June 6, 1933. M. OSNOS 1,912,995

CONSTANT CURRENT SYSTEM

Filed May 29, 1929

Fig. 1

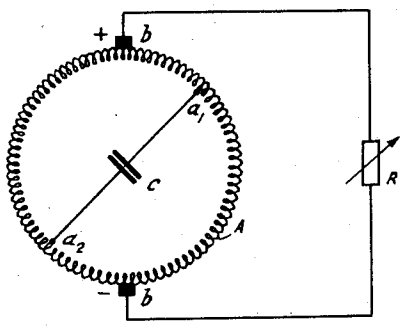


Fig. 2

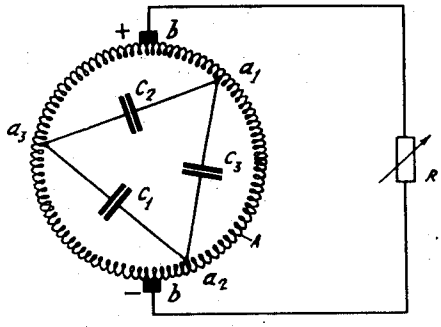


Fig. 3

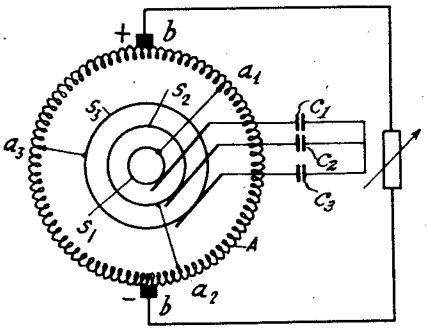
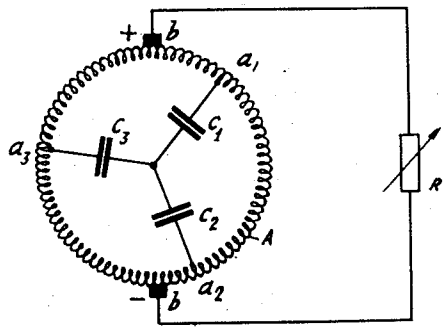


Fig. 2-a



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UNITED STATES PATENT OFFICE

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CONSTANT CURRENT SYSTEM

Application filed May 29, 1929, Serial No. 366,846, and in Germany June 12, 1928.

The present invention is concerned with a direct current machine, which, when doing generating work upon a variable resistance, maintains its current at a practically constant value, and which is characterized by great simplicity.

The invention is based upon the understanding of the fact that the current supplied from a direct current dynamo will undergo only inconsiderable variations in the presence of large alterations in the external resistance, if two or more points of its armature winding are united with a correspondingly great number of condensers either directly, if the latter are built together with or into the armature, or indirectly through slip rings, when the condensers are arranged somewhere outside the generator, and if furthermore the said condensers are so dimensioned that the alternating current system formed by them and the portions of the armature united therewith are tuned exactly or nearly so to the frequency corresponding to its speed of rotation.

A number of exemplifications of the scheme according to this invention are schematically illustrated in the accompanying drawing in which

Figure 1 illustrates diagrammatically a preferred embodiment of my invention;

Figure 2 illustrates another embodiment thereof in which three condensers are used;

Figure 2*a* shows another way of connecting the apparatus of Figure 2; and

Figure 3 illustrates my invention with the condensers connected outside the revolving parts of the machine.

The variable resistance R is fed from the armature winding A of a direct current generator by way of commutator brushes *bb*. In the scheme shown in Figure 1, two diametrically opposite points *a*1, *a*2, of the armature winding are bridged (shunted) by a condenser C. The latter is either built into the armature or else it is connected through slip rings or brushes.

In the circuit diagram shown in Figure 2, three built-in capacities C1, C2, C3 in ring connection, and in Figure 2*a*, in star-connection, are united with three equi-distant points *a*1, *a*2, *a*3 of the armature winding.

In the circuit scheme shown in Figure 3, the equi-distant points *a*1, *a*2, *a*3, are connected with slip rings *s*1, *s*2, *s*3, respectively, and to these three capacities outside the generator arranged in ring or star-fashion are connected in a similar manner.

The embodiments hereinbefore referred to and shown in the drawing are of the two-pole kind. In case of a multi-pole machine, if desired, the number of condenser branches may be chosen smaller than the number of armature winding branches connected therewith, provided that equipotential connections are established in known manner between homologous points of the armature winding.

It is moreover not absolutely necessary that a single armature winding should be employed to represent simultaneously the direct current winding furnishing the current to be kept at a constant value to the external circuit, and the alternating current winding in conjunction with condensers C. On the contrary, arrangements could be chosen also in such a way that in the same slots, two electrically separate windings are disposed, one of which to act as a normal direct current winding and the other one as an alternating current winding with which the condensers are united in a way as hereinbefore set forth, and which must be tuned to the frequency of the potential induced therein.

The capacities may consist, primarily, of condensers, although they may also be impedances comprising condensers and inductances. Under favorable conditions, also synchronous motors or commutator machines running under no-load may be used as the capacities.

The machine hereinbefore described can be used also for doing motoring work.

I claim:

1. In a direct current generator adapted to supply an approximately constant current in the presence of a varying load, an armature winding and means comprising reactances connected between electrically

equi-distant points thereof adapted to tune portions of said armature between said equi-distant points to the frequency of the induced alternating current potential.

2. In an electrical energy generating device, a rotating armature winding, means for tapping off energy therefrom, a loading device connected to said tapping means, and a plurality of reactive circuits each thereof being shunted across equivalent portions of said armature winding for tuning each of said portions to a frequency corresponding to the speed of rotation of said armature.

3. In an electrical energy generating device, a rotating armature winding, means for tapping off energy therefrom, a loading device connected to said tapping means and a plurality of reactive circuits each thereof shunted across equivalent portions of said armature winding for forming with said armature portions a plurality of tuned circuits tuned to a frequency corresponding to the speed of rotation of said rotating armature.

4. In an electrical energy generating device, a rotating armature winding, means for tapping off electrical energy therefrom, a load circuit connected to said tapping means, a plurality of capacity elements each one thereof having one of its terminals connected to a common point, and its other terminal connected to a respective point on said armature each of said capacity elements being adapted to tune a portion of the armature to a frequency bearing a predetermined relationship to the speed of rotation of the armature.

5. In an electrical energy generating device, a rotating armature winding, means for tapping off electrical energy therefrom, a load circuit connected to said tapping means, a plurality of slip-rings each one thereof being respectively connected to a point on said armature, a plurality of reactances each thereof having one of its terminals connected to a common point and other of its terminals connected respectively to one of the slip-rings said reactances being adapted to tune various portions of the armature winding to a frequency related to the speed of rotation of the armature.

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