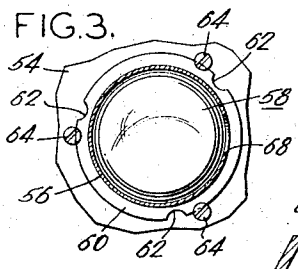
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LIGHTING FIXTURE

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FIG. 3.



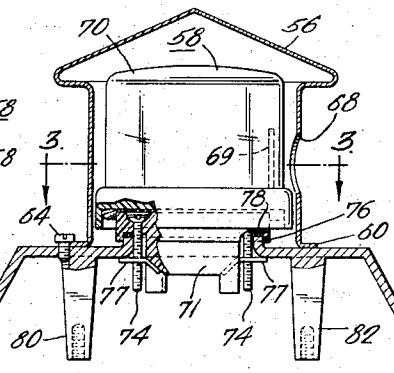




FIG. 1.

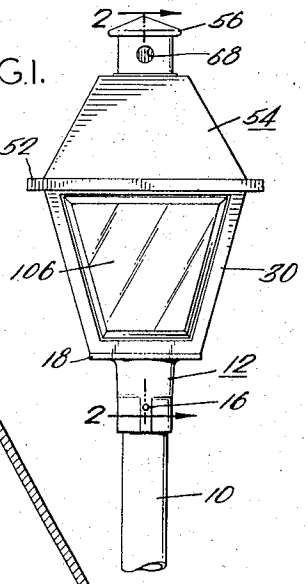



FIG. 2.

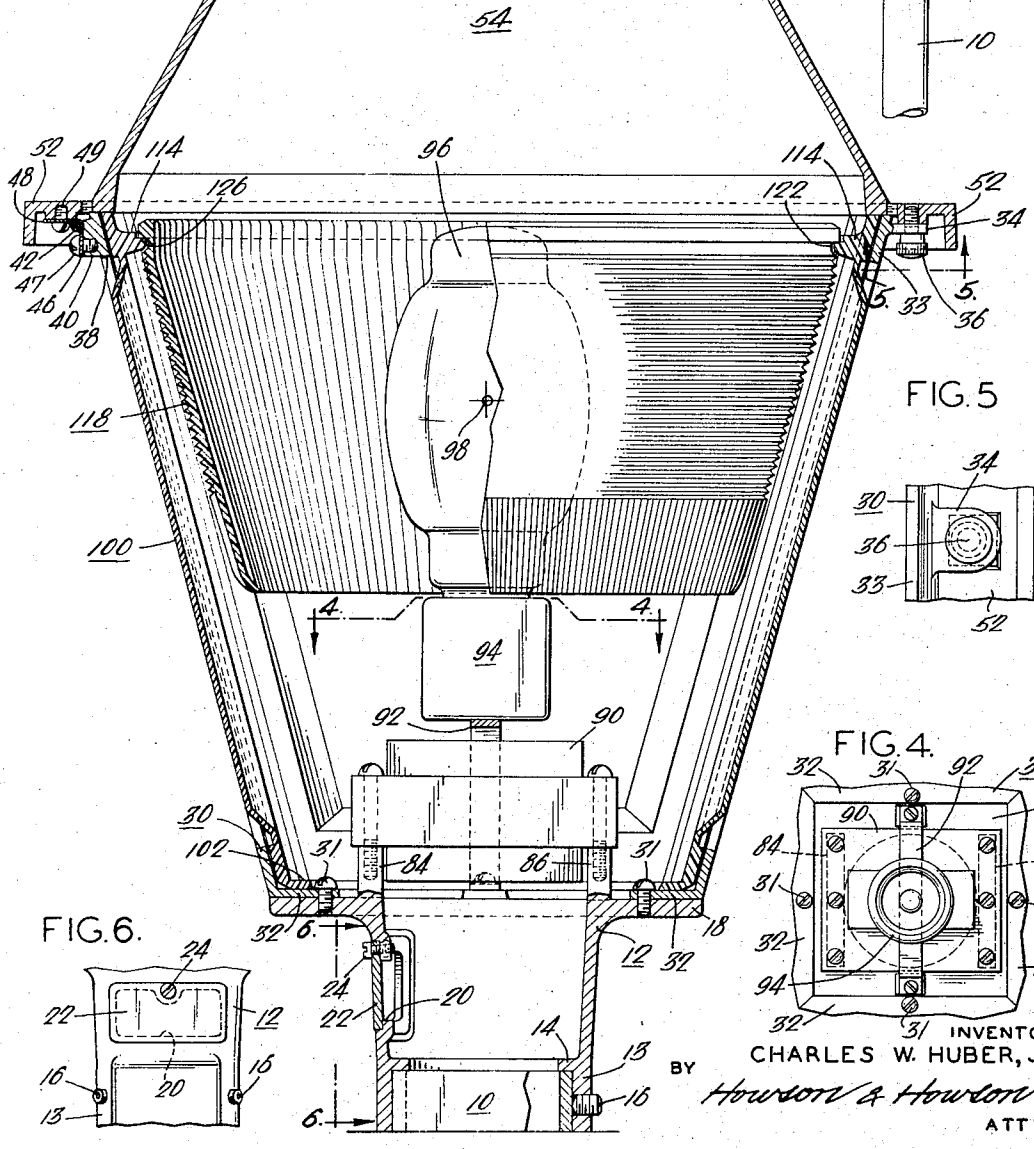



FIG. 5




FIG. 6.




FIG. 4.




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FIG. 7.

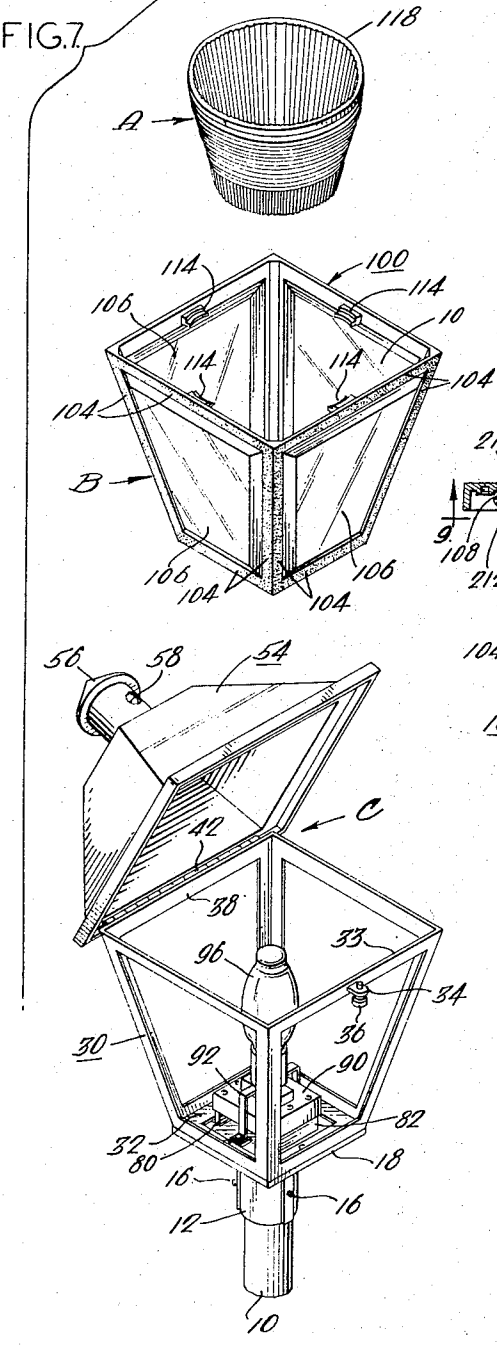



FIG. 8.

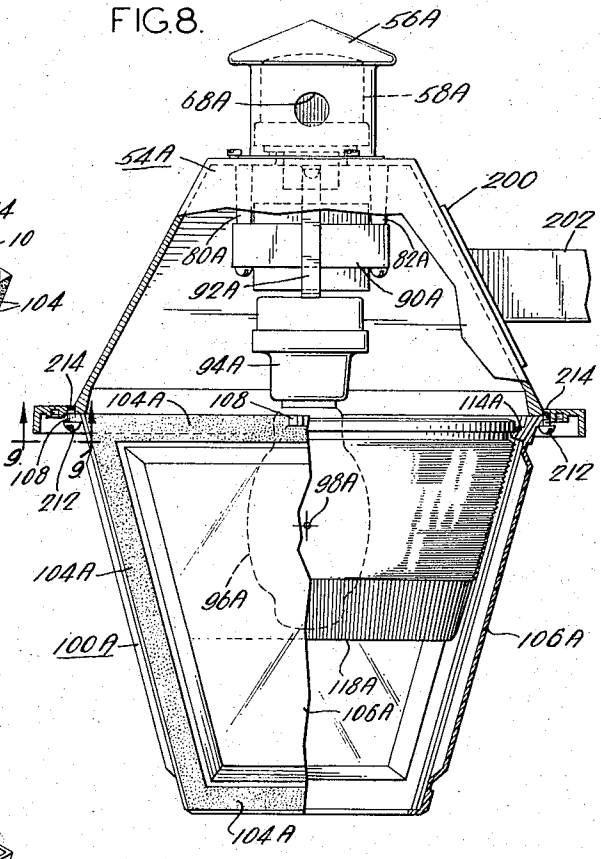



FIG. 9.

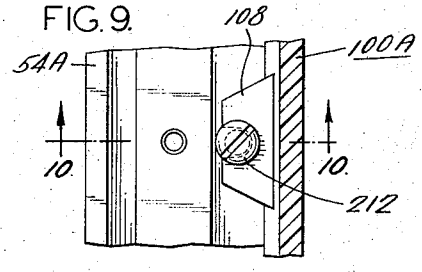
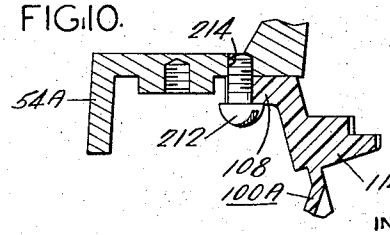



FIG. 10.




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FIG. 11.

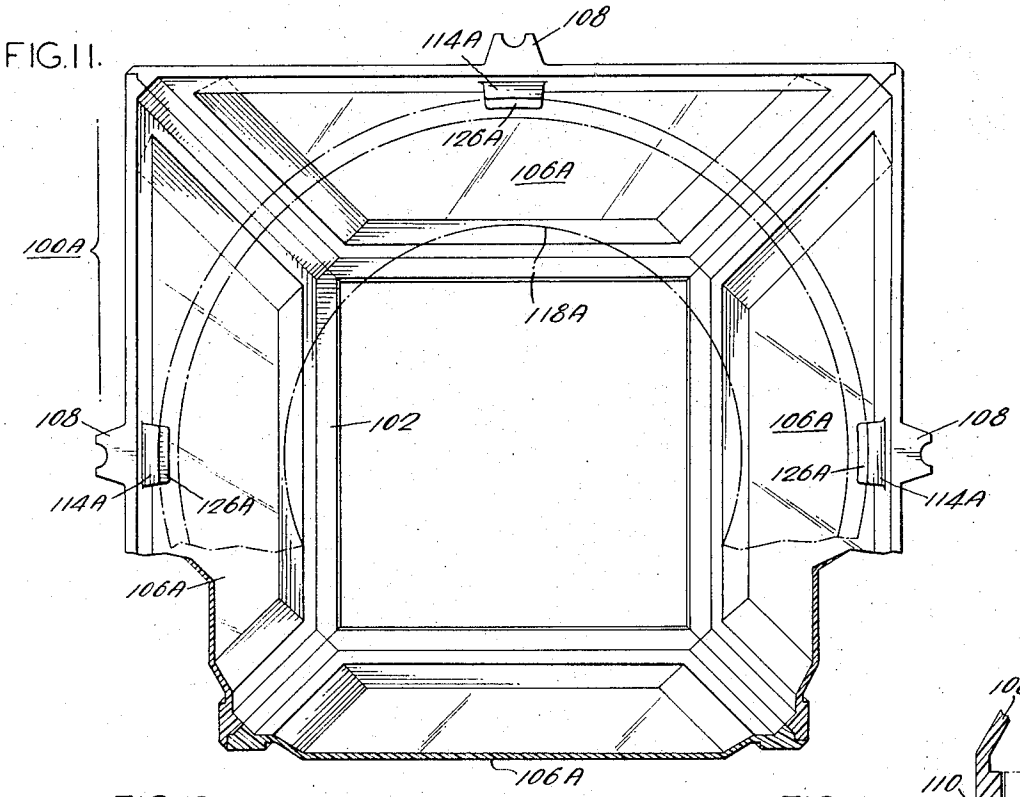



FIG. 13.

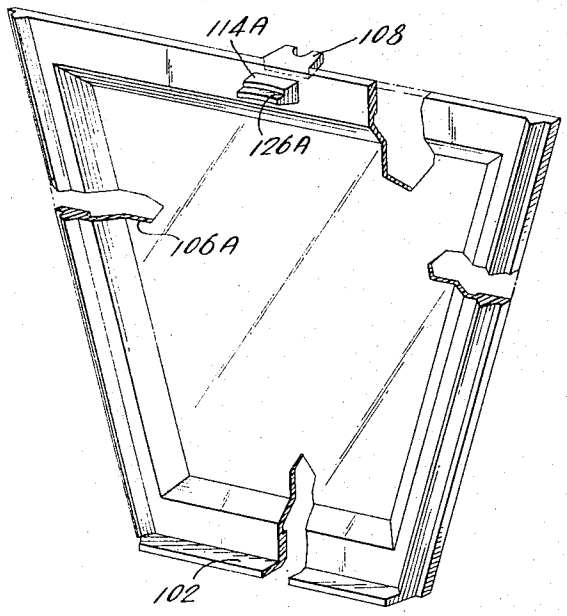



FIG. 12.

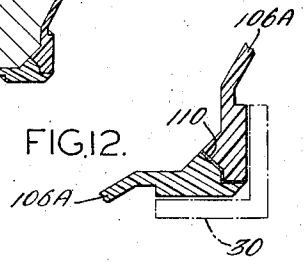
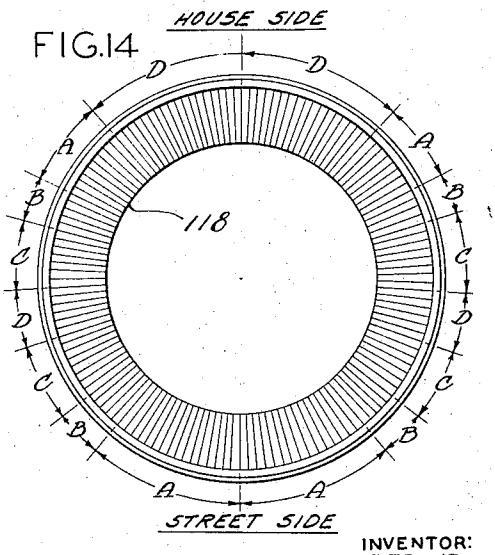



FIG. 14




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United States Patent Office 3,366,785
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3,366,785

# LIGHTING FIXTURE

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1 Claim. (Cl. 240—3)

## ABSTRACT OF THE DISCLOSURE

A lighting fixture employing a light source within a pane assembly of colonial appearance, and a refractor surrounding the light source between light source and pane assembly for providing controlled directional illumination from the fixture, whereby both colonial appearance and controlled illumination are provided. The pane assembly is a unitary structure of frusto-pyramidal form, with inwardly-extending projections on each side panel for supporting the refractor therein. The bottom-supported embodiment of the fixture uses a supporting base adapted to slip over a supporting column and a frame structure mounted on the base which provides a colonial framing of the flat translucent side panels and also supports a hinged cover and cupola of colonial appearance. In the top-mounted embodiment, the supporting base and frame are not used, the pane assembly depending from the top cover and having painted peripheral regions on each side panel thereof simulating the appearance of a frame.

### *Background of the invention*

Lighting fixtures having a colonial appearance have been popular for some time for purposes such as illumination of drives, walks and patios of private residences and the like, and, particularly recently, have also become popular for use along public ways and in commercial establishments such as automobile service stations, restaurant parking areas, etc. The colonial appearance is typified by use of an assembly of translucent side panels in polyhedral arrangement, usually frusto-pyramidal, surrounding the light source and having an opaque region along the edges of the side panels. The smaller cross-sectional end of the frusto-pyramidal form is generally disposed downwardly, and a top closure or cover of frusto-pyramidal form is usually employed, with its smaller cross-sectional end disposed upwardly. A cupola atop the cover is also common, as is a peripheral flange or band extending outwardly from the cover and side panel assembly near their juncture.

While such fixtures present a pleasing esthetic appearance, they have been characterized in the past by poor and uncontrolled illumination patterns which in general are unsuitable, or at least less than optimum, for many purposes. For example, when such a fixture is mounted high over a service station or parking area it may be desirable to concentrate the light downwardly onto the subjacent terrain. When used for residential street-lighting it may be preferred to concentrate the light toward the street and sidewalk and prevent it from glaring into the windows of adjacent houses. When used to illuminate private residential grounds it may be desirable to be able to change the illumination pattern easily, for example normally to concentrate the light on a path or patio and, at other times when the residents are away, to illuminate the house and the grounds near it so as to discourage intruders. Ease of assembly, of adjustment and of disassembly for cleaning and maintenance, as well as simplicity and low expense are other desirable features.

Analogous problems and desiderata exist in connection with other similar forms of lighting fixtures in which style requires use around the light source of a light-translucent structure which produces a poor illumination pattern.



Accordingly it is an object of the invention to provide a new and useful lighting fixture.

Another object is to provide a new and useful lighting fixture of colonial appearance which provides an improved illumination pattern.

A further object is to provide such a lighting fixture which in one form can be mounted on its bottom or, using substantially the same parts, can readily be made in a form suitable for mounting by its top cover.

It is also an object to provide a lighting fixture of colonial appearance having a controlled directional illumination pattern, which fixture is simple, economical to produce, and easy to assemble, disassemble, clean, maintain and adjust.

### *Summary of the invention*

These and other objects of the invention are achieved by the provision of a lighting fixture of colonial type in which a light source is surrounded by a translucent outer envelope of non-prismatic surface configuration, and in which a prismatic refractor is disposed about the light source between the source and the outer envelope to provide the desired external illumination pattern, whereby the desired external appearance is maintained while providing any of a variety of predetermined illumination patterns through selection and adjustment of the refractor.

Pursuant to the invention in a further aspect, the outer translucent envelope is an integral polyhedral assembly of translucent panes, preferably frusto-pyramidal, having inwardly-extending projections for supporting the refractor rotatably thereon. In one preferred form of the invention in which the fixture is bottom mounted, the translucent pane assembly fits within a frame structure and rests on the bottom thereof, the frame structure providing a framing of each of the side panels of the frusto-pyramidal pane assembly and also supporting a hinged cover. In another preferred embodiment in which the fixture is mounted from its top or cover, the pane assembly is also provided with outwardly-extending projections by which it is secured to the underside of said cover, and the external edge regions of the pane assembly are coated with a visually-distinctive material, such as black paint, to provide the appearance of a colonial frame. In these embodiments of the invention the fixture is readily assemblable and adjustable by hand, and readily disassemblable by hand for cleaning, adjustment and maintenance.

### *Brief description of the drawings*

These and other objects and features of the invention will be more readily comprehended from a consideration of the following detailed description, taken together with the accompanying drawings, in which:

FIGURE 1 is an elevational view of a preferred embodiment of the invention in which the lighting fixture is bottom-mounted;

FIGURE 2 is an enlarged sectional view taken along lines 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary sectional view taken along lines 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary sectional view taken along lines 4—4 of FIGURE 2;

FIGURE 5 is a fragmentary sectional view taken along lines 5—5 of FIGURE 2;

FIGURE 6 is a fragmentary elevational view taken along lines 6—6 of FIGURE 2;

FIGURE 7 is an exploded perspective view of the lighting fixture of FIGURE 1;

FIGURE 8 is a vertical sectional view of another preferred embodiment of the invention in which the fixture is top-mounted;

FIGURE 9 is a fragmentary view taken along lines 9—9 of FIGURE 8;

FIGURE 10 is a sectional view taken along lines 10—10 of FIGURE 9;

FIGURE 11 is a plan view, with parts broken away, of the translucent pane assembly used in the embodiment of FIGURE 8;

FIGURE 12 is an enlarged fragmentary sectional view of a portion of the panel assembly of FIGURE 11;

FIGURE 13 is a perspective view of one of the translucent side panels of the pane assembly of FIGURE 11; and

FIGURE 14 is a schematic representation of the various zones of differing refractive characteristics of the refractor shown in FIGURES 2 and 8.

*Description of the preferred embodiments*

Referring first, by way of example only, to the embodiment of the invention shown in FIGURES 1–7, FIGURE 1 illustrates the over-all external appearance of the lighting fixture as arranged for bottom mounting on a hollow supporting column **10**. Column **10** may be fixed to the terrain in any conventional manner at its lower end. The fixture has a base support structure **12** which rests on the upper end of the column **10**. As shown particularly clearly in FIGURE 2, the supporting column **10** may be a metal cylinder which fits within the interior of a lower cylindrical portion **13** of the support structure **12** so that the upper surface of the column abuts the lower surface of an inwardly-extending circular flange **14** interior to and integral with the base support structure **12**. Three set-screws such as **16** are threaded through the cylindrical portion of base support structure **12** at 120° intervals to bear against the supporting column **10** and to hold the lighting fixture in fixed position when the screws are tightened. The portions of the lower part of base support structure **12** through which the set-screws are threaded may be ridged to provide additional thickness for the threads therein.

The base support structure **12** may be an integral casting, of aluminum for example, having an upper square supporting flange **18** disposed horizontally for supporting the remainder of the lighting fixture. An opening **20** is preferably provided through a portion of the sidewall of the base support structure **12** to permit access to interior wiring, the opening **20** normally being closed by a recessed cover **22** secured by a screw **24**.

A metal frame structure **30**, which may be painted black, is supported on the upper surface of supporting flange **18** by means of screws such as **31**. As can be seen more clearly in the perspective view at C of FIGURE 7, frame **30** has four similar sides, preferably cast integrally, the frame structure as a whole in this example being substantially frusto-pyramidal in shape with its larger cross-sectional dimension upward. Each side of the frame structure is trapezoidal in outline and has a trapezoidal opening therein. Each side also has an inwardly-extending flange **32** along its bottom edge by means of which the frame structure is secured to the supporting flange **18** on the base support structure **12**. At the center of the top rail **33** of one of the sides of the frame structure there is provided an outwardly-extending ear **34** having an aperture therein to receive a screw **36** used, as described later herein, to hold the top cover closed.

The top rail **38** opposite rail **33** of frame structure **30** is provided with a thickened portion **40** (see FIGURE 2) on which there is mounted a hinge **42**. More particularly, one hinge plate **46** is secured to frame rail **38** by screws such as **47** while the other hinge plate **48** is secured by screws such as **49** to the underside of a peripheral flange **52** running around the edge of the fixture cover **54**.



The cover **54** is also generally frusto-pyramidal in shape, having its smaller cross-sectional dimension upwards. Atop the cover **54** there is a removably mounted cupola **56** of light-opaque material which covers, and forms a directional shield for, a photocell unit **58** contained therein. Thus, as shown particularly clearly in FIGURE 3, the lower end of cupola **56** is provided with an outwardly-turned flange **60** having three cut-outs **62** in its edge, so that the cupola may be affixed to cover **54**, or removed therefrom, by lining-up the cut-outs **62** with the heads of three screws **64** in the top of the cover **54**. To affix the cupola, the flange **60** is positioned beneath the screw heads by rotating the cupola from its aligned position in either direction and then tightening the screws. In this way the cupola may be fixed in any desired orientation.

An opening **68** is provided in the lateral surface of the cupola to determine the direction from which light from the exterior is permitted to reach the photocell **69** inside the photocell unit **58**. The opening **68** is normally oriented toward the north, the photocell **69** being connected to the electrical supply line by appropriate wiring (not shown) to turn off the lighting fixture during the daylight hours while permitting it to come on at night.

The photocell unit **58** may be conventional in form. In this example the photocell unit includes the photocell **69** itself and a housing **70** within and to which the photocell is mounted. The entire photocell unit is plugged into a receptacle **71** mounted on the top of cover **54**. Receptacle **71** may, for example, be a conventional three-prong locking type receptacle provided with mounting screws such as **74** which extend downwardly through cover **54** by way of an opening in the top of the cover formed by a circular upturned flange **76**. Appropriate locking tabs such as **77** are secured at one end in corresponding recesses in a downwardly-extending portion of receptacle **71**, and each is threadingly engaged by one of the screws **74**. The receptacle **71** can therefore be rotated to any desired position and the screws then tightened to urge the tabs against the undersurface of cover **54** and there hold the receptacle in fixed position. A resilient O-ring **78** may be provided between receptacle **71** and flange **76**. The photocell unit is provided on its bottom with suitable means for mounting it in the receptacle and providing the necessary electrical connections, typically comprising a three-prong locking-type plug arrangement.

Cover **54** also has formed integrally therewith, as by casting, a pair of downwardly-extending spaced pedestals **80** and **82** having tapped holes in the lower surfaces thereof, which are not utilized in the present embodiment of the invention but, as described later herein, are used in the top-mounted form of the invention illustrated particularly in FIGURE 8.

Returning now to the contents of the lower portion of the fixture, a pair of rectangular, generally block-like pedestals **84** and **86** are provided on the upper surface of supporting flange **18**, preferably by casting them integrally with the base support structure **12**. The usual electrical ballast **90** is mounted on the latter pedestals by appropriate screws. A supporting strap **92** is screwed at its opposite ends to pads **93** on the base supporting flange **18**, and extends upward and across the top of the ballast **90**. The light support **94**, which may be a lamp socket, is appropriately mounted on strap **92** and the light source **96** is screwed into it in operating position. The light source **96** may be any electric lamp suitable for the particular application, the effective center of illumination being indicated at **98**.

Surrounding light source **96** is a translucent pane assembly **100**, shown particularly clearly at B of FIGURE 7. The translucent pane assembly is generally frusto-conical and four-sided so as to be similar to the general configuration of frame **30**, but is somewhat

smaller so that it may readily be dropped into the interior of frame 30. Plastics are preferred for the material of the pane assembly, although glass can be used. The pane assembly 100 is open at its top and bottom, in this example being provided with an inwardly-extending flange 102 at its lower end which rests upon the lower flange 32 of frame 30. Each side panel of the pane assembly 100 has a trapezoidal peripheral framelike portion 104, which is the portion which fits against and behind the rails of the frame 30. Each side panel has a central portion 106 which is bevelled outwardly so as to extend into each of the openings provided by frame 30. Preferably the pane assembly is of molded translucent plastic except for the peripheral frame-like portions 104 which are painted black on their outer sides as indicated by the stippling at B of FIGURE 7. In the embodiment of FIGURE 1 the painted portions of the side panels lie behind the frame 30 which itself is preferably painted black, and hence it is not material whether or not the frame-like portions of the pane assembly are painted; however, the painting of the frame-like portions of the pane assembly is significant in the embodiment of FIGURE 8 to be described later herein. The main central pane portions of the side panels are flat, and are preferably finely-pitted like ground-glass so as to be translucent but not transparent.

Details of the preferred construction of the translucent pane assembly 100 are shown in FIGURES 11–13, which show the pane assembly with external projections 108 which are used in the embodiment of FIGURE 8 but are cut off when the pane assembly is to be used in the embodiment of FIGURE 2. Each of the side portions of the pane assembly is preferably molded separately, as represented in FIGURE 13, and provided with overlapping edge portions which fit together and are secured by a suitable cement as represented at 110 in FIGURE 12. The individual side panels may be identical, and are preferably formed by molding in a mold which has been previously treated so as to produce a finely-pitted surface which permits light to pass through it but prevents objects within the pane assembly from being readily visible from the exterior.

As can be seen particularly clearly in FIGURES 2 and 7B, inwardly-extending supporting projections 114 are provided near the top of each of the side panels of pane assembly 100, each such projection being centered laterally with respect to its associated side panel. These projections are preferably molded integrally with each of the side panels. The inward ends of these projections are formed to engage and support a prismatic refractor 118 of generally frusto-conical form which is mounted within the pane assembly 100 with its smaller cross-sectional end downward and its conical axis passing through the axis of the light source 96 so as to surround the light source in symmetrical fashion. In the present example the refractor 118 is provided near its top with a peripheral groove 122 into which the inward ends of each of the projections 114 extend. In the embodiment shown, each of the projections is provided at its inward end with a shoulder region 126 which engages, supports and centers the refractor 118. The refractor is located so that the center of illumination 98 of lamp 96 is located to coincide with the design light center of the refractor.

The refractor 118 may be of any of a variety of known forms having the property of producing the desired directional pattern for the light passing through it from light source 96. The choice of the pattern of light distribution designed into the refractor depends upon the particular application and the purpose to be served by the lighting fixture. In the present example the refractor is of a plastic material, such as a polycarbonate or acrylic, although glass can be used. Its outer surface has different vertically-spaced prismatic regions and its inner surface has different prismatic regions angularly-spaced about the axis of the refractor, as represented schematically in FIGURE 14. In the latter figure the regions indicated by the same letter have the same refractive properties. For example, where the lighting fixture is used for street illumination the upper side of FIGURE 14 may represent the side on which a house is located and the lower side may be the street side. In this case the refracting zones may be so chosen and positioned as to provide the desired illumination pattern for illuminating the street while preventing strong illumination or glare toward the windows of the house. Such refractors and their design and use being well known in themselves, they will not be described in detail herein.

There are various ways to assemble the apparatus described above, one of which is as follows. The ballast 90 is screwed to the supporting pedestals 84 and 86, the strap 92 is screwed to the supporting flange 18, and the frame structure 30 is screwed to the supporting flange 18. The base support structure is slipped over the supporting column 10 and the set-screws 16 tightened. The electrical wiring for the fixture may be connected to the supply wiring by working through opening 20 and the cover 22, after which the screw 24 is tightened to clamp the cover closed. The light source 96 may then be screwed into its socket 94 with the top or cover 54 open. The translucent pane assembly 100 may then be lowered inside frame 30 to seat in its proper position therein, after which the refractor 118 is lowered into position to be engaged and supported by the projections 114. The refractor may then be rotated by hand to provide the desired orientation of illumination pattern. The cover 54 may then be closed and the screw 36 tightened to secure the cover in its closed position. With the cupola 56 and photocell unit 58 removed, the screws 74 are loosened and the locking-type receptacle 71 turned to the position for which the photocell will be oriented toward the north, and the screws retightened. The photocell unit 58 is then plugged in, cupola 56 placed in position and turned until the opening 68 therein is also oriented toward the north, after which the cupola-clamping screws 64 are tightened.

To replace the light source, the top cover 54 need merely be opened, the old lamp removed, a new one inserted and the cover reclosed. To clean the fixture, the cover may be opened, the refractor and translucent pane assembly removed and taken to a place convenient for cleaning, cleaned and replaced. As pointed out above, the refractor can also be readily rotated in position to rotate the pattern of illumination for any desired purpose.

In this way there is provided a lighting fixture of colonial appearance which nevertheless provides controlled directional illuminating characteristics, which is relatively simple to make and use, and which can readily be disassembled for cleaning or replacement purposes.

FIGURES 8, 9 and 10 illustrate an embodiment of the invention in which the lighting fixture is top-supported and yet may utilize only parts which are also utilized in the bottom-mounted form of fixture previously described, except perhaps for the lamp socket which may in some cases be slightly different to provide the same center of illumination by the lamp. Accordingly elements of the embodiment of FIGURE 8 corresponding to those of the embodiment of FIGURE 2 are indicated by the same numeral with the suffix A.

In this case the cover 54A may be bolted at one of its side surfaces to a flange 200 on a metal supporting arm 202, which may be tubular or a rod of rectangular cross-section for example. Arm 202 in turn may, for example, be fastened to a vertical supporting pole (not shown) affixed to the ground, or provided with a mounting plate at its opposite end for wall mounting, thereby to provide an overhanging position for the fixture. The cover 54A, cupola 56A and the arrangement for mounting and utilizing the photocell unit 58A may all be the same as in the embodiment of FIGURE 2. In this case, however, the pedestals 80A and 82A are uti-

lized to mount the electrical ballast 90A, and the strap 92A is screwed to the undersurface of the top of the cover. The lamp socket 94A is mounted on the lower end of strap 92A and the light source 96A is screwed into the socket 94A in an upside-down position so that its center of illumination 98A occupies substantially the same position with respect to the refractor 118A as in the previously-described embodiment.

In this example the frame structure 30 and the base support structure 12 are not utilized. Instead the translucent pane assembly 100A is mounted from the cover 54A by means of outwardly-extending projections or tabs 108 molded integrally with each of the side panels, as shown particularly clearly in FIGURES 9, 10, 11 and 13. The latter tabs are formed directly opposite the inwardly-extending projections 114A which support the refractor 118A in a manner previously described. More particularly, the translucent pane assembly 100A is secured by means of four screws 212, one on each side of the assembly, which are screwed into threaded recesses 214 provided in the flange 52A of the top cover. The above-mentioned projections 108 are thereby clamped to the top cover 54A to support the pane assembly and refractor. To clean the fixture, the screws 212 are removed and pane assembly 100A and refractor 118A dropped away from the top cover. The lamp can be removed through the opening in the bottom of the fixture. If diffusing of the downward illumination is desired, a suitable removable diffusing plate can be inserted through the bottom of the fixture to lie against the inner surface of inwardly-extending flange 102A of the pane assembly 100A.

The painted peripheral frame-like portions of each of the side panels of the pane assembly 100A are no longer shielded by the frame as in the previous embodiment, but because of their coating with black paint simulate the appearance of the black frame customarily used in colonial type fixtures, thereby preserving the over-all colonial appearance.

It is pointed out that the same translucent pane assembly which is utilized in the embodiment of FIGURE 8 may be utilized in the embodiment of FIGURE 2 merely by cutting off the outwardly-extending projections 108. Accordingly, in production only a single type of pane assembly need be made, namely that which has both inwardly and outwardly extending projections and has the black-painted frame-like peripheral region around the side panel; in the case of the embodiment of FIGURE 1 the outer projections are not utilized and the black-painted region is covered by the frame and hence is not significant; in the embodiment of FIGURE 8, both the inwardly and outwardly extending projections are utilized and the black-painted regions supply the colonial appearance of a black frame.

Accordingly there has been provided a lighting fixture having a colonial appearance which nevertheless, because of the use of a refractor inside the pane assembly, can provide the desired directional illuminating characteristics. The novel integral pane assembly constitutes a rigid, strong, easy to make, easily inserted and removed assembly which provides simple adjustable support for the refractor and is useable with only minor modification for either a bottom-mounted or top-mounted lighting fixture. The arrangement of the other parts is such as to permit many identical parts to be utilized in either bottom-mounted or top-mounted embodiments thereof.



It will be appreciated that the exact shape and configuration of the pane assembly, and of the surrounding frame when utilized, may be different from that shown, especially with respect to the numbers of side panels which may be greater or less than the number shown, although usually the cross-section of the device of the pane assembly will be a regular polygon with identical side panels.

While the invention has been described with reference to specific embodiments thereof in the interest of complete definiteness, it will be understood that it may be embodied in any of a variety of other forms without departing from the spirit and scope of the invention as defined by the appended claim.

What is claimed is:

1. A lighting fixture of generally colonial appearance and directional illumination characteristics, comprising:

a light source;

an integral polyhedral assembly of substantially flat panel members each having a central quadralateral translucent region and a peripheral border having an appearance differing from that of said translucent region, said panel members being disposed symmetrically about said light source;

a refractor of circular cross-section surrounding said light source symmetrically and disposed between said light source and said translucent regions for imposing a predetermined directional pattern on the light from said source, said refractor being supported on said polyhedral assembly;

a polyhedral cover over said assembly of panels;

a frame structure having a bottom surface on which said assembly rests and comprising peripheral rail members framing each of said panel members;

hinge means for mounting said cover on said frame structure, said cover being pivotable on said hinge member to permit removal of said assembly and said refractor from said frame structure;

said assembly and said frame structure being frusto-pyramidal in form with their smaller cross-sectional ends disposed downwardly and said cover being frusto-pyramidal with its larger cross-sectional end disposed downwardly, said assembly comprising integral inwardly-extending projections for supporting said refractor; and

a cupola mounted atop said cover containing a photocell unit for controlling the supply of electrical current to said light source.


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