June 15, 1965 W. M. WALDBAUER 3,189,736

LIGHTING FIXTURE

Filed May 21, 1963 5 Sheets-Sheet 1

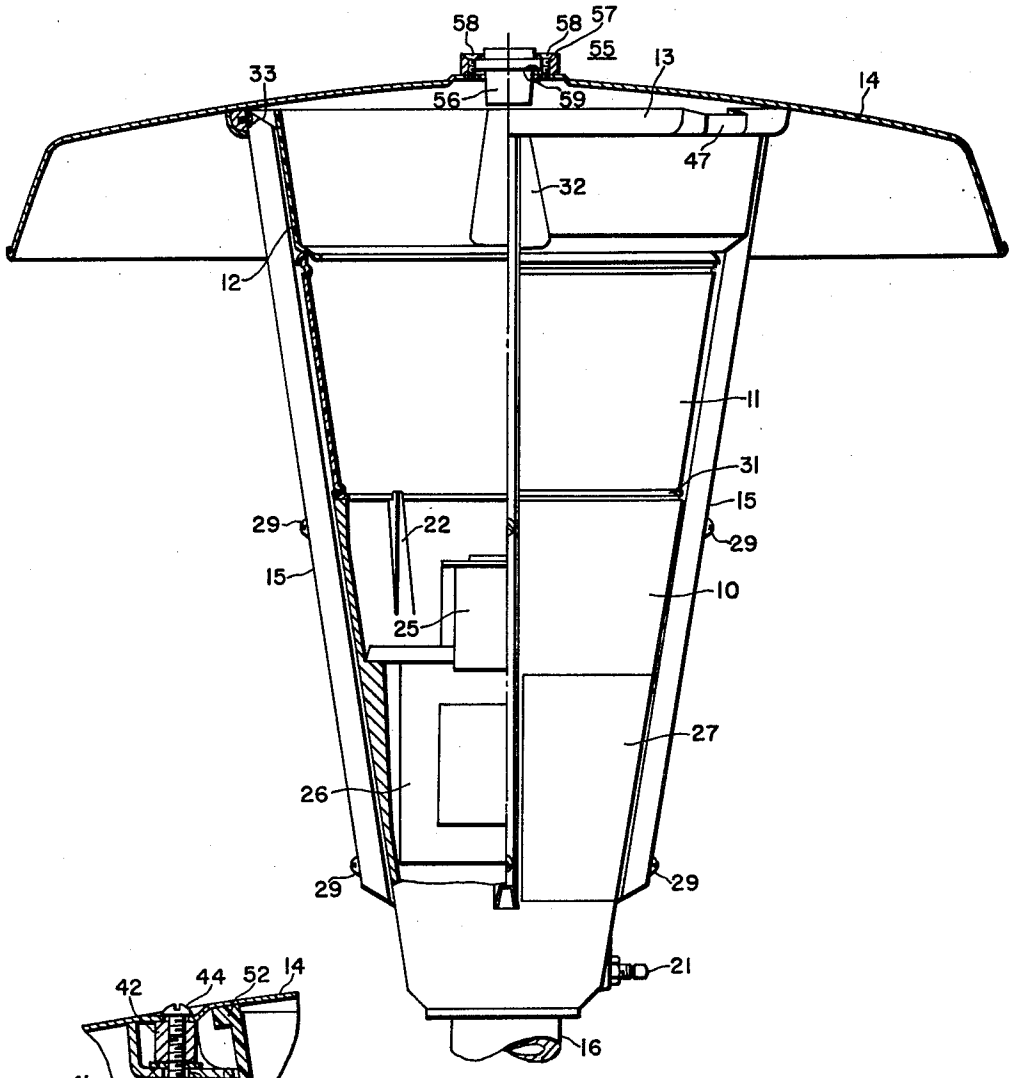

Fig.1.

Fig.2.

WITNESSES

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LIGHTING FIXTURE

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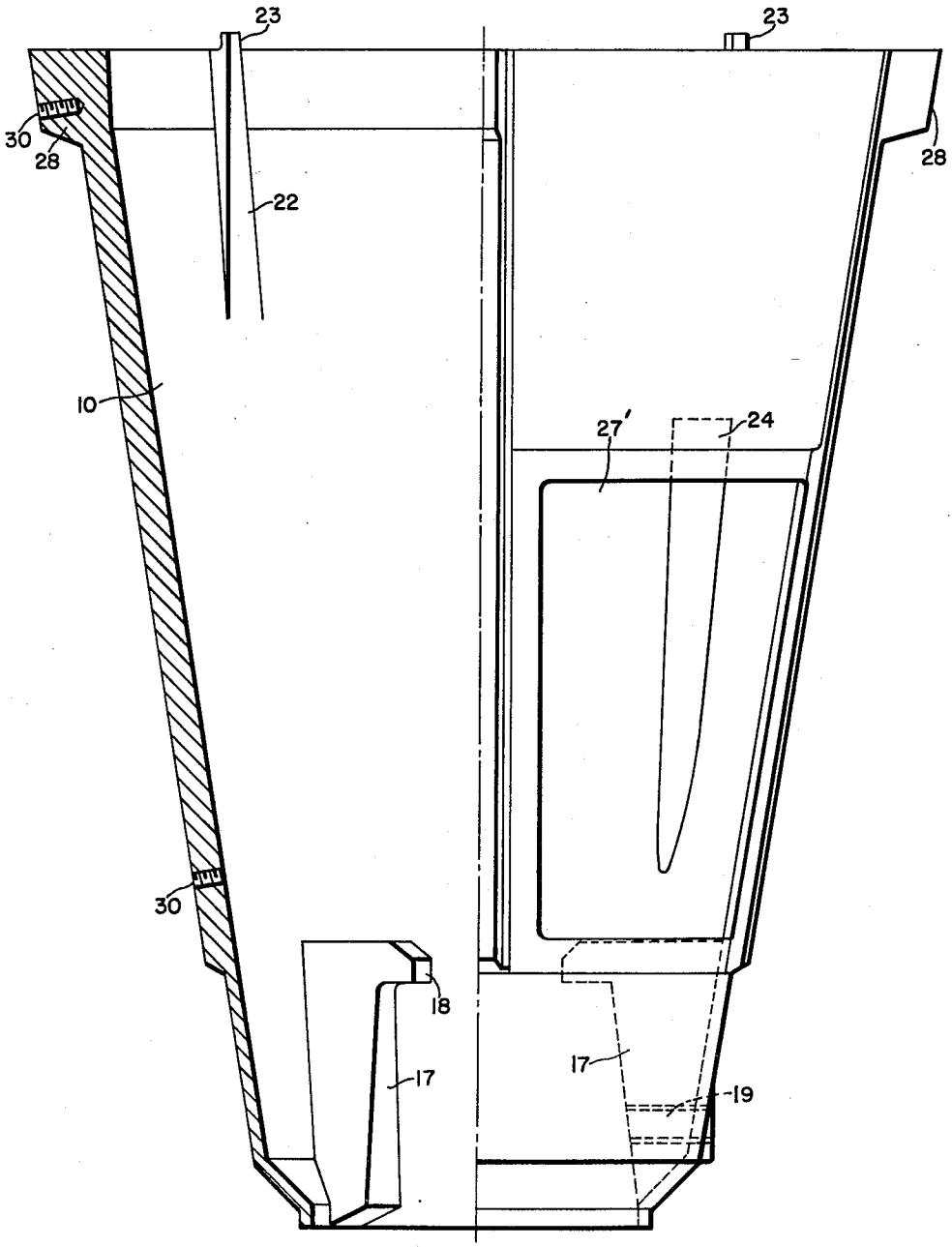

Fig. 3.

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LIGHTING FIXTURE

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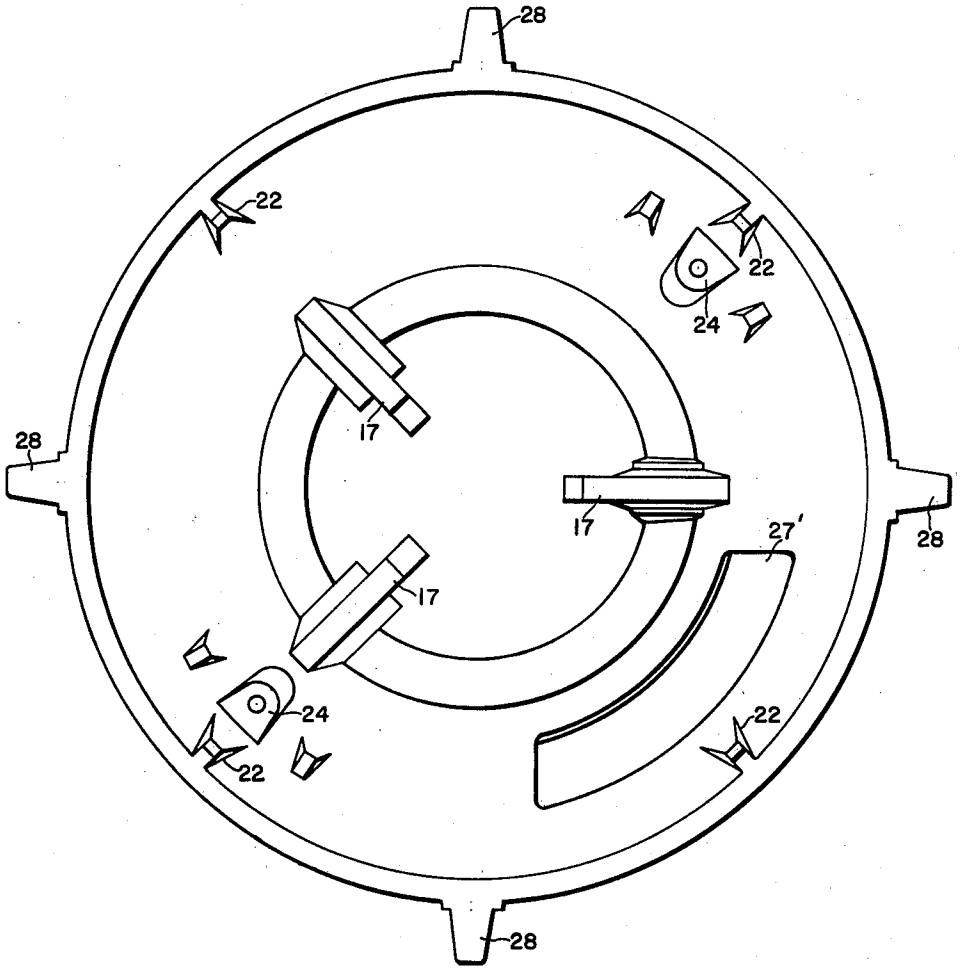

Fig. 4.

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LIGHTING FIXTURE

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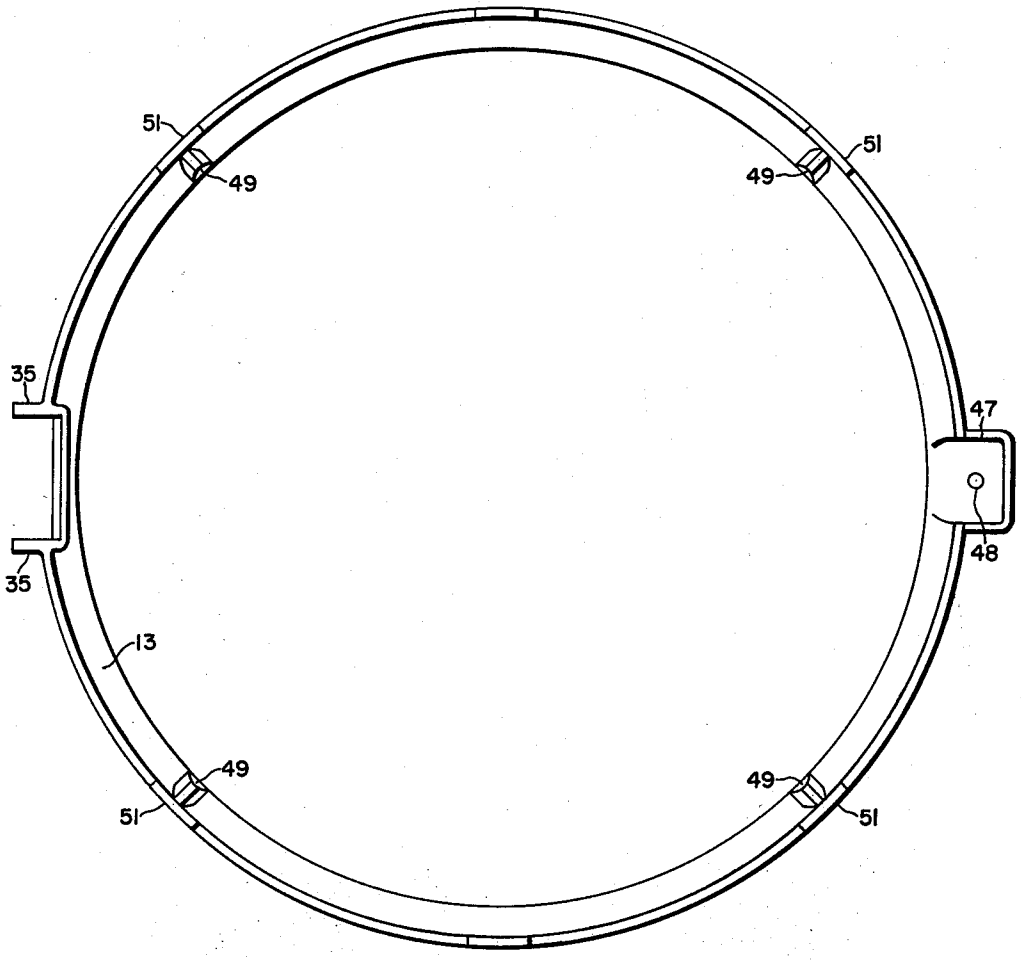

Fig.5.

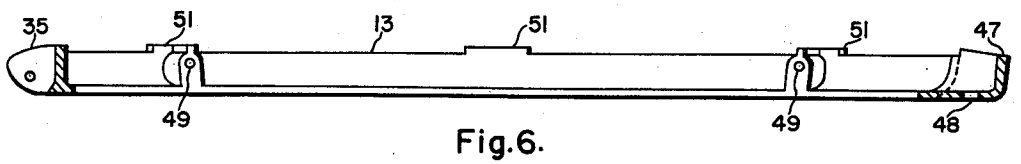

Fig.6.

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LIGHTING FIXTURE

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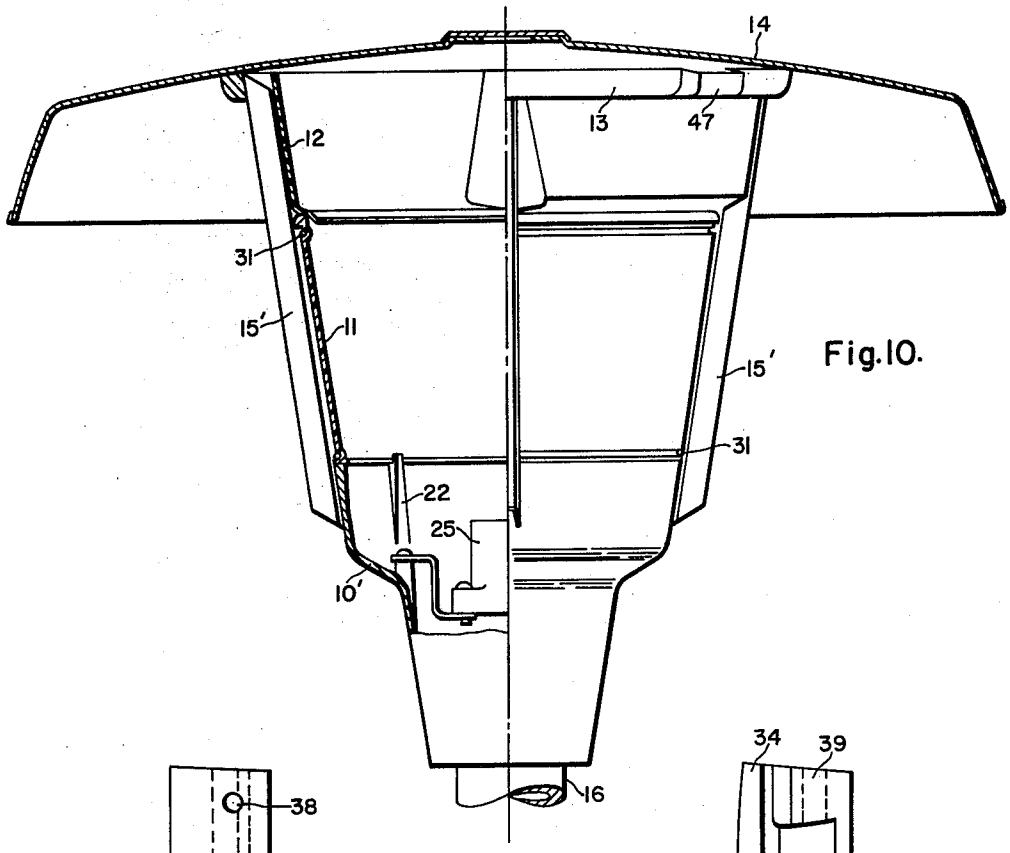

Fig.10.

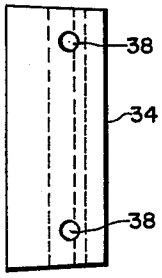

Fig.7.

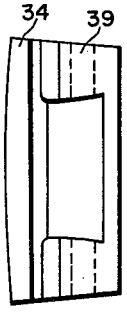

Fig.8.

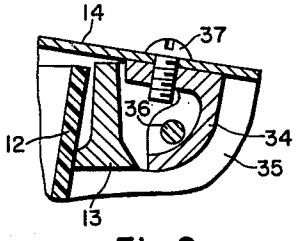

Fig.9.

United States Patent Office 3,189,736 Patented June 15, 1965

3,189,736

LIGHTING FIXTURE

Walter M. Waldbauer, North Olmsted, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Filed May 21, 1963, Ser. No. 281,916
7 Claims. (Cl. 240—3)

This invention relates, generally, to lighting fixtures and, more particularly, to outdoor lighting fixtures, generally known as luminaires.

An object of the invention is to provide a luminaire suitable for the lighting of malls, campus type developments, parks, recreation areas, parking areas, residential and business streets, etc.

Another object of the invention is to provide an improved luminaire which may be readily attached to the top of a post or pole.

A further object of the invention is to provide an improved luminaire having a sectionalized refractor assembly.

Still another object of the invention is to provide a luminaire having a hinged cover or reflector which can be opened to permit optical members to be lifted out of the supporting housing of the luminaire.

A still further object of the invention is to provide spaced members extending from the housing for supporting the cover assembly and which merge into the general appearance of the luminaire.

Other objects of the invention will be explained fully hereinafter or will be apparent to those skilled in the art.

In accordance with one embodiment of the invention, an inverted generally frustoconical-shaped housing may be attached to the top end of a pole by means of a single set screw. A sectionalized generally frustoconical-shaped refractor is mounted on top of the housing and a generally frustoconical-shaped diffuser is mounted on top of the refractor. Four outer bars equally spaced around the housing are attached to the housing and extend to the top of the diffuser where they support a top ring to which a cover is hinged. The bars cover the joints between quadrants of the refractor. A door in the housing provides access to a ballast assembly inside the housing.

For a better understanding of the nature and objects of the invention, reference may be had to the following detailed description, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a view, partly in elevation and partly in section, of a luminaire embodying the principal features of the invention;

FIG. 2 is a detail view of a latch for the cover of the luminaire;

FIG. 3 is an enlarged view, partly in section and partly in elevation, of the metal housing for the luminaire;

FIG. 4 is a top plan view of the housing;

FIG. 5 is an enlarged view, in plan, of a top ring for the luminaire;

FIG. 6 is a view, partly in section and partly in elevation of the ring shown in FIG. 6;

FIGS. 7, 8 and 9 are detail views of the hinge for the cover of the luminaire; and

FIG. 10 is a view, partly in section and partly in elevation, of a modification of the luminaire shown in FIG. 1.

Referring to the drawings, and particularly to FIG. 1, the luminaire shown therein comprises a housing **10**, a refractor assembly **11**, a diffuser **12**, a top ring **13**, a cover **14**, and four bars **15** which are equally spaced around the outside of the luminaire. As shown, the luminaire may be mounted on top of a post or pole **16**.

The housing **10** is preferably cast from aluminum or other suitable material. As shown most clearly in FIGS. 3 and 4, the housing is generally frustoconical in shape, open at both ends, and is mounted in an inverted position with the end having the smaller diameter at the bottom and the end having the larger diameter at the top.

The housing is provided with three equally spaced, integrally formed internal ribs **17** at its bottom end for mounting the housing on the pole **16**. Each rib **17** has an inwardly extending projection **18** thereon for engaging the top of the pole. A threaded opening **19** is provided in one rib **17** for receiving a set screw **21**, shown in FIG. 1, for attaching the housing to the pole **16**.

The housing **10** is also provided with four equally spaced internal shoulders **22** at the top of the housing. Each shoulder **22** has an upwardly extending projection **23** thereon. The shoulders **22** support the refractor assembly **11**. Oppositely disposed bosses **24** are provided on the inside of the housing **10**. The bosses **24** support a lamp holder **25** and a ballast assembly **26**. A door **27** is provided for an opening **27'** in the housing **10** between two of the vertically extending bars **15** to permit access to the ballast assembly **26**. Four equally spaced external projections **28** extend longitudinally of the housing **10**. One of the bars **15** is attached to each projection **28** by screws **29**, as shown in FIG. 1, which are threaded into holes **30** in the projections **28**.

The refractor **11** and the diffuser **12** are preferably composed of plastic material. However, they may be composed of glass if desired. The refractor **11** is preferably made in four quadrants which are held assembled by bands or wires **31** disposed in grooves at the top and/or bottom of the refractor assembly. The refractor is generally frustoconical in shape and is mounted with the small end at the bottom and the large end at the top. The refractor can be made in one piece if desired. However, a wide variety of light distribution can be achieved by suitable arrangement of various quadrant sections. As previously explained, the refractor assembly is supported by the shoulders **22** on the housing **10**.

The diffuser **12** is preferably made in one piece. It is also generally frustoconical in shape and is disposed at the top of the refractor assembly with the small end of the diffuser resting on the top of the refractor **11**. The diffuser is provided with insert portions **32** in order to clear the bars **15**.

As shown in FIG. 1, the top ring **13** encircles the top of the diffuser **12**. The ring **13** is supported by the four bars **15** to which it is attached at the top of the bars by screws **33**. The cover **14** is mounted on the ring **13** by means of a hinge **34**. As shown in FIG. 5, the ring **13** has two spaced projections **35** thereon for receiving the hinge member **34** which is retained between the projections **35** by means of a pin **36**.

The hinge member **34** is shown in FIGS. 7, 8 and 9. It is attached to the cover **14** by screws **37** which may be threaded into tapped openings **38** in the hinge member. The hinge member has an opening **39** therethrough for receiving the pin **36** to retain the hinge member between the projections **35** on the ring **13**.

The cover **14** is preferably formed from sheet aluminum. It may be painted a suitable color on the outside and reflecting white on the inside. As shown most clearly in FIGS. 1 and 2, the cover **14** is retained closed by means of a latch assembly **41**. The latch assembly **41** comprises a short bar **42** attached to the cover **14** by a screw **44**. The bar **42** is engaged by a screw **46** held captive by a washer **45** in a lateral projection **47** on the top ring **13**. The screw **46** may be of the quick release type.

As shown in FIGS. 5 and 6, the projection **47** has an opening **48** therein for receiving the screw **46**. The projection **47** is located diametrically opposite the hinge member on the ring **13**. The ring **13** has tapped openings **49**

therein for receiving the screws 33 for attaching the ring to the outer bars 15. When the cover 14 is opened the diffuser 12 and the refractor 11 may be lifted out of the luminaire for cleaning purposes.

As shown most clearly in FIGS. 5 and 6, the ring 13 has spaced upwardly extending projections 51 thereon which engage the cover 14 when it is closed. Likewise, the diffuser 12 has spaced upwardly extending projections 52 (see FIG. 2) around its top. In this manner clearance is provided between the main portions of the ring 13, the diffuser 12 and the cover 14. Also, the bottom opening of the housing 10 for the pipe 16 is larger than the pipe, thereby permitting air to enter between the ribs 17 at the bottom of the housing. Heat from the lamp creates a chimney effect causing the air to rise. The hot air is exhausted between the diffuser and the cover, and between the ring and the cover.

If automatic control of the luminaire is desired, a photocontrol unit 55 may be mounted on the top of the cover 14 as shown in FIG. 1. The photocontrol unit comprises a receptacle 56 which is retained in an opening in the cover 14 by means of an adapter 57 which is attached to the cover by screws 58. A gasket 59 may be provided between a flange on the receptacle 56 and the cover 14.

The outer bars 15 are generally U-shaped in cross-section. The wires from the photocontrol unit 55 may be disposed inside one of the bars 15 to connect the photocontrol unit with the ballast equipment in the housing. The bars 15 are disposed over the joints between quadrants of the refractor 11, thereby concealing the joints. The bars extend from near the bottom of the housing to the top ring 13.

The modified luminaire shown in FIG. 10 is similar to the one shown in FIG. 1 with the exception that the housing does not contain the ballast equipment. Accordingly, the housing 10' shown in FIG. 10 is shorter in length than the housing 10 shown in FIG. 1. The housing 10' is attached to a pole 16 in the same manner as the housing 10. The outer bars 15' in the structure shown in FIG. 10 are shorter than the bars 15 in FIG. 1 since they extend only from near the top of the housing 10' along the refractor 11 and the diffuser 12 to the top ring 13 to which they are attached in the manner hereinbefore described. The refractor 11 is supported by the housing 10' in the manner hereinbefore described and the diffuser 12 is mounted on top of the refractor 11 as previously described.

From the foregoing description it is apparent that the invention provides a luminaire which may be readily attached to the top of a supporting post or pole. The internal ribs provided in the housing for supporting the luminaire insure good alignment with the pole. The sectionalized refractor permits flexibility of light control and distribution. The hinged top cover, which also functions as a reflector, permits the plastic components to be lifted out for cleaning and also permits lamp replacement. The four bar system for supporting the top members of the luminaire merges into the general appearance of the luminaire. The bars also provide a raceway for the wires from the photocontrol unit when one is utilized. When the longer housing is provided, the ballast equipment may be mounted inside the housing.

Since numerous changes may be made in the above described construction, the different embodiments of the invention may be made without departing from the spirit and scope thereof. It is intended that all matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. A luminaire for vertical mounting on a support, said luminaire comprising:

(a) a hollow housing terminating in upper and lower ends, connecting means disposed proximate the lower end of said housing for affixing said housing to said support, and refractor holding means proximate the upper end of said housing;

(b) a plurality of support means affixed to said housing and extending upwardly from said housing;

(c) a hollow refractor member terminating in upper and lower ends, the lower end of said refractor member resting on said refractor holding means, the outer surface of said refractor member interfitting between said plurality of upwardly extending support means to prevent substantial lateral movement of said refractor member;

(d) a hollow light diffuser terminating in upper and lower ends and supported at its lower end by the upper end of said refractor member, the outer surface of said diffuser interfitting between said plurality of upwardly extending support means to prevent substantial lateral movement of said diffuser;

(e) a cover supporting means affixed to the upper ends of said upwardly extending support means and having an opening therein greater than the outside diameters of said diffuser and said refractor member; and

(f) a cover hingedly affixed to said cover supporting means and having a closed and an open position, when in said closed position said cover acting to block any substantial upward movement of said diffuser and refractor member, when said cover is in said open position said diffuser and said refractor member being readily removable from said luminaire by lifting them upwards through said cover supporting means.

2. The luminaire as specified in claim 1, wherein a light source holder means is secured within said housing.

3. A luminaire for vertical mounting on a support, said luminaire comprising:

(a) a hollow housing terminating in upper and lower ends, connecting means disposed proximate the lower end of said housing for affixing said housing to said support, and refractor holding means proximate the upper end of said housing;

(b) a plurality of support bars affixed to said housing and extending upwardly from said housing;

(c) a hollow refractor member terminating in upper and lower ends, the lower end of said refractor member resting on said refractor holding means, the outer surface of said refractor member closely interfitting between said plurality of upwardly extending support bars to prevent lateral movement of said refractor member;

(d) a hollow light diffuser terminating in upper and lower ends and supported at its lower end by the upper end of said refractor member, the outer surface of said diffuser interfitting closely between said plurality of upwardly extending support bars to prevent lateral movement of said diffuser;

(e) a cover supporting ring affixed to the upper ends of said upwardly extending support bars and having an inside diameter greater than the outside diameters of said diffuser and said refractor member; and

(f) a cover hingedly affixed to said cover supporting ring and having both a closed and an open position, when in said closed position said cover acting to block any substantial upward movement of said diffuser and refractor member, and when said cover is in said open positon said diffuser and said refractor member being readily removable from said luminaire by lifting them upwards through said cover supporting ring.

4. A luminaire for vertical mounting on a support, said luminaire comprising:

(a) a hollow housing terminating in upper and lower lower ends, connecting means disposed proximate the lower end of said housing for affixing said housing

to said support, and refractor holding means proximate the upper end of said housing;

(b) a plurality of support bars affixed to said housing and extending upwardly from said housing;

(c) a hollow refractor member terminating in upper and lower ends, the lower end of said refractor member resting on said refractor holding means, the outer surface of said refractor member closely interfitting between said plurality of upwardly extending support bars to prevent lateral movement of said refractor member;

(d) a hollow light diffuser terminating in upper and lower ends and supported at its lower end by the upper end of said refractor member, the outer surface of said diffuser interfitting closely between said plurality of upwardly extending support bars to prevent lateral movement of said diffuser:

(e) a cover supporting ring affixed to the upper ends of said upwardly extending support bars and having an inside diameter greater than the outside diameters of said diffuser and said refractor member;

(f) a cover hingedly affixed to said cover supporting ring and having a closed and an open position, when in said closed position said cover extending over and beyond said cover supporting ring and acting to block any substantial upward movement of said diffuser and refractor member, when said cover is in said open position said diffuser and said refractor member being readily removable from said luminaire by lifting them upwards through said cover supporting ring; and

(g) latching means affixed to said supporting ring for releasably engaging said cover.

5. A luminaire for vertical mounting on a support, said luminaire comprising:

(a) a hollow housing terminating in upper and lower ends, connecting means disposed proximate the lower end of said housing for affixing said housing to said support, and refractor holding means proximate the upper end of said housing;

(b) a plurality of support bars affixed to said housing and extending upwardly from said housing, said support bars having a U-shaped cross section with the concave side thereof facing inwards;

(c) a hollow refractor member terminating in upper and lower ends, the lower end of said refractor member resting on said refractor holding means, the outer surface of said refractor member closely interfitting between said plurality of upwardly extending support bars to prevent lateral movement of said refractor member;

(d) a hollow light diffuser terminating in upper and lower ends and supported at its lower end by the upper end of said refractor member, the outer surface of said diffuser interfitting closely between said plurality of upwardly extending support bars to prevent lateral movement of said diffuser;

(e) the inwardly disposed concave surface of said support bars and the outer surfaces of said refractor member and said diffuser which are proximate said support bars forming a plurality of elongated enclosures;

(f) a cover supporting ring affixed to the upper ends of said upwardly extending support bars and having an inside diameter greater than the outside diameters of said diffuser and said refractor member;

(g) a cover hingedly affixed to said cover supporting ring and having a closed and an open position, when in said closed position said cover acting to block any substantial upward movement of said diffuser and refractor members, when said cover is in said open position said diffuser and said refractor member being readily removable from said luminaire by lifting them upwards through said support ring; and

(h) photocontrol means mounted on top of said cover with wires extending therefrom through at least one of said elongated enclosures.

6. A luminaire for vertical mounting on a support, said luminaire comprising:

(a) an inverted frustoconical hollow housing terminating in upper and lower ends and having a door located therebetween, connecting means disposed proximate the lower end of said housing for affixing said housing to said support, and refractor holding means proximate the upper end of said housing;

(b) a plurality of support means affixed to said housing and extending upwardly from said housing;

(c) an inverted frustoconical hollow refractor member terminating in upper and lower ends, the lower end of said refractor member resting on said refractor holding means, the outer surface of said refractor member closely interfitting between said plurality of upwardly extending support means to prevent lateral movement of said refractor member;

(d) a hollow light diffuser terminating in upper and lower ends and supported at its lower end by the upper end of said refractor member, the outer surface of said diffuser interfitting closely between said plurality of upwardly extending support means to prevent lateral movement of said diffuser;

(e) a cover supporting means affixed to the upper ends of said upwardly extending support means and having an opening therein greater than the outside diameters of said diffuser and said refractor member;

(f) a cover hingedly affixed to said cover supporting means and having a closed and an open position, when in said closed position said cover acting to block any substantial upward movement of said diffuser and refractor members, when said cover is in said open position said diffuser and said refractor member being readily removable from said luminaire by lifting them upwards through said cover supporting means; and

(g) a ballast means mounted within said housing and accessible from the outside through said door provided in the side of said housing.

7. A luminaire for vertical mounting on a support, said luminaire comprising:

(a) a hollow housing terminating in upper and lower ends, a plurality of spaced connecting means disposed proximate the lower end of said housing for affixing said housing to said support, a space between said connecting means providing for cool air intake, and refractor holding means proximate the upper end of said housing;

(b) a plurality of support means affixed to said housing and extending upwardly from said housing;

(c) a hollow refractor member terminating in upper and lower ends, the lower end of said refractor member resting on said refractor holding means, the outer surface of said refractor member closely interfitting between said plurality of upwardly extending support means to prevent lateral movement of said refractor member;

(d) a hollow light diffuser terminating in upper and lower ends and supported at its lower end by the upper end of said refractor member, the outer surface of said diffuser interfitting closely between said plurality of upwardly extending support means to prevent lateral movement of said diffuser;

(e) a cover supporting ring affixed to the upper ends of said upwardly extending support means and having an inside diameter greater than the outside diameters of said diffuser and said refractor member;

(f) a cover hingedly affixed to said cover supporting ring and having a closed and an open position, when in said closed position said cover acting to block any substantial upward movement of said diffuser and refractor members, when said cover is in

said open position said diffuser and said refractor member being readily removable from said luminaire by lifting them upwards through said support ring;

(g) hot air exhaust spaces provided between said cover and said cover supporting ring;

(h) a light source holder means secured within said hollow housing; and

(i) a light source held in said light source holder means, whereby when said luminaire is operating the heat given off by said light sources heats the air within said luminaire causing a natural up draft therein of cool air entering through the spaces between said connecting means and leaving through said hot air exhaust spaces.

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