F. G. DICKERSON.

DISPLAY APPARATUS.

APPLICATION FILED DEC. 2, 1915.

1,222,083.

Patented Apr. 10, 1917.

2 SHEETS—SHEET 1.

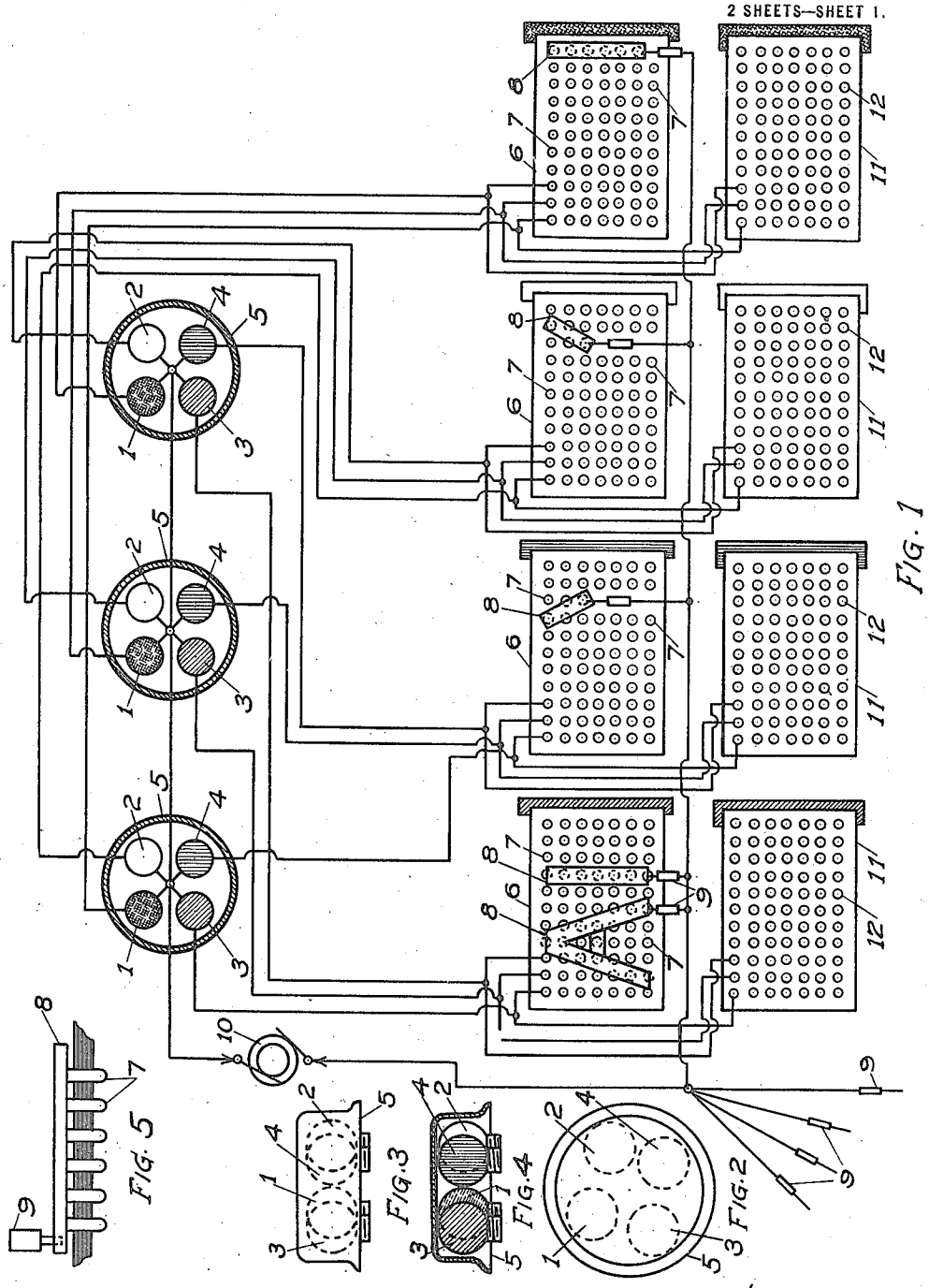


FIG. 1

FIG. 5

FIG. 3

FIG. 4

FIG. 2

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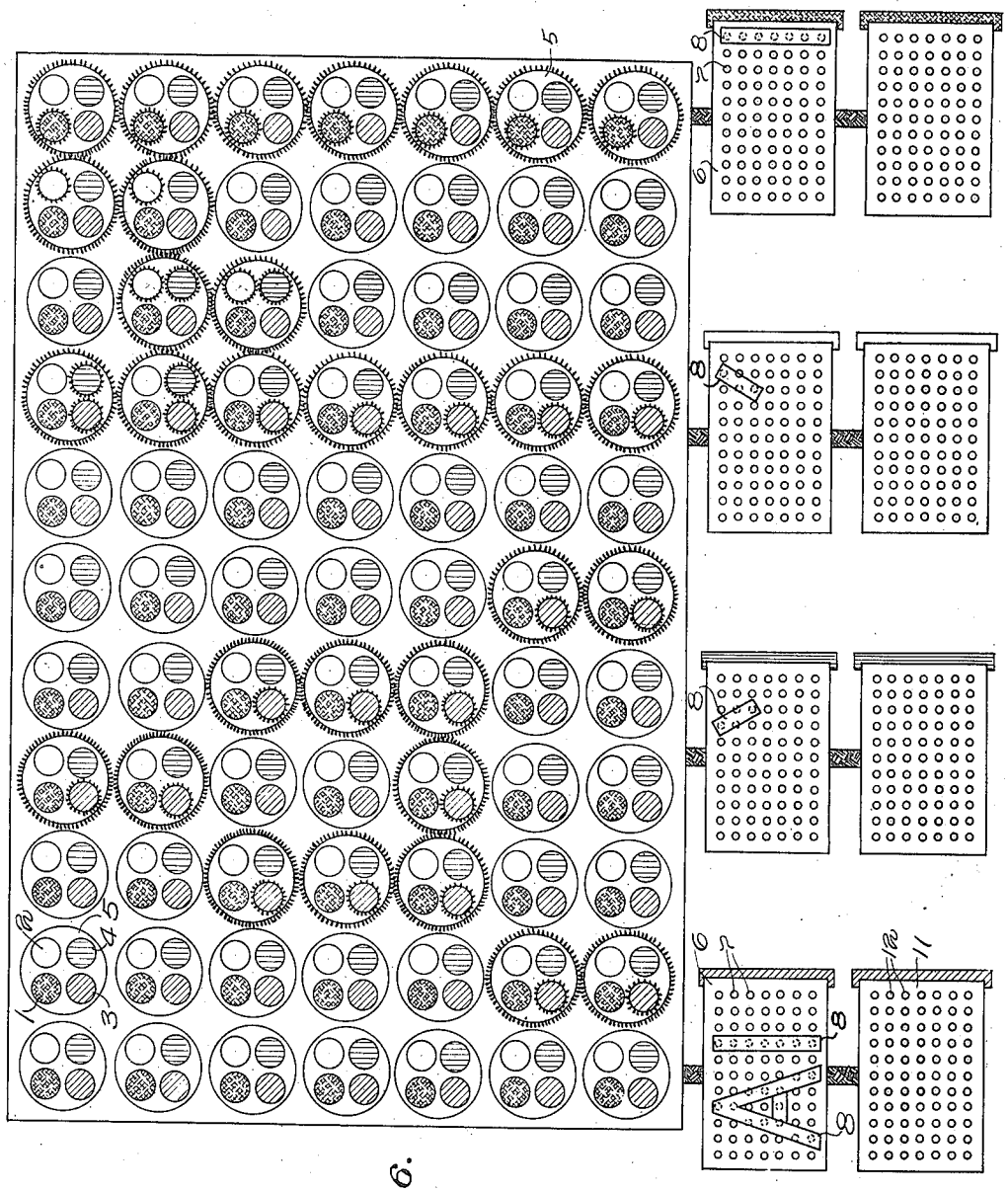


Fig. 6.

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UNITED STATES PATENT OFFICE.

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DISPLAY APPARATUS.

1,222,083. Specification of Letters Patent. Patented Apr. 10, 1917.

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To all whom it may concern:

Be it known that I, FRED G. DICKERSON, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Display Apparatus, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to display apparatus and, in its preferred embodiment, is in the nature of an improvement upon the system disclosed in the application of William A. Fricke, Serial No. 25,356, filed May 3, 1915, though there are other features of the invention.

My invention may generally be described as comprising display apparatus including a plurality of sets of different display elements, display elements in each of said plurality of sets being similar to display elements in the other sets, individual circuits for the display elements, and circuit controlling switching means individual to each circuit and in controlling relation thereto independently of the other switching means. In the preferred embodiment of the invention I employ multiply related terminals for each circuit, contact boards carrying said terminals that are distributed among them, metallic patterns for engaging a plurality of terminals upon a board or boards, said patterns being provided with means for effecting the inclusion thereof and the terminals engaged thereby in circuit, and circuit closing switching mechanism coöperating with the terminals upon another board or boards in also controlling the circuits of the display elements. The metallic patterns are desirably associated with circuit closing means which are in separable relation therewith whereby the patterns may be physically separated from the equipment when not in use and may be electrically associated therewith when they are to be used whereby the wiring for including the patterns in circuit is much simplified.

I will explain my invention more fully by reference to the accompanying drawing showing the preferred embodiment thereof and in which Figure 1 is a diagrammatic illustration of a display system equipped in accordance with my invention; Figs. 2, 3 and 4 are respectively plan, side and sectional views of a group of display elements as preferably arranged; Fig. 5 is a detail illustrating the manner of including a metallic pattern and the terminals engaged thereby in circuit, and Fig. 6 is another view more fully illustrating the relative dispositions of the lighting centers and the switching contacts upon a group of boards to which boards the lighting centers are common.

Like parts are indicated by similar characters of reference throughout the different figures.

In Fig. 1 I have diagrammatically indicated three display centers at each of which a set or group of four display elements 1, 2, 3 and 4 is located. The display elements may be in the form of variously colored lamps, such as small incandescent lamps, the bulb of lamp 1 being (for example) colored orange; the bulb of lamp 2, white; the bulb of lamp 3, green, and the bulb of lamp 4, red; these lamps being shaded in the drawings to denote these colors. The sets or groups of display elements are desirably segregated, each set having lamps 1, 2, 3 and 4 being desirably covered by a translucent cap or container 5, clouded glass being suitable material of which to form such cap. Each covering 5 is thus somewhat in the nature of a screen for the lamps of its set and serves to diffuse the light of the lamps behind it to prevent material shifting of the lighting center so far as may be apparent to the observer, the light produced at each set being substantially fixedly localized by the diffusing cover irrespective of the location of the lamp or lamps glowing within the cover. I do not wish to be limited, however, to the employment of the segregating elements. There are as many transmitting boards 6 as there are colors among the lamps, each transmitting board being individual to a color, as indicated by the shading upon the right hand end thereof. Each board carries contact terminals 7 (equal in number to the number of groups of display elements, these contacts being disposed similarly to the groups though placed much closer together), the green lamps having terminals upon the first board, the red lamps having terminals upon the second board, the white lamps having terminals upon the third board and the orange colored lamps having terminals upon the fourth board. The transmitting boards 6 may be

used conjointly with current conducting metallic patterns 8, each pattern being adapted to electrically connect a number of terminals upon the same board. Each pattern may be provided with a plug receiving recess for receiving a connecting plug 9 of which there are several connected with a generator of electricity 10, the employed patterns being separably associated with the generator by means of said plugs. The other terminal of the generator has connection with one terminal at each display element, the other terminals at the display elements being connected with the contact terminals 7 as illustrated.

The contact or transmitting boards 6 are desirably accompanied by other contact or transmitting boards 11 which carry terminals 12, each board 6 having a complemental board 11, the contact terminals upon both of these boards being in similar position, each two similarly positioned contact terminals being in multiple. The patterns 8 may be employed to close the circuits of the lamps whose terminals 7 said patterns engage and to maintain such circuits closed for any desired length of time, after which the patterns are removed to open the circuits they had established. The drawing shows only a few patterns, it being obvious that a large variety may be employed to suit the purpose for which the display apparatus is used. In accordance with common practice, these patterns are carried in the stock of the user of the display equipment, the user selecting patterns corresponding to those that are to be displayed and applying them to the boards 6 in locations corresponding to the locations to be occupied by the corresponding patterns upon the display board. While such circuits are closed certain of the plugs 9 may be applied to the terminals 12 to effect and control the display of other lamps whose circuits are not maintained by the patterns. For example, the first contact board 6 has patterns 8 in engagement with certain contacts thereon that cause the lighting of green lamps in locations corresponding to the locations of the contacts engaged by such patterns; the second board 6 has a pattern 8 in engagement with certain contacts thereon that cause the lighting of red lamps engaged by such patterns and some of which lamps are in the same groups with the glowing green lamps and others of which lamps are not in such groups, etc., concerning the colors pertaining to the remaining boards 6, and any one or all of the contact boards 11 may have their contacts 12 engaged by a stylus 9 or other circuit closing element also to light the lamps corresponding to the contacts 12 that are engaged, the stylus 9 obviously having no effect when engaging contacts 12 that are in multiple with contacts 7 that are engaged by patterns 8. When the stylus 9 is applied to any contact 12 upon any board 11 whose multiple 7 is not engaged by a pattern 8, the corresponding lamp in the group to which the selected board 11 pertains is caused to glow. Thus, for example, the left hand vertical row of contacts 7 in each of the four boards 6 is not occupied by a pattern whereby the symbols that are caused to be displayed by the patterns applied to the boards 6 may be accompanied by temporary manifestations caused by moving a stylus 9 over the left hand row of contacts in some board 11. If it is desired to make a green streak in the left hand end of the display board a stylus 9 is rubbed over the left hand row of vertical contacts upon the first board 11; if a red streak is desired the second board 11 is selected; if a white streak is desired the third board is selected; and if an orange streak is desired the fourth board 11 is selected. If any combination of these colors is desired the boards 11 corresponding to the colors of the desired combination are together selected. If the patterns applied to the boards 6 should happen to be free from engagement with all of the contacts in the outer horizontal and vertical rows then symbols corresponding to such patterns could be displayed upon the display board while borders of selected colors or combinations of colors surrounding said symbols could be sketched by applying the stylus 9 to the contacts in the outer vertical and horizontal rows of contacts. In short, the boards 6 together with the patterns enable the fixed display of symbols and the boards 11 in conjunction with the styli 9 enables the fleeting display of light in conjunction with such symbols at points on the display board corresponding to the contacts upon the boards 11 that are engaged by a stylus or styli 9 but where contacts are not in multiple with any contacts engaged by the patterns. While I prefer to employ a fleeting display of light in conjunction with the fixed display effected by the patterns, it is obvious that the invention need not be limited to a fleeting display.

It will be apparent from the drawing and foregoing description that a pattern applied upon any contact board (say any of the boards 6) will cause lamps in different sets to glow and inasmuch as each set is in effect at a single lighting center, the observer will have presented to his view characters corresponding to the employed patterns.

While I have herein shown and particularly described the preferred embodiment of my invention I do not wish to be limited to the precise details of construction shown as changes may readily be made without departing from the spirit of my invention, but

Having thus described my invention I

claim as new and desire to secure by Letters Patent the following:—

1. Display apparatus including a plurality of sets of differing display elements, display elements in each of said plurality of sets being similar to display elements in the other sets; individual circuits for the display elements; a plurality of contact boards carrying terminals individual to the circuits of the display elements, which terminals are distributed among the boards, each board carrying terminals that belong to similar display elements; current conducting patterns for engaging a plurality of terminals upon each board and provided with means for effecting the inclusion thereof and the terminals engaged thereby in circuit; additional boards having terminals in multiple with the terminals on the aforesaid boards; and means coöperating with the terminals of the latter board in also controlling the circuits of the display elements.

2. Display apparatus including a plurality of sets of differing display elements, display elements in each of said plurality of sets being similar to display elements in the other sets; individual circuits for the display elements; a plurality of contact boards carrying terminals individual to the circuits of the display elements, which terminals are distributed among the boards, each board carrying terminals that belong to similar display elements; current conducting patterns for engaging a plurality of terminals upon each board and provided with means for effecting the inclusion thereof and the terminals engaged thereby in circuit; additional boards having terminals in multiple with the terminals of the aforesaid boards; and circuit closing means cooperating with the terminals on the latter boards in also controlling the circuits of the display elements.

3. Display apparatus including display elements; circuits for the display elements; a plurality of contact boards; multiply related terminals for each circuit, said contact boards carrying multiply related terminals that are distributed among them; current conducting patterns for engaging a plurality of terminals upon one of the boards and provided with means for effecting the inclusion thereof and the terminals engaged thereby in circuit; and means cooperating with the terminals upon the other board in also controlling the circuits of the display elements.

4. Display apparatus including display elements; circuits for the display elements; a plurality of contact boards; multiply related terminals for each circuit, said contact boards carrying multiply related terminals that are distributed among them; current conducting patterns for engaging a plurality of terminals upon one of the boards and provided with means for effecting the inclusion thereof and the terminals engaged thereby in circuit; and circuit closing means coöperating with the terminals upon the other board in also controlling the circuits of the display elements.

5. Display apparatus including display elements; circuits for the display elements; a contact board carrying terminals of said circuits; current conducting patterns for engaging a plurality of terminals upon said board; and circuit closing means separably related to said patterns for engaging the same to include them and the terminals engaged thereby in circuit.

6. Display apparatus including display elements; circuits for the display elements; a plurality of contact boards; multiply related terminals for each circuit, said contact boards carrying multiply related terminals that are distributed among them; means coöperating with the terminals upon one board in controlling the circuits of the display elements; and means coöperating with the terminals upon the other board in also controlling the circuits of the display elements.

7. Display apparatus including a transmitting board that contains a plurality of contact terminals and provided with circuit closing contacting means for coöperation with said terminals to effect operation of the display apparatus; a display board having display elements; circuits for governing the operation of the display elements and each having and being individual to a contact terminal upon the transmitting board; and supplemental controlling circuits for the display elements to enable some of the employed display elements to be maintained in set display condition when the circuits that caused them to be set in display condition are restored to normal.

In witness whereof, I hereunto subscribe my name this eighteenth day of August, A. D. 1915.

FRED G. DICKERSON.

Witnesses:
G. L. Cragg,
E. L. White.