

(No Model.)

2 Sheets—Sheet 1.

E. A. EDWARDS.

ARMATURE FOR DYNAMO ELECTRIC MACHINES.

No. 301,872.

Patented July 15, 1884.

Fig. 1.

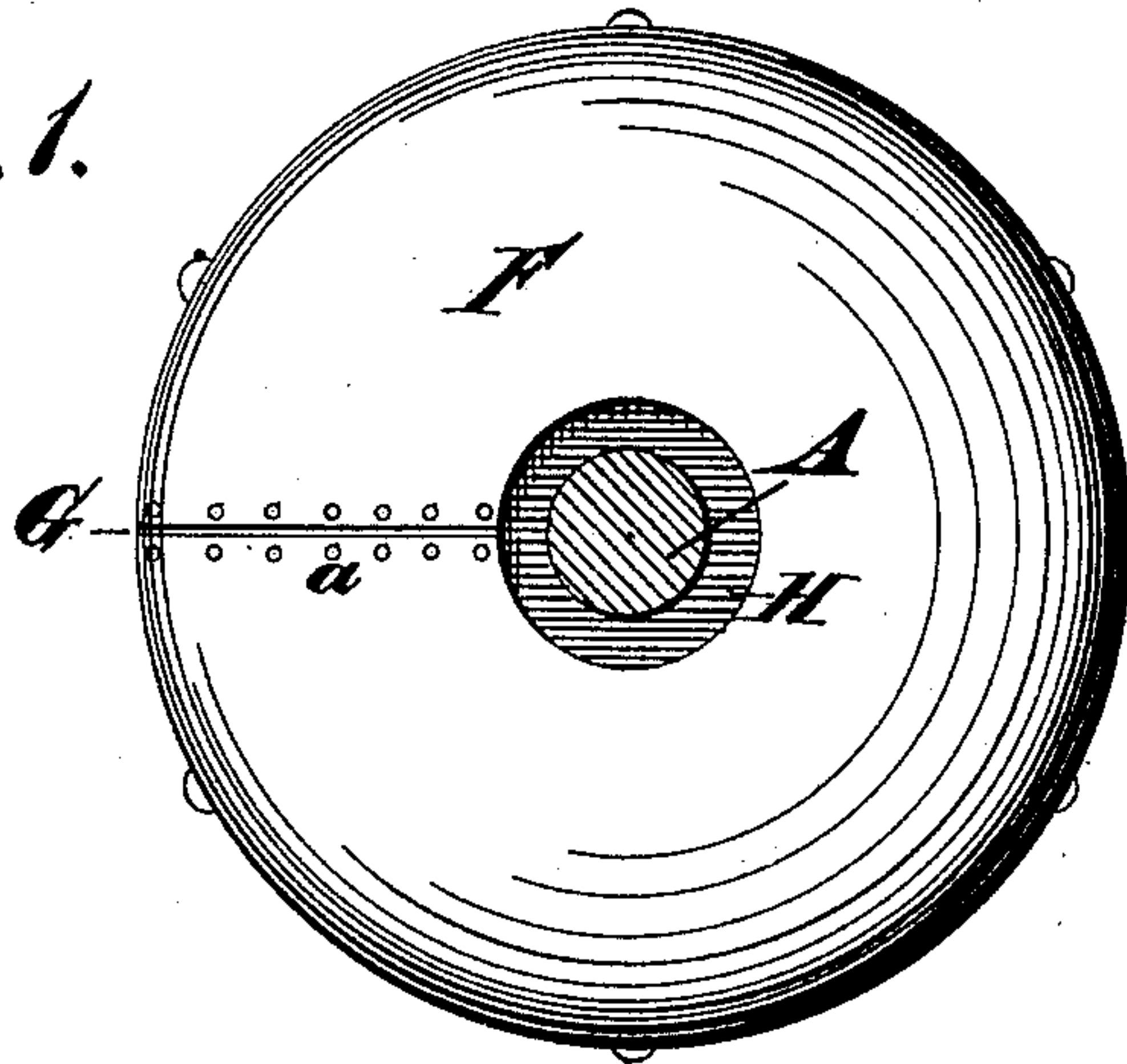


Fig. 2.

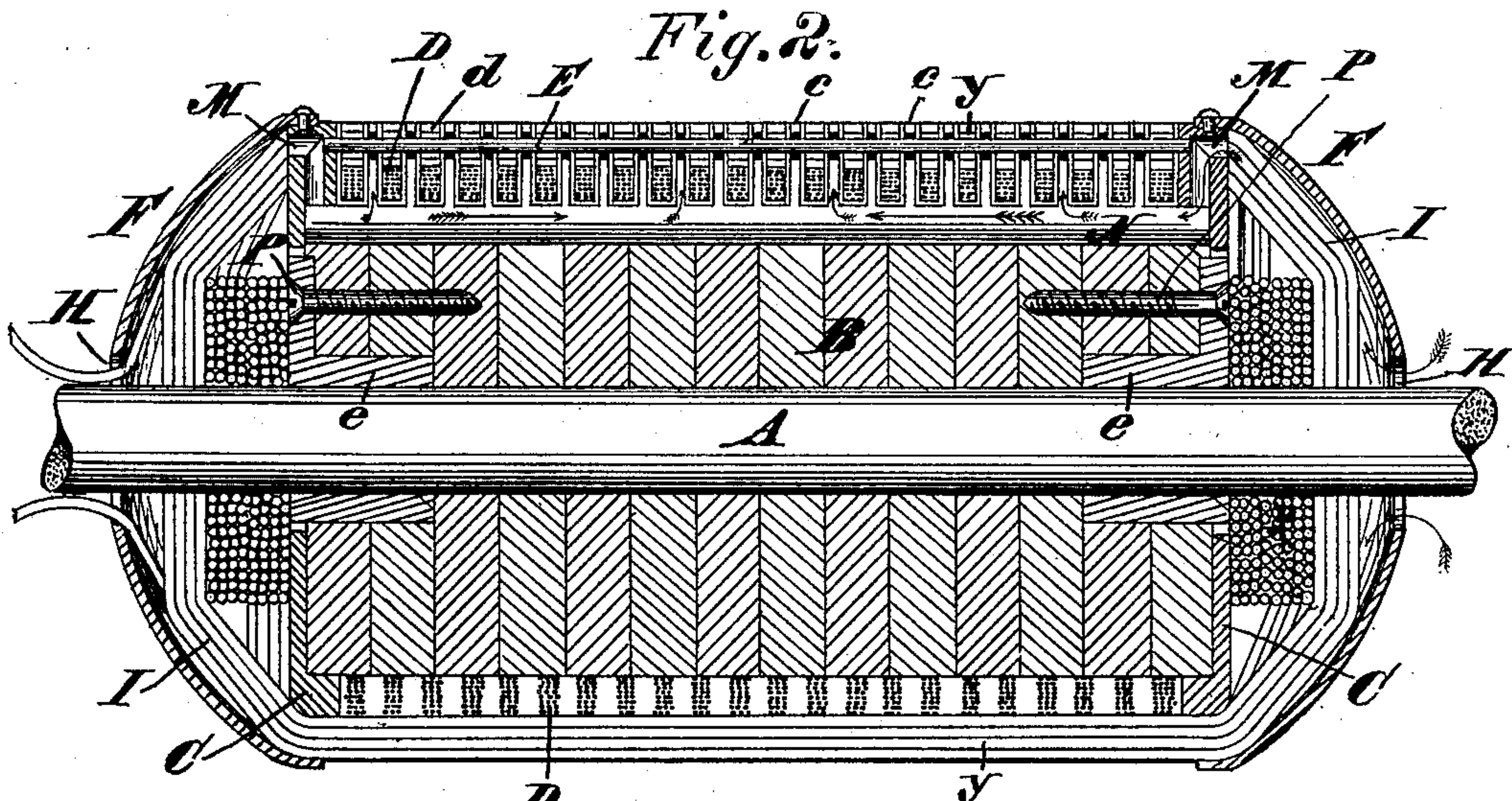
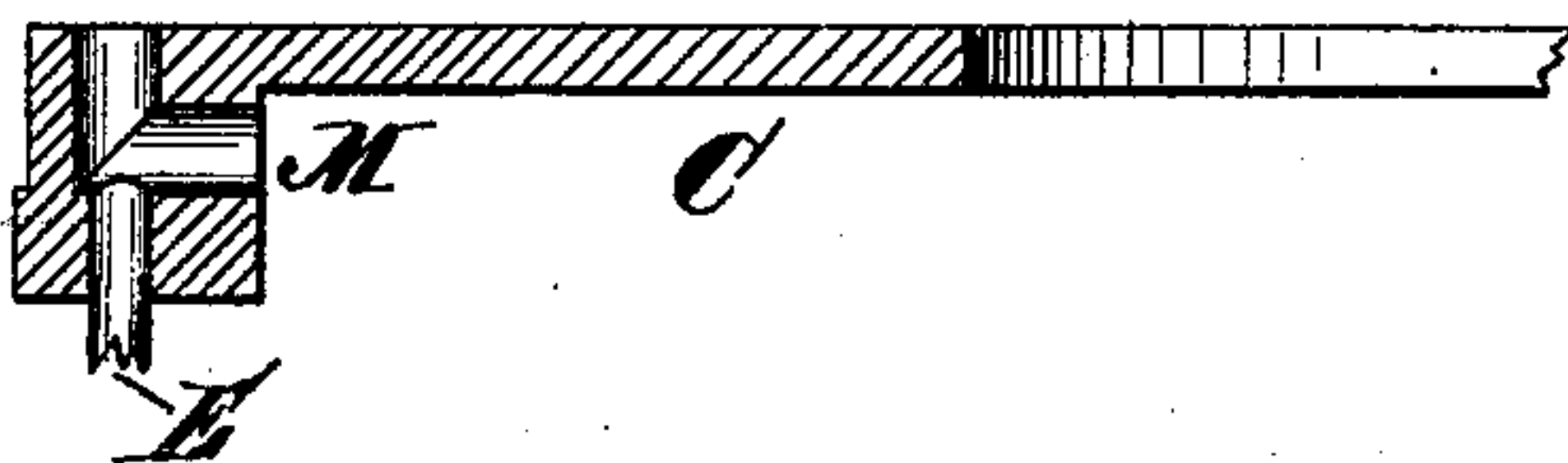


Fig. 3.



Attest

E. G. DeWald.  
Jm. E. Jones

Inventor

Edgar A. Edwards,  
by Wood & Boyd  
his Attorneys



(No Model.)

2 Sheets—Sheet 2.

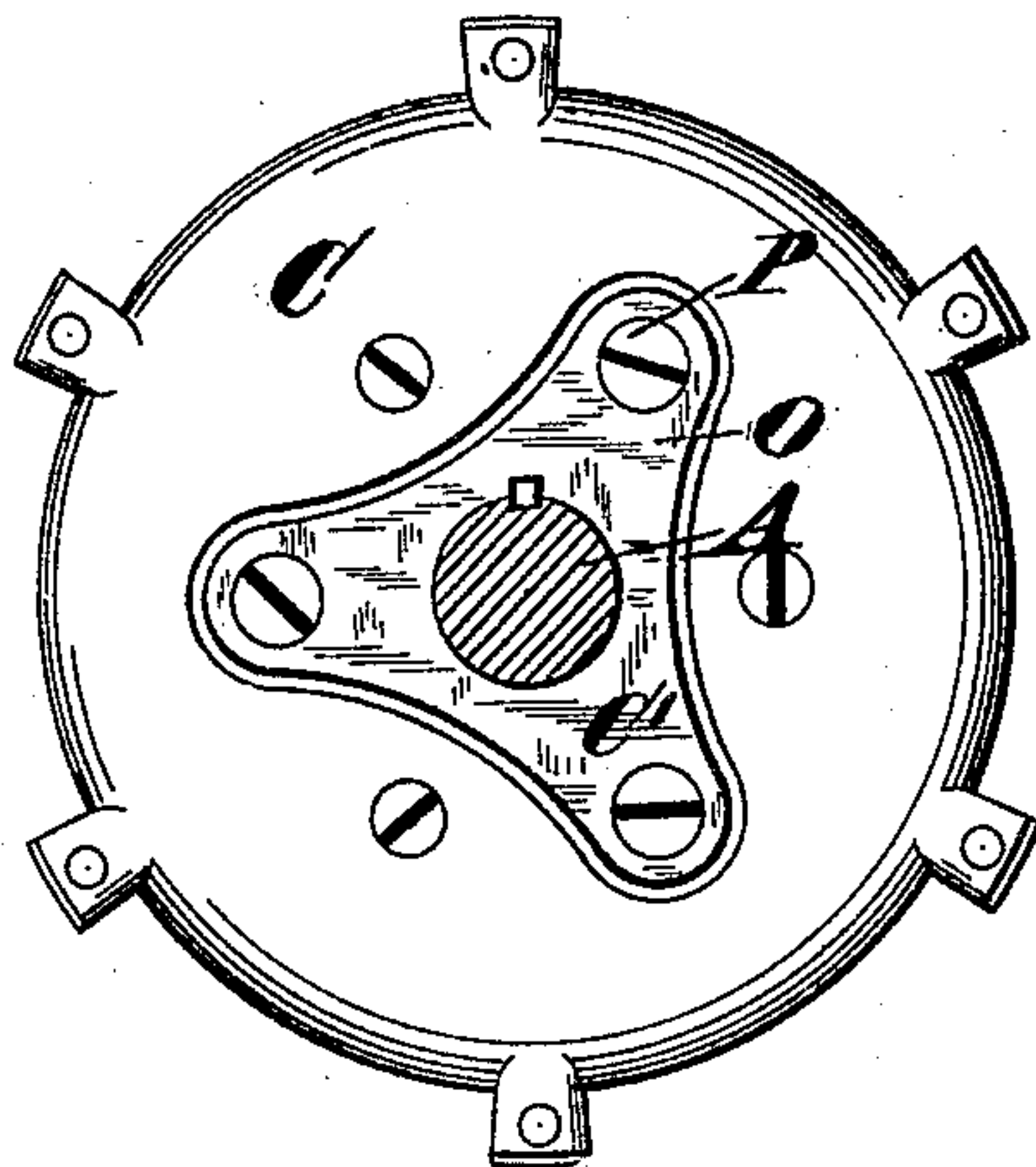
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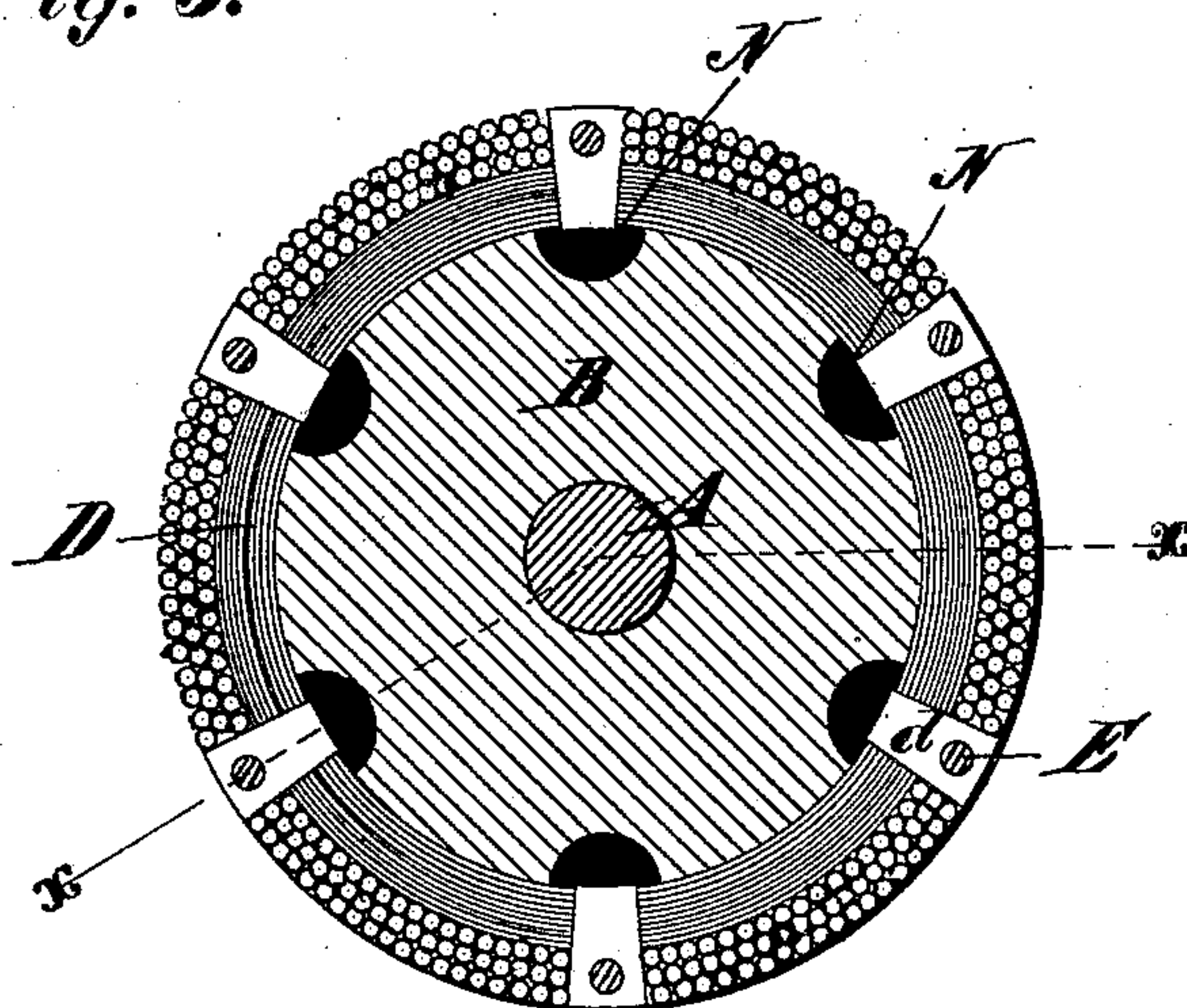
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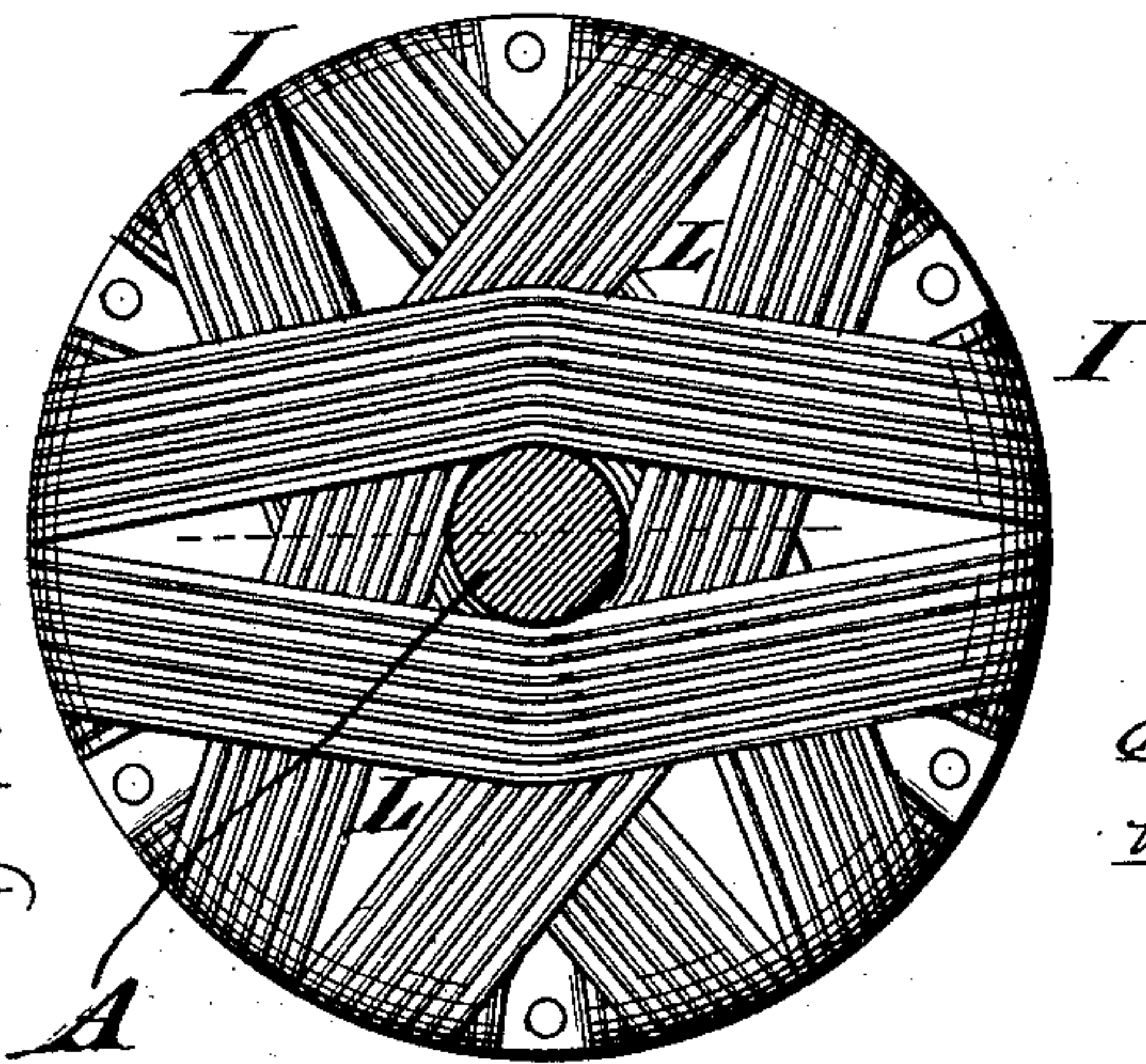
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Attest*  
*C. F. DeWald*  
*per C. Jones*

*Inventor*  
*Edgar A. Edwards*  
*by Wood O. Boyd*  
*his Attorney*



# UNITED STATES PATENT OFFICE.

EDGAR A. EDWARDS, OF CINCINNATI, ASSIGNOR TO OSCAR M. GOTTSCHALL,  
TRUSTEE, OF DAYTON, OHIO.

## ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 301,872, dated July 15, 1884.

Application filed October 18, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, EDGAR A. EDWARDS, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Armatures for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to that class of armatures for dynamo or magneto electric machines in which the inductive wire is wound wholly upon the exterior surface of a supporting-core, and means are provided so that a current of air may be forced through the armature and between or around the coils to carry off any heat generated therein; and its objects are to furnish such a construction as to insure a thorough ventilation of the armature, causing the air-currents to impinge on as great an extent as possible of the coils, and over the largest possible amount of the core-surface, and also to construct the inclosing end disks of the armature, so as to prevent to a great degree, if not totally, the circulation in the core of induced or Foucault currents. The means of accomplishing these objects will be fully set forth in the description of the accompanying drawings, in which—

Figure 1 is an elevation of the end drum of the armature; Fig. 2, a section on line  $x x$ , Fig. 5; Fig. 3, a detail sectional view of one of the air-passages in end plate, C; Fig. 4, an end elevation of the armature-core; Fig. 5, a section on line  $y y$ , Fig. 2; Fig. 6, an end view of the armature with the drum removed.

A represents the shaft of the armature; B, a core made of diamagnetic material, and preferably of wooden disks slipped upon the shaft A, and secured thereto in any desired manner.

C represents the end plates, rigidly secured to the core B.

$e$  represents inwardly-projecting hubs, which may be cast on and with the end-plate, C, for more firmly securing the core to the shaft A.

D represents iron wire rings, which are formed by winding the wire in U-shaped brackets  $d$ , which are insulated upon tie-rods E, which are connected to the armature-shaft, as substantially shown and described in Letters Patent No. 275,169, granted April 3, 1883.

Other methods of making the iron-wire rings may be employed in lieu of the form here shown; but the form here shown I deem the best.

F represents metallic disks or drum-heads, which are rigidly secured to the periphery of heads C by the flange or rim turned upon the outer edge of the disks F. These disks are shown of concave form. They may be made of cylindrical form and still accomplish the same result, though not so perfectly.

G represents a seam or slit cut from the periphery of disks F inwardly to the shaft-hole, as shown in Fig. 1.

$a$  represents rivets for uniting the edges formed by the slit G to a piece of rubber, leather, or other insulating material, so as to form a seam and prevent a circulation of electric currents circumferentially over the surfaces of disks F when they are made of metal.

H represents an opening formed in disks F around the shaft A, for admitting air into the interior of the armature.

I represents the transverse coils of the armature.

L represents spaces between these coils, through which the air passes from the entrance H, from which it passes up through spaces L to air-passages M, which are formed through the heads C, and connecting with the spaces L between the armature-coils at the ends of the armature with a space, N, which is formed between the series of rings D, out through which the air escapes, as indicated by the arrows in Fig. 2, for ventilating or keeping the armature-coils cool.

By inclosing the ends of the armature with the disk F and admitting the air near the axis, and providing a space between the disk F and the coils I with air-passages M, N, and  $c$ , the centrifugal force developed by revolving the armature propels the air through with great rapidity, and forms an automatical air-compression device, operating somewhat after the manner of a blower. This mode of constructing the armature and arranging the air-passages so as to keep a current of air passing at all times through and between the transverse and radial coils is very important, and effects a thorough ventilation of the armature.

O, Fig. 4, represents the preferred form of



constructing the hubs, the disks C being made of a separate piece of metal from that of disks C', and secured thereto by screws or bolts.

The armature could be made of skeleton form without the diamagnetic core B and still embrace the features of invention specified in the first three clauses of claim herein.

I claim—

1. An armature composed of a series of rings, D, having air-spaces *e*, in combination with air-spaces N and M between the rings and coils and core, for conducting currents of air endwise into the interior of the armature and discharging it radially outward, substantially as herein set forth.

2. A dynamo or magneto electric machine provided with disks F, inclosing the ends of the armature, having air-orifices H at or near the axis, and with air-passages N and M between the rings or coils and core for carrying the air through the armature-coils and discharging it radially outward through spaces *e*, substantially as herein set forth.

3. An armature composed of the diamagnetic core B, having air-spaces N, arranged longitudinally along periphery of the core B and between the rings or coils and core, in combination with the rings D, having air-spaces *e* between them, and the disks F, inclosing the ends of coils I, with the air-orifices H near the axis A, substantially as herein set forth.

4. In an armature for a dynamo or magneto electric machine, the metallic disks F, inclosing the ends of the coils of the armature, provided with the radial seam G, for preventing the circulation of the induced currents, substantially as herein set forth.

In testimony whereof I have hereunto set my hand.

EDGAR A. EDWARDS.

Witnesses:

JOHN S. BALDWIN,  
ANNA EDWARDS.