

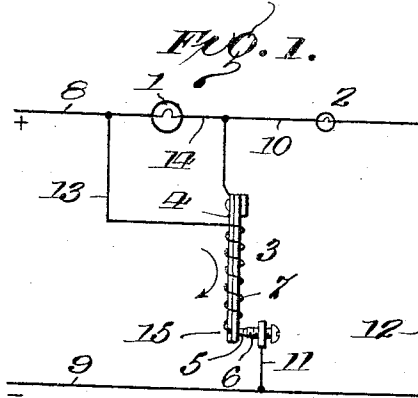
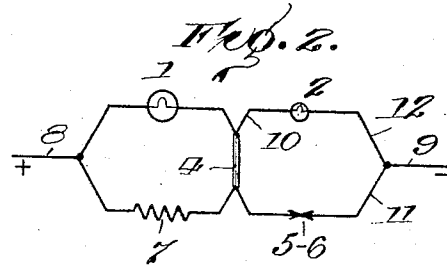
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ELECTRIC CIRCUIT CONTROL SYSTEM

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ELECTRIC-CIRCUIT-CONTROL SYSTEM

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The present invention relates generally to electric circuit control systems and more particularly to an arrangement for effecting alternate operation of a pair of electrically operated devices such as lamps, motors etc.

The chief object of the invention is to provide a combination and arrangement of circuits and apparatus to produce a system of control of the above type that will be simple, inexpensive and occupy a minimum amount of space.

This object of the invention is attained by a novel arrangement of the circuit connections whereby a simple electrically operated switch having a single pair of contacts, preferably of the type known as intermittent thermal switches, may be used to control two circuits, thereby doing away with the use of a two-circuit switch which is much larger, more expensive, and less simple in structure.

While the invention in its broader aspects is applicable to any use where the alternate operation of a pair of any kind of current consuming devices is to be effected automatically, it finds its greatest present usefulness in the control of a pair of incandescent lamp circuits for advertising or signaling, in which latter use it is described and shown in the following specification and drawings accompanying the same.

In the drawings:

Fig. 1 is a diagram showing a preferred form of the invention;

Fig. 2 is a simplified diagram of the circuit connections of Fig. 1 to more clearly show the series parallel arrangement.

Referring to the drawings in detail, the devices to be controlled are here shown as a pair of electric lamps 1 and 2. The switch 3 may be any known or other suitable type of electrically operated time-element switch adapted to open and close a pair of contacts and is here shown as an intermittent thermal-switch comprising a bimetallic thermostatic bar 4, arranged to bend or warp in the direction indicated by the adjacent arrow upon an increase in temperature, and to normally hold the contact 5, carried by the bar, in contact with a stationary contact 6, the contact 5 being in electrical connection with the bar 4.

An energizing or heating element 7 in the form of a resistance wire is operatively associated with the thermostatic bar 4. The system derives current from a suitable source, not shown, over the line wires 8 and 9, which, for convenience in tracing the circuits, are marked with plus and minus signs, respectively, although it will of course be understood that the invention may be practiced with either direct or alternating current.

The lamps 1 and 2 are connected across the line in series relation with each other, the lamp 1 being of a relative high current-carrying capacity, say 25 watts for a 110 volt circuit, while the lamp 2 is of a relatively low current-carrying capacity, say 10 watts. The object of using lamps of different current-carrying capacities in the specific examples here illustrated is to render the branch of the circuit in which lamp 1 is located of such greater current-carrying capacity than the branch containing lamp 2, that alternate operation of the lamps in the manner hereinafter described is thereby permitted. It is to be understood, therefore, that any other arrangement effecting this difference in current-carrying capacity of the two circuit branches may be used, and that the invention is not limited to the specific case here shown where this is done by using lamps which themselves are of different current-carrying capacities. The switch contacts 5—6 are connected across the terminals of the lamp 2 by way of conductor 10, bar 4, conductor 11 and conductor 12, while the heating element 7 is connected across the terminals of lamp 1 by way of wire 13, bar 4 and wire 14, the lower terminal of the heating element 7 being connected with the bar at 15. It will be seen, especially upon reference to Fig. 2, that the high capacity lamp 1 and energizing or heating element 7 of the switch 3 are connected in multiple with each other, that the low capacity lamp 2 and the switch contacts 5—6 are also connected in multiple with each other, and that these two multiple groups are connected in series across the line.

In operation, the switch contacts being in closed position, current flows from line 8 through lamp 1 and heating element 7 in mul-

multiple to bar 4 and thence through lamp 2 and contacts 5—6 in multiple to line wire 9. As the resistance of the bar 4 and contacts 5—6 is negligible they form a substantially complete short-circuit across the terminals of the lamp 2 which causes lamp 2 to remain extinguished and connects both the lamp 1 and heating element 7 directly across the line wires 8—9, thus permitting them to become fully energized. The lamp 1 now glows, and the element 7 heating the thermostatic bar 4 causes the latter to gradually warp in the direction indicated by the adjacent arrow and carry with it the contact 5 out of engagement with the contact 6. This opens the shunt around the lamp 2 which now becomes connected in series with the multiple group comprising lamp 1 and heating element 7. The current flow which is now limited by the low capacity lamp 2, is sufficient to light lamp 2 but too small to light the high capacity lamp 1. The lamp 2 is now lighted and the lamp 1 extinguished while the current through the heating element is sufficiently limited by the resistance of lamp 2 and the branch through lamp 1 to permit the thermostatic bar 4 to cool sufficiently to warp back and close the contacts 5—6, thus restoring the circuits to the original condition and completing a cycle of operation which is repeated indefinitely.

While only certain specific embodiments and applications of the invention have been here described for the purpose of disclosure, it is to be understood that the invention is not limited to such specific forms and uses, but embraces all such modifications and variants thereof as fall within the scope of the appended claim.

What I claim is:

A circuit control system for alternately operating a pair of electrically operated devices, comprising a device of relatively high current-carrying capacity and a device of relatively low current-carrying capacity normally connected in series in relation to each other, and an electrically operated time element switch having a single pair of contacts opened and closed periodically and having its energizing circuit connected in multiple with the device of relatively high current-carrying capacity, said contacts being connected in multiple with the device of relatively low current-carrying capacity.

In testimony whereof I hereunto affix my signature.

WILLIAM G. LEAMON.