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THEATER DIMMER AND THE LIKE

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Fig. 1.

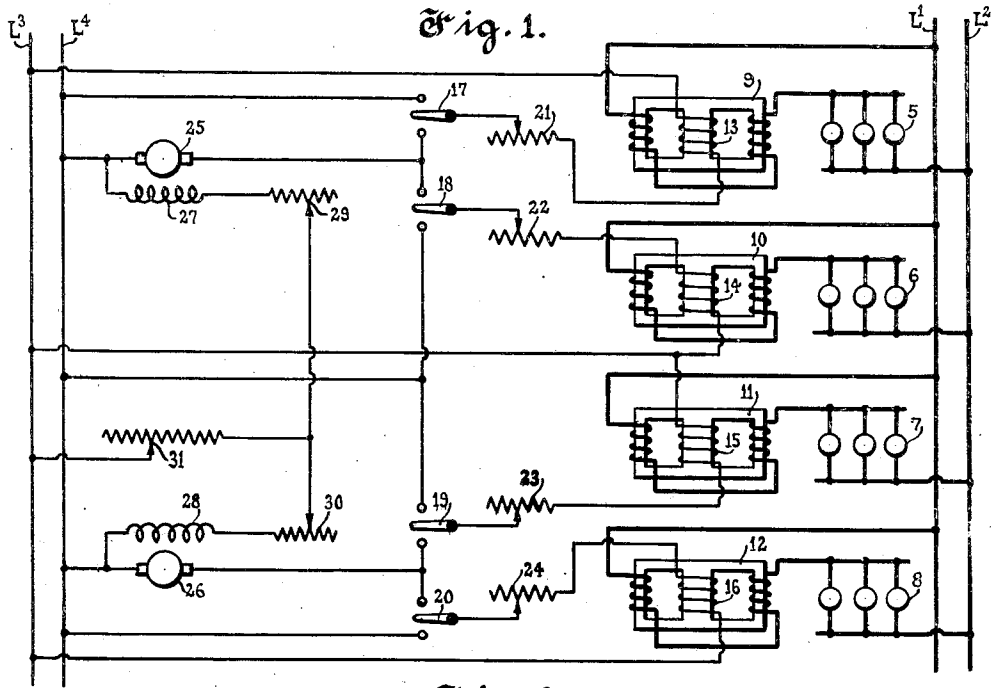
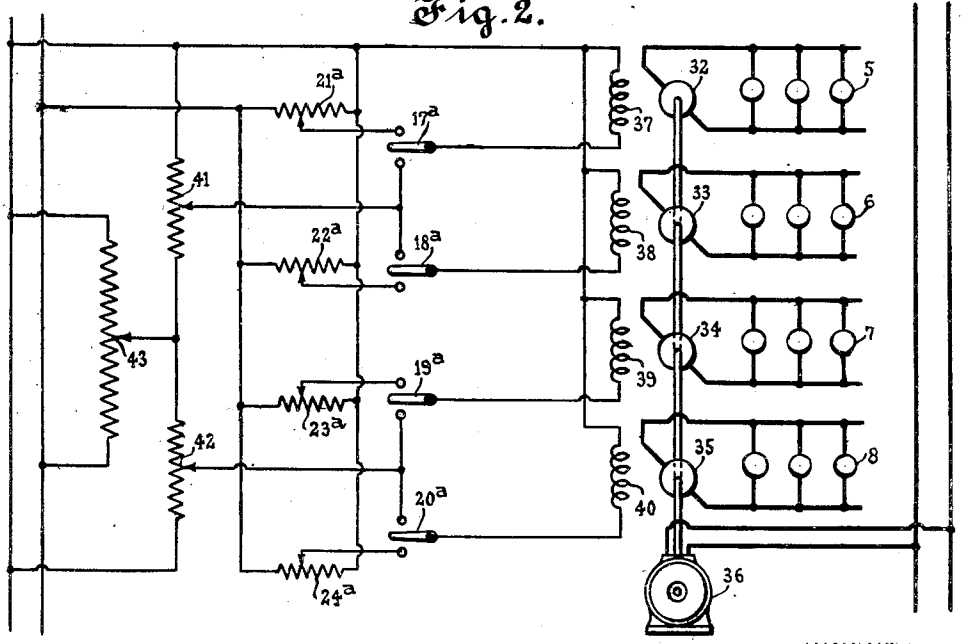


Fig. 2.



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THEATER DIMMER AND THE LIKE.

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This invention relates to theater dimmers and the like and more particularly to improved control therefor.

Heretofore in energization and illumination intensity control of a plurality of lighting circuits it has been proposed to provide individual, group and master control of the circuits and to commutate the several circuits to afford individually the control desired. Also it has been proposed to provide for proportional dimming or control of several circuits whereby predeterminable definite relations of the illumination intensities, thereof may be maintained during enactment of joint control, the illumination intensity of each circuit beng variable by proportional positive or negative increments of its former value.

The present invention has among its objects that of providing for securement of the foregoing and other control features in an improved and simplified manner.

Another object is that of reducing the number of switches and other instrumentalities employed for adequate energization and illumination intensity control including the foregoing features.

Another object is that of providing for enactment of amplified control as aforecharacterized and wherein provision is made for maintaining the control characteristics and electrical condition of the individual circuits substantially independent of the number and electrical condition of the concurrently energized circuits.

Various other objects and advantages of the invention will hereinafter appear.

In the accompanying drawing, wherein are illustrated certain of the embodiments which the invention may assume in practice;

Figure 1 is a diagrammatic view illustrative of a proposed embodiment; while,

Fig. 2 is a similar view illustrative of a modified construction and arrangement.

Referring first to Fig. 1 of the drawing, the same illustrates lamp circuits 5, 6, 7 and 8, which may be designated respectively as white foot, white border, red foot and red border lamp circuits of a theater or the like, to be supplied from A. C. lines L^1 L^2 and to be subjected to amplified energization and illumination intensity control, as by means of magnetic amplifiers 9, 10, 11 and 12, respectively, the latter being individually provided with control windings 13, 14, 15 and 16 to be supplied from a convenient source, such as lines L^3 L^4, of direct current or of alternating current of materially lower frequency than that of the current supplied by lines L^1 L^2. The foregoing arrangement provides for control, including continuous variation between and including zero and maximum values, of the illumination intensity of the lamps in the individual circuits through suitable control of the electrical condition of the individual control windings 13 to 16, such latter control being in turn effected by the means now to be described by way of example.

To such end corresponding terminals of said windings 13 to 16 are directly connected with line L^3 as shown, the opposite terminals of said windings being arranged for connection with line L^4 by means of individual switches 17, 18, 19 and 20, individual rheostats 21, 22, 23 and 24 being arranged to be in circuit between each of said windings and its associated switch. The described arrangement thus provides complete individual energization and illumination intensity control of the lamps of the several circuits.

Moreover, each of said switches 17 to 20 is of the double throw type, having also an intermediate off position, the arrangement being such that actuation of any switch in one direction from off position serves to connect its associated amplifier winding through its rheostat directly to line L^4 whereas opposite actuation of any switch serves to connect its associated winding through the rheostat again to line L^4 but subject to control by means of the group and master control devices now to be described.

Assuming selection of circuits for group control to be made in accordance with similarity of color, a common return connection to line L^4 is provided for the amplifier windings controlling the white foot and white border lamps and similarly for the windings controlling the red foot and red border lamps, said return circuits being provided with individual control means which may in practice comprise a suitable potentiometer connected resistor (as shown in Fig. 2) or an analogous device, such as a shunt wound generator with field control (as shown in Fig. 1), whereby the impressed po-

tential and other electrical conditions of the amplifier coils of any given color group may be regulated without affecting materially the corresponding electrical conditions of the other control circuits which are also supplied from the common source L^3 L^4.

To such end it is proposed, as shown in Fig. 1, to provide individual bucking generators 25 and 26 in the aforementioned coil group joint return circuit connections, said generators to be driven at constant speed (by suitable means, not shown) and being provided with individual separately excited fields 27 and 28 having associated individual rheostats 29 and 30 whereby the value of the opposing voltage delivered by the individual generators may be controlled. Moreover fields 27 and 28 are provided with a common return circuit connection through a master rheostat 31 to line L^3, or through a suitable potentiometer connected resistor whereby the same provides for control of the illumination intensity of the lamps of all the circuits jointly.

Also it is to be observed that this construction provides for so-called proportional control, whereby any relation of values of illumination intensity predetermined by setting of individual rheostats 21 to 24 is maintained during joint control by group rheostats 29 and 30 or master rheostat 31 and any relation of group intensities determined by setting of group rheostats 29 and 30 is maintained during control by master rheostat 31.

In Fig. 2, wherein is illustrated an analogous but slightly modified dimmer control system, the lamp circuits 5 to 8 are arranged to be supplied by individual generators 32, 33, 34 and 35 to be driven by a common motor 36 supplied from lines L^1 L^2. Said generators are respectivly provided with independently controllable fields 37, 38, 39 and 40 whereby both the energization and also the illumination intensity of their individually associated lamps may be controlled.

Each of said field circuits has a direct connection with line L^3 as shown, connection of the opposite ends of the respective field coils with line L^4 being controllable and commutatable by means of individual double throw switches 17^a, 18^a, 19^a and 20^a to include certain potential varying devices as in the preceding figure, thus enabling individual, group and master control both of energization and intensity of the several fields.

Thus potentiometer connected resistors 21^a, 22^a, 23^a and 24^a are provided for individual control of the electrical condition of field windings 37 to 40 respectively as in the preceding example. However, in the present instance said resistors are shown located beyond their associated switches, whereby proportional dimming involving said resistors is not provided. However, obviously the arrangement of said resistors and switches illustrated in Fig. 1 is equally applicable in Fig. 2.

Also in Fig. 2 the bucking generators 25 and 26 of Fig. 1, together with their directly associated parts, are replaced by potentiometer connected resistors supplied by lines L^3 L^4, said resistors 41 and 42 having a common connection to said supply circuit through an additional potentiometer connected resistor 43. Potentiometers 41 and 42 thus provide for group control and potentiometer 43 provides for master control of the energization and intensity of fields 37 to 40 and of their associated lamp circuits. Also proportional control by groups is provided.

Further it is to be understood that the aforedescribed connections including potentiometer connected resistors and the like provide for smooth regulation of the illumination intensity of the several lamp circuits between and including zero and maximum values, without requiring interruption either of the lamp circuit or of the control circuit, whereby arcing resulting from contact separation may be eliminated and the size and construction of the resistors may be reduced and simplified.

While the aforedescribed constructions differ in certain details and by way of substitution of equivalent devices it is apparent that the same are fundamentally similar in that each provides for simplified full individual control of the several lamp circuits and also provides for full electrical group and master control including proportional control of said circuits as distinguished from mechanically interlocked or relayed control thereof, the electrical condition of each control circuit being maintained substantially independent of that of the other of said circuits. Also it is to be understood that the control herein contemplated may involve or be effected by means of numerous forms of apparatus differing from but functionally equivalent to those particularly illustrated and described.

What I claim as new and desire to secure by Letters Patent is:

1. In an illumination control system having a plurality of lamp circuits, the combination with energization and intensity control means for said circuits comprising individual electrical control elements to be energized from a common source, of associated means providing for individual and joint control of the electrical conditions of said control elements including reduction of the control current to zero without interruption of the respective control circuits, whereby the electrical condition of each is maintained substantially independent of that of the other of said elements.

2. In an illumination control system hav-

ing a plurality of lamp circuits, the combination with energization and intensity control means for said circuits comprising individual electrical control elements to be energized from a common source, of associated joint and selective potential control means for said elements functioning to render the electrical condition of each of said elements substantially uninfluenced by that of the other of said elements, said means comprising means enabling reduction of the control current to zero without interrupting the line connections of the respective control circuits.

3. In an illumination control system having a plurality of lamp circuits, the combination with energization and intensity control means for said circuits comprising individual electrical control elements to be energized from a common source, of associated means providing for individual and proportional joint control of the electrical condition of said control elements while maintaining the electrical condition of each substantially uninfluenced by that of the other of said elements, said means comprising means enabling reduction of the control current to zero without interrupting the line connections of the respective control circuits.

4. In an illumination control system having a plurality of lamp circuits, the combination with energization and intensity control means for said circuits comprising individual electrical control elements to be energized from a common source, of associated means providing for individual and joint control of the electrical condition of said elements, said last-mentioned means including potential varying devices adapted to maintain the electrical condition of each of said control elements substantially independent of that of the other of said elements, said potential varying devices enabling reduction of the control current to zero without interrupting the line connections of the respective control circuits.

5. In an illumination control system having a plurality of independently controllable lamp circuits, the combination with energization and intensity control means for said circuits comprising individual electrical control elements to be energized from a common source, of associated means providing for individual, group and master control of the electrical condition of said elements, said means comprising potentiometer type resistance varying devices so disposed and connected as to provide for maintaining a predeterminable definite relation between the electrical conditions of the several control elements during joint control of such conditions of said elements, the electrical condition of each of said elements being also maintained substantially uninfluenced by variations in electrical condition of other of said elements.

In witness whereof, I have hereunto subscribed my name.

RICHARD B. HUNTER.