

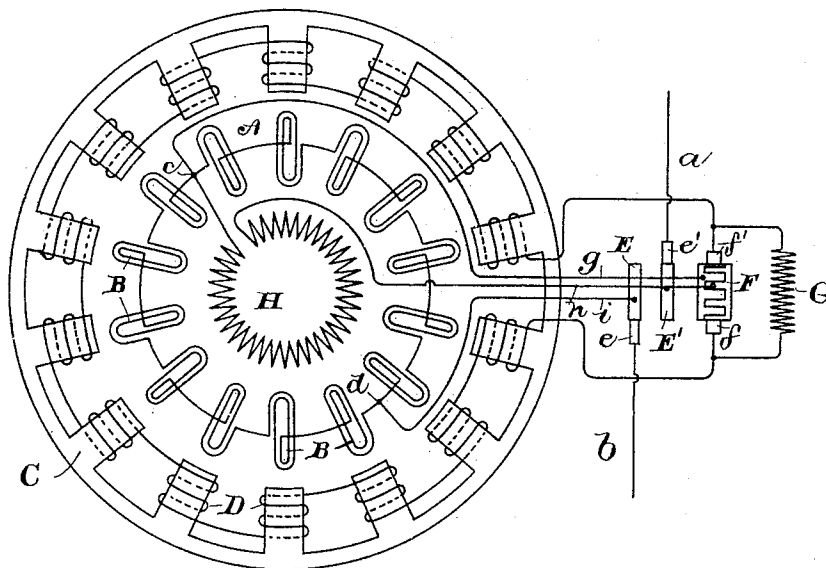
(No Model.)

A. EKSTRÖM.

ALTERNATING CURRENT DYNAMO ELECTRIC MACHINE.

No. 533,873.

Patented Feb. 12, 1895.



WITNESSES.

A. F. Macdonald.

S. Johnson.

INVENTOR

Axel Ekström.

Geo. R. Blodgett.

Att'y.

UNITED STATES PATENT OFFICE.

AXEL EKSTROM, OF LYNN, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF BOSTON, MASSACHUSETTS.

ALTERNATING-CURRENT DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 533,873, dated February 12, 1895.

Application filed July 26, 1894. Serial No. 518,661. (No model.)

To all whom it may concern:

Be it known that I, AXEL EKSTROM, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Alternating-Current Dynamo-Electric Machines, of which the following is a specification.

My invention relates to alternating current dynamo-electric machines; and has for its object to provide a means of compounding such machines which shall obviate some of the objections incident to present arrangements.

It is well known that in the construction of alternators a portion of the current of the machine must be passed through a commutator and thence around the field-magnets, in order to compound them for the proper rise of potential under increase of load. This operation, simple in principle, is difficult in practice, because, where the entire current is commuted, the sparking at the commutator is so great as to destroy its surface, and the number of segments of the commutator being necessarily small, the act of commutation has to deal in each case with very large current. It has been the practice to put a shunt around the commutator of such resistance as to force through the commutator just the proportion of exciting current deemed desirable by the designer; but in practice it is objectionable to make this shunt of sufficient size to take the amount of current required to save the commutator contacts.

It is to obviate these difficulties that I have devised my invention, which consists in adding to the present arrangement a second auxiliary shunt of considerable capacity inserted between one terminal of the armature windings, the collecting ring and the commutator, in the manner hereinafter described, by which the larger portion of the current is carried direct to the collecting ring without passing through the commutator or the outside shunt. This shunt I prefer to arrange upon the armature itself, and thus avoid sliding connections of any kind.

The accompanying drawing shows a diagrammatic representation of my invention. 50

A is the armature, of which B, B are the coils.

C is the field-magnet system, D being the windings thereon. I have illustrated only the series winding upon the coil, but it is to be understood that the usual separate exciter is employed so as to provide the machine with the compound field necessary. 55

E, E' are the collecting rings, of which e, e' are the brushes. 60

F is the commutator provided with the brushes f, f', and G is the outside shunt commonly employed. 65

g, h, i are the leads to the armature coils and interior shunt respectively. 70

a, b are the mains.

c, d are the terminals of the armature coils.

H is the revolving shunt carried by the armature. 75

The construction and operation of the machine will be readily understood from the foregoing description. 80

The coils of the armature, as illustrated in the drawing, are in multiple. From the terminal d the lead i goes to the collecting ring E, the current passing over the line b. The path from the terminal d through the armature coils is in multiple to the other terminal c from which point it has two paths provided, one by the lead g direct to the commutator, the other through the shunt H and by the lead h to the collecting ring E'. The current passing in the commutator and through the shunt G goes around the field-magnet coils from the brush f', for instance, and thence returns to the brush f and by the lead h from the commutator to the collecting ring E' and the line a. 85

As thus illustrated and described, I provide a path for part of the current which avoids the commutator altogether; and the resistances of the two shunts G and H are so proportioned that just the amount of current desired will pass through the commutator and around the field magnet coils. It is manifest that this current will also depend upon the amount of current in the main circuit, and 95

that thus the compounding action, as ordinarily performed in alternators, will be efficient and complete.

What I claim as new, and desire to secure
5 by Letters Patent of the United States, is—

1. In an alternating current dynamo-electric machine, the combination of a revolving armature with coils adapted to generate an alternating current, and a shunt between one
10 terminal of such coils and one of the collecting rings, the shunt carried by and revolving with the armature, as herein described and set out.

2. In an alternating current dynamo-electric machine, and in combination, coils carried
15 upon a revolving armature, one terminal of such coils connected to collecting rings and the other terminal to a commutator, and a shunt between one of the terminals, the col-

lecting ring, and the commutator, as herein
described and set out. 20

3. In an alternating current dynamo-electric machine, coils carried upon a revolving armature, collecting rings connected to the terminals of such coils, a commutator in the
25 lead from one of the terminals to one of the collecting rings, a shunt between such terminal and the collecting ring carried upon and revolving with the armature, and a second shunt around the commutator, substantially
30 as set out herein.

In witness whereof I have hereunto set my hand this 21st day of July, 1894.

AXEL EKSTROM.

Witnesses:

JOHN W. GIBBONEY,
HENRY O. WESTENDARP.