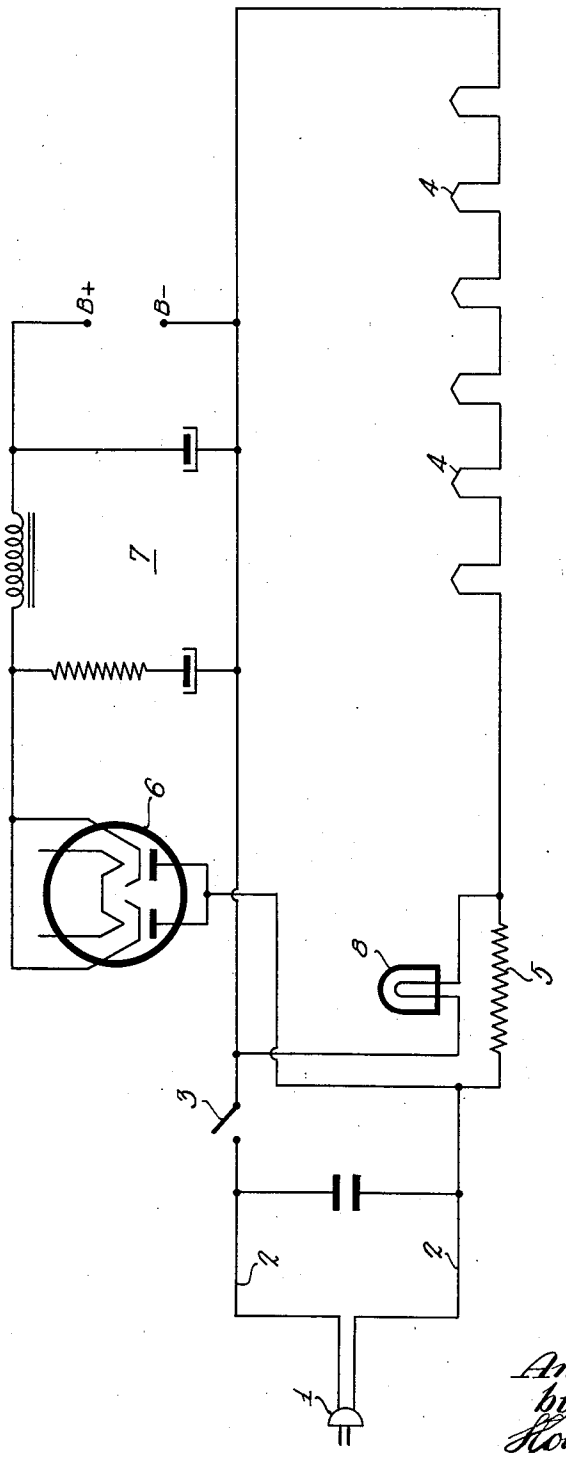
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PILOT LIGHT CIRCUIT FOR RADIO RECEIVERS AND THE LIKE

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PILOT LIGHT CIRCUIT FOR RADIO RECEIVERS AND THE LIKE

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6 Claims. (Cl. 250—27)

This invention relates to pilot light circuits for A. C.-D. C. receivers and more particularly to a novel circuit for operating the pilot light at supply line voltage.

Because of the frailty of the filaments in supply line voltage incandescent lamps of the small wattage sizes suitable for pilot lights, and their resultant inability to withstand the "shock" of being turned on and off large numbers of times without premature burn out, it has been customary to use a 6 volt pilot light in A. C.-D. C. receivers in series with the heaters of the vacuum tubes. This has been unsatisfactory, however, for on starting the incandescent filament comes quickly to its operating temperature, while the cathode heaters, which are of comparatively heavy wire, take considerable time to reach operating temperature. During a period of several seconds the resistance in series with the pilot light is too low to reduce the current to proper value and a much higher than normal operating voltage is imposed on the lamps. Various expedients have been attempted to solve this problem; for example, tapped cathode heater tubes, ballast tubes, thermal relays and the like have been tried. As previously explained, supply line, e. g., 110–120 volt, pilot lights as a substitute for the troublesome series arrangement has found no favor as a solution up to the present time, since the 110–120 volt lights of small wattage were always subject to the objection that quick burn outs due to the starting surge were inevitable.

It is one object of the present invention to provide a novel pilot light circuit which enables the use of supply line voltage pilot lamps and which eliminates the above-mentioned objection thereto.

It is another object of the invention to provide a circuit which gives reduced voltage for a pilot lamp on starting and substantially full voltage during operation of the radio set.

In the accompanying drawing, the single figure is a diagrammatic illustration of the power supply for a A. C.-D. C. radio receiver embodying the invention.

Referring specifically to the single figure, there is shown a power plug 1 connected to the line wires 2 which include a switch 3. In series across the line are the cathode heaters 4 and the resistor 5. Also connected to one side of the power line are the plates of the rectifier tube 6. In the conventional manner, the cathodes of tube 6 are shown connected to a filter 7 to supply the high plate voltage to the receiver.

In accordance with the present invention the pilot light 8 may be connected from the junction between the resistor 5 and the cathode heaters 4 to the other side of the power line. The voltage rating of this pilot light is preferably the supply line voltage.

In the operation of the circuit, when the switch 3 is closed, the heaters 4 are cold and offer very low resistance to the flow of current. If, for example, these heaters normally draw .150 ampere, the initial current may rise as high as one-half ampere. Resistor 5 may be approximately 50 ohms if the total voltage drop in the heaters 4 at operating current is approximately equal to the line voltage, and the voltage drop in the resistor will be 7½ volts under operating conditions but may be 25 volts under initial starting conditions. It is apparent that the voltage drop across the lamp 8 will be line voltage minus the voltage drop in the resistor 5, and under normal continuous 120 volt operation the pilot light will receive 120 volts minus 7½ volts or 112½ volts, whereas under starting conditions it will receive 120 volts minus 25 volts or 95 volts. It is therefore apparent that instead of receiving the full shock of the entire line voltage on cold starting, the lamp will receive only about 80% of the line voltage and will therefore be heated up much more gradually and its life will be greatly prolonged.

It will also be noted that the normal voltage drop in resistor 5 is approximately equal to the voltage of the 6 volt lamp heretofore employed in series with the heaters, and therefore such voltage drop does not affect the operation of the heaters.

In general, the resistor 5 may have a value such that the normal voltage drop thereacross is approximately 6 to 9 volts.

While in the circuit shown a single resistor is used, the resistor might be divided and connected part in each line lead without departing from the invention. It will be apparent also that other modifications of the invention are possible.

I claim:

1. In an A. C.-D. C. radio receiver in which the heater elements of the vacuum tubes are connected in series across a source of power, and in which the heater current when the heaters are at operating temperature is much lower than when the heaters are cold and the voltage drop across the heaters at rated current when the heaters are at operating temperature is approximately equal to the voltage of the source of power, the combination of a resistor in series with said heater elements between one of the terminals of

the power source and the heater elements, said resistor having a relatively low voltage drop at said rated heater current, and an incandescent lamp having a voltage rating substantially equal to the voltage of said power source, said lamp being connected directly between the other terminal of said power source and the junction of said resistor and the heater elements, whereby said incandescent lamp receives substantially less than line voltage when the tube heaters are first connected to the power source, and substantially full line voltage after the heaters have reached operating temperature.

2. A circuit for prolonging the life of a supply line voltage pilot lamp in a A. C.-D. C. receiver having series-connected cathode heaters, which comprises a resistor connected between one side of the power line and said heaters, the voltage drop at operating current across said resistor being of the order of a few volts, and a pilot lamp adapted to receive substantially the full line voltage connected directly between the other side of the power line and the junction of said resistor and the heaters, whereby said lamp receives substantially less than line voltage when said heaters are first connected to the power line, and substantially full line voltage after said heaters have reached operating temperature.

3. A circuit for prolonging the life of a pilot light as defined in claim 2, in which the resistor has a normal voltage drop of approximately 6 to 9 volts.

4. In an A. C.-D. C. receiver in which the tube heaters are connected in series across a source of supply voltage, and in which said heaters have a lower resistance when cold than when at operating temperature, and require appreciable time to reach operating temperature, resistance means connected in series between the source of supply voltage and the heaters, and a pilot lamp connected across the heaters, said lamp being adapted to receive substantially the full line voltage but subject to deleterious effects if full line voltage is repeatedly applied, said resistance means having a materially greater voltage drop thereacross when the heaters are cold and a larger current is flowing than when the heaters are at operating temperature.

5. In a radio receiver, a plurality of tube heater elements connected to a power supply line, a pilot lamp connected across said supply line and adapted to receive substantially the full line voltage, and means for materially reducing the voltage across said lamp during initial operation and for increasing the voltage across said lamp during subsequent operation.

6. In a radio receiver, a plurality of tube heater elements connected to a power supply line, a pilot lamp connected across said supply line and adapted to receive substantially the full line voltage, and means including a linear resistance in series with said elements and said lamp for materially reducing the voltage across said lamp during initial operation and for increasing the voltage across said lamp during subsequent operation.

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