

Aug. 5, 1958

F. GÜNTHER ET AL
OPERATING TABLE LAMP

2,846,566

Filed Oct. 12, 1954

4 Sheets-Sheet 1

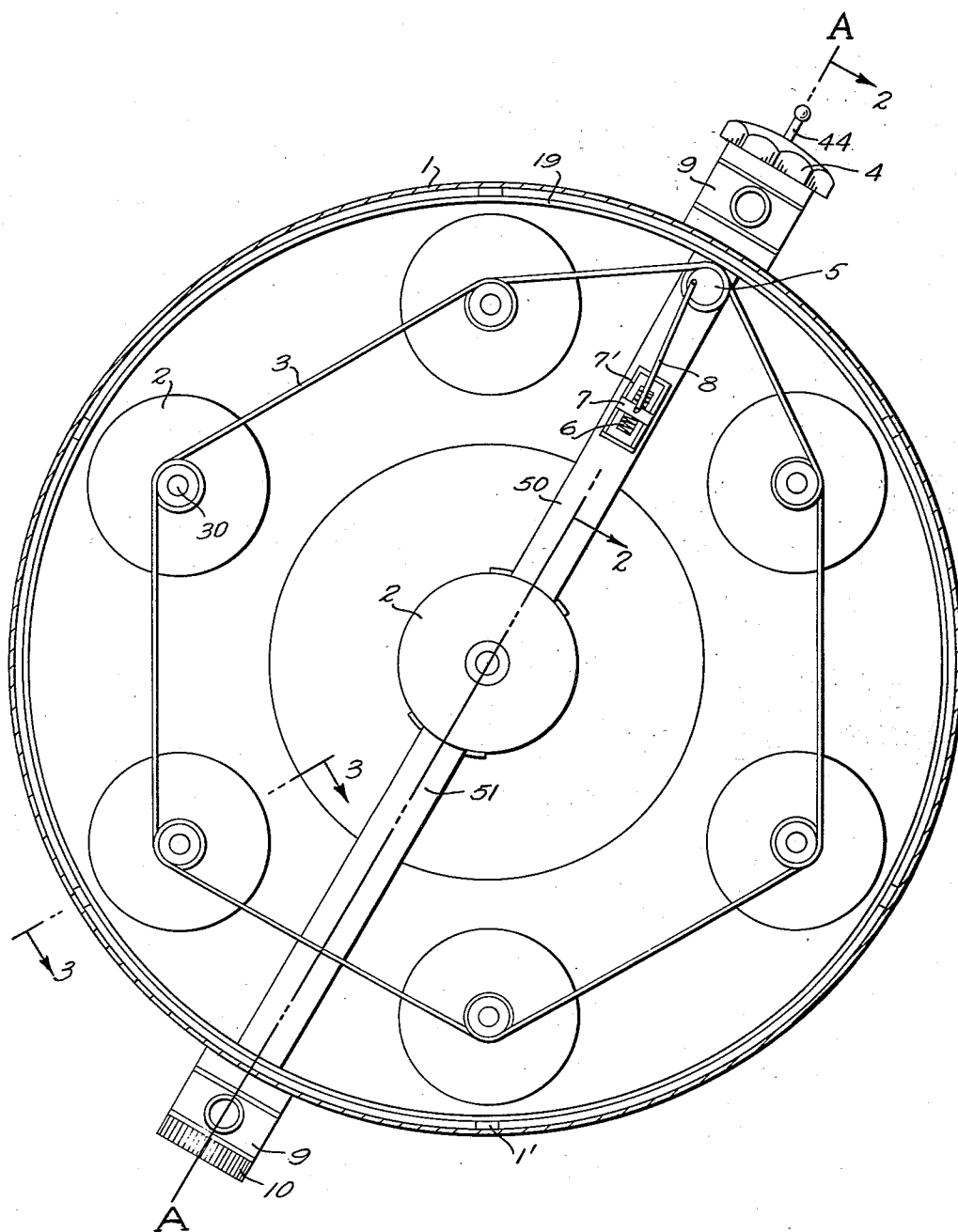


FIG. 1.

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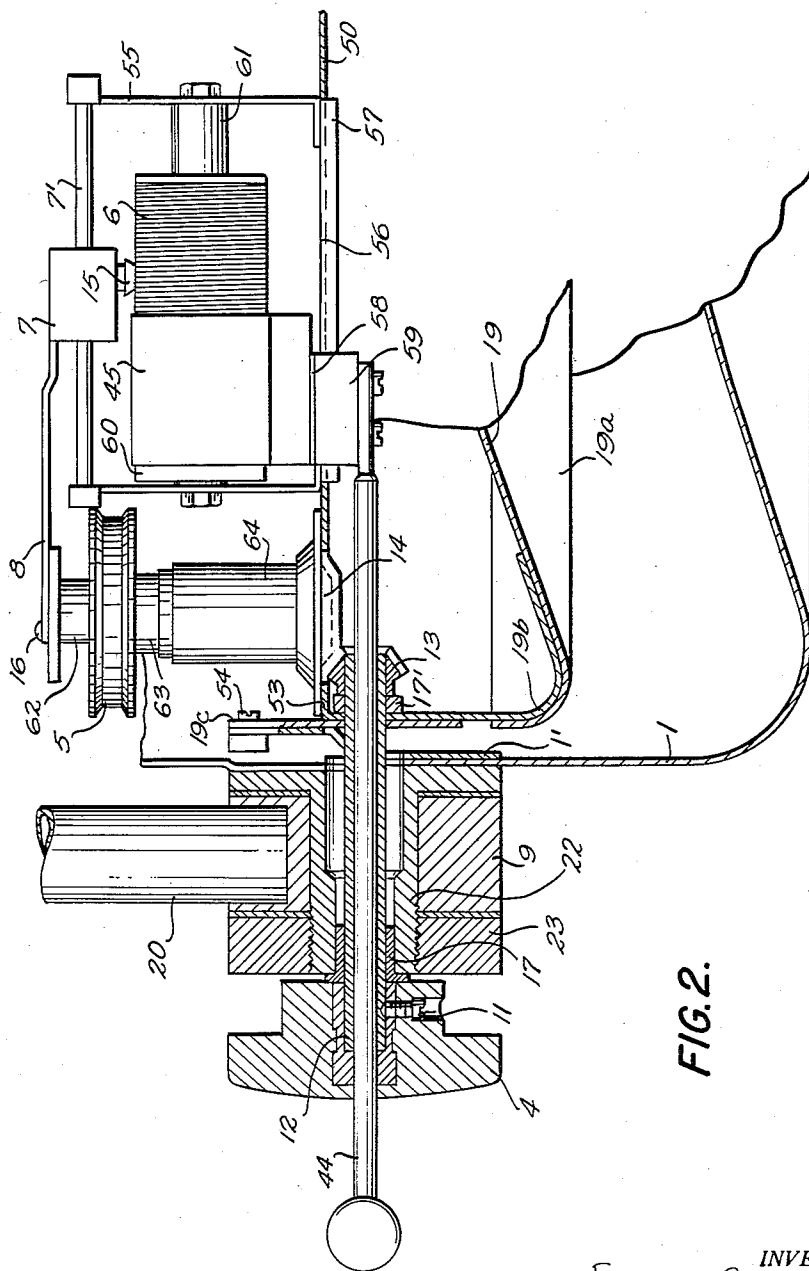
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

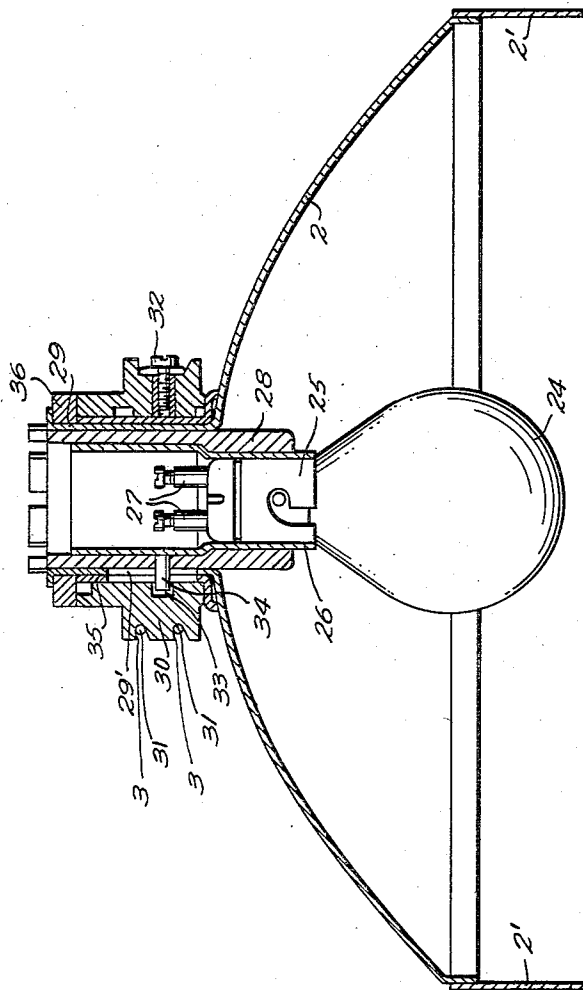


FIG. 3.

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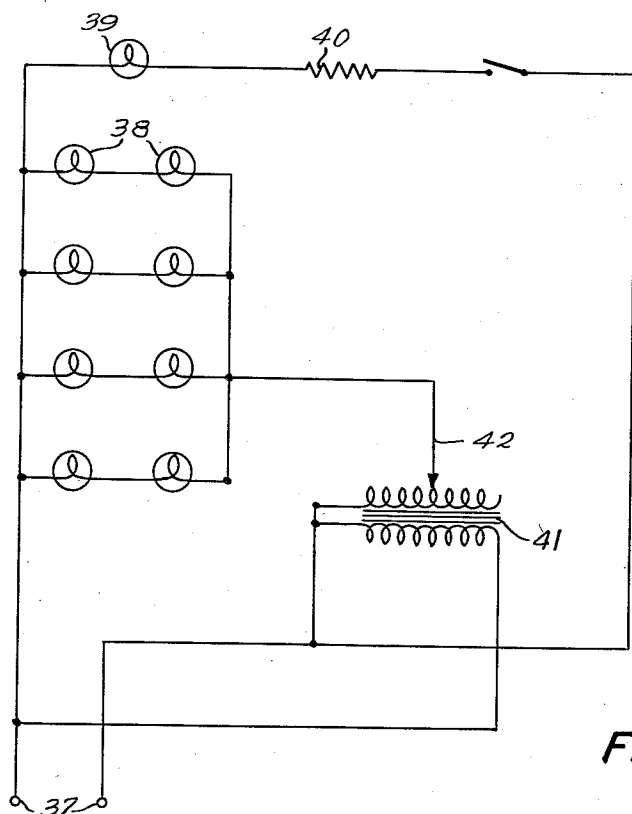


FIG. 4.

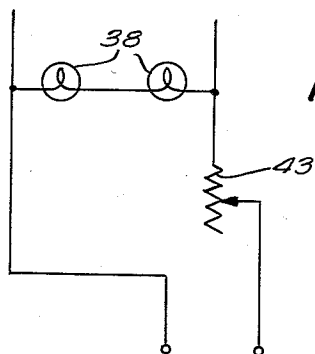


FIG. 5.

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OPERATING TABLE LAMP

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Application October 12, 1954, Serial No. 461,834

Claims priority, application Germany October 14, 1953

14 Claims. (Cl. 240—1.4)

The present invention relates to illuminating devices and in particular to illuminating devices of the type used, for example, to illuminate an operating table.

With such devices it is possible to regulate the size of the field which is illuminated by the device. However, inasmuch as the voltage applied to the lamps of the illuminating device remains constant while the size of the illuminating area changes, it is evident that a relatively bright light will be provided for relatively small illuminated areas and a relatively dim light will be provided for relatively large illuminated areas. This effect is particularly undesirable in illuminating devices used with operating tables since it is of the utmost importance that the surgeon have a vision which is not affected by the glare from a light which is too bright or by a lack of sufficient illumination.

One of the objects of the present invention is to overcome the above drawbacks by providing an illuminating device which is capable of maintaining a substantially constant light intensity at the area illuminated by the device irrespective of changes in the size of this area.

A further object of the present invention is to provide an arrangement which automatically regulates the voltage applied to the lamps of an illuminating device in such a way as to maintain a constant light intensity in illuminated areas of different sizes.

Another object of the present invention is to provide a voltage variation of the above type which is stepless so that the voltage may be regulated in accordance with even small changes in the size of the illuminated area.

An additional object of the present invention is to provide structure capable of accomplishing the above objects and at the same time being made up of simple and ruggedly constructed parts which are very reliable in operation.

With the above objects in view the present invention mainly consists of an illuminating device which includes a reflector means for reflecting light in a given direction. A lamp carrying means is carried by the reflector means for movement in one direction with respect to the reflector means for increasing the area illuminated by the device and in an opposite direction with respect to the reflector means for decreasing the illuminated area. An electrical circuit includes the lamp carrying means for energizing the same, and this electrical circuit also includes a voltage varying means for varying the voltage applied to the lamp carrying means. A moving means is operatively connected to the lamp carrying means for moving the same in both of said directions and to the voltage varying means for actuating the latter to increase the voltage applied to the lamp carrying means when the moving means moves the lamp carrying means in the direction which increases the illuminated area and for decreasing the voltage applied to the lamp carrying means when the moving means moves the lamp carrying means with respect to the reflector

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means in that direction which decreases the size of the illuminated area.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantage thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a partly sectional schematic top plan view of an illuminating device constructed in accordance with the present invention;

Fig. 2 is a fragmentary, sectional view taken along the line 2—2 of Fig. 1 in the direction of the arrows and shows the actual details of the structure on an enlarged scale with respect to Fig. 1;

Fig. 3 is a sectional, elevational view taken along the line 3—3 of Fig. 1 in the direction of the arrows and showing the details of one of the lamps of the invention on an enlarged scale as compared to Fig. 1;

Fig. 4 is a wiring diagram illustrating the electrical connections to the lamps; and

Fig. 5 is a fragmentary wiring diagram illustrating the wiring of the lamp arrangement of Figs. 1—3.

Referring now to the drawings, it will be seen from Fig. 1 that the illuminating device of the invention includes an outer housing 1 which has a relatively small height as compared to its diameter, this housing 1 having, of course, a transparent bottom wall through which the light is directed. Members 1' fixed to and distributed about the inner face of housing 1 are also fixed to an intermediate carrying member 19 which carries the reflectors 2. The carrying member 19 is formed with openings aligned with the reflectors 2 so that the light may be directed by reflectors 2 through these openings in member 19 and through the outer housing 1. As is shown in Fig. 3, each of the reflectors is fixed at its bottom periphery to a pair of substantially rigid members 2' which extend downwardly from each reflector 2 to the top face of member 19 and which are fixed to the latter member so that in this way the reflectors 2 are mounted on the member 19, the members 2' being fragmentarily shown in Fig. 3.

As is apparent from Fig. 1, all except one of the reflectors 2 are arranged along a circle whose center coincides with that of the housing 1, and one of the reflectors 2 is located directly at the center of the housing 1. An elongated strip 50 is located above the member 19, extends to the central reflector 2, to which the strip 50 is fastened, and the opposite end of the strip 50 is carried by member 19 in the manner shown in Fig. 2, this strip 50 being of a fairly rigid material and serving to carry various elements. A similar strip 51 extends in the opposite direction from the central reflector 2 and is also carried by the member 19 in the manner shown in Fig. 2. Thus, referring to Fig. 2 it will be seen that the member 19 includes a bottom portion 19a, an annular member 19b fixed to the periphery of bottom portion 19a and extending upwardly therefrom, the strip 50 being joined at 53 as by welding or the like to the top periphery of member 19b. The member 19 further includes an annular member 19c connected by screw members 54 to the members 1' which are in turn fixed to the inner face of the housing 1.

As is shown diagrammatically in Fig. 1, each of the reflectors 2 carries a sleeve 30 which is turnable on the reflector, and each sleeve 30 is connected to a lamp carrier, in a manner described below, in such a way that rotation of sleeve 30 shifts the lamp carrier associated therewith along the axis of the reflector 2. An elongated wire 3 is wound about the sleeves 30 and passes from

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one sleeve 30 to the next sleeve 30 in the manner shown in Fig. 1, this wire 3 also passing about a pulley 5 turnably carried by the strip 50 in a manner described below. Thus, turning of pulley 5 about its axis will move the wire 3 to turn all of the sleeves 30 through the same angle so as to shift the lamps respectively along the axes of the reflector. The pulley 5 is rotated by manual rotation of knob 4, in a manner described below. A rod 8 is eccentrically connected at one end to the pulley 5 and its opposite end to a slide member 7 which carries an electrical contact engaging an electrical resistance 6. The slide member 7 is slidable between guides 7' carried by the strip 50.

The resistance 6 and the electrical contact carried by member 7 are located in the same circuit as the lamp carries carried by the reflectors 2, and the arrangement is such that when these lamp carriers are moved in that direction which increases the area illuminated by the device the voltage applied to the lamps also is increased so that the illuminated area does not become dim even though it is increased in size, and in the same way when the size of the illuminated area is decreased by rotation of the knob 4 the rod 8 shifts the slide member 7 so as to shift the contact member carried thereby along the resistor 6 in such a way as to decrease the voltage applied to the lamps, and thus the light will not become undesirably bright and glaring when the size of the illuminated area is decreased.

Pins which are described below are fixed to the housing 1 and extend therefrom through bearing rings 9 which are fixed to stationary supports in a manner also described below, so that the entire illuminating device is turnable about the axis A—A of the bearings 9. A knob 10 is fixed to the pin which extends through the left bearing 9 of Fig. 1 so that by turning knob 10 the entire device may be tilted about axis A—A to direct the light to a desired location. An extension 44 is shown in Fig. 1 and is described below, this extension 44 serving to remove resistor 6 from the circuit when desired.

Referring now to Fig. 2 it will be seen that the guides 7' for the member 7 form part of a frame 55 which is fixed to the top face of the strip 50, this strip 50 being formed with a cutout 56, as by having a portion 57 of strip 50 struck downwardly. A carriage 58 is slidable on strip 50 within the frame 55 and includes a depending portion 59 extending through the cutout 56 so that the carriage 58 is shiftable along the strip 50. A clamp 45 is fixed to the carriage 58 for shifting movement therewith and this clamp 45 is clamped to a sleeve 60 on which the resistor 6 is wound, the clamp 45 being insulated from resistor 6 in any known way. A bar 61 is fixed to opposite ends of the frame 55 and extends through the sleeve 60 to guide the latter. The frame 55 is provided with H-shaped members at its opposite ends so that this frame 55 is located on opposite sides of the cutout 56 and has a transverse portion to which the bar 61 is connected.

Fig. 2 clearly shows the electrical contact 15 which is located in the electrical circuit in a manner described below, and the slide member 7 in addition to being connected to the contact 15 is connected to the rod 8 which is in turn connected pivotally at 16 to a member 62 fixed eccentrically to the top face of pulley 5, as viewed in Fig. 2. The pulley 5 is fixed at its bottom face to a cylindrical member 63 which is coaxial with pulley 5 and which extends therefrom slidable through a sleeve 64 which is fixed to the strip 50 and which covers an opening formed in the strip 50. A bevel gear 14 is fixed to cylindrical member 63 and extends through this latter opening into mesh with a bevel gear 13 which is fixed to a tubular member 12. This tubular member 12 is fixed at its outer end to the knob 4 by a set screw 11, so that in this way turning of the knob 4 turns the tubular member 12 about its axis to rotate the gears 13 and 14 and thus turn the pulley 5 which forms a crank means for the

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rod 8 to shift the latter and thereby shift elements 7 and 15 so that elements 6 and 15 serve as a variable resistor to vary the voltage applied to the lamps.

Fig. 2 shows a pin 22 fixed to the outer face of housing 1 and extending through the bearing ring 9 which is the right bearing ring of Fig. 1. It will be seen that the pin 22 is tubular so that the tube 12 passes freely through the pin 22 as well as through a cutout in the housing 1, the member 1' shown in Fig. 2, and the member 19. A tubular member 20 is fixed to and extends from the bearing ring 9, this member 20 being, for example, bifurcated at its end not shown in Fig. 2 to facilitate fixing of member 20 to a stationary support. Furthermore, the pin 22 is threaded at its outer end and receives a nut 23 which clamps the entire device to the bearing ring 9 in a predetermined angular position about the axis A—A of Fig. 1. The pin which extends through the left ring 9 of Fig. 1 may be solid and is fixed to the knob 10 so that when the nut 23 is loosened knob 10 may be turned to turn the entire device about axis A—A, after which the nut 23 may again be tightened to maintain the device in its adjusted position.

As is shown in Fig. 2, a rod 44 extends slidably through the knob 4 and tube 12 and is connected at one end to the carriage 59. Thus, by manually shifting rod 44 to the right, as viewed in Fig. 2, it is possible to locate contact 15 on the clamp 45 which is insulated from the resistor 6, and in this way the resistor may be eliminated from the circuit so that the illuminating device of the invention may be operated in a conventional manner, if desired.

As is shown in Fig. 2, the pin 22 carries a bearing 17 for the tubular member 12, and another bearing 17' therefor is fixed to the inner face of member 19.

Referring now to Fig. 3, it will be seen that each reflector 2 is provided with a tubular portion 29 extending along the reflector axis, and this tubular portion 29 is provided with an elongated cutout 29' substantially parallel to the axis of the reflector. A bulb 24 is removably connected through a bayonet connection to a socket 25 provided with terminals 27 to receive the electrical leads of the electrical circuit. The socket 25 is fixed within a tubular insulating member 26 which is in turn fixed within a tubular member 28 which slides within the tubular portion 29 of the reflector 2. Parts 25—28 form a lamp carrier which is movable in the tubular portion 29 along the axis of the reflector, as shown in Fig. 3. A pin 34 is fixed to the tubular member 28 and extends through the cutout 29' of the tubular portion 29.

The details of one of the sleeves 30 is shown in Fig. 3, and it will be seen that the sleeve 30 is turnably carried by a tubular member 35 located at the exterior of tubular member 29, the tubular member 35 being formed with an elongated cutout aligned with cutout 29'. The sleeve 30 is formed at its inner face with a helical groove 33 into which pin 34 extends, this pin 34 also extending through the cutouts of tubular portion 29 and member 35. A ring 36 is fixed to the exterior of tubular portion 29 and engages the sleeve 30 to prevent axial shifting of the latter. Thus, when the sleeve 30 is turned the pin 34 will be forced by the helical groove 33 to move along the cutout 29' as well as the aligned cutout of member 35, and in this way the lamp carrier 25—28 is shifted along the axis of the reflector 2. The outer face of sleeve 30 is formed with a pair of parallel annular grooves 31 which are interconnected at a portion of the periphery of sleeve 30 by an axially extending groove, and a screw 32 is threadedly connected to the sleeve 30 and is located at this axially extending groove which communicates with both grooves 31. Thus, the wire coming from a sleeve 30 to the right of that shown in Fig. 3, for example, is located in the top groove 31 and passes therefrom through the axially extending groove where screw 32 is located to the bottom groove 31 and from this bottom groove to the sleeve 30 located to the left of that of Fig. 3. The

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screw 32 serves to clamp the wire 3 to the sleeve 30 at the places where it passes from one groove 31 to the other groove 31. In this way the wire 3 passes from one sleeve 30 to the next and is also wound about the pulley 5 in the manner discussed above so that upon turning of the knob 4 the lamp carriers will be shifted respectively along the reflector axes to move the bulbs 24 respectively carried thereby along the reflector axes and in this way increase or decrease the size of the area illuminated by the device of the invention, the contact 15 moving along the resistor 6 simultaneously to vary the voltage applied to the lamps in direct proportion to the size of the illuminated area.

Thus, with the arrangement of the invention it is possible to provide a substantially constant light intensity at the area illuminated by the device of the invention irrespective of the size of this area, since in order to do this it is only necessary to properly correlate the movement of contact 15 along resistor 6 with the location of the lamps. Instead of this type of stepless arrangement, it is also possible to provide a step by step change in the voltage applied to the lamps, although with such an arrangement the constancy of the light intensity will not be as great. However, it has been found in practice that if the light intensity varies within the range of 30% from an average light intensity satisfactory results are produced. Furthermore, variations in the light intensity at relatively small areas of illumination may not be considered undesirable under certain circumstances so that the resistor 6 may be located in such a position as to provide a substantially constant light intensity only with relatively large areas of illumination, if desired.

Instead of a variable resistor it is possible to use a transformer for varying the voltage of the lamps, and such an arrangement is shown in the wiring diagram of Fig. 4 where the terminals 37 are connected to the lines. Where the source of current is 220 v. the lamps 38, which correspond to the lamps used in the device of the invention, may be arranged as indicated in Fig. 4, these lamps being 110 v. lamps, so that the best possible use is made of the current. Thus, pairs of series arranged lamps 38 are arranged in parallel, and a contact 42 is associated with a transformer 41 for varying the voltage supplied to these lamps. The contact 42 may of course be shifted in the same way as the contact 15 described above. Where an odd number of lamps are required, then an additional 110 v. lamp 39 may be connected in series with a proper resistance 40 so that the proper amount of current is supplied to the lamp 39. This lamp 39 corresponds to the central lamp of Fig. 1, and it is pointed out that this central lamp is never shifted with respect to its reflector and does not have its voltage changed.

Fig. 5 fragmentarily shows how a variable resistor 43, corresponding to the variable resistor 6, 15, is connected into the circuit of Fig. 4.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of illuminating devices differing from the types described above.

While the invention has been illustrated and described as embodied in automatically regulable illuminating devices, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are

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intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a voltage varying means for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both of said directions and to said voltage varying means for actuating the latter to increase the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said one direction with respect to said reflector means and to decrease the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said opposite direction with respect to said reflector means.

2. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a voltage varying means for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both directions and to said voltage varying means for actuating the latter to vary the voltage applied to said lamp carrying means in direct proportion to the size of the illuminated area and at a rate which maintains a substantially constant light intensity at the illuminated area irrespective of the total size of the area.

3. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a voltage varying means for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both directions and to said voltage varying means for actuating the latter to vary the voltage applied to said lamp carrying means in direct proportion to the size of the illuminated area and at a rate which maintains the light intensity at the illuminated area, irrespective of the total size of the illuminated area, within a range which does not vary by more than 30% from an average light intensity.

4. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a variable resistor for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both of said directions and to said variable resistor for actuat-

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ing the latter to increase the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said one direction with respect to said reflector means and to decrease the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said opposite direction with respect to said reflector means.

5. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a transformer for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both of said directions and to said transformer for actuating the latter to increase the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said one direction with respect to said reflector means and to decrease the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said opposite direction with respect to said reflector means.

6. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; a plurality of lamp carriers carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carriers for energizing the same, said electrical circuit including a single voltage varying means for varying the voltage applied to all of said lamp carriers; and moving means operatively connected to said lamp carriers for moving the same in both of said directions and to said voltage varying means for actuating the latter to increase the voltage applied to said lamp carriers when said moving means moves said lamp carriers in said one direction with respect to said reflector means and to decrease the voltage applied to said lamp carriers when said moving means moves said lamp carriers in said opposite direction with respect to said reflector means.

7. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a voltage varying means for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both of said directions and to said voltage varying means for actuating the latter to increase the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said one direction with respect to said reflector means and to decrease the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said opposite direction with respect to said reflector means, said moving means including a manually operable member located at the exterior of said reflector means for manual actuation of said moving means to simultaneously move said lamp carriers and vary the voltage applied thereto.

8. An illuminating device comprising, in combination, reflector means for reflecting light in a given direction; lamp carrying means carried by said reflector means for movement in one direction with respect to said reflector

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means to increase the area illuminated by the device and in an opposite direction with respect to said reflector means to decrease the illuminated area; an electrical circuit including said lamp carrying means for energizing the same, said electrical circuit including a voltage varying means for varying the voltage applied to said lamp carrying means; and moving means operatively connected to said lamp carrying means for moving the same in both of said directions and to said voltage varying means for actuating the latter to increase the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said one direction with respect to said reflector means and to decrease the voltage applied to said lamp carrying means when said moving means moves said lamp carrying means in said opposite direction with respect to said reflector means, said moving means including a manually operable member located at the exterior of said reflector means for manual actuation of said moving means and an elongated wire operatively connected on the one hand to said manually operable member and on the other hand to said lamp carrying means and voltage varying means to simultaneously move said lamp carrying means and vary the voltage applied thereto upon movement of said manually operable member.

9. In an illuminating device, in combination, a reflector; a lamp carrier carried by said reflector for movement along the axis thereof; an electrical circuit including said lamp carrier and including a resistor and a contact movable along said resistor and included in said electrical circuit for varying the voltage applied to said lamp carrier; and moving means connected to said lamp carrier and contact for simultaneously moving said lamp carrier along said axis and said contact along said resistor.

10. In an illuminating device, in combination, support means; a reflector carried by said support means and having at its center a tubular portion formed with a cutout extending along said tubular portion; a lamp carrier shiftable in said tubular portion of said reflector; a pin fixed to said lamp carrier and extending through said cutout of said tubular portion; a sleeve turnably located on said tubular member at the exterior thereof and having an inner face formed with a helical groove into which said pin extends so that turning of said sleeve on said tubular portion of said reflector shifts said lamp carrier along the axis of said reflector; crank means carried by said support means for turning movement thereon; transmission means interconnecting said crank means and sleeve for turning the latter when said crank means turns; an electrical circuit including said lamp carrier, a resistor carried by said support means and an electrical contact carried by said support means for movement along said resistor; and second transmission means interconnecting said crank means with said contact for shifting the latter along said resistor upon turning of said crank means, whereby the voltage to a lamp carried by said lamp carrier will be varied simultaneously with the movement of the lamp along the axis of the reflector.

11. In an illuminating device, in combination, support means; a reflector carried by said support means and having at its center a tubular portion formed with a cutout extending along said tubular portion; a lamp carrier shiftable in said tubular portion of said reflector; a pin fixed to said lamp carrier and extending through said cutout of said tubular portion; a sleeve turnably located on said tubular member at the exterior thereof and having an inner face formed with a helical groove into which said pin extends so that turning of said sleeve on said tubular portion of said reflector shifts said lamp carrier along the axis of said reflector; a pulley mounted for turning movement about its axis on said support means; a wire wound about said sleeve and pulley for turning said sleeve when said pulley turns so that turn-

ing of said pulley causes movement of said lamp carrier along the reflector axis; an electrical circuit including said lamp carrier, a resistor carried by said support means, and an electrical contact carried by said support means for movement along said resistor; and a rod 5 connected eccentrically to said pulley and also connected to said contact for shifting the latter along said resistor when said pulley turns so as to vary voltage of a lamp carried by said lamp carrier simultaneously with movement of the lamp along the reflector axis.

12. In an illuminating device, in combination, support means; a reflector carried by said support means and having at its center a tubular portion formed with a cut-out extending along said tubular portion; a lamp carrier shiftable in said tubular portion of said reflector; a pin fixed to said lamp carrier and extending through said cutout of said tubular portion; a sleeve turnably located on said tubular member at the exterior thereof and having an inner face formed with a helical groove into which said pin extends so that turning of said sleeve on said tubular portion of said reflector shifts said lamp carrier along the axis of said reflector; a pulley mounted for turning movement about its axis on said support means; a wire wound about said sleeve and pulley for turning said sleeve when said pulley turns so that turning of said pulley causes movement of said lamp carrier along the reflector axis; an electrical circuit including said lamp carrier, a resistor carried by said support means, and an electrical contact carried by said support means for movement along said resistor; a rod connected eccentrically to said pulley and also connected to said contact for shifting the latter along said resistor when said pulley turns so as to vary voltage of a lamp carried by said lamp carrier simultaneously with movement of the lamp along the reflector axis; and a knob turnably carried by said support means and operatively connected to said pulley for turning the latter so that said knob may be manually operated to regulate the position of a lamp carried by said lamp carrier with respect to said reflector and to simultaneously regulate the voltage applied to the lamp.

13. In an arrangement of the character described, in combination, a lighting device including a lamp carrier and a reflector therefor, said lamp carrier and reflector

being mounted for movement relative to each other between different positions wherein said light device illuminates areas of different sizes, respectively; variable voltage supply means connected to said lamp carrier and being movable between different positions wherein different voltages are supplied to said lamp carrier so that the light output of the latter depends upon the position of said variable voltage supply means; and means operatively associated with both said lighting device and said variable voltage supply means for simultaneously moving both between their respective positions in such a manner that irrespective of the size of the area being illuminated by said lighting device the light intensity with which such area is being illuminated is substantially the same.

14. In an arrangement of the character described, in combination, a lighting device including a lamp carrier and a reflector therefor, said lamp carrier and reflector being mounted for movement relative to each other between different positions wherein said lighting device illuminates areas of different sizes, respectively; variable voltage supply means connected to said lamp carrier and being movable between different positions wherein different voltages are supplied to said lamp carrier so that the light output of the latter depends upon the position of said variable voltage supply means; and means operatively associated with both said lighting device and said variable voltage supply means for simultaneously moving both between their respective positions in such a manner that irrespective of the size of the area being illuminated by said lighting device the light intensity with which such area is being illuminated lies within a range which does not vary by more than 30% from an average light intensity.

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