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2,486,727

PHOTOGRAPHIC LIGHT CONTROL DEVICE

Filed March 23, 1948

2 Sheets-Sheet 1

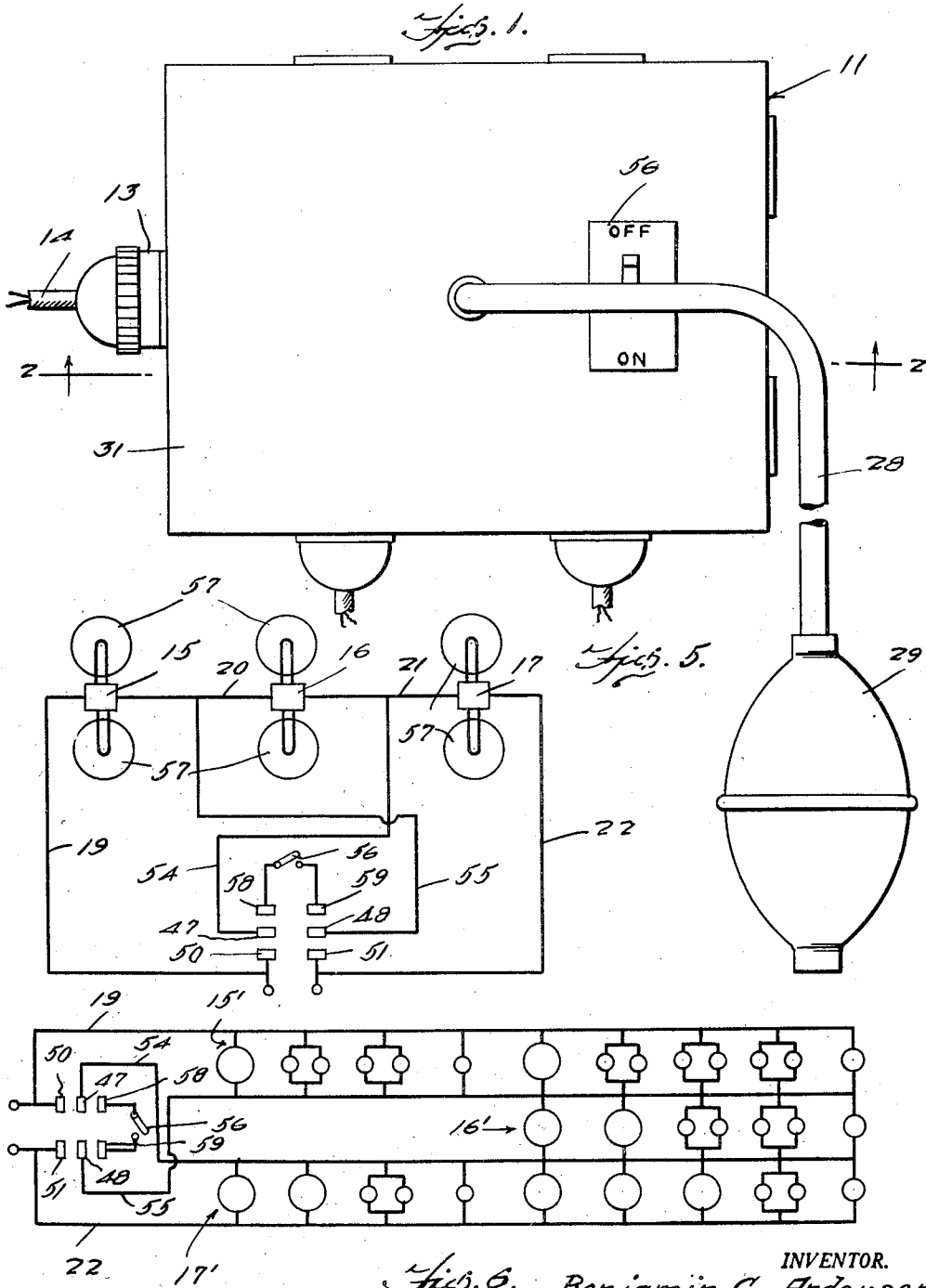


Fig. 6. INVENTOR. Benjamin C. Anderson
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2 Sheets-Sheet 2

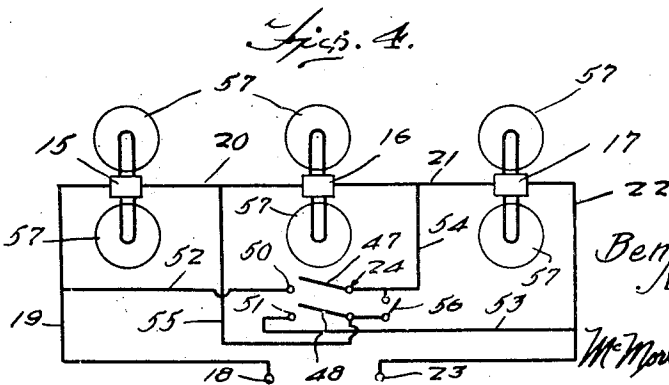
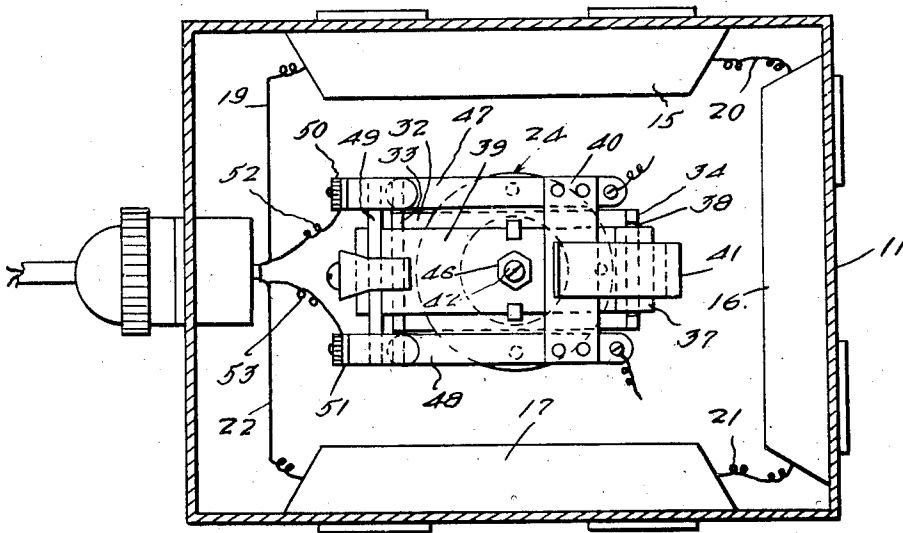
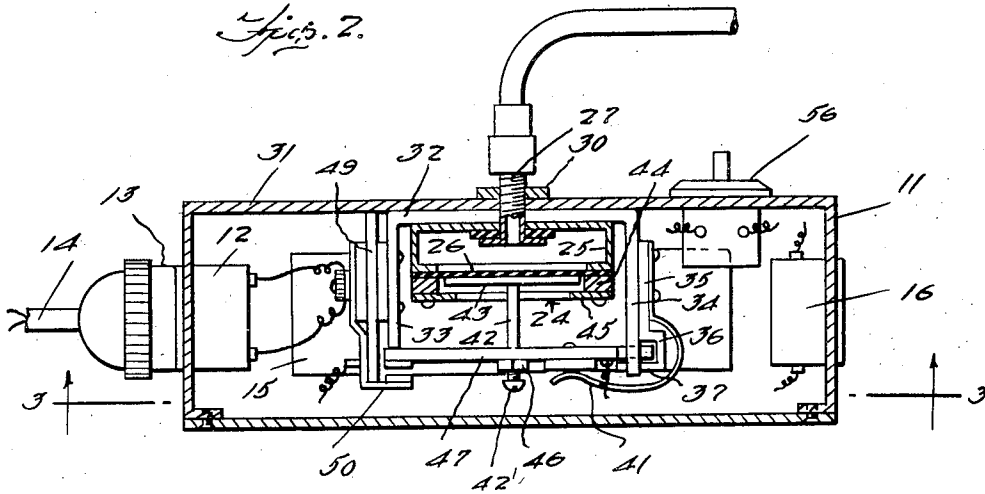


Fig. 3.

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UNITED STATES PATENT OFFICE

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PHOTOGRAPHIC LIGHT CONTROL DEVICE

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Application March 23, 1948, Serial No. 16,436

3 Claims. (Cl. 171-97)

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This invention relates to photographic apparatus, and more particularly to improved apparatus for controlling illumination while taking pictures.

A main object of the invention is to provide a novel and improved lamp control device for regulating the intensity of illumination during photography, said device being very simple in construction, easy to operate, and providing a considerable degree of variation of illumination although employing conventional photographic lamp bulbs as the source of illumination.

A further object of the invention is to provide an improved pneumatically-controlled lamp switching device for use in photography, said device providing different degrees of illumination as required before and during the exposure of the photographic plate or negative, whereby the effects of glare are minimized, lamp economy is obtained, and efficient control of lighting conditions by the photographer is achieved.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a top plan view of a photographic lamp control device constructed in accordance with the present invention.

Figure 2 is a cross-sectional view taken on line 2-2 of Figure 1.

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

Figure 4 is a schematic wiring diagram illustrating the basic electrical connections of the lamp control device of Figure 1.

Figure 5 is a schematic wiring diagram illustrating a modification of the wiring arrangement of the device of Figure 1.

Figure 6 is a diagram similar to Figure 5, but illustrating the use of various lamp combinations in each of the circuits controlled by the device of the present invention.

Referring to the drawings, 11 designates a housing of generally rectangular shape, although other desired shapes may be employed within the spirit of the invention. Mounted in one end wall of housing 11 is a conventional socket 12 of the male type, and engaged therewith is a conventional female plug 13 connected to a line cord 14. Secured in the other walls of housing 11 are respective double female sockets 15, 16 and 17. One terminal of socket 12, indicated at 18 is connected by a wire 19 to one terminal of socket 15. The other terminal of socket 15 is connected by a wire 20 to one terminal of socket 16. The other

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terminal of socket 16 is connected by a wire 21 to one terminal of socket 17. The remaining terminal of socket 17 is connected by a wire 22 to the remaining terminal, indicated at 23, of socket 12.

Designated generally at 24 is a single-throw double-pole pneumatic switch, which comprises a cylindrical housing 25 having a flexible diaphragm 26 as its bottom wall and connected by a fitting 27 secured to its top wall to a flexible hose 28 having connected to its end a rubber bulb 29. Switch housing 25 is secured within housing 11 by the fitting 27 which passes through the top wall 31 of housing 11 and is secured thereto by a nut 30. Secured to the top wall 31 of housing 11 by fitting 27 is an inverted U-shaped bracket member 32 which is interposed between switch housing 25 and said top wall 31 and has the vertical depending arms 33 and 34.

Secured to arm 34 is a bracket element 35 formed with a bottom inwardly facing channel portion 36 having an inwardly projecting bottom arm 37. The lower end of arm 34 is formed with a notch 38 through which arm 37 projects.

Loosely received in channel portion 36 and in notch 38 is one end of an armature 39. Transversely secured to armature 39 is an insulating bar 40 and bearing upwardly against bar 40 is the free end of a leaf spring 41 secured at its other end to the upper portion of bracket element 35, whereby armature 39 is biased upwardly. Armature 39 is notched at each side at its intermediate portion, and is straddled at said notched intermediate portion by the lower centrally-notched portion of a vertical plate member 42.

A disc member 43 is rigidly secured at its under side to the top end of vertical plate member 42 and bears against diaphragm 26. Disc 43 is movably positioned in a cylindrical cavity defined by an annular block 44 secured to housing 24 below diaphragm 26. Block 44 carries at its lower surface an annular stop disc 45, which limits downward movement of disc 43. Instead of employing disc 45 a suitable stop arm may be secured to bracket arm 33, said stop arm being arranged to underly the movable end of armature 39 so as to limit downward movement thereof. Designated at 42' is an adjustment screw threaded through armature 39 and engageable with the bottom edge of plate member 42. Screw 42' is provided with a locknut 46. By means of screw 42' the plate member 42 may be elevated to a desired position of adjustment with respect to armature 39. When bulb 29 is compressed, diaphragm 26 will be flexed downwardly causing

armature 39 to be pivoted downwardly against the biasing force of spring 41.

Secured to the ends of bar 40 are respective switch arms 47 and 48. Secured to bracket arm 33 is an insulating plate member 49 carrying stationary contact strips 50 and 51 engageable by the respective switch arms 47 and 48 responsive to downward movement of armature 39, as above described. Contact strip 50 is connected by a wire 52 to wire 19 and contact strip 51 is connected by a wire 53 to wire 22. Switch arm 47 is connected by a wire 54 to wire 21 and switch arm 48 is connected by a wire 55 to wire 20. Mounted in the top wall 31 of housing 11 is a single-pole single-throw switch 56.

To facilitate discussion of the apparatus, an initial arrangement is illustrated in which the terminals of switch 56 are connected to the respective switch arms 47 and 48, as shown in Figure 4. Normally, with all switch contacts open, the respective double sockets 15, 16 and 17 are connected in series to the line wires 19 and 22, as shown in Figure 4, whereby the lamps connected to said double sockets, shown at 57 in Figure 4, glow at uniform dimness.

With the parts in normal positions, as shown in Figure 4, if bulb 29 is compressed, switch arms 47 and 48 engage the respective contact strips 50 and 51. This connects wire 54 to wire 52 and wire 55 to wire 53. All of the double sockets 15, 16 and 17, are thus connected in parallel to the line wires 19 and 22, and the lamps glow with uniform maximum brilliance.

Should it be desired to accomplish uniform dim-bright illumination control employing only the lamps in double sockets 15 and 17 as shown in Figure 4, the lamps in double socket 16 being removed, switch 56 can be closed to shunt double socket 16, thereby connecting double sockets 15 and 17 in series with the line wires 19 and 22, and causing the lamps in double sockets 15 and 17 to glow at uniform dimness. Here an undesirable condition arises however, in that if bulb 29 is compressed before switch 56 is opened, short-circuiting of the line wires will occur. To avoid this undesirable arrangement, to avoid the possibility of a short circuit, and to conveniently permit the desirable versatility arising from the option of using either three or two double sockets to accomplish uniform dim-bright illumination control over a greater number of lighting combinations, extra stationary contacts may be provided, as shown at 58 and 59 in Figure 5, said contacts being carried by the insulating plate 49 above the respective contact elements 50 and 51, the switch arms 47 and 48 being normally in respective contact therewith. To these extra contacts the terminals of switch 56 are preferably connected in lieu of switch arms 47 and 48. Under these conditions, when bulb 29 is compressed, the switch arms 47 and 48 will move downwardly out of engagement with contacts 58 and 59 and into engagement with contacts 50 and 51, changing all three double sockets 15, 16 and 17, from series energization to parallel energization with switch 56 open, or changing sockets 15 and 17 (socket 16 being ignored on the assumption that it is not required) from series energization to parallel energization with switch 56 closed. This is all accomplished with no risk of short-circuiting the line wires even if either of switch arms 47 or 48 should fail to operate. Nor will a short circuit occur if switch 56 is accidentally not in the desired position.

Figure 6 illustrates an arrangement generally

similar to Figure 5, except that parallel lamp circuits 15', 16' and 17' are connected in place of the double sockets 15, 16 and 17 of the arrangement of Figure 5. The large circles represent bulbs of twice the wattage of those represented by the smaller circles. Said parallel lamp circuits may contain various balanced arrangements of conventional lamps to provide different degrees of illumination with uniform dim-bright control. Particularly diagrammed in Figure 6 are nine uniform dim-bright lighting combinations possible with conventional "No. 1" and "No. 2" photoflood lamps, each of which combinations can be safely carried by the average 15 ampere house circuit. The first four lighting arrangements in Figure 6 are accomplished with switch 56 closed and using only the sockets connected to the lamp circuits 15' and 17' (corresponding to the double sockets 15 and 17 in Figure 5). As explained above in connection with Figure 5, switch arms 47 and 48 will normally be in contact with the respective upper contact elements 58 and 59. In this position, with switch 56 closed, branch 16' is shunted out of the circuit, creating a series arrangement of branches 15' and 17'. Thus uniform dimming is accomplished.

When bulb 29 is compressed, switch arms 47 and 48 move away from their normal contact with the respective upper contact elements 58 and 59, breaking the series arrangement, and move into engagement with respective contact elements 50 and 51, causing the branch circuits 15' and 17' to be connected in parallel to the line wires 19 and 22, and providing uniform maximum illumination.

The other five lighting arrangements in Figure 6 are accomplished with switch 56 open using lamp circuits 15', 16' and 17'. Under normal conditions, with switch 56 open, circuits 15', 16' and 17' will be connected in series with the line wires 19 and 22, the lamps thus burning at uniform dimness. When the bulb 29 is compressed, switch arms 47 and 48 move into engagement with respective contact elements 50 and 51, causing the branch circuits 15', 16' and 17' to be connected in parallel to the line wires 19 and 22 and providing uniform maximum illumination.

Any combination of commercially available types of lamps which can be arranged in the proper balanced grouping of twos or threes may be employed with the means above described to obtain uniform dim-bright illumination control, and the number and size of the lamps employed will be limited only by the maximum current rating of the line wires and other conductors employed in the system.

While certain specific embodiments of an illumination control means for photography have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the claims appended herewith.

What is claimed is:

1. A photographic illumination system comprising a first, a second and a third outlet socket, a two wire power line having one wire permanently connected to one side of said first socket and its other wire permanently connected to one side of said third socket, conductor means permanently connecting the other side of said first socket to one side of said second socket and conductor means permanently connecting the other

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side of said third socket to the other side of said second socket to permanently connect said first, second and third sockets in series with said line wires, and manually operated means for temporarily connecting said outlet sockets in parallel to said line wires comprising a double pole switch, conductor means connecting one side of said switch between said one line wire and the conductor means between said third and said second outlet sockets, and conductor means connecting the other side of said switch between said other line wire and the conductor means between said first outlet socket.

2. A photographic illumination system comprising a first, a second and a third outlet socket, a two wire power line having one wire permanently connected to one side of said first socket and its other wire permanently connected to one side of said third socket, conductor means permanently connecting the other side of said first socket to one side of said second socket, conductor means permanently connecting the other side of said third socket to the other side of said second socket to permanently connect said first, second and third sockets in series with said line wires, manually operated means for temporarily connecting said outlet sockets in parallel with said line wires comprising a double pole switch, means connecting one side of said switch between said one line wire and the conductor means between said third and said second outlet sockets, and means connecting the other side of said switch between said other line wire and the conductor means between said first outlet socket and said second outlet socket, and a second manually operated switch connected between the two sides of said second outlet socket whereby, with said second switch closed, said first and said third outlet sockets can be energized without energizing said second outlet socket.

3. A photographic illumination system comprising a first, a second and a third outlet socket, a two wire power line having one wire permanently connected to one side of said first socket and its other wire permanently connected to one side of said third socket, conductor means permanently connecting the other side of said first

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socket to one side of said second socket, conductor means permanently connecting the other side of said third socket to the other side of said second socket to permanently connect said first, second and third sockets in series with said line wires, manually operated means for temporarily connecting said outlet sockets in parallel to said line wires comprising a switch having two opposed pair of contacts, a pair of switch arms, means resiliently holding said switch arms in electrically conductive engagement with respective contacts of one of said opposed pair of contacts, manually operated means connected to said switch arms for moving said switch arms away from said one pair of contacts and into electrically conductive engagement with respective contacts of the other pair of contacts, means connecting one contact of said other pair with said one line wire and the respective switch arm to the conductor means between said third and second outlet sockets, means connecting the other contact of said other pair of contacts to said other line wire and the respective switch arm to the conductor means between said first and second outlet sockets for connecting each of said outlet sockets directly between said line wires when said switch arms are manually closed with said other pair of contacts, and a manually operated switch connected between the two contacts of said one pair of contacts and operative when closed to establish a shunt circuit around said second outlet socket.

BENJAMIN C. ANDERSON.

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Certificate of Correction

Patent No. 2,486,727

November 1, 1949

BENJAMIN C. ANDERSON

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 5, line 13, after the word "socket" and before the period insert *and said second outlet socket*;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 21st day of February, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.

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