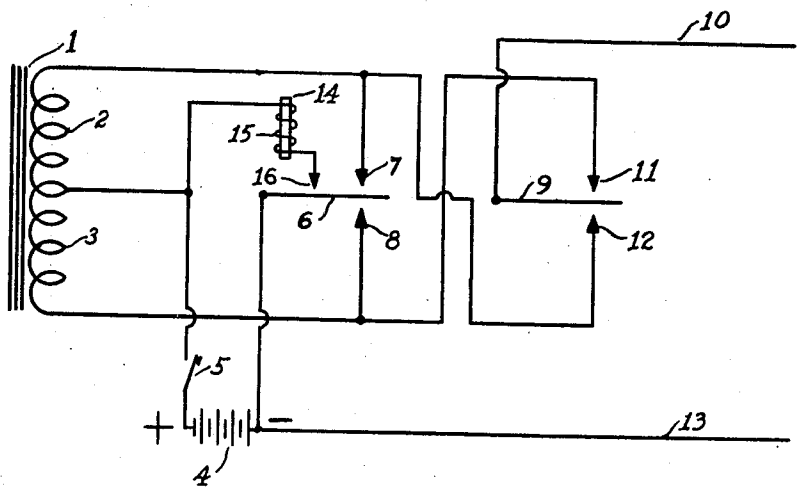
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DIRECT CURRENT VOLTAGE DOUBLER

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DIRECT CURRENT VOLTAGE DOUBLER

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The present invention relates to voltage modifying means. More specifically, the invention relates to a voltage modifying means of the vibrator type.

It is one of the objects of the invention to provide a voltage modifying means of the transformer vibrator type wherein I am enabled to multiply or divide the voltage from a given source of supply through the medium of a transformer vibrator circuit wherein I am enabled to dispense with a large amount of material to thereby effect a saving of both material and weight.

More specifically, one of the objects of my invention is to provide a voltage doubler of the transformer vibrator type dispensing with the secondary winding of the transformer.

For the purpose of disclosing my invention, I have illustrated an embodiment thereof in the accompanying drawing, in which the figure is a diagrammatic view of the vibrator transformer system embodying the features of my invention.

In the embodiment of the invention illustrated in the drawing, the voltage doubling system comprises a transformer 1 having a split inductance winding, comprising two sections 2 and 3. The winding is provided with a center tap connected to one side of a battery 4. Preferably I provide a controlling switch 5 for controlling the circuit. The opposite side of the battery 4 is connected to a vibrating reed or contact member 6 adapted to vibrate between a pair of oppositely disposed relatively stationary contacts 7 and 8, which are respectively connected to the end terminals of the inductance winding.

A second vibrating contact member 9 is connected to an output lead 10. This reed 9 vibrates between a pair of oppositely disposed relatively stationary contacts 11 and 12. The contact 11 is connected to the end terminal of the winding section 3 and the contact 12 is connected to the end terminal of the winding section 2. The opposite side of the battery 4 is connected to an output lead 13 between which lead and the lead 10, the load may be connected.

The reeds 6 and 9 may be and usually are mechanically connected to operate in synchronism and the reeds are driven through the medium of the driving magnet 14 having a winding 15, one terminal of which is connected to one side of the battery 4. The opposite terminal of the winding 15 is connected to a relatively stationary contact 16 adapted to be engaged by the reed 6 when the reed is in neutral position. Accordingly, when the switch 5 is in the closed position the reeds 6 and 9 will be driven in one direction by the magnet 14 and into engagement respectively with the contacts 7 and 11. As soon as the reeds are moved under the influence of the magnet 14 to cause the reeds 6 and 9 to engage the respective contacts 7 and 11, the circuit, through the winding 15, is broken permitting the reeds 6 and 9, under their momentum, to move into engagement with the contacts 8 and 12 respectively. At the same time the circuit of the magnet 14 is re-established. Accordingly the reed 6 is vibrated between the contacts 7 and 8 alternately making and breaking the circuit between these contacts and likewise the reed 9 is simultaneously vibrated to alternately make and break contact with the reeds 11 and 12.

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With the reeds 6 and 9 respectively engaging contacts 7 and 11 and assuming that the battery 4 delivers 12 volts, 12 volts will be supplied to a circuit including the battery, the winding 2, contacts 7 and the opposite side of the battery. Likewise 12 volts from the battery 4 will be delivered from the plus side of the battery 4, in the opposite direction, the contact 11 and thence to the plus output lead 10 and thence through the load by output lead 13 to the minus side of the battery. However, due to the 12 volts delivered to the winding 2, 12 volts will be induced in the winding 3 which superimposed upon the 12 volts delivered from the battery will result in 24 volts being delivered to the load. In other words, this voltage induced by the winding 2 in the winding 3 will double the voltage of the battery to the load.

Likewise when the reeds 6 and 9 are engaged with contact 8, the 12 volts of the battery will be delivered to winding 3 from the plus side of the battery 4 to the minus side of the battery 4 through the contact 8 and reed 6. At the same time 12 volts will be delivered to the winding 2 and thence by contact 12 to the plus side 10 of the load. At the same time winding 3 will induce 12 volts in winding 2 so that actually there is delivered 24 volts to the plus side 10 of the load.

It is, therefore, apparent that with the single induction winding I am enabled to double the voltage delivered to the load from the battery 4. It will be understood, of course, that the voltages referred to are merely for the purpose of illustration as it is quite obvious that batteries delivering larger voltages than 12 volts may be used or any other source of supply may be used other than the battery.

I claim as my invention:

1. A vibrating interrupter system for modifying the voltage delivered from a direct current source, comprising an inductance winding having a center tap adapted for connection with one

side of a direct current source, a first vibrating interrupter including a vibrating member adapted for connection to the opposite side of said direct current source and oppositely disposed contacts respectively connected to the opposite end terminal of said inductance winding, a second vibrating interrupter including a vibrating member adapted for connection with one side of the load and a pair of oppositely disposed contacts respectively connected to the opposite end terminals of said inductance windings.

2. A vibrating interrupter system for modifying the voltage delivered from a direct current source of power, comprising an inductance winding having a center tap adapted for connection with one side of a direct current source, a first vibrating interrupter including a vibrating member adapted for connection with the opposite side of the direct current source and oppositely disposed contacts respectively connected to the opposite end terminals of said inductance winding, a second vibrating interrupter including a vibrating member adapted for connection with one side of the load and a pair of oppositely disposed contacts respectively connected to the opposite terminals of said inductance winding, the connections between said pair of contacts with the opposite terminals of the inductance windings being the reverse of the connections between opposite contacts and the terminals of said induction winding of the first vibrating interrupter.

3. A vibrating interrupting system for modifying the voltage delivered from a direct current source, comprising a pair of inductance winding sections, each of said sections having one terminal connected to a direct current source, a first vibrating interrupter including a vibrating contact adapted for connection with the opposite side of said direct current source and a pair of oppositely disposed contacts respectively connected to the other terminals of said induction winding sections and a second vibrating interrupter including a vibrating contact adapted for connection with one side of the load and a pair of oppositely disposed contacts respectively connected to the outer terminals of said inductance winding sections.

4. A system for modifying the voltage delivered from a direct current source, comprising a first

and second induction winding, each having an end terminal connected to one side of a direct current source, means for alternately connecting the other end terminals of said first and second windings to the opposite side of said direct current source and means for connecting the end terminal of said second winding with one side of the load when the first winding is connected to the opposite side of the direct current source and vice-versa.

5. A system for modifying the voltage delivered from a direct current source of supply to a load comprising a first and second inductance winding arranged in inductance relation to one another and each having one end terminal connected with a direct current source of supply, means for alternately connecting the other terminals of said windings with the other side of said direct current source of supply independently of the load, and means for alternately connecting the windings in series with a source of direct current with the load, the connections of the other winding with the source of direct current supply being such as to induce a voltage in the first winding in such a direction as to supplement the voltage of the source of supply.

6. A system for modifying the voltage delivered from a direct current source of supply to a load comprising a pair of inductance windings arranged in inductance relation to one another and a direct current source of supply, means for connecting said direct current source of supply alternately in series with said windings with the load and means for simultaneously connecting the winding not connected with the load with the direct current source and in such a relation that said winding not connected with the load will induce a voltage in the winding connected to the load in a direction to add to the voltage of the source of supply.

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