

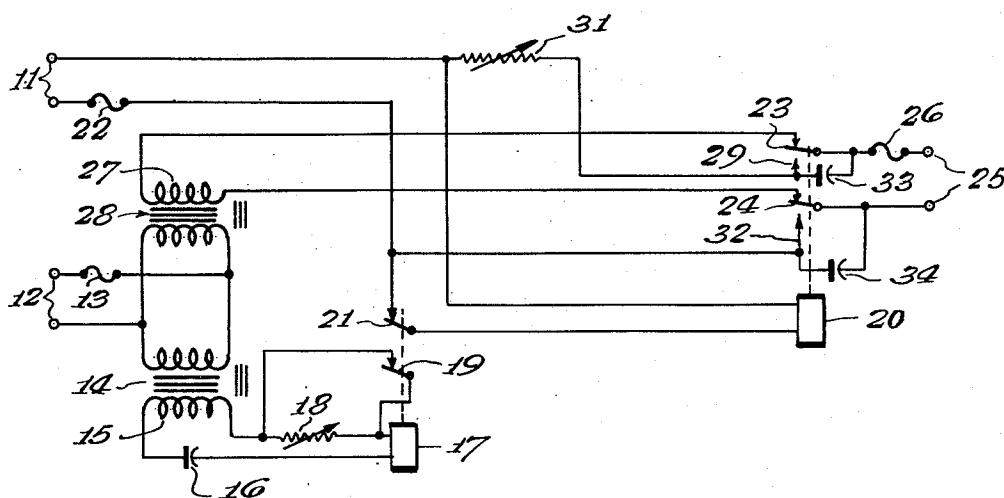
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EMERGENCY POWER SYSTEM

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EMERGENCY POWER SYSTEM

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The present invention relates to a system for assuring power supply to an oscillograph lamp.

In United States Letters Patent No. 2,539,832 and No. 2,447,752 there is disclosed an apparatus for automatically recording transient phenomena occurring on a power distribution system. This apparatus is automatically responsive to chance or unanticipated transients and disturbances. Whenever such phenomena occurs, a recording oscillograph is rapidly brought into operation to record the phenomena. The details of the oscillograph are amply described in the aforementioned patents. A lamp to illuminate the galvanometers is kept burning from a suitable source of 12 volt energy. Most conveniently the lamp is supplied from an alternating current source, if the primary power to operate the apparatus is not drawn from a 12 volt D. C. source. Usually this alternating current source is not entirely independent from the power system which is connected to the automatic oscillograph for recording the phenomena occurring. If the alternating current source for the lamp should be interrupted, it is possible that some phenomena might occur which should be recorded, and hence it is essential to assure a supply of 12 volt power to illuminate the automatic oscillograph lamp.

Usually some other source of power is available at a central station where most of the automatic oscillographs are installed, and hence it is desired to provide a safe system for assuring constant flow of energy to the oscillograph lamp from either the conventional alternating current source or from the auxiliary source when the alternating current source fails.

It, therefore, is an object of the present invention to provide an improved power supply system operative whenever the alternating current power fails.

Another object of the invention is to provide an assured power supply for an oscillograph whenever the alternating current power drops below a certain voltage.

A still further object of the invention is to provide 12 volts direct current from a 125 volt direct current supply whenever the alternating current power supply fails.

Other and further objects of the invention subsequently will become apparent by reference to the following description taken in conjunction with the accompanying drawings, wherein:

The figure is a circuit diagram of the power supply system comprising the present invention.

Referring to the drawing it will be noted that the system shown in the figure has a pair of input terminals 11 which normally are connected to a source of direct current voltage such as 125 volts. Another pair of input terminals 12 are connected to a source of 115 volts alternating current. The circuit is shown in the condition when no power is being supplied to either terminals 11 or 12. The terminals 12 are connected through a fuse 13 to a transformer 14 which is a regulating transformer supplying a constant voltage across the secondary winding 15 within the limits of the regulating ability of the transformer. The secondary winding 15 is connected in a circuit

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which includes a series capacitor 16, a relay 17 and a variable resistor 18. The relay 17 when deenergized closes a pair of contacts 19 which are connected in shunt to the variable resistor 18. The relay when deenergized also closes another pair of contacts 21 which are connected in series with a fuse 22 adjacent one terminal of the pair of terminals 11. The circuit comprising the regulating transformer 14, the capacitor 16, the relay 17 and the resistor 18 is a voltage sensitive relay circuit.

The relay contacts 21 are connected in series with a relay 20 so that the relay 20 in effect is connected across the terminals 11 as long as the relay 17 is not energized. The relay 20 when deenergized closes a pair of contacts 23 and another pair of contacts 24 to interconnect a pair of output terminals 25 suitably provided with a fuse 26 to the secondary winding 27 of a regulating transformer 28 having its primary winding energized from the alternating current source 12. When the relay 20 is energized the pair of contacts 29 are closed which connect the upper conductor leading to the output terminals 25 to an adjustable resistor 31, which in turn is connected to one terminal of the direct current source 11. When the relay 20 is energized, another pair of contacts 32 is closed which connects the other terminal of the output circuit 25 to the other terminal of the direct current source 11. It will be noted that the contacts 29 are by-passed by a capacitor 33, and the contacts 32 are by-passed by a capacitor 34 inasmuch as these contacts when interrupted open a direct current circuit. Normally the output terminals 25 supply 12 volts alternating current to the lamp of the automatic oscillograph of the type described in the aforementioned patents. The regulating transformer 29 assures a substantially constant voltage at the terminals 25. If, however, the alternating current source 12 dropped in voltage below the ability of the transformer to regulate the output voltage or is interrupted, the relay 17 will be deenergized thus opening its pair of contacts 21. The closing of the contacts 21 energizes the current relay 20 to that it opens contacts 23 and 24 thus disconnecting the output terminals 25 from the secondary winding 27 of the transformer 28. The output terminals 25 are now connected to the direct current source 11 through the adjustable load resistor 31.

The variable resistor 18 is normally in series with the relay 17 when the relay 17 is energized, thereby assuring proper operation of the relay throughout the range of normal regulated alternating current supplied by the transformer 14. Once the relay has been deenergized, the resistor 18 is then short circuited, thus providing extra current to the relay 17 to cause it to operate to an energized portion upon restoration of input voltage to within regulating level of the transformer. Thus, this assures a system wherein the relay 17 will be operated only when it is certain that the alternating current power 12 has been fully restored to its proper voltage value.

While for the purpose of illustrating and describing the present invention a preferred circuit arrangement has been shown in the drawing, it is to be understood that the invention is not to be limited thereby since such modifications may be embodied as may be commensurate with the spirit and scope of the invention set forth in the appended claims.

I claim as my invention:

1. The combination comprising an alternating current supply input circuit, a low voltage output circuit, a voltage regulating transformer normally connected between said alternating current input circuit and said output circuit, a direct current relay normally deenergized to connect said transformer with said output circuit, a normally energized alternating current relay connected to control the energization of said direct current relay, said alternating current relay being connected in an isolated circuit includ-

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ing an adjustable resistor, a capacitor and a secondary winding of a transformer having its primary winding connected to said alternating current supply circuit, said alternating current relay having a pair of contacts shunting said resistor when said relay is deenergized.

2. The combination comprising a source of alternating current, a transformer connected to said source, a series circuit connected to said transformer comprising a capacitor, a relay and a variable resistor, said relay having a pair of normally closed contacts connected in shunt across said variable resistor, said relay having a second pair of normally closed contacts, a source of direct current, and a direct current relay connected in series with said latter pair of contacts, a regulating step-down transformer connected to said alternating current source, said direct current relay having two pairs of normally closed contacts connected in series between an output circuit and said regulating step-down transformer, said direct current relay having two pairs of normally open contacts connected between said output circuit and a series resistor connected to said direct current source.

3. The combination comprising an alternating current supply input circuit, a low voltage output circuit, a volt-

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age regulating transformer normally connected between said alternating current supply input circuit and said output circuit, a source of direct current, a direct current relay in deenergized condition to connect said transformer with said output circuit, said direct current relay when energized having contacts to connect said output circuit to said direct current source, a normally energized alternating current relay connected to control the energization of said direct current relay, said alternating current relay being connected in an isolated series circuit comprising an adjustable resistor, a capacitor and the secondary winding of a transformer having its primary winding connected to said alternating current supply circuit, said alternating current relay having a pair of contacts shunting said resistor when said relay is deenergized.

References Cited in the file of this patent

UNITED STATES PATENTS

1,435,255	Puxon	Nov. 14, 1922
1,492,691	Leich	May 6, 1924
1,882,473	Beetem	Oct. 11, 1932