

A. KINGSBURY.
COLLECTOR RING FOR DYNAMO ELECTRIC MACHINES.
APPLICATION FILED SEPT. 6, 1910.

993,076.

Patented May 23, 1911.

Fig. 1.

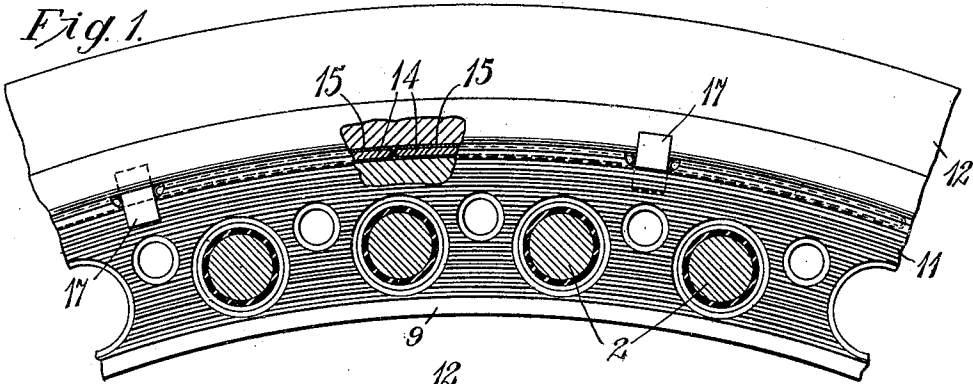
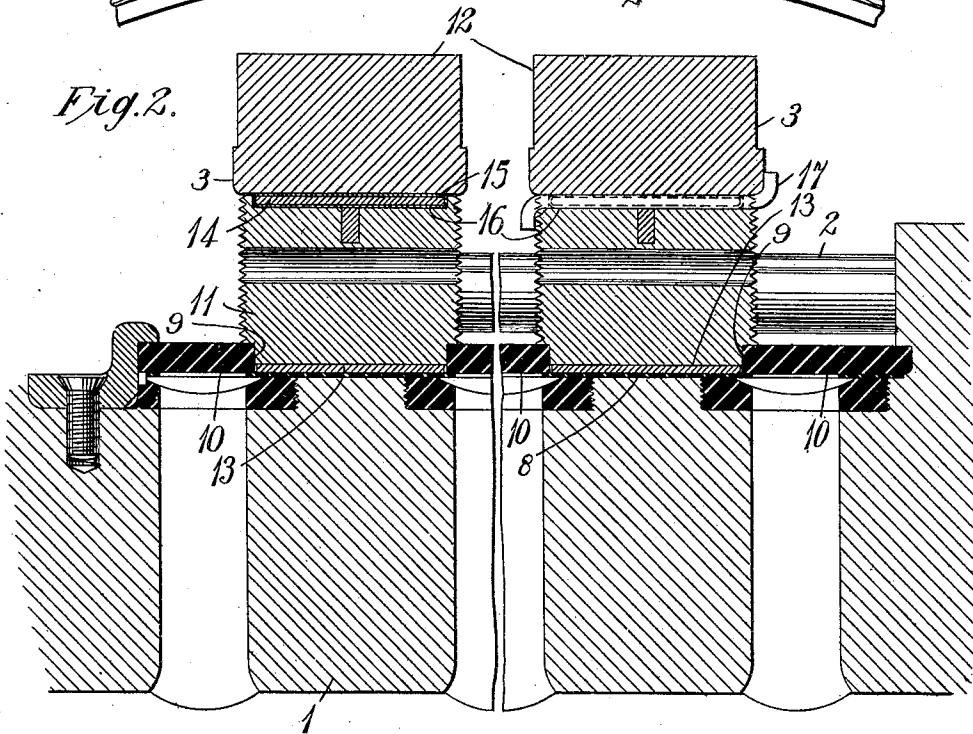


Fig. 2.



WITNESSES:

Fred H. Miller
R. J. Carbone

INVENTOR

Albert Kingsbury
BY
Cheley & Carr
ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT KINGSBURY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE
ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

COLLECTOR-RING FOR DYNAMO-ELECTRIC MACHINES.

993,076.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed September 6, 1910. Serial No. 580,767.

To all whom it may concern:

Be it known that I, ALBERT KINGSBURY, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Collector-Rings for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to collector rings for dynamo-electric machines and particularly to such collector rings as are adapted for use with unipolar generators and other machines in which they wear rapidly and are called upon to conduct large currents.

The object of my invention is to provide a ring of the class and for the service above indicated that shall be simple and durable in construction and have a removable wearing ring surface which may readily and cheaply be replaced.

Armatures pertaining to unipolar machines of large size are usually provided with two sets of collector rings which are separated from the core member by annular projections and are connected by a large number of armature conductors. The ends of the armature conductors are preferably screw-threaded to engage tapped holes in the collector rings to which they are electrically connected, and extend through, and are insulated from, the rings to which they are not connected. It is, therefore, evident that it is very difficult to remove and replace any one of the collector rings and that an operation of this kind involved a great deal of time and expense.

According to my present invention, I divide the collector rings into two parts which may, for convenience, be termed, respectively, the inner ring member and the outer or wearing ring member. The arrangement of parts is such that the armature conductors are, in every case, connected to the inner rings, the outer or wearing rings being capable of removal without great difficulty and without disturbing the armature connections in any way. In order to avoid the possibility of the wearing ring members becoming loosened and moved out of their proper positions, springs are interposed between them and the inner ring members. These springs are similar to those shown and described in my co-pending application, Serial No. 471,635, filed January 11, 1909. By reason of their location, however, they are wrapped

with sheet copper, or other good conducting material, in order to avoid material losses by reason of a drop of potential between the outer and the inner ring members.

Figure 1 of the accompanying drawings is a side elevation of a portion of a collector ring constructed in accordance with my invention, and Fig. 2 is a longitudinal section of a portion of an armature of a unipolar generator provided with collector rings which embody my invention.

Referring to the drawings, the armature here shown comprises a magnetizable core member 1, conductors 2 and collector rings 3. The collector rings are mounted upon the core member 1 which is first provided with an insulating cylinder or wrapping 8. Each of the rings is under-cut to form annular notches 9 at its inner edges to receive the ends of spacing blocks 10, of wood or other insulating material, which are disposed between the adjacent collector rings in the form of segmental rings and which space the collector rings apart, as set forth in my above mentioned prior application. In order to hold the rings firmly in position at relatively high speeds and temperatures, when they are materially increased in size by reason of the expansion of the metal, resilient seats are provided, which are composed of a plurality of plates 13, preferably constructed of spring steel and assembled directly under the rings in the form of segmental metal rings, as shown and described in my co-pending application, to which reference has already been made. Each of the rings is composed of two separable parts which may be designated, respectively, as an inner ring member 11 and an outer or wearing ring member 12. The outer and inner ring members are separated by segmental rings which are similar to the resilient seats under the inner rings and are composed of a plurality of plates 14, preferably constructed of spring steel, each having a wrapping or envelop 15 of sheet copper or other good conducting material. The envelops 15 serve to reduce the resistance losses in the collector rings, since the current is forced to flow between the stationary brushes (not shown) which engage the outer cylindrical surface of the outer ring member 12 and the armature conductors 2 which are directly connected to the inner ring member 11.

In order to hold the springs 14 in position

between the outer and inner ring members, the latter are provided with annular recesses 16 which correspond, in depth, to the thickness of the spring.

5 Retaining pieces 17, which are located between the parts 11 and 12, at intervals, consist of cross strips which extend beyond the side surfaces and are bent in opposite directions against said surfaces.

10 As the outer rings become worn, more or less rapidly, in operation, it is highly desirable to be able to easily remove the worn portions and replace them without disturbing the winding connections of the machine.

15 For machines of relatively large capacity, the diameters of the rings are large and, consequently, the expansion and contraction of the core member 1 and of the rings would tend to materially loosen the latter so that a sufficiently good contact between the inner and outer ring members to carry the current, would not be maintained except for the resilient seats under the inner ring member and between the two members, as hereinbefore described.

25 Structural modifications may be effected within the spirit and scope of my invention

and, consequently, I do not wish limitations to be imposed which are not expressly set forth in the appended claims. 30

I claim as my invention:

1. A collector ring for dynamo-electric machines comprising inner and outer ring members and an interposed resilient spacing means. 35

2. A collector ring for dynamo-electric machines comprising an inner ring member adapted to be physically connected to the windings of the machine, an outer ring member and an interposed resilient spacing means of high conductivity. 40

3. A collector ring for dynamo-electric machines comprising inner and outer ring members and an interposed resilient spacer composed of a series of plates of resilient material having envelopes of high current conductivity. 45

In testimony whereof, I have hereunto subscribed my name this 18th day of August, 1910.

ALBERT KINGSBURY.

Witnesses:

C. W. MCGHEE,
R. J. DEARBORN.