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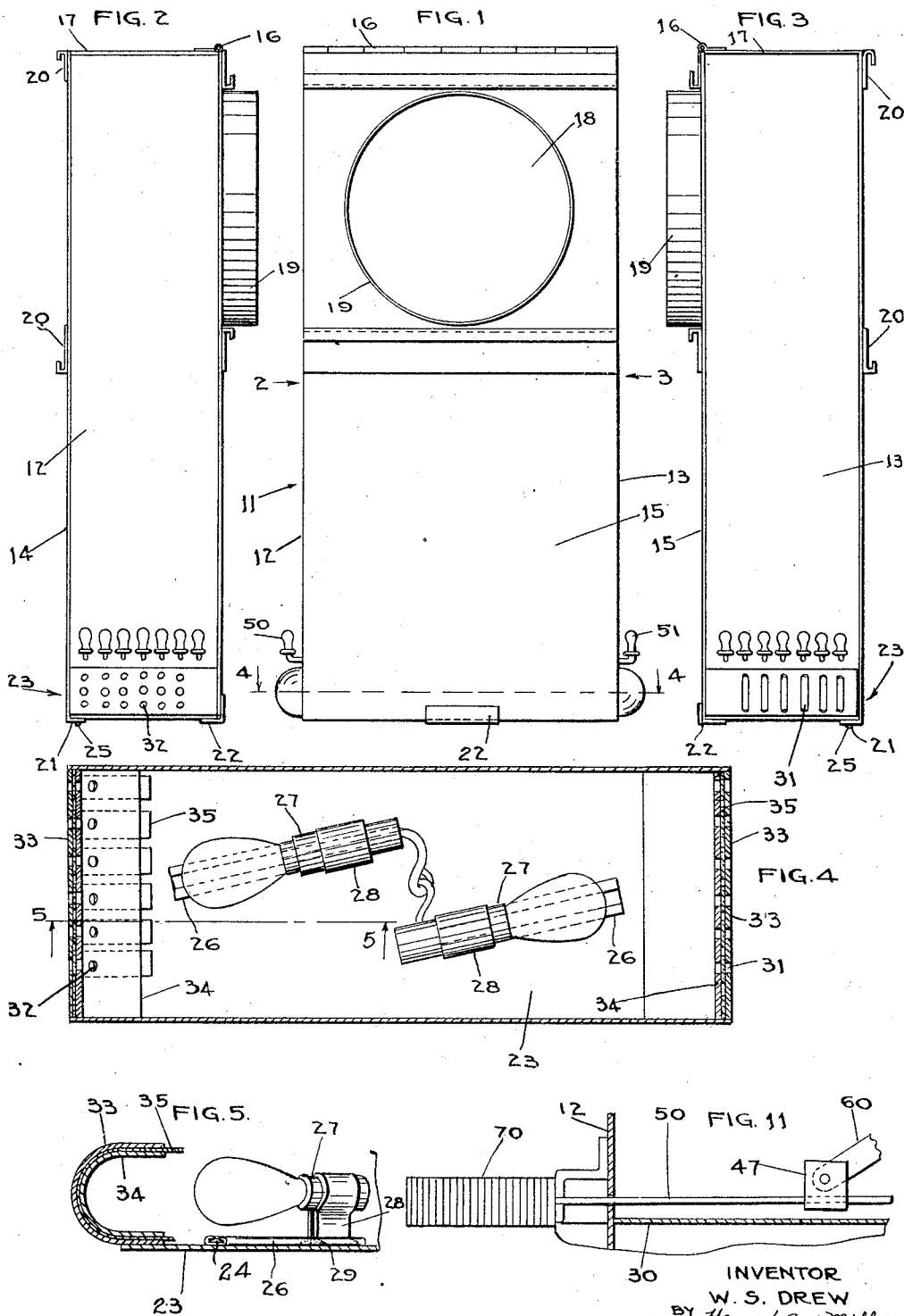
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ILLUMINATED COLOR CHANGER FOR SPOT AND FLOOD LIGHTS

Filed June 29, 1927

2 Sheets-Sheet 1



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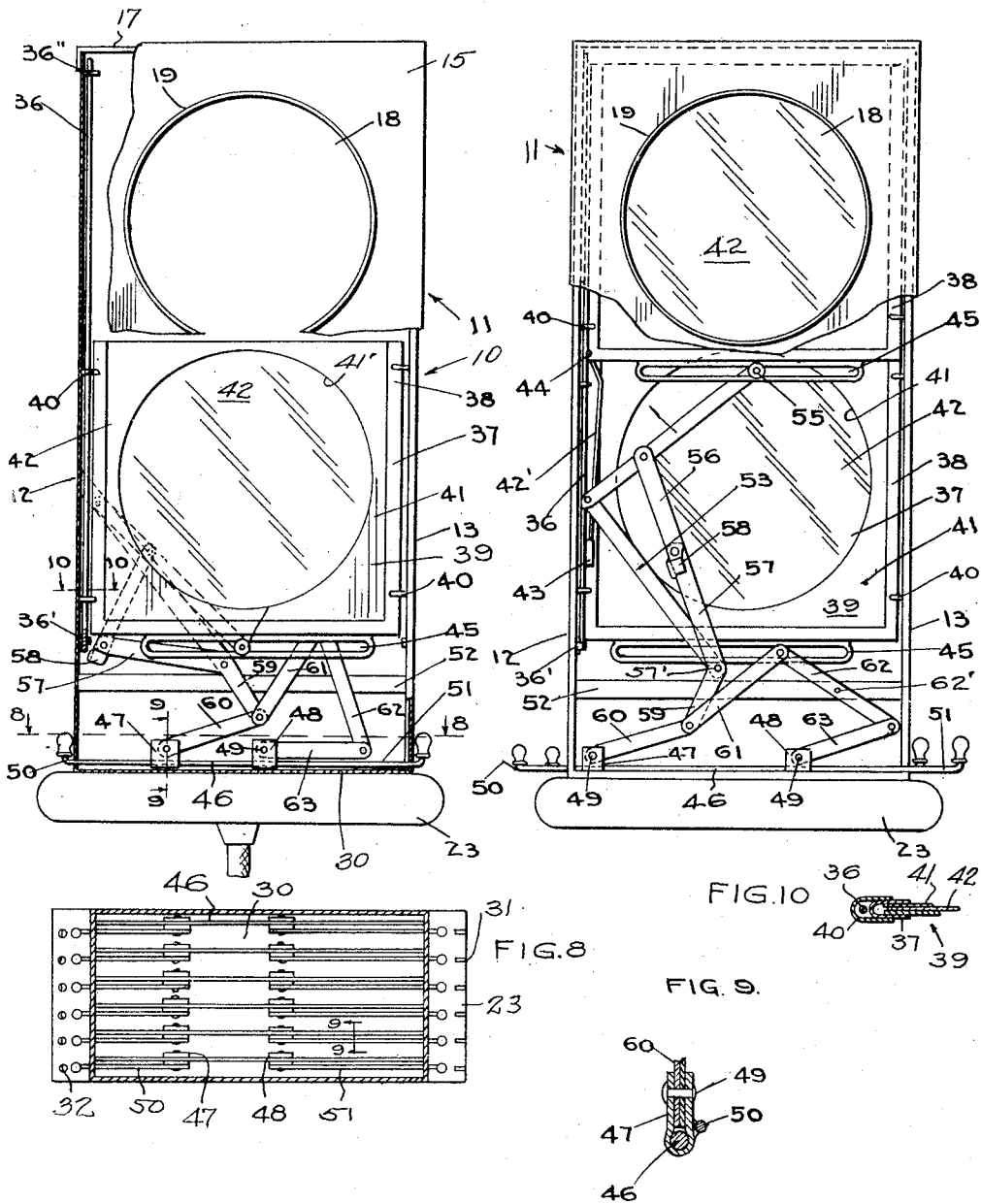
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FIG. 6

FIG. 7



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ILLUMINATED COLOR CHANGER FOR SPOT AND FLOOD LIGHTS

Application filed June 29, 1927. Serial No. 202,316.

My invention is a color changer for spot, flood and border lights particularly adapted for theatre or similar use where it is frequently desired to make quick changes of the color of the light cast by the spot lights or other illuminant being employed.

An object of my invention is the construction of a color changer suitable for spot lights and other illuminating devices, in which a plurality of color screens may be conveniently packed together in a box-like structure, any one or more of which may be manipulated to move in front of the illuminating device, or to be quickly withdrawn therefrom. Another object of my invention is the construction of an assembly of different color screens slidably mounted to shift in front of or away from a spot light and to have these operative from either side of the assembly.

Another feature of my invention is in identifying each of the handles by means of which the screens may be moved to or from operative position, by providing an aperture in the base of the box-like structure adjacent each of the handles and interposing a translucent film between the aperture and a source of light within the base, the color of the film corresponding to the color of the associated screen. As a result, in a darkened theatre the operator can manipulate the proper handles to use the desired screens, without being in danger of using the wrong color.

Another feature of my invention is the particular mechanical movement of levers and links by means of which the color screens may be moved into and out of operative position before an illuminating device.

In constructing my invention I provide a box-like casing which has an opening extending completely therethrough at the upper part thereof, through which light may be projected; and in the box-like structure is mounted a series of supporting frames, each slidable upwardly and downwardly in

the casing and having a translucent color screen on each of the frames except one which carries an opaque screen to block out the spot light. Adjacent the base of the casing there are a plurality of pull rods having handles; and these pull rods are connected by links to the levers of the frame so that any particular frame or combination may be elevated into alignment with the spot light, and thus impart the color of the selected color screen to the light emanating from the illuminating device; or a modified color may be obtained by the use of two or more screens. At the bottom of the casing I have a lamp box with electric lights therein, and on the opposite edges of such box there are apertures or slits. In alignment with the pull rods there are strips of colored film corresponding to the color of the respective screens operated by the associated pull rods, thereby enabling an attendant to readily choose the proper rod to be manipulated to move the desired color screen. As another feature of my invention, the pull rods may be operated by solenoids or the like to make remote control of the device possible.

My invention in its various aspects may be more readily understood from the following description and drawings, in which:

Figure 1 is a rear elevation of my invention, showing the side thereof which is toward the spot light when in use.

Figure 2 is a side elevation taken in the direction of the arrow 2 of Fig. 1.

Figure 3 is the opposite side elevation, taken in the direction of the arrow 3, of Fig. 1.

Figure 4 is a horizontal section on the line 4—4 of Fig. 1, the direction of view being indicated by the arrows, showing the lamp box.

Figure 5 is a detail vertical section on the line 5—5 of Fig. 4, with the direction of view indicated by the arrows.

Figure 6 is an elevation of the color

changer with portions of the housing broken away to disclose the unit containing the moving frames and screens and showing the screens in their lowermost or withdrawn position.

Figure 7 is a similar view, showing one of the screens in its elevated or operative position in front of the spot light.

Figure 8 is a horizontal section on the line 8—8 of Fig. 6.

Figure 9 is a detail vertical section on the line 9—9 of Fig. 8 with the direction of view as indicated.

Figure 10 is a detail horizontal section on the line 10—10 of Fig. 6, the view being taken in the direction of the arrows, showing the guides for the frames.

Figure 11 is a detail vertical section showing a modified form of actuating means.

The casing 11 in which a removable unit 10 containing the color screens is housed, is formed with a front wall 14 and the rear wall 15. The rear wall is preferably hinged at 16 to the top wall 17. There is a large opening 18 in both front and rear walls and on the rear wall there is an outwardly extending flange 19 surrounding the opening 18 to fit around the spot light. The front wall is provided with slide-ways 20 extending transversely thereacross, so that an additional color screen to those housed in the casing may be utilized. The unit 10 is removably insertable into the casing 11, and comprises a rigid frame made up of opposite side walls 12 and 13 connected by a bottom 30 and bars 17' at the top, the bars 17' being spaced to permit ready replacement of the color screens after the unit 10 has been removed from the casing 11. The front 15 of the casing has an inwardly turned flange 21 at the bottom; and the hinged back also has a flange 22. These flanges engage a lamp box 23; and screws 25 may be inserted through the flange 21, firmly holding the lamp box in position, it being understood that the casing 11 is of such length that both the unit 10 and the lamp box 23 may be accommodated therein.

The lamp box has a pair of inclined guide-ways 26 formed by bending a strip of metal to provide a channel 24 restricted along the top throughout its length. Lamp sockets 27 are each mounted on a web 28 having a T-head flange 29 fitting in the associated channel 24. This allows the lamps to be adjusted close to or remote from the sides of the lamp box so as to vary the intensity of the light by means of which the identifying films are illuminated. The lamp box is open at the top but the light is prevented from illuminating the screens by means of the bottom wall 30 of the unit 10.

The ends of the lamp box are preferably rounded, one end being provided with a series of slots 31 and the other end with a

series of rows of apertures 32. The ends of the lamp box are formed of outer and inner walls 33 and 34, the slots and apertures being formed through both walls; and strips of gelatine film 35 or the like may be slipped between the walls and give different colors of illumination through the slots and the apertures. These strips of color correspond to the associated color screens hereunder mentioned, and are in alignment with the pull rods for operating the screens as hereunder set forth.

The construction and mounting of the sliding screens is substantially as follows, having reference particularly to Figs. 6, 7 and 8:

On the side walls 12 and 13 of the unit 11 there are mounted slide-way rods 36. Each of these rods is threaded into a fixed nut 36' adjacent the bottom of the unit and is held in place at the upper end by an apertured lug 36'', allowing displacement of the rods and changing of the screen frame carriages 37 which are vertically slidable on these rods. The carriages 37 preferably are U-shaped in cross section to permit insertion of the screen frames 39. The eyes 40 attached to the U-shaped carriage 37 fit loosely around the rods 36 and thus permit vertical movement of the screens. The frames 39 having the transparencies are composed of opposite thin plates of metal 41 having large apertures 41' therethrough with the coloring material 42, such as gelatine, gripped between these sheets and exposed through the apertures 41'; and a spring catch 42' having one end 43 solidly attached to each of the carriages 37, and the other end engaging through apertures 44 in the associated plates 41 to releasably retain the frame 39 within its carriage 37. On the lower edge of each of the frames there is a slotted slide 45.

The manner of manipulating the screens to raise and lower them is substantially as follows, having reference particularly to Figs. 6 through 9:

On the bottom wall 30 of the unit 10 there are mounted a series of fixed rods 46; and on each of these rods there are two carriers 47 and 48 constructed, as shown in Fig. 9, of a U-shaped strip of metal with a pivot pin 49 connecting the upper parts of each. Soldered or otherwise secured to each of the carriers there is a pull rod 50 attached to the carrier 47 and 51 attached to the carrier 48. These pull rods extend through apertures in the opposite sides of the casing.

A series of fixed bars 52 extend across the casing from side to side, there being one for each screen; and rigidly connected to each bar and to one of the side walls of the unit 10 there is a brace rod 53. Pivottally connected adjacent the upper end of the brace rod 53 there is an operating lever 54 which has a

small roller 55 engaging in the slide 45 on the base of the associated screens. Pivottally connected to the operating lever 54 intermediate its ends there is a link 56, and pivottally
 5 connected to the link there is a bell crank 57 which is pivoted to the brace rod 53 by a pin 57', the link having a stop 58 permitting the upper part of the bell crank and the link to swing into alignment, as shown in Fig. 7, and
 10 preventing movement beyond such alignment.

The lower end 59 of the bell crank is connected to a link 60 which in turn is pivoted to the carrier 47 to which is connected the pull rod 50. Also to the lower end 59 of the bell
 15 crank there is pivottally connected a link 61, and to this at one end a lever 62, this lever 62 being pivoted intermediate its ends to the stationary bar 52 by a pivot 62' and pivoted at its other end to a link 63 which is pivottally
 20 connected to the carrier 48, this latter carrier being attached to the pull rod 51.

The manner of controlling and operating the screens is substantially as follows, having reference particularly to Figs. 6, 7 and 8.

25 Presuming all the screens are in their lowered position, as shown in Fig. 6, if the operator pulls one of the pull rods 50 on one side outwards, this transmits motion to the associated carrier 47 and pulls on the link 60, thus
 30 actuating the bell crank 57, swinging it from the position shown in Fig. 6 to that shown in Fig. 7, which action pulls upward on the link 56 and draws the link 56 into alignment with the upper part of the bell crank in the manner
 35 of an elbow joint and thrusts upwardly on the operating lever 54 to elevate the carriage 37, the roller 55 travelling laterally in the slot 45. This brings the apertures 42' into register with the openings 18 so that light passing
 40 through the openings is colored by the selected screen 42. The movement of the bell crank pulls the link 61 and pivots the lever 62 which pulls the link 63 to slide the carrier 48 toward its side of the unit, so that the pull rod 51 is
 45 thrust outwardly. Thus when the rod on one side is pulled, the rod on the opposite side is forced outwardly, hence it is immaterial whether the rod 50 or 51 is pulled to raise the screen, as the pulling movement on the rod
 50 51 draws the carrier 48 to one side, operating the link 63 and the links 62 to push the link 61 to actuate the bell crank from the position of Fig. 6 to that of Fig. 7.

It is to be understood that the cross bars 52, the brace 53 and the various links and levers,
 55 may be made quite thin and of sheet metal so that a comparatively large number of screens may be housed in a casing which is comparatively thin from back to front.

60 It will be obvious that when a screen is raised by pulling out on the pull rods, thus imparting a color to the light thrown by the spot light, that another screen may be also pulled upwardly, combining the colors and
 65 giving a color different from either of the

screens, and in the same manner, three or more color screens may be utilized together, giving composite colors. In order to remove the screens from the spot light, it is only necessary to thrust the pull rods inwardly far enough to
 70 swing the links 56 and upward parts of the bell cranks 57 out of alignment, the weight of the screens then functioning to slide them downward.

The object of having slots and apertures on
 75 opposite sides of the lamp box is so that the attendant, in fitting this box in the dark, may have it correctly placed so that the color strips visible through the ends of the lamp box will correspond with the color screens in the cas-
 80 ing. Frequently the spot lights are in more or less inaccessible positions and the operator may reach for these pull rods and operate them in accordance with the illumination through the slots and the apertures in the
 85 lamp box.

If it is desired to have a remote control for the device, I mount a series of solenoids 70 (see Fig. 11) on either of the opposite sides of the casing and in such case they can be con-
 90 nected to adjacent pull rods of adjacent screens, as one solenoid may operate each screen. The wires may then be taken from the solenoids to a remote control switch so that the color screens may be controlled from a
 95 distance.

Various changes may be made in the principles of my invention without departing from the spirit thereof, as set forth in the description, drawings and claims. 100

I claim:

1. A color changer comprising in combination a casing, a plurality of screens of different colors slidably mounted therein, and means carried by said casing and oper-
 105 atable from opposite sides of the casing on the outside thereof to selectively slide any screen optionally to or from operative position.

2. An illuminated color changer comprising
 110 in combination a box-like casing having a plurality of slidable color screens, a plurality of pull rods extending outwardly from opposite sides of the casing, means inter-
 115 connecting each of the pull rods and each of the screens whereby the screens may be selectively slid longitudinally of the casing, there being an opening in the casing for projection of a spot light.

3. A color changer comprising in combina-
 120 tion a structure having a plurality of shiftable color screens, an operating device for each screen, a lamp box affixed to said structure and having a lamp therein and a plu-
 125 rality of openings therein with colors corresponding to each of the screens showing therethrough, each color being in alignment with the device operating the screen of corresponding color.

4. A color changer comprising in combina- 130

tion a casing having a plurality of slidable color screens, a plurality of pull rods extending outwardly from opposite sides of said casing, each rod being connected to a screen to slide same longitudinally of the casing, the casing having an opening for the projection of light therethrough, a lamp box secured to the casing having a plurality of colors on opposite sides, said colors corresponding to the colors of the screens, and any particular color being in alignment with the pull rods for operating the corresponding screen.

5. A color changer comprising in combination a casing having a plurality of slidable color screens, a plurality of pull rods extending outwardly from opposite sides of said casing adjacent the bottom, each rod having a link and lever connection to a screen to slide such screen longitudinally of the casing, the casing having openings for the projection of light therethrough, a lamp box secured to the casing having a plurality of removable colors on opposite sides and different shaped openings to admit the light of said colors, the colors on opposite sides being in alignment with the rods operating similar colors in the casing.

6. In a color changer, a casing having a plurality of slidable color screens, each screen having a slotted slide, an operating lever pivoted to one side of the casing and operating in said slide, a bell crank having a link, such link being connected to the lever, and a pull rod for each screen operatively connected to the bell crank.

7. In a color changer, a box-like casing having a slidable color screen with a slot at the base of said screen, an operating lever engaging in said slot and pivotally connected to one side of the casing, a bell crank pivoted on a fixed structure, a link engaging said lever and connected to the crank by an elbow joint, a slidable push rod and a link connecting the other end of the bell crank to said push rod.

8. A color changer, as claimed in claim 7, a pull rod on the opposite side of the casing, and a plurality of links interconnecting the latter pull rod with the end of the bell crank opposite the elbow link.

9. In a color changer, a box-like casing having a plurality of slide rods on opposite sides, a plurality of color screens, each slidable on a pair of rods, each screen having a slot at the lower end, a plurality of fixed bars extending from side to side of the casing, a bell crank for each screen, means pivotally connecting each of said bell cranks to the cross bar, a link pivoted at one end with an elbow joint to the operating end of the bell crank, an operating lever pivotally connected to one side of the casing and engaged within the slot on the associated screen, said elbow link being pivoted at its other end to said operat-

ing lever intermediate its ends, a plurality of fixed guide rods at the lower end of the casing, each having a pair of carriers thereon, pull rods connected to said carriers extending outwardly through the casing, and links and levers connected to said carriers through the end of the bell crank opposite that having the elbow link.

10. In a color changer, a box-like casing having a plurality of shiftable color screens, a lamp box secured to the lower end of the casing, said box having a lamp adjustably mounted therein, the box having double walls at one end forming slideways for strips of colored material and openings through said walls to illuminate said strips, and means to operate the color screens of the casing in alignment with the said color strips.

11. In a color changer, a casing, means for removably attaching said casing to an illuminating device in position for the light emanating therefrom to pass through the casing, a unit removably insertable in said casing, a plurality of color screens, each slidable on a pair of rods and having a transversely extending slot, a plurality of bars fixed to said unit and extending laterally thereof, a bellcrank associated with each screen, means pivotally connecting each of said bellcranks to the cross bar, a link pivoted at one end with an elbow joint to the operating end of the bellcrank, an operating lever pivotally connected to one side of the unit and engaged within the slot of the associated screen, said elbow link being pivoted at its other end to said operating lever intermediate the ends thereof, a plurality of fixed guide rods at the lower end of the unit, each having a pair of carriers slidably disposed thereon, pull rods connected to said carriers and extending outwards to be accessible from the exterior of the casing, and links and levers connecting each of said carriers to the associated bellcrank.

12. In a color changer, a casing, means for removably mounting said casing upon an illuminating device in position for the light emanating therefrom to pass through the casing, a unit removably insertable into said casing, a plurality of color screen carriages, each slidable upon a pair of rods, a translucent color screen insertable into each of said carriages, means associated with each carriage for removably locking said color screen therein, each of said carriages having a slot extending transversely thereof, a plurality of fixed bars extending laterally of the unit, a bellcrank associated with each carriage, means pivotally connecting each of said bellcranks to the associated cross bar, a link pivoted at one end with an elbow joint to the operating end of said bellcrank, an operating lever pivotally connected to one side of the unit and engaged within the slot of the associated carriage, said elbow link being pivoted at its other end to said operating lever inter-

mediate the ends thereof, a plurality of fixed
guide rods extending transversely of the unit
at its lower end, each having a pair of car-
riers thereon, a pull rod connected to each of
5 said carriers and extending outwards to be
accessible from the exterior of the casing, and
links and levers connecting the carriers of
each guide rod to the associated bellcrank
whereby the associated carriage is elevated
10 when one of the pull rods is pulled outwards
to interpose the associated screen into said
light and to push the other pull rod outwards
of the casing.

In testimony whereof I have signed my
15 name to this specification.

WILLIS STEWART DREW.

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