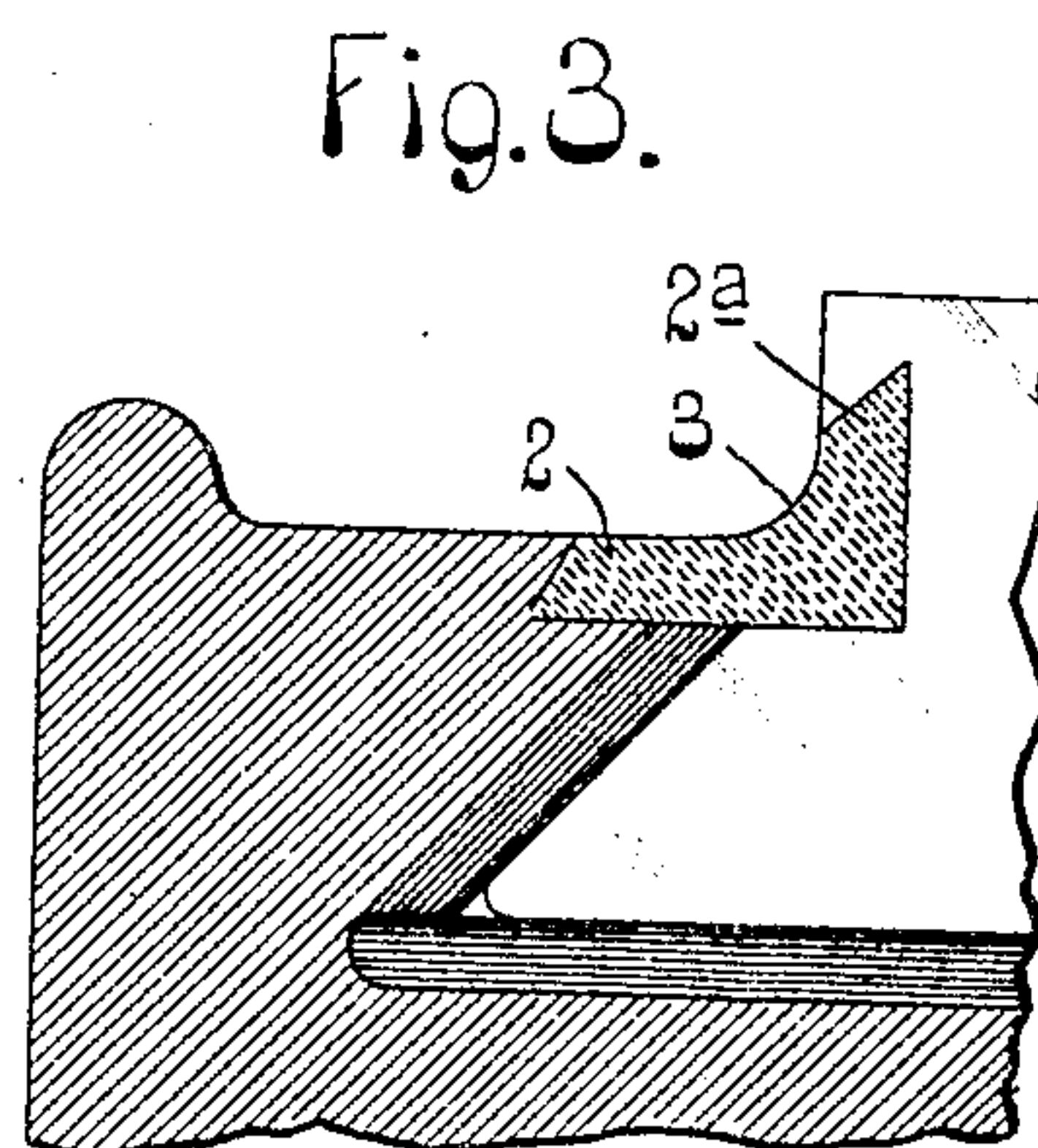
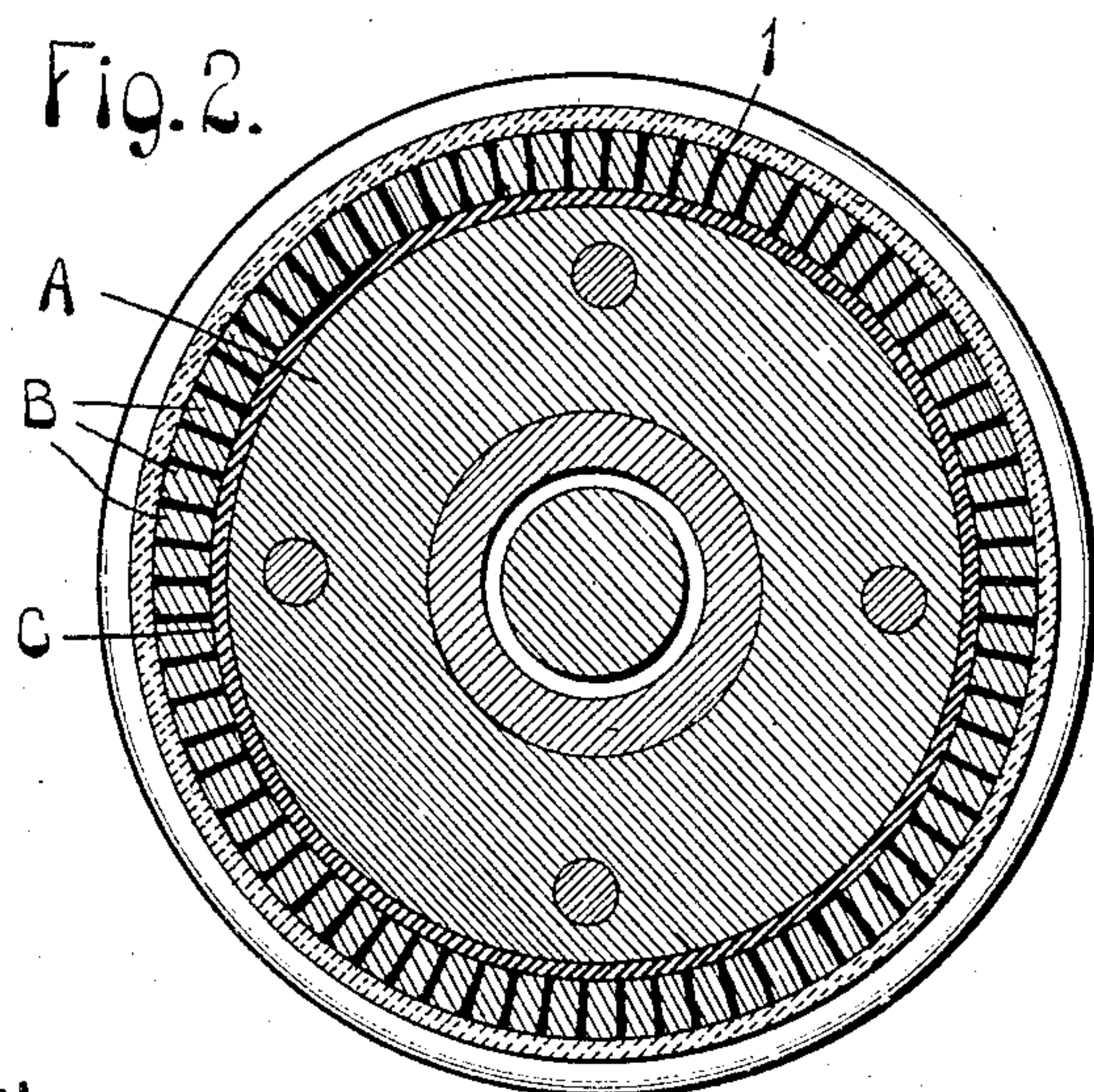
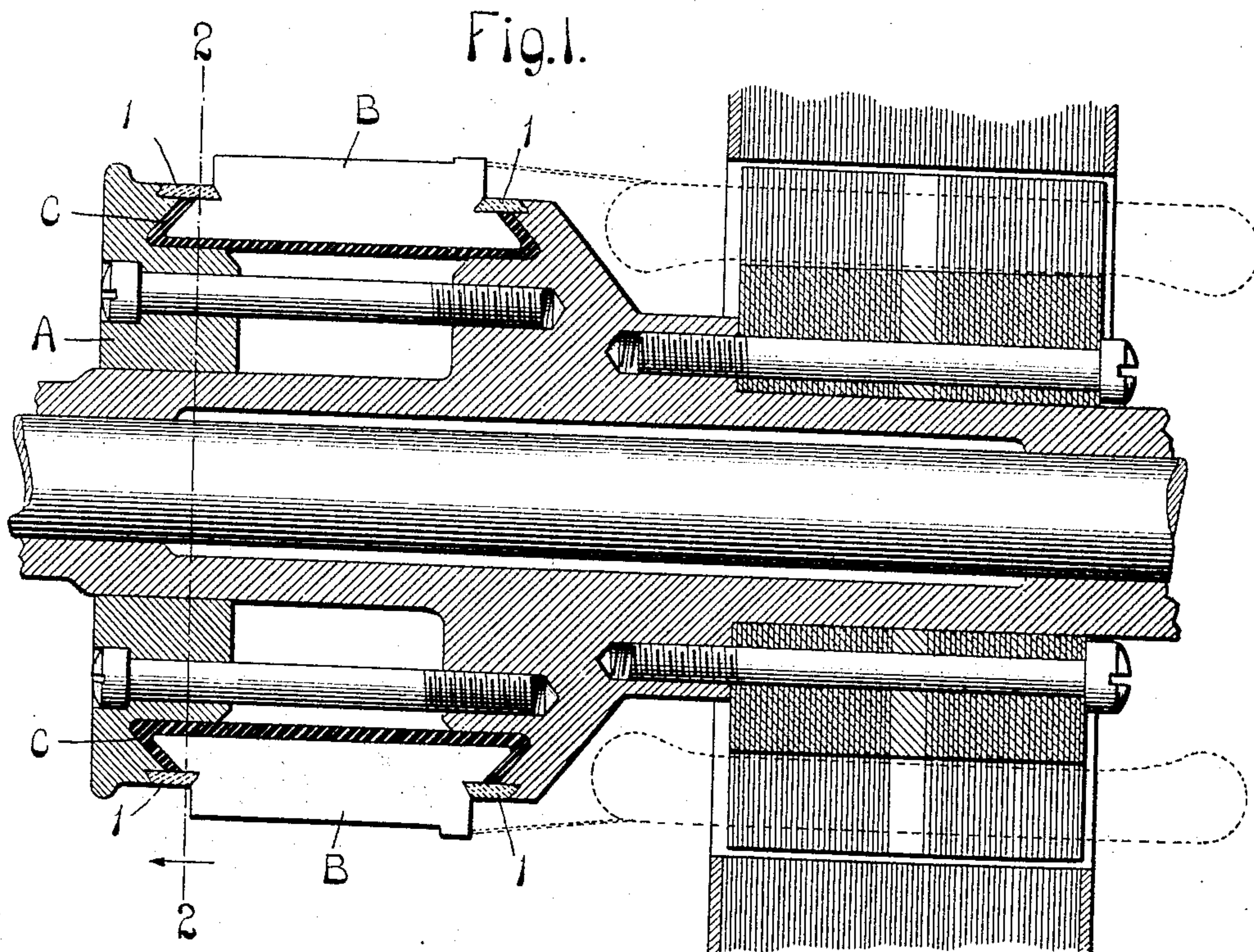


A. J. PFAFF.  
COMMUTATOR FOR MOTORS.  
APPLICATION FILED APR. 29, 1908.

912,612.

Patented Feb. 16, 1909.



Witnesses  
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Atty's.



# UNITED STATES PATENT OFFICE.

ANDREW J. PFAFF, OF ST. LOUIS, MISSOURI, ASSIGNOR TO EMERSON ELECTRIC MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

## COMMUTATOR FOR MOTORS.

No. 912,612.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed April 29, 1908. Serial No. 429,854.

*To all whom it may concern:*

Be it known that I, ANDREW J. PFAFF, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Commutators for Motors, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal sectional view of a commutator constructed in accordance with my invention; Fig. 2 is a cross sectional view taken on the line 2—2 of Fig. 1; and Fig. 3 is a detail sectional view of a modified form of my invention.

This invention relates to motors, and particularly to the commutators of motors.

The main object of my invention is to provide a commutator of simple construction in which the head of the commutator is provided with rings of hard and smooth insulating cement arranged adjacent to the ends of the segments that are mounted on said head.

Referring to the drawings which illustrate the preferred form of my invention, A designates the head of a commutator, and B designates the commutator segments mounted on said head and provided with projecting end portions that extend into undercut recesses in the head, the segments being insulated from each other and from the head by means of mica C or some other suitable insulating material. Rings 1 of insulating cement are mounted on the head adjacent the ends of the segments so as to prevent carbon and metal dust from accumulating on the head at the ends of the segments and thus causing short circuits between the segments. I prefer to form these rings 1 from some suitable insulating cement which can be run into an approximately dovetailed groove formed partly in the outer surface of the head A of the commutator and partly in the ends of the segments and then be machined down to produce a smooth surface. One kind of insulating cement that I have found to be very well adapted for this purpose is a composition of plaster-paris and shellac but it will, of course, be obvious that

various other insulating cements could be used for this purpose. These rings are oil and heat proof and as they have hard smooth surfaces they can be wiped off and kept clean easily so that dirt cannot collect at the ends of the segments and thus short-circuit same.

Instead of using a cement ring of the shape shown in Fig. 1 I can use a cement ring 2 provided with an upwardly projecting flange 2<sup>a</sup> that is set into the vertical end faces of the commutator segments, as shown in Fig. 3. I prefer to provide the ring shown in Fig. 3 with a curved surface 3 at the junction of the horizontal and vertical portions so as to eliminate a corner in which dirt might collect.

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

1. A commutator provided with a head, segments mounted on said head, and rings of self-hardening insulating material arranged in grooves formed partially in the outer surface of the head and in the ends of the segments; substantially as described.

2. A commutator provided with a head, segments mounted on said head, and insulating rings set into the outer surface of the head and in the end portions of the segments and consisting of hard molded material; substantially as described.

3. A commutator provided with a head, segments mounted on said head and having projecting end portions that extend into undercut recesses in said head, and rings of molded insulating material engaging said segments and lying flush with the outer surface of the head; substantially as described.

4. A commutator provided with a head, segments mounted on said head and projecting outwardly therefrom, the outer surface of the head and the end portions of the segments being cut away so as to form approximately dove-tailed grooves, and rings of molded insulating material arranged in said grooves; substantially as described.

5. A commutator provided with a head, segments mounted on said head and projecting outwardly therefrom, and rings of self-hardening insulating material lying flush with the outer surface of the head and extending into undercut grooves formed in the



end portions of the segments and in the outer surface of the head; substantially as described.

6. A commutator provided with a head, segments mounted on said head and projecting outwardly therefrom, and a ring of insulating material filling a groove in the outer surface of said head and having a radially disposed flange that is set into the ends of the segments; substantially as described.

7. A commutator provided with a head, segments mounted on said head and projecting outwardly therefrom, a ring of hard and smooth insulating material arranged in a

groove formed in the outer surface of said head adjacent one end of said segments, and an integral radially disposed flange on said ring which is set into the end faces of said segments, said ring having a curved surface at the point where the flange merges into the body of the ring; substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this twenty seventh day of April 1908.

ANDREW J. PFAFF.

Witnesses:

WELLS L. CHURCH,  
GEORGE BAKEWELL.