

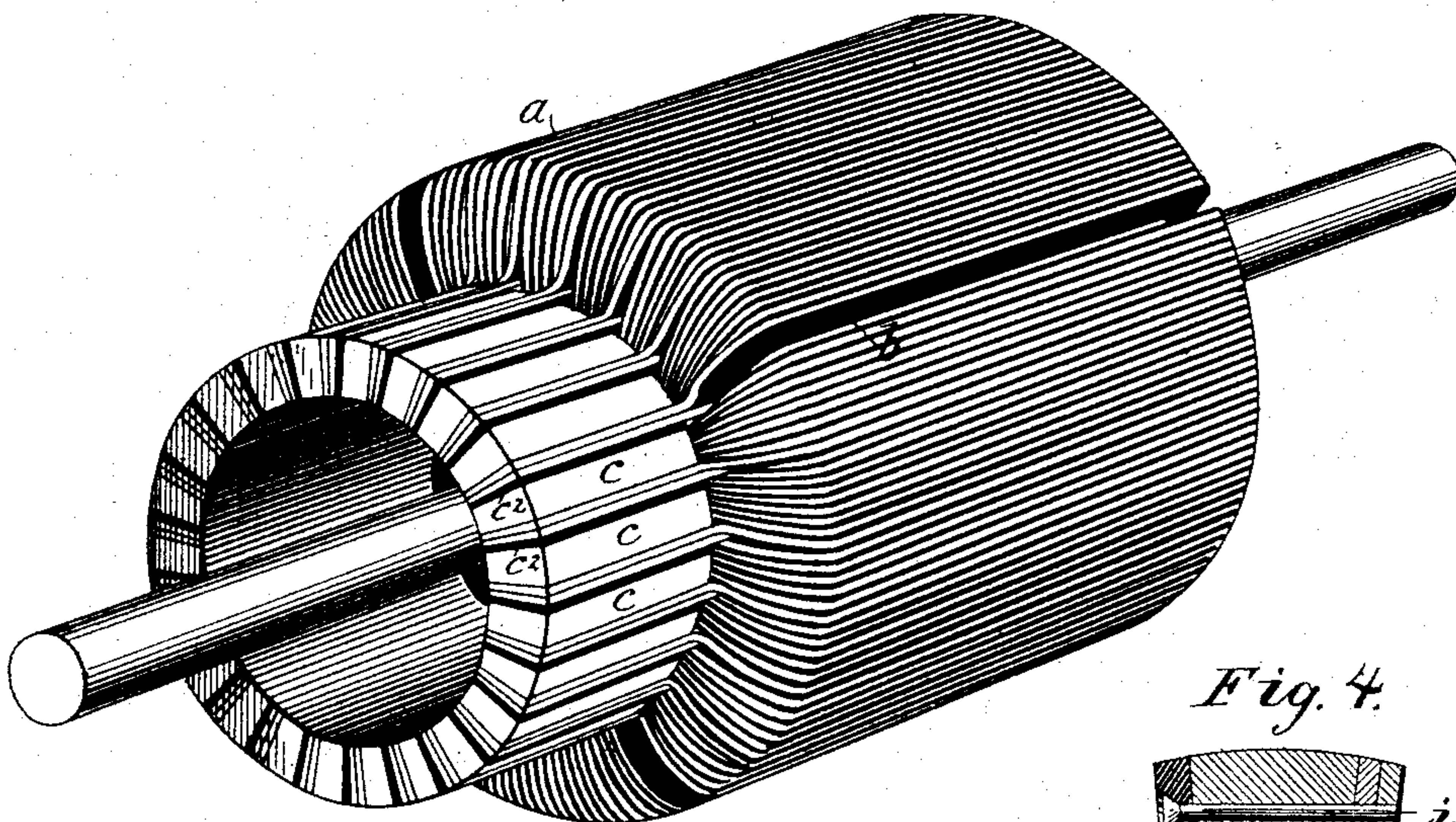
(No Model.)

C. F. WINKLER.  
COMMUTATOR.

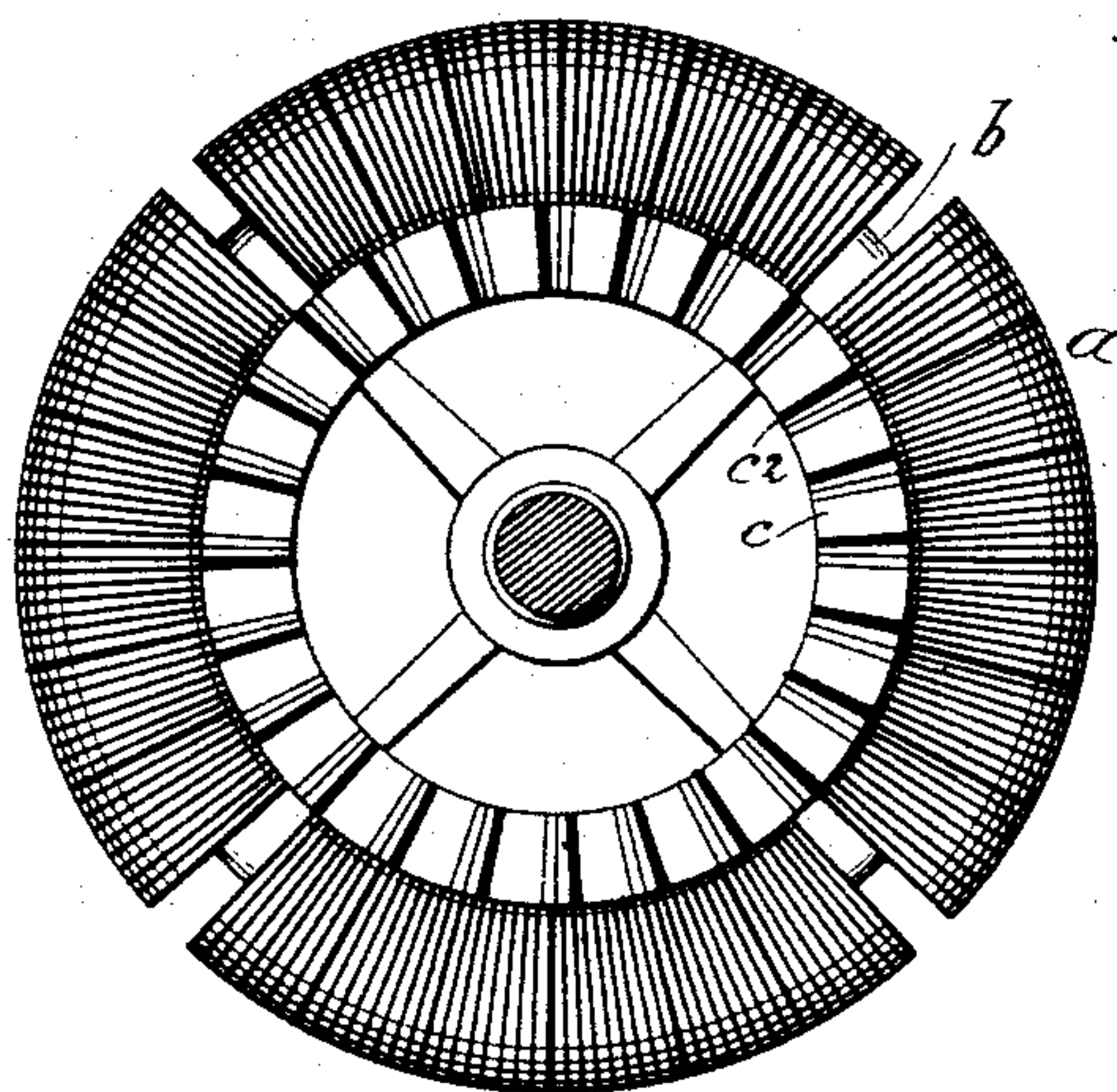
No. 412,350.

Patented Oct. 8, 1889.

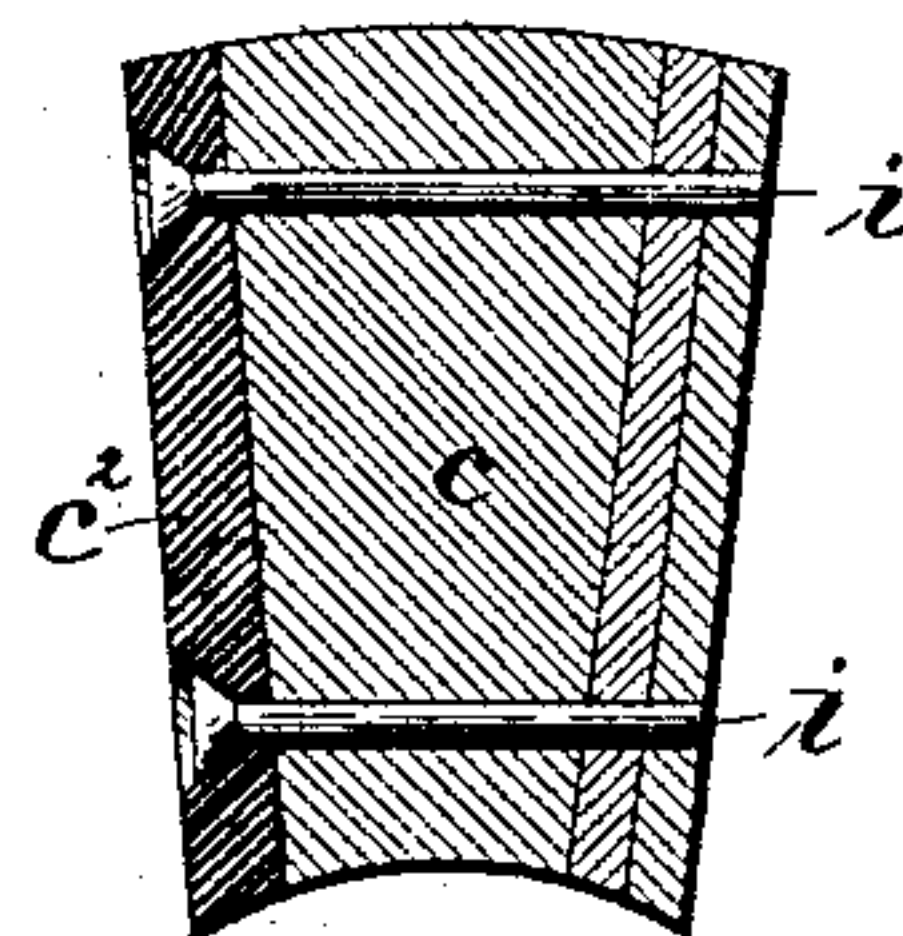
*Fig. 1.*



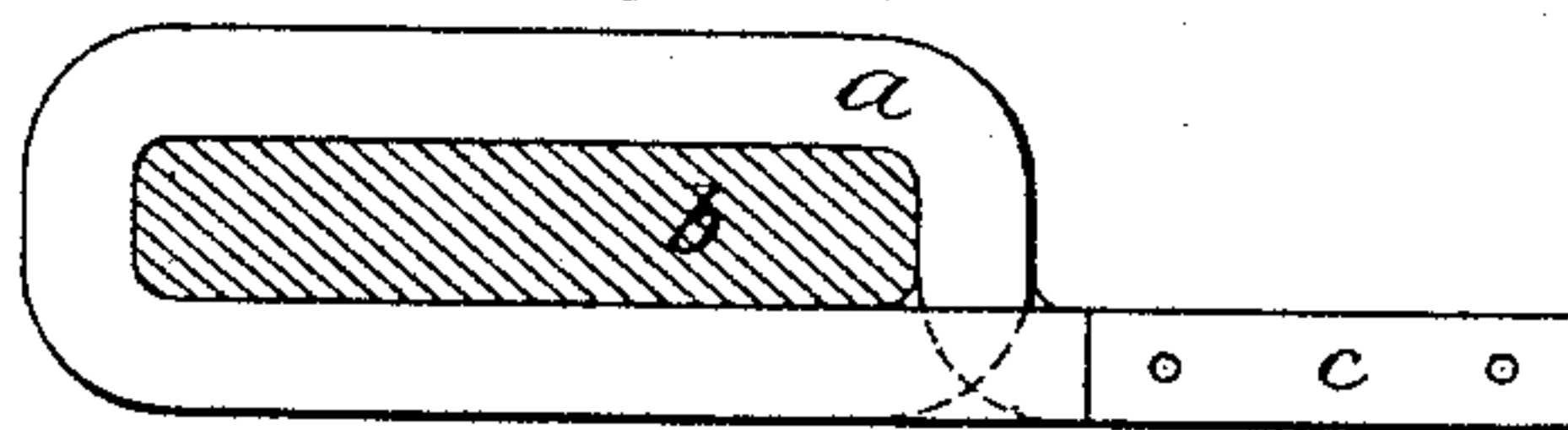
*Fig. 2.*



*Fig. 4.*



*Fig. 3.*



WITNESSES.

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# UNITED STATES PATENT OFFICE.

CHARLES F. WINKLER, OF HOOSICK FALLS, NEW YORK.

## COMMUTATOR.

SPECIFICATION forming part of Letters Patent No. 412,350, dated October 8, 1889.

Application filed January 26, 1889. Serial No. 297,662. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. WINKLER, a citizen of the United States, residing at Hoosick Falls, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Commutators, of which the following is a full, clear, and exact specification.

My invention relates to dynamo-electric machines and motors, and has particular reference to an improvement in the armatures and commutators for the same.

The object of the invention is an efficient apparatus of cheap construction.

The invention consists in the details of construction, which will be hereinafter described.

In the accompanying drawings, Figure 1 represents a perspective view of a dynamo-machine, armature, and commutator constructed according to my invention. Fig. 2 is an elevation of the commutator end of the same. Fig. 3 is a partial longitudinal section of the armature and commutator. Fig. 4 is a detail view showing the manner of securing the parts of the commutator together.

In my armature I do not use a wire-winding; neither do I use a magnetic core of the ordinary construction. The particular construction of the armature is described in my application serially numbered 297,661, filed January 26, 1889.

Briefly stated, the armature consists of coils of flat iron strips of some considerable width, the convolutions being separated by similar strips of insulating material. The armature is supported by a spider upon the shaft, in the usual manner, and the points where the spider joins with the supporting-core of the armature (which in this case may be of wood) is left free of the metallic strips in order to facilitate the mounting of the machine.

As shown, the armature is of the ordinary drum or Gramme type. The flat strips *a* constituting the coils are given several turns around the supporting-core *b* with strips of insulating material between, and they stand with their edges to the core and their flat sides in radial planes from the shaft. The

two ends of each coil are extended outward longitudinally and parallel to the shaft about 50 on a level with the internal diameter of the armature, the end of the coil finishing at the external diameter being carried around and down to a level with the internal diameter, in order that the two ends may be extended 55 side by side. All the ends of the coils being extended in this manner the result is a cylindrical body supported directly by the armature and of less diameter than the same. The beginning and end of the adjacent coils 60 are connected together in the usual manner, as shown, each pair of ends forming a commutator-segment. Of course, the insulating-strip is removed from between the connected ends of the coils. 65

The details necessary to the completion of the commutator consist of blocks or plates of copper or other suitable metal *c*, which are attached to both or to one side of each of the joined extended ends of the coils by 70 means of pins *i i*, thus thickening the same for the purpose of filling up the cylinder and giving each segment a good contact-surface for the brush, and preventing sparking by excessive spaces between the segments. In 75 addition to the copper plates there is inserted between each pair of the connected ends strips of insulating material *c'* of small thickness. These serve the ordinary purpose of insulating material between the segments of a commutator. These are held in 80 place by the same pins *i i*.

The periphery of the commutator portion is trued off and given a smooth surface for the brushes. It will thus be seen that I have 85 provided a very cheap form of commutator, and one which cannot be otherwise than efficient in its operation. I dispense entirely with all forms of mounting for the commutator direct from the shaft. 90

Having now described my invention, I claim—

1. A commutator formed by joining the extended ends of the coils on the armature in couples, and re-enforcing said ends by attaching thereto a block of metal, a segment 95

of insulation being placed between the adjoining re-enforced ends, substantially as described.

2. The combination, with an armature,  
5 of a commutator formed of the joined extended ends of the coils of the armature, said ends being re-enforced by metal blocks secured thereto by means of pins, substantially as described.

In witness whereof I have hereunto signed in my name in the presence of two subscribing witnesses.

CHARLES F. WINKLER.

Witnesses:

WILLIAM L. HALL,  
HENRY S. PRUYN.