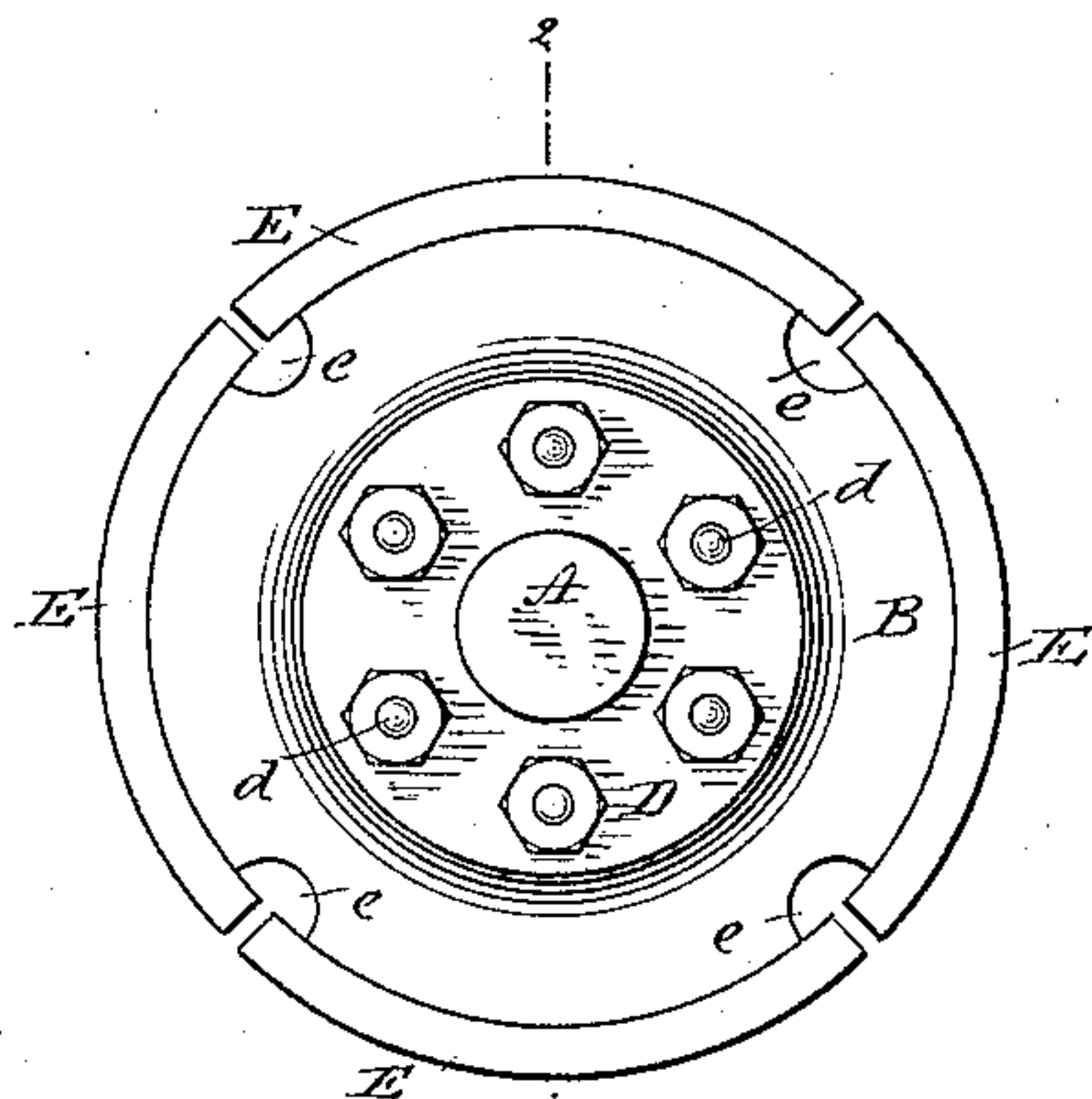


Fig. 2.

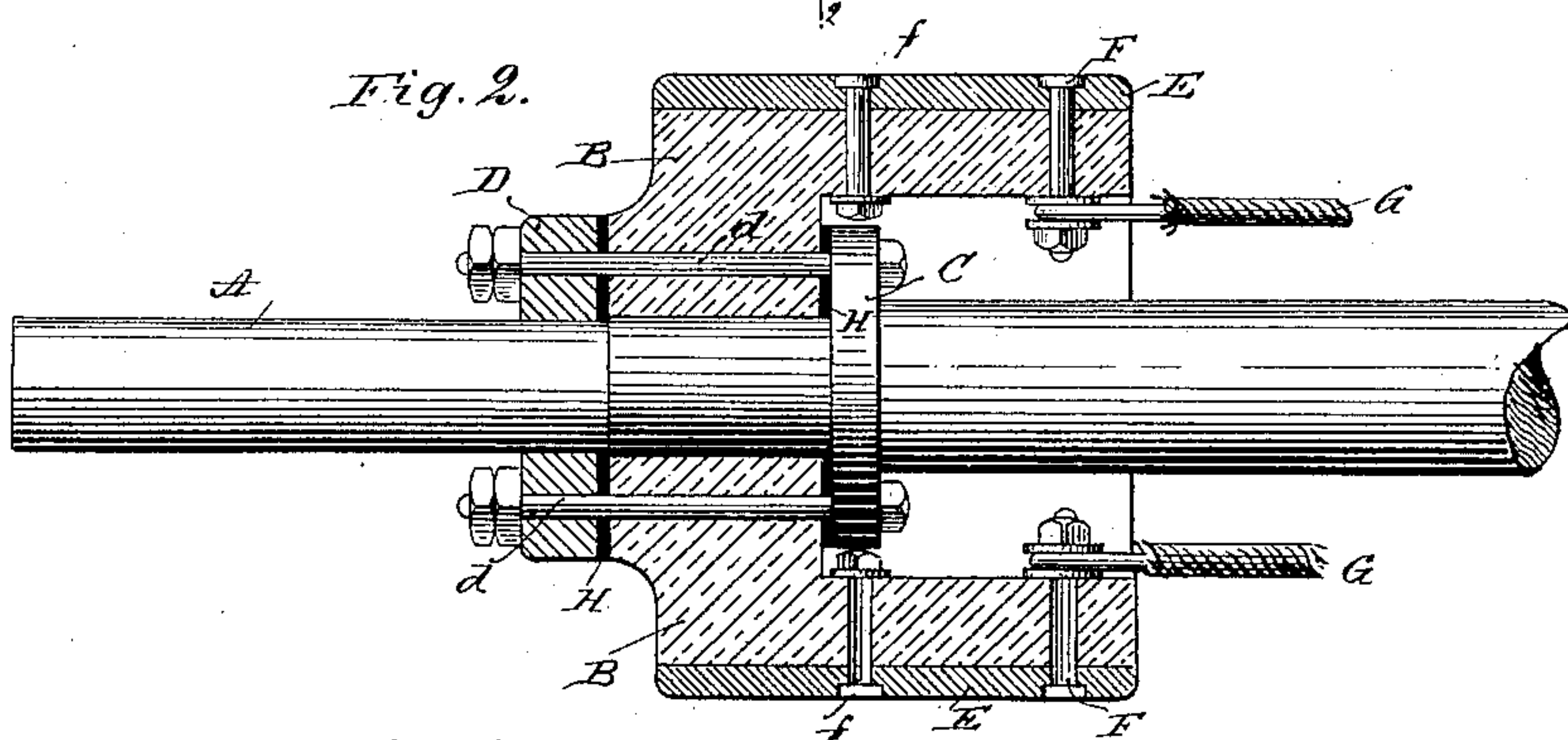


Fig. 3.

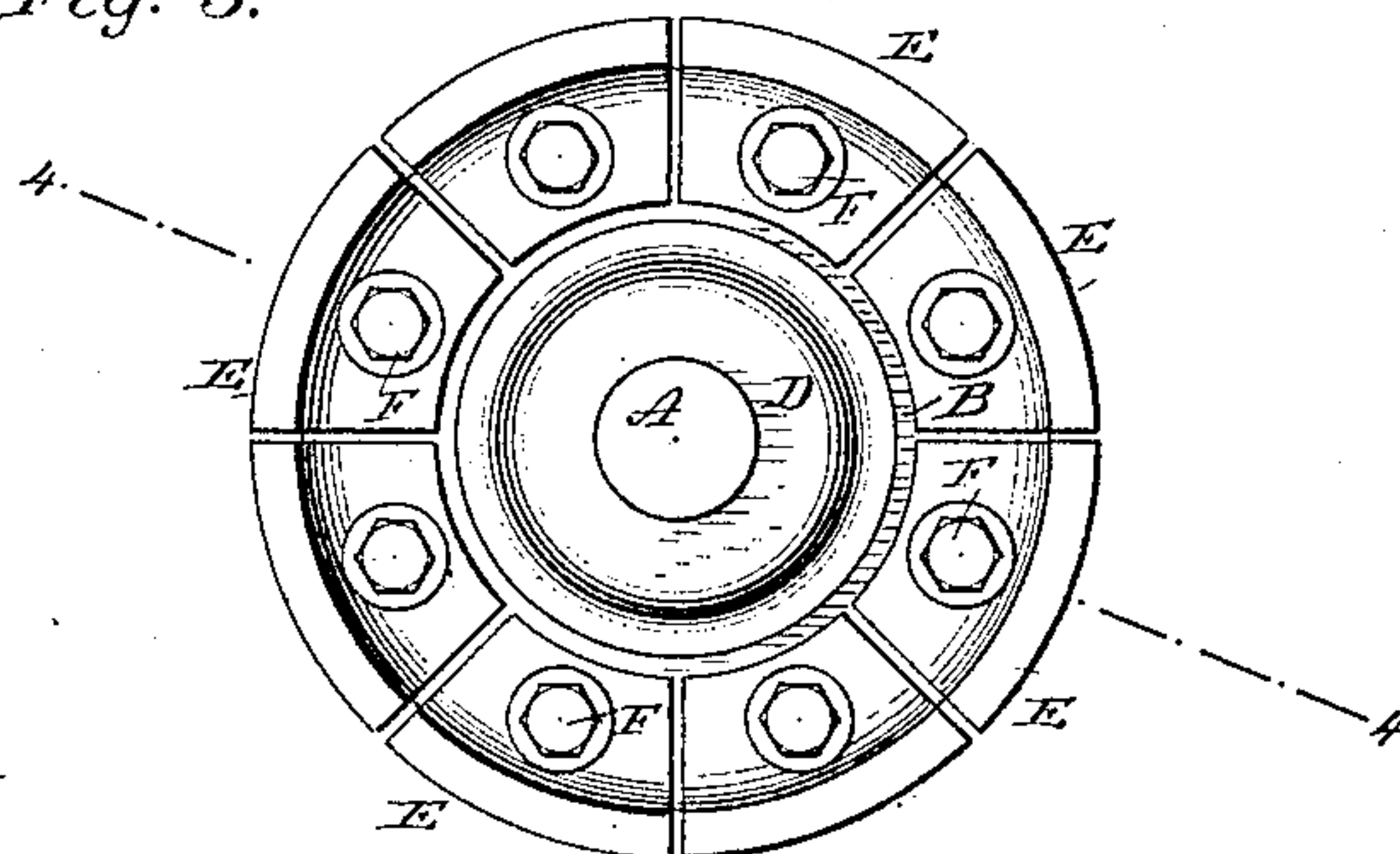
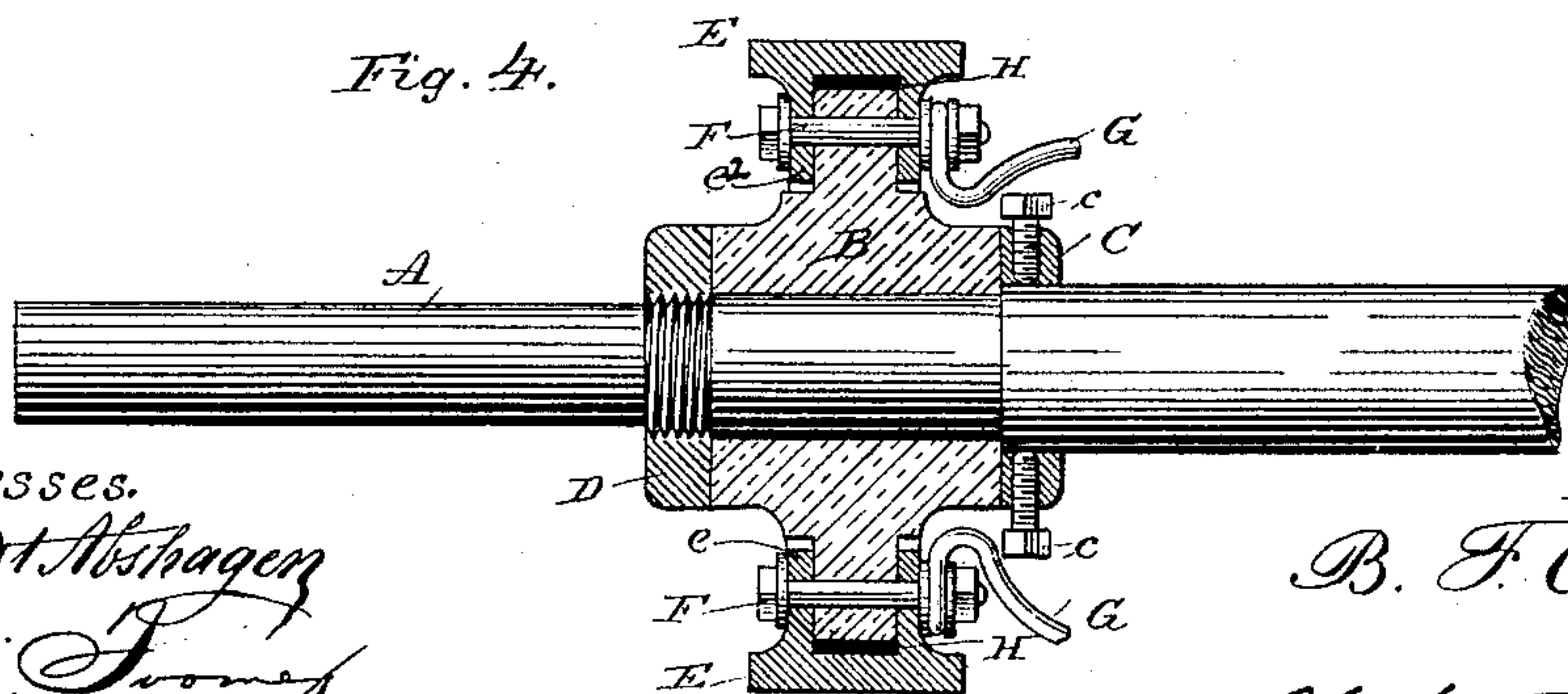


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

BENJAMIN F. ORTON, OF EAST SAGINAW, MICHIGAN.

COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 323,361, dated July 28, 1885.

Application filed May 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. ORTON, a citizen of the United States, and a resident of East Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Commutators for Electric Apparatus, of which the following is a specification.

My invention relates to the construction of commutators for dynamo-electric machines, motors, and other electric apparatus, and its object is to simplify the construction, cheapen the cost, and improve the efficiency of such devices.

My invention consists in a commutator constructed of a hub of glass or other suitable insulating material, having a lateral extension or flange and commutator plates or segments secured to the outer surface of the support thus formed by bolts or other mechanical devices passing preferably through the flange, and having at their inner ends binding, clamping, or other connecting device for the attachment of wires or conductors to be electrically connected with the commutator plates or segments.

My invention consists, also, in certain peculiarities of construction and combinations of parts that will be hereinafter more fully described, and will be specifically stated in the claims.

Hitherto in the art it has been usual to employ as insulating material for the support or attachment of commutator-segments hard rubber, vulcanite, wood, or such like materials. It is found in practice that these materials are one or more liable to the objection of softening, charring, or warping by heat, or of shrinking. Besides, they have been hitherto usually made into the desired forms by working them by suitable tools.

To overcome the first stated objections it has been proposed to make the support for the commutator plates or segments from slate or other stone; but such materials, while being excellent for the purpose, are not easily worked into the desired forms.

To overcome the above objections and to cheapen and facilitate the construction, as well as to obtain a support having in high degree the qualities of rigidity, strength, and good insulation, I propose to make the support for

the commutator segments or plates from glass, cement, or similar insulating material that can be cast or molded into the desired shape, and that is, at the same time, a good insulator, and to attach or support the commutator plates or segments to the material of the support, instead of to the anchoring-plates cast in the material of the support, by bolts, screws, or such like devices ordinarily employed in the art for such purpose, said screws or bolts passing into or through openings in the insulating material of the support.

In the accompanying drawings, Figure 1 is an end view of a commutator embodying my invention. Fig. 2 is a longitudinal cross-section on the line 2 2, Fig. 1, in a direction parallel to the shaft upon which the commutator is mounted. Fig. 3 is an end view of a modified form of commutator containing my invention. Fig. 4 is a longitudinal section of the commutator shown in Fig. 3, on the line 4 4, parallel to the shaft on which the commutator is mounted.

A indicates the shaft of a dynamo-electric machine or other device with which the commutator revolves or upon which it is mounted, while B indicates a support for the commutator plates or segments E. The support B is formed as shown with a lateral extension or flange as indicated in Fig. 2, beneath which the wires G pass for attachment to the devices whereby electrical connection with the segments is formed. Such devices are here shown as consisting of bolts or pins F, passing through the segment and the material of the support, and furnished beneath the flange with binding-nuts, washers, &c., or other suitable electrical binding or clamping device by which the wires G may be secured to or otherwise kept in electrical connection with the bolt or pin. The bolt or pin is here shown as assisting to clamp the commutator-segment in place. It is not necessary, however, that it should act in this way, as it is only necessary that it should be at one end in electrical connection with the segment, and that its other end should extend through the flange so that the wire or conductor G may be electrically connected to it. The bolts *f* are bolts whereby the segments are held in place. If the pins F be made to act as bolts, however, it is obvious that the bolts *f* might be dispensed with.

The support B is preferably made from glass, from which it may be readily molded or cast into the desired shape. Bolt-holes for the attachment of the commutator-segments may be formed at the same time or may be afterward drilled.

The support might be made of any other vitreous material or cement or other insulating material that can be molded and possesses considerable rigidity and strength.

In this kind of support I obtain strength, cheapness, and efficiency in higher degree than has heretofore been attained in this class of devices.

The support B consists preferably of a hub or disk resting directly upon the shaft A and held in place between a flange, C, upon the shaft and a washer or plate, D, of suitable material, by means of bolts *d*. A cushion, of soft rubber or other suitable material, (indicated at H,) may be interposed between the hub and the flange and plate to permit any slight expansion of the support by heat to take place readily.

In constructing the insulating support in practice I generally prefer to form it with small recesses or depressions across the surface upon which the conducting segments or plates of the commutator rest, and at points coinciding with the slots or openings between said segments. Such recesses or depressions are indicated at *e*, Fig. 1. They serve to prevent the lodgment of dirt or conducting material at the bottom of the slots between the segments and in contact with such segments, thus preventing the formation of short circuits between the segments.

In the modification of my invention shown in Figs. 3 and 4, the hub or support B is narrowed at its rim, but in a radial direction, instead of in a direction parallel to the shaft, as in Figs. 1 and 2. The commutator-plates are provided with ears *e*² on one or both sides, coming down on one or both sides of the rim. Bolts F pass transversely through the narrowed portion of the support, but parallel to the shaft, instead of radially, as in Figs. 1 and 2, and hold the segments in place by passing through the ears or extensions *e*². In other respects the construction is substantially the same as in Figs. 1 and 2. The flange C is, however, fastened by a screw, *c*, to the shaft, and the washer or plate D is in the form of a nut screwing upon the shaft. These are, however, differences in mechanical details not affecting the character of the invention.

The portions of the segments E in Figs. 1

and 2, through which the connecting pins or bolts pass, may or may not be a wearing-surface, as may be deemed desirable. I ordinarily prefer to make them a wearing-surface, but if they be not, it is obvious that the width of the conducting-segments at such points become immaterial and need be only sufficient to form a good bearing for the head of the bolt, or good electrical connection with such other connecting device as the constructor may desire to use.

What I claim as my invention is—

1. In a commutator, a supporting hub or block of insulating material for the commutator-segments, mounted on a shaft and having a lateral extension or flange parallel to said shaft, as and for the purpose described.

2. The combination, with the flanged insulating cylindrical support, of commutator plates or segments secured to the outer surface thereof, and wires or conductors, as G, carried to the inside of the flange and electrically united by suitable devices with the segments.

3. The combination, with the insulating hub or support, of the lateral flange or extension, bolts or pins extending through the commutator-segment and the flange to the inner side of the latter, and a wire or conductor attached to the inner end of the pin or bolt.

4. The combination, with the insulating support for the commutator-segments, of a lateral extension or flange, and connections from the segments extending through said flange to the under side thereof for attachment of the wire or conductor to be electrically connected with the commutator.

5. A commutator-support formed in a single piece and having recesses or depressions at points beneath the openings between its conducting segments or plates.

6. The cylindrical hub B, of insulating material, having the recesses or depressions, as *e*, for the purpose described.

7. A commutator-support of insulating material having depressions or recesses formed in the surface upon which the commutator plates or segments rest, and at portions thereof coinciding with the slots or openings between the segments.

Signed at New York, in the county of New York and State of New York, this 8th day of May, A. D. 1884.

BENJAMIN F. ORTON.

Witnesses:

THOS. TOOMEY,
GEO. C. COFFIN.