

Aug. 18, 1925.

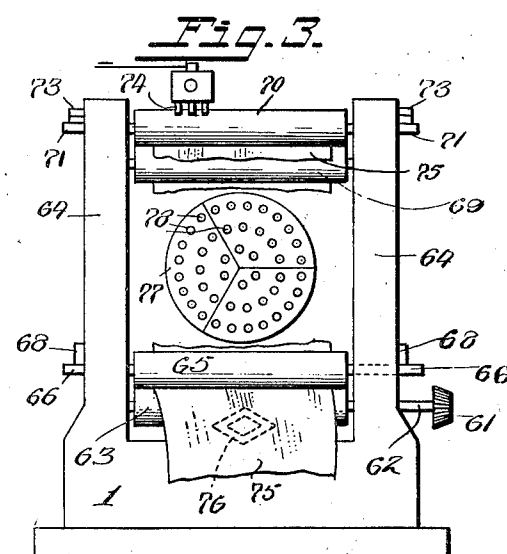
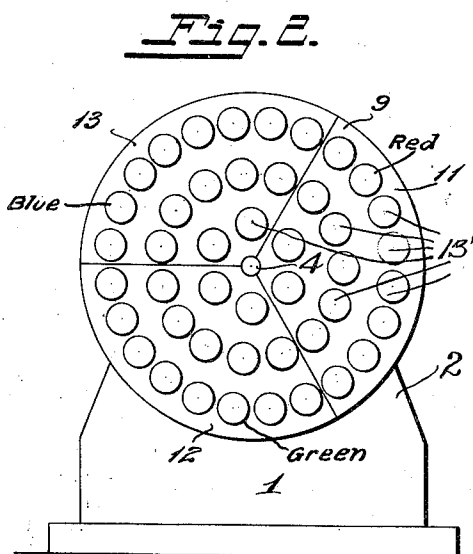
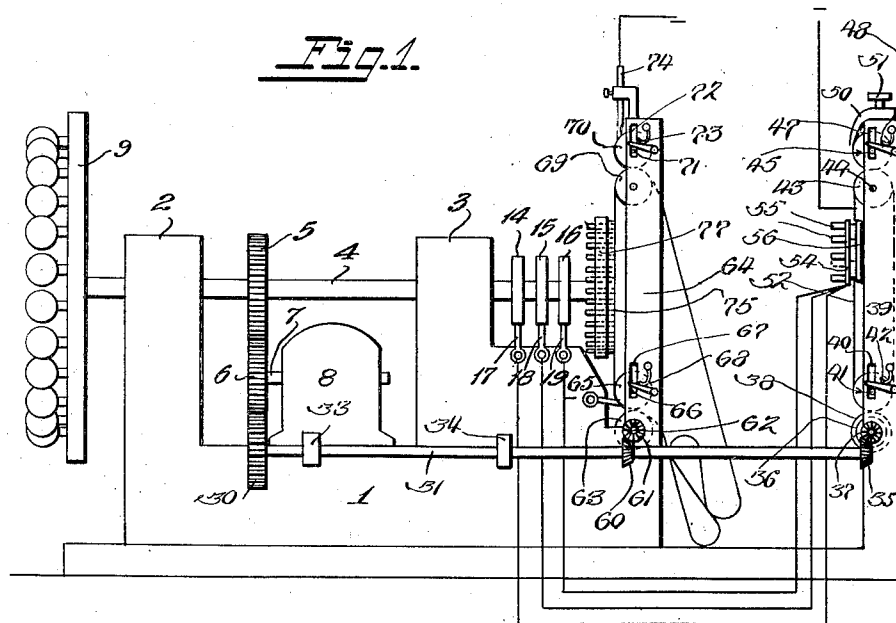
L. C. McCANN

1,550,036

COLORED LIGHT DISPLAY APPARATUS

Filed Feb. 25, 1924

3 Sheets-Sheet 1



Design Control.

Inventor
Leo C. McCann
 By *Seimmet Seimmet*
 Attorney

Aug. 18, 1925.

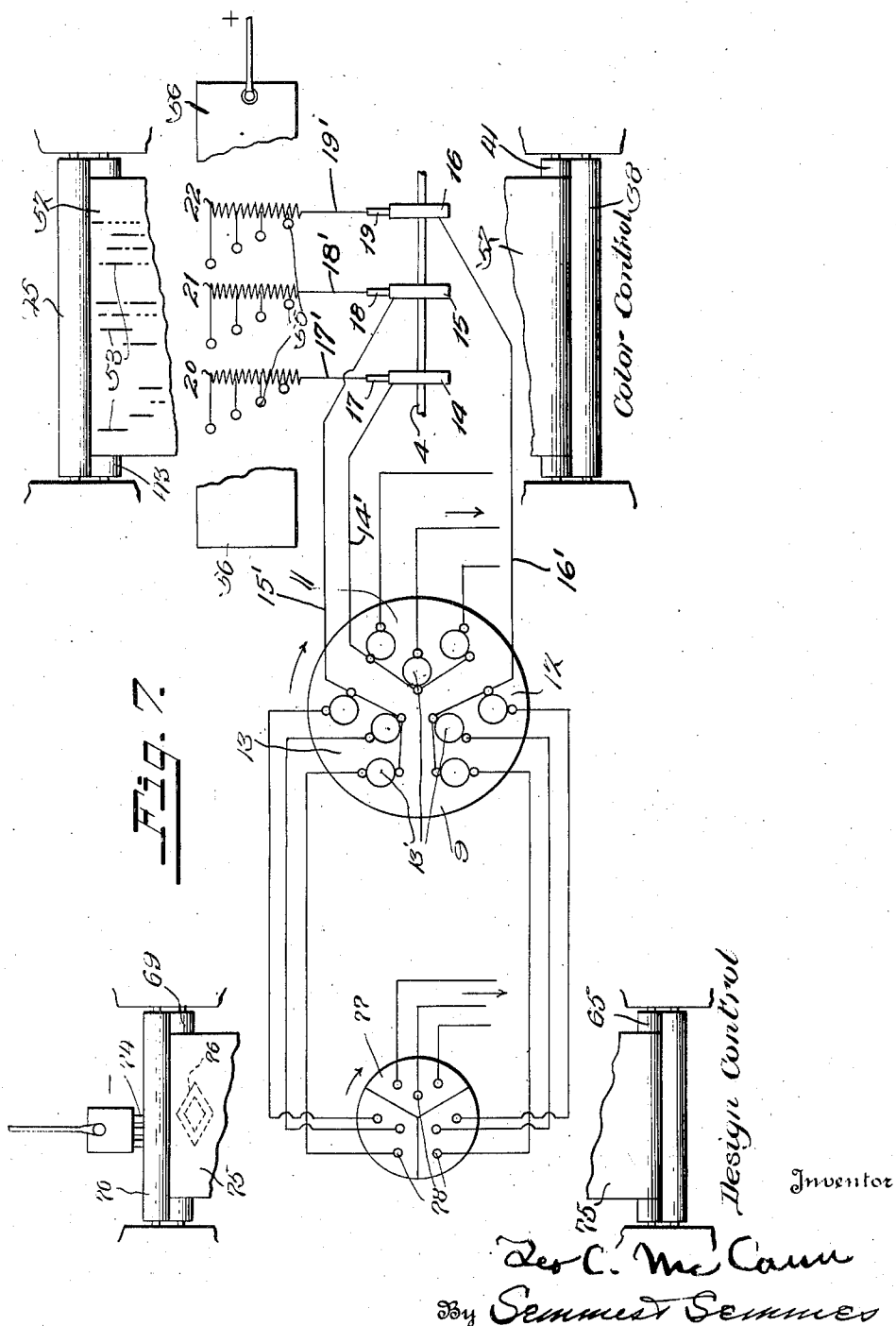
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COLORLED LIGHT DISPLAY APPARATUS

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3 Sheets-Sheet 2



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COLORED LIGHT DISPLAY APPARATUS

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3 Sheets-Sheet 3

Fig. 4.

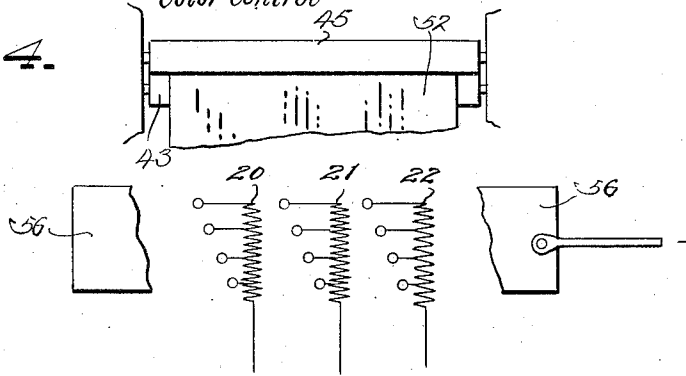


Fig. 5.

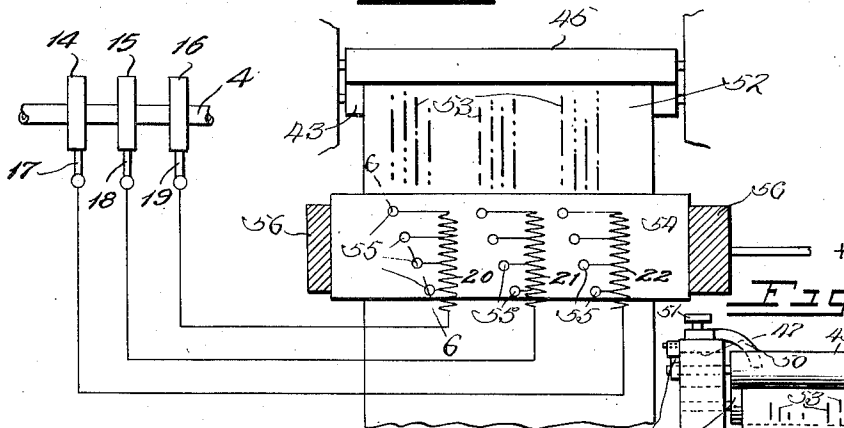
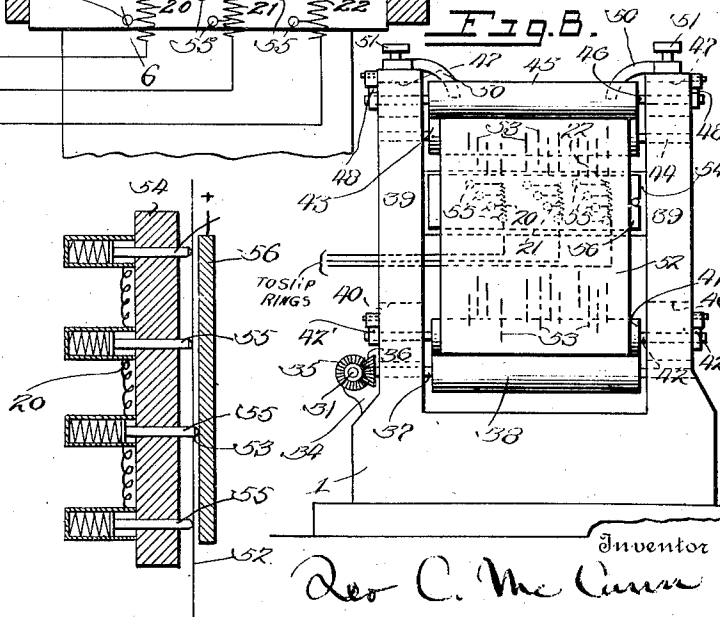


Fig. 6.



Inventor

Rev C. Mc Carver

By *Semmes Semmes*

Attorney

Patented Aug. 18, 1925.

1,550,036

UNITED STATES PATENT OFFICE.

LEO C. McCANN, OF SAN FRANCISCO, CALIFORNIA.

COLORED-LIGHT DISPLAY APPARATUS.

Application filed February 25, 1924. Serial No. 695,442.

To all whom it may concern:

Be it known that I, LEO C. McCANN, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Colored-Light Display Apparatus, of which the following is a specification.

This invention relates to certain new and useful improvements in apparatus to be used for advertising purposes, and it more particularly relates to the class of devices in which electric lights are used.

This application is a continuation in part of my application, Serial No. 386,136, filed June 2, 1920.

One of the objects I have in view is to provide means which will not only display the symbol or sign to be advertised, but to use electric lights in connection therewith in such a manner that the sign or symbol is bathed in a flood of light having a variety of color changes.

Another object I have in view is to provide rheostats in series with each lamp of the primary colors used whereby the variable color effects mentioned above may be rendered still more luminous and blending, or its opposite, through the action of the rheostats, the purpose being to secure in the color field produced by the revolution of the lamp disc a constant variety of colors from tones the most subdued to those brilliantly luminous.

Another object of my invention is to provide in addition to the lights heretofore mentioned, means for producing interesting designs which may be superimposed upon the revolving field of color and move across the same, said designs being less luminous than the field itself, and preferably of a color strongly contrasting therewith so that the impression upon the eye will be vivid and strongly suggestive, the luminous effects and the designs displayed upon the color field depending upon the picture or design control wheel and the color intensity control sheet, as will be more fully hereinafter described.

A further object of my invention is to provide a mechanism which will display design and color changes, in which the moving parts operate by rotation of balanced elements, thus avoiding vibration caused by motion of reciprocation.

Another object of my invention is to con-

struct a device of the character indicated which will be simple and durable, the handling of which in use will prove practical and easy, and the manufacture of which will be comparatively inexpensive.

With these and other objects in view which may be incident to the use of the improvements, the invention consists of the parts and combinations thereof hereinafter set forth and claimed with the understanding that the several necessary elements constituting the same may be varied in proportions and arrangement without departing from the nature and scope of the invention.

In order to make the invention more clearly understood, there are shown in the accompanying drawings means for carrying the same into practical effect without limiting the improvements in their useful applications to the particular constructions which, for the purpose of explanation have been made the subject of illustration.

In the drawings:

Figure 1 is a side elevation showing my device;

Fig. 2 is a front view of the revolving disc showing the electric lamps mounted;

Fig. 3 is a rear view of the mechanism used to control the design to be thrown upon the field of color;

Figs. 4 and 5 are views showing the mechanism to vary and control the intensity of the lamps of each of the primary colors;

Fig. 6 is a cross sectional view on line 6-6 of Fig. 5;

Fig. 7 is a diagrammatic view illustrating the manner of operation of my invention, the number of lamps shown being illustrative only.

Fig. 8 is a rear view of the intensity control mechanism.

Located upon the base 1 are the standards 2 and 3, and mounted in the upper part thereof is a hollow shaft 4, having a gear 5, which intermeshes with another gear 6, upon the driving shaft 7 of an electric motor 8, which operates the device. To one end of this shaft 4 is secured a rotatable lamp disc 9, provided on its outer face with three banks or sets 11, 12 and 13 of differently colored electric lamps 13', each set occupying on the disc a segmental portion of a superficial area sufficient for each bank or set to produce effects of color of equal intensity, some colors requiring more lamps of the same candle power to produce a given

intensity than other colors. Set 11 is composed of red lamps; set 12 of green lamps; and set 13 of blue lamps; it being understood that said colors are complementary colors, and that any other combinations of colors for producing a like effect may be employed.

All the lamps in set 11 are connected to a wire 14', in electrical connection with a slip ring 14, mounted on the hollow shaft 4. A brush 17 makes electrical connection with slip ring 14 and through a lead 17' with a rheostat 20. The lamps in set 12 are connected, through a lead 16', to a slip ring 16 mounted on the hollow shaft 4, and a brush 19 makes electrical connection between the slip ring 16 and a rheostat 22, through a lead 19'. Similarly the lamps in set 13 are electrically connected through lead 15' with the slip ring 15, with which a brush 18 is in electrical contact. Through the lead 18' the brush 18 is in electrical connection with a rheostat 21. Current passing through any rheostat then passes through the brushes to the slip rings on the hollow shaft 4, and thence to the lamps of a set.

When all the lamps 13' of the banks or sets of lamps are lit and the disc 9 is rotated, the colors blend, and any desired color effect may be obtained by regulating the amount of the current supplied to the banks, since by varying the intensity of the lights and therefore of the colors, all of the colors of the rainbow from red through blue can be secured by reason of the fact that the disc 9 is rotated at sufficient speed to give but one color effect to the eye.

Meshing with the gear 6 of the motor 8 is a gear 30 mounted on a drive shaft 31 which is carried upon the support 1 in bearings 33 and 34. This drive shaft 31 supplies power to operate the color and design control mechanisms. Upon the end of the shaft 31 is a conical gear 35 which meshes with a conical gear 36 on the end of a shaft 37 passing through a roller 38, which shaft is journaled in upwardly projecting parallel arms 39 of the support 1. Mounted above the roller 38 and journaled in a slot way 40 is a roller 41 whose shaft 42 passes through the slot way 40 above referred to. To keep the roller 41 in contact continually with roller 38, there are provided a pair of spring contact fingers 42'—adapted to be fastened to each of the parallel arms 39 and to be continually pressed upon the portion of the shaft 42 extending through the arms 39. These contact fingers 42' keep rollers 38 and 41 spring pressed together so that the motion imparted to the roller 38 through the meshing of its conical gear 36 with the conical gear 35 of the drive shaft 31 will always impart motion to the roller 41 mounted above it, and any material between these rollers will be drawn through them. At

the upper end of the arms 39 is mounted a roller 43 on a shaft 44 which is journaled in the arms 39. Above this roller is mounted a roller 45 having a shaft 46 slidably mounted in slot way 47 formed in the arms 39. Similar to the structure at the bottom of the arms 39 there are provided a pair of spring pressed fingers 48, which hold the roller 45 in constant spring pressed contact with the roller 43. In order to furnish means whereby any sheet of material passing the two sets of rollers at the top and bottom of the arms 39 may be kept stretched taut, there is shown a friction finger 50 with an adjusting screw 51, the pressure of which finger upon the upper roller 45 may be adjusted to apply any desired degree of tension to a sheet of material passing through the rollers 38 and 41 and the rollers 43 and 45. Adapted to pass between the above mentioned rollers is a sheet of non-conducting material 52 having slotted apertures 53 punched in its surface. Opposite the traveling sheet of non-conducting material 52 is mounted a rheostat board 54, through which are adapted to pass spring pressed pins 55 in circuit with the different sections of the three rheostats 20, 21 and 22. Behind the non-conducting sheet of material 52 is a metallic contact plate 56 leading to one of the main line terminals.

Upon rotation of the shaft 31 the gear 35 meshing with gear 36 imparts motion to roller 38. This causes roller 41 above it to revolve and to draw the sheet of non-conducting material 52 between the two rollers. Since the sheet passes between the two rollers 43 and 45 at the top of the arm 39, and since the roller 45 has a friction finger 50 in contact therewith, the sheet of non-conducting material is held taut and moved between the two sets of rollers. The sheet 52 passes between contact plate 56 and the rheostat board 54 carrying the rheostats 20, 21 and 22. The spring pressed contact pins 55 are in contact with the moving non-conducting sheet 52, and pass through the slotted apertures 53 in the sheet 52 and makes contact with the contact plate 56, thus closing electric circuits passing through the three banks of lamps 11, 12 and 13 on lamp disc 9.

As shown in Figure 5, within each rheostat there are four gradations of the amount of impedance that can be thrown into each circuit. By inspection of Figure 7, the plan of wiring for the color control mechanism will be apparent. All of the lamps in a bank or set have a single wire leading to a single slip ring, and thus the amount of color controlling current flowing to each of the three banks may be controlled through one rheostat for each bank. The intensity of the illumination of banks 13 of the lamps is controlled by the amount of resistance thrown into the circuit by the rheostat 21. The amount of resistance thrown into that

circuit depends upon which of the spring pressed contact pins 55 is in contact with the contact plate 56, and this is in turn governed by the position of the slotted apertures 53 in the non-conducting sheet 52. The operation for the control of each of the other two banks 11 and 12 is exactly similar, the controlling rheostats being 20 and 22 respectively. By forming suitable slots in the non-conducting sheet 52, any desired color or combination of colors will be shown on the revolving lamp disc 9 for since this disc is rapidly rotating the colors will blend and any desired tint in the spectrum will be shown.

Referring to the design control mechanism, a gear 60 mounted upon the drive shaft 31 is adapted to mesh with a gear 61 carried by the shaft 62 of a roller 63 mounted in upwardly projecting parallel arms 64. Mounted above the roller 63 is another roller 65 whose shaft 66 slides in slots 67 in the arms 64. The roller 65 is held in contact with the roller 63 by means of spring tension arms 68 bearing against the shaft 66. Mounted at the upper end of the upwardly projecting parallel arms 64 is a roller 69, and mounted above it and in contact therewith, is another roller 70, of conducting metal, whose shaft 71 passes through slots 72 in the arms 64. Against the shaft 71 press spring tension arms 73. In adjustable frictional engagement with the roller 70 is a contact arm 74 having a lead to the main line. The amount of pressure of the contact arm 74 with the roller 70 regulates the frictional drag on any sheet of material passing through to the top rollers 69 and 70 and thus the sheet will be kept stretched taut between the top and bottom sets of rollers. The roller 70 at the top of the support is, as before stated, of conductive material, and passing between rollers 60 and 70 is a sheet of conductive material 75 having a design 76 formed of non-conductive material thereon. Rotating with the shaft 4 is a design disc 77 having spring pressed contact pins 78, similar in construction to the spring pressed contact pins 55 of the color control mechanism, see Figure 6. Leading from each of the lamps 13' mounted on lamp disk 9 is a lead to one of the spring pressed contact pins 78 on the design disc 77, see diagram Figure 7. Upon rotation of the drive shaft 31, the sheet 75 of conducting material is caused to pass under tension across the face of the design disc 77 and the contact pins 78 complete an electrical circuit through contact arm 74, conducting roller 70, conducting sheet 75, pins 78 and through the leads to lamps 13' on the lamp disc 9. When the non-conducting design 76 passes over the face of the design disc 77, the contact pins 78 passing over the design receive no current through

the conducting sheet 75 and the lamps 13' on the lamp disc 9 corresponding to those contact pins are extinguished.

From an inspection of the foregoing it is apparent that through the color control mechanism the banks or sets of lamps 11, 12 and 13 receive varying amounts of electrical current in accordance with the arrangement of the slotted apertures 53 in the non-conductive sheet 52 passing between the rheostat board 54 and the contact plate 56. All the lamps in each set are connected to one wire for that set, and since the leads from the slip rings 14, 15 and 16 pass to one of the three rheostats 20, 21 and 22, the impedance in the circuit of each bank or set of lamps 11, 12 and 13, and therefore the amount of current flowing, is controlled by the contact pins 55 that pass through the slotted apertures 53 in the non-conducting sheet 52 and complete the circuit through the contact plate 56. Since the lamp disc 9 revolves at a high enough rate to blend the colors, any desired tint may be obtained. Not only is this effect achieved but a design may be thrown upon this colored field by means of the design control apparatus. In the design control, the flow of current to any single lamp is controlled by its corresponding contact pin 78 on the revolving design disc 77. The design 76 upon the conducting sheet 75 is non-conductive and when that design passes under any one of the contact pins 78, the lamp corresponding to that pin is extinguished, and so the design is thrown upon the colored revolving field. In practice a large number of lamps would be used but for purposes of explanation, but a few are illustrated. The principle of operation being exactly the same with few or many shown.

While I have herein shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth by way of illustration, as it is apparent that many modifications and variations may be made therein by those skilled in the art without departing from the spirit of the invention or exceeding the scope of the appended claims.

I claim:

1. In an apparatus for producing light effects, the combination with a rotatable disk provided with electric lamps of two or more of the cardinal colors, circuits for said lamps, and means to rotate said disk, of means to produce impedances in the circuits so as to control the intensities of each color and thereby produce a resultant varying color blend.

2. In an apparatus for producing light effects, the combination with a rotatable disk provided with sets of lamps, each set being of a different cardinal color, circuits

for said lamps, and means to rotate the disk, of means to automatically produce impedances in the circuits so as to control the intensity of color in each set to vary the color blend.

3. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors mounted upon a shaft, of means to rotate said disk, rheostats, a stencil sheet, and means controlled by the stencil sheet and associated with the rheostats to control and vary the intensities of the lamps.

4. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors mounted upon a shaft, and means to rotate said disk, rheostats in circuit with the lamps, contact pins for the rheostats, and a non-conductive stencil sheet controlling the movement of the contact pins to vary the intensities of the lamps.

5. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors mounted upon a shaft, of means to rotate the disk, rheostats in circuit with the lamps, a metallic terminal plate, and a non-conductive stencil sheet in operative relation to the rheostats and said plate to control and vary the intensities of the lamps.

6. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors, and means to rotate the disk to cause the colors to blend, of a picture or design sheet, and means cooperating with said sheet and with the disk to superimpose said design upon the field of color produced by said disk.

7. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors, and means to rotate the disk to cause the colors to blend, of a sheet of conductive material with a picture or design worked out in insulating material thereupon, and means cooperating with said sheet and with the rotatable disk to superimpose said design upon the field of color produced by said disk.

8. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors, and means to rotate the disk to cause the colors to blend, of a picture or design sheet, of electrical contact points adapted to pass over said sheet and pick out the picture or design, and means to superimpose it upon the field of color.

9. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors, mounted upon a shaft, and means to rotate the disk to cause the colors to blend,

a sheet of conductive material with a picture or design worked out in insulating strips thereupon, of a rotatable picture control wheel operating in unison with the rotatable disk, said picture wheel being provided with electric contact points adapted to pass over the picture sheet to pick out the design thereon and superimpose it upon the field of color.

10. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors mounted upon a shaft, and means to rotate the disk to cause the colors to blend, a sheet of conductive material with a picture or design worked out in insulating strips thereupon, of a rotatable picture control wheel mounted upon the same shaft with the said disk and operating in unison therewith, said picture control wheel being provided with spring mounted contact points adapted to pass over the picture sheet to pick out the design thereon and superimpose it upon the field of color.

11. In an apparatus for producing light effects, the combination with a rotatable disk provided with electric lights of two or more cardinal colors, electric circuits for said lights, means to rotate said disk to cause the colors to blend, rheostats in series with the lamps, and means to produce impedances through said rheostats in the light circuits so as to control the intensities of each color, of a design sheet, and means cooperating with said sheet and with the disk to superimpose said design upon the field of color produced by the disk.

12. In an apparatus for producing light effects, the combination with a rotatable disk provided with sets of lamps, circuits for said lamps, each set being of a different cardinal color and means to rotate the disk to cause the colors to blend, rheostats in series with each of the lamps constituting a set, and means to automatically produce impedances through said rheostats in the lamp circuits so as to control the intensity of the color of each set, of a sheet of conductive material with a design worked out in insulating material thereupon, means cooperating with said sheet and with the rotatable disk to superimpose said design upon the field of color produced by said disk.

13. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors mounted upon a shaft, means to rotate said shaft to cause the colors to blend, rheostats and a stencil sheet in operative relation to the rheostats to control and vary the intensity of the lights, of a design sheet, electrical contact pins adapted to pass over said sheet to pick out the design, and means to electrically superimpose it upon the field of color.

14. In an apparatus for producing light effects, the combination with a rotatable disk provided with lamps of two or more cardinal colors mounted upon a shaft, means
5 to rotate said shaft to cause the colors to blend, slip rings mounted on said shaft, rheostats electrically connected with said slip rings, a non-conductive stencil sheet in operative relation therewith to control and
10 vary the intensities of the lights, of a sheet of conductive material with a picture or design worked out in insulating strips thereupon, a rotatable picture control wheel provided with electrical contact pins adapted
15 to pass over the picture sheet to pick out the design thereupon and to superimpose it upon the field of color.

15. In an apparatus for producing light effects, the combination with rotatable disk
20 provided with lamps of two or more cardinal colors mounted upon a shaft, means to rotate the disk to cause the colors to blend, slip rings mounted upon said shaft, means to rotate the disk and rings synchronously,
25 rheostats connected in series with the sets of slip rings, a metallic contact plate, spring mounted contact pins in operative relation to said rheostats and said plate, of a non-metallic sheet, means to move the sheet
30 across the face of the contact pins, and openings in said sheet through which the pins may contact with the contact plate to control and vary the intensity of the lights in accordance with the action of the pins, a

sheet of conductive material with a picture
35 or design worked out in insulating material thereupon, and means cooperating with said sheet and with the rotatable disk to superimpose said design upon the field of color produced by the disk.
40

16. In an apparatus for producing light effects, the combination with a rotatable disk provided with sets of lamps in sectors, each set being of a different cardinal color and means to rotate the disk, of rheostats in
45 series with each set of lamps, and means to automatically vary the amount of resistance of the rheostats so as to control the intensity of color in each sector.

17. In an apparatus for producing light
50 effects, the combination of a rotatable support provided with electric lamp light sources of two or more of the cardinal colors with means to rotate said support, and means to vary the voltage on the lamps so
55 as to control the intensities of each color and thereby produce a resultant varying color blend.

18. In an apparatus for producing light effects, the combination of a rotatable support provided with electric light sources of
60 two or more colors with means to rotate said support, and means to vary the intensities of the light sources and thereby produce a resultant varying color blend.

In testimony whereof I affix my signature.

LEO C. McCANN.