Sept. 13, 1932. F. B. ADAM 1,876,824

DIMMER CONTROL APPARATUS

Filed May 18, 1929 2 Sheets-Sheet 1

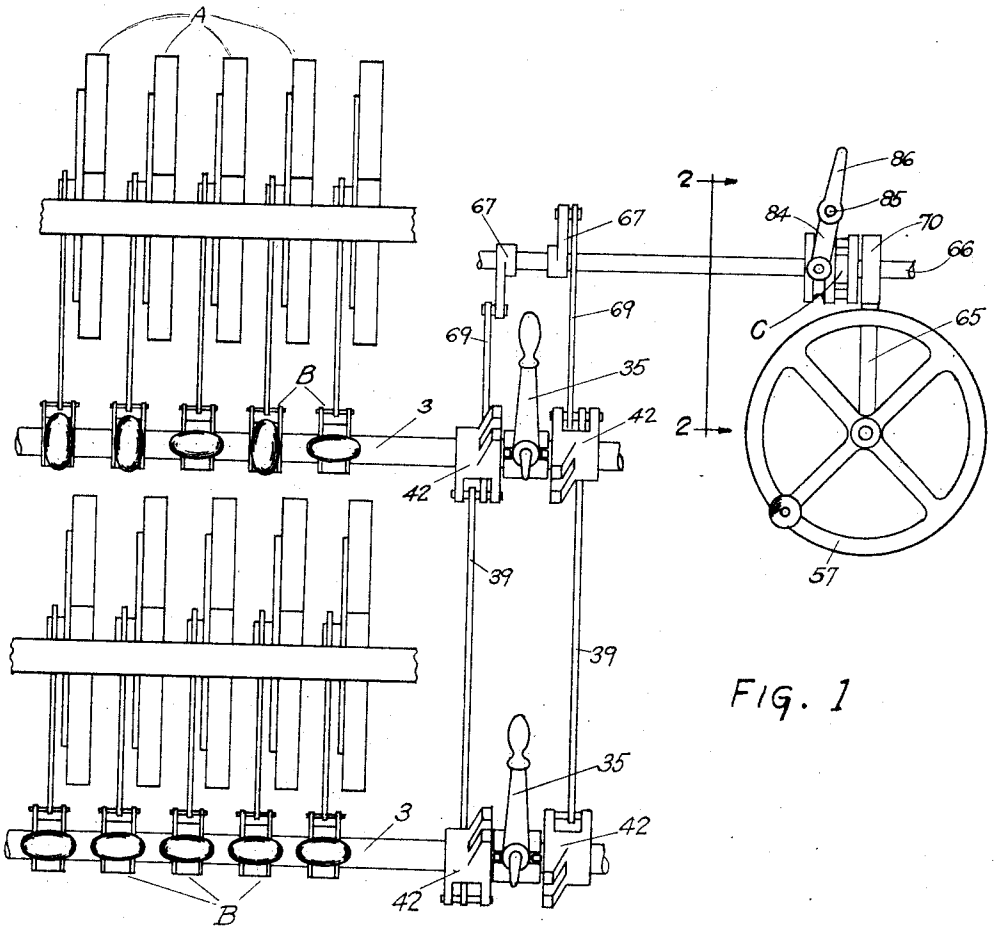


FIG. 1

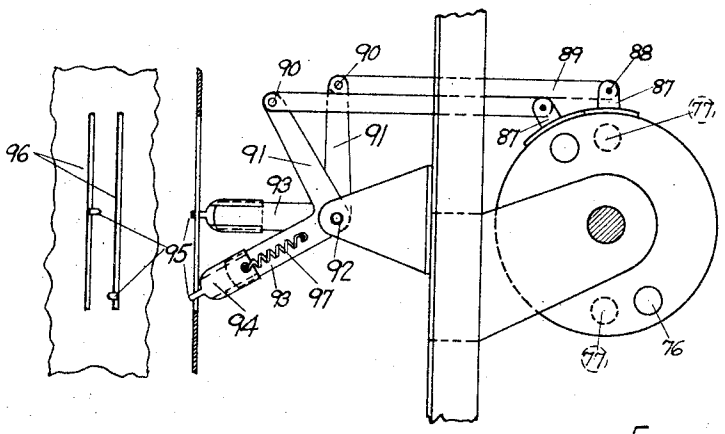


FIG. 5

FIG. 4

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DIMMER CONTROL APPARATUS

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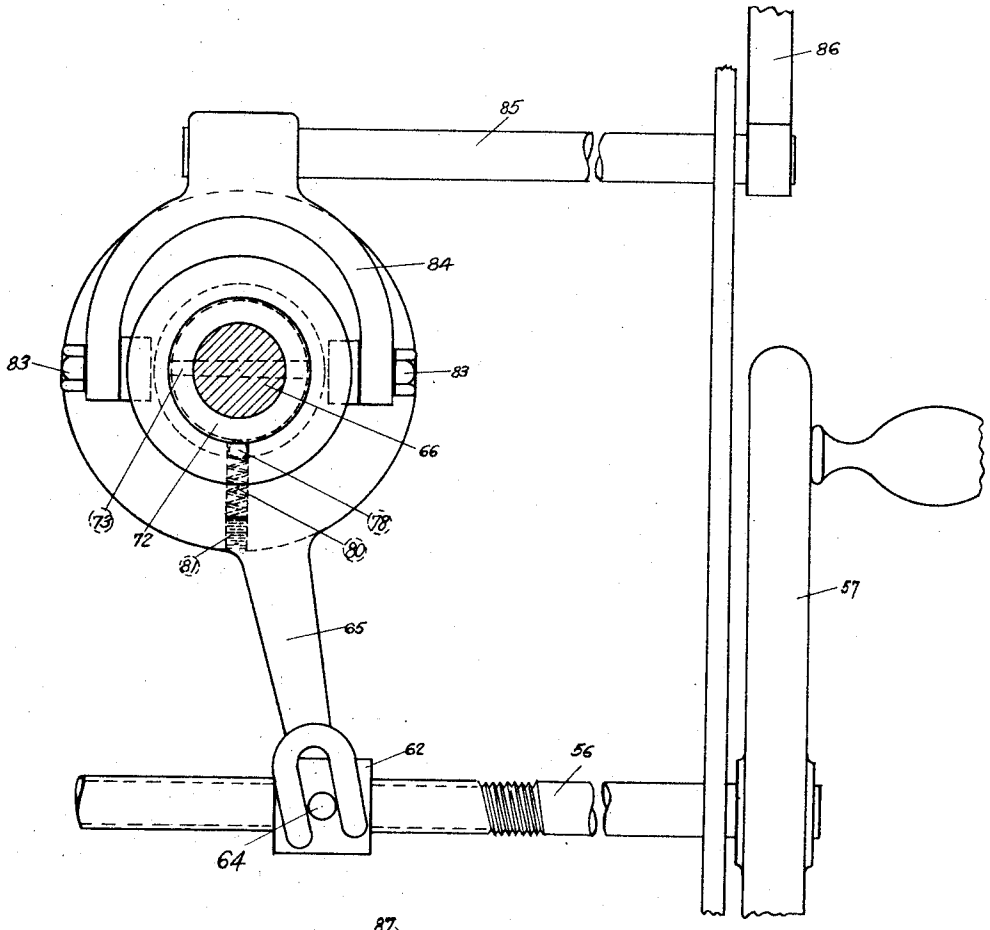


FIG. 2

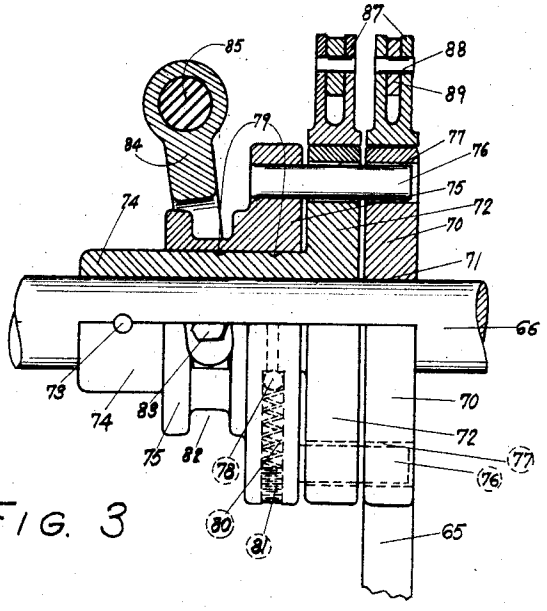


FIG. 3

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DIMMER CONTROL APPARATUS

Application filed May 18, 1929. Serial No. 364,231.

An object of this invention is to provide, in a system of lighting dimmers including a so-called grand master control or the like, by which any or all of the dimmers in the bank may be simultaneously controlled, improved means enabling the dimmers to be controlled, optionally by either the grand master control, or by the use of one or more subordinate control elements.

A further object of the invention is to provide an improved construction and arrangement of clutch means, in connection with a grand master control of a dimmer system, by which such a control may be selectively engaged and disengaged from operative connection with the remainder of the actuating apparatus of the system.

A still further object of the invention is to provide an improved construction and arrangement of clutching means, associated with a so-called grand master control or the like, in which the grand master control is to be brought into a uniform operative relation with the remainder of the actuating apparatus of the system, and in which there is provided improved means for indicating the relative position of the clutch parts, whereby to facilitate their ready engagement.

Further objects and advantages of the invention will appear from the following description of a preferred embodiment of the invention, considered together with the accompanying drawings, in which:

Fig. 1 is a front elevation of a portion of a dimmer assembly showing a preferred form and arrangement of a grand master control or slow motion drive, together with a clutch actuation handle; Fig. 2 is an enlarged, fragmentary side elevation, partly in section, of the apparatus as viewed along the line 2—2 of Fig. 1; Fig. 3 is a vertical sectional elevation of a preferred form of clutch; Fig. 4 is a side elevation of a preferred form of clutch-position indicating means, and Fig. 5 is a fragmentary front elevation, showing a preferred manner of presenting the clutch-position indicating means on a dead-front control board.

The purposes and advantages of certain parts of the assembly as well as their combinations and setting, will be best understood by reference to my co-pending application of Serial No. 300,194, filed August 17, 1928. This co-pending application relates to an agroupment or bank of dimmers, arranged in rows, with means for variously associating the dimmers, either for actuation in the same or in relatively opposite directions. Only so much of the matter described in the above noted co-pending application will be herein referred to, as is necessary for a complete understanding of the present invention; the detailed description of the parts, their relation and interconnection being incorporated herein by reference to the above noted application. To facilitate reference between the present and the above noted applications, the former reference numerals have been employed in describing the present drawings, insofar as applicable to parts shown in both applications.

The present, as well as the preceding application noted, contemplate, in preferred embodiment, a plurality of dimmers A, disposed in rows, and each dimmer having an individual control device B. The individual dimmer control includes clutching means enabling each of the dimmers to be actuated independently or interlocked with a shaft, such as 3, for group actuation, as may be desired. It will be understood that the individual dimmer controls are disposed along and rotatable about the shaft 3, there being one or more of such shafts for each row of the dimmers, depending upon whether or not relatively opposite actuation of dimmers in the same row is provided for as in my co-pending application filed April 26, 1929, Serial No. 358,281. Each row of dimmers identified by a given shaft 3, is provided with a master control handle 35 secured to the shaft 3. Adjacent each of the master levers 35, is a pair of levers 42 rotatable relative to the shaft and arranged for selective operative connection with their associated control lever by means of a clutch, (not shown). In the preferred construction, the rows of dimmers, each identified with a given shaft 3, are disposed one above another, and each row of

dimmers is in circuit relation with lights of a given color.

It will be understood that each master control lever 35 is employed for actuating its shaft 3, to effect group actuation of any selected number of the individual dimmers which may be interlocked by their respective clutching means.

Simultaneous control of the dimmers in more than one row, is found in the provision of links 39, serving to interconnect the levers 42 disposed on a given side of their associated master control levers.

When the dimmers of the bank are interconnected for simultaneous operation in substantial number, the energy required for manipulation may attain such proportions as to render it inexpedient to actuate all of the dimmers by means of a single master control lever 35. To the end of providing a reduction gear whereby a substantial number of interconnected dimmers may be simultaneously operated with a minimum of effort, there is provided a grand master control, such as a slow motion wheel 57, which serves directly to actuate a threaded shaft 56, on which is carried a traveling nut or the like 62, having in the present instance a pivoted connection 64 with a driving lever 65. The lever 65 is in turn operatively associable, through a suitable clutch hereinafter described, with a rocker shaft, or jack shaft 66, in such a manner that, when the clutch is engaged, the movement of one end of the lever 65 will result in rotation of the shaft. Carried by the rocker shaft, and extending from opposite sides thereof, is a pair of arms 67, each having one end secured to the shaft 66 for rotation therewith. The opposite end of each of the arms or levers 67 is pivoted as at 68 to a link, such as 69; the free end of each of the links 69 being connected either to a member 39 or directly to one of the levers 42. As will be seen from the disposition of the arms 67 on opposite sides of the shaft 66, rotation of this shaft in a given direction will result in moving one of the links 69 in one direction, while the other thereof is moved oppositely. As will be noted from the drawings, (Fig. 1) one of the links 69 is operatively connected with the levers 42 aligned on one side of the master levers 35, while the other link 69 is operatively associated with the levers 42 on the opposite side of the aligned levers 35.

Since, as referred to above, the clutching means associated with each of the levers 35 provides for selectively connecting a given master control lever and hence its associated shaft 3, to one or the other of the paired levers 42, which are arranged to be moved in opposite directions, it will be obvious that the rows of dimmers may be related for simultaneous actuation in either the same or in opposite directions, and that for purposes of slow dimming, or of full uniform control of all interconnected dimmers, the wheel 57, together with the shaft 56, rocker shaft 66 and link 69 may be employed.

As was indicated in the co-pending application first above noted, it is desirable in some installations to control the dimmer groups without the use of the wheel 57 or some equivalent grand master control. It was there mentioned that this might be accomplished by omitting or disconnecting the drive lever 65, as a result of which a plurality of the dimmer rows may be controlled by interlocking them with the appropriate levers 42, and by actuating one of the interlocked master control levers in the direction desired. In smaller installations this practice is entirely satisfactory without employing the wheel 57, shaft 56 and related parts, and is likewise satisfactory in larger installations when comparatively few dimmers are to be simultaneously actuated.

To enable a grand master control, such as the slow motion actuating device of the present disclosure, to be operatively disconnected from the remainder of the dimmer actuating apparatus, I provide a clutch indicated generally at C, disposed, by prefence, on the shaft 66 and serving selectively to effect an operatively connection between the link 65 and this shaft.

The clutch assembly illustrated constitutes a clutch element or collar 70 which may be formed integrally with, or secured to the lever 65 and provided with a centrally disposed aperture 71 to receive the shaft 66. The collar 70 is, however, freely rotatable about the shaft 66 and adapted to be operatively connected thereto, as desired, by means hereinafter described. Disposed adjacently of the collar 70 is a plate or collar 72 which is by preference secured to the shaft 66 as by a key, pin or the equivalent 73. The collar 72 is provided with an extended hub portion 74, upon which is slidably movable, an additional plate or collar 75. Carried by this plate, is one or a plurality of engaging pins 76 which are preferaby of such a length, as indicated in Fig. 3, as to extend through the collar 72 and at least substantially through the collar 70; there being suitable pin receiving apertures 77 formed in the collars 72 and 70. In order to provide definite engaging and disengaging clutch positions, identified by limits of movement of the collar 75, I prefer to provide a pair of grooves which may be formed in the hub portion 74. Engaging one or the other of these grooves according to the clutch position, is a locking means consisting, in the present instance, of a ball 78 which is urged against the hub portion 74 and into one of the grooves 79 by a spring 80; the spring and ball being in turn positioned in the collar 75 in a suitable bore,

which is closed by a screw or threaded plug 81.

As a means for actuating the clutch between its engaged and disengaged positions, an annular groove 82 is provided in a portion of the collar 75 and into this groove are arranged to project a pair or more of cap screws 83, the screws being threadedly carried in a pivoted throw-out yoke 84. This yoke is in turn secured to a clutch actuating shaft 85 as by a pin or key, (not shown). The shaft 85 may be supported in a suitable bearing (not shown) mounted at any convenient point on the frame work of the control board, and is provided at its extremity with an actuating handle 86, preferably accessible from the board front, as shown.

As will readily appear from the preceding description, engagement and disengagement of the clutch is effected by movement of the plate or collar 75, lengthwise of the shaft 66 and along the hub 74 between the positions determined by the spacing of the grooves 79 on the hub portion 74. By movement of the handle 86, the collar 75 and pins 76 may be moved, for disengagement, to the left in Fig. 3, whereupon the pins 76 are withdrawn from the apertures in the element 70. This element, together with the link 65, may then be rotated independently of the slow motion drive. Movement of the clutch handle in the opposite direction again brings the parts to the position shown in Fig. 3, wherein the pins 76 extend through the apertures 77 to effect an operative engagement between shaft 66, collars 72 and 70 and the link 65.

Since, when the clutch is disengaged, the shaft 66 may have been rotated, and since the clutch elements 72 and 70 are engageable only in certain relative positions, it is advisable particularly when employing a dead front board, to provide indicating means for the position of these parts, visible from the front of the board, whereby the clutch parts may readily be brought into engaging position. To this end I have provided means, such as indicated by Fig. 4 including, for example, to indicate the position of the collar 72 secured to shaft 66, an arm 87, which may be secured to the collar in any suitable manner. The arm 87 includes a pivot portion 88, by which the arm is connected to a link 89, pivoted, in turn, at 90 to a bell-crank lever 91. This lever is by preference rotatable about a fixed pivot 92, which may be carried by a suitable bracket, or any stationary portion of the assembly. The outwardly-extending arm 93 of the lever is provided with a slide 94 which carries at its outer extremity a pointer 95, or some equivalent indicating means visible from the front of the board, and extending through a slot 96 therein. The member 94 is rendered movable lengthwise of the arm 93 by the manner of its engagement with the exterior surface of the arm. Such movement is yieldingly opposed by a coil spring 97, connected at one end to the slide, and at the other to a pin or equivalent anchorage on the arm 93. This arrangement permits the pointer 95 to have a straight-line movement along the outer face of the control-board, despite the arcuate movement of the arm 93.

For convenience of description, only one of the indicating devices has been described. A companion indicating device is provided, which may be identical in construction, for ascertaining the position of the plate or collar 72. Since the several parts of each indicating device are identical in the present showing (Fig. 4), identical reference numerals are employed in connection with the paired indicating devices.

The companion indicators or pointers 95 are thus presented for up-and-down movement on the face of the control board, in adjacence to each other. The arrangement is preferably such that the pointers are aligned when the clutch parts 72 and 70 are in position to be engaged. It will thus appear that the pointers 96 not only indicate the relation of clutch parts in which clutch engagement may be effected by the handle 86, but also serve to indicate the direction of movement necessary to bring the parts into engaging relation.

It will be seen that the clutch assembly disposed and constructed according to the present invention, greatly facilitates the operation of a bank of dimmers of the type described, in that it renders optional the use of either the grand master control, or one of the master control levers, for the actuation of any selected number of the dimmers, by rows, in either the same or in opposite directions. The device herein described enables a change, instantly, in the connection between the slow motion control and the individual color rows, thereby making for greater flexibility of operation, and providing a choice of control elements according to the nature of the result desired.

While I have described in detail, for illustrative purposes, a preferred embodiment of the invention, it will be understood that the construction and arrangement of parts may be varied substantially without departing from the spirit and full intended scope of the invention as defined by the appended claims.

I claim as my invention:

1. In a lighting control system including a dead-front control board, a bank of dimmers, arranged in rows, interconnecting means for the individual dimmers, clutching means for interconnecting a plurality of rows, and a shaft adapted to be operatively connected to any number of said dimmers, the combination of an actuating gear for said shaft, a manual shaft-actuating element connected to said gear, a clutch associated with the actuating gear and shaft members opera-

tively related to the parts of the clutch, adapted to indicate their engaging positions and a clutch actuating element, said actuating elements and indicating members being disposed on the face of said control board, and said shaft, actuating gear and clutch, at the rear thereof.

2. In a lighting control system including dimmers each provided with interlocking means, and disposed in rows, clutching means adapted for operatively associating each row with other of the rows, and an operating shaft common to said rows, the combination, with a dead-front control board, of a shaft actuating member, a clutch for connecting said shaft and member, and a clutch actuating element, said clutch element being disposed for manual actuating from the front of said board.

3. In a lighting control system in combination with a dead-front control board, a bank of dimmers arranged in groups, clutching means associated with each of the dimmers, means for interconnecting the groups of dimmers, a member for the unified control of any selected number of said dimmers, a reduction gear associated with said control member, a clutch for engaging and disengaging said reduction gear, and means for indicating the relative position of certain of the clutch elements, said means being visible from the front of said control board.

4. In a lighting control system including a bank of dimmers disposed in rows, clutching means for the individual dimmers, clutching means common to each dimmer row, and a shaft adapted to be operatively connected to any number of said dimmers, the combination of a dead-front control board, an actuating gear for said shaft, a clutch associated with the actuating gear and shaft, and means on the front of said board, for indicating the relative positions of portions of the clutch.

5. In a lighting control system including a bank of dimmers arranged in rows, clutching means adapted for controlling the dimmers individually, clutching means for interconnecting the dimmer rows, and a shaft adapted for accumulative operation of any number of said dimmers, the combination of a dead-front control board, an actuating gear for said shaft, a clutch for selectively operatively relating said gear and shaft, means accessible from the front of the board, for actuating the clutch, and means visible from the front of said board for indicating the position of a clutch element.

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