June 15, 1965 V. S. WINCE 3,189,740

LUMINAIRE

Filed Oct. 9, 1962 2 Sheets-Sheet 1

Fig. 1.

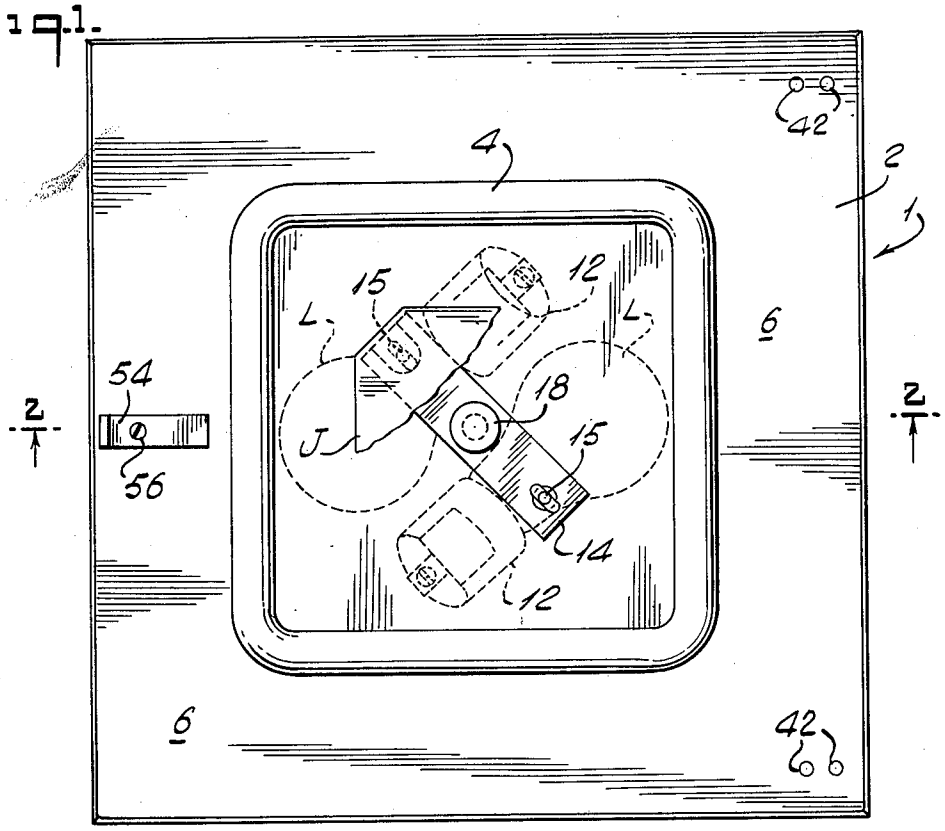


Fig. 6.

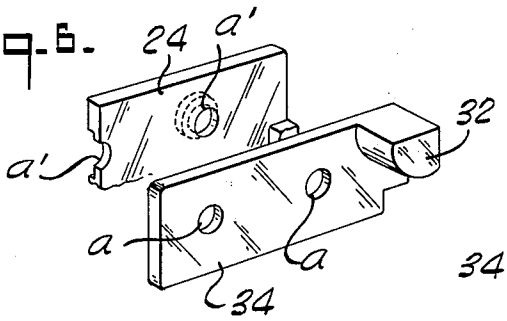


Fig. 5.

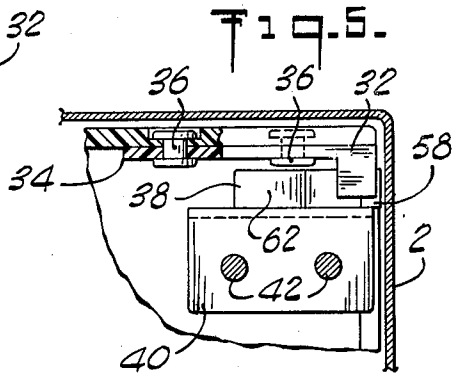
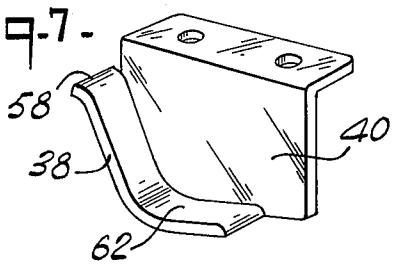


Fig. 7.



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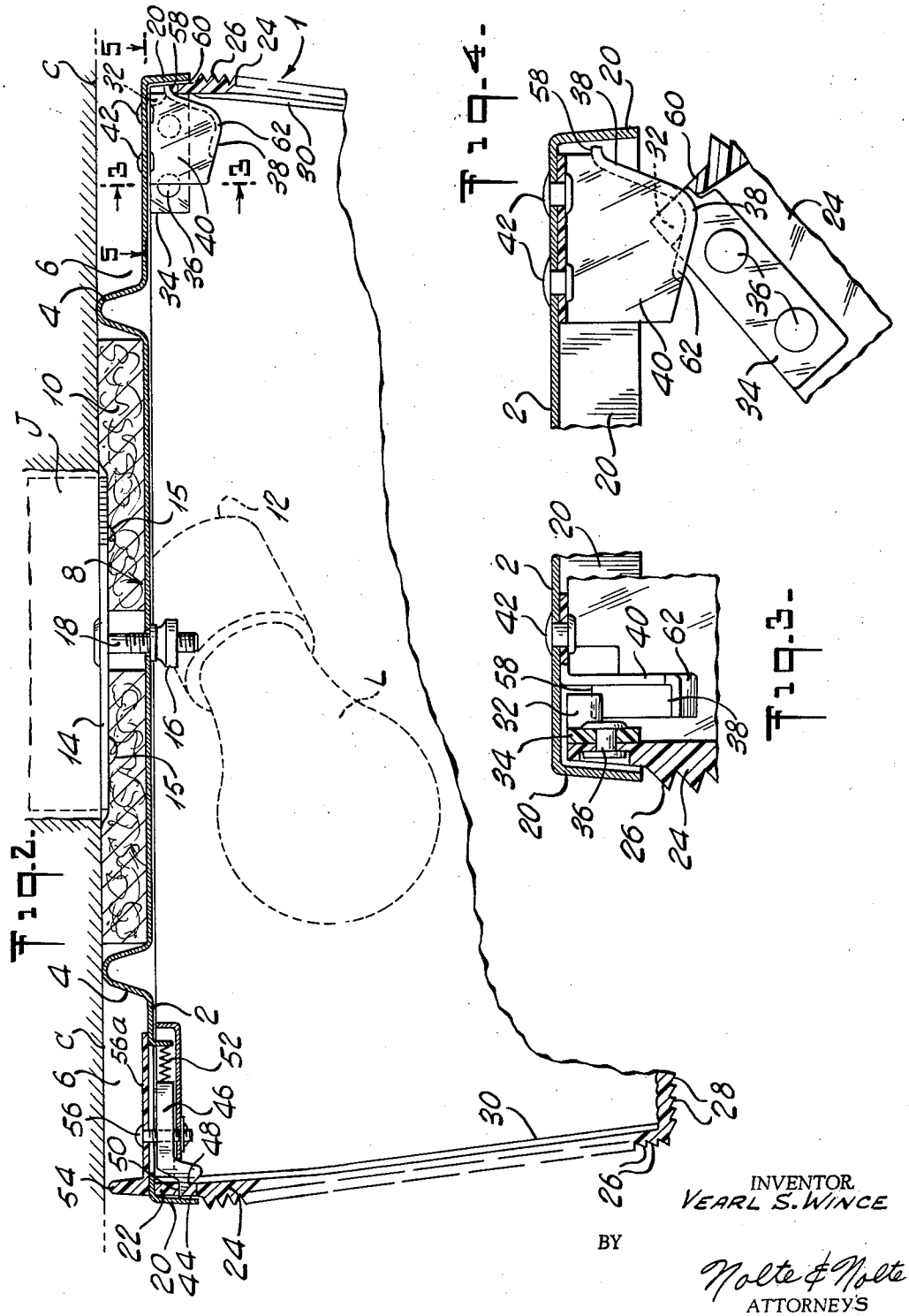


FIG. 2.

FIG. 4.

FIG. 5.

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LUMINAIRE

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10 Claims. (Cl. 240—78)

The invention relates to lightweight luminaires for the lighting of interior or protected outdoor areas, and more particularly to a surface mounted luminaire of the type described.

The luminaire and fixture provided according to the invention is preferably attached to standard flush-mounted junction boxes, but if desired can also be mounted remote from junction boxes on suitable portions of a ceiling.

It is an object of the invention to provide a fixture having a lightweight plastic, or the like, refractor.

It is a further object of the invention to provide a luminaire of the type described with a hinged, lightweight plastic lens and, in this respect, the hinge construction connecting the lightweight lens and the fixture housing is made compatible with comparatively heavy duty operation.

It is yet another object of the invention to provide for convection cooling of the combined parts of the luminaire whereby heat damage to the lightweight refractor is eliminated.

Accordingly, the luminaire of the present invention has a lightweight refractor made of a plastic or like material, affording relatively low production costs, greater safety if broken, and relatively easy movability. The lightweight, plastic refractor is provided with a simple, unobtrusive, but comparatively heavy duty, hinge structure, adapted to be supported by a simple hinge trackway affixed to the mounting plate fixture of the luminaire. The hinge trackway includes two principal portions, a first portion supporting the hinge pin of the refractor in the closed position thereof, and a second trackway portion supporting the hinge pin in the open position of the refractor.

In a luminaire of the above described type, the heat generated by the lamp must be properly dispersed. If no provision for the dispersal of the generated heat is made the temperature could cause damage to the wires in the junction box, to the ceiling structure material in contact with the luminaire, and last but not least, the plastic material comprising the refractor lens. Accordingly, the mounting fixture plate of the luminaire of the present invention is spaced from the ceiling, whereby the ambient air can circulate freely by means of convection between the greater part of the area of the mounting fixture plate and the adjacent ceiling. The remaining parts of the mounting plate, for which no provision is made for the cooling by convection currents is separated from the junction box by means of heat insulation of any desired type.

Further objects and advantages of the invention will become apparent from the following detailed description and the appended drawings, wherein:

FIGURE 1 is a plan view of the luminaire according to the invention;

FIGURE 2 is a cross sectional view, partly broken away, taken along the line 2—2 of FIGURE 1;

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

FIGURE 4 is a fragmentary portion of the hinge shown in FIGURE 2, shown in the open position;

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

FIGURE 6 is a fragmentary exploded perspective view of a portion of the hinge mounting; and

FIGURE 7 is a perspective view of the hinge trackway.

In FIGURES 1 and 2 a luminaire 1 is shown. The top portion of the luminaire 1 comprises a mounting fixture or plate 2, which is spaced from an adjacent ceiling mounting surface C. (FIG. 2 only) by a spacing ridge 4. The spacing ridge 4 divides the upper surface of the mounting fixture 2 into an area 6, which is exposed to the ambient air and relies on convection currents for the cooling of the top side of the exposed portion 6 of the mounting fixture 2. The portion 8 of the mounting fixture 2, which is within the spacing ridge 4, is separated from the mounting surface and a junction box J by a suitable layer of appropriate insulating material.

In FIGURES 1 and 2, two incandescent lamps L are shown within the luminaire 1 disposed within conventional incandescent lamp sockets 12. The sockets 12 are mounted in a conventional manner within the luminaire 1.

In the embodiment shown, a sheet metal mounting strap 14 is attached by means of bolts 15 to the junction box J which is in turn mounted in the ceiling C. The mounting fixture 2 of the luminaire is attached from the mounting strap by means of a nut 16 and a bolt 18.

The outer edge 20 of the mounting fixture 2 is turned downward around all sides of the mounting fixture and is adapted to accept the top flange 22 of a lightweight plastic refractor lens 24. The lens 24 is provided with outside prisms 26 and 28, and inside prism 30 for directing light from the source L efficiently.

The refractor lens 24 is preferably made of a lightweight, translucent or transparent plastic material such as Lucite (an acrylic resin) or the like, which can be manufactured at low cost and affords greater safety if broken, than prior art glass refractor lenses.

In order to provide a rugged hinge assembly for the otherwise lightweight lens 24, a pair of axially aligned hinge pins 32 (FIGS. 2–6) are provided adjacent to the ends of two opposing sides of the lens 24. In the embodiment shown in the drawing, the hinge pins 32 are not molded integrally with the refractor lens 24, but are made integral with plates 34 made of high strength translucent or transparent plastic such as polycarbonate or the like. End plate 34, integral with hinge pin 32 is secured to the lens 24 by means of rivets 36, for which preformed apertures *a* and *a'* are provided in the plates 34 and lens side walls, respectively. Each of said hinge pins are preferably formed with an angular and a curved surface, for reasons to be described subsequently.

Each of the hinge pins 32 is adapted to move along a hinge track 38, molded integrally with a track mounting plate 40. The track 38 and its mounting plate 40, like hinge pins 32 and plates 34, are preferably made of clear plastic so as not to create dark shadows on the adjacent portions of the refractor lens 24. The track mounting plate 40 is attached by rivets 42 to the fixture mounting plate 2.

On the unhinged side of the refractor 24, a slidable tongue 46 is mounted under the mounting plate and is,

along with an integral handle portion 54 thereof, guided for outward and inward movements via a bolt 56 and slot 56*a* arrangement in the top portion of the mounting plate. The tongue 46 is biased constantly outward by a compression spring 52. The tongue, at its outward end, is formed with bevelled edge 48 and a flat retaining edge 50. A slot 44 is provided in the unhinged side of the lens 24, and is aligned with the tongue 46, so that when the lens is being shut, the lower edge of the slot slides past the bevel edge 48 and pushes the tongue 46 against the spring 52. After the slot has cleared the bevel edge of the tongue 46, the tongue slides forward as pressed by the spring and enters the slot.

In the closed position of the lens 24, with the upper edge of the slot 44 supported by the retaining edge 50 of the tongue 46, the hinge pin 32 rests on a small, upper horizontal surface 58 of the hinge track 38. To open the lens for relamping, cleaning or other maintenance, the tongue 46 is withdrawn from the slot 44 by applying slight inward pressure to the latch handle 54. The lens 24 will start to pivot on the pins 32. As the lens pivots downward, the upper portion of the pivoted side of the lens 24 approaches the end of the downwardly bent outer edge 20 of the mounting fixture and contacts it along one or more points of a line at 60 (FIG. 2), and the pivotal center of the lens opening motion becomes temporarily transferred to along the line 60, forcing the pivot pins 32 off the upper horizontal surface 58 of the track 38. The pins 32 subsequently slide down the track 38 to a lower portion 62 thereof, where the pins 32 come to rest. The lens may now pivot around the pins 32 in the lower portion 62.

As best seen in FIGURE 6, the hinge pin 32 is formed with two flat outer sides disposed at a 90° angle relative to each other, and an arcuate portion disposed opposite the sides and connecting the same. The curving portion is adapted to contact the hinge track 38 at all positions of the lens, while the flat sides of the hinge pin 32 are adapted to snugly fit into the corner formed between the mounting fixture plate 2 and its outer edge 20. This snug or wedge-like fit is assured by the close fit of the lens beneath the fixture skirt and by the fact that the latched side of the lens is maintained in its horizontal position via the action of the latch. Thus, it is assured that at the time of closing the lens, the hinge pin will be retained on the horizontal surface 58 and any possibility of the hinge pin dropping down, unwantedly onto the lower portion 62 of the hinge track, is eliminated.

If desired, the lens can be removed from the track 38 by freeing the pins from the hinge track entirely by lifting the lens and moving it away from the hinge tracks the thickness of which track is accommodated by the provision of the vertical spacing between the hinge pins and the rear or hinged sidewall of the lens, as best seen in FIGS. 2 and 4.

It is understood, while only one embodiment of the invention was shown, the scope, thereof, is to be interpreted from the appended claims.

What I claim is:

1. A luminaire for substantial flush mounting upon a mounting surface, comprising a fixture housing, said housing including a back plate with an outer surface for facing the mounting surface, spacing means extending outwardly of said outer surface and disposed inwardly of the edges of said back plate for contacting the mounting surface and for spacing said back plate a slight distance therefrom, light and heat generating means depending below said back plate and disposed adjacent the inner surface thereof, a light transmissive lens enclosure having sides, the upper edges of which oppose the inner surfaces of said back plate adjacent the edges thereof, the area of said back plate extending between the outer edges thereof and said spacing means being exposed to ambient temperatures when said luminaire is mounted on the mounting surface.

2. The luminaire of claim 1, wherein said spacing means is an outstanding ridge formed integrally of said back plate and inwardly of the edges thereof, said ridge circumposing inner portions of said back plate.

3. The luminaire of claim 1, wherein said light transmissive lens enclosure is made of a lightweight thermoplastic material, complementary means are connected to said fixture housing and to said lens enclosure for hinging said lens enclosure to said housing and for securing the same in a closed position with respect thereto and said complementary means are made of light transmissive heavy duty plastic material.

4. The luminaire of claim 1, wherein complementary means are connected to said fixture housing and to said lens enclosure for hinging said lens to said housing and for securing said lens enclosure in the closed position with respect thereto, said lens enclosure complementary means comprise a pair of opposing pins extending inwardly and coaxially toward one another from the inner surfaces of opposing lens enclosure sides adjacent said upper edges thereof, and said fixture complementary means consist of upwardly facing trackways for freely receiving said pins and extending downwardly and inwardly from said fixture housing and beneath and inwardly of said pins.

5. The luminaire of claim 4, wherein a housing skirt depends from said back plate and extends around the outer surfaces of said lens enclosure sides adjacent said upper edges, the uppermost surfaces of said trackways are spaced from the inner surfaces of said back plate and said pins are formed with upper and outer surfaces conforming to said inner surfaces of said back plate and the inner surface of said housing skirt, said upper and outer surfaces of said pins being in flush engagement with said inner surfaces of said back plate and said skirt when said lens enclosure is in the closed position, and said pins are supported on said uppermost surfaces of said trackways, the portion of said housing skirt opposite said complementary means includes support means for latching and holding said lens enclosure in the closed position with said pins wedged in flush alignment with said fixture back plate and housing skirt.

6. The luminaire of claim 5 wherein said pins are convex along their inner and lower surfaces and the lower upwardly facing surfaces of said trackways are concave and receive the convex surfaces of said pins when said lens enclosure is swung to an open position with respect to said fixture housing.

7. The luminaire of claim 5, wherein said lens enclosure sides include a front and back side and said pins extend parallel and adjacent said back side, the top edge of said back side being spaced from and underlying and extending in planes below said pins, the flush alignment of said outside surfaces of said pins with said housing skirt disposing said back side in vertical side by side alignment with the associated portion of said housing skirt, the space between said pins and said back side accommodating the thickness of the innermost portions of said trackways whereby assembly of said pins, on and off said trackway surfaces is accomplished by passing the trackways between said top edge of said back side and said pins.

8. A lens for a ceiling fixture and the like comprising a web and sides extending from the edges of said web, said lens being made of a light transmissive lightweight thermoplastic material, and a pair of hinge elements extending inwardly of said sides towards one another, means connecting said hinge elements to a respective lens side, said hinge elements being fabricated of a light transmissive heavy duty plastic material, each of said hinge elements including a wall connected to a respective hinge side and a pin integral with said hinge element wall, said

pins extending adjacent the upper edges of said sides and including outer surfaces which are flat for flush alignment with similarly shaped and associated fixture parts.

9. The lens of claim 8, wherein the inner surfaces of said pins are convexly formed for rolling pivotal movement upon associated fixture parts.

10. The lens of claim 8, wherein said lens sides include a back side and said pins extend parallel and adjacent said back side, the free edge of said back side being diminished in height relative to the other said sides and being spaced from said pins, the space between said pins and said back side providing a passageway for associated fixture pin supporting elements.

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