(No Model.)

C. F. WINKLER.

DYNAMO ELECTRIC MACHINE.

No. 412,349. Patented Oct. 8, 1889.

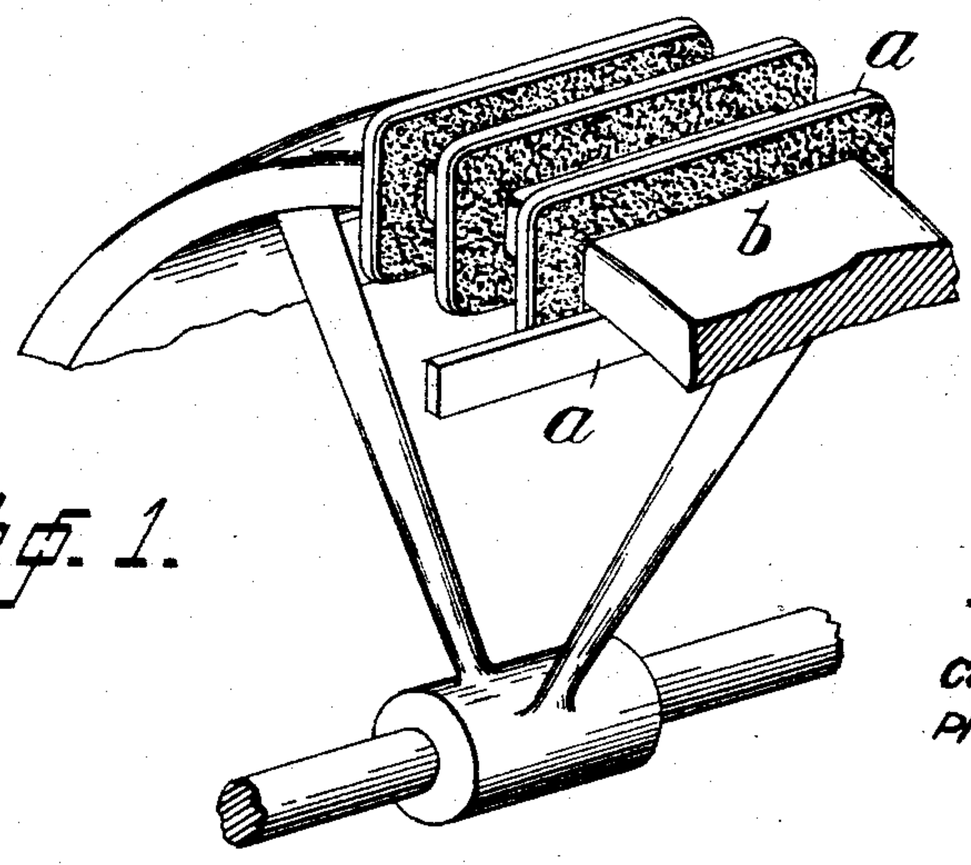


Fig. 1.

Fig. 5.

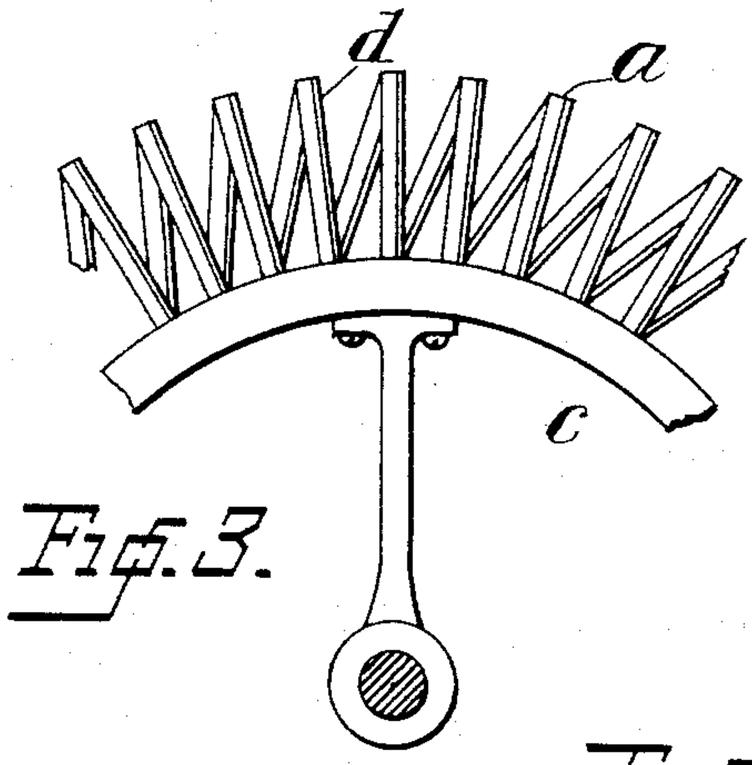


Fig. 3.

Fig. 4.

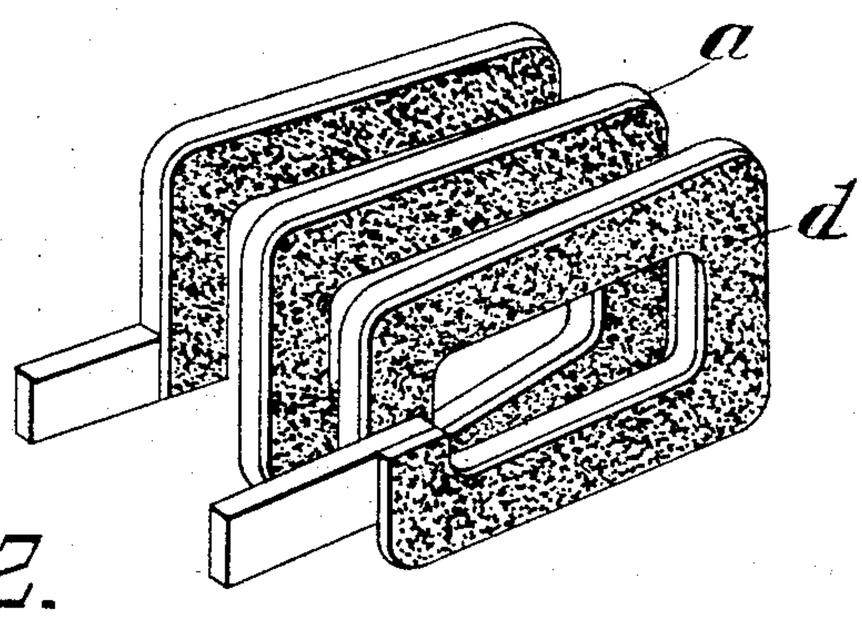
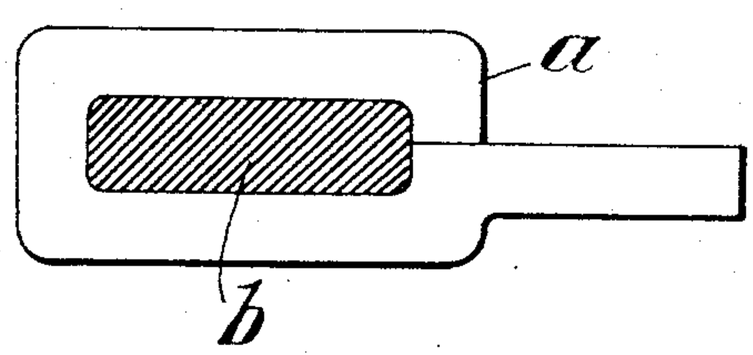


Fig. 2.



WITNESSES:

Will A. Courtland

Wm A Rosenbaum

INVENTOR

Charles F. Winkler

BY

W. J. Johnston

ATTORNEY

UNITED STATES PATENT OFFICE.

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

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,349, dated October 8, 1889.

Application filed January 26, 1889. Serial No. 297,661. (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 Dynamo-Electric Machines and Motors, of which the following is a specification.

My invention relates to dynamo-electric machines and motors; and it consists of improvements in the armatures of the same.

The construction will be described with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of my improved armature, showing one section of the winding. Fig. 2 represents a section through the ring. Fig. 3 represents a side elevation of a portion of the armature, showing modified manner of supporting the same. Fig. 4 represents a detail view, in perspective, of the electro-magnetic portion of the armature; and Fig. 5 represents a cross-section of the conductor, showing the same copper-plated.

In my improved armature I do not use a magnetic core of the description heretofore used—that is to say, a separate ring of iron.

My magnetic core and electrical conductor are embodied in one and the same body. In other words, I provide an electric conductor of soft iron. It therefore serves the double purpose of magnetic and electric conductors. I am aware that iron is not so good a conductor of electricity as copper, and to make up for the difference in conductivity of the two metals I make my iron armatures of much larger cross-section than would be required to carry an equal amount of current on a copper conductor.

One of the objects of my invention is to provide a machine which will generate a heavy current at low electro-motive force, and to accomplish this I increase the cross-section of the iron conductor even more than is necessary to compensate for the lack of conductivity of iron. Where the cross-section is so great and the induced current has such free outlet, it is impossible (within limits) to generate a current which is dangerous to handle.

Another object I have in view is the production of a machine whose work is interfered with by eddy or Foucault currents as little as possible. Eddy currents are set up and become injurious by reason of the great amount of iron in the usual magnetic core. To dissipate such currents it has been proposed to laminate this core. I accomplish the same effects which laminations would produce by making my magnetic core in the form of a spiral, which, so far as the effects of cutting the lines of force are concerned, are the same as the effects produced by laminations.

Referring to the accompanying drawings by letter, *a* represents the combined electric and magnetic conductor of my armature. This conductor is of soft iron and in cross-section is rectangular. It is in the form of a ribbon of more or less diameter, according to the size of the machine. In Fig. 1 I have shown this conductor wound upon a core *b*, of wood. This construction will stiffen the armature to some extent, but is not deemed necessary, inasmuch as the form shown in Fig. 3 might be used with perhaps equal efficiency. Fig. 3 shows the coils standing upon edge on the outside of a wooden cylinder *c*, supported by means of a spider from the shaft. One side of the convolutions of the conductor is covered by a sheet of insulating material *d*. This prevents electrical connection between the adjacent convolutions. The iron ribbon serving both as the electrical conductor and magnetic conductor, I eliminate to the greatest extent the Foucault or eddy currents. This having been accomplished, it follows that it requires less power to produce a given efficiency. The extreme cross-section of the ribbons or strips also renders it impossible to burn out the coils. It will be observed, further, that there is no extensive insulation of conductors. The edges of the plates or strips are not covered with insulation at all, and this fact, besides cheapening the construction, also enables me to bring the iron of the armature closer to the poles. The periphery of the armature is composed of the alternate bare edges of the conductor and the edges of the insulation.

In some sizes of machines, in order to proportion the electrical conductivity to the mag-

netic conductivity, it may be necessary to plate the iron conductor with copper to a greater or less thickness. This will increase the electrical conductivity. This idea is illustrated in Fig. 5.

Having thus described my invention, I claim—

1. An armature for dynamos or motors, consisting of coils or convolutions of flat plates, strips, bars, or ribbons of iron, in combination with a core for supporting the same, formed of wood or other non-conducting material upon which said conductors are wound.

2. In a dynamo or motor, an armature provided with a core of wood or other non-electro-magnetic material, in combination with a conductor wound thereupon, consisting of a continous flat strip of iron having secured to one of its sides a flat strip of insulating material, the said conductor being wound on edge, substantially as and for the purpose described.

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

CHARLES F. WINKLER.

Witnesses:
WILLIAM L. HALL,
HENRY S. PRUYN.