

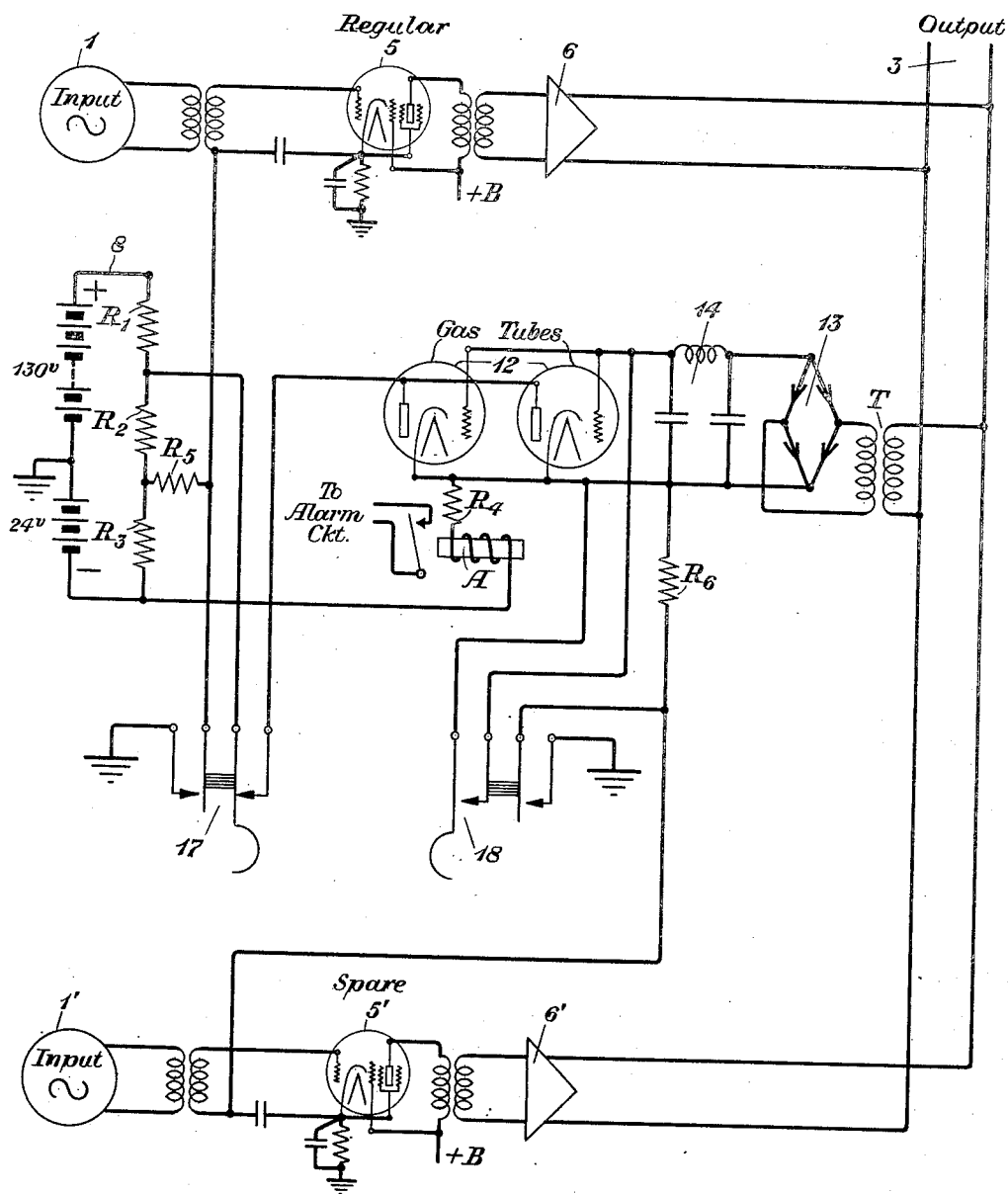
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POWER TRANSFER CIRCUIT

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POWER TRANSFER CIRCUIT

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This invention relates to power control circuits and more particularly to means whereby an auxiliary or spare power supply is independently available to replace the regular supply if the latter, from any cause, fails to deliver normal power.

The invention will be better understood by reference to the following specification and accompanying drawing in which the single figure circuit diagram illustrates the use of my invention in a portion of a communication system although it is to be understood that this particular use is for illustrative purposes only.

Referring to the figure there is shown a regular source of power which here is indicated as an alternating current generator 1 of carrier frequency currents for signaling or other purposes, these being supplied to an output circuit 3. In the transmission path from the generator 1 is included a vacuum tube amplifier 5 and such other amplifier 6 as may be desired to bring power delivery to the output circuit to requisite value. The tube 5 is here shown as the well-known pentode type of tube but it will be apparent as the description proceeds that other types of tube may be used. The grid of this tube 5 is given normally a suitable potential from the potentiometer 8, as will be described hereinafter, the value of this potential being such that the tube 5 is operative to establish delivery of the desired power to the output circuit 3. The circuit as thus described may be spoken of as the regular supply.

A similar circuit comprising an input 1', a tube 5' and an amplifier 6', serving as a standby or spare supply is also provided, being connected to the output circuit 3. The grid of the tube 5', however, is normally so biased from the potentiometer 8, as hereinafter described, as to block its action so that it is inoperative for the delivery of power to the output circuit 3.

The potentiometer or voltage divider 8, here shown as consisting of three resistances, R_1 , R_2 and R_3 , is placed across a suitable source of direct current voltage, such as a power pack or such as a battery. The voltage from this source may be chosen of any appropriate value but for the sake of concreteness it is here shown as made up of two units of 130 and 24 volts. These two units are shown as connected in series aiding with the junction point grounded. The resistance values chosen for this illustration are such that the voltage drop across R_1 will be approximately 40 volts, the drop across R_2 will be approximately 90 volts and the drop across R_3 will be 24 volts.

The grid bias of the regular supply amplifier is shown as obtained through resistance R_5 at the junction of R_2 and R_3 . With these particular connections and values it will be noted that the biasing voltage of the grid of tube 5 is zero. At the same time the grid of tube 5' is connected to the negative end of the 24 volt battery while the cathode is connected to ground so that the grid is given a strong negative bias, which value is sufficient to block this tube and render the circuit inoperative for the delivery of power.

Supplemental to these circuits are shown two gas discharge tubes 12 with heated cathodes. Plate voltage is supplied to these tubes in parallel from the potentiometer circuit, in this case approximately 114 volts. Two tubes are used in parallel so as to minimize chances of tube failure; either tube alone will serve. The cathodes of the gas tubes are connected to the -24 volt battery terminal through resistance R_4 and to the grid of the spare amplifier through resistance R_6 . The gas tubes normally have a negative bias obtained by rectifying part of the amplifier output through transformer T and copper oxide rectifier 13 and filter 14.

If the voltage on the output leads should drop below a predetermined amount the negative grid bias on the gas tubes will drop below their firing point so that one or the other will break down and conduct current, with a voltage drop across the tubes characteristic of gas discharge tubes which may be from about 7 to 20 volts. The current through these tubes will produce a voltage drop across resistance R_4 of approximately 24 volts so that the grid of the spare amplifier will be brought near to ground potential and the spare amplifier will then transmit power to the output circuit. At the same time the voltage of the junction on R_2 and R_3 will be materially lowered, say to about -15 volts from ground, which blocks the regular amplifier and prevents its restoring if the trouble in the regular supply circuit is intermittent. The current through the gas tubes may also be used to operate an alarm relay A associated with the resistance R_4 to give a suitable alarm indicating that the spare amplifier is in operation.

A switch 17 is provided in the circuit, normally in the position to close circuit from the potentiometer to the plates of the gas tubes. The restoration of the output voltage on the line by the spare amplifier reestablishes the grid bias on the gas tubes but this does not extinguish them. Operation may, however, be restored to the regular supply by momentarily operating the key

