

(No Model.)

J. BEATTIE, Jr..  
ARMATURE FOR DYNAMO ELECTRIC MACHINES AND MOTORS.  
No. 459,923. Patented Sept. 22, 1891.

Fig. 1.

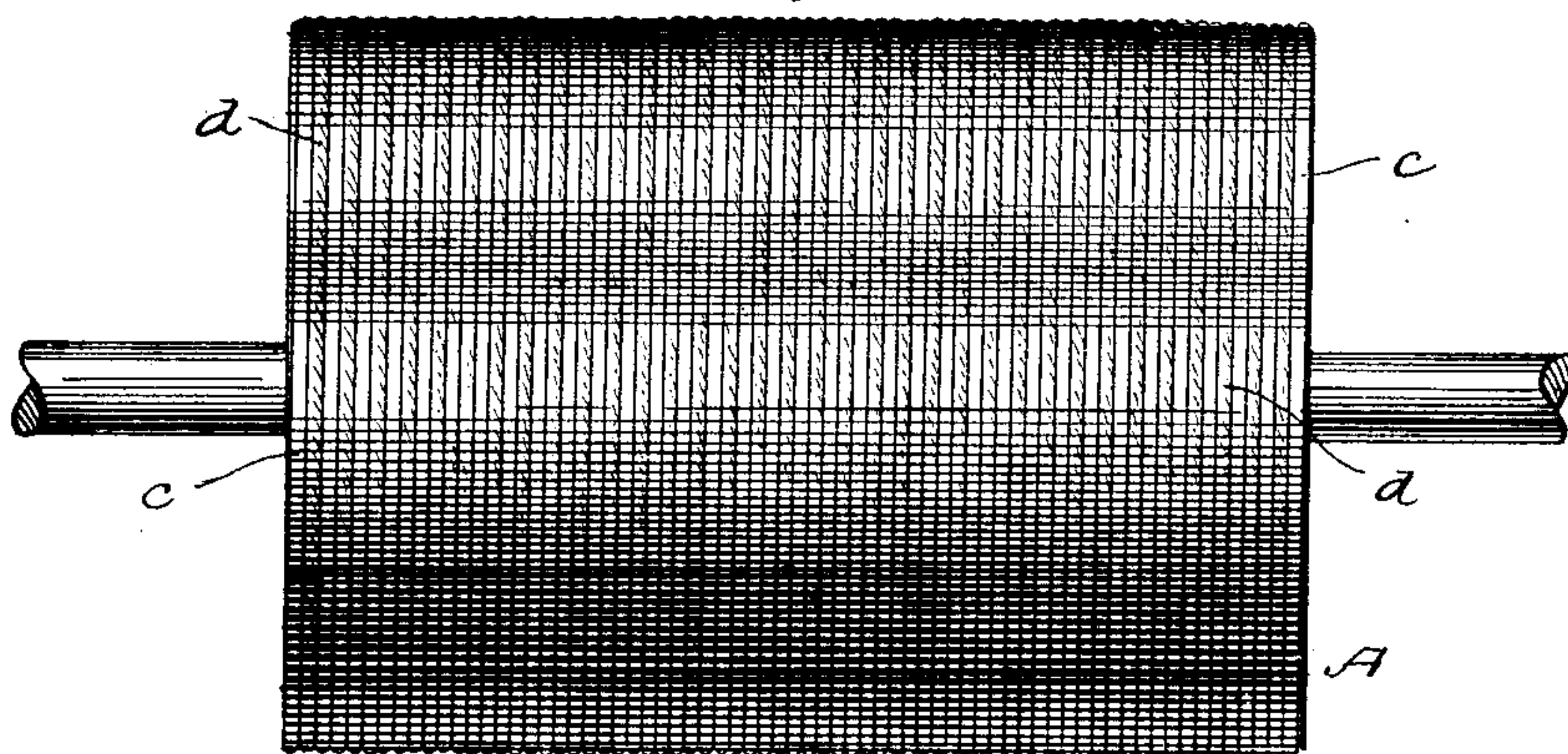


Fig. 2.

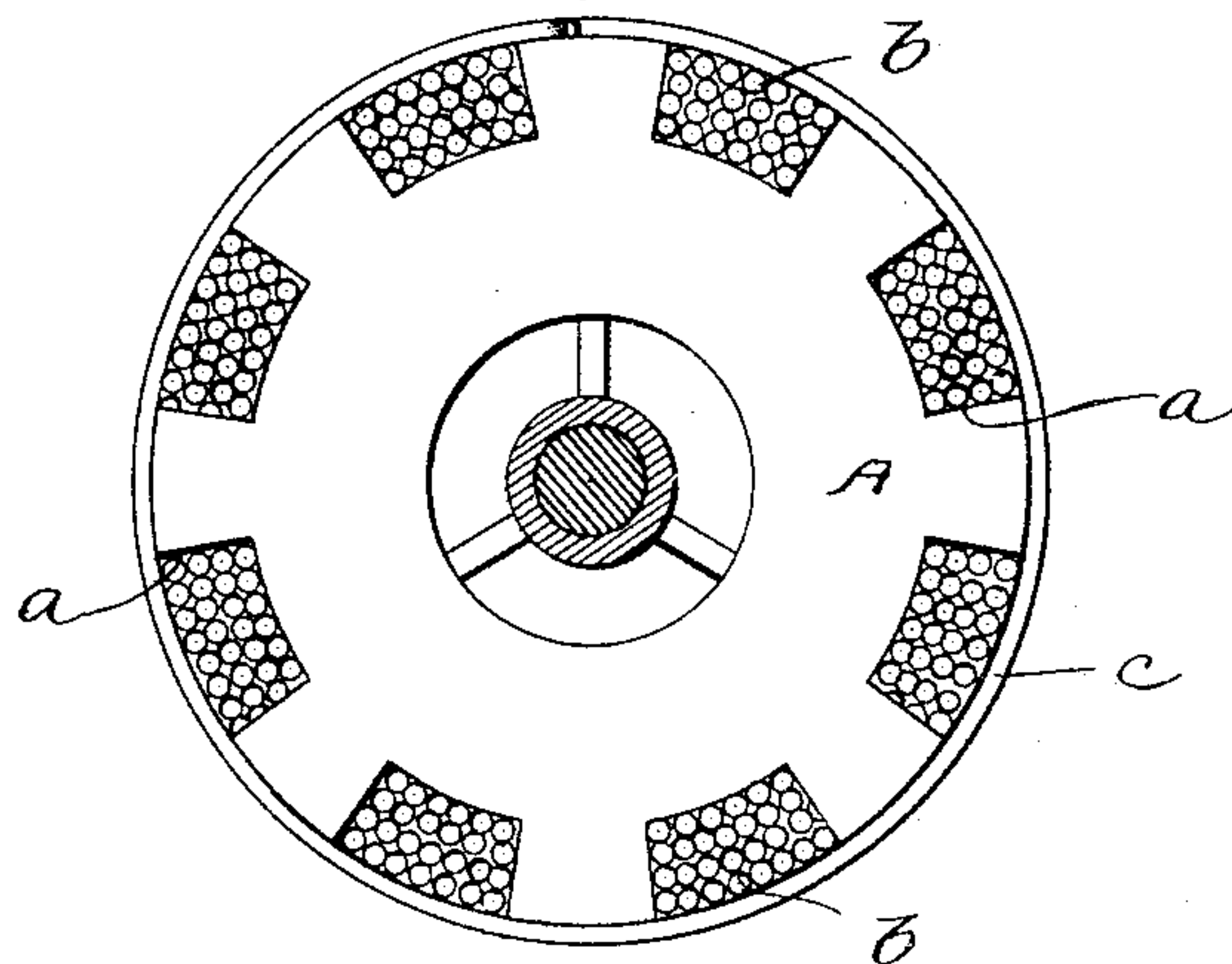
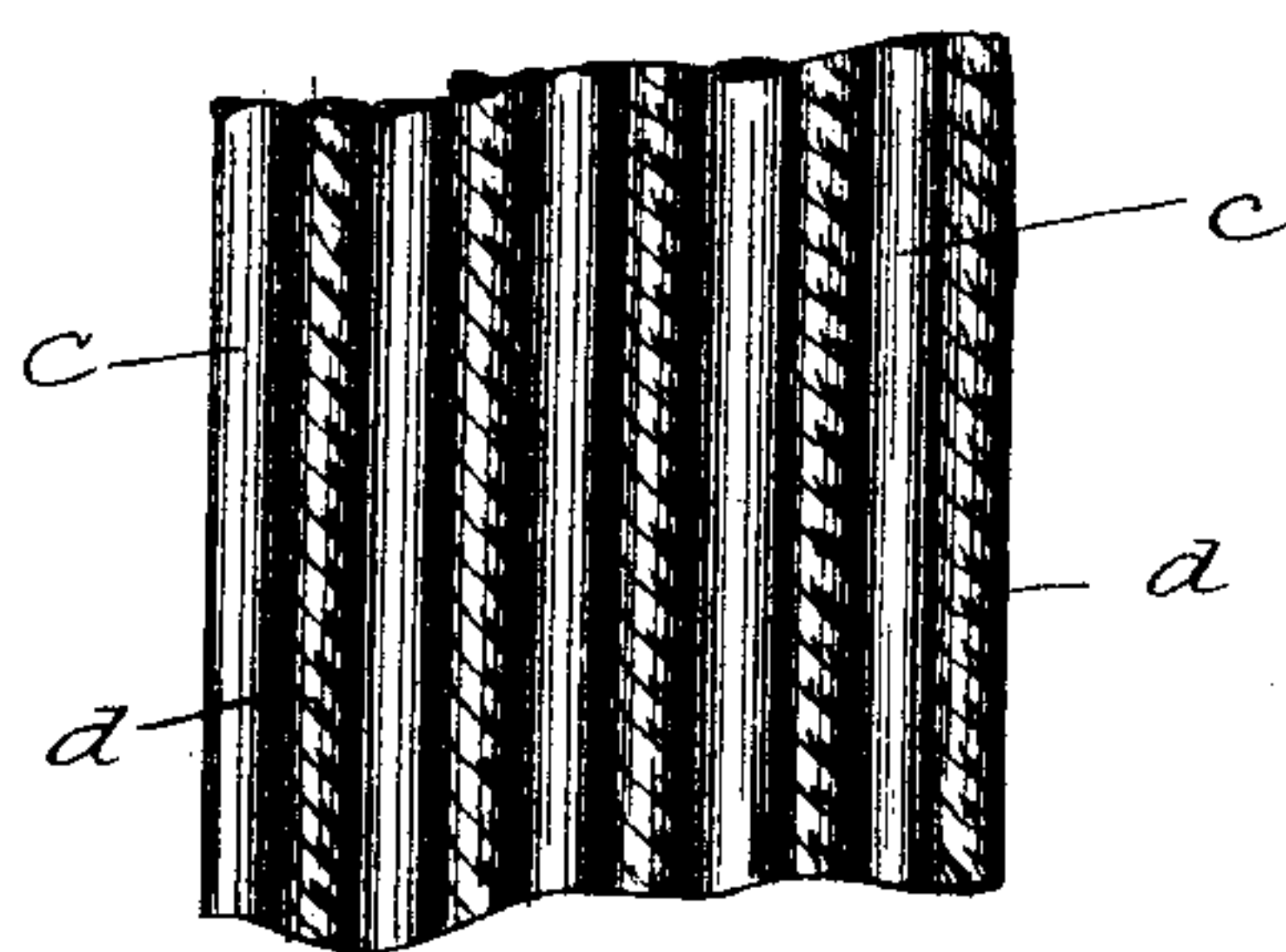


Fig. 3.



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# UNITED STATES PATENT OFFICE.

JOHN BEATTIE, JR., OF FALL RIVER, MASSACHUSETTS.

## ARMATURE FOR DYNAMO-ELECTRIC MACHINES AND MOTORS.

SPECIFICATION forming part of Letters Patent No. 459,923, dated September 22, 1891.

Application filed December 9, 1890. Serial No. 374,006. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BEATTIE, Jr., a citizen of the United States, residing at Fall River, county of Bristol, State of Massachusetts, have invented certain new and useful Improvements in Armatures for Dynamo-Electric Machines and Motors, of which the following is a specification.

My invention relates to dynamo-electric machinery, and has particular reference to the construction of the armatures of the same.

The object of the invention is to improve the construction of what is known as the "Pacinotti" type of armature. This armature consists of a ring or cylinder having deep grooves in its periphery parallel to its axis, which form projections or teeth in the core of the armature. The coils or conductors are deposited in the grooves. The surface or periphery of the armature is therefore made up of alternate longitudinal rows of iron and conductors, which necessarily render the surface more or less uneven and necessitates a considerable air-space between the armature and the pole-pieces of the machine, besides causing humming when the armature is in motion. It has been proposed to obviate this objection by covering the surface or periphery of the armature with sheet-iron. This overcomes the objections noted above, but introduces a new one—to wit, the sheet-iron becomes hot and buckles, besides injuring the insulation of the conductors.

My invention consists in substituting for the sheet-iron cover a layer of bare iron wire wound spirally upon the surface of the armature from end to end with the convolutions slightly separated from one another, and insulating material consisting, preferably, of a textile cord wound between them. This covering, when wound closely, furnishes a smooth surface containing a sufficient iron to conduct the lines of force and sufficiently broken up to prevent undue heating.

Referring to the accompanying drawings, Figure 1 represents a side view of an armature constructed according to my invention. Fig. 2 is a transverse section of the same; and Fig. 3 is an enlarged detail of a portion of the surface of the armature, showing how the covering is laid.

Referring to the drawings by letter, A represents the core of an armature. It may be either a Gramme ring or a Siemens armature; but it is provided with grooves *a* of more or less depth, which run across the periphery parallel to its axis. The core A may be of solid iron, or preferably, as usually constructed, of thin iron plates with sheets of insulating material between them.

*b* represents the electric conductors, consisting, usually, of insulated copper wire, which entirely fill the grooves *a*.

*c* represents the serving of bare iron wire, which is wound around the periphery of the armature from end to end, a small space being left between the convolutions for a serving of insulating material *d*, such as twine or a specially-prepared material.

I do not confine myself to any particular way of winding the wire or the insulating material, as the same may be put on separately or simultaneously and by any method desired.

As before stated, the iron wire is bare, and it is placed in direct contact with the projections of the armature-core and forms in reality a part or extension of said core. This layer of wire and insulating material presents an even surface, permitting of very close running to the pole-pieces, and from the fact that the iron is separated the heating thereof will be reduced to the minimum. Humming of the armature also will be prevented. Of course all the advantages of close running to the pole-pieces are secured by this invention—that is, slow speed and few ampère-turns on the field-magnet.

If desired, the iron wire may be a series of wire rings sweated onto the armature and alternating with rings of insulating material. The wire will at any rate be wound upon the armature under tension and will act as a binding agent to hold the conductors in place.

Having thus described my invention, I claim—

An armature for dynamo-electric machines or motors, consisting of an iron core having grooves in its periphery parallel to the axis of the armature and in which the armature-conductors are deposited, in combination with iron wire and insulating material wound or

placed upon the surface of the armature at  
substantially right angles with the armature-  
conductors, the convolutions or turns of the  
iron wire alternating with the convolutions  
5 or turns of the insulating material, substan-  
tially as described, and for the purpose set  
forth.

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

JOHN BEATTIE, JR.

Witnesses:

ANDREW J. JENNINGS,  
ARTHUR S. PHILLIPS.