

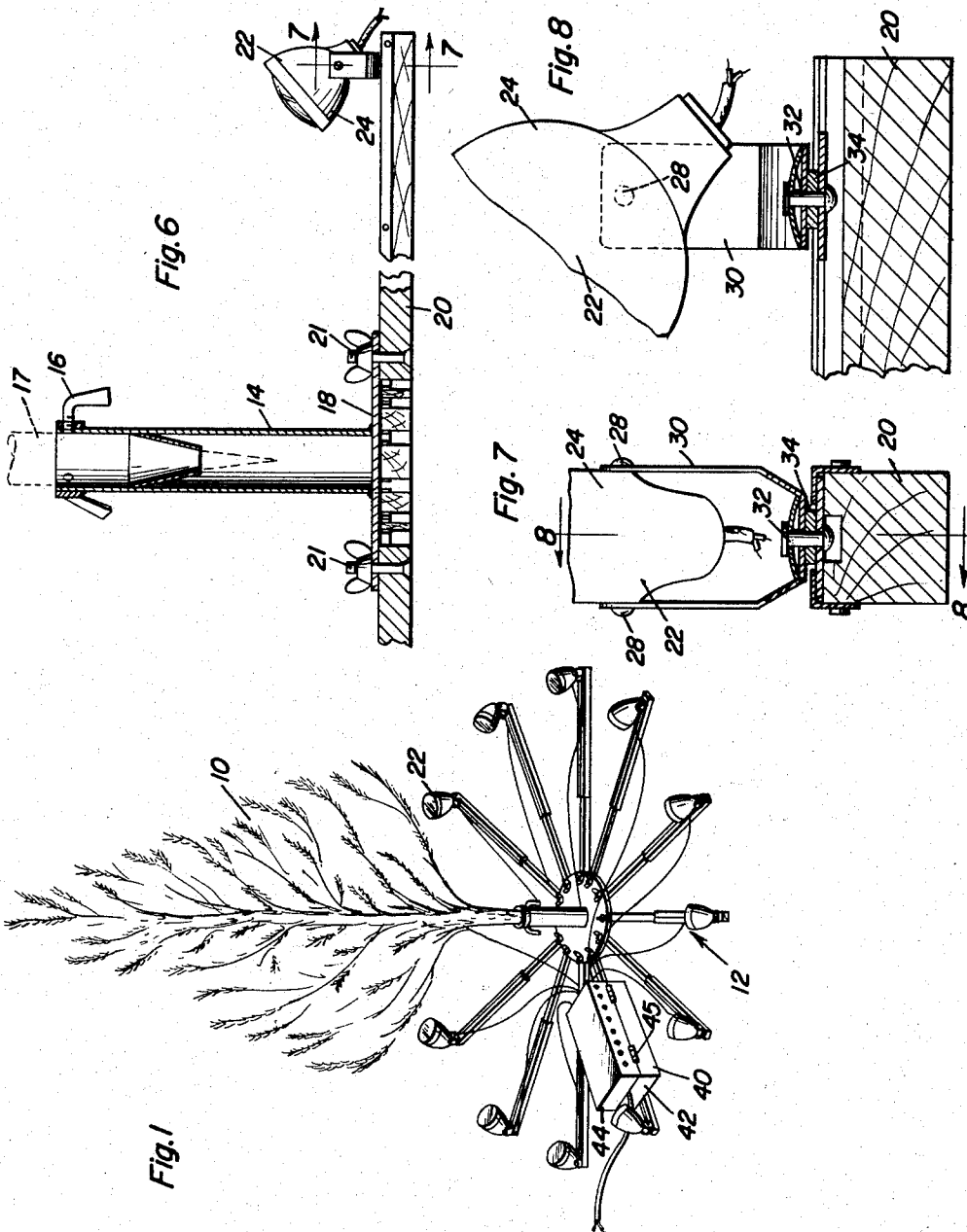
March 17, 1959

S. BARKER
FLASHER MECHANISM

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4 Sheets-Sheet 1



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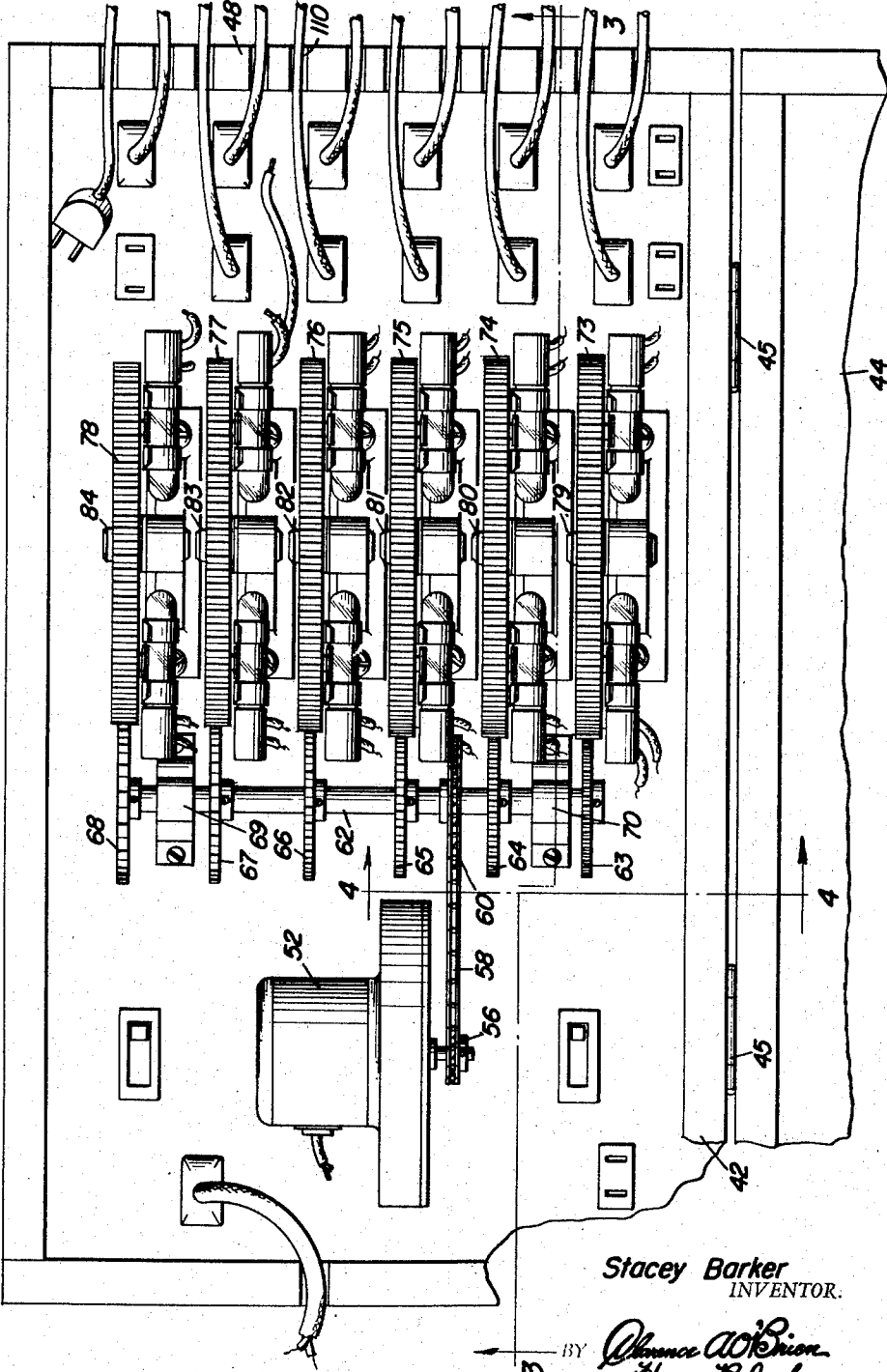
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FLASHER MECHANISM

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Fig. 2



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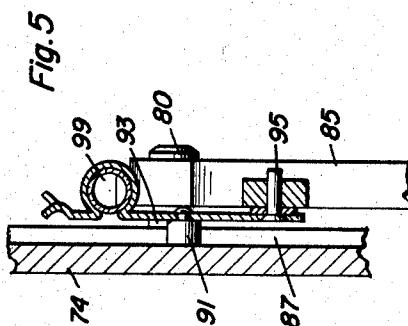
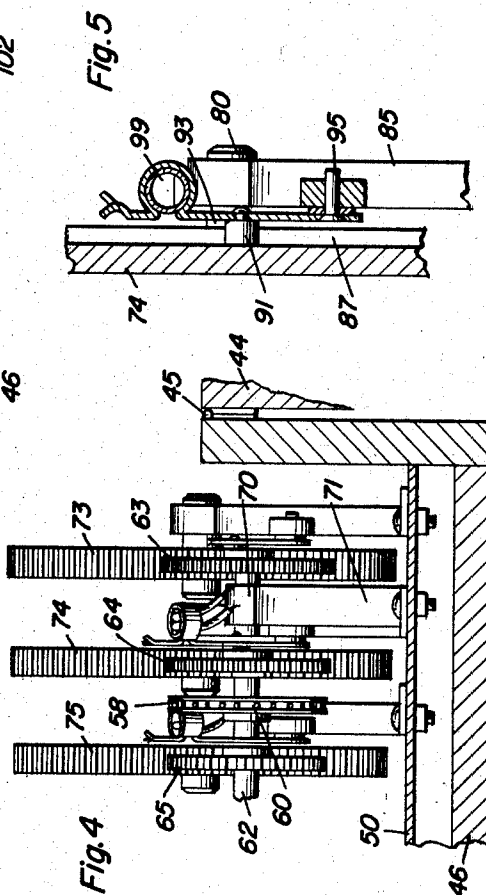
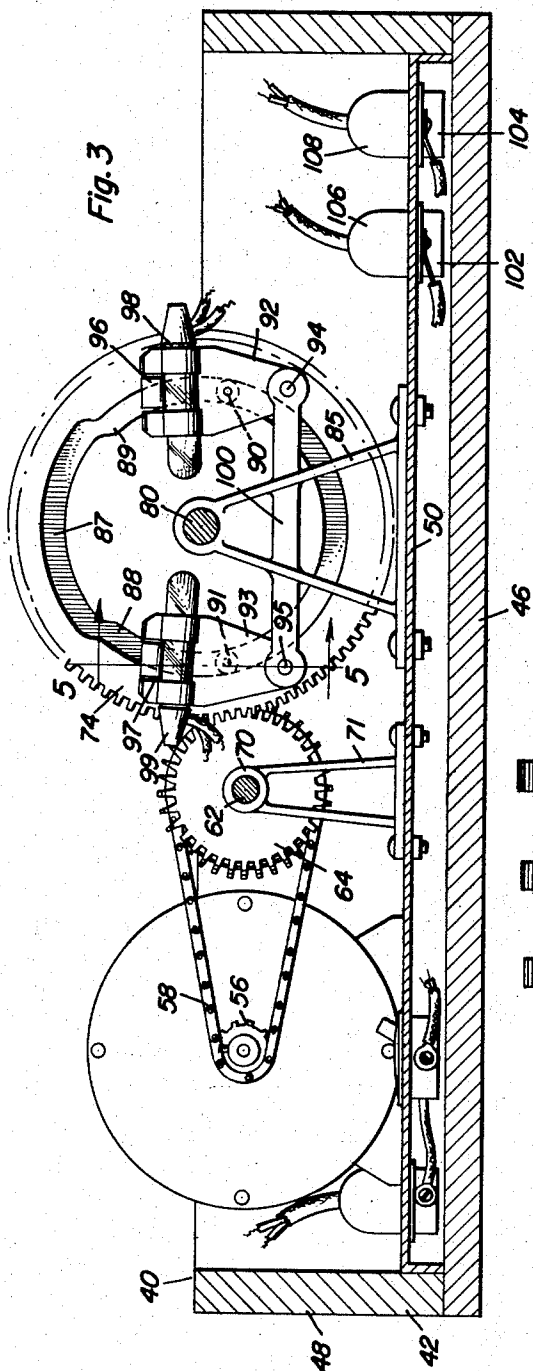
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4 Sheets-Sheet 3



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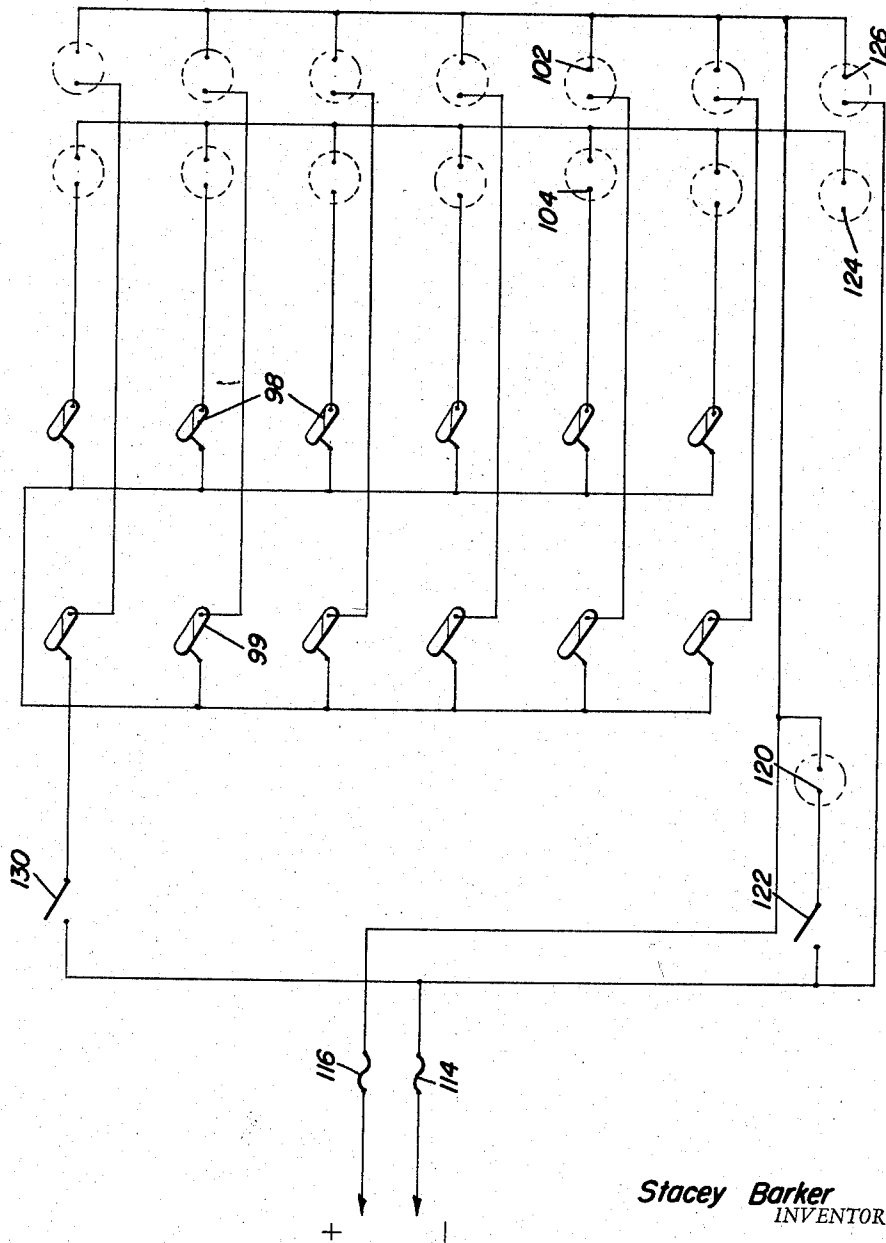
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Fig. 9



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FLASHER MECHANISM

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Application February 6, 1958, Serial No. 713,621

7 Claims. (Cl. 315-186)

This invention relates to devices for controlling electric lights and particularly to a device for producing a lighting effect by energizing and deenergizing electric lights of any type.

There are a great many devices for controlling electric lights when they are used as parts of displays, billboards, water fountains and others. These devices form a definite pattern with a prearranged continuity or repeat cycle for the lights.

This invention differs entirely from this concept to the extent that to the casual or studied observer, no pattern or repeat cycle can be observed. The invention is embodied in the provision of an almost completely random lighting cycle and especially when used with lights of different colors and projected on an object. For example, the object may be an evergreen tree used as a display during a holiday season. When so used, the effects are rapturous and enthralling, enticing a view for long periods of time because of the many different colors, the intermingling of colors producing hues and shades and tones of colors. Above all, the absence of any pattern or routine for the lighting effects achieves this desired end.

The object of this invention, therefore, is to provide a new decorative lighting system for displays, advertising, fountains and various other purposes and uses.

The invention is embodied in a mechanism which successfully energizes, for a period of time, lights of different colors or shades. The mechanism preferably has a small electric motor which drives a group of independently rotatable gears through a jack shaft that supports a number of pinions. The gearing ratios of the pairs of engaged gears differ from each other, and each pair of gears is arranged to operate one or more, preferably two switches, turning it on and off to energize and deenergize two lights.

Although it may be said that there is actually a repeat cycle in this device, the repetition takes place after so long a period of time that in comparison to other equipment for cycling lights, this invention appears to have a complete random operation.

A further object of the present invention is to provide a structurally simple, portable and easily installed and removed unit by which to control the energization of a plurality of lights for any purpose compatible with the device.

Other features and advantages and objects of this invention will appear from the following description taken in conjunction with the drawings, wherein:

Figure 1 is a perspective view of an evergreen tree with which a display lighting system in accordance with the invention is connected, the evergreen tree schematically representing any object or portion thereof that is to be displayed for any purpose.

Figure 2 is a top view of the unit in Figure 1 with the cover opened to expose parts of the interior of the unit.

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Figure 3 is a sectional view taken on the line 3-3 of Figure 2.

Figure 4 is a sectional view taken on the line 4-4 of Figure 2.

5 Figure 5 is a sectional view taken on the line 5-5 of Figure 3.

Figure 6 is an enlarged sectional view of a part of the display equipment in Figure 1.

10 Figure 7 is a sectional view taken on the line 7-7 of Figure 6.

Figure 8 is a sectional view taken on the line 8-8 of Figure 7.

Figure 9 is a wiring diagram of the unit.

15 In the accompanying drawings there is an evergreen tree 10 which schematically represents any object or portion thereof, for example, a surface of an object, on which the rays from the lights of display equipment 12 are to be applied. The display equipment 12 includes a tree holder 14 consisting of an upwardly opening tube with fasteners 16 to hold the trunk 17 of the tree 10 fastened therein. Base 18 is attached to the lower end of the tree holder and has twelve spokes 20 extending radially therefrom and separably connected thereto, as by bolt and nut assemblies 21. The spokes are provided with a channel or track so that the lights 22 at their outer ends can be varied in distance from tree 10.

20 Light 22 is constructed of a lamp housing 24 in which there is an electric light bulb or some other source of illumination. It is preferred that the lamps in the group of lamps be made of different colors or have different color lens or in some other way cast a colored light onto the tree 10.

25 The lamp housing 24 is supported on pivots 28 that are carried at the upper ends of the sides of U-shaped mounting bracket 30. This bracket is rotatably adjustable about its support spindle 32, the latter held spaced slightly above the top surface of its spoke 20 by spacer 34. By virtue of this construction the lamp housing 22 can be adjusted about a horizontal axis (pivot pins 28) or about a generally vertical axis (spindle 32) so that the beam of light will be passed in the direction that is desired by the user.

30 The unit 40 is the control for the twelve electric lights 22. Although twelve lights are illustrated and are described as one embodiment of the invention, it is to be clearly understood that this number may be increased or reduced without departing from the invention. Unit 40 is placed in a case 42 that has a closure or lid 44 attached by hinges 45 to one wall of the case 42.

35 The case 42 has a bottom 46, side walls 48 to one of which hinges 45 are secured, and a false bottom 50. This false bottom 50 supports the mechanism by which the lights 22 are switched. This mechanism consists of a small electric motor 52 that preferably has a gear reducer built on one of its ends through which drive sprocket 56 is powered. Chain 58 is engaged with the drive sprocket and with the sprocket 60 on jack shaft 62. Six pinions 63, 64, 65, 66, 67 and 68 are fixed to jack shaft 62, as by setscrews and collars. Since the sprocket 60 is also fixed to the jack shaft 62, all of the pinions will be rotated in response to actuation of electric motor 52. Bearings 69 and 70 at the upper ends of bearing supports 71, hold the jack shaft supported above the false bottom 50 in case 42. Bearing supports 71 are each secured to this false bottom and rise upwardly therefrom. Each pinion (Figure 2) has a slightly different number of teeth and a slightly different diameter.

40 The six pinions are engaged with six gears 73, 74, 75, 76, 77 and 78, each of which is independently mounted. The teeth of gears 73, 74, 75, 76, 77 and 78 are the same in number and since they are enmeshed with pinions that

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each has a different number of teeth, the speed of rotation of the gears will differ. Each of the six gears is mounted on its spindle, there being spindles or shafts 79, 80, 81, 82, 83 and 84, and these are mounted for rotation in bearings at the upper ends of support brackets 85 (Figure 3). The support brackets are secured to the false bottom 50 and rise upwardly therefrom. Their bearings are at their upper ends.

Each gear, for example, typical gear 74 of Figure 3, has a cam 87 cut in one of its faces and in the form of a groove. The cam is generally circular with two lobes 88 and 89 or deviations from the circle which correspond to lobes. Two cam followers 90 and 91 are held captive in cam 87 and are attached to switch holders 92 and 93. Each switch holder consists of a plate mounted on its pivot pin 94 and 95 at its lower end and provided with spring clips 96 and 97 at its upper end. Mercury switches 98 and 99 are held by the spring clips and move with the switch holders 92 and 93 as they are oscillated in response to rotation of gear 74 and more particularly, in response to movement of the cam followers 90 and 91 in the cam groove 87. The pivot pins 94 and 95 for the switch holders 92 and 93 are mounted on the ends of support arm 100 that is carried by the bearing support or bracket 85.

Each mercury switch is wired with an electrical outlet, for example outlets 102 and 104 of Figure 3 are wired with mercury switches 98 and 99 so that the mercury switches control the outlets. Plugs 106 and 108 are plugged into the outlet and wired with individual lights 22. By virtue of this construction the individual lights can be plugged in and separated very easily. It is preferred that one of the walls 48 of the case 42 have a number of openings 110 through which the wires from the light 22 may pass.

Reference is now made to the wiring diagram of Figure 9. As shown in this figure current from a source of electrical potential is applied to fuses 114 and 116 in a fuse block that is carried by the case 42. Motor 52 has an electric wire and plug that is adapted to be fitted into the motor outlet 120, and the motor outlet is controlled by motor switch 122, each of these being carried by false bottom 50 of case 42. Motor outlet 120 and its switch 122 are connected across the line and are in circuit with the fuses 114 and 116. Service outlets 124 and 126 that are connected in parallel, are provided in the case 42 and are wired in series with the fuses 114 and 116. Each of the mercury switches is connected in series with its light outlet or socket. For example see Figure 9 showing mercury switches 98 and 99 serially connected with their outlets 102 and 104. However, the groups of mercury switches and their outlets are connected in parallel with main light switch 130 on one side of the line so that the entire lighting circuit can be energized and deenergized.

In practical use, the desired display is set up, one possible display shown in Figure 1. Then when the switches are closed, the motor 52 becomes energized and rotates the jack shaft through the gear reducer and chain drive (Figure 3). The jack shaft supported pinions rotate the gears with which they are enmeshed but due to the different gear ratios for each pair of gears, the gears will be rotated at different speeds. Accordingly, the mercury switches of each pair are opened and closed at different times and these directly control the energization of their individual lights. The lights are operated at seemingly erratic intervals when compared to each other and this creates an effect which does not appear to have any continuity. On the contrary the lighting effect appears to be completely random with some lights being energized with others. In other words, for a while a red light may be energized with a green light, but after a while when this red light is again energized, it will be on at the same time that a yellow light is on.

Changes in size, shape and arrangement of details

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and parts such as come within the purview of the invention claimed, can be resorted to in actual practice.

Having described the invention what is claimed as new is as follows:

1. In a display which has a plurality of electric lights, control equipment for energizing the lights in a seemingly completely random fashion, said equipment comprising a motor, a jack shaft, a case within which said jack shaft is mounted for rotation, a plurality of pinions on said jack shaft, a plurality of independently rotating gears enmeshed with said pinions, the gear ratios of the pairs of pinions and gears differing so that said gears rotate at different speeds, a plurality of switches, switch holders, means mounting said switch holders for oscillation in said case, means drivingly connecting said gears and said switch holders to oscillate said switch holders in response to rotation of said gears, and means including electric wires extending from said switches to the lights for energizing the lights.

2. In a display which has a plurality of electric lights, control equipment for energizing the lights in a seemingly completely random fashion, said equipment comprising a motor, a jack shaft, a case within which said jack shaft is mounted for rotation, a plurality of pinions on said jack shaft, a plurality of independently rotating gears enmeshed with said pinions, the gear ratios of the pairs of pinions and gears differing so that said gears rotate at different speeds, a plurality of switches, switch holders, means mounting said switch holders for oscillation in said case, means drivingly connecting said gears and said switch holders to oscillate said switch holders in response to rotation of said gears, and means including electric wires extending from said switches to the lights for energizing the lights, said energizing means including an electrical outlet carried by said case for each light, said wires including portions which extend from said switches to said electric outlets, plugs, other portions of said electric wires extending from said plugs which are adapted to be separably connected with said outlets and connected with said lights.

3. The combination of claim 2 wherein said electric lights include light housings, means mounting said light housings for adjustment about intersecting axes so that the beam of light from said lights may be directed to selected areas.

4. In a display which has a plurality of electric lights, control equipment for energizing the lights in a seemingly completely random fashion, said equipment comprising a motor, a jack shaft, a case within which said jack shaft is mounted for rotation, a plurality of pinions on said jack shaft, a plurality of independently rotating gears enmeshed with said pinions, the gear ratios of the pairs of pinions and gears differing so that said gears rotate at different speeds, a plurality of switches, switch holders, means mounting said switch holders for oscillation in said case, means drivingly connecting said gears and said switch holders to oscillate said switch holders in response to rotation of said gears, and means including electric wires extending from said switches to the lights for energizing the lights, said energizing means including an electrical outlet carried by said case for each light, said wires including portions which extend from said switches to said electric outlets, plugs, other portions of said electric wires extending from said plugs which are adapted to be separably connected with said outlets and connected with said lights, said case having a false bottom to which said outlets are secured, a main switch for said lights and carried by said case, and electric conductors extending from said main switch and to a source of potential and to said switches that are carried by said switch holders.

5. In an apparatus to control a group of electric lights, the combination of a motor, a group of gears, means mounting said gears for rotation independently of each other, means drivingly connecting said motor to gears

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for rotating said gears at speeds which are different from each other whereby one gear operates at a speed different from the adjacent gears, switch holders, switches carried by said switch holders, means operatively connecting said switches of said switch holders to the lights that are to be controlled, means drivingly connecting said switch holders to said gears for oscillating said switch holders in response to rotation of said gears.

6. In a display that has a plurality of electric lights, means for energizing said electric lights in a seemingly random sequence, said means including a plurality of mechanical members, means for rotating said mechanical members at speeds that differ between mechanical members, a plurality of brackets, means on said bracket supporting said mechanical members for rotation, a plurality of switches adapted to control the electric lights, a switch holder for each switch, means mounting said switch

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holders for oscillation on said bracket, and means drivingly connecting said switch holders to said members.

7. The combination of claim 6 wherein said members consist of gears, said means drivingly connecting said means for rotating said members including a motor, a jack shaft, pinions on said jack shafts and enmeshed with said gears.

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