(No Model.)

I. R. PRENTISS.

POLYCIRCUIT DYNAMO.

No. 594,489. Patented Nov. 30, 1897.

Fig. 1

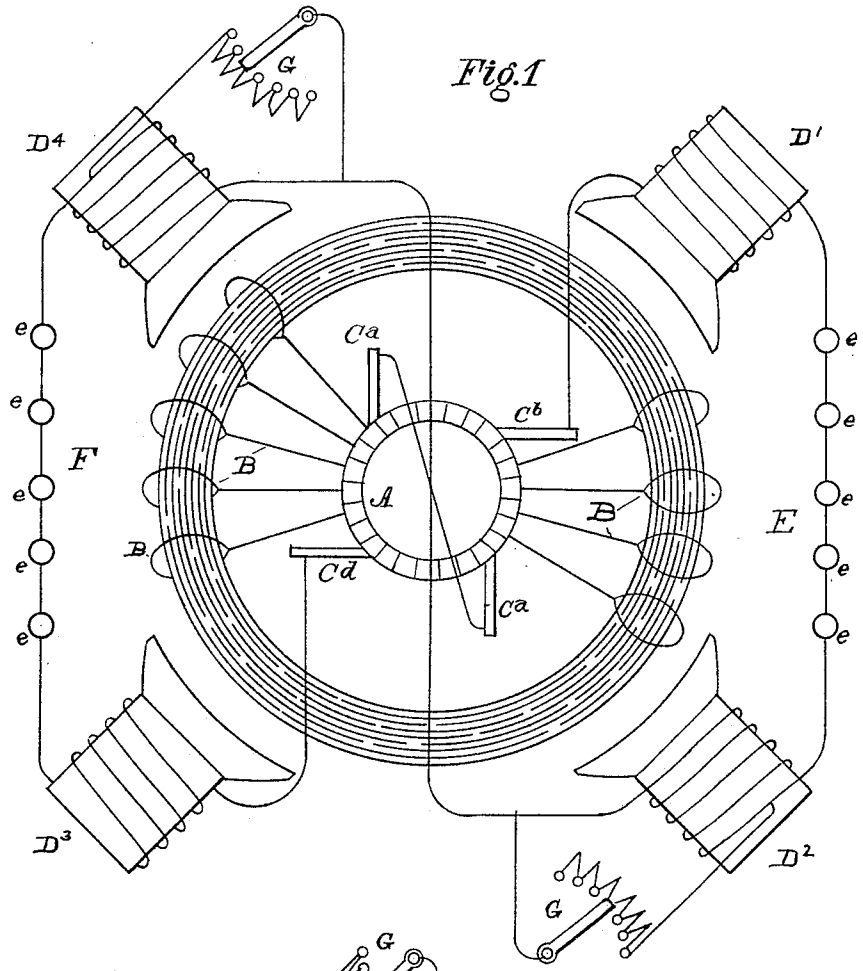
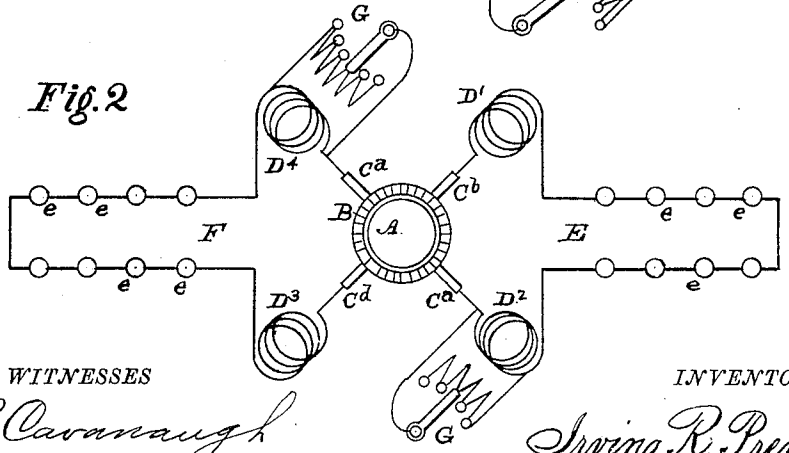


Fig. 2



WITNESSES

H. B. Cavanaugh

Lorw Prentiss

INVENTOR

Irving R. Prentiss

by Chas. Wm. Vorce

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

IRVING R. PRENTISS, OF CLEVELAND, OHIO.

POLYCIRCUIT DYNAMO.

SPECIFICATION forming part of Letters Patent No. 594,489, dated November 30, 1897.

Application filed March 31, 1897. Serial No. 630,080. (No model.)

To all whom it may concern:

Be it known that I, IRVING R. PRENTISS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Polycircuit Dynamos; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in dynamo-electric machines and to the method of connecting the armature and field coils of a multipolar dynamo and the manner of regulating the machine.

The object of the invention is to enable a number of different circuits to be independently operated from the same dynamo without electrical connection between the circuits, each separate circuit being independent of the others and separately regulated and controlled within itself and the electromotive force of the dynamo or circuits being maintained at a point not greater than that required to operate the largest of the circuits. By this means it is rendered possible to make a very large arc-dynamo capable of maintaining a much larger number than usual of arc-lamps, while allowing currents of different quantities to be operated from the same dynamo.

In the art of arc-lamp lighting the usual practice is to operate all the lamps from one machine in a single circuit in series at a constant current, which requires the electromotive force to be very high. A method of connecting the lamps has also been devised in which the total load is divided into circuits which are interposed between the rings of the commutator, and by this arrangement the greatest electromotive force of the dynamo is that which is necessary to operate the largest circuit; but in that case all the circuits are electrically connected together in series, with the commutator-rings connected in between the circuits, so that only one quantity of current can be used, although the electromotive force of each circuit may be varied. A serious objection to that arrangement is that any interruption of either of the circuits disables the dynamo and hence all of the circuits.

By my invention it is made possible to operate a number of circuits from one dynamo in precisely the same manner as if each separate circuit was connected to and operated by a separate dynamo.

My present invention relates to closed-coil armatures, its application to open-coil armatures being embraced in my pending application, Serial No. 611,508, filed November 9, 1896.

In the drawings hereto annexed, Figure 1 is a diagrammatic representation of a dynamo having a closed-coil armature connected for polycircuit operation, and Fig. 2 is a similar diagram representing a modification of the arrangement shown in Fig. 1.

A four-pole dynamo has been chosen to illustrate the invention; but it is to be understood that the invention is applicable to a dynamo of any number of poles.

A represents the commutator; B, the armature coils or bobbins, a part only of which is shown; C^a C^b C^d, the commutator-brushes; D' D^2 D^3 D^4, the field-coils and poles; E F, the external circuits comprising a number of lamps *e* or other load, and G the variable resistance for governing the circuit. Each lamp-circuit or load is connected in series with two or more of the poles and their corresponding brushes or group of brushes, but there is no connection between the circuits themselves. The result of this is that the dynamo is in effect divided into two separate machines, one supplying each circuit.

The regulation of a constant-circuit dynamo may be effected in various well-known ways, but I prefer the shunting of current around the field-spools as a mode of regulation, as shown in the drawings, and I apply this method to each alternate field-spool, or, where two spools of same polarity are used, to every alternate pair, the shunting of the current around the spool being effected by connecting a variable resistance G G across the terminals of the field-coil. The shunted field-spools might be adjoining or consecutive spools or pairs of spools; but I regard the shunting of alternate spools or pairs as the better plan.

The changing of the variable resistance or the moving of the brushes or other form of regulation may be effected by hand or preferably by any well-known or suitable auto-

matic device for the regulation of dynamos, as the particular mechanism of the device for regulating the machine forms no part of the present invention.

The commutator-brushes C^a under all the poles of like polarity, as positive or negative, are connected together, as shown in Fig. 1, where a four-pole dynamo is illustrated, and one of the external circuits and load is interposed between the connected brushes and each brush under an opposite pole. Thus in Fig. 1 the current flows from brush C^b, through the field-magnet D′, circuit E, and field-magnet D^2 back to the common connection of all of the brushes which are of a polarity opposite to C^b. In like manner current flows from brush C^d, through the field-coils D^3, circuit F, and field-magnet D^4 back to the common connection between the brushes of like polarity. The same arrangement would of course be made in any additional number of circuits if a machine with more than four poles were used.

In the arrangement shown in Fig. 2 the brushes C^a C^b under two adjacent poles D′ D^2 of opposite polarity are connected through the field-magnets of those poles to an external circuit E, and the brushes under the next two adjoining poles of opposite polarity are connected in the same way with circuit F, and so on with any number of poles, each two poles of opposite polarity operating an independent circuit in the same way. In these circuits the current may go in either direction.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a multipolar dynamo a closed-coil armature having the brushes under each pair of field-magnets of opposite polarity connected in series with an external circuit, substantially as described.

2. In a multipolar dynamo a closed-coil armature having the brushes under each pair of adjoining field-magnets of opposite polarity connected in series with an external circuit, substantially as described.

3. In a multipolar dynamo a closed-coil armature having the brushes under all the poles of one polarity connected together, and a separate independent external circuit connected between said connected brushes and each brush under a pole of polarity opposite to that of the said connected brushes, substantially as described.

4. In a multipolar dynamo having a closed-coil armature, a plurality of external circuits in each of which are connected in series two poles of opposite polarity and their corresponding brushes, substantially as described.

5. In a multipolar dynamo having a closed-coil armature a plurality of external circuits in each of which are connected in series two poles of opposite polarity and their corresponding brushes, a variable resistance being connected in shunt around one of the field-spools in each circuit, substantially as described.

6. In a multipolar dynamo a closed-coil armature having the brushes under all the poles of one polarity connected together, and a separate independent external circuit connected between said connected brushes and each brush under a pole of polarity opposite to that of the said connected brushes, a variable resistance being connected in shunt around one of the field-spools in each circuit, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

IRVING R. PRENTISS.

Witnesses:
JOHN N. MYLER,
H. B. CAVANAUGH.