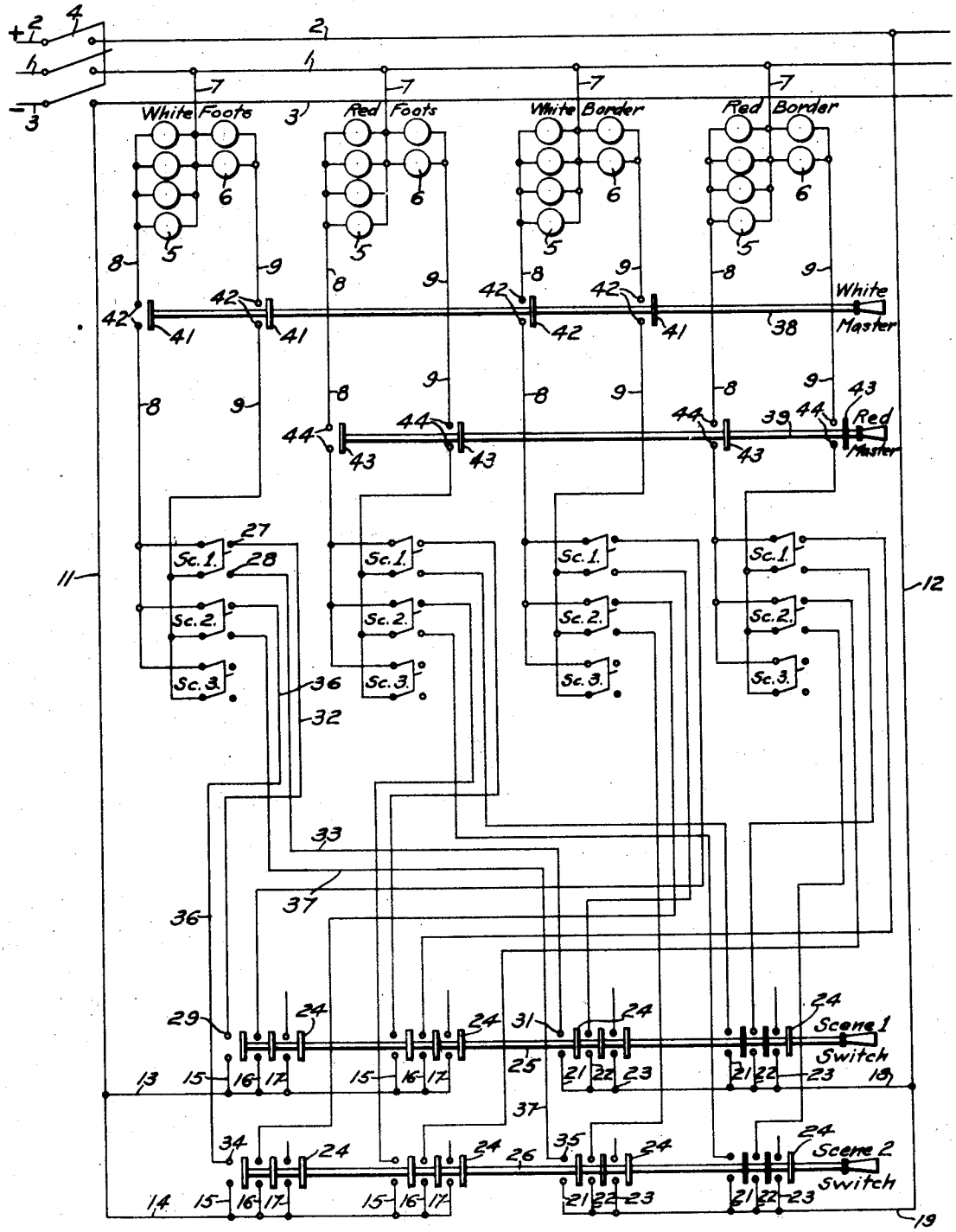
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THEATER LIGHTING CONTROL APPARATUS

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INVENTOR

James C. Masek

BY

Wesley G. Carr

ATTORNEY

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JAMES C. MASEK, OF IRWIN, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA

THEATER-LIGHTING CONTROL APPARATUS

Application filed June 10, 1927. Serial No. 197,826.

My invention relates to theater-lighting control apparatus and particularly to theater-lighting apparatus wherein the circuits are controlled by directly-connected switches, as distinguished from theater-lighting apparatus wherein the circuits are controlled by contactor switches and low-current control circuits.

An object of my invention is to provide a theater-lighting control system of the multi-scene pre-set type wherein the lighting circuits are controlled directly by manually operable switches and wherein a three or more wire distributing system is employed.

Another object of my invention is to provide a theater-lighting control system having the above-noted characteristics, wherein the loads or lamps of each circuit are connected to the neutral conductor of a three or more wire system and wherein the loads or lamps of a circuit are connected to at least two separate feed conductors.

In the copending application, Serial No. 577,830, filed July 27, 1922, by Bert F. Fuller, and in the copending application, Serial No. 199,702 (Case No. 12,343), filed June 18, 1927 by me, both of which are assigned to the Westinghouse Electric & Manufacturing Company, theater-lighting control apparatus is disclosed wherein the contactor switches are controlled by electromagnets connected to control circuits. The control circuits are controlled by pre-selecting switches connected in a two-wire control system and, therefore, the problems incident to direct switching connections in a three or more wire system are not encountered.

In a three-wire system wherein the loads are controlled by directly connected manually operable switches, each circuit may contain a number of loads or lamps that may be unequally distributed between the two separate feed conductors of the three-wire circuit. The simplest form of control for a system of this character would consist in providing switches in the neutral wire or bus. However, such a system would be objectionable for the reason that, where the lamps are unequally distributed between the two feed conductors of a circuit, interruption of the neutral bus circuit would result in abnormal voltages being applied to the group of lamps having the least number connected to a feed conductor. Such increase in voltage would result in failure of the lamps and throw such circuits out of commission.

A further object of my invention is to provide a theater-lighting system wherein the feed conductors of a lamp circuit are opened concurrently and maintained open while not in service, in order that the difficulty above-mentioned may be obviated.

These and other objects of my invention that will be made apparent throughout the further description thereof are attained by means of the apparatus hereinafter described and illustrated in the accompanying drawing, wherein

The single figure is a wiring diagram of a theater-lighting control system embodying features of my invention.

Referring to the drawing, the system includes a neutral feed bus 1 and feed busses 2 and 3 which, for the purpose of illustration may be considered as positive and negative busses, respectively.

The feed busses are provided with a main multi-pole switch 4 for controlling all of the circuits connected to the feed busses. As illustrated, four lighting circuits, namely, white foot lights, red foot lights, white border lights and red border lights are shown as connected to the feed busses 1, 2 and 3. Each load circuit comprises a plurality of groups of lamps 5 and 6 that are connected to the neutral branch busses 7. The lamps of groups 5 and 6 are connected, respectively, to separate feed conductors 8 and 9.

It is an object of my invention to provide means whereby the illumination may be pre-set for a plurality of scenes and wherein, after certain selector switches have been pre-set, certain groups of lighting circuits will be energized when a selected scene switch is closed.

For the purpose of illustration, circuits are provided to cause white and red illumination of the foot lights and the border lights.

Scene switches are provided for two scenes and selection switches are provided in each circuit for three scenes. It will be understood that any number of scenes may be accommodated by adding scene switches of the type shown and by adding a corresponding number of presettable selector switches to be hereinafter described.

In the diagram main feed conductors 11 and 12 are connected to the busses 3 and 2, respectively, the bus 11 being provided with groups of branch leads 13 and 14, one for each scene switch, and the branch leads 13 and 14 are provided with groups of terminals 15, 16 and 17, a group for each load circuit. The main feed conductor 12 is provided with branch leads 18 and 19, one for each scene switch, and each branch lead is provided with groups of terminals 21, 22 and 23. All of the said branch terminals are adapted to be engaged by bridging contacts 24 mounted on insulating switch bars 25 and 26 of the scene 1 and scene 2 switches, as indicated in the figure.

Each load or lighting circuit is provided with a group of individually pre-settable selective switches, marked Sc1, Sc2 and Sc3, representing the selector switches for scenes 1, 2 and 3. The selector switches are of the double-pole type and serve to connect the separate feed conductors 8 and 9 to their respective bridging contacts on their respective scene switch. For illustration, the contact jaws 27 and 28 of the Sc1 selector switch are connected, respectively, to terminals 29 and 31 by conductors 32 and 33 and are adapted to be engaged by the bridging contact members 24 of the scene 1 switch.

The scene 2 pre-settable selector switch of the white foot light circuit is connected to terminals 34 and 35 by conductors 36 and 37, respectively. The said terminals are adapted to be engaged by bridging contact members 24 of the scene 2 switch.

The pre-settable selector switches of the other circuits are similarly connected to their respective scene switches and, by reason of the arrangement of connectors and switches, any desired number of circuits may be preselected for energization when any selected scene switch is closed. If it is desired that the white foot lights and red border lights be illuminated during scene No. 1 and scene No. 3, the selector switches Sc1 and Sc3 are closed. The circuits associated therewith will be energized when the scene 1 and scene 3 switches are closed.

Color master switches 38 and 39 are provided for the purpose of controlling the color of the lamps of any part of the stage during any particular scene. Such switches are desirable in the event that it is desired to drop out any particular color during a scene. Under ordinary operating conditions, all of the color master switches will be maintained in closed position, thus depending upon the pre-selection of the circuits by means of the scene Sc1, Sc2, etc., switches to function in a predetermined manner.

It will be noted that the white color master switch 38 is provided with bridging contact members 41 for engaging contact terminals 42 of the feed conductors 8 and 9 of the white foot light and white border light circuits. The red color master switch 39 is provided with bridging contact members 43 for engaging contact members 44 of the feed conductors 8 and 9 of the red foot light and red border light circuits.

Assuming that the main multi-pole switch 4, the white color master switch 38, the scene 1 switch and the Sc1 selector switch of the white foot light circuit are closed, current passes through the conductor 11, branch conductor 13, terminals 15 and 29, conductor 32, terminal 27, Sc1 switch blade, feed conductor 8, contact terminals 42 bridging member 41, contact terminal 42, lamps of group 5 to the neutral branch conductor 7 that is connected to the main neutral bus 1.

Current passes through the feed conductor 12, branch conductor 18, branch terminals 21, switch member 24 of the scene 1 switch, terminal 31, conductor 33, contact terminals 28, Sc1 switch, feed conductor 9, terminal 42, bridging switch 41 of the white color master switch 38, terminal 42, feed conductor 9 and lamps of group 6 of the branch neutral conductor 7, connected to the neutral bus 1. Similarly, current will pass through any closed presettable selector switch to the load circuits when its respective scene switch is closed and when the color master switch is closed.

By reason of the fact that both feed conductors of a lighting circuit are open concurrently, there is no danger of the voltage rising in the various lamp circuits and, consequently, there is no danger of the lamps being put out of commission.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

I claim as my invention:

1. In a three-conductor distributing system having a neutral conductor and two feed conductors, a plurality of load circuits each having loads connected to the neutral conductor and to separate said feed conductors, a plurality of separately operable switches for controlling the circuits through the said separate conductors and a corresponding number of double-pole selector switches for each load circuit for selectively connecting the said separate conductors to a selected separately operable switch.

2. In a three-conductor distributing system having a neutral conductor and two feed conductors, a plurality of load circuits divided into separate groups and each load circuit having loads connected to the neutral conductor and to separate said feed conductors, a plurality of separately operable switches for controlling the circuit through the said separate conductors, a corresponding number of double-pole selector switches for each load circuit for selectively connecting the said separate conductors to a selected said separately operable switch and a separate switch for each said group for controlling the circuit through the said separate conductors of each group.

3. In a three-or-more-conductor theater-lighting system having a neutral conductor and two or more feed conductors, a plurality of load circuits each having loads connected to the neutral conductor and to a separate said feed conductor, a plurality of scene switches for controlling the circuit through the said separate conductors and a corresponding number of pre-settable double-pole selector switches for each load circuit for selectively connecting the separate conductors to a said selected scene switch.

4. In a three-or-more-conductor theater-lighting system having a neutral conductor and two or more feed conductors, a plurality of load circuits divided into groups and each having loads connected to the neutral conductor and to a separate said feed conductor, a plurality of scene switches for controlling the circuit through the said separate conductors, a corresponding number of double-pole selector switches for each load circuit for selectively connecting the separate conductors to a selected scene switch and a separate color switch for each group for controlling the circuit through the said separate conductors of each group.

5. In a three-conductor distributing system having a neutral conductor and two or more feed conductors, a plurality of load circuits each having loads connected to the neutral conductor and to a separate feed conductor, a plurality of separately operable switches for controlling the circuit through the said separate conductors and a corresponding number of pairs of selector switches for each load circuit for selectively connecting the said separate conductors to a selected said separately operable switch.

In testimony whereof, I have hereunto subscribed my name this 2nd day of June, 1927.

JAMES C. MASEK.