

May 6, 1958

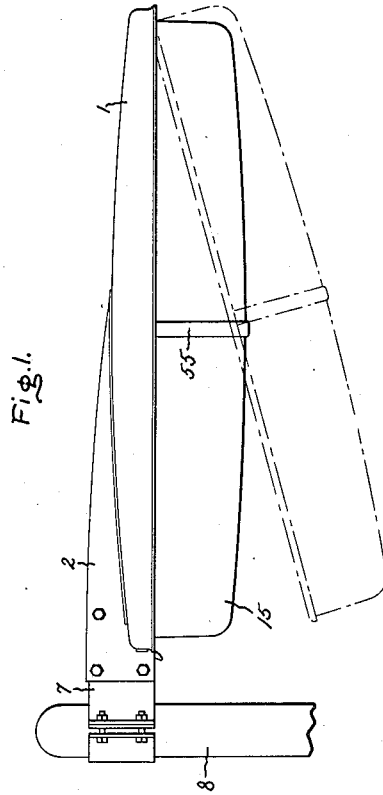
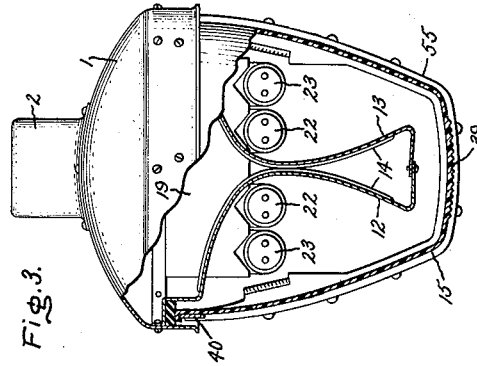
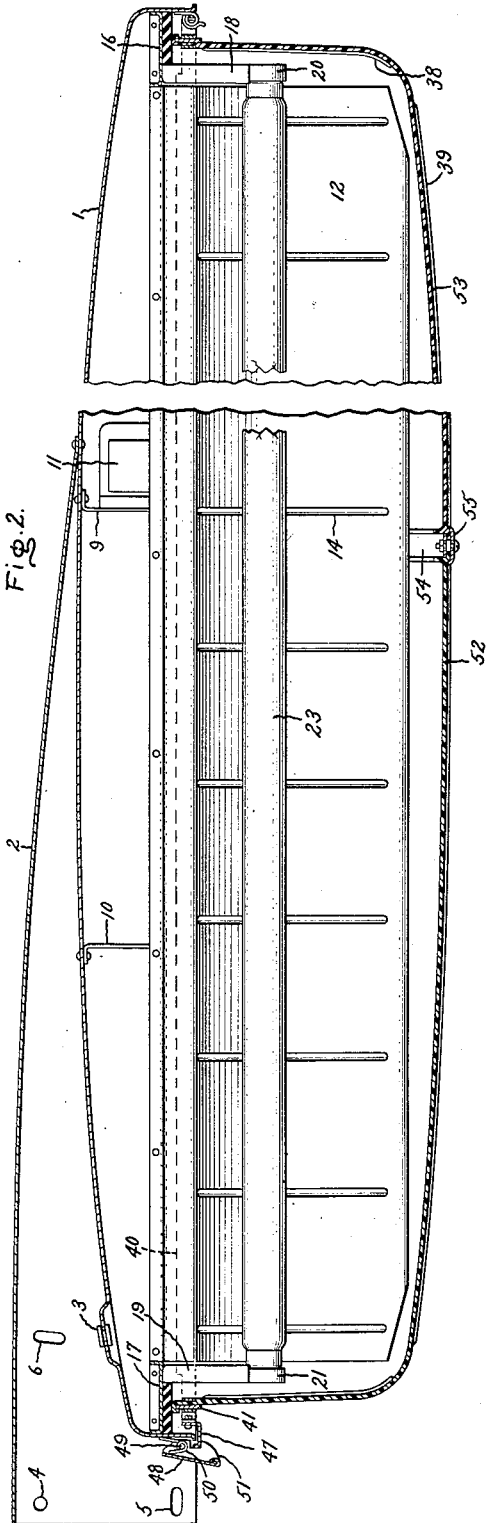
J. P. FOULDS

2,833,916

LUMINAIRE

Filed May 25, 1953

2 Sheets-Sheet 1



Inventor:  
John P. Foulds,  
by *Richard E. Hosley*  
His Attorney.

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2 Sheets-Sheet 2

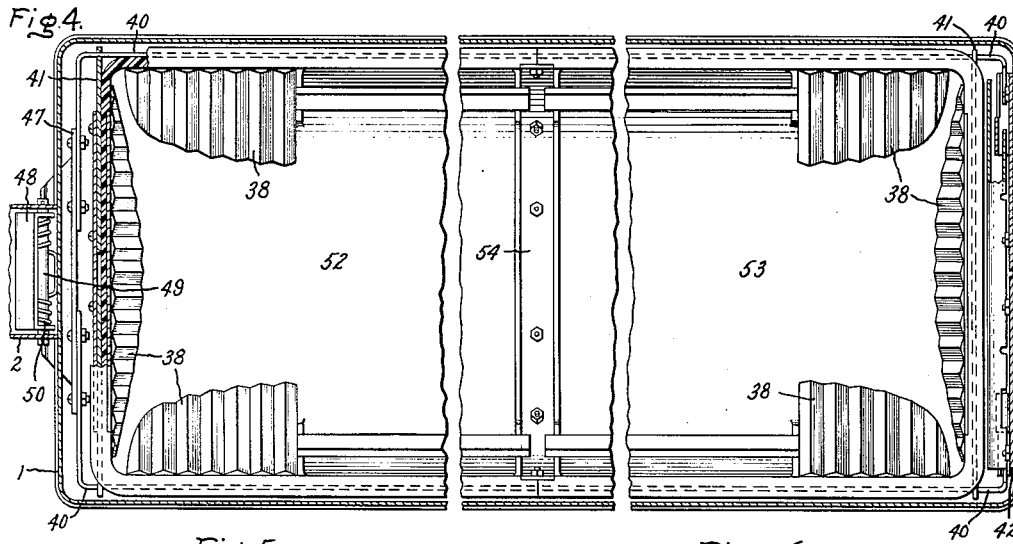


Fig. 5.

Fig. 6.

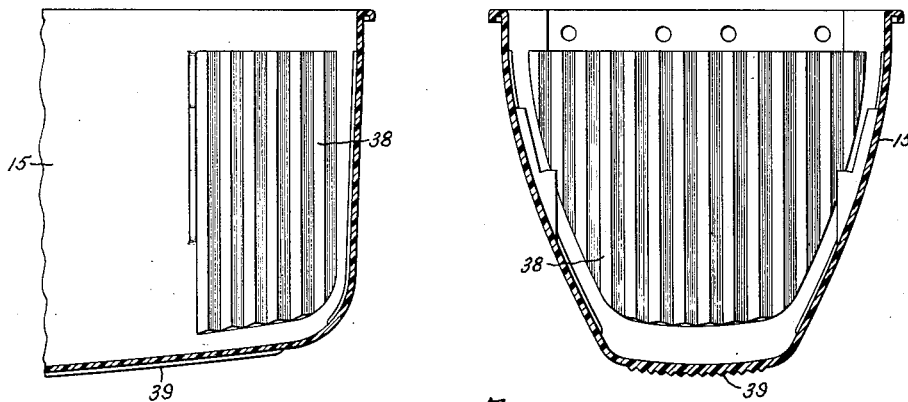


Fig. 7.

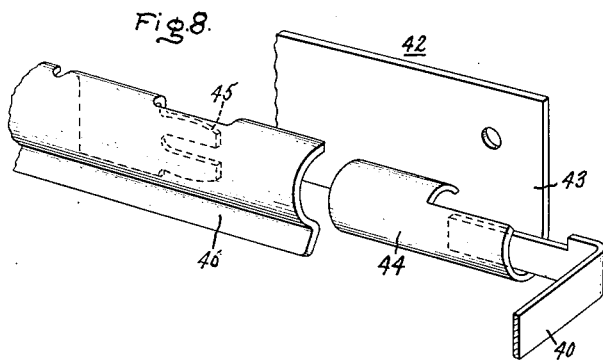
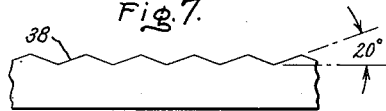


Fig. 8.

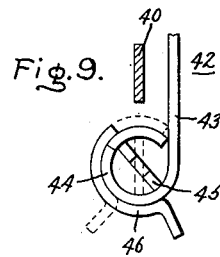


Fig. 9.

Inventor:  
John P. Foulds,  
by *Richard E. Hooley*  
His Attorney.

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2,833,916

LUMINAIRE

John P. Foulds, Lynnfield Center, Mass., assignor to General Electric Company, a corporation of New York

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3 Claims. (Cl. 240—25)

My invention relates to luminaires and more specifically to luminaires particularly suited for street or roadway lighting.

Luminaires employing large rectilinear light sources such as fluorescent tubes are themselves usually of an elongated shape and are customarily fitted with elongated light transmitting globes enclosing or otherwise protecting the light sources and the polished reflector surfaces of the luminaire. Because of their necessarily large size, these globes are often molded of a clear plastic, but whether of plastic or glass, it is desirable that they should be adequately supported all around their periphery in order to be effective in protecting the interior of the luminaire. The problem of how best to support these globes under large temperature extremes without causing them to crack due to differential thermal expansion of the globe and its support is a serious one.

It is a principal object of this invention to provide improved means for supporting the elongated globe of such a luminaire so that the differences in thermal expansion and contraction of the globe relative to its support and the body portion of the luminaire are accommodated by the manner in which the globe is mounted in its support.

Further objects of my invention will become apparent from a consideration of the particular embodiment thereof illustrated in the accompanying drawings.

Fig. 1 of these drawings is a side view illustrating in outline my improved luminaire which has been shown mounted on a pole with the globe and support therefor also shown by dot and dash lines in a dropped position when supported by the hinge at one end thereof.

Fig. 2 is a longitudinal sectional view of my luminaire showing certain structural features thereof.

Fig. 3 is an end view, partially in section, of my luminaire showing additional structural features thereof.

Fig. 4 is a sectional view of Fig. 2 taken along the top edge portion of the globe structure and illustrating the internal structure thereof as well as the manner of its mounting in its supporting frame and the mounting of its supporting frame in the hood structure of the luminaire.

Fig. 5 is a fragmental side sectional view of an end portion of the globe showing the prism arrangement therein at its ends.

Fig. 6 is a similar end sectional view illustrating the prism arrangement in these ends.

Fig. 7 is a detail showing the natures of the prisms employed.

Fig. 8 is an exploded detailed view of the separable hinge structure employed for supporting the globe frame in the hood of my luminaire; and

Fig. 9 is an end view of the hinge arrangement shown in Fig. 8.

The particular embodiment of my invention illustrated in these drawings comprises an elongated hood structure supported from a cantilever-type top bracket and provided with a light transmitting globe formed of two com-

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plementary parts. These globe parts are joined at their open ends by a clamp which also serves to attach the globe structure as a whole to the center portions of two guide rails forming part of a globe-supporting frame which is hinged at one end and latched at its other end to the hood structure. The hood and the globe-supporting frame therein are formed of metal having the same or substantially the same temperature coefficient of expansion and contraction and the globe, by reason of its central support on its supporting frame, is free to move lengthwise thereof to accommodate its different rate of thermal expansion and contraction. The globe in its closed position encloses the reflectors and the supports at the ends thereof for a plurality of elongated light sources which in the arrangement shown are tubular fluorescent lights. A more detailed disclosure of the luminaire will now be given in the following description thereof.

The mechanical design of the luminaire is such that it is supported from one cantilever-type top bracket in order to eliminate all externally positioned guides and supports therefor. The hood 1 which constitutes part of the body structure of the luminaire is hung from a channel shaped bracket 2 having a mounting portion extending beyond the inner end of the hood and a tapered portion of decreasing thickness extending along the top of the hood and having flanged edges which are attached thereto forming a hollow enclosure in the bracket. As shown in Fig. 2, the dome is provided with wiring passages 3 which extend therethrough into the enclosure of the bracket. The mounting portion of the bracket is provided with three pairs of matching bolt holes 4, 5 and 6, two pairs of which, 5 and 6, are elongated in order to provide an adjustment about a pivot point formed by the bolts extending through the bolt holes 4. This mounting portion of the bracket may be attached to a clamp 7 which in the arrangement illustrated in Fig. 1 comprises two clamping members which are connected by bolts which when tightened produce a secure clamping engagement with a supporting member such as the pole 8 there illustrated. It is of course apparent that other members may be substituted for the clamp 7 so that the luminaire may be supported on the sidewalls of buildings or on supporting means other than the pole-type support illustrated in Fig. 1.

The hood 1 of the luminaire is reinforced by transverse braces 9 and 10 which are fastened to the down turned edges of the hood and also to the top of the reflectors therein in such a way that the whole structure becomes a boxed member providing the greatest rigidity possible for the weight and shapes involved. The ballast units, filament transformers, and capacitors connected in the lamp circuits are mounted within the hood on these transverse braces 9 and 10 or directly on the inside surface of the hood. The mounting of the filament transformer 11 on the brace 9 has been illustrated in the drawing, but the other parts referred to as well as the wiring has not been illustrated in order to simplify the drawing. It is of course understood that the input wires to these devices in the hood will extend through the wiring passageways 3 into the interior of bracket 2.

Two reflectors 12 and 13, which are mounted back-to-back and are pointed along the street in opposite directions, constitute the reflector structure of the luminaire which is mounted in the hood 1 thereof. These reflectors are provided with stiffening ribs 14 which are flattened along an area where the reflectors engage one another along their back surfaces. These reflectors extend lengthwise of the hood and each has one longitudinal edge portion attached to the hood and flanged within the hood near its point of attachment therewith to form seats for the wall structure about the opening in the

elongated globe 15 of the luminaire. The other longitudinal edge portions of these reflectors 12 and 13 are bent inward toward one another and fastened to one another to provide an assembly which positions the reflectors 12 and 13 relative to one another and the hood structure 1 of the luminaire.

Two members 16 and 17, each constituting end fillers and lamp socket supports are mounted in hood 1 at the ends of reflectors 12 and 13 so that one surface thereof forms a continuation across the ends of the reflectors of the globe seats provided by their flanged edge portions above referred to. Gasket strips of suitable material, such as neoprene sponge, are attached to these globe seats for forming a rain and dust tight connection between the globe and the body structure of the luminaire. These gasket strips may be attached to the globe seats by a suitable adhesive cement. The lamp socket supports 18 and 19 of these members 16 and 17 extend downwardly from the hood to position lamp sockets 20 and 21 at the ends of reflectors 12 and 13. Pairs of fluorescent lights 22 and 23 are mounted in a horizontal plane between aligned sockets 20 and 21 and constitute the two light sources of the luminaire which are respectively positioned in front of each of its reflectors 12 and 13.

Globe 15 of the luminaire is preferably transparent and made of a clear molded plastic material. For convenience in manufacture it is made in two pieces which when joined along their inner open ends form the completed globe. The two parts may be made of equal size and in the same mold thereby reducing the cost of manufacture. As best shown in Figs. 4, 5 and 6, prisms 38 are provided on the inside end surfaces of the globe and prisms 39 are provided on the outside bottom portion thereof. As shown in Fig. 8 these prisms are symmetrical and have facing surfaces with an angularity of 20°. These prisms are provided for their obscuring effect at the ends and bottom of the globe, but may be faced to secure a desired distribution of light. They also serve to effect an elongation of the light source as viewed from the street and to prevent a dark area along the bottom of the luminaire where the reflector thereof blocks a direct supply of light from the lamps therein.

As shown in Figs. 2, 3 and 4, according to the invention claimed herein globe 15 is attached to and supported by a globe frame having spaced side members 40 and spaced cross members 41 making a freely sliding connection with said side members for lengthwise movement thereof. Each cross member 41 is formed of two parts attached to the outer top edges of the globe and each of these parts is provided with a slot that fits over a reduced portion of the ends of the side rails near the ends thereof. These cross members in combination with a strip joining their inner ends and a strip located inside the globe and between which the upper end portions of the globe are sandwiched in a bolted assembly, serve to reinforce the top edge portion of the globe at its ends.

The ends of the side rails 40 at the outer end portion of the luminaire are turned inwardly toward one another to form the pivot part of a hinge connection by which the globe frame is supported on the outer end of the hood of the luminaire. As best shown in Figs. 8 and 9, the other part of the hinge connection is formed by a member 42 having a body portion 43 which is attached to the flanged outer end of the hood and has turned over portions 44 at each end thereof which are adapted to receive the inturned ends of the side rails 40 to complete the hinged connection. The turned over end portions 44 of the hinge member 42 has open portions at the top outer ends thereof through which the inturned ends of the side rails 40 may freely pass, and closed inner portions which receive and hold the slotted end portions 45 forming part of a catch or latch 46 which is assembled so that portion 45 of latch 46 is located within the closed portions of parts 44 of hinge member 42. Consequently, latch 46 is rotatable about the longitudinal axis of the end

portions 44 of hinge member 42 and can be moved from positions in which its end portions either close or open the passageway in the outer ends of the hinge member for the inturned ends of side rails 40. When latch 46 is turned into a position uncovering the end portions of parts 44 of hinge member 43, the inturned ends of the side rails 40 may be removed from hinge member 42 in order to remove the globe frame and the globe supported thereby from its hinged support in hood 1 of the luminaire.

The ends of side rails 40 at the inner end of the luminaire are turned inwardly toward one another and connected with one another by a member 47 forming part of a latch whose other part 48 is pivoted on a hinge pin 49 which extends transversely of and is supported by the side walls of the top bracket 2 of the luminaire. Part 48 of the latch is biased toward the other part 47 thereof by a spring 50 and member 48 is provided with a cammed striking face 51 which engages part 47 of the latch when the globe frame is moved toward the hood to its closed position. In the closed position, member 47 of the latch, which is mounted on the ends of the globe frame, engages and is held in a slotted portion of part 48 of the latch in order to complete the latching connection which holds the frame in its closed position. With this arrangement the globe and the frame in which it is supported may be pushed into place without handling the latch since the latch automatically goes into the engaged position.

The complementary parts 52 and 53 of globe 15 are provided, along their upper edges which form the opening in the completed globe, with flanged edge portions which are grooved to accommodate the side rails 40 and end members 41 of the globe frame. The open ends of parts 52 and 53 are assembled and held in place relative to one another between two clamping straps 54 and 55 which engage the flanged edges of parts 52 and 53 to provide a rigid globe assembly at the clamp. The ends of the clamping straps 54 and 55 are also attached to a mid-portion of side rails 40 in order to complete a connection between the globe and its supporting frame. At the end corners of the globe, members 40 and 41 of the globe frame are provided with cutaway portions which prevent interference between these members and the flanged edges of the globe. By reason of the construction employed the edges of the globe around the opening therein are supported by reinforced metal pieces, which permit the ends of the globe, on each side of clamp 54-55, by which it is supported on side rails 40 to move freely lengthwise of these side rails to accommodate the unequal expansion and contraction of the globe, which is formed of plastic, and the side rails, which are formed of metal. The globe-supporting frame and hood in which it is mounted are both formed of metal and will have corresponding amounts of thermal contraction and expansion and the consequent correspondence in the change in form of these parts will not interfere with the hinged connection of the globe frame in the hood 1 of the luminaire. For a luminaire having an overall length of 7 feet, the difference in expansion between an aluminum hood and a plastic globe will amount to about  $\frac{3}{8}$  of an inch in the usual range of outdoor temperatures. The particular luminaire being described is designed for accommodating four 6 ft. fluorescent lamps of the rapid start street lighting type, each of which is rated at 5300 lumens.

It is quite obvious that the particular embodiment of my invention above described may be variously modified without departing from the spirit and scope of my invention. Thus, while I have described only one preferred embodiment of my invention, certain modifications will occur to those skilled in the art and I, therefore, intend to cover in the appended claims all such modifications, as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A luminaire comprising: an elongated hood having

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an elongated opening therein for a globe; an elongated globe-supporting frame including a pair of spaced side rails mounted in and extending lengthwise of said globe opening in said hood; an elongated globe formed of a light-transmissive material having a temperature coefficient of expansion differing from that of said frame, said globe having a pair of lengthwise extending sidewalls and a pair of end walls closing the respective ends of said side walls forming an elongated opening extending lengthwise of said globe, and a supporting flange extending along the sidewalls adjacent that portion thereof which forms a part of said globe opening with the flanged portions of said globe engaged by said side rails; and clamps mounted on the closed ends of said globe, said clamps having end portions supported on the end portions of said side rails with which they make a freely sliding connection for movement lengthwise thereof as a result of differential expansion and contraction between said globe and said globe-supporting frame under varying temperature conditions.

2. A luminaire comprising: an elongated hood having a seating surface therein for the wall structure of a globe at an elongated opening therein; an elongated globe formed of a light transmitting material and having a pair of side walls joined at the ends forming an elongated opening extending lengthwise of said globe and a supporting flange on each side wall adjacent said globe opening forming a portion thereof; means holding the wall structure of said globe at the opening therein against said seating surface in said hood including a frame having spaced side members formed of a material having a temperature coefficient of expansion differing from that of said globe and spaced cross members making a freely sliding connection with said side members for lengthwise movement thereof, said side members engaging said globe flanges and supporting said globe thereby; and means attaching said cross members of said globe holding means to the closed ends of said globe.

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3. In a luminaire, the combination of: an elongated trough-shaped globe formed of a light-transmitting material and having a pair of longitudinally extending sidewalls, a pair of end walls closing the respective ends of said side walls, and flanged surfaces extending lengthwise of each of said side walls; and means supporting said globe in said luminaire comprising an elongated globe-supporting frame including a pair of spaced side rails formed of a material having a temperature coefficient of expansion differing from that of said globe and supporting said side walls by said flanged surfaces, and cross members mounted on said end walls of said globe having end portions supported on the end portions of said side rails, the flanged surfaces of said globe, and the end portions of said cross members engaging said side rails with a freely sliding connection for movement lengthwise thereof due to differential dimensional changes of said globe and side rails under varying temperature conditions.

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