

(No Model.)

2 Sheets—Sheet 1.

C. COERPER.  
DYNAMO ELECTRIC MACHINE.

No. 402,066.

Patented Apr. 23, 1889.

fig. 1.

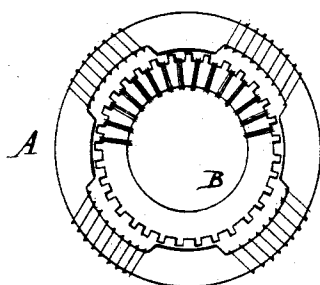


fig. 2.

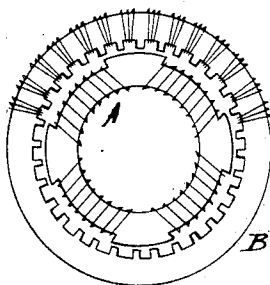


fig. 3.

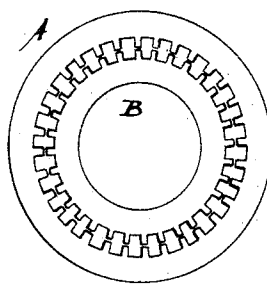


fig. 4.

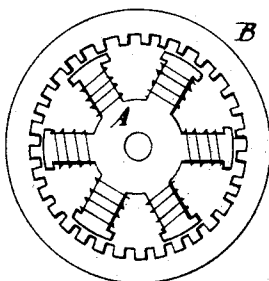


fig. 5.

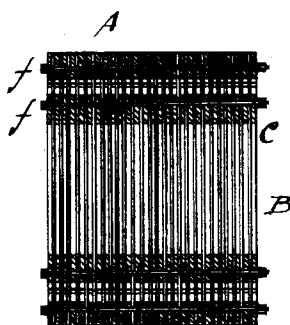


fig. 6.

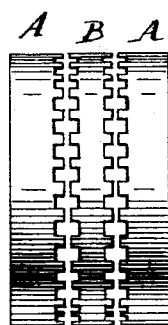
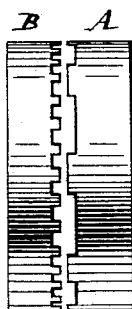


fig. 7.



WITNESSES:

*Hennig Huber.*  
*Carl Marx*

INVENTOR.

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BY *Goepel & Raegen*  
ATTORNEYS.

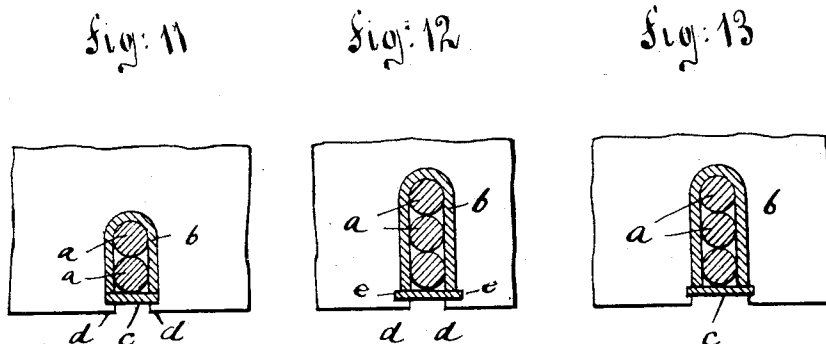
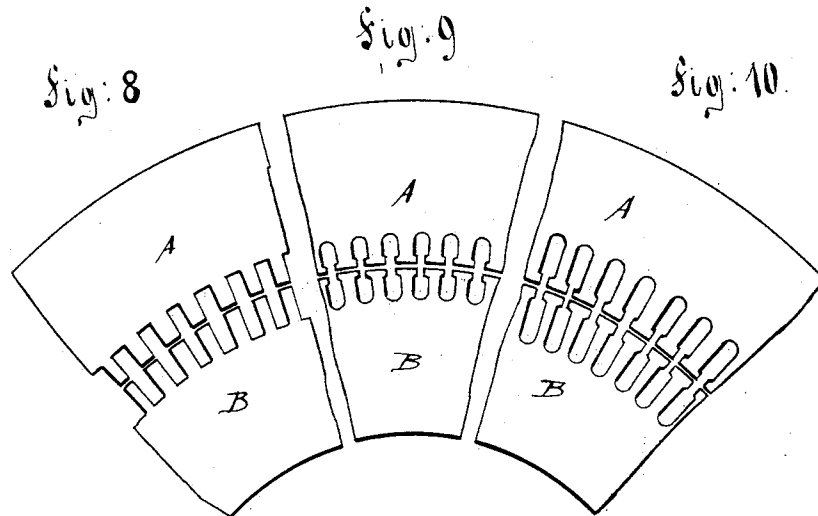
(No Model.)

2 Sheets—Sheet 2.

C. COERPER.  
DYNAMO ELECTRIC MACHINE.

No. 402,066.

Patented Apr. 23, 1889.



WITNESSES:

*Henry Huber*  
*Carl Kuep*

INVENTOR

*Carl Coerper*

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*Goesel Paegner*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

CARL COERPER, OF EHRENFELD, NEAR COLOGNE-ON-THE-RHINE, PRUSSIA, GERMANY, ASSIGNOR TO THE HELIOS ACTIEN-GESELLSCHAFT FÜR ELEKTRISCHES LICHT UND TELEGRAPHENBAU, OF SAME PLACE.

## DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 402,066, dated April 23, 1889.

Application filed July 19, 1887. Serial No. 244,717. (No model.) Patented in France June 22, 1887, No. 184,384; in England June 24, 1887, No. 9,013; in Belgium June 28, 1887, No. 77,982, and in Italy August 31, 1887, XXI, 21,986, XLIII, 352.

*To all whom it may concern:*

Be it known that I, CARL COERPER, a subject of the King of Prussia, Germany, residing at the city of Ehrenfeld, near Cologne-on-the-Rhine, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Dynamo-Machines, (which heretofore were patented to me by the governments of England, dated June 24, 1887, No. 9,013; Italy, dated August 31, 1887, Vol. XXI, No. 21,986, and Vol. XLIII, No. 352; Belgium, dated June 28, 1887, No. 77,982, and France, dated June 22, 1887, No. 184,384,) of which the following is a specification.

In case dynamo-electric machines are used for transmitting power by means of alternating currents, the masses of iron are heated to quite a high degree by the repeated changes of polarization. As long as the dynamo-machine is not working with its full or normal revolutions, which is always the case in the beginning of the operation or when the machine is subjected to a greater strain than it is adapted to, these changes of current affect the field-magnets as well as the armature. This causes heating and consequent loss of power.

The object of my invention is to reduce this heating and consequent loss of power to a minimum, which I obtain by making the cores of the field-magnets as well as of the armature of a series of thicknesses of sheet-iron, which are placed side by side and united by suitable devices, said pieces of sheet metal having notches to receive the wires.

The invention also consists in the construction and combination of parts and details, as will be fully described and set forth hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of an external field-magnet and internal armature made according to my improved method, the wire being partly omitted. Fig. 2 is an end view of an external armature and an internal field-magnet made according to my improved method. Fig. 3 is an end view of an external field-magnet with internal armature of my improved construction.

Fig. 4 is an end view of the external armature and internal field-magnet of my improved construction. Fig. 5 is a cross-sectional view of my improved field-magnet and internal armature. Figs. 6 and 7 are side views of a field-magnet and armature side by side. Figs. 8, 9, and 10 are detail views showing the manner of forming the notches in the plates. Figs. 11, 12, and 13 are detail cross-sectional views showing the notches in the plates, the wires in the notches, and the insulating-pieces surrounding the wires.

Similar letters of reference indicate corresponding parts.

The cores for the field-magnets A and for the armature B are composed of a series of sheet-iron rings, C, Fig. 5, placed side by side and held together by bolts *f*, passed transversely through the several thicknesses of sheet-iron; or said several thicknesses of sheet-iron can be held together by any suitable clamping devices.

As shown in Fig. 1, the core A for the field-magnet is provided in its inner edge or side with notches or recesses for receiving the wires, said notches or recesses being provided in the sheet-iron rings before the same are united. The core B for the armature is provided in its edges with like notches for receiving the wires.

As shown in Fig. 2, the notches of the armature are on the inside and the notches for the field-magnet are on the outside.

As shown in Fig. 3, the notches of the field-magnet are on the inside and those of the armature-core on the outside, the notches of the field-magnet core and armature being about the same size.

As shown in Fig. 4, the core of the field-magnet is constructed with radial arms, around which the wires are wound, said core being also composed of layers of sheet metal. In place of forming the said core of sheet metal side by side, it may be formed in the shape of concentric rings, on which the wires are wound, as in Figs. 6 and 7.

In Fig. 6 an armature B is shown between two field-magnets A, and in Fig. 7 the arma-

ture-core B is shown at one side of the field-magnet core A. As stated, all these cores are provided with notches on which the wires are wound, as in the Weston machine. This construction to a certain extent is defective, especially when the armature is on the inside, as the wires are apt to spread outward, and it is very difficult for them to be held in place, and it is also more or less difficult to wind them on the core. The sheet-metal teeth between the notches are decreased in size considerably and the effectiveness of the machine is decreased. In order to avoid these defects, the notches are formed as shown in Figs. 9 and 10—that is, they are widened a short distance back of the edge, so that the notches serve to retain the wires—while the tooth portion between the notches is enlarged, as is also the space for the wires. Tongues *d d* project toward each other at the open ends of the notches, and the distance between the adjacent ends of said tongues is of such size that a wire can easily be passed in between them. A piece, *b*, of insulating material is placed in the notch, and into this insulating-piece the wires *a a* are passed, and then a cross-piece, *c*, is inserted between the inner edges of the tongues *d d* and the outer ends of the pieces of insulating material *b*, as shown in Fig. 11.

If desired, notches *e e* may be formed at the inner edges of the tongues *d d* for receiving the ends of the piece *c*, as shown in Fig. 12, whereby said pieces are held more securely in position.

As shown in Fig. 11, the tongues *d d* are flush with the inside of the insulating-piece *b*, and a short distance from the edge of the same, the space between the same forming a notch for receiving a piece, *c*, for holding the wires in place.

As shown in Fig. 13, the width of the notch is the same throughout.

As shown in Figs. 11, 12, and 13, the notches may be made for two or more wires, as may be required.

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

1. In a dynamo-electric machine, an armature-core provided with notches for receiving the wires, tongues projecting toward each other at the open ends of said notches, and cross-pieces supported by said tongues, substantially as shown and described.

2. In a dynamo-electric machine, an armature-core having notches in its rim, which notches have their width increased a short distance from their outer ends, and insulating-pieces in said notches, which insulating-pieces serve for receiving the wires, substantially as shown and described.

3. In a dynamo-electric machine, the combination, with an armature-core provided with notches, of insulating-pieces in said notches, tongues at the open ends of said notches, and cross-pieces for retaining the wires in place in the insulating-pieces, substantially as shown and described.

4. In a dynamo-electric machine, the combination, with an armature-core having notches and tongues at the outer ends of said notches, of insulating-pieces in said notches, and cross-pieces at the open ends of the notches for retaining the wires in place in the notches, said cross-pieces resting on the inner edges of the tongues, substantially as shown and described.

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

CARL COERPER.

Witnesses:

E. KOCH,

E. SCHWABE,

*Both of Ehrenfeld.*