March 29, 1932. E. A. HEINZ 1,851,180

DISPLAY

Filed May 15, 1931

FIG. 1.

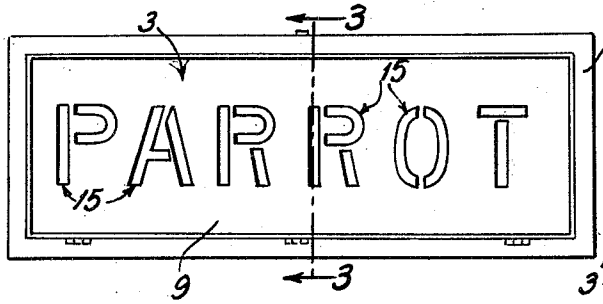


FIG. 2.

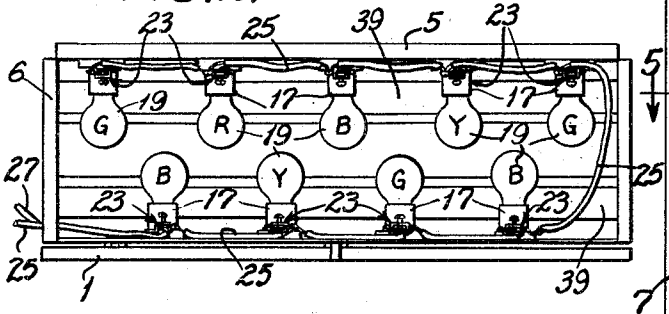


FIG. 3.

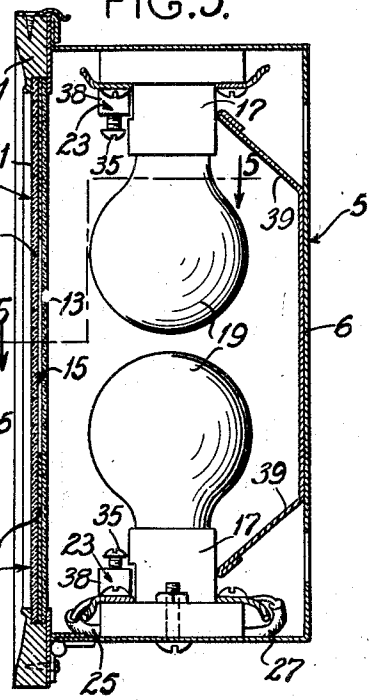


FIG. 4.

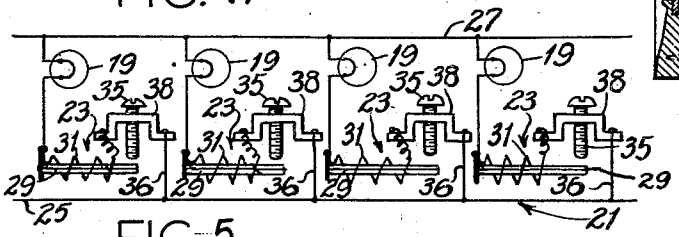


FIG. 5.

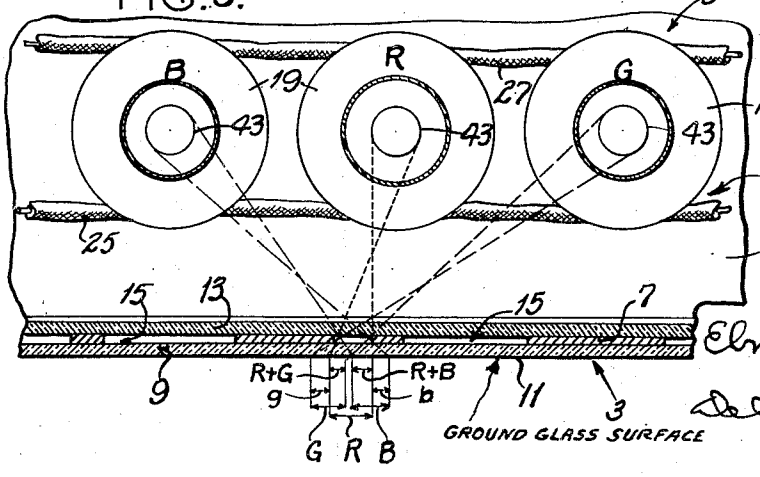
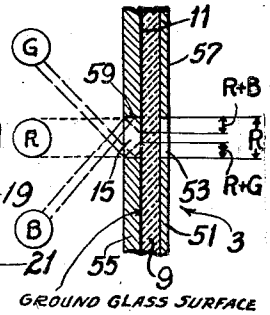


FIG. 6.



Elmer A. Heinz, Inventor.

Dale G. Haynes, Attorney.

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UNITED STATES PATENT OFFICE

ELMER A. HEINZ, OF BENLD, ILLINOIS, ASSIGNOR TO THE MULTI-COLOR SIGN COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI

DISPLAY

Application filed May 15, 1931. Serial No. 537,557.

This invention relates to a display, and with regard to certain more specific features to a display providing a varying lighting effect.

Among the several objects of the invention may be noted the provision of a display in which the observed lighting effect is automatically but irregularly variable; the provision of a display of the class described in which the lighting effect is continuously varied by a continuously varying source of light; and the provision of a display of the class described which is simple to manufacture and has no mechanically driven parts. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which are illustrated several of various possible embodiments of the invention,

Fig. 1 is a front elevation of the invention;

Fig. 2 is a view similar to Fig. 1 but shows a hinged front cover frame swung down;

Fig. 3 is an enlarged vertical section taken on line 3—3 of Fig. 1;

Fig. 4 shows diagrammatically an electrical circuit of the display;

Fig. 5 is a detailed horizontal sectional view taken on line 5—5 of Fig. 3 with certain parts removed and illustrating certain lighting effects; and,

Fig. 6 is a view similar to Fig. 5 but showing a modified form of the invention.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

It is desirable in interior window displays to use electric signs to attract attention. For this purpose the so-called neon sign is in many applications too brilliant. The old "blinker" type of sign has become so usual that its advertising value has been greatly reduced. However, a sign which provides a movement of some type, whether of light or of physical means attracts attention. Such signs have been provided, but because many of them involve mechanically driven parts such signs are expensive. My invention provides a sign which produces a varying moving lighting effect and which has no mechanically driven parts and hence in which there is substantially no wear.

Referring now more particularly to Figs. 1 and 2 there is shown a cover frame 1 in which there is adapted to be mounted an advertising means 3. The frame 1 is hinged to a box 5 which is made of metal or wood or the like 6. The advertising means 3 comprises a sheet 7 in which is stenciled (numeral 15) the desired words or pictures to be advertised. The stenciled portions provide regions through which varied lighting effects may be passed. The front of the sheet may be painted an attractive color or be provided with additional advertising. In front of the sheet or card 7 is mounted a pane of glass 9 which has a ground surface 11 in the front thereof. Behind the card 7 is mounted a pane of plain glass 13 which holds the card 7 against the back surface of the pane 9. It is thus seen that light from the interior of the box goes through the glass 13, through the stencilled portions 15 of the card 7, through the glass 9 to the ground surface 11, where the outline of the stencil is formed.

As shown in Figs. 2 and 3, sockets 17 are mounted along the top and bottom walls of the box 5. Variously colored lights 19 are mounted in the sockets 17, these being connected in parallel across an electric circuit 21 as shown in Fig. 4. Thermostatic controls 23 are provided in each socket 17 to automatically vary the intensity of the lights 19.

As shown in Fig. 4 the circuit 21 comprises lines 25 and 27 across which are connected the lights 19 and the thermostatic controls 23. The thermostatic controls 23 may comprise any thermostatic means for varying the current supply to a lamp, and in this case comprise a thermostatic element 29 around which is wound the resistance or heating coil 31, which coil is put in series with the lamp 19 across the wires 25 and 27, a wire 36 and a metal bridge 38. The strip 29 is adapted to

make an electrical connection with an adjustable screw 35 mounted in the bridge 38 when said strip 29 is heated by the resistance 31. When the lines 25 and 27 are connected to a source of electrical power (considering the line 25 to be at the higher potential) current flows through the resistance 31, through the lamp 19 to the line 27, and the lamp burns dimly because of the resistance 31 in series with it. As the element 29 is heated by the resistance 31 contact is made between the screw 35 and strip 29 and the resistance 31 is short circuited. Thus the lamp 19 is connected directly to the line 25 by the line 36, the bridge 38, screw 35 and strip 29, whereby it receives the full potential across the lines 25 and 27 and accordingly burns far more brilliantly than when it did in series with the resistance 31. The element 29, no longer being heated by the resistance 31, cools and breaks contact with the contact 35. The element 29 is now again heated by the resistance 31 which is cut into the circuit and the lamp 19 burns dimly. The screws 35 are provided to vary the distance through which the element 29 moves so that it flashes at different time intervals.

Thus when the lines 25 and 27 are connected with a source of power the individual lights 19 go off and on as they are operated by the individual elements 29. The elements 29 not being mechanically timed with respect to one another do not operate according to definite cycles, that is, the time at which a certain light 19 may be on brightly or dimly will change. Further, the relative times at which the various lights are on or off is continuously changing, that is, they are indifferently timed. No definite cycle is established for a single lamp or for the lamps as a group. As will be pointed out hereinafter this comprises a definite advantage.

When a resistance 31 is in series with a light 19 the light 19 burns so dimly as to be substantially ineffective and when in this condition the lights will be referred to, hereinafter, as being "off". When a resistance 31 is short circuited the light 31 will be said to be "on".

A baffle 39 is provided to protect the box from the heat. The baffle 39 may be finished with a bright reflecting surface whereby the light from each lamp is reflected to all parts of the interior of the box and consequently against all parts of the card 7.

As shown in Fig. 2 the lamps 19 may be of any color such as green, red, blue, or yellow, as designated by the capital letters G, R, B and Y. These colors are in no sense limiting but are satisfactory for purposes of description. When the frame 1 is in a closed position and the sheet 7 is in place, and the circuit 21 is connected to a source of power, projections or images of the stenciled portions 15 will be formed on the ground surface 11 of the glass pane 9 and will be continuously changing in color, as well as in width and in shading effect. This changing, moving coloring effect is brought about because at any instant a letter such as, for instance, the "T" in the word "PARROT" may be lighted primarily by the blue lamp directly behind it, the green lamp being off, but the yellow lamp being on. This results in a shading of some parts into a mixture of blue and yellow which is equivalent to green. Then when the green light comes on the green portion of the letter will be reinforced or deepened. However, this cycle may not be repeated in connection with corresponding variations going on elsewhere in respect to the other letters because of the indifferent timing of the thermostatic switches one with respect to another.

This moving, lighting effect is brought about by the various rays of light which pass through the stenciled portions 15 to the surface 11. Thus a letter "R" in the word "PARROT" can receive light directly from as many as four or five of the lamps, and indirectly from substantially all of the lamps by means of the reflector or baffle 39. Because these various sources are continuously going "on" and "off" independently of each other the color and quantity of light which passes through the portion "R" is varied. Thus it is seen that at all times the color of the projections or images of the letters on the ground surface 11 is effected by the continuous changing of the lamps 19 from "on" to "off" or from "off" to "on" position.

Referring to Fig. 5 there is shown a specific example of the way in which the shading and color and the width of a letter may be changed by three lamps 19 without considering the light reflected from the baffles 39. Lamps having filaments 43 and comprising a blue, a red and a yellow lamp arranged as shown in Fig. 5 are to be used for example.

The light from the red lamp when "on" will cover the area as shown by the bracket R. The light from the green lamp when "on" will cover the area shown by the bracket large G. The light from the blue lamp when "on" will cover the area shown by the bracket large B. Thus at the moment when all three lights are on, the image will be bordered by green and blue borders shown by the brackets *g* and *b* which will effectively shade off to yellow and purple respectively shown by the brackets R+G and R+B.

If the green light goes off leaving the other two on the image will now comprise a red border shading to a purple and then to a blue, etc. As the lights 19 flash "on" and "off" the images of the stenciled portions 15 will continuously change and appear to move or shift.

Because the lamps 19 are not arranged along the center line of the box 5 the light reaching different portions of the length of

a stenciled portion is different and hence the coloring effect changes throughout the length.

The light intensity of the sign may be varied by varying the strength of the lamps 19 and/or by varying the reflecting surface of the baffle 39. Further, the baffle 39 may be supplanted by grouping smaller lamps 19 in groups behind the light receiving portions or stencil 15, whereby the portion will always be lighted, and the color effect always changing.

An advantage of this arrangement of the advertising means 3 is that not only do the borders of the letters change color, but also the width of the letters constantly changes, thereby providing a second moving effect. Furthermore, this arrangement is adapted for night advertising where the daylight does not affect the brilliancy of the sign. The diffusion of the light through the ground glass lights up the whole surface of the ground glass to some extent, and this lighting effect is also constantly changing. Thus the effect obtained is two-fold: (1) Projections or images are formed on the ground glass surface 11 which are constantly changing; (2) a lighting effect of the ground glass surface 11 with various soft color mixtures which make the whole sign most attractive at night. It is noted that this slight lighting effect of the ground glass surface 11 is not appreciably visible in the daytime.

Referring now to Fig. 6, a modification of the advertising means 3 is shown which is adapted to give a more brilliant lighting effect of the letters or stencil portions 15 in the daylight than was given by the arrangement of the advertising means 3 as shown in Figs. 3 and 5.

In this modification the advertising means 3 comprises a relatively thick inner sheet 55, which is thicker than the sheet 7, but which also has stenciled portions 15 cut out to form, for example, the word "PARROT". Next to the sheet 55 is placed a pane of glass 9 with its ground surface 11 next to the sheet 55. The outer layer of the advertising means 3 comprises a relatively thin sheet 51 having stenciled portions 53 which exactly correspond with the stenciled portions 15 of the sheet 55. The outer surface 57 of the sheet 51 may be decorated as desired to provide an artistic face.

As described in connection with the example shown in Fig. 5, blue, red and green lights 19 directly light the stencil portion 15 of the section of the sheet 55 shown. The rays from the red lamp R fall directly on the ground glass surface 11 through the stencil portion 53. Rays from the blue lamp B falling at an angle on the thick side wall 59 of the stencil portion 15 and the sheet 55 are reflected therefrom unto the ground surface 11. Likewise rays from the green lamp G are reflected onto the ground glass surface 11 by the opposite wall 59. Thus, as shown by the brackets R, and R plus B, and R plus G, when all the lights 19 are on, the portion of the surface 11 which is observed by a customer through the stencil portion 53 of the sheet 51 has a central red portion, bordered by purple and orange borders respectively. As hereinbefore described, as the lights 19 flash "on" and "off", this lighting effect on the observed portion of the ground surface 11 changes. It is to be understood that rays from the lights B and G also fall directly on the ground glass surface as explained in connection with the example shown in Fig. 5. Likewise, in Fig. 5, rays falling on the walls of the stenciled portions 15 are reflected onto the surface 11, as just explained in connection with Fig. 6. Such a reflection was not shown in connection with Fig. 5 in that a much larger figure would have been required to avoid confusing the lines designating the rays of light.

The sheet 51 with its stencil portions 53 serves to block out the images formed on the surface 11 whereby more definitely defined letters or figures are portrayed by the advertising means 3. In other words, the sheet 51 serves to cut out all rays beyond the width of the stencil portion 15. This effect, combined with the darker surface with which the surface 57 is preferably provided, serves to set off to a greater advantage the lighted letters and figures portrayed by the advertising means 3.

Furthermore, reversing the position of the ground surface 11, that is, putting it next to the sheet 55 serves to provide a greater depth and to enhance the blocking and shading effect of the images formed by the stencil portions 15. It is to be understood, however, that in the modification shown in Fig. 6, the ground glass surface 11 may be placed next to the sheet 51 which will allow a greater area to be covered by the rays reflected from the side walls 59, and hence will provide wider borders for the images formed by the stencil portions 15.

An advantage of the invention is the color effect obtained on the ground glass surface 11 through the irregular lighting of the various lamps 19. The irregularity removes the monotony of a mechanical blinker. Further, there are no mechanically driven parts to wear out, and to raise the cost of production. The sheet 7 or the sheets 55 and 51 may be easily changed by removing them from the frame 1, where they are held by suitable means, and inserting new cards with different stenciling; or, in the second instance by merely inserting a new card 51, having the same stencil work but a different design on the surface 57. The provision of an irregularly but substantially continuously changing image on the ground glass surface 11 is effective in attracting the attention. The

shifting appearance is equally effective to accomplish this end.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A display comprising regions to be lighted, and electrical means adapted to light said regions, said means comprising lamps mounted in sockets, and automatic means adapted to irregularly vary the intensity of at least one lamp independently of other lamps, said regions comprising stenciled portions of a relatively thick sheet adapted to reflect light from the walls of the stenciled portion and a ground surface adapted to substantially diffuse all of the light striking said surface whereby said surface is adapted to show images of said stenciled portions.

2. A display comprising a circuit, a plurality of lamps connected therein, at least some lamps provided with lights of characteristics different from those of the others, flashers controlling the lamps, said flashers being timed indifferently with respect to one another, the display having at least one display aperture adapted to receive light from more than one lamp, said aperture having side walls adapted to reflect some of said received light, and a projection surface adjacent said aperture adapted to diffuse light coming through said aperture and reflected from the walls of said aperture.

3. A display comprising a circuit, a plurality of lamps connected therein, at least some lamps provided with lights of characteristics different from those of the others, flashers controlling the lamps, said flashers being timed indifferently with respect to one another, the display having at least one display aperture adapted to receive light from more than one lamp, said aperture having side walls adapted to reflect some of said received light, and a projection surface adjacent said aperture adapted to diffuse the light coming through said aperture and reflected from the walls of said aperture whereby an image of said aperture is formed, and means beyond said surface adapted to define said image.

4. A display comprising regions to be lighted, electrical means adapted to light said regions, said means comprising lamps, automatic means adapted to discontinuously and irregularly vary the intensity of each lamp independently of all the other lamps, said regions comprising stenciled portions of an inner sheet, means adjacent said sheet adapted to diffuse light coming through said stenciled portions and reflected from the walls of said stenciled portions, and a relatively thin sheet adjacent said diffusing means having stenciled portions corresponding with said first-mentioned stenciled portions.

5. A display comprising a stencil, a surface adapted to show an image projected by the stencil, walls on said stencil adapted to reflect light to form borders on said image, colored lamps adapted to supply light to said stencil, and means adapted to vary the color and intensity of the light delivered to said stencil and reflected from said walls.

In testimony whereof, I have signed my name to this specification this 22nd day of April, 1931.

ELMER A. HEINZ.