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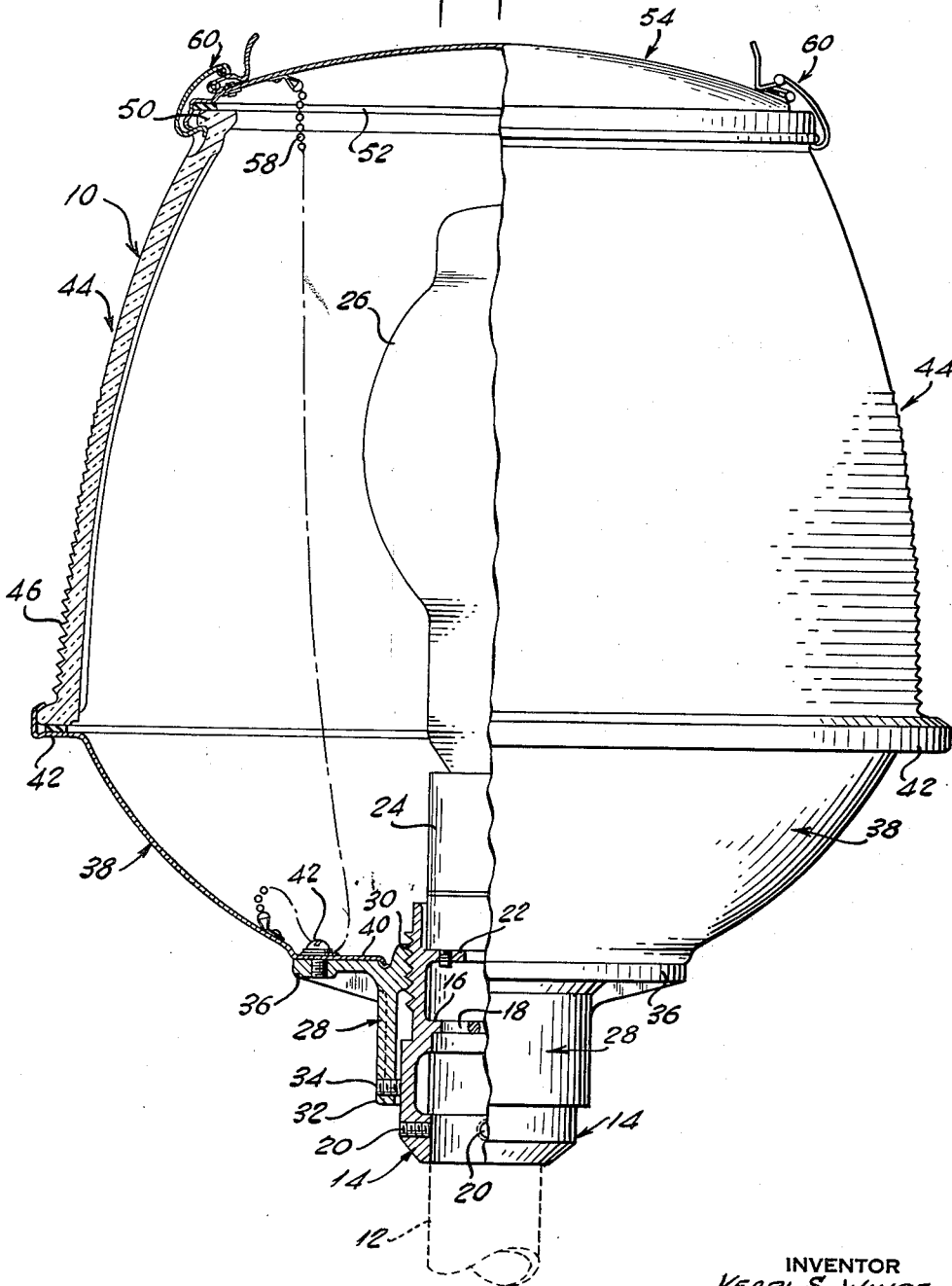
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LUMINAIRE

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3 Sheets-Sheet 1

Fig. 1.



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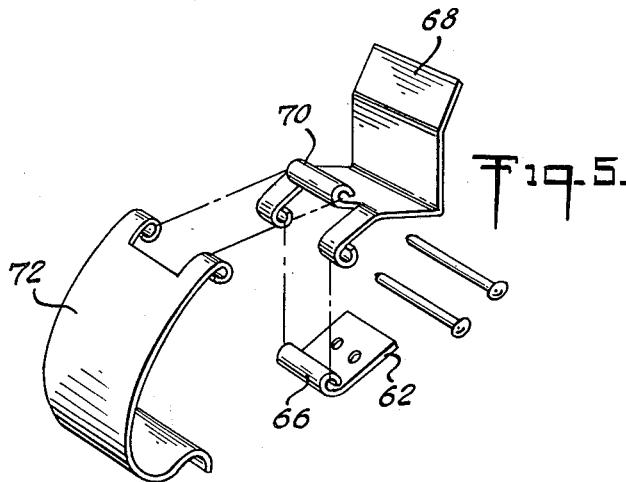
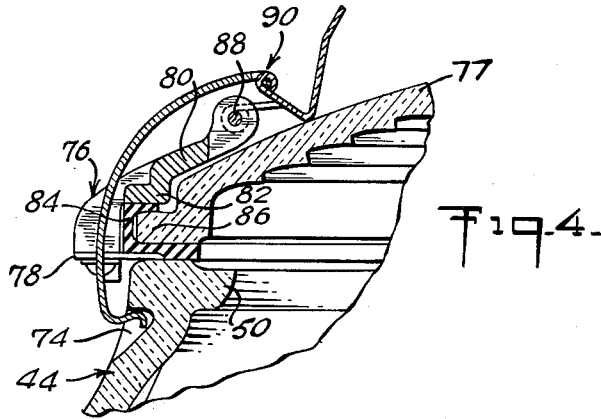
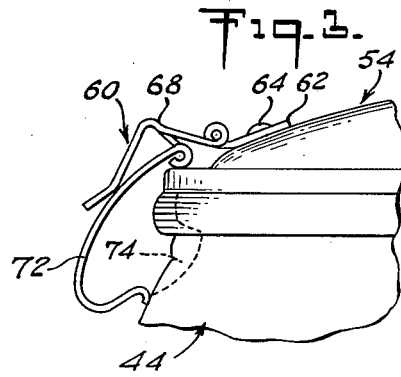
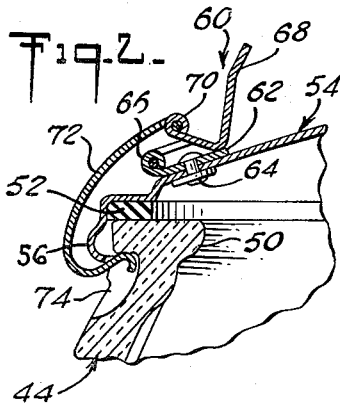
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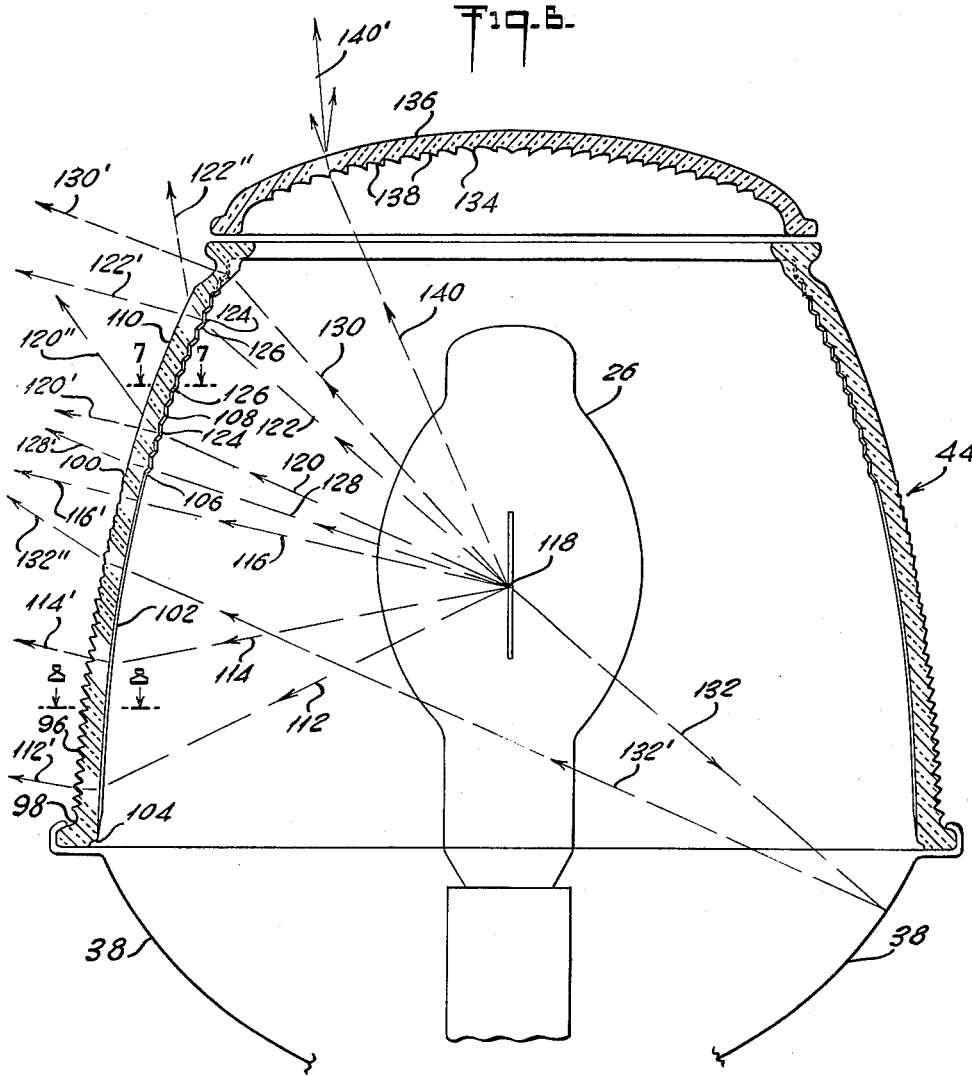


Fig. 7.

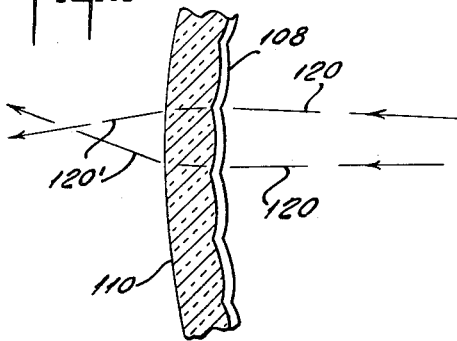
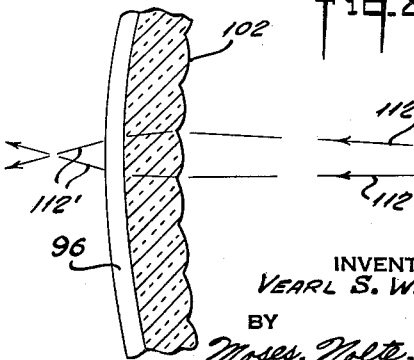


Fig. 8.



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3,191,022
LUMINAIRE

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Continuation of application Ser. No. 775,604, Nov. 21, 1958. This application Mar. 1, 1962, Ser. No. 177,936
8 Claims. (Cl. 240-25)

This is a continuation of application Serial No. 775-604, filed November 21, 1958, now abandoned.

This invention relates in general to luminaires and particularly to a new and useful post-mounted type luminaire particularly adapted for illuminating outdoor substations and having an improved construction permitting its easy erection on a post supporting member, including a cover member which is easy to remove for access to the interior and having means for adjusting the position of the reflector and refractor in relation to the light source to allow the emitted beam of light to be raised or lowered.

While not limited thereto, the present invention is particularly directed to a lighting unit designed for lighting outdoor substations. One of the principal requirements for luminaires of this type is that it should illuminate disconnect switches which are usually 20 feet or more above the ground and mounted on an open structure of the substation. The switches are usually in multiple rows several feet apart. In order to properly illuminate such switches it is necessary that the luminaires be mounted some distance below the switch level so that there is little danger of anyone who services the luminaires coming into contact with the high voltage carrying members thereabove. Also it is desirable that the luminaires be above the eye level of anyone standing on the ground so that their vision will not be impaired by glare from the luminaire when looking up at the switches. A usual mounting height for the luminaire is about ten feet. It is necessary that luminaires of this type be of simple construction permitting easy disassembly of the parts for lamp servicing and renewal and should include a construction which would give the desired light distribution without causing glare.

In the construction of luminaires of the type with which this invention is concerned, great difficulty has been encountered in providing means permitting ready assembly of the luminaire to a supporting post while permitting access to the interior of the luminaire for cleaning or bulb changing purposes. In previous constructions, it was necessary to remove the light transmitting refractor member in order to effect cleaning of this member or removal of a lamp from the interior thereof. With such constructions, it was a time consuming job to effect lamp change or cleaning of the interior of the refractor.

In accordance with the present invention there is provided an improved luminaire construction of the post-mounting type including a socket receiving sleeve member which is easily mounted on the top of the post and which includes a threaded portion adapted to receive a dish-shaped reflector upon its outer annular periphery on which a light transmitting member, or refractor, is positioned. The complete assembly includes a cover member which is held fast to the upper portion of the light transmitting member by an improved latching construction permitting easy removal of the cover. The cover is

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also chain connected to the reflector portion of the lamp assembly.

The construction permits easy assembly to a post as well as easy removal of a cover for access to the interior of the luminaire, the cover being chain connected to the lower portion of the luminaire in order to prevent its disassociation from the remaining parts.

The luminaire refractor is mounted on the reflector which is easily adjustable in relation to the light source to effect directing of a light to the desired location of illumination. A feature of the construction is that a reflector cover may be replaced with a refractor cover to permit the upward directing of light in those instances where it is so desired.

Accordingly, it is an object of this invention to provide an improved luminaire construction.

A further object of this invention is to provide an improved post-mounted luminaire including portions which are easily assembled to a post for mounting purposes and a cover which is readily removable for cleaning and lamp renewal purposes.

A further object of the invention is to provide a luminaire which includes means for adjusting the position of the refractor and reflector in relation to the light source to direct light over desired areas for illumination.

A further object of the invention is to provide a luminaire particularly adapted for mounting on a post type support which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of this invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a partial elevation and partial transverse section of a luminaire constructed in accordance with the invention and showing the general mechanical arrangement and some of the prismatic structures thereof;

FIG. 2 is an enlarged fragmentary detail of the cover latching mechanism indicated in FIG. 1;

FIG. 3 is a fragmentary elevational detail of the latching mechanism indicated in FIG. 2 but showing the mechanism in an unlatched position;

FIG. 4 is a view similar to FIG. 2 but indicating a latching construction for use with a glass refractor cover;

FIG. 5 is an exploded perspective view of the latching member;

FIG. 6 is a view similar to FIG. 1 indicating the light ray directing effect of the refractor;

FIG. 7 is a horizontal section taken along the line 7-7 of FIG. 6; and

FIG. 8 is a horizontal section taken along the line 8-8 of FIG. 6.

Referring to the drawings in particular the invention as embodied therein includes an improved post-type luminaire generally designated 10 which is mounted on an upstanding conduit member or supporting post 12 (indicated in phantom).

The luminaire 10 includes a socket receiving and post-mounting supporting sleeve generally designated 14 which is mounted directly on top of the post 12. The

sleeve member 14 is provided with a central internal partition wall 16 having openings 18 therein for the passing of an electrical wire lead therethrough. The partition wall 16 normally rests on the top of the post 12 and the sleeve member 14 is secured in position to the post as by a plurality of set screws 20.

The upper interior portion of the sleeve member 14 is provided with an internally projecting annular flange 22 upon which a lamp socket 24 is mounted. Light bulb 26 is seated in socket 24 which, in turn, is electrically connected through electrical leads passing through the center of the sleeve member and the openings 18 down through the center of the post 12.

In accordance with the invention, the sleeve member 14 is threaded externally to receive a similar internally threaded collar supporting member generally designated 28. The collar member 28 includes an internally threaded portion 30 at its upper end and downwardly extending bearing portion 32 which surrounds the lower portion of the sleeve member 14. The collar member 28 is held against rotation in respect to the sleeve member 14 as by a set screw 34.

The collar member 28 includes an outwardly extending annular flange 36 upon which is positioned a pan-shaped reflector 38 which has an annular flange portion 40 which rests on the flange portion 36. The pan-shaped reflector is secured to the collar member 28 by a plurality of bolts 42 which are threaded into the flange 36.

The reflector 38 includes an upper annular flange 42 which supports a substantially frusto-conical light transmitting member or refractor 44.

The refractor 44 includes an upper flange portion 50 having a flat top surface upon which is positioned a ring or washer 52 of resilient material such as rubber, plastic or the like.

In accordance with the invention, a cover member generally designated 54 having outwardly extending annular flange 56 at the lower end thereof is positioned on top of the refractor 44 with the internal surface of this flange portion 56 resting on the washer 52. The cover member 54 is connected through a flexible chain 58 to the bottom of the pan reflector member 38 to insure that the cover is maintained in association with the remaining luminaire parts.

A feature of the cover construction is that it may be secured tightly to the refractor 44 by latching mechanisms generally designated 60, 60 arranged on diametrically opposite sides of the cover. In accordance with the invention the latching mechanisms 60, 60 are arranged to effect tight engagement of the refractor 44 by the cover 54 and quick disengagement therefrom to permit cover removal for access to the interior of the luminaire.

Each of the latching mechanisms 60, 60 (see FIGS. 2, 3 and 5) includes a securing clip pivot mount 62 which is secured to the cover 54 as by rivets 64. The pivot mount 62 includes a pivot bearing portion 66 upon which is pivotally mounted a substantially V-shaped latching arm 68. The latching arm 68 includes a latch pivot bearing portion 70 which is offset from the pivot bearing 66 and upon which a substantially hook-shaped latch 72 is pivotally mounted.

The flange portion 50 of the refractor 44 is recessed as at 74 just below its lower outer face to receive the hooked portion of the latch pivot bearing 72. In the position indicated in FIG. 2, the latch 72 is indicated in a position in the recess 74 of the refractor 44, and the latching arm 68 is in contact with the top face of the clip pivot mount 62. In this position, the latch 72 is maintained in tight bearing contact against the flange 50 and the recess 74. When it is desired to remove the cover 54 it is merely necessary to rotate the latching arm 68 to the position indicated in FIG. 3 to bring the latch 72 out of the recess 74 and permit easy removal of the cover. The cover, of course, may be removed so that it hangs from the side of the luminaire on the chain 58.

In the embodiment indicated in FIG. 4, a cover member 77 having light transmitting characteristics such as glass is provided. For such material it is difficult to mount a latching mechanism such as the mechanism 60 directly on the cover. For this purpose, a mounting mechanism generally designated 76 is provided. The mounting mechanism 76 includes a clip member 78 which rests on the upper flange 50 of the refractor 44. The mechanism 76 includes a ring 82 and located at two diametrically opposite locations thereon are integral latch mechanism mounting members 80 which together with the ring form a channel portion 82 which is lined with a U-shaped resilient material 84 which is shaped to receive an outwardly extending flange portion 86 of the glass cover 77. Flange 86 is covered with the U-shaped resilient material 84 which forms a seal between the flange 50 of the refractor 44 and the flange 86 of the cover 77. The clips 78 bear against the lower face of the resilient material 84 and retain the glass cover 77 within the ring 82 when the mounting member 76 is removed for servicing. The mounting members 80 are spaced to support a pivot bearing 88 at their upper ends adjacent to cover 77. A latching mechanism generally designated 90 is provided which is identical to the mechanism indicated in FIGS. 2, 3 and 5, with the exception that the clip pivot mount 62 is replaced by a mounting member 80.

The refractor 44 carries annular refracting prisms 96 on the bottom portion of its exterior between spaced points indicated at 98 and 100. The interior of the refractor is provided with vertically extending flutes 102 which cover the inner face between points 104 and 106 and as most clearly shown in FIGS. 6 and 7, extend all the way up the side in the upper portion of the refractor where annular prisms 108 are superimposed on them. This super imposition is most clearly brought out in FIG. 7 where the fluted vertical configuration of horizontal prisms 108 is seen. Above the intermediate point 106 there are provided interior annular prisms 108 as just discussed while above the point 100 on the outer face there is provided a smooth surface 110.

Light rays 112, 114 and 116 from a point light source 118 are diffused laterally by the flutes 102 as indicated in FIG. 8 and are bent into beam directions 112', 114' and 116' by the outer refracting prisms 96.

Light rays 120 and 122 which strike the faces 124 of the prisms 108 are bent substantially into beam directions 120' and 122'. Rays 120 and 122 are also diffused laterally as shown in FIG. 7 via the action of the fluted configuration extending from prisms 102 in the lower portion of the refractor.

Since in accordance with the invention it is also desirable to direct some light upwardly, light rays 120 and 122 striking lower faces 126 of the prisms 108 are bent in above the beam directions 120'' and 122''. The faces 124 and 126 are designed so that the lowest ray 128 striking the face 126 and the highest ray 130 striking face 124 are substantially parallel as shown at 128' and 130'. This insures a smooth transition of light intensity in above beam direction.

Light intercepted by the reflector 38 is reflected back across the unit axis at a vertical angle low enough so that it is not intercepted by the lamp arc or filament. A typical one of such rays is shown at 132, 132' and 132''.

When other than a symmetrical beam distribution is required, the refractor 44 could be modified by substituting laterally directing prisms in place of the vertically extending flutes 102. With such prisms various lateral light distributions could be obtained. Somewhat the same modification of light patterns can also be obtained by mounting metal shields between the lamp 26 and the refractor 44. The inner face of such shield is advantageously specular so that the shield reflects the shielded light back into useful directions.

In those instances where the opaque cover is replaced

by the refractor cover additional upwardly directed light is obtained. Since the mercury and incandescent lamps used in such luminaires have relatively thin vertical light sources 118, they are deficient in light emission near the zenith. Furthermore, the mechanical members which hold these sources in place cast upward shadows. The main function of a refractor cover lamp is to modify the uneven pattern of light from the source 118 into a smooth upwardly projecting beam. This is accomplished by use of concentric prisms 134 on the inner face and radial flutes 136 on the outer face. Faces 138 of prisms 134 are curved in cross section, the curve being so designed that the greater amount of incident light is directed to near zenith direction as indicated by light rays 140, 140'. Radial flutes 136 give a slight amount of diffusion at right angles to that given by the prism 134.

Thus the invention provides an extremely simple luminaire construction which may be secured to a mounting post in a matter of a few minutes. The parts are simply related and may be assembled in their proper related positions or disassembled with ease and rapidity. The refractor and reflector may be easily adjusted in relation to the light source to vary the light distribution around the luminaire. The improved construction permits rapid disassembly of the complete luminaire for cleaning or repair purposes as well as easy removal of the refractor cover for cleaning or bulb changing purposes.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

I claim:

1. A post mounted luminaire comprising a mounting sleeve member having an internal flange adapted to be connected to a post, a light source base on said sleeve member, a light source on said base, a substantially pan-shaped reflector of shallow depth having an upper, outer, annular flange, a lower, inner, centrally located restricted portion and with at least a major portion of said reflector located below said light source, vertically adjustable means between said sleeve member and said lower restricted portion of said reflector and mounting said reflector on said sleeve member for vertical adjustment thereon and in a position to reflect light from said light source upwardly and laterally across a vertical center line passing through said light source, the reflected light passing below said light source, a substantially cylindrical refractor having its lower end mounted on the flange of said reflector, said reflector constituting means for directing light from the light source to the lower portions of said refractor, said refractor including means at the lower portion thereof for directing direct light from said light source in a substantially parallel radially and upwardly extending beam, and means at the upper portion thereof for directing light upwardly, and a refractor cover over the top of said substantially cylindrical refractor and having light directing means for transmitting the greater amount of direct light incident thereon to near zenith direction.

2. The post mounted luminaire according to claim 1 wherein said light directing means on said cover comprise concentric rows of prisms on its inner face and radially extending flute means are provided on the outer face of said cover for diffusing light in planes at right angles to the direction of light effected by said concentric rows of prisms.

3. A post mounted luminaire for directing light in upwardly extending beam directions comprising, a light source, a substantially shallow pan-shaped reflector located below said light source and providing means centrally thereof for mounting the same on a post for vertical adjustment therealong independently of said light source, a light directing refractor member mounted on said reflector and extending above said light source and sur-

rounding the same, said reflector being shaped and disposed relative to said light source for reflecting light therefrom upwardly across the vertical center line of the luminaire and below said light source to the lower portion of said refractor, prism means on the lower portion of said refractor and on the outer surface thereof for refracting light directed thereto into upwardly and radially extending parallel light beams, and horizontally oriented prisms extending around the inner surface of said refractor and substantially covering the upper portion thereof, each of said horizontally oriented prisms providing an upper and a lower surface converging inwardly of said refractor, both said upper and lower surfaces of each said horizontally oriented prisms being in the path of light emitted from said light source and being disposed for refracting the light directed to said upper surfaces into an upwardly and radially extending substantially parallel beam at an angle substantially the same as the light beam from the direct light incident on the lower portion of said refractor and for refracting light directed to said lower surfaces upwardly into angles higher than said last mentioned beam.

4. The post mounted luminaire of claim 3 wherein the upper portion of said refractor converges inwardly at the top thereof and disposes said surfaces of said horizontally oriented prisms in the path of said light, vertically oriented flute means around the inner surface of said refractor extending into the upper portion thereof, and said horizontally oriented prism means are superimposed directly upon said vertically oriented flute means so that the light refracted into said upwardly and radially extending beam and into angles higher than said beam is diffused laterally.

5. A refractor for a luminaire including a light source and comprising a tubular member adapted to be supported in a position surrounding the light source, said tubular member including a lower portion for extending below the light source and an upper portion for extending above the light source, prism means horizontally oriented on the lower portion of said member for directing direct light from the light source into a radially and upwardly extending parallel main beam, and prism means for refracting direct light from said light source into an upwardly and radially extending parallel beam at an angle substantially the same as the main parallel beam and for further refracting light upwardly into angles higher than the main beam, said prism means comprising horizontally oriented prisms extending around and substantially covering the inner surface of said upper portion of said member from the upper boundary of said lower portion, each of said horizontally oriented prisms on said upper portion providing an upper and a lower surface, said surfaces of each of said prisms on said upper portion converging inwardly of said member, both of said upper and lower surfaces of each of said horizontally oriented prisms on said upper portion being positioned for disposition relative to the light source for receiving direct light therefrom and for, respectively, refracting the direct light into an upwardly and radially extending parallel beam at an angle substantially the same as the main parallel beam and refracting light upwardly into diverging paths at angles higher than the main beam.

6. The refractor of claim 5 wherein said upper portion of said member converges inwardly describing a curved contour which disposes both said surfaces of said horizontally oriented prisms relative to the light source for receiving light therefrom.

7. The refractor of claim 5 wherein vertically oriented flutes are provided around the inner surface of said member and extend into said upper portion, and said horizontally oriented prisms are superimposed directly upon said flutes, whereby light refracted into said upwardly and radially extending beam and upwardly into angles higher than said main beam is diffused laterally.

8. The refractor of claim 7 wherein said upper portion

of said member converges inwardly describing a curved contour which disposes both said surfaces of said horizontally oriented prisms relative to the light source for receiving light therefrom.

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