(No Model.)

2 Sheets—Sheet 1.

W. THOMSON.

DYNAMO ELECTRIC MACHINE.

No. 333,174. Patented Dec. 29, 1885.

Fig. 2.

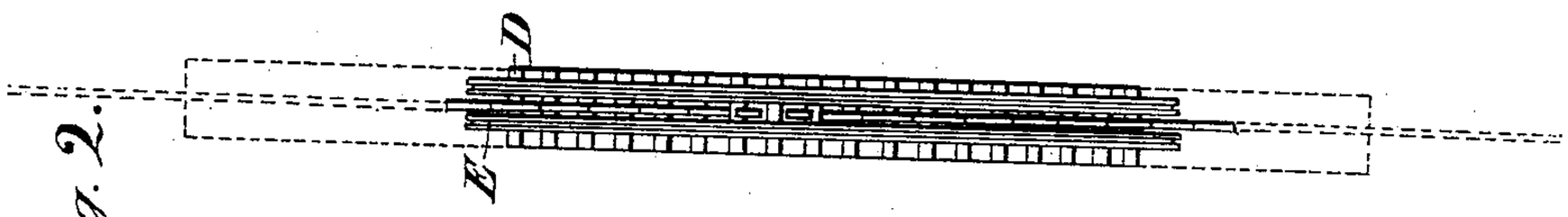
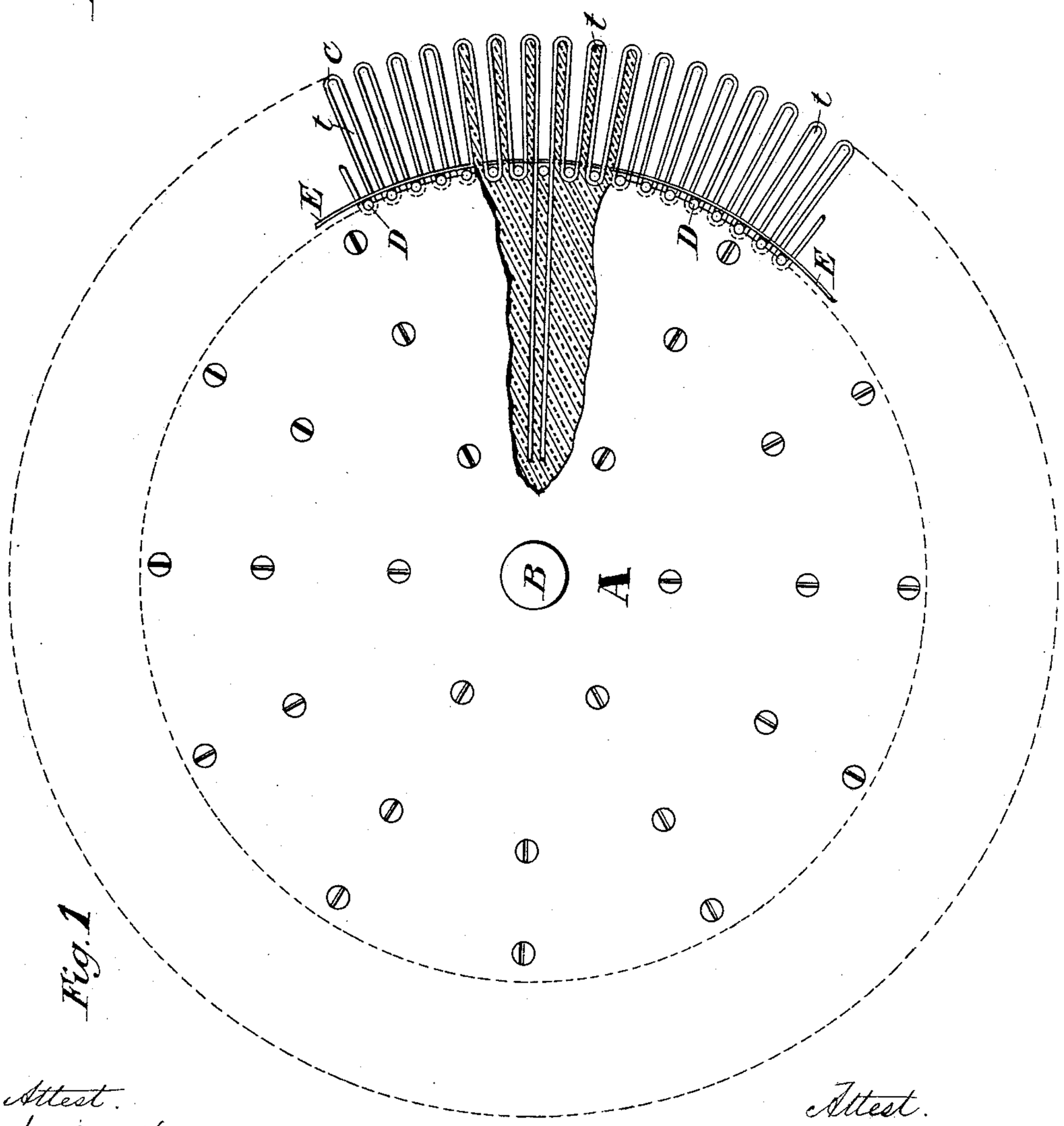


Fig. 1



Attest.
Wm Sayers
H. B. Knight

Attest.
William Thomson
By Knight Bros.
attys

(No Model.)

2 Sheets—Sheet 2.

W. THOMSON.

DYNAMO ELECTRIC MACHINE.

No. 333,174. Patented Dec. 29, 1885.

Fig. 4.

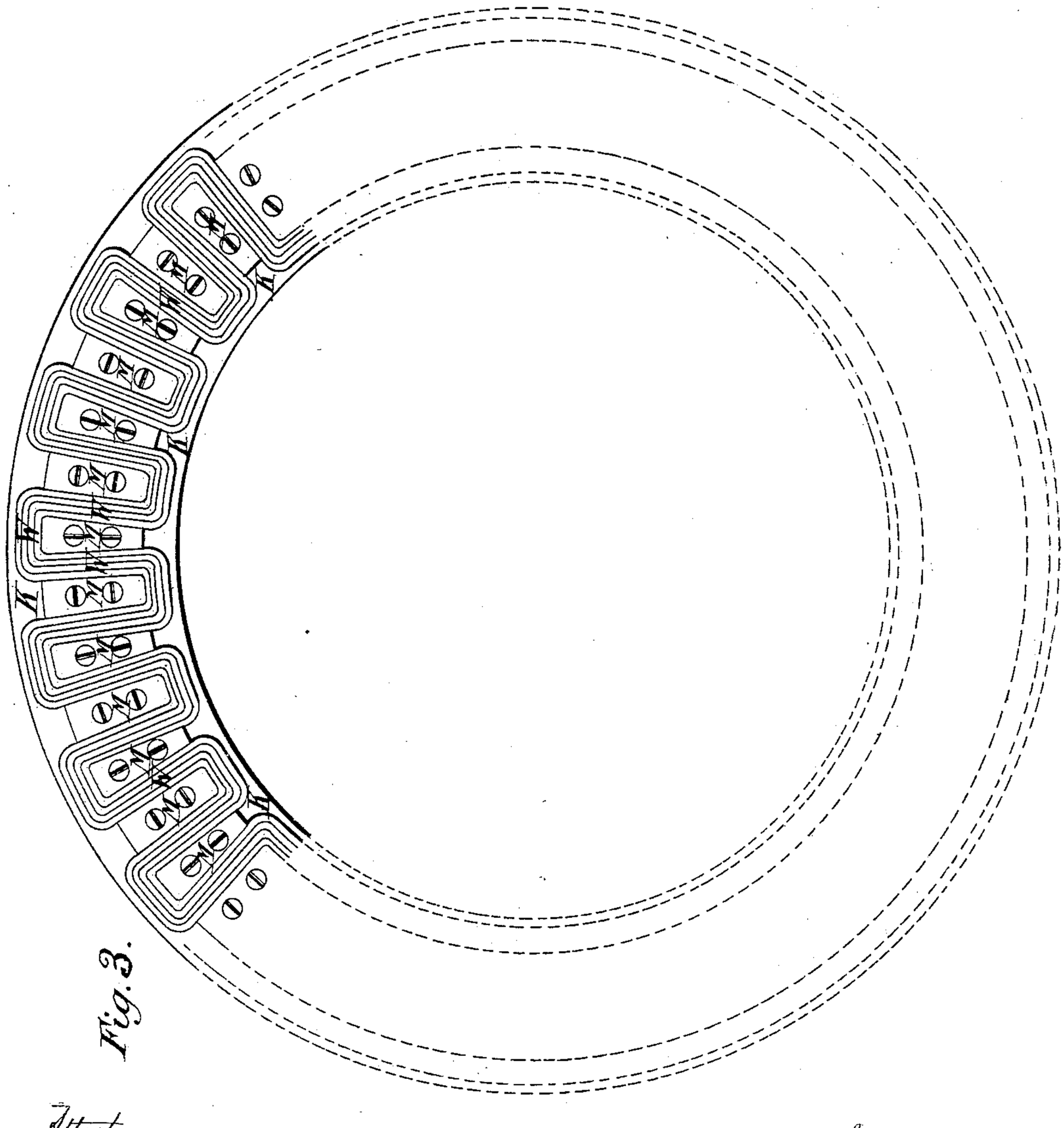


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM THOMSON, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 333,174, dated December 29, 1885.

Application filed December 21, 1882. Serial No. 79,814. (No model.) Patented in England December 26, 1881, No. 5,668; in France June 26, 1882, No. 149,772; in Belgium July 7, 1882, No. 58,404; in Italy November 14, 1882, No. 14,756; in Portugal November 21, 1882, No. 793, and in Spain April 20, 1883, No. 854.

To all whom it may concern:

Be it known that I, Sir WILLIAM THOMSON, knight, of Glasgow College, doctor of laws and professor of natural philosophy in the University and College of Glasgow, in the county of Lanark, Scotland, have invented certain Improvements in Dynamo-Electric Machines, (for which I have received the following Letters Patent: Great Britain and Ireland, No. 5,668, dated December 26, 1881; Belgium, No. 58,404, dated July 7, 1882; France, No. 149,772, dated June 26, 1882; Italy, No. 14,756, dated November 14, 1882; Portugal, No. 793, dated November 21, 1882, and Spain, No. 854, dated April 20, 1883,) of which the following is a specification.

My invention consists in a machine having an armature composed of a wooden disk with radial projections from its periphery and a conductor wound in a zigzag manner in and out of the corrugations formed by the said projections.

In the accompanying drawings, Figure 1 is a side view of the armature; Fig. 2, an edge view thereof; Fig. 3, a face view of the field-magnet, and Fig. 4 a section of the same.

The armature consists of a wooden disk, A, with projecting radial teeth *t*, the whole mounted on an axle, B. A flat strip of copper or a square copper wire, C, bent round the teeth *t* to the form shown in the drawings, is fastened to the edge of the disk A in the manner hereinafter described, and having its two ends passing in toward the center of the disk to two contact-pieces arranged in any well-known way.

The fastening of the conductor C is effected in the following manner: A sufficient number of notches are cut across the edge of the disk A to form the teeth *t* and receive the bends of conductor C. The conductor C being placed in position wooden pins D are then laid in the notches over the conductors, the pins being of such a length as to project a little beyond the surface of each side of the disk A. A stout steel wire, E, is then passed two or three times round the edge of the disk A on each side of the square wire C, and so serves the purpose of pressing each wooden pin into its notch, in that way binding the conductor more firmly to the edge of the disk with strength enough to resist centrifugal force.

The above-described armature is adapted to be rotated in the face of the fixed field-magnet hereinafter described, and two or more of them may be mounted on the same shaft with interval enough for the field-magnets, and be connected up in series or multiple arc or used separately, as desired.

When greater electro-motive force and less resistance are required, the zigzag may be made multiple of strip-copper, as hereinafter described with reference to the construction of the field-magnets, Figs. 3 and 4.

The hereinbefore-described form of armature is well adapted for an alternating-current machine, the magnetic fields by which the radial portions of the moving conductor are excited being produced either by fixed steel magnets or by fixed electro-magnets giving alternate areas of red and blue (true south and true north) magnetic polarity on the two sides of the space in which the radial bars move.

When electro-magnets are used, I arrange them, as shown in Figs. 3 and 4, so that each straight radial part of the conductor W serves to excite the soft iron of two contiguous electro-magnets, M M. A flat annular cast-iron ring, K, is provided, having suitably-shaped pieces of soft iron, M M, bolted or screwed, as shown, on its surface. A flat strip of sheet-copper or a considerable number of mutually-insulated flat strips are then bent so as to pass around these soft-iron blocks M M in a zigzag manner, as shown in Figs. 3 and 4, and with the breadth of the strips W everywhere perpendicular to the surface of the ring K. A sufficient number of such copper strips W, insulated from each other and from the iron blocks M M and ring K, are joined in series from the exciting-conductor. When several armatures are mounted on one shaft, the intermediate magnets have both their ends operating and are fixed in their places without the iron ring K.

In this form of dynamo a separate exciter must be used, and any convenient form of brush may be adopted.

I claim as my invention—

1. The combination, in a rotary armature for dynamo-electric machines, of wooden disk A, radial teeth *t*, and zigzag conductor C, substantially as described.

2. The combination of disk A, teeth *t*, conductor C, pins D, and binding-wire E, substantially as described.

3. The combination of a series of soft-iron cores, M, and inclosing insulated conductor W, wound in a zigzag, as described, whereby the adjacent cores are oppositely and the alternate cores similarly polarized.

4. The combination of ring K, cores M, and zigzag conductor W, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM THOMSON.

Witnesses:
ST. JOHN VINCENT DAY,
ROBERT ADAM GUNN,
Both of 115 *St. Vincent Street, Glasgow.*