

July 2, 1946.

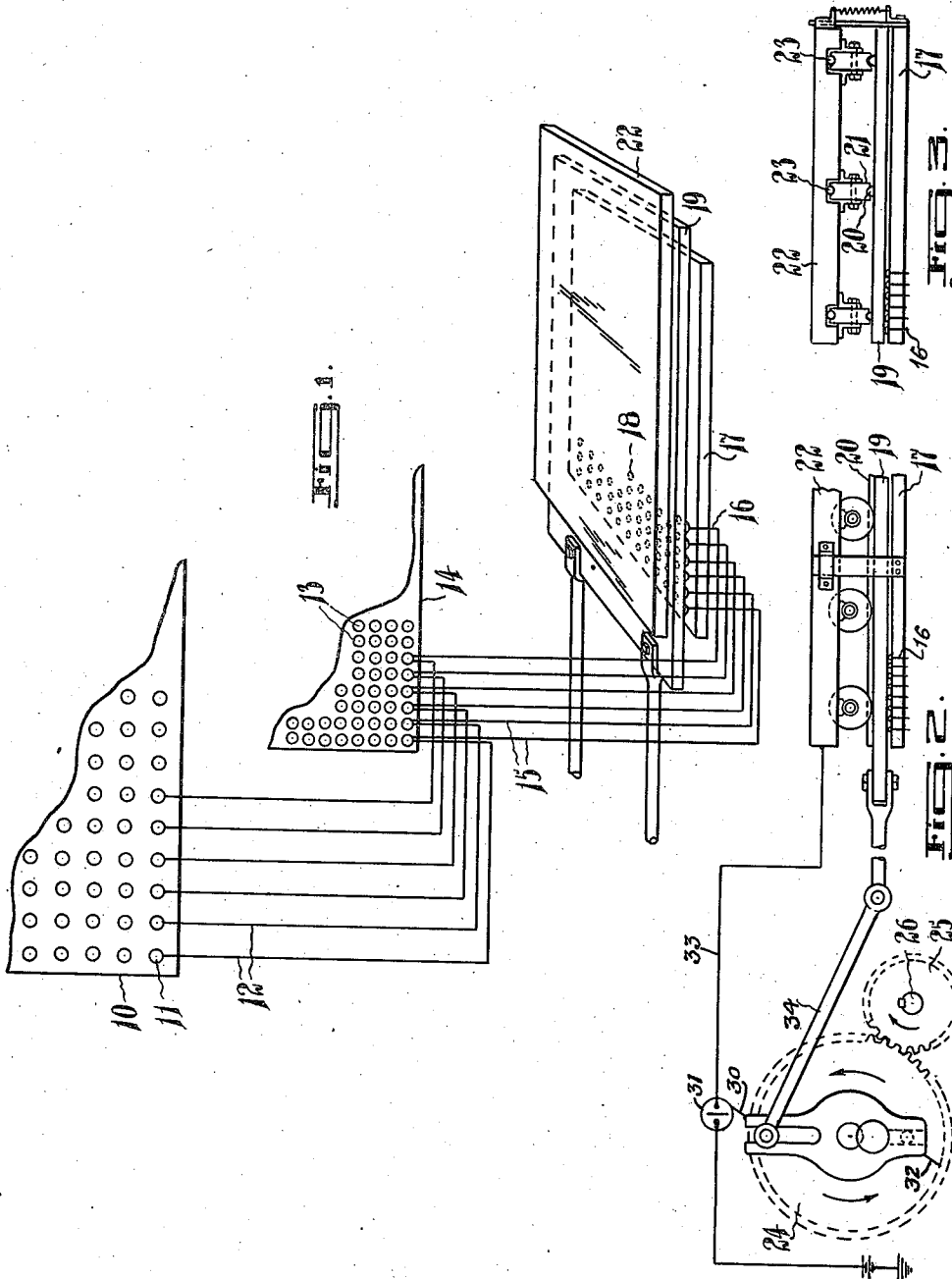
F. P. ELLIOTT

2,402,992

CONTROL SYSTEM

Filed Feb. 22, 1944

2 Sheets-Sheet 1



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FIG. 4

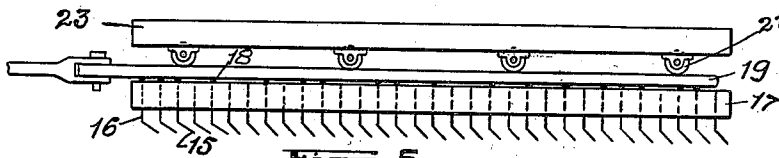
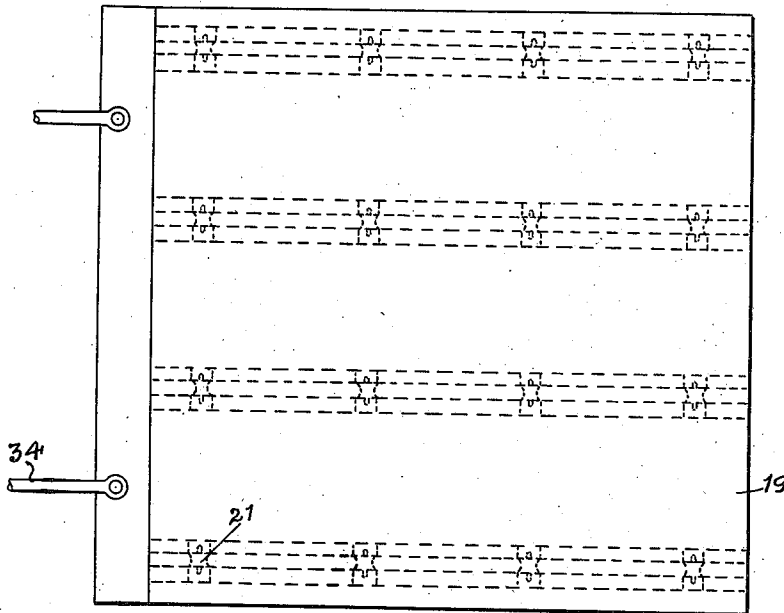


FIG. 5

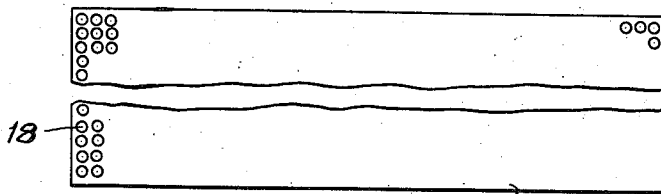


FIG. 6.

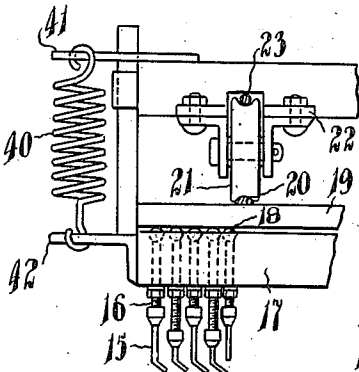


FIG. 7.

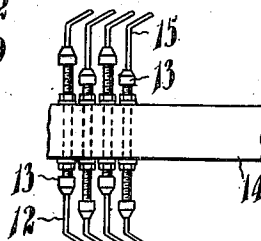


FIG. 8

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CONTROL SYSTEM

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5 Claims. (Cl. 177-346)

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This invention relates to a new and useful control mechanism for illuminated display signs.

The invention is directed to providing a control system for an illuminated display sign and is particularly directed to providing a control system for a display sign of the type commonly known as an animated sign in which the circuits to the lamps forming the sign are energized at and for different periods of time so that the lamps are illuminated in a predetermined sequence and remain illuminated for a predetermined time interval.

Animated display signs are relatively well known, and are used, principally, for advertising purposes. Such signs, however, have several disadvantages. For example, it is necessary to dismantle the sign to make changes in the arrangement of the display. Also, the control mechanism is very complicated.

One of the objects of this invention is to provide a control system by means of which the subject matter of the display to be flashed on the sign can be varied by easily executed changes in the wiring of the control system and without the necessity of any changes in the wiring of the sign itself, thereby obviating the necessity of dismantling the sign to change the subject matter of the display flashed thereon.

A further object of the invention is to provide a control system including an electrically energized plate adapted for movement over a contact plate provided with removable contacts whereby the flow of current to each individual lamp in the sign is at all times under positive control and by means of which switches in the lamp circuits may be entirely eliminated.

A still further object of the invention is to provide a novel form of removable contact for each lamp circuit which ensures that each lamp to be illuminated receives the same amount of current and which permits of a positive control over all lamps to be illuminated and ease and ready accessibility for making changes in the display to be flashed on the sign.

The control system of the present invention comprises, in combination, a control panel having connectors, each connector being connectable to an electric lamp, a contact plate having connectors terminating in removable contacts, each of said last mentioned connectors being connectable to a selected connector on the control panel and means for completing the circuit from a source of power to each removable contact in predetermined sequence and for a predetermined time interval.

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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 connections from a bank of electric lamps forming a display sign through the master control panel to the contact plate;

Figure 2 is a side elevation of the contact plate and associated parts;

Figure 3 is an end elevation of the contact plate and the movable electrically energized plate;

Figure 4 is a plan view of the movable plate;

Figure 5 is an enlarged side elevation of the movable plate and the contact plate;

Figure 6 is a plan view of the contact plate;

Figure 7 is an enlarged side elevation of a portion of the contact plate; and

Figure 8 is an enlarged side elevation of a portion of the control panel.

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

Figure 1 illustrates a general arrangement of an electric sign embodying the control system of the present invention. The numeral 10 indicates the sign which comprises a bank of electric lamps 11. Each lamp is connected, by a wire 12, to a connector 13 provided in the control panel 14. For convenience, the position of each connector 13 in the control panel corresponds to the position of the lamp 11 to which it is connected in the sign. Each connector 13 is connected, by a wire 15, to a connector 16 provided in the contact plate 17.

The connectors 13 extend through the panel 14, which is formed of electrically non-conductive material such as that sold under the trade name "Bakelite," and are of a standard design such that the wires 12 and 15 are readily secured to and removable from the respective ends.

One end of each connector 16 is of standard design to receive the end of the wire 15. Each connector 16 extends through the plate 17 to terminate in a recessed end which is preferably of concave shape. The removable contacts 18 are preferably spherical in shape and are adapted to seat snugly in the recessed ends of the connectors 16 and extend beyond the surface of the plate. The contacts 18 may be in the form of round balls and are preferably formed of, or coated with, a good conductor of electricity, such as copper.

An electrically energized plate 19 is movable over the contact plate 17. The plate 19 can be

electrically energized by any one of a number of arrangements such as by direct connection with a source of electrical energy. A preferred arrangement is illustrated in the drawings in which tracks 20 are provided on, or formed in, the upper surface of the plate 19 and parallel to the direction of movement. Grooved wheels 21, journaled in bearings carried by a fixed frame 22, are rotatable on the tracks 20. Each of the wheels 21 is in contact with a source of power, such as an electrically energized power line 23, or a bus bar or an electrically energized plate, and, in turn, energizes the movable plate 19.

To improve the contact between the wheels 21 and the contact plate 17, it is preferred to draw them together by means of a spring 40 one end of which is connected to a projection 41 extending from the frame 22, the other end being connected to a projection 42 extending from the contact plate 17.

The plate 19 is moved over the contact plate by any one of several standard driving arrangements such as through a pitman arrangement as illustrated in Figure 2. In this arrangement, one end of the plate is connected to a connecting rod 34, the other end of which is adjustably and eccentrically connected to a gear 24 which is driven by a gear 25 mounted on a motor shaft 26. The connection between the connecting rod and gear is preferably made adjustable so that changes can easily be made in the rate and distance of movement of the plate 19.

The electric lamps of a display sign incorporating the control system of the present invention are permanently connected to the connectors 13 of the control panel 14, each lamp preferably being connected to a connector correspondingly positioned in the control panel. The control panel is set up, of course, in a position where it is convenient to work on it regardless of the position of the sign. The design to be displayed on the sign, that is, the lamps which are to be illuminated and the sequence of illumination, is worked out and the wires 15 from the connectors 13 to the connectors 16 are arranged such that the wires 15 are connected to the connectors 16, and through the connectors 16 to the removable contacts 18, in the order in which the lamps are to be illuminated. For example, the connectors of the lamps to be illuminated first are connected to the first row of removable contacts 18 contacted by the energized plate 19 at the beginning of the movement of that plate over the contact plate 17. The remainder of the wires are connected to the rows of connectors 16 in the order in which the lamps are to be illuminated.

In operation, the energized movable plate 19 moves on the removable contacts 18, thereby completing the circuits to the respective contacts as it comes in contact with and moves over them. When the energized plate 19 has moved to a position in which contact is made with all the removable contacts 18, all the circuits are closed to all the lamps in the sign which are to be illuminated in the sequence in which they are to be illuminated. Provision can be made to hold the circuits closed for a predetermined period, such as by a time switch in the main power line to the energized plate 19 and the driving motor, or alternatively, by mechanical arrangement of the driving connection to the energized plate 19.

If it is preferred to have all the circuits to the lamps opened simultaneously when the energized plate 19 commences its return movement, this

can be accomplished readily by the insertion of a switch, such as a rotary switch indicated by the numeral 31, in the power line 33 to the energized plate 19. When, on continued rotation of the gear 24, the energized plate 19 commences its return movement, the finger 30 trips the switch 31 to open the circuit to the energized plate 19. On completion of a half revolution, the finger 32 again trips the switch 31 to close the switch and the circuit to the energized plate is closed.

It is found that the control mechanism described above is capable of many practical embodiments in illuminated signs. For example, when the energized plate 19 closes the circuits in only one or both directions of its movement, it is applicable for animated signs, that is, when parts of the sign are illuminated in a predetermined sequence and terminating in the complete illumination of the display to be illuminated.

Alternatively, it can be applied, by the inclusion in the power supply line 33 of a timing switch, for flashing signs of the type in which a message is flashed on and off the sign at predetermined intervals. In this type of sign, the lamp circuits could be held open until the last row of contacts are contacted by the energized plate 19 and the rate of movement of the energized plate 19 regulated to close and open all the circuits at predetermined intervals.

As a further modification, the mechanism can be regulated to operate the type of sign in which the lamps are illuminated permanently, or for predetermined periods.

The advantage of the mechanism is that the arrangement of the lamps to be illuminated can be changed by minor changes in the wiring of the contact plate and rearrangement of the contacts without dismantling the sign and without extensive and costly changes in the master control panel. The provision of the removable contacts serves several useful purposes, the contacts are highly efficient and ensure that each lamp will receive the same amount of current; the contacts connected to the lamps which are not to be illuminated are easily removed and the circuits to such lamps remain open; and they also provide a bearing surface for the energized plate.

Any changes in the display sign are easily effected by changing the arrangement of the connections from the control panel to the contact plate without any change in the connections from the control panel to the lamps in the sign. The connectors of the control panel and the contact plate are, of course, located such that they are readily accessible and any rearrangement of the wiring from the control panel to the contact plate is easily made.

It will be understood, of course, that modifications of the preferred embodiment of the invention can be made by others skilled in the art in the light of the teachings herein without departing from the scope of the invention as defined in the appended claims.

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

1. A control system for an illuminated display sign including a plurality of electric lamps, said control system comprising a non-electric conductive control panel having electrical connectors, each connector being connectable to a correspondingly positioned electric lamp in the display sign, a non-electric conductive contact plate having rows of electrical connectors terminating

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in removable contacts, each of said last mentioned connectors being connectable to a selected connector on the control panel, and electrically energized means movable over said contacts for completing the circuits from a source of electrical power to each removable contact in progressive sequence.

2. A control system for an illuminated display sign including a plurality of electric lamps, said control system comprising a non-electric conductive control panel having electrical connectors, each connector being connectable to a correspondingly positioned electric lamp in the display sign, a non-electric conductive contact plate having rows of electrical connectors terminating in removable contacts, each of said last mentioned connectors being connectable to a selected connector on the control panel, and electrically energized means movable over the removable contacts to complete the circuits from a source of power through the removable contacts to the control panel and to the selected lamps to be illuminated, and means for moving the electrically energized means over said contacts.

3. A control system for an illuminated display sign including a plurality of electric lamps, said control system comprising a non-electric conductive control panel having electrical connectors, each connector being connectable to a correspondingly positioned electric lamp in the display sign, a non-electric conductive contact plate having rows of electrical connectors terminating in removable contacts, each of said last mentioned connectors being connectable to a selected connector on the control panel, and electrically energized means movable progressively over the removable contacts to complete the circuits from a source of electrical power through the removable contacts to the connectors of the control panel and to the lamps to be illuminated, and means for moving the electrically energized means at a predetermined rate of speed over said contacts.

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4. A control system for an illuminated display sign including a plurality of electric lamps, said control system comprising a non-electric conductive control panel having electrical connectors, each connector being connectable to a correspondingly positioned electric lamp in the display sign, a non-electric conductive contact plate having rows of electrical connectors, each connector terminating in a recessed end adapted to receive a spherical shaped contact removably seated in said recess, each of said last mentioned connectors being connectable to a selected connector on the control panel, an electrically energized means movable progressively over the removable contacts to complete the circuits from a source of electrical power to the connectors of the control panel and to the lamps to be illuminated, and means for moving the electrically energized plate at a predetermined rate of speed over said contacts.

5. A control system for an illuminated display sign including a plurality of electric lamps, said control system comprising a non-electric conductive control panel having electrical connectors, each connector being connectable to a correspondingly positioned electric lamp in the display sign, a non-electric conductive contact plate having rows of electrical connectors, each connector terminating in a recessed end adapted to receive a spherical shaped contact removably seated in said recess and extending beyond the surface of the contact plate, each of said last mentioned connectors being connectable to a selected connector in the control panel, and electrically energized means movable progressively over the exposed surfaces of said contacts to complete the circuits from a source of electrical power to the connectors of the control panel and to the lamps to be illuminated.

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