

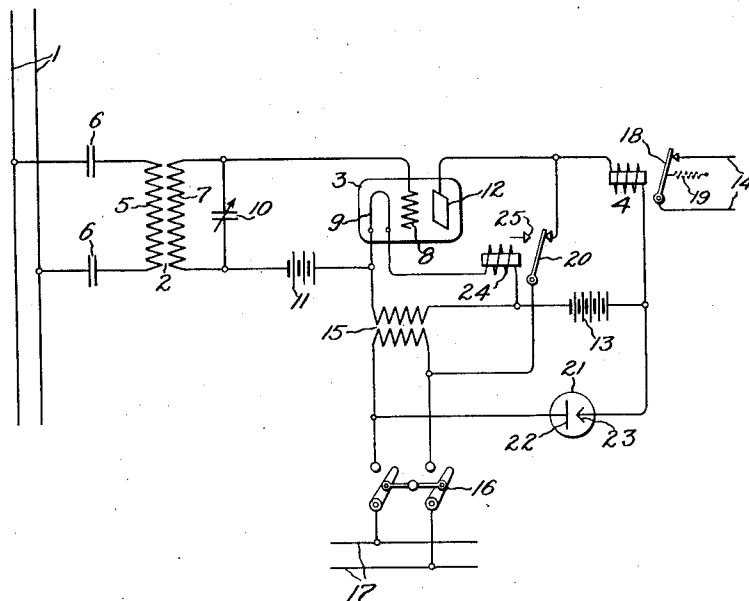
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REMOTE CONTROL SYSTEM

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UNITED STATES PATENT OFFICE

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REMOTE-CONTROL SYSTEM

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My invention relates to remote control systems and more particularly to means for controlling a circuit at a remote point by means of carrier current supplied to a system of distribution.

It has heretofore been proposed to employ carrier current systems to control remote circuits. Such systems usually employ an electric discharge device in the nature of a glow tube as a detector of the carrier frequency current. In the present device, instead of a glow tube, a three-element electric discharge device is employed as a detector of the high frequency current. The use of a discharge device of this character presents the difficulty that the filament may burn out and thereby render the system inoperative, and it is one of the objects of my invention to provide means whereby this difficulty may be overcome.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claim. My invention itself, however, both as to its organization and method of operation will best be understood by reference to the following specification taken in connection with the accompanying drawing in which the single figure shows diagrammatically a circuit organization whereby my invention may be carried into effect.

Referring to the drawing, I have indicated at 1, the mains of a system of distribution. Associated with the system is a receiver which includes a transformer 2, an electric discharge device 3, and a relay 4. Transformer 2 consists of a primary winding 5 connected to the distribution system through coupling condensers 6, which also serve to exclude current of power frequency from the receiver. The secondary winding 7 of the transformer is connected to the grid 8 and cathode 9 of the three-element discharge device 3. A condenser 10 is connected across the secondary winding 7 and serves to tune the receiver to the frequency of the carrier current employed. A source of energy 11, which in the present instance is a battery, is connected to the grid 8, and supplies a negative bias thereto, so that nor-

mally no current flows in the output circuit of the discharge device. The output circuit of the discharge device includes an anode 12, a source of energy 13 and a relay 4, the latter being adapted to control the remote circuit 14. Heating current for cathode 9 is supplied from the secondary winding of a transformer 15, which may be connected by a double pole switch 16, to an alternating current source indicated at 17.

Relay 4 includes a switch arm 18 which opens and closes the remote circuit 14, the arm being actuated to the position indicated on the drawing by means of a spring 19. The winding of relay 4 is adapted under certain conditions to be connected in circuit with the alternating current source 17 through a switch 20, and a glow tube or discharge device 21. The glow tube 21 comprises a receptacle filled at a certain pressure with an inert gas, such as neon, and having two dissimilar electrodes therein as indicated at 22 and 23. Owing to the dissimilar character of the electrodes, current will flow through the tube 21 in one direction only. An electromagnet 24, the winding of which is included in circuit with the cathode 9, controls the operation of switch arm 20.

Normally, when switch 16 is in closed position, the filamentary cathode 9 will be supplied with heating current from transformer 15, electromagnet 24, which is in circuit with cathode 9, will be energized, and switch arm 20 will be moved against the dead contact indicated at 25, thus opening and maintaining open the circuit from the alternating current source 17 to the winding of relay 4. Under such circumstances, when carrier current having a certain frequency for which the circuit of the device 3 is tuned, is supplied from a transmitter, not shown, to the distribution system 1, the carrier frequency current will be detected by the discharge device 3, grid 8 will be rendered alternately positive and negative, and current will flow in the output circuit of the discharge device, thereby energizing the winding of relay 4 and opening remote circuit 14.

If the current flowing through the filament-

tary cathode 9 should for any reason become interrupted, electromagnet 24 would become deenergized, and the switch arm 20 would be immediately released and actuated, either by its own weight or by means of a spring, not shown, to the position indicated on the drawing. In the latter position a circuit would be closed from the alternating current source 16, through switch arm 20 and glow tube 21 to the relay 4, thus maintaining the energization of relay 4, independently of the discharge device 3.

Instead of the source 17, current may be supplied if desired from the mains 1. Various modifications of my invention will readily suggest themselves to persons skilled in the art without departing from the scope of my invention as set forth in the appended claim.

What I claim as new and desire to secure by Letters Patent of the United States, is:

In combination, an electron discharge device having a cathode circuit, an anode circuit, and a grid circuit, a relay connected in said anode circuit, means for supplying control current to said grid circuit thereby to control the operation of said relay, a source of potential for energizing said cathode circuit, a relay connected in said cathode circuit and connections from said source of potential to said first-mentioned relay, said connections including contacts on said second-mentioned relay whereby upon failure of current in said cathode circuit said first-mentioned relay becomes energized from said cathode source of potential.

In witness whereof, I have hereunto set my hand this 28th day of December, 1925.

WALTER R. G. BAKER.