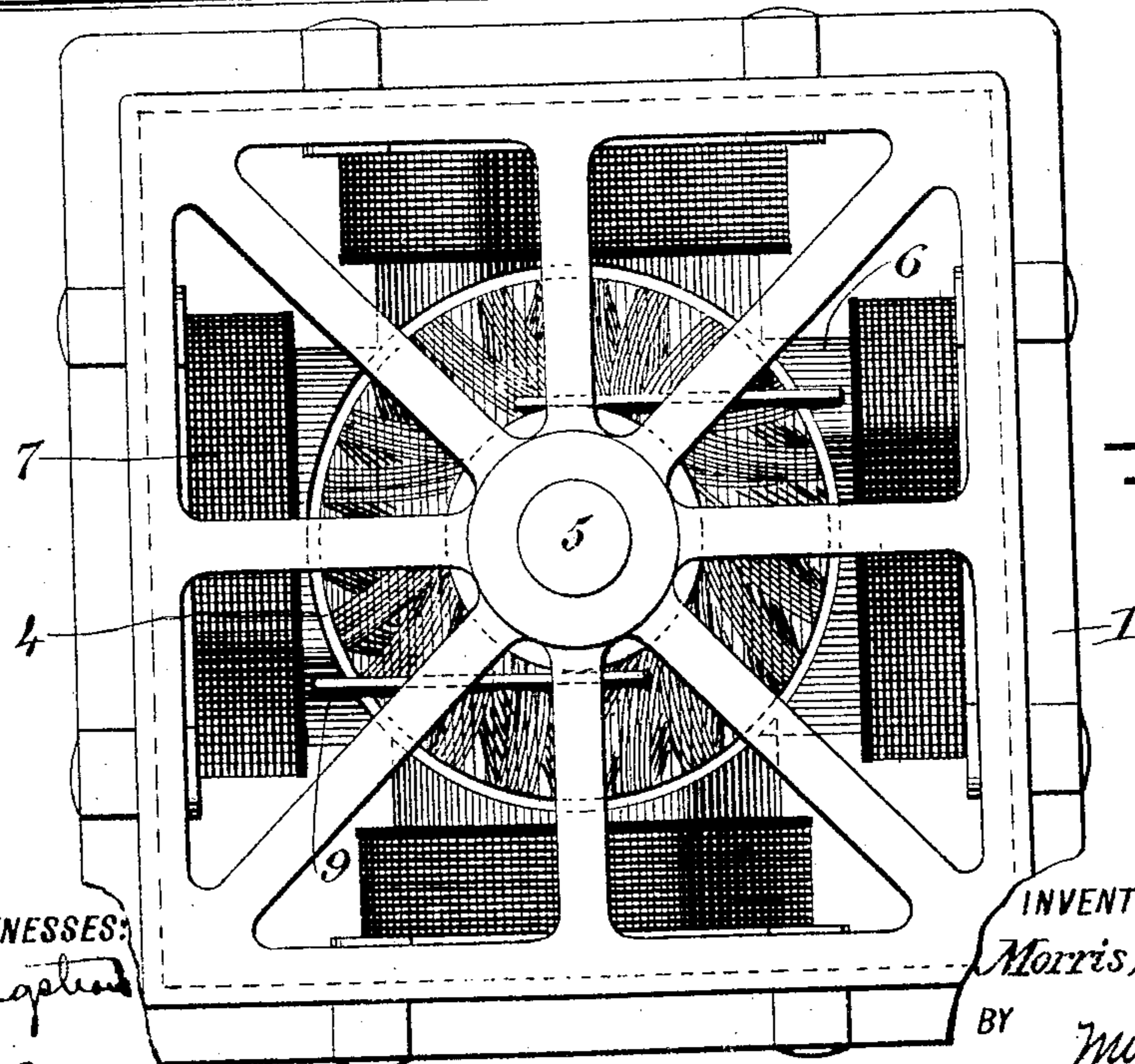
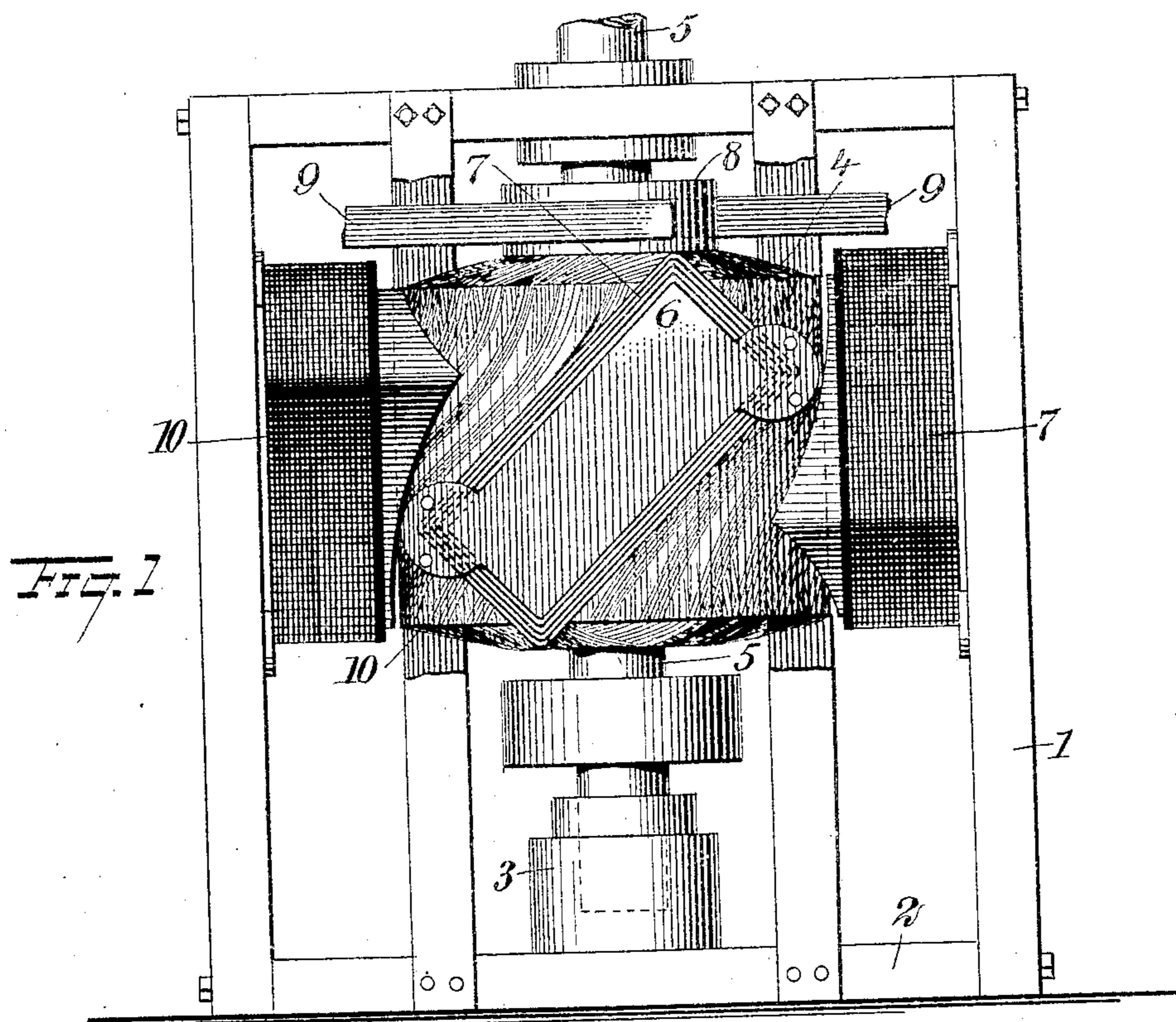


No. 804,628.

PATENTED NOV. 14, 1905.

M. SCHWARTZ.  
ELECTRICAL GENERATOR.  
APPLICATION FILED MAR. 7, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

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*J. D. Ammen*

INVENTOR

*Morris Schwartz*

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*Munn*  
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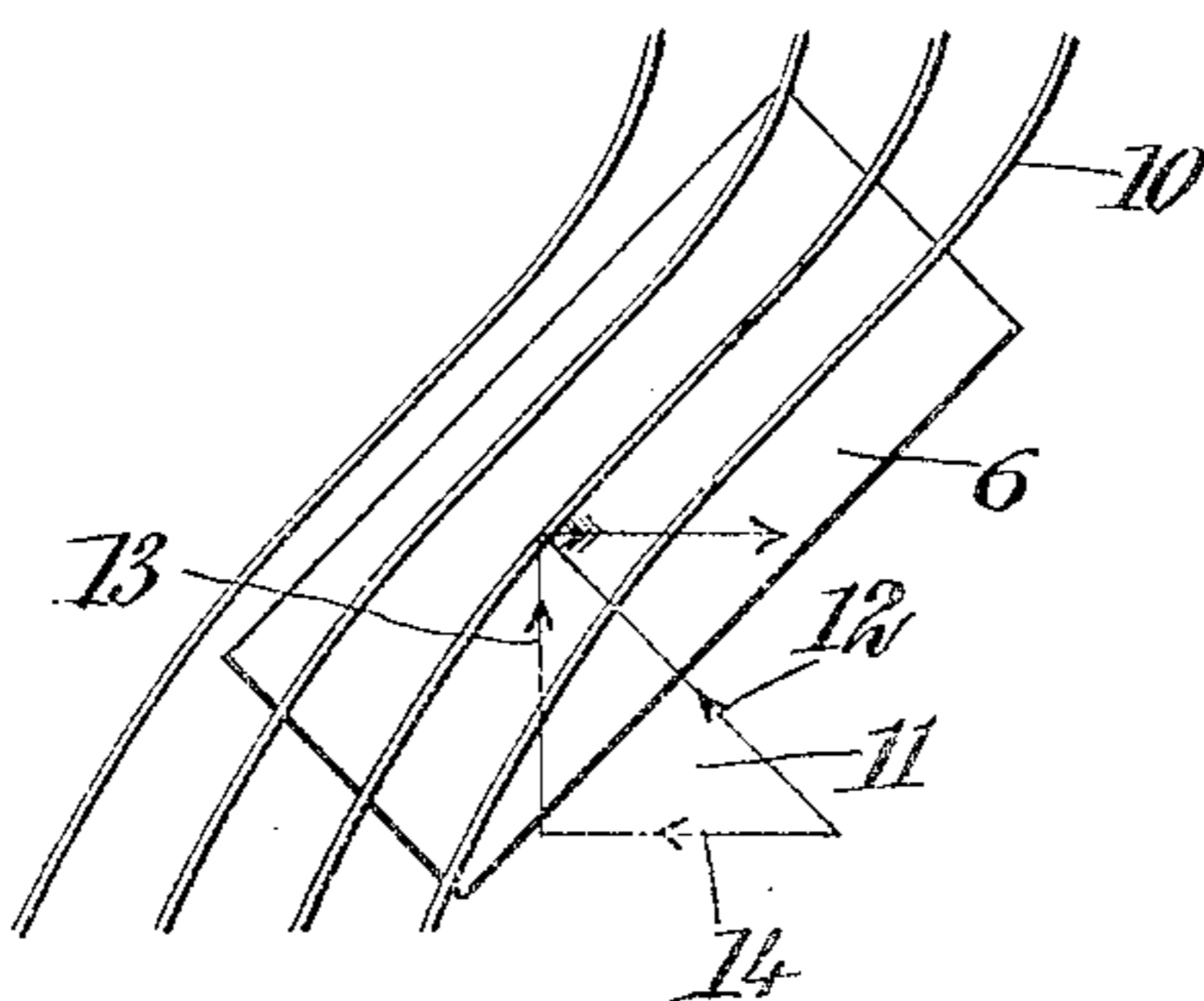
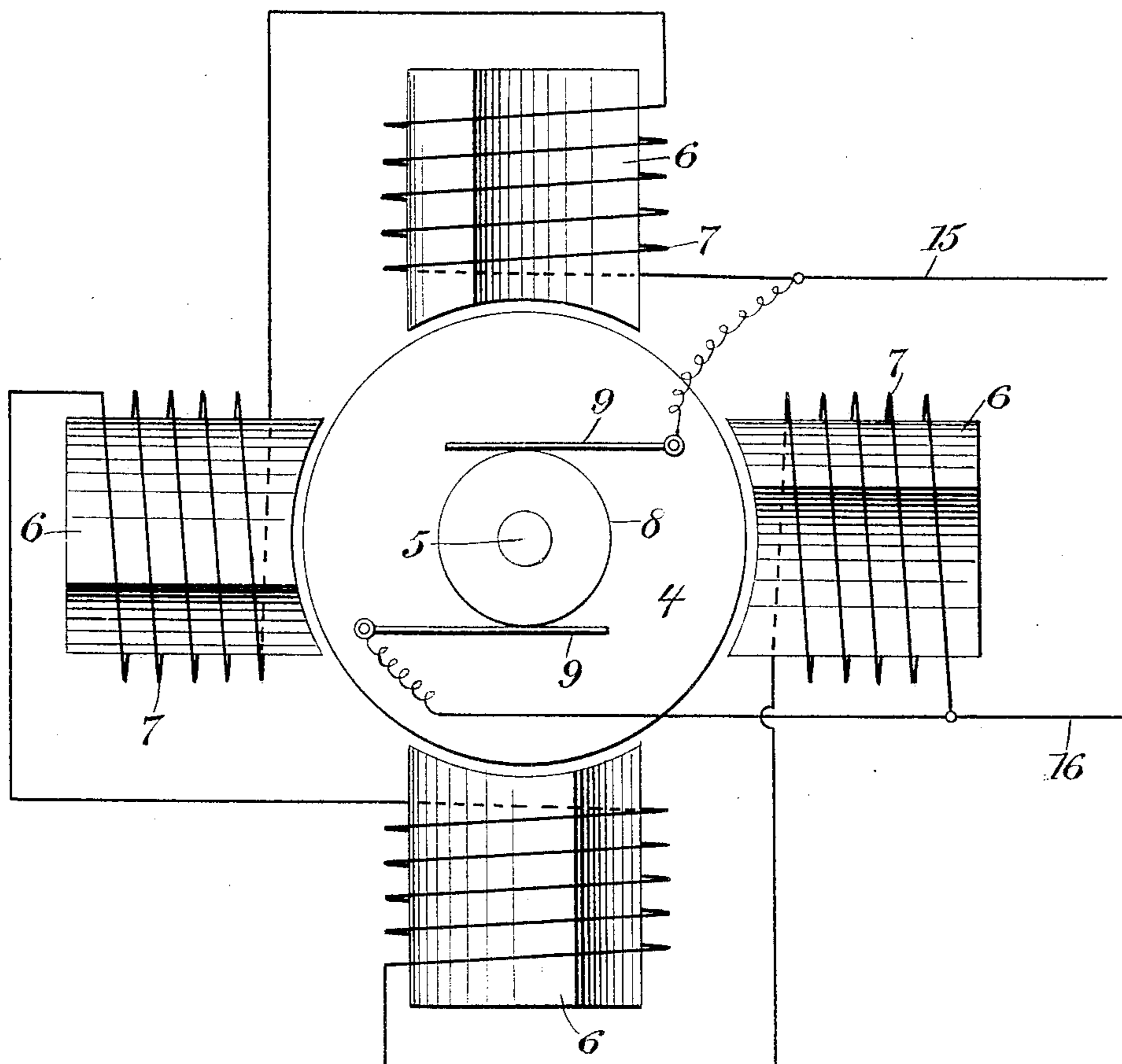
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2 SHEETS—SHEET 2.

Fig. 3



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Fig. 4

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# UNITED STATES PATENT OFFICE.

MORRIS SCHWARTZ, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO NEW YORK ELECTRICAL GENERATOR COMPANY, OF NEW YORK, N. Y.

## ELECTRICAL GENERATOR.

No. 804,628.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed March 7, 1905. Serial No. 248,889.

*To all whom it may concern:*

Be it known that I, MORRIS SCHWARTZ, a subject of the King of Roumania, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Electrical Generator, of which the following is a full, clear, and exact description.

This invention relates to electric generators; and the object of the invention is to produce a generator which will have a high efficiency and which will be saving in the conversion of the mechanical energy into electromotive force.

More specifically, the invention concerns itself especially with the construction and method of wiring of a dynamo-electric machine.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an elevation of a generator embodying my invention, certain parts being shown broken away and in section. Fig. 2 is a plan of the generator shown in Fig. 1, certain parts being broken away. Fig. 3 is a plan showing the general arrangement of the poles, and Fig. 4 is an elevation of the forward face of a pole-piece and representing the manner in which the conductors of the armature are disposed as they pass the face of the pole-piece.

In the drawings the views are largely diagrammatic.

Referring more particularly to the parts, and especially to Figs. 1 and 2, 1 represents a frame of any common construction, provided with a base 2, upon which is mounted a suitable step-bearing 3, which supports an armature 4, mounted upon a vertical shaft 5, as indicated. As shown in Fig. 2, the frame 1 is preferably substantially square in form, and each side is provided with a pole-piece 6, which projects inwardly on the armature 4. These pole-pieces are substantially rectangular in cross-section, as indicated most clearly in Figs. 1 and 4. They are disposed with their major axes inclined at an angle to the horizontal of substantially forty-five degrees. The forward faces of these pole-pieces are preferably cut away, so that they conform substantially to the form of the armature-body. These pole-pieces 6 are provided with

a winding 7, enabling them to be excited by the passage of a current in the usual manner. At the upper extremity of the armature a commutator 8 is formed, with which brushes 9 cooperate in the usual manner.

The theory of this generator is most clearly illustrated in Figs. 3 and 4. Referring now to these figures, and especially to Fig. 4, it should be stated that the armature 4 is wound with conductors 10, which are disposed in helices upon the body of the armature, as indicated most clearly in Figs. 1 and 4. The windings of the armature and their arrangement with respect to the poles is indicated most clearly in Fig. 4, where it will appear that the bodies of the conductors 10 are inclined with respect to the direction of rotation and are disposed substantially parallel with the major transverse axis of the pole-piece as they pass its face. The direction of rotation is such as that indicated by the arrow in Fig. 4. By this arrangement the effectiveness of the lines of force cut by the moving conductor is greatly increased, and a high electromotive force is developed in the armature-winding. The relation of the forces acting upon any conductor as it passes the pole-face is illustrated at 11 in Fig. 4, where the line 12 represents the drag or electrical resistance to the movement of the conductor. As shown, this force is exerted substantially at right angles to the direction of the conductor. Hence this force will be exerted upwardly, as indicated by the arrow upon the line 12. This force 12 may, of course, be resolved into a vertical force represented by the line 13 and the horizontal drag force by the line 14. The horizontal force 14 then becomes the effective drag force. Thus it follows that while the lines of force are cut at unreduced or even increased rate, the resulting effective drag force is minimized. It will also appear that the force 13, which is exerted in a vertical and upward direction, tends rather to reduce the resistance than to increase the same, so that a benefit is derived from this arrangement in this respect. It will readily appear, of course, that as this force opposes the action of gravity upon the armature the step-bearing 3 will be relieved of a portion of the weight of the armature. In this way the principal frictional resistance is reduced.

The advantages suggested are derived solely from the peculiar inclination of the pole-pieces

in connection with the helical winding of the armature, and it is, of course, immaterial how the poles are excited or in what manner the armature may be formed. The armature may  
5 be a ring-armature or a drum-armature, or, in fact, it may be of any well-known type having the required winding.

In Fig. 3 the rectangular pole-pieces 6 are illustrated as being four in number and arranged oppositely. There may, of course, be  
10 as many of these poles as desirable, but they should always have the general form shown, and each pole should be set, as indicated in Fig. 4, with respect to the axis of the arma-  
15 ture.

The winding of the generator may be what is known as a "shunt-winding," such as that indicated in Fig. 3, where 15 and 16 represent the conductors of the main.

20 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An electric generator having an armature

mounted to rotate on a vertical axis, said armature having helically-wound conductors whereby said conductors incline, and pole-  
25 pieces having their axes inclined whereby they are substantially parallel with the adjacent parts of said conductors.

2. An electric generator having an armature mounted to rotate with a vertical shaft and  
30 having conductors wound in an inclined direction thereupon, elongated pole-pieces having their major axes inclined, and means for rotating said armature in the direction in which said major axes inclined upwardly, whereby  
35 the drag upon said conductors is exerted in an upwardly-inclined direction.

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

MORRIS SCHWARTZ.

Witnesses:

F. D. AMMEN,

JNO. M. RITTER.