

[54] **LUMINAIRE MOUNTING ASSEMBLY AND LIGHTING METHOD**

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[51] Int. Cl. **F21s 1/10, F21s 3/10, F21s 13/10**

[58] Field of Search **240/84, 25, 41.6, 44**

[56] **References Cited**

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[57] **ABSTRACT**

A luminaire assembly has an array of six luminaires mounted at the top of a high pole, and each of the luminaires has a preselected asymmetrical lighting pattern that is rotatably controllable by rotation of a lower optical assembly mounted on an upper main support housing. Rotation indexing mass on the assembly and housing indicate the relative position of the assembly to the housing to enable simply accomplished rotatable alignment of the overall lighting pattern.

10 Claims, 11 Drawing Figures

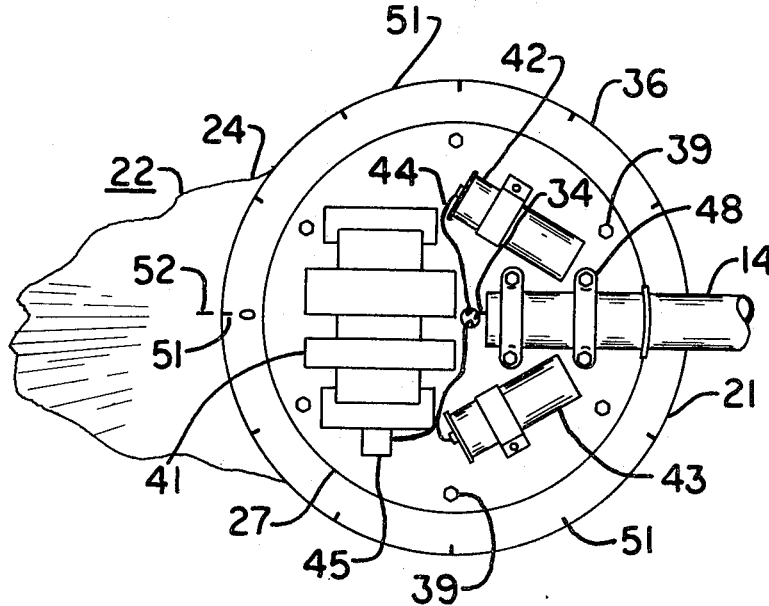


FIG. 1

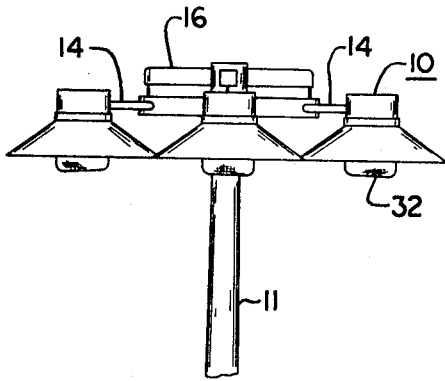


FIG. 2

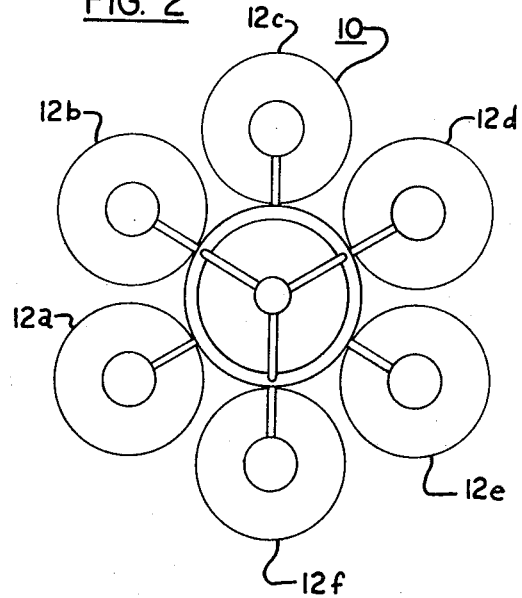


FIG. 3

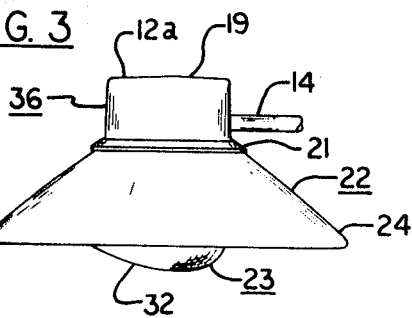


FIG. 4

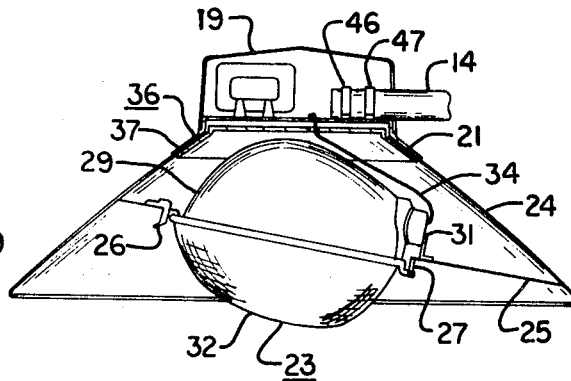
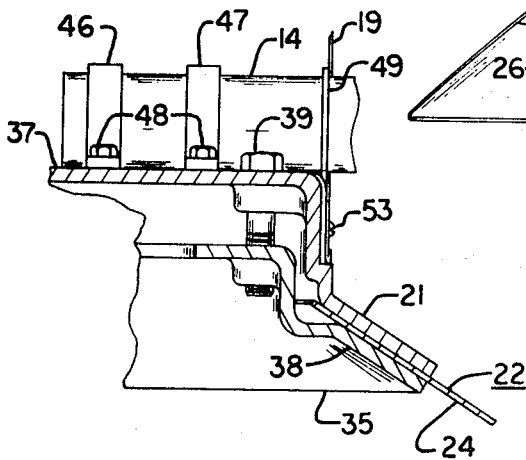


FIG. 5



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FIG. 6

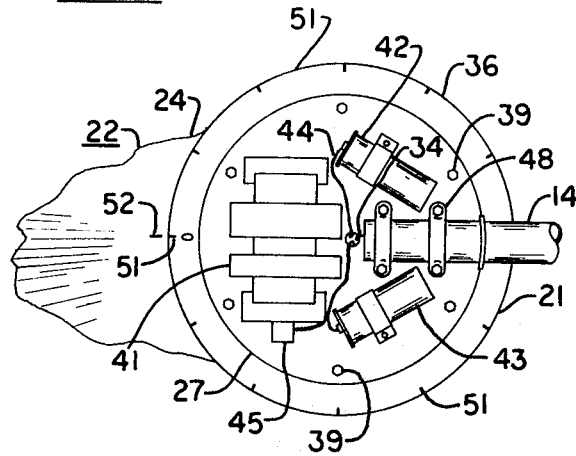


FIG. 7

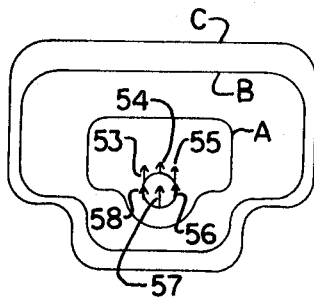


FIG. 8

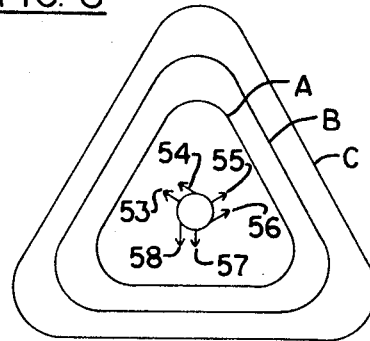


FIG. 9

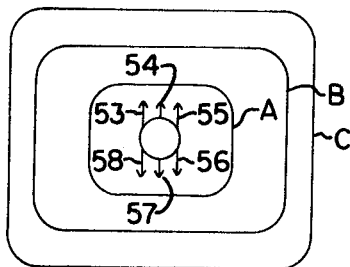


FIG. 10

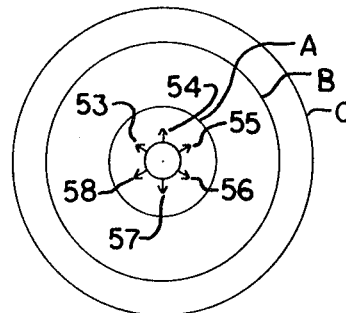
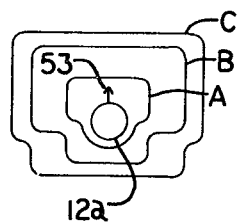


FIG. 11



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LUMINAIRE MOUNTING ASSEMBLY AND LIGHTING METHOD

This invention relates to luminaire lighting assemblies, particularly high intensity luminaires for high mast mounting and methods for utilizing such luminaires.

Area lighting by luminaires, particularly of the high intensity type such as those using mercury lamps, has become subject to increasing demands for luminaires having pleasing esthetic qualities and providing relatively high intensity and reliability. Most such lighting is presently accomplished by single luminaire assemblies mounted in pairs or groups atop high poles. The difficulties in obtaining the desired lighting with a minimum number of poles and with the desired area coverage has not been successfully accomplished, primarily because of inadequacies in construction and versatility in lighting patterns.

With this invention a luminaire lighting assembly and method is provided that enables a relatively small number of poles each supporting high mast type lighting luminaire assemblies to be used to effectively and esthetically illuminate a given area. It enables the lighted area for each of the luminaire assemblies to be directed to provide selected area configurations. It also enables lighting patterns that are of such a nature that the loss of a single luminaire does not result in totally dark areas in the lighting pattern.

Other objects and advantages of this invention will be apparent from the following detailed description.

FIG. 1 is a simplified side view of a pole and mounted luminaire assembly according to this invention;

FIG. 2 is a top view of the luminaire assembly shown in FIG. 1;

FIG. 3 is a side view of a single luminaire shown in FIG. 1;

FIG. 4 is a simplified phantom side view of the luminaire shown in FIG. 3;

FIG. 5 is a detailed, partial sectional view of the luminaire shown in FIG. 4;

FIG. 6 is a top view of the luminaire shown in FIG. 4 with the top cover plate removed; and

FIGS. 7, 8, 9 and 10 are representations of some of the lighting area intensity configurations available with the luminaire assembly shown in FIG. 1.

FIG. 11 represents a single light area intensity configuration.

Referring to FIGS. 1 and 2, a luminaire assembly 10 is mounted on a mast or pole 11 that would typically be a high level mast in a range of 100 to 180 feet and would typically position assembly 10 above an area to be lighted. Luminaire assembly 10 comprises six luminaires 12a through 12f, with each of the luminaires substantially identical in construction. The luminaires are each attached to a means for supporting the luminaires comprising a connecting tenon 14 and a luminaire support assembly 16 adapted to support the six luminaires in any manner known in the art.

Referring to FIGS. 3, 4 and 5, the luminaires, considering luminaire 12a specifically, are attached to tenon 14 and comprise a cover housing 19 having retaining screws 53, an annular conical lip 21, a conical support assembly 22 and an optical assembly 23. Referring to FIGS. 4, 5 and 6, showing simplified details of the construction of luminaire 12a, support assembly 22 supports optical assembly 23 and comprises a conical support section 24 with a mounting plate 25 connected to support cone 24 and to optical assembly 23, a latch 26 and a hinge 27.

Optical assembly 23 is of any available type designed to project light in a preselected determinable pattern in a manner known in the art. The actual lighting pattern is usually controlled by the optical characteristics of optical assembly 23 but could also be further modified by selecting the angle of the mounting of the optical assembly to the horizontal. Optical assembly 23 comprises a mercury lamp (not shown), for example, mounted inside of a reflector 29 and connected to a socket 31, that projects light through a transparent refractor 32. Latch 26 locks refractor 32 in place and hinge 27 receives refractor 32 and enables optical assembly 23 to be opened for

access to the lamp. Electrical conductors 34 carry electrical power for the operation of the lamp.

Referring to FIG. 4 and FIGS. 5 and 6 for details, conical support assembly 22 is supported by a main support housing 36 that comprises an upper main frame 37, conical lip 21 which is a conical extension of upper main frame 37, and a lower main frame 38 connected to upper main frame 37 by any known means for connecting, such as bolts 39.

Lower main frame 38 has a lower annular conical lip 35 in adjacent cooperative relationship with conical lip 21 of upper main frame 37. Conical lips 21 and 35 are adapted to receive and support support-cone 24 between them. A means for adjustably clamping cone 24 between lips 21 and 35 is provided by bolts 39 which may be selectively tightened and loosened. Lip 21 and support-cone 24 have compass type index markings with a single index mark 52 located on support-cone 24 and compass index marks 51 on conical lip 21.

Upper main frame 37 is connected to tenon 14 by two clamps 46 and 47 connected to upper main frame 37 by bolts 48. A resilient gasket 49 is mounted to seal the opening for tenon 14 in housing cover 19.

Referring to FIG. 6, electrical ballasting equipment for the lamp comprises a ballast 41, capacitors 42 and 43 and electrical conductors 44 that are connected to a terminal assembly 45, to conductor 34 from lamp socket 31 and to a power source (not shown) through tenon 14.

Referring to FIGS. 7 through 10, typical area lighting configurations that are obtainable with a luminaire mounting assembly according to this invention are shown. For a typical lighting pattern for each luminaire, conical support assemblies 22 of each luminaire 12a-12f may be rotated to have index mark 52 adjusted in a direction as indicated by the arrows 53 through 58 shown in FIGS. 7 through 10. The arrows correspond to typical rotational positions for luminaire assemblies 12a through 12f, respectively. The arrows schematically show some of the possible directive configurations that are available with typical luminaires. For the configurations shown, lines A, B and C are based on illumination levels appearing at the points on the ground indicated by lines A, B and C at comparative ratios of foot-candlepower at line A at one, line B at 0.5, and line C at 0.15. This ratio and configurations will vary with the types of lamps used and the candlepower distribution pattern of the individual luminaires used. FIG. 11 shows a typical single light pattern of the optics of a suitable individual commercial luminaire that could be used to obtain the pattern shown in FIGS. 7 through 10. In FIG. 11 individual luminaire 12a is shown with an indexing rotation shown by arrow 53 with the same illumination level ratios A, B and C as in FIGS. 7-10.

In the utilization of assembly 10 according to this invention, assembly 10 is mounted at the top of high mast 11, the relative orientation of support assembly 22 of each luminaire is selected to provide a selected composite lighting pattern of a type shown in FIGS. 7-10 or any other attainable pattern that may be desired. Each of the luminaire optics is oriented by rotating support cone 24 to place index mark 52 at a selected relation to compass index marks 51. The relative positions of the support are preselected and are accomplished by loosening bolts 39, orienting support cone 24 to line up index mark 52 with a selected compass index mark 51, tightening bolts 39 to clamp support cone 24 between lips 35 and 21, and replacing housing cover 19 and securing it with screws 53.

Thus, a method of lighting an area is provided that utilizes permanently mounted luminaires in arrays with each of the luminaires having a selected nonsymmetrical light throwing pattern, rotating the optical portion of each of the luminaires to provide a selected portion of a desired composite light pattern, and tightening the luminaire optical assemblies in position to thereby provide a selected light pattern as shown in FIGS. 7 through 10.

I claim:

1. A luminaire assembly having a plurality of luminaires supported by a luminaire support assembly for mounting on a pole, said luminaires each comprising:

