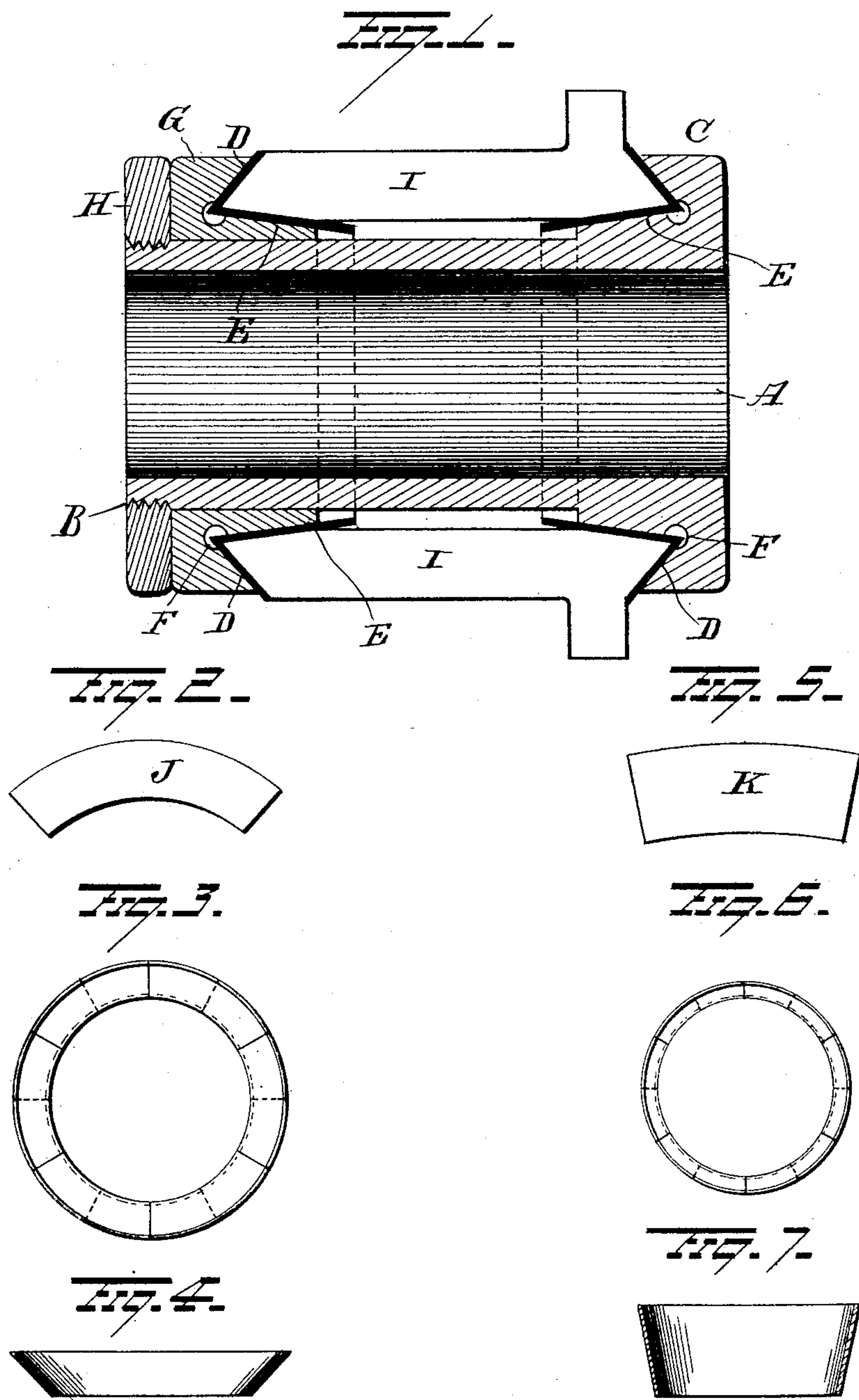


(No Model.)

S. H. SHORT.  
COMMUTATOR.

No. 462,880.

Patented Nov. 10, 1891.



Witnesses

E. J. Nottingham  
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Inventor

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# UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO.

## COMMUTATOR.

SPECIFICATION forming part of Letters Patent No. 462,880, dated November 10, 1891.

Application filed May 26, 1891. Serial No. 394,162. (No model.)

*To all whom it may concern:*

Be it known that I, SIDNEY H. SHORT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Commutators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in commutators; and it consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure I is a view in longitudinal section of a commutator constructed in accordance with my invention. Fig. II is a plan view of one of the insulating-blanks from which is formed the insulating-washer, of which Fig. III is a plan view and Fig. IV is a view in vertical section. Fig. V is a plan view of a blank from which is formed another insulating-washer, of which Fig. VI is a plan view and Fig. VII a view in vertical section.

A represents the body of the commutator, which consists of a tubular sleeve, one end of which is screw-threaded at B, while its opposite end is formed with an annular flange C. The inner face of the annular flange is constructed with the sharply-beveled surface D and the slightly-beveled surface E, which converge, as shown, and meet and merge into the annular circular recess F, which latter extends entirely around the commutator-sleeve. On the opposite end of the sleeve is placed the ring G, which is provided with beveled faces D and E and annular circular recesses F, which correspond in form and dimensions to those on the annular flange C. The collar G is placed upon the commutator-sleeve and is secured in place and has lateral movement imparted thereto by the screw-ring H.

I represents the commutator-bars, any number of which may be employed, and which are independently secured and insulated from each other in a manner hereinafter described. The opposite ends of each one of the commutator-bars I are provided with beveled faces, which correspond to the beveled faces or sur-

faces D E, formed on the annular flange and adjustable ring of the commutator.

In Fig. II the blank J is formed of mica or other suitable insulating material, and a number of these blanks are assembled and made to overlap each other and are then cemented together by any suitable material, so as to form a dish-shaped insulating-washer of the form shown in Figs. III and IV, and washers of such form are placed between the sharply-beveled ends of the commutator-bars and the sharply-beveled surfaces D D of the commutator. K represents another form of blank, which is cut from mica or other suitable insulating material and is represented in Fig. V, and a number of these blanks are assembled together, their ends made to overlap, and which are cemented or fastened together so as to form a dish-shaped washer, as represented in Figs. VI and VII, and washers of this kind are placed between the slightly-beveled surfaces formed on the opposite ends of the commutator-bars I and the slightly-beveled surfaces E E on the opposite ends of the commutator-bar.

It will thus be observed that when the commutator-bars are arranged in the position illustrated in Fig. I their opposite ends are thoroughly insulated from the body of the commutator and also from each other by means of the insulating-washers interposed between the beveled ends of the commutator-bars and the beveled converging surfaces or seats formed on the opposite ends of the commutator. Lateral motion being imparted to the ring G by screwing the ring H on the sleeve of the commutator serves to force the beveled or wedge-shaped ends of the commutator-bars snugly in contact with the insulating-washers, and such wedge-shaped seats or faces operate firmly to secure the commutator-bars against any lateral displacement. The annular circular recess F receives the meeting and outer edges of the two washers J and K, allowing them to be forced therein by the commutator-bars, and hence rendering it impossible for the latter to puncture or rupture such washers and thus insuring a thorough insulation of the commutator-bars from the commutator-sleeve.

It is evident that slight changes in the form



and construction of parts might be resorted to without departing from my invention—as, for instance, instead of forming the annular flange C integral with the sleeve of the commutator it might be independent thereof and secured in place by a screw-ring H, as is the case with the flange G, and other similar changes might be made. Hence I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a commutator, the combination, with a sleeve having an annular flange formed on one end thereof and integral therewith and an adjustable flange encircling said sleeve, both of said flanges being constructed with

inwardly-converging inclined or beveled faces of different angles of inclination, of commutator-bars having beveled ends conforming to the inclined bearing-faces on said end flanges and a nut for securing the parts in place, substantially as set forth.

2. An insulating-washer for commutators, consisting of segmental blanks of insulating material arranged with their ends overlapping each other and formed into a dish-shaped washer, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

S. H. SHORT.

Witnesses:

JNO. T. HUNTINGTON,  
A. B. CALHOUN.