

Nov. 25, 1947.

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2,431,381

CONTROL SYSTEM

Filed Feb. 22, 1944

2 Sheets-Sheet 1

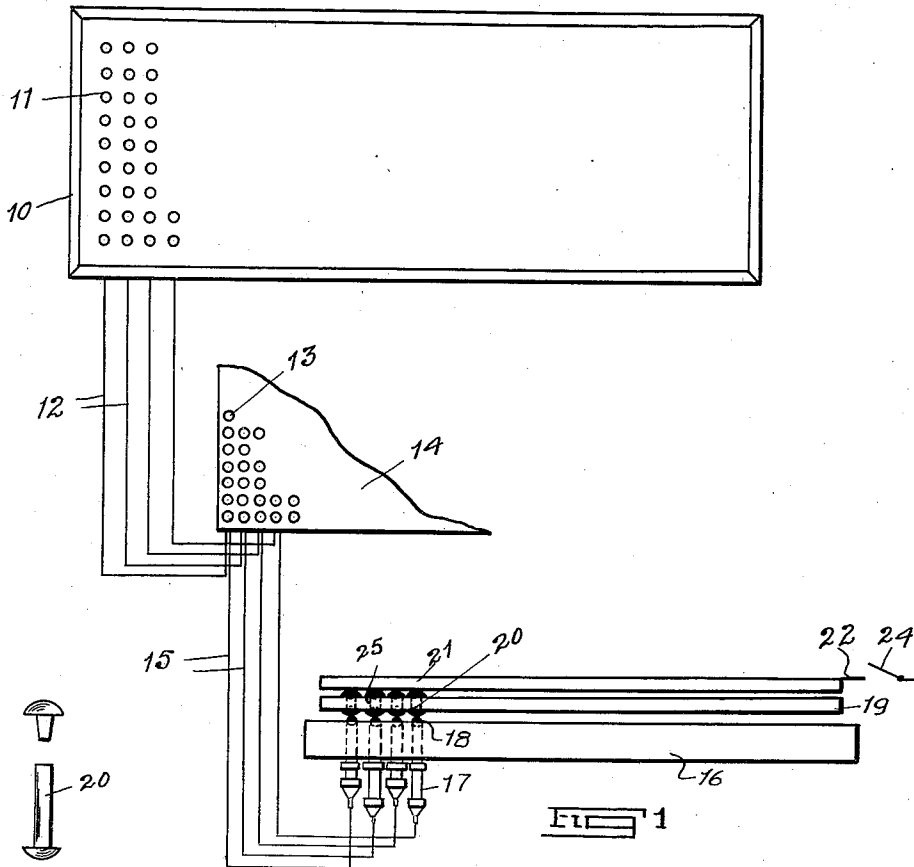


Fig. 1

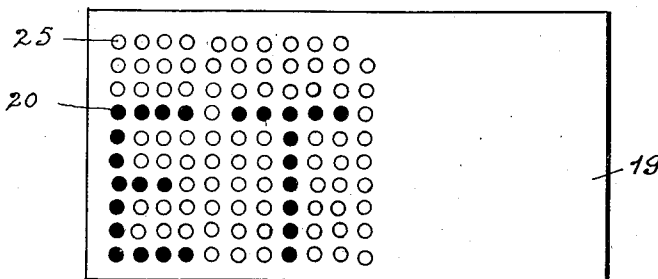


Fig. 2

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2 Sheets-Sheet 2

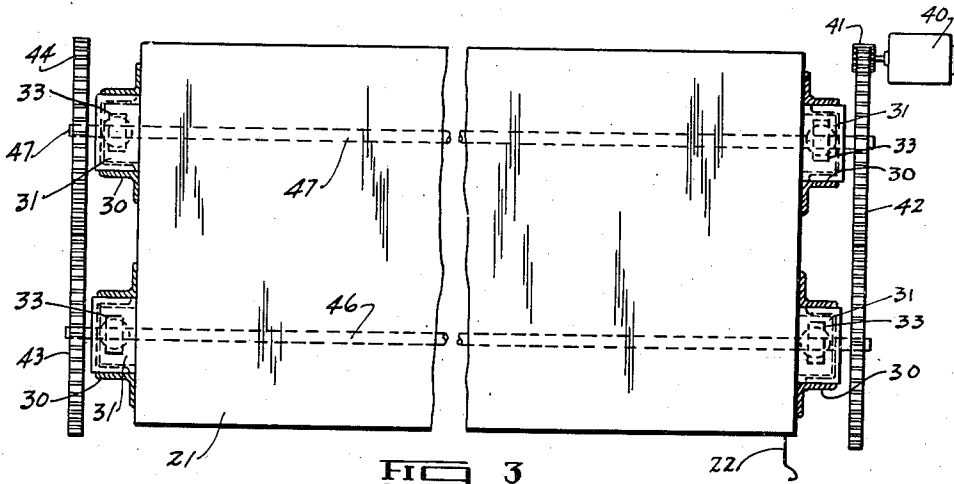


FIG. 3

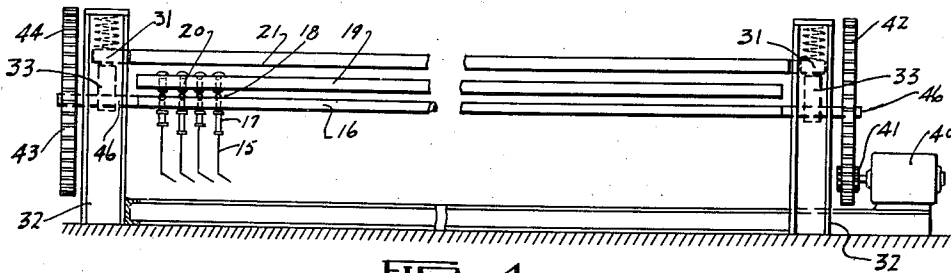


FIG. 4

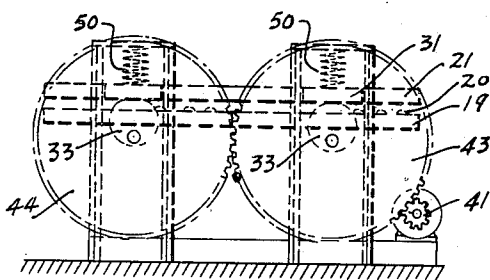


FIG. 5

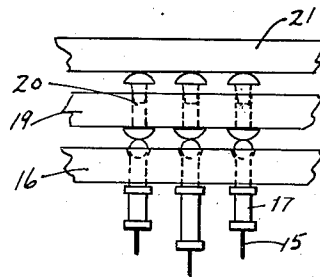


FIG. 6

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CONTROL SYSTEM

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5 Claims. (Cl. 200-46)

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This invention relates to an electric control system and is particularly directed to providing a control system for an electrically illuminated display sign of the type wherein the electric lamps forming the display are illuminated at and for predetermined time intervals.

Electrically illuminated display signs are well known and are in wide spread use for advertising purposes. The present invention is directed to providing a control system for an illuminated sign of the type wherein a predetermined arrangement of electric lamps are illuminated at and for predetermined time intervals.

One of the objects of the invention is to provide a control system for an electrically illuminated display sign of the flashing type in which the display flashed on the sign can be changed by an easily executed rearrangement of the circuits to selected lamps to be illuminated without any rearrangement of the lamps and/or the sign structure.

A further object of the invention is to provide a control system in which a display to be flashed on an electrically illuminated sign can be easily changed without any appreciable shutdown in the operation of the sign.

A still further object of the invention is to provide a control system for an electrically illuminated display sign which is inexpensive to manufacture and install and when in operation requires a minimum of attention.

An understanding of the manner in which the above and other objects of the invention are attained may be had from the following description, reference being made to the accompanying drawings, in which:

Figure 1 is a diagrammatic view of the electrical connections from each of a plurality of electric lamps forming a display sign through a master control panel to the control system;

Figure 2 is a top plan view of the perforated plate;

Figure 3 is a top plan view of an arrangement for raising and lowering the electrically energized plate at predetermined intervals;

Figure 4 is an end elevation of the modification illustrated in Figure 3;

Figure 5 is a side elevation of a driving arrangement;

Figure 6 is a detail, fragmentary view of the control system illustrated in Figure 1; and

Figure 7 is a side elevation of a suitable form of connector.

Like reference characters refer to like parts throughout the specification and drawings.

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A physical embodiment of the control system of the present invention comprises, in general, a display sign formed of a plurality of rows of electric lamps, a contact plate having a plurality of rows of connectors, each connector terminating in an electrical contact, electrically energized means, and means for completing the electrical circuits from the electrically energized means to selected contacts, and means for closing and opening the electrical circuits at predetermined intervals.

Referring to the drawings, the numeral 10 indicates a display sign formed of a plurality of rows of electric lamps 11. Each lamp 11 is connected, by a wire 12, to a connector 13 which is mounted in the master control panel 14. For convenience, each connector 13 is mounted in the control panel 14 in a position corresponding to the position of the lamp 11 in the sign to which it is connected.

Each connector 13 is connected, by a wire 15, to a similarly positioned connector 17 mounted in the contact plate 16. Each connector 17 preferably extends transversely through the contact plate and terminates in a recessed end which is adapted to receive a removable, spherical shaped contact 18 which extends beyond the surface of the contact plate 16. The contacts 18 are formed of or coated with electrically conductive material while the contact plate is formed of electrically non-conductive material according to standard practice.

The electrically energized means is preferably in the form of a plate 21 which is formed of or coated with electrically conductive material such as copper. The dimensions of the energized plate 21 are approximately the same as or slightly larger than those of the surface of the contacts carried by the plate 16. The plate 21 is preferably mounted parallel to and spaced apart from the contact plate 16 and is connected to a source of electrical power by the lead 22.

A plate 19 is mounted between the electrically energized plate 21 and contact plate 16. The plate 19 is of approximately the same size of the energized plate 21 and is preferably formed of electrically non-conductive material, and is formed with rows of perforations 25 which, when the plate is in place, are in alignment with the rows of contacts 18 carried by the contact plate 16. The plate 19 is designed to carry the connectors 20, which are preferably of a dumb bell shape, the shank of each connector extending through the plate and the conical shaped ends contacting the electrically energized plate 21 and

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one of the contacts 18. The connectors 20 are arranged in the plate 19 to complete the electrical circuits from the electrically energized plate 21 to selected contacts 18 and through the contacts 18 and the connectors 17 associated therewith to the selected electric lamps to be illuminated and form the display to be flashed on the sign.

The connectors 20 are arranged in the plate 19 in the design to be flashed on the display sign and they complete the electrical circuits only to those contacts 18 which are connected to the lamps which form the display. For example, in Figure 2, connectors 20 are shown as applied to the plate 19 to form the letters "ET." These connectors contact correspondingly positioned contacts 18 which, in turn, complete the circuits to the lamps which form the letters "ET" in the sign.

Various arrangements for closing and opening the electrical circuits at predetermined intervals can be incorporated into the system. For example, a mechanical arrangement such as illustrated in Figures 3, 4 and 5 can be used. In this arrangement, lugs 31 extending from the electrically energized plate 21 are mounted in guides 30 formed in the frame 32. In its lowest position in the guides 30, the plate 21 rests on the uppermost contact surfaces of the connectors 20 and in its highest position, the plate is clear of those contact surfaces. The plate 21 is raised and lowered by the rotation of cams 33 which are in continuous contact with the under surface of the lugs 31.

The rotation of the cams 33 is, of course, synchronized so that the cams are all in the same relative position during their rotation. The cams are driven from the motor 40 through a pinion 41, a gear 42, drive shafts 46 and 47 and gears 42, 43 and 44, the cams being mounted on the shafts 46 and 47, which shafts are driven by the gears 42 and 44 respectively. Springs 50 are preferably mounted in each guide 30 above the lugs 31 to exert an opposing pressure against the plate and thereby improve the connection between the plate and the surfaces of the contacts.

A simpler and preferred arrangement for closing and opening the electrical circuits to the selected lamps, is by the provision of a time switch 24 in the power line to the electrically energized plate, as illustrated in Figure 1. A standard form of time switch can be used for this purpose and can be set to close and open the circuits at predetermined intervals.

The operation of the control system is very simple. The contacts 20 are arranged in the plate 19 according to the display to be flashed on the sign. The plate 19 is then placed in its position between the electrically energized and contact plates, one contact surface of each of the connectors 20 being in contact with a correspondingly positioned contact 18 on the contact plate 16. The electrical circuits through the connectors 20 to the selected lamps in the sign are closed and opened such as in the manner described hereinabove.

It is found that the control system of the present invention has many advantages. For example, the system is inexpensive to construct, install and operate. It can be located in any position convenient to the operator and its location is entirely independent of the location of the display sign to which it is connected. Changes in the display to be flashed on the sign can be made quite easily by an easily executed re-arrangement of the connectors 20 in the plate 19. Where it is desired to change the display at frequent inter-

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vals, a number of plates 19 can be prepared beforehand and easily inserted in their operative positions at the required times. The control system also can be used in conjunction with control systems for other types of display signs, such as display signs of the animated and travelling message types.

It will be understood, of course, that modifications can be made in the embodiment of the invention described and illustrated herein without departing from the scope of the appended claims.

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

1. In a control system for an electrically illuminated sign, a non-electric conductive contact plate having a plurality of rows of electrical connectors, each connector being connected to an electric lamp and the number of connectors corresponding to the number of lamps in the sign to be illuminated, each connector terminating in a ball shaped electrical contact extending beyond the surface of the plate, an electrically energized plate parallel to and spaced apart from said contact plate, a non-electric conductive plate between said contact and electrically energized plates and spaced apart therefrom, said non-electric conductive plate having rows of perforations alignable with said contacts, and electrical connectors extending through selected perforations for completing the electrical circuits from said electrically energized plate to aligned contacts on the contact plate, and means for closing and opening said circuits at predetermined intervals.

2. In a control system for an electrically illuminated sign, a non-electric conductive contact plate having a plurality of rows of electrical connectors, each connector being connected to an electric lamp and the number of connectors corresponding to the number of lamps in the sign to be illuminated, each connector terminating in an electrical contact extending beyond the surface of the plate, an electrically energized plate parallel to and spaced apart from said contact plate, a non-electric conductive plate between said contact and electrically energized plates and spaced apart therefrom, said non-electric conductive plate having rows of perforations alignable with said contacts, and electrical connectors extending through selected perforations for completing the electrical circuits from said electrically energized plate to aligned contacts on the contact plate, and timing means for closing and opening the completed electrical circuits at predetermined intervals.

3. In a control system for an electrically illuminated sign, a non-electric conductive contact plate having a plurality of rows of electrical connectors, each connector being connected to an electric lamp and the number of connectors corresponding to the number of lamps in the sign to be illuminated and each connector terminating in an electrical contact extending beyond the surface of the plate, an electrically energized plate parallel to and spaced apart from said contact plate, a non-electric conductive plate between said contact and electrically energized plates and spaced apart therefrom, said non-electric conductive plate having rows of perforations alignable with said contacts, and electrical connectors extending through selected perforations for completing the electrical circuits from said electrically energized plate to aligned contacts on the contact plate, and means for moving said electrically energized plate into

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and out of contact with the electrical connectors carried by said perforated, non-electric conductive plate to close and open the completed electrical circuits at predetermined intervals.

4. In a control system for an electrically illuminated sign, a non-electric conductive contact plate having a plurality of rows of electrical connectors, the number of connectors corresponding to the number of lamps in the sign to be illuminated, and each connector terminating in an electrical contact extending beyond the surface of the plate, electrically energized means substantially parallel to and spaced apart from said contact plate, a non-electric conductive plate between said electrically energized means and said contact plate, said non-electric conductive plate having rows of perforations alignable with said contacts, and electrical connectors extending through selected perforations for completing the electrical circuits from the electrically energized means to aligned contacts on the contact plate, and means for closing and opening said circuits at predetermined intervals.

5. In a control system for an electrically illuminated sign, a non-electric conductive contact plate having a plurality of rows of electrical connectors, the number of connectors corresponding to the number of lamps in the sign to be illuminated and each connector terminating

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in an electrical contact extending beyond the surface of the plate, electrically energized means substantially parallel to and spaced apart from said contact plate, a perforated plate formed of electrically non-conductive materials between and spaced apart from said electrically energized means and said contact plate, the rows of perforations being alignable with said contacts, and electrical connectors extending through selected perforations of said perforated plate for completing the electrical circuits from the electrically energized means to aligned contacts on the contact plate, and means for closing and opening said circuits at predetermined time intervals.

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