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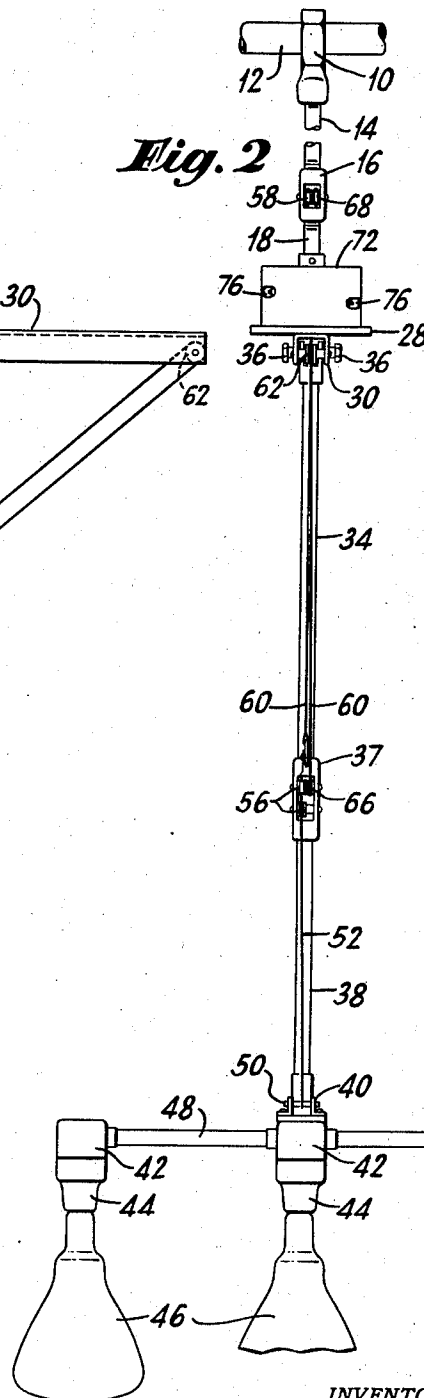
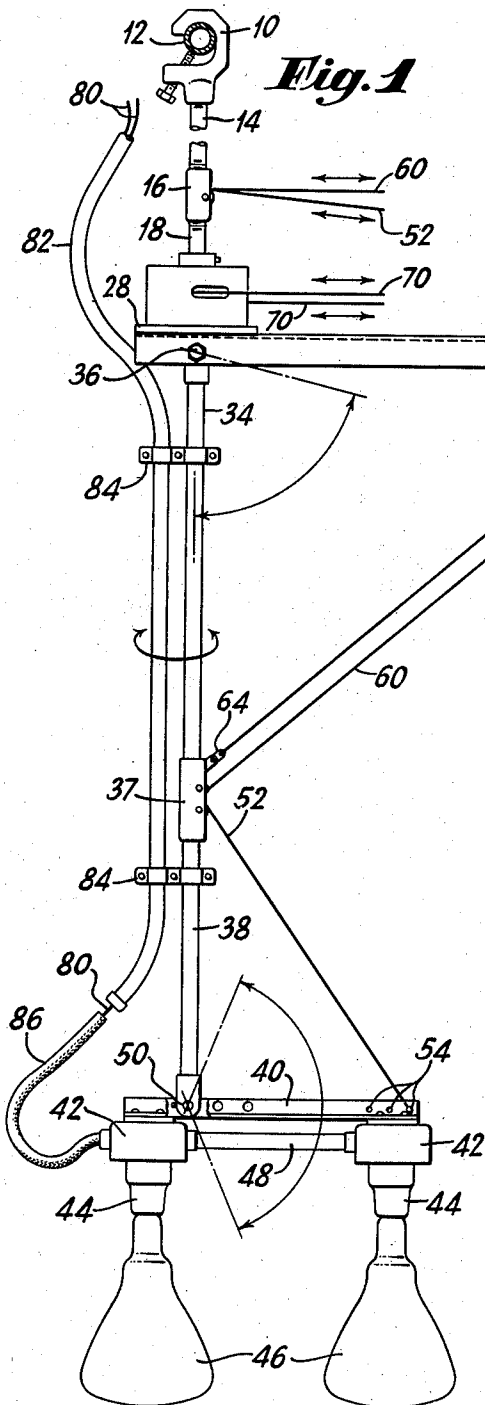
W. C. EDDY

2,221,079

ILLUMINATION DEVICE

Filed April 29, 1939

2 Sheets-Sheet 1



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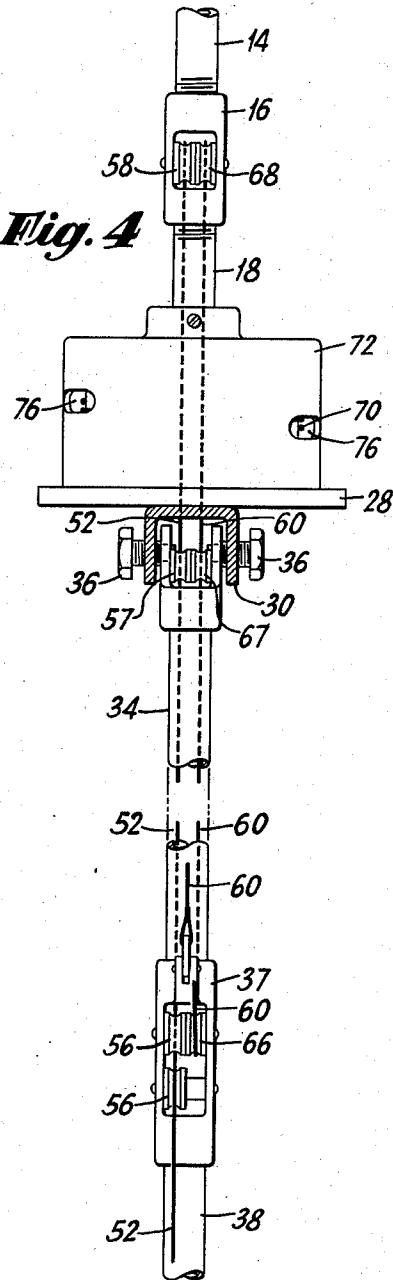
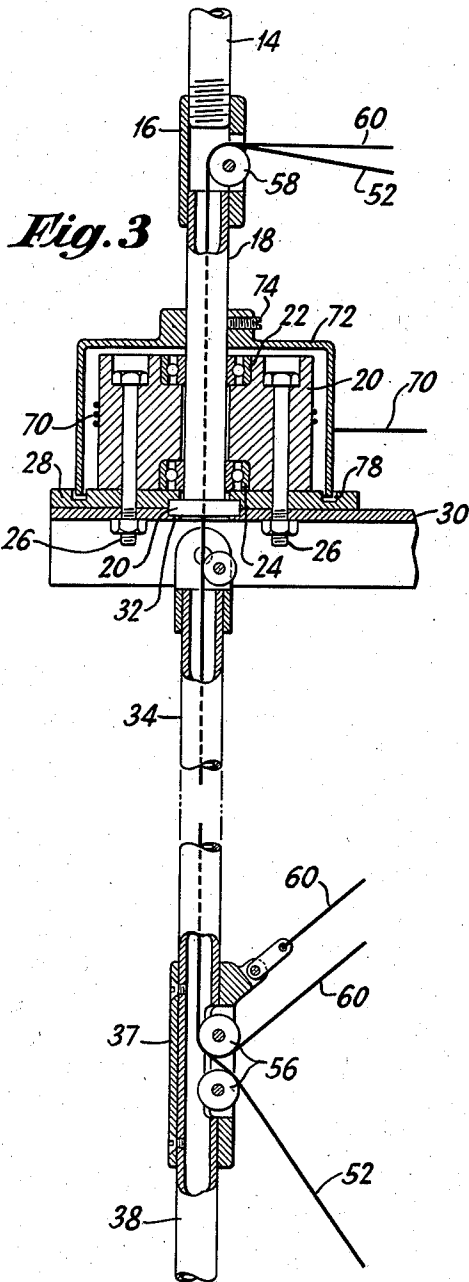
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2 Sheets-Sheet 2



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2,221,079

ILLUMINATION DEVICE

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8 Claims. (Cl. 248—323)

This invention relates to an improvement in illumination devices and more particularly to a device for illuminating a subject or object to be photographed or televised in a moving picture or television studio. Likewise the improvement finds substantial application and utility in theatrical lighting. A still further function is in connection with hospital operating rooms where adequate lighting is highly essential. In fact, this device is primarily of a nature such as to find utility in any form of industrial, theatrical, medical or other use where dirigible lighting devices are desired.

In moving picture and television studios which furnish a convenient field of use to which this invention will be related herein for descriptive purposes, considerable care must be exercised in lighting the object to be photographed or televised in order that the resultant picture or image may appear natural with all undesirable shadows or highlights eliminated. It is customary in such work to illuminate the studio by means of a plurality of sources of light which are generally attached to the ceiling of the studio or to some appropriate grid work for supporting said lighting devices. Since the sources of light are best attached to the ceiling in order to afford the desired illumination, and in order that the lights may be so removed as to not obstruct the floor of the studio or the shifting of cameras, scenery, and other equipment such as sound effects or sound pick-ups thereabout, it is often difficult to control the area illuminated and the angle of illumination since the light sources per se have not heretofore been in such a position or have not been so arranged as to be adequately and conveniently controlled from the floor of the studio. With the device described and disclosed herein, it is possible to attach a plurality of groups of sources of illumination to the ceiling of the studio with the desired flexibility of operation provided. In this way each of the groups is arranged in dirigible manner so as to be readily controlled from a remote point so that the sources of illumination may be rotated, tilted, or otherwise shifted in order that they may occupy substantially any position within the confines of a hemisphere.

Accordingly, it is one purpose of the present invention to provide a new and improved illumination device which may be attached to the ceiling of a moving picture or television studio or to some overhead grid-work in the studio with the device so arranged as to be capable of manipulation from a remote point.

Another purpose of the present invention resides in the provision of a lighting device in which one or more sources of illumination are attached to a framework with the framework so mounted as to be rotatable about a vertical axis through substantially 360 degrees.

Still another purpose of the present invention resides in the provision of means whereby a framework supporting a plurality of sources of illumination may be rotated substantially 90 degrees about a pivot point somewhat removed from the framework and that point of pivot situated in the vertical axis of rotation.

A further purpose of the present invention resides in the provision of means whereby a framework supporting a plurality of sources of illumination may be tilted or pivoted about a point relatively adjacent the framework, the framework being capable of a movement of substantially 180 degrees about this pivot point.

A still further purpose of the present invention resides in the provision of means whereby all of the rotational or pivotal movements may be controlled from a remote point and the further provision of means whereby such movement may be accomplished with a minimum of time and effort.

Another purpose of the present invention resides in the provision of an illumination device including one or more sources of illumination in which the sources of illumination may be directed at any desired set or subject within the confines of the studio and wherein the elevation of the sources of illumination may be controlled without disturbing the direction of the illumination.

Still another purpose of the present invention resides in the provision of an illumination device in which one or more sources of illumination may be moved about so as to occupy substantially any desired position within a hemisphere and whereby the light from the sources of illumination may be directed at any desired area in the studio from a desired position.

Other purposes and advantages of the present invention will become more apparent to those skilled in the art from a reading of the following specification, particularly when considered with the drawings, wherein like reference characters represent like parts, and wherein:

Figures 1 and 2 represent different views of the entire illumination device, and

Figures 3 and 4 represent sectional and detailed views of portions of the illumination device.

Referring now to the drawings, and particularly to Figures 1 and 2, the illumination device is provided at the top end thereof with any desired and satisfactory clamp member 10, by means of which the entire device may be attached to a beam or support grid-iron 12 associated with the ceiling of the moving picture or television studio, the attachment being such as to maintain rigid connection between the top of the illumination device and such supporting grid-work. A tubular member 14 is provided, which is attached to the clamp member 10 in any desired manner, such as by threading, and to this tubular member is connected a fair-leader 16 through which the control cables for the device are passed. Depending from the fair-leader 16 is a further tubular member or spindle 18 which is terminated at its lower end with a head or enlargement 20 as shown in Figure 3. This tubular member or spindle 18 acts as a support member for the illumination device and is stationary with respect thereto, the device being rotatable thereabout.

Positioned on the spindle 18 is a pulley 20, shown in Figure 3, and a pair of bearings 22 and 24 are provided in order that the pulley 20 may be freely rotated on the spindle 18. Attached to the pulley by means of bolts 26 is a circular plate member 28 and an extension arm 30. The extension arm may be made in the form of a U-shaped steel bar and the arm 30 and plate 28 are provided with openings through which the spindle 18 affords a means for counteracting the vertical forces which are present due to the weight of the illumination device. Preferably the extension member 30 is provided with a shoulder 32 in order that the pulley 20, the circular member 28 and the arm 30 cannot be moved axially with respect to the spindle 18, the shoulder 32 cooperating with the enlarged portion 20 of the spindle.

Attached to the extension 30 is another tubular member 34, the attachment being such as to permit the tubular member 34 to be pivoted about the point of attachment in order that the tubular member 34 may be raised from a dependent position to a position substantially horizontal and parallel with the extension arm 30. This attachment is accomplished by means of a pair of opposed pivot bolt members or set screws 36, which are best shown in Figure 4 and which are threaded into the U-shaped extension arm. At the lower end of the tubular member 34 is a fair-leader 37 through which the control cables for controlling the sources of illumination may be passed. The operation of this fair-leader and the manipulation of the illumination device will be explained more completely later.

Below the fair-leader 37 is a further tubular member 38 and to the lower end of this tubular member is pivotally attached a framework 40 which supports one or more sources of illumination. Directly attached to the framework 40 are a plurality of outlet boxes 42, each of which is provided with a socket member 44 into which is inserted a source of illumination or lamp 46. The outlet boxes 42 are joined together by means of conduits 48 in order that they may be rigidly supported and in order that conductors for supplying current to the various sources of illumination 46 may be passed therethrough. The framework 40 is pivotally attached to the end of the tubular member 38 by means of a pin 50 and a plurality of support points are provided along the framework 40 in order that the point of pivot

with respect to the framework may be altered to suit the desired requirements.

The framework 40, together with the sources of illumination 46 carried thereby, are pivoted with respect to the tubular member 38 and may be rotated with respect thereto through an angle of substantially 180 degrees. This pivotal movement or rotation is accomplished by means of a cable 52 which is attached to the framework 40 at one or another of a plurality of points 54, the cable being passed through the fair-leader 37 and extending through the interior of the tubular member 34. The fair-leader 37 is provided with a plurality of rollers or small pulleys 56 in order to prevent chafing or binding of the control cable 52. At the upper end of the tubular member 34 another roller or pulley 57 is provided in order that the control cable 50 may freely move therethrough when the sources of illumination are in an elevated position. The control cable 52 extends through the bore of the spindle 18 and emerges from the fair-leader 16 which is provided with a pulley 58. When the control cable 50 is released, and tension is removed therefrom, the weight of the framework and the lamps 46 carried thereby is sufficient to cause rotation of the sources of illumination about the pin 50 in a counter-clockwise direction as viewed in Figure 1, and when the control cable 52 is pulled or tensioned the framework and sources of illumination or lamps are rotated in a clockwise direction about the pin 50 approximately 180 degrees from its previous released position.

For elevating the sources of illumination a control member 60 is provided which is passed over a pulley 62 at the end of the extension arm 30. The end of the control cable 60 is permanently attached to the fair-leader 37 by means of an attachment device 64. The control cable 60 passes through the fair-leader 37 and cooperates with pulley 66 in order to prevent chafing or binding of the control cable, the control cable being extended through the tubular member 34 and the spindle 18, and finally emerging from the fair-leader 16. The fair-leader 16 is also provided with a pulley 68 in order to permit free movement of the control cable therethrough.

It may be seen, therefore, that when no tension is applied to the control cable 60 the illumination device will hang substantially vertically from the pivot point 36, but when the cable 60 is tensioned or pulled the entire illumination device including the tubular members 34 and 38 will be rotated about the pivot points 36 and the sources of illumination will be rotated in a counter-clockwise direction substantially 90 degrees. In order to permit ready and easy movement or elevation of the sources of illumination, a mechanical advantage may be derived through the use of the block and tackle arrangement including the pulley 62. Any degree or type of mechanical advantage may, of course, be used to suit the desired requirements.

For rotating the entire assembly about a vertical axis, that is, about the spindle 18, the pulley 20 is provided with a cable 70 which is wound about the periphery of the pulley. By pulling either end of the cable 70 the pulley 20 is rotated and since the extension arm 30 and the circular member 38 are rigidly attached thereto by means of the bolts 36 the entire illumination device is rotated about the spindle 18 on the bearings 22 and 24. The bearings are provided particularly in view of the fact that when the sources of illumination are elevated or raised as

a result of the cable 60 being tensioned, considerable torque is exerted on the spindle and the bearings minimize the friction which would result thereby. For properly directing or guiding the cable 70 on the pulley 20, a stationary fair-leader housing 72 is provided which is attached to the spindle 18 by means of a set screw 74, the fair-leader cap or housing being provided with a plurality of openings 76 through which the control cable 70 is passed. As shown in Figures 2 and 4, these openings 76 are displaced vertically in order that the control cable 70 may properly cooperate with the pulley 20. In order that the fair-leader casing or housing 72 may completely enclose the pulley 20, the circular member 28 is provided with an annular recess 78 into which the lower edge of the housing 72 may extend.

It may be seen from the above explanation that when either end of the control cable 70 is pulled or tensioned, a rotation of the entire illumination device about the spindle 18 is accomplished, regardless of the actual position of the sources of illumination as determined by the control cables 52 and 60.

For supplying electrical current to the sources of illumination, a pair of conductors 80 are provided, these conductors being passed through a conduit 82 which is attached to the tubular members 34 and 33 by means of brackets 84. At the lower end of the conduit 82 a flexible loom or similar flexible conduit 86 is provided through which the conductors 80 are passed in order that they may enter the outlet boxes 42 and conduits 43. The flexible loom 86 is used in order that the sources of illumination may be easily pivoted about the point 50 and the conduit 82 is so bent that the upper end thereof is relatively adjacent the support tube 14 in order to minimize the amount of flexing of the conductors 80 when the illumination device is rotated or manipulated. If desired, the plurality of sources of light may be included in two or more separate electrical circuits in order that selective energization of the various lamps of the device may be exercised. Such a feature is particularly useful during rehearsal where full illumination is not necessary.

From the above, the advantages of the present invention may be well appreciated and it may be seen that the plurality of sources of illumination 46 may be rotated substantially 360 degrees about a vertical axis. Furthermore, these sources of illumination may also be elevated or lowered by pivoting about the points 36 so as to increase or decrease the area illuminated by the device 46. Also, regardless of the rotational position or the elevation of the sources of illumination, the framework 40 and the sources of illumination carried thereby may also be pivoted about a point 50 which is relatively adjacent the framework in order to alter the angle of illumination so that the area illuminated by the sources of illumination 46 may be changed. In actual moving picture or television studio work, a plurality of illumination devices such as shown and described herein are normally attached to the ceiling of the studio so that the spacing of the devices is such as to prevent any possible interference regardless of the manipulation of any individual device. Regardless of the number of such devices positioned in the studio, all of the control cables therefor may terminate at a single control board along a portion of one wall of the studio, from which point a single operator may control any one or all of the illumination devices and may also adjust the sources of illumination of each

individual device so as to occupy any position within substantially a complete hemisphere.

In order to facilitate operation of the device and to assure proper positioning of the devices, the control cables 52, 60 and 70 may be provided at the operating end thereof with a plurality of rings of different colors which may be adjusted along each of the control cables in such a manner that when a certain prescribed illumination is desired, all of the rings of a particular color or designation may be brought to a predetermined position thereby causing all of the illumination devices to be oriented or tilted to the desired prescribed position.

The energization of the various sources of illumination or lamps which are located on each of the illumination devices used in the studio may also be controlled from the control panel at which the control cables terminate by means of electrical switches in order that each lamp or group of lamps may be selectively controlled and be made operative or inoperative in accordance with the lighting requirements.

The lamps or sources of illumination shown and described herein are preferably of the type wherein each lamp is provided with an integral or internal reflecting surface, although the specific lamp used is not material so far as the subject matter of this invention is concerned. Furthermore, the plurality of lamps may be replaced by a single tubular gaseous discharge lamp having a luminescent interior coating. Such a lamp would be so shaped and constructed as to project light from a sizeable area.

The illumination device is particularly useful as a device for producing back lighting of subjects or objects and since the device may be remotely controlled no attendant need be stationed at the light source. Through the use of the remote control and in view of the extreme flexibility of the device any moving subject may be readily followed.

Although the device disclosed herein is described and illustrated in more or less detail, it is to be understood that various obvious alterations or modifications may be made therein without departing from the spirit and scope thereof, and it is desired that any and all such modifications be considered within the purview of this invention except as limited by the hereinafter appended claims.

I claim:

1. An illumination device comprising a source of illumination, means including an extension for dependently supporting said source of illumination from a structure, means for rotating said source of illumination and the extension about a predetermined axis of rotation, means for pivoting said source of illumination about a pivot point near one end of the extension, means for further pivoting said source of illumination about a pivot point near the other end of the extension, and means for controlling the rotational and pivotal movements from a remote control point.

2. An illumination device for illuminating a field of action comprising a plurality of lamps, means for supporting said lamps from an elevated structure, means for rotating said lamps about a vertical axis, means for rotating said lamps about a horizontal axis, means for pivoting said lamps about a pivot point relatively adjacent the point of support and spaced from the horizontal axis of rotation, means for controlling the rotational and pivotal motions from a remote control point, and means to control the rotational and pivotal motions instantaneously operating

whereby the selected motions may selectively vary between one and the total motions provided.

3. An illumination device comprising a source of light, means for dependently supporting said source of light from the ceiling of a studio, means for rotating said source of light about a vertical axis, means including at least a part of said first named means for independently rotating said source of light about a pair of spaced horizontal axes, at least one of which is located in the vertical axis of rotation, means for independently and remotely controlling all of said rotational movements whereby the source of light may be caused to occupy substantially any point in a hemisphere, and means for controlling the energization of said source of light.

4. An illumination device comprising a plurality of sources of illumination, means for dirigibly and dependently supporting said sources of illumination, means for rotating said sources of illumination through substantially 360 degrees about a vertical axis, means for independently rotating said sources about a pair of spaced parallel horizontal axes to provide arcuate motions of the sources throughout arcs of substantially 180 and 90 degrees respectively, and means for remotely and selectively controlling all of said rotational movements whereby the sources of illumination may be caused to occupy, in accordance with the selected rotations, substantially any point on the surface of a hemisphere having its boundary limits described by maximum rotation in all directions.

5. An illumination device comprising a plurality of lamps, means for dependently supporting said lamps, means for rotating said lamps through substantially 360 degrees about a vertical axis, means for rotating said lamps through substantially 180 degrees about a horizontal axis, means for rotating said lamps through substan-

tially 90 degrees about a second horizontal axis spaced from but parallel to said first horizontal axis whereby said lamps may be caused to occupy substantially any position in a hemisphere, means for remotely controlling the energization of said lamps, and means for controlling the rotational movements of said lamps from a remote control point.

6. An illumination device comprising a plurality of lamps, means for dependently supporting said lamps, means for rotating said lamps through substantially 360 degrees about a vertical axis, means for rotating said lamps about a horizontal axis to describe thereby an arcuate motion of at least substantially 90 degrees whereby said lamps may be caused to occupy substantially any position on the surface of a hemisphere, and means for remotely controlling the rotational movements of the lamps.

7. A lighting device comprising a lamp, means including an extension for dependently supporting said lamp in spaced relationship from an elevated structure, means for rotating said lamp about a first horizontal axis near one end of the extension, and independent means for rotating said lamp about a second horizontal axis co-planar with the first horizontal axis and near the other end of the extension.

8. A lighting device comprising a lamp, means including an extension for dependently supporting said lamp in spaced relationship from an elevated structure, means for rotating said lamp about a first horizontal axis near the end of the extension adjacent said lamp, independent means for rotating said lamp about a second horizontal axis co-planar with the first horizontal axis near the end of the extension adjacent the elevated structure, and means for remotely and selectively controlling both of said rotational movements.

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