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[54] **LUMINAIRE**
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240/41.55, 240/47
[51] Int. Cl..... **F21s 1/02**
[50] Field of Search..... 240/41.55,
47, 73, 78, 41, 41.35, 8.2, 103

ABSTRACT: A wall mounted luminaire comprising a one-piece housing having a transverse wall sloping downwardly toward the rear forming an upper ballast compartment and a lower lamp compartment. The housing has rear vent openings at the top and bottom to permit convection flow of heated air through the housing while providing for drainage of rainwater which may enter the unit.

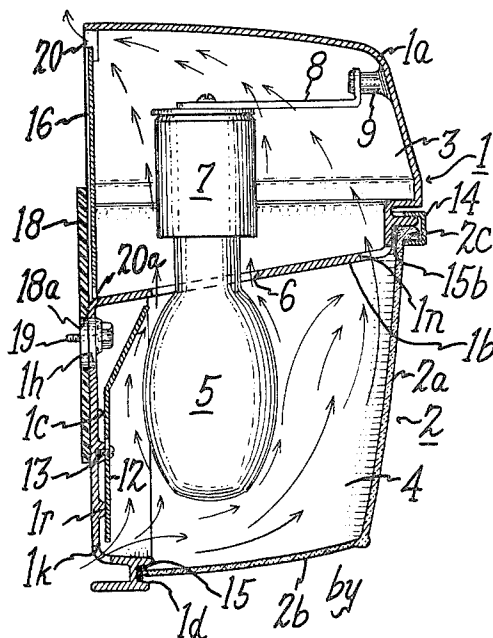
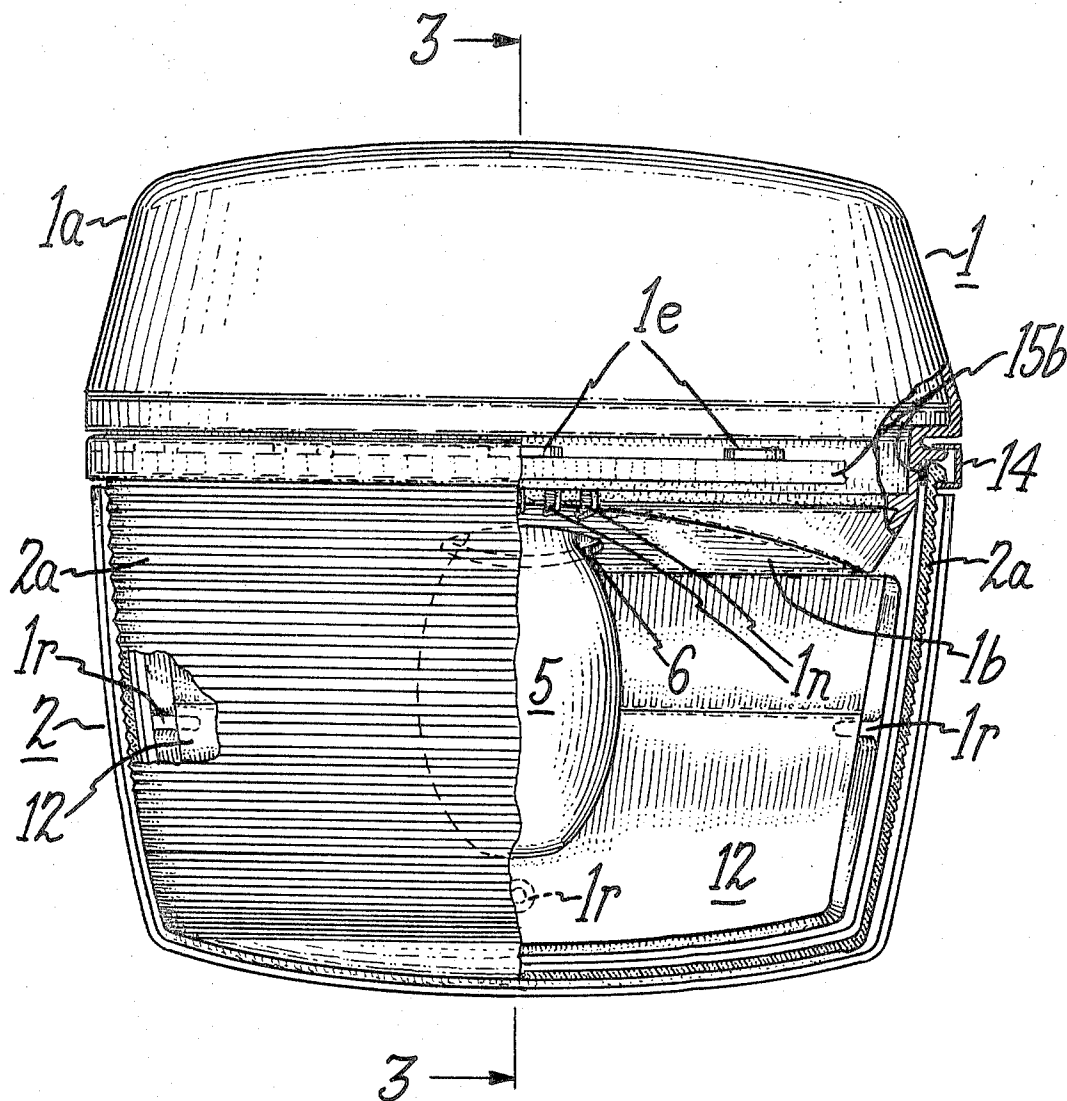
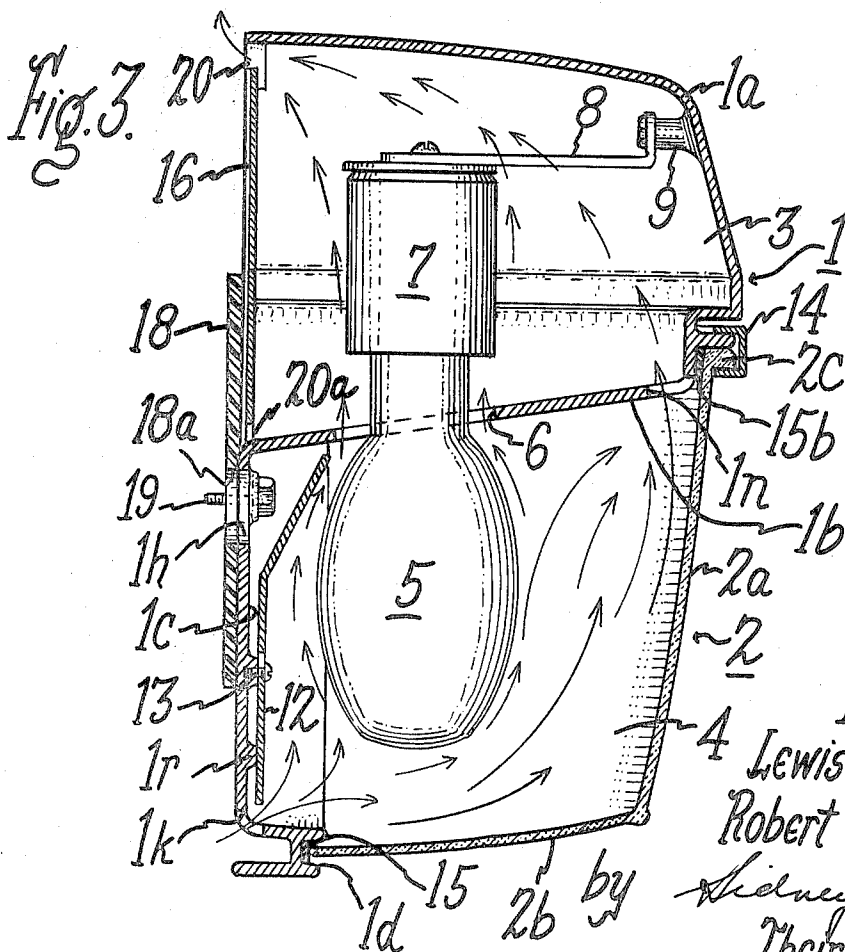
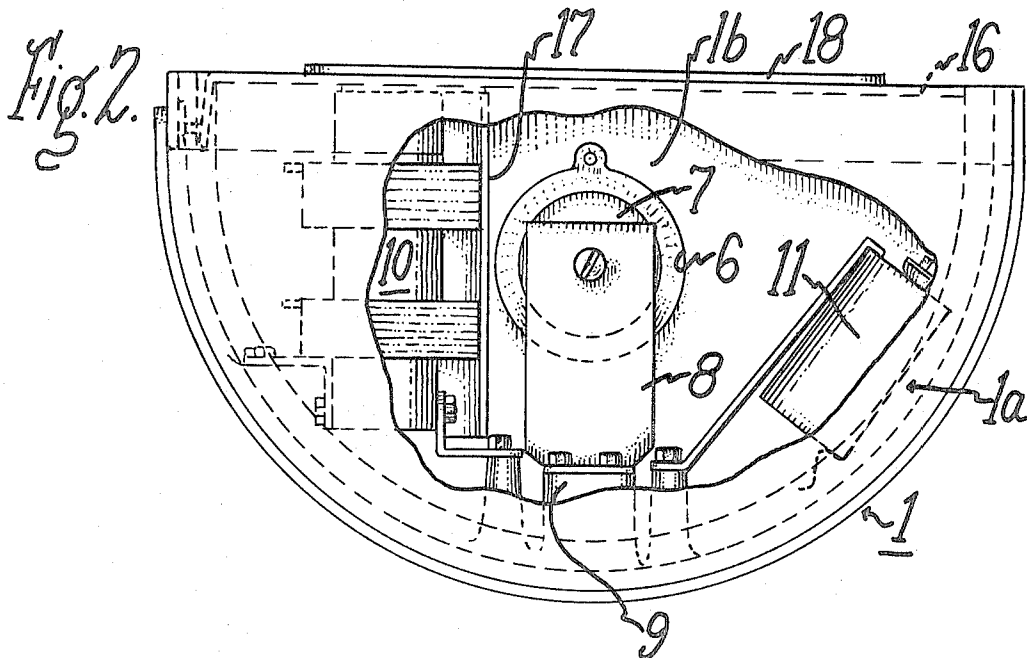


Fig. 1



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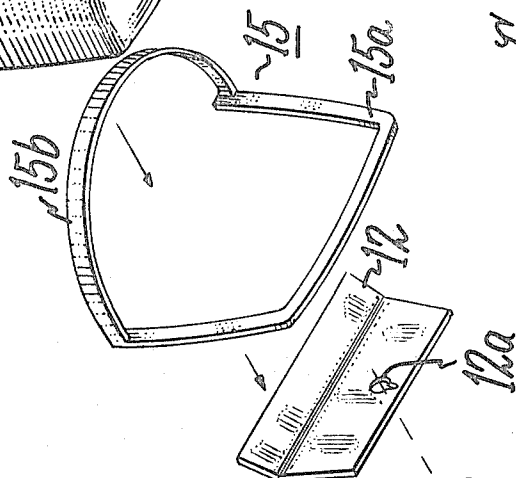
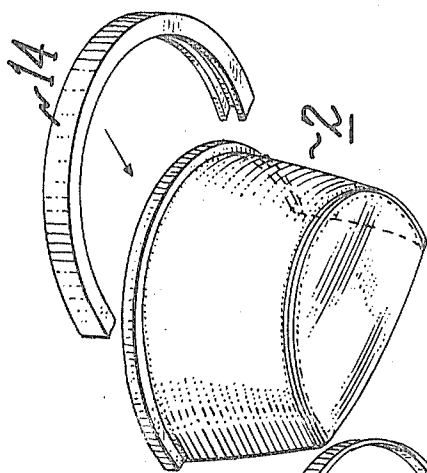
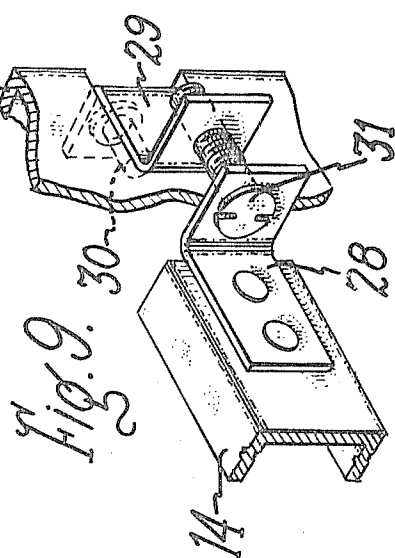
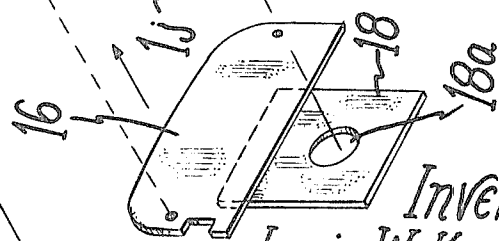
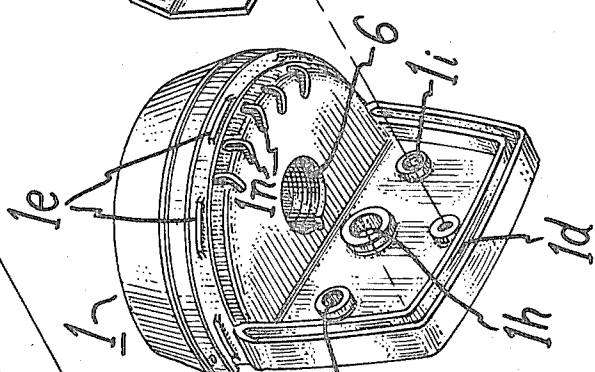
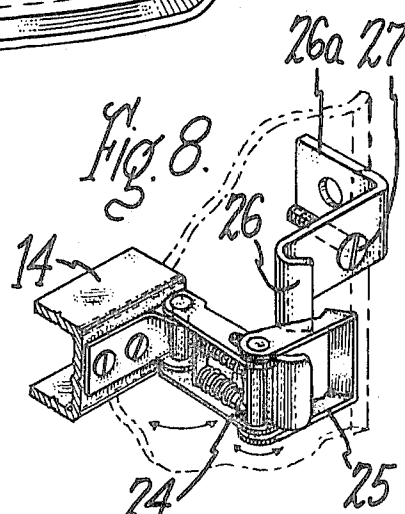
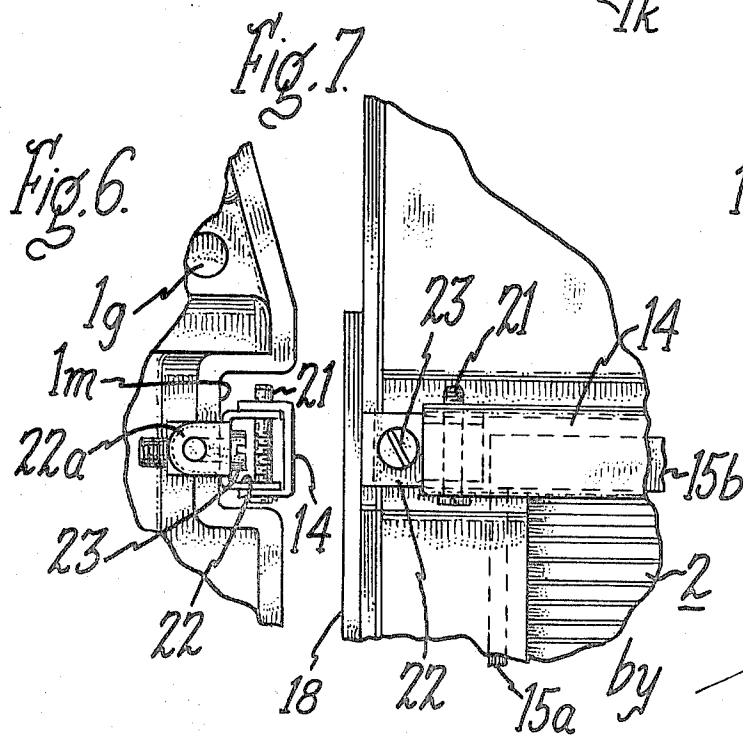
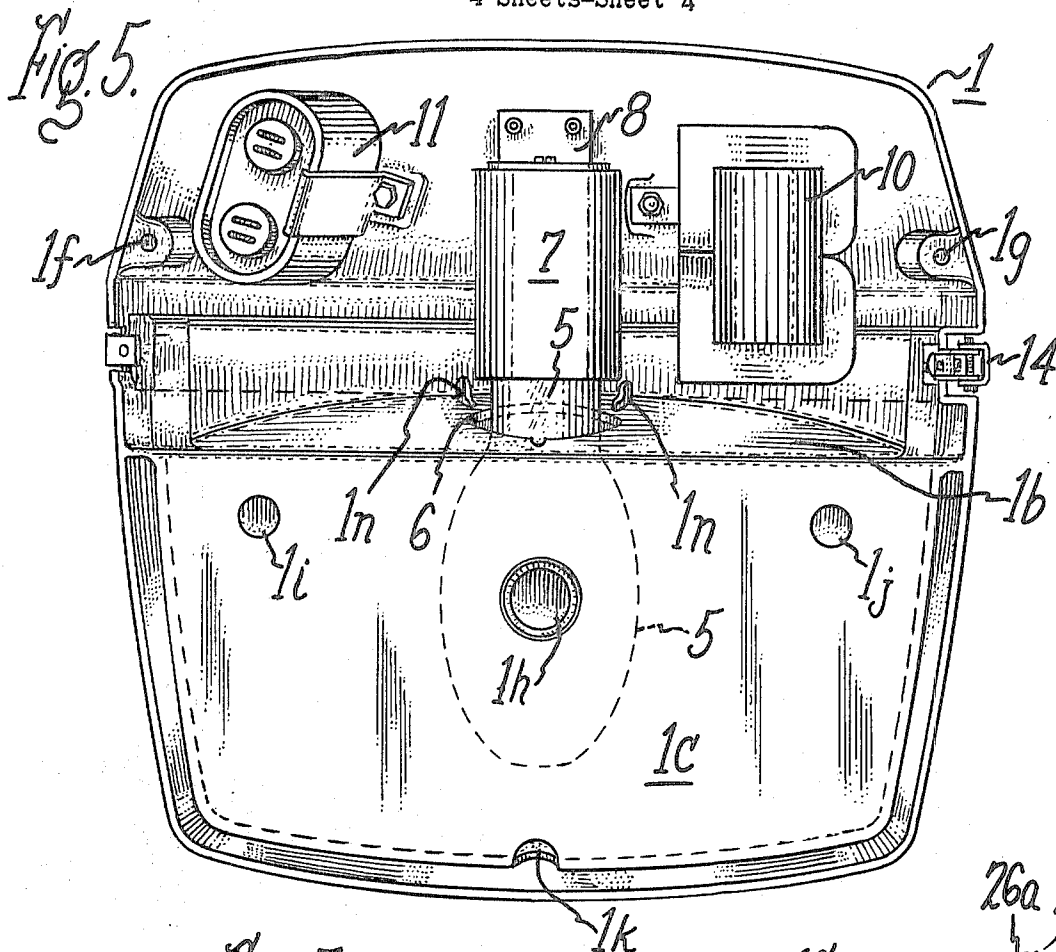


Fig. 4.



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LUMINAIRE

The present invention relates to luminaires, and in particular concerns luminaires of outdoor type adapted to be mounted on walls for illuminating walkways, entrances, parking lots and other areas.

It is an object of the invention to provide a wall-mounted luminaire having an improved housing construction for passage of cooling airflow while preventing the entry of water to the interior thereof.

Another object of the invention is to provide a luminaire of the above type which is mechanically strong, has a minimum number of parts facilitating assembly of the unit, is relatively inexpensive to manufacture, is neat in appearance, and provides protection against weather conditions, vandalism and the effects of heat generated therein.

A particular object of the invention is to provide a luminaire of the above type having an improved refractor mounting arrangement.

Other objects and advantages will become apparent from the following description and the appended claims.

With the above objects in view, the present invention in a broad aspect relates to a luminaire comprising, in combination, a housing having a rear wall, a transverse wall projecting forwardly from the top of the rear wall, and a top wall defining with the transverse wall a rearwardly open upper compartment above the rear wall, a light transmitting closure such as a refractor detachably secured to the front of the housing defining with the rear wall a lower compartment separated from the upper compartment by the transverse wall, lampholder means mounted in the upper compartment, the transverse wall having a lamp opening below the lampholder means through which a lamp may be inserted with substantial clearance for operative attachment to the lampholder means, the rear wall being formed at the bottom thereof with an aperture, whereby during operation of the luminaire cool air drawn into the lower compartment through the bottom aperture passes upwardly around the lamp, through the lamp opening and out through the rearward opening of the upper compartment.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front elevational view, partly broken away, of a luminaire constructed in accordance with the invention;

FIG. 2 is a top plan view of the FIG. 1 luminaire, with parts broken away to show the interior of the upper ballast compartment;

FIG. 3 is a cross-sectional view of the FIG. 1 luminaire taken along the line 3-3;

FIG. 4 is an exploded view of the luminaire in reduced scale showing its component parts in perspective;

FIG. 5 is a rear elevational view of the luminaire with back plate removed;

FIG. 6 is a detailed view of the clamp band hinge as viewed from the rear;

FIG. 7 is a view of the clamp band hinge as viewed from the side;

FIG. 8 is a detailed view of the latching mechanism of the clamp band; and

FIG. 9 is a perspective view of a different form of latching device.

Referring now to the drawings and particularly to FIGS. 1-3, there is shown a luminaire of somewhat semicylindrical form comprising a housing 1 formed of one piece, typically of cast aluminum, with a top wall 1a, a transverse wall 1b and a vertical rear wall 1c. Enclosing the lower portion of housing 1 is a refractor 2 having a semicylindrical sidewall 2a and semicircular bottom wall 2b and being held in assembly on housing 1 by clamp band 14, as more fully disclosed hereinafter. Transverse housing wall 1b divides the interior of the luminaire into an upper ballast compartment 3 and a lower lamp compartment 4. Lamp 5 is arranged in compartment 4 with its stem portion extending upwardly through an aperture 6 in transverse wall 1b and its base threadably engaging lamp

socket 7, which is secured within upper compartment 3 by bracket 8 fixed to a boss 9 on the inside of top housing wall 1a. Also mounted in upper compartment 3 by means of suitable brackets secured to bosses projecting rearwardly from top wall 1a (see FIG. 2) are ballast transformer 10 and capacitor 11, the arrangement being such that the latter ballast components are spaced above the floor of transverse wall 1b. If desired, an electrically insulating shield 17 may be inserted in the space between the socket 7 and ballast transformer 10 as shown in FIG. 2 to prevent contact with the transformer by service personnel through lamp opening 6 during relamping operations.

In lower compartment 4, reflector 12, which is somewhat trapezoidal in shape, is attached by a single mounting comprising keyhole 12a and screw 13 secured to a boss on rear housing wall 1c behind lamp 5, and as seen in FIG. 3, the upper portion of reflector 12 is bent forwardly relative to its lower portion. Reflector 12 rests against three support bosses 1r (see FIG. 1) projecting from spaced points of rear wall 1c. The length of the supporting bosses 1r may be varied as desired to change the optical configuration of reflector 12.

Rear housing wall 1c is formed in a central region behind the bent upper portion of reflector 12 with an aperture 1h for insertion on an electrical conductor conduit in installation of the unit. The bent portion of reflector 12 thus defines with rear wall 1c a compartment in which the power leads and the luminaire wiring connections thereto may be disposed.

The half-cup shaped refractor 2 which encloses lamp compartment 4 is formed with a flange 2c around its upper rim and is held in assembly with housing 1 by semicircular clamp band 14, which, being channel-shaped in cross section, embraces the bottom of flange 2c and the top surfaces of retaining bosses 1e which project at spaced intervals (see FIG. 1) around the front and sides of top wall 1c. As seen in FIG. 4, the front side of rear housing wall 1c is formed along its margin with a recess 1d in which the lower U-shaped portion 15a of a gasket 15 is seated. Gasket 15 also has an upper semicircular portion 15b which engages the curved outer surface of housing 1 below retaining bosses 1e. Gasket 15 thus forms a weatherproof seal at the joint between mating surfaces of housing 1 and refractor 2. Gasket 15 is typically made of a thick, soft, rubber-foam material of closed-cell type which is adhesively attached to housing 1. Clamp band 14 is hinged at one end to housing 1 and latched at its other end to the housing, as more fully described below, so that refractor 2 may be removed after band 14 is unlatched and swung outwardly on its hinge.

The rear opening of housing compartment 3 is closed by back coverplate 16 which is held in assembly on the housing by suitable means such as screws received in tapped bosses 1f, 1g on the opposite sides of the upper compartment (see FIG. 5). A platelike gasket 18 may further be provided on the rear face of the housing as seen in FIG. 3 to seal out water from conduit boxes or the like over which the unit may be mounted. Aperture 18a in gasket 18 is in register with conduit opening 1h in the rear wall 1c of the housing. The unit is mounted on the supporting vertical surface, such as a wall, by lag bolts 19 or the like (see FIG. 3) passing through apertures 1i, 1j in rear housing wall 1c (FIG. 5).

As seen in FIG. 3, backplate 17 is so dimensioned that its upper edge is spaced below top housing wall 1a, thus defining a vent slot 20 extending along the top of the unit. At its bottom edge, backplate 16 is similarly spaced above wall 1b to provide a drain opening to allow drainage of any water that may enter through vent slot 20. At the bottom of rear housing wall 1c an aperture 1k is formed about midway between the lateral edges thereof. At its forward edge transverse wall 1b is formed with a plurality of spaced vent holes in providing communication between lower compartment 4 and upper compartment 3.

By virtue of the arrangement described, the luminaire unit during operation is effectively cooled by convection flow and heat radiation so as to enable the use of synthetic material such as polycarbonate and acrylic plastics instead of glass for

refractor 2 which might otherwise be adversely affected by the heat generated in the luminaire. As air within lower compartment 4 is heated by lamp 5 it rises. As indicated by arrows in FIG. 3, the hot air close to lamp 5 passes upwardly along the lamp and through opening 6 surrounding the lamp stem into upper compartment 3, and then escapes through rear vent slot 20 to the exterior. The heated air further away from lamp 5 in the lower compartment is directed by the upper bent portion of reflector 12 and the upwardly slanting underside of housing wall 1b towards the front portion of the latter wall where it reaches and passes through vent holes in into upper compartment 3, from which it leaves through rear vent 20. Cooler air is drawn into the luminaire through bottom aperture 1k. The location of the latter aperture is such that it allows cool air to be drawn from a large area and serves as a drain hole to prevent collection of water which might enter the luminaire. In addition, in the installed position of the luminaire on a vertical surface, aperture 1k is hidden and thereby does not allow substantial leakage of light therethrough; as a result it avoids attraction and entry of insects into the luminaire interior.

In addition to providing for convection cooling as described, the one-piece housing, which typically is of cast aluminum having good heat conduction properties, serves to effectively conduct heat from the lower optical compartment to the upper ballast compartment and dissipates the heat by radiation from its exposed top, side and front wall surfaces to the atmosphere.

A further feature of the invention is the structure provided for holding the refractor 2 in assembly on the unit. The hinged end of clamp band 14, as seen in FIG. 6, lies in a notch 1m formed in the housing sidewall and is hingedly secured to the housing by means of hinge pin 21, which couples the end of clamp band 14 to a journal member 22 secured to housing 1 by screw 23 and having spaced projections fitting within band 14 and pivotally connected thereto by pin 21. Tab 22a of the journal member which is bent over on the rear of housing 1 prevents rotation of the journal member. Hinge pin 21 is held captive in operative position by the walls of notch 1m. If desired, a screw passing through a hole in tab 22a may be driven into a tapped hole at the rear edge of the housing (not shown) in place of screw 23 so as to provide a tamperproof attachment of the clamp band hinge when the fixture is mounted against a wall.

The other end of clamp band 14 is provided with a latching device comprising a finger tab or lever 24 hinged at one end to band 14 and having pivotally attached thereto intermediate its ends a spring-loaded latch 25 adapted to engage catch member 26 fixed to housing 1 by screw 27. As in the case of the hinged journal member 22, catch member 26 has a tab 26a bent over the rear edge of the housing to prevent rotation thereof, and similarly may thereby be secured by a screw driven into the rear of housing 1 for preventing tampering therewith.

An alternative tamperproof latching device is shown in FIG. 9 and comprises tab 28 fixed to clamp band 14, tab 29 with a bent-over portion secured to housing 1 by a screw 30 driven into the rear of the housing wall, and screw 31 connecting together the spaced, laterally projecting portions of tabs 28 and 29. The head of screw 31 is of a type which can be turned only by a special tool. As will be evident, the arrangement is such that with the luminaire mounted against a wall, the clamp band cannot be readily removed or unlatched.

To ensure effective sealing between refractor 2 and housing 1, the refractor is formed so that its top edge face which abuts the housing is at 90° to the plane of its rearward abutting edge faces, whereas the corresponding refractor-engaging surfaces of housing 1 are at an angle of slightly less than 90°, so that when clamp band 14 is latched in place and presses against the top rim of refractor 2, the bottom edge of the refractor is tightly pressed against the bottom edge gasket.

In a further feature which enhances the sealing engagement of refractor 2 in housing 1, the upper surfaces of positioning bosses 1e slope upwardly in an inward direction, with the result

that when clamp band 14 is latched in place, it is pushed upwardly by the camming action of these slopes and thereby forces the refractor rim 2c more tightly against the mating surfaces of positioning bosses 1e.

The described luminaire construction affords numerous advantages. The one-piece housing structure provides, in addition to the cooling functions mentioned, superior mechanical strength and a compact construction which reduces the number of luminaire parts, simplifies assembly operations, and makes the luminaire substantially less expensive to manufacture. The sloped transverse housing wall serves to aid convection flow, prevents passage of water to the optical compartment while avoiding collection of water on the wall itself, and aids in forwardly directing the light reflected therefrom in the optical compartment, especially when coated with a reflective paint.

Reflector 12 with forwardly slanting top portion serves not only to reflect light outwardly through the refractor but also to cover the luminaire mounting screws and the wiring connections to the power leads entering the rear of the housing. The arrangement is such that the installer need not enter the ballast compartment for installation or normal maintenance operations. Relamping of the luminaire is readily done by simply unlatching clamp band 14 and removing refractor 2 to provide access to lamp 5, without risk of contact with electrical leads, ballast components or other energized electrical equipment or entry of rainwater into the electrical compartment.

While the present invention has been described with reference to particular embodiments thereof, it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the scope of the invention. Accordingly, we wish to have it understood that we intend herein to cover all such modifications as fall within the true spirit and scope of our invention.

We claim:

1. A luminaire comprising, in combination, a housing having a rear wall, a transverse wall projecting forwardly from the top of said rear wall, and a top wall defining with said transverse wall a rearwardly open upper compartment above said rear wall, a light transmitting closure detachably secured to the front of said housing defining with said rear wall a lower compartment separated from the upper compartment by said transverse wall, lampholder means mounted in the upper compartment, said transverse wall having a lamp opening below said lampholder means through which a lamp may be inserted with substantial clearance for operative attachment to the lampholder means, said rear wall being formed at the bottom thereof with an aperture, whereby during operation of the luminaire cool air drawn into the lower compartment through said bottom aperture passes upwardly around the lamp, through said lamp opening and out through the rearward opening of the upper compartment.

2. A luminaire as defined in claim 1, said transverse wall sloping upwardly toward the front.

3. A luminaire as defined in claim 2, said transverse wall having at least one aperture at the front thereof through which heated air may flow from the lower compartment to the upper compartment.

4. A luminaire as defined in claim 2, said transverse wall having a plurality of spaced apertures at the front thereof through which heated air may flow from the lower compartment to the upper compartment.

5. A luminaire as defined in claim 3, including electrical operating components mounted in the upper compartment.

6. A luminaire as defined in claim 5, including a reflector mounted on said rear wall in the lower compartment for directing light from the lamp outwardly through said light transmitting closure.

7. A luminaire as defined in claim 6, said reflector having a lower portion extending generally along said rear wall and a forwardly bent upper portion, said upper portion directing convection airflow toward said lamp opening and defining with said rear wall a wiring compartment.

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8. A luminaire as defined in claim 5, and a cover on the rear opening of said upper compartment, said cover being spaced at its top from said top wall so as to define therewith a vent for escape of heated air from said upper compartment.

9. A luminaire as defined in claim 8, said cover being spaced at its bottom from said transverse wall so as to define therewith a drain opening.

10. A luminaire as defined in claim 1, said top wall having a front surface and clamp band means clamping said light transmitting closure at its top to the front surface of said top wall.

11. A luminaire as defined in claim 10, said front surface being formed with projecting means having top and bottom surfaces, said clamp band means clamping said light transmitting closure to the bottom surface of said projecting means.

12. A luminaire as defined in claim 11, said light transmitting closure having a top surface bearing against said projecting means and a rear edge face urged against a bearing surface of said rear housing wall, said top surface and said rear face being at a predetermined angle relative to one another,

said bottom surface and said bearing surface being at an angle less than said predetermined angle relative to one another.

13. A luminaire as defined in claim 10, said housing having opposite sides formed with recessed portions, hinge means at one end of said clamp band means hingedly connecting the same to said housing and arranged within one of said recessed portions, and latch means at the other end of said clamp band means for detachably connecting the same to said housing, said other end of said clamp band means being arranged within the other recessed portion.

14. A luminaire as defined in claim 1, and means for mounting said housing at its rear wall on a vertical supporting surface.

15. A luminaire as defined in claim 10, said clamp band means being hingedly connected at one end to said housing and latched at the other end to said housing, and means at the rear of said housing securing the respective ends of said clamp band means to said housing.

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