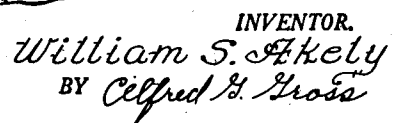


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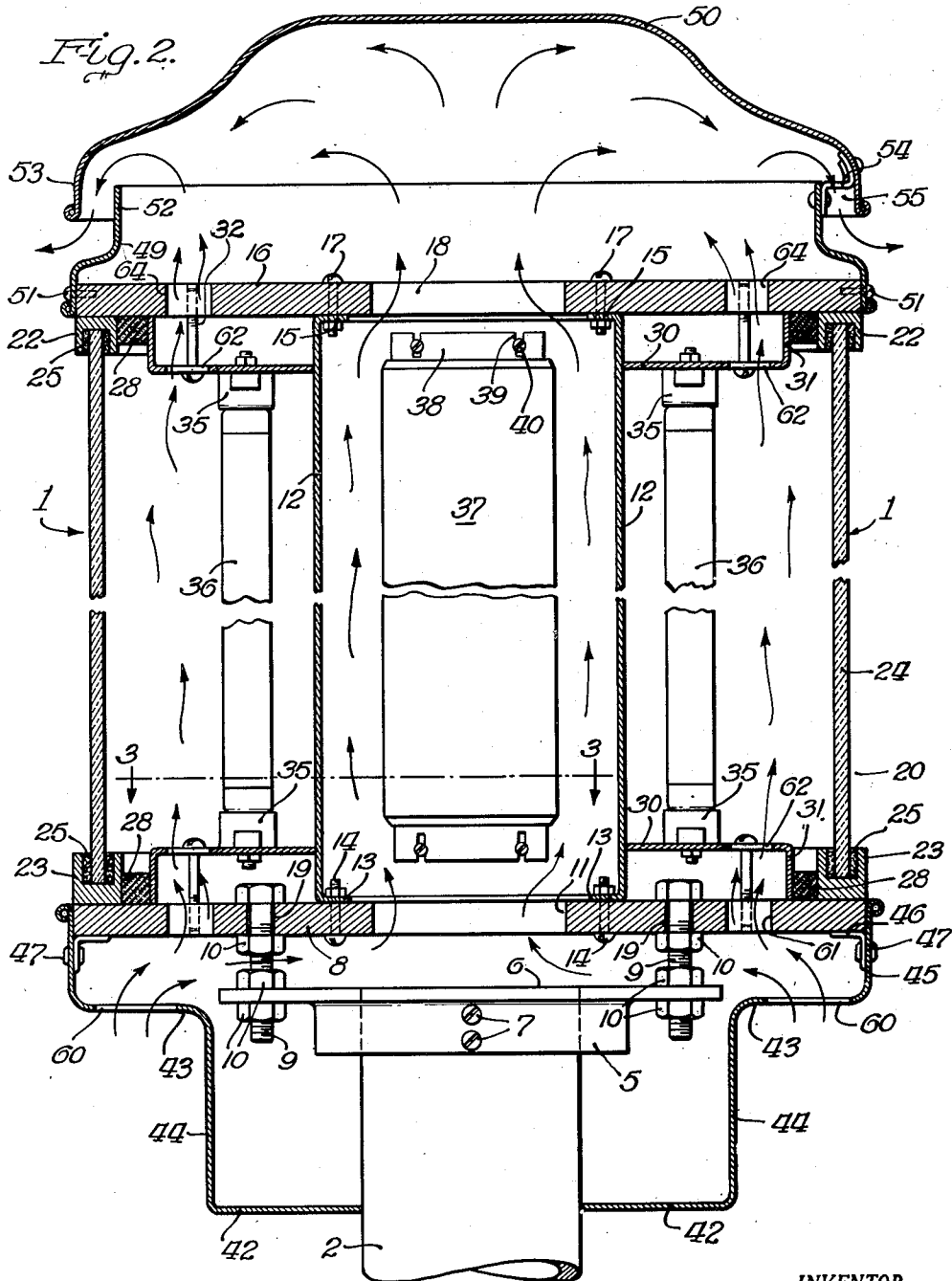
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FLUORESCENT LIGHTING FIXTURE HAVING
AIR-COOLED LAMP AND BALLAST CHAMBER

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2 Sheets-Sheet 2



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FLUORESCENT LIGHTING FIXTURE HAVING AIR-COOLED LAMP AND BALLAST CHAMBER

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9 Claims. (Cl. 240—25)

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My invention relates to the art of illumination and more particularly to improvements in lighting fixtures of the high intensity outdoor type.

It is a principal object of my invention to provide an outdoor fixture, especially of the fluorescent type, having a plurality of high intensity lamps and their required auxiliary equipment housed in a compact weather sealed casing which is constructed to allow free flow of cooling air over and around the lamps and auxiliary equipment, to maintain these elements at safe temperature levels.

It is a further object of my invention to provide a lighting fixture of the above mentioned character in which a central hollow upstanding column serves as the frame of the fixture, reflector for the lamps, a common wall of separate air flow channels for cooling the lamps and their auxiliary equipment and as a housing for parts of said auxiliary equipment.

Other objects and advantages of the invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

Figure 1 is an elevational view of a pedestal mounted lighting fixture embodying my invention,

Figure 2 is a broken elevational sectional view, drawn to an enlarged scale, of my lighting fixture taken on the line 2—2 of Figure 1,

Figure 3 is a partial sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a fragmentary view of an end frame and air distributing plate, and

Figure 5 is a fragmentary plan view of an outer shroud and air inlet member.

Referring now to the drawing in detail and first to Figure 1, my fixture 1 is shown supported upon a pedestal 2 having an enlarged base member 3 secured in any suitable manner to a supporting surface.

Referring to Figure 2, a combined supporting collar 5 and plate 6 telescopes over the upper end of the pedestal 2 and is rigidly secured thereto by set screws 7. A bottom frame plate 8 is positioned above the plate 6 in spaced relation to provide an air channel therebetween. The frame plate 8 is supported from the plate 6 by a plurality, preferably three, of levelling studs 9 which extend through holes 19 in the plate 8 and are secured to the plates 6 and 8 by the levelling nuts 10. The frame plate 8 has a central opening 11 to the interior of hollow upstanding column member 12 which rests upon the plate 8 around the opening 11 and is provided with an intumed base flange 13 which receives securing bolts 14 passing

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through holes 21 in the plate 8 to secure same to the column 12. The column member 12 may be circular in section but is preferably polygonal. The upper end of the member 12 is provided with an intumed flange 15 which underlies and supports a top frame plate 16, identical with plate 8 except for the omission of holes 19 and the position of holes 21 as will appear hereinafter, which is secured to the flange 15 by bolts 17 passing through holes in plate 16 corresponding to the holes 21 but positioned radially inwardly of the column 12. The frame plate 16 has a central opening 18 within the perimeter of the column 12 and flange 15 and substantially aligned with the opening 11 in the plate 8. The elements 8, 12, and 16 thus form a rigid frame for the fixture proper, rigidly and adjustably supported upon the pedestal 2.

An outer light transmitting, and weather shielding casing 20 extends around the central column 12 between the plates 8 and 16 to form the outer wall of an annular lamp chamber. The casing 20 consists of upper and lower channel members 22 and 23, respectively, which receive the upper and lower edges of the glass wall 24 which is secured and sealed in the channels by sealing compound 25. The casing 20 may be of known type but is preferably of the type made in two sections having vertical channel members 27, corresponding to the channels 22 and 23, along the meeting edges with the bases of the channels abutting to seal the vertical meeting edges of the casing sections. A thin gasket may be interposed between the abutting channels 27 if desired. One pair of the abutting channels 35 may be hinged to the plates 8 and 16 or each pair may be secured together by any suitable fastening means to allow ready removal of both casing sections. The channel members 22 and 23 press firmly against a sponge rubber sealing gasket 28 to air seal the top and bottom portions of the casing with respect to the plates 8 and 16.

A pair of lamp supporting plates 30 surround the column 12 at the upper and lower ends thereof. Each plate 30 has an outer flange 31 resting upon one of the frame plates 8 and 16 to space the plates 30 therefrom and engaging the inner face of the sealing gasket 28. The plates 30 are secured in position by stud bolts 32 passing through holes 33, see Figure 3, in the plates 30 and threadedly engaging in threaded holes 34 in the plates 8 and 16. Each plate 30 carries a plurality of lamp sockets 35 each of which is aligned with a corresponding socket on the plate 30 at the opposite end of the column 12. Each pair of aligned sockets 35 is adapted to support an elon-

gated lamp 36 extending vertically in the annular space between the column 12 and casing 20. A suitable ballast 37 for the lamp 36 is mounted inside the column 12. The casing of the ballast 37 is provided with flanges 38 having notches 39 which receive suitable anchoring elements such as self tapping screws 40 to secure the ballast to the column 12. As shown, all the ballast structure for the lamps 36 is in a single casing but a plurality of casings may be mounted in the column 12 if required by the number and size of the lamps 36. The electrical connections between the source of energy, the lamp sockets and the ballast form no part of the invention and are not illustrated. The wires forming these connections may be threaded through certain air passages to be described hereinafter.

An ornamental shroud member embraces the pedestal 2 to conceal the fixture mounting and levelling structure. The shroud member consists of a horizontal downwardly facing annular section 43 interposed between a pair of cylindrical sections 44 and 45 and a bottom horizontal annular section 42 embracing the pedestal 2 and joined to the lower end of the section 44. The section 45 embraces and conceals the peripheral edge of the frame plate. The shroud is secured to L-shaped lugs 46, depending from the lower face of the plate 8, by small studs 47 extending through the shroud section 45.

The top of the fixture consists of an ornamental air exhausting and weather shielding structure composed of a stack member 49 and an imperforate top dome member 50. The stack member 49 engages the peripheral edge of the plate 16 and is secured thereto by small studs 51. The upper portion of the stack member 49 is reduced in diameter to form an upstanding cylindrical section 52. The dome 50 has a lower cylindrical portion 53, of larger diameter than and surrounding the cylindrical portion 52 to form a downwardly facing vertically extending annular air exhaust duct 55 therewith. A plurality of spacing and supporting lugs 54 are secured to the dome 50 and stack 49 to maintain the element in fixed spaced relation.

The shroud section 43 is provided with a plurality of downwardly facing air inlet openings 60, see Figure 5, to admit cooling air to the underside of frame plate 8. Air so admitted has a free path of flow between the shroud and plate 8 to the space between the plates 6 and 8 whence it can flow through opening 11, column 12, over and around the ballast 37, and through the opening 18 in plate 16 to the air exhausting duct 55. Air admitted to the underside of the frame plate 8 also has a free path of flow through openings 61 in the plate 8, see Figure 4, the space between the lower lamp supporting plate 30 and frame plate 8, openings 62 in plate 30, over and around the lamps 36 and the outer face of column 12, through openings 62 in the upper lamp supporting plate 30, between the upper-plate 30 and the frame plate 16 and through openings 64 in the upper frame plate 16 to the air exhausting duct 55.

From the foregoing it is apparent that a plurality of free paths of flow of cooling air are provided to dissipate the heat liberated by the lamps 36 and ballast 37. The ballast is rigidly and securely pressed into contact with the column 12 by the screws 40 whereby heat is conducted from the ballast into the column 12 which then dissipates this heat to air flowing on both sides thereof. The outer face of the column 12 is pol-

ished or enameled to provide a reflecting surface for light and heat radiated by the lamps 36.

It is apparent that the downward facing air inlets 60 lying well within the outer peripheral portions of the fixtures are effectively shielded to prevent rain from entering the fixture along with the cooling air. The downwardly facing shielded air exhaust duct 55 likewise bars the entry of rain water. All parts of the apparatus are air sealed except for the above noted air inlet and exhaust passages. The air inlet and exhaust passages are so related to the other portions of the apparatus that any rain which might be splashed or wind driven into the exposed ends of these passages is barred from reaching the electrical apparatus by substantial vertical passageways which insure gravitational separation and drainage of such moisture.

The outdoor high light intensity fixtures herein described have been found to protect all electrical parts from moisture while maintaining the lamps, ballast and electrical parts at safe temperature levels even though such fixtures must dissipate the heat equivalent of large quantities of electrical energy, in some instances several hundred watts, released by the lamps and ballast. The present construction induces a large flow of cooling air through and around all parts of the apparatus by the chimney effect of the heat imparted to the air with the result that the temperature of all parts of the apparatus is maintained at levels which are too low to impair the electrical parts of the structure or to melt or destroy the insulation of such parts.

The protection herein applied for is not limited to the precise details of construction and arrangements illustrated and described, but is intended to include such modifications thereto as may come within the scope of the appended claims.

I claim:

1. A lighting fixture comprising an upstanding cylindrical light transmitting casing, a tubular member within and spaced from said casing, upper and lower end frames connecting the adjacent ends of said casing and tubular member, said end frames having openings to the interior of said tubular member and said casing, lamp socket supporting plates surrounding said tubular member at opposite ends of said casing in spaced relation to said end frames and having air flow openings therethrough, a plurality of lamp supporting sockets on said plates, a plurality of fluorescent lamps mounted in said sockets, a ballast for said lamps mounted within said tubular member, and cover members for said end frames forming air chambers therewith and each having downwardly directed air passages communicating with said air chambers.

2. A lighting fixture comprising an upstanding frame structure formed to provide a lamp chamber and a ballast chamber therein, lamp supporting means carried by said frame in said lamp chamber, a ballast carried by said frame in said ballast chamber, said frame having upper and lower end members provided with air flow ports therein opening into each of said chambers whereby to provide cooling air flow paths through each of said chambers, an air inlet and rain shedding member secured to said frame and forming an air chamber with the lower of said end members, said air inlet member having a downwardly facing air inlet port therein positioned below said lower end member and within the permieter of said frame, and an air outlet and rain shedding structure secured to said frame

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and forming an air chamber with the upper of said frame members, said air outlet structure comprising a cylindrical member secured to said upper end member around the air flow ports therein and an imperforate dome member overlying said cylindrical member and having a depending cylindrical skirt surrounding the upper end of said cylindrical member in spaced relation thereto.

3. A lighting fixture comprising an upper frame member, a lower frame member, an elongated tubular member joined at its ends to said upper and lower frame members, a light transmitting casing sealed at its ends to said upper and lower frame members in spaced relation to said tubular member to form a lamp chamber with said tubular member and said frame members, means in said lamp chamber for supporting fluorescent lamps therein, lamp ballasts mounted in said tubular member between said frame members, said upper and lower frame members having openings therethrough to said lamp chamber and having other openings therethrough to the interior of said tubular member, an air inlet shroud secured to said lower frame member outwardly of said openings and forming an air inlet chamber with said lower frame member, said shroud having a portion thereof positioned in spaced relation to said lower frame member and provided with a downwardly facing air inlet port, and an air exhausting and rain shielding structure secured to said upper frame member outwardly of said openings and forming an air exhaust chamber with said upper frame member including means forming an air exhaust passageway from said air exhaust chamber having a downwardly directed outlet.

4. A lighting fixture comprising a cylindrical light transmitting casing, an end plate attached to each end of said casing, a tubular member attached at its ends to said plates and positioned within said casing to define an annular lamp chamber therewith, means within said lamp chamber for supporting a plurality of fluorescent lamps in substantial alignment with the axis of said casing, cover members attached to each of said end plates and defining air chambers therewith at each end of said casing, an electrical ballast supported in said tubular member between said end plates, each of said end plates being formed with openings therethrough providing communication between said air chamber and the interior of said tubular member and said lamp chamber, and each of said cover members being formed with downwardly facing air flow ports.

5. A lighting fixture comprising a light transmitting casing forming a lamp chamber, means for supporting fluorescent lamps in said lamp chamber, a rain shedding shroud structure forming an air chamber attached to the upper end of said casing and including means forming an air exhaust passage from said air chamber terminating in a downwardly facing air outlet, a rain shedding shroud structure forming an air chamber attached to the lower end of said casing and having a downwardly directed air inlet port therein, each of said shroud structures having openings therein to said lamp chamber to provide an air flow passageway between said air chambers through said lamp chamber, means in said casing forming an air duct between said air chambers distinct from said lamp chamber, and a ballast in said air duct whereby said lamp chamber and said ballast chamber are cooled by

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individual air streams flowing between said air chambers.

6. An outdoor lighting fixture comprising an upstanding tubular member, an end frame attached to each end of said tubular member, each of said end frames having a portion projecting outwardly of said tubular member and laterally of the axis thereof, a light transmitting wall member attached to said projecting portions of said end frames and forming a sealed lamp chamber with said portions of said end frames and said tubular member, a plurality of fluorescent lamps in said lamp chamber extending between said projecting portions of said end frames, ballasts for said lamps in said tubular member between said end frames, means mounting said ballasts on said tubular member in heat transfer relation thereto, openings in said end frames providing air flow passageways into and out of said lamp chamber and said tubular member, and a shroud means joined to each of said end frames forming an air chamber therewith, each of said shroud means being formed with an air flow port providing communication between the exterior of said fixture and the air chamber within such shroud means, and each of said air flow ports opening below a rain shedding portion of said fixture.

7. A lighting fixture adapted to be mounted upon a supporting pedestal comprising a cylindrical light transmitting casing, an end plate attached and sealed to each end of said casing, a tubular member attached to said end plates within said casing to form an annular lamp chamber within said casing between said end plates, means within said annular chamber for supporting a plurality of fluorescent lamps, ballasts for said lamps mounted within said tubular member between said end plates, a cover structure attached to the upper of said end plates forming an air exhaust chamber therewith and having a downwardly facing air exhaust opening, a lower cover member attached to the lower of said end plates forming an air inlet chamber therewith and having a central opening for receiving a support pedestal and a downwardly facing air inlet opening between said central opening and the peripheral portion thereof, a mounting plate within said air inlet chamber adapted to be secured to the upper end of a support pedestal within said air inlet chamber, spaced supporting studs extending between said mounting plate and the lower of said end plates supporting said lower end plate from said mounting plate in spaced relation thereto, and each of said end plates being formed with openings communicating each of said air chambers with the interior of said tubular member and said lamp chamber.

8. A lighting fixture adapted to be mounted upon an upstanding support pedestal comprising an upstanding cylindrical light transmitting casing, a light impervious tubular member positioned concentrically of said casing to form an annular lamp chamber therewith, a frame structure attached to each end of said casing and said tubular member and having openings therethrough communicating with said lamp chamber and the interior of said tubular member, a shroud on the upper end of said fixture overlying and forming an air exhaust chamber with the upper of said frame structures and having a downwardly directed air exhaust port underlying a rain shedding portion of said shroud, a mounting member adapted to be attached to

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the upper end of a support pedestal, means supporting the lower of said frame structures from said mounting member in spaced relation thereto to allow free air flow around said mounting member into said tubular member and lamp chamber through the lower of said frame structures, and a lower shroud member mounted on said fixture forming an air inlet chamber with the lower of said frame structures and having a downwardly directed air inlet port underlying a rain shedding portion of said fixture, said lower shroud member enclosing said support member and having an opening adapted to receive a support pedestal.

9. A lighting fixture comprising; a frame structure including an upstanding tubular member, an upper rain shedding shroud structure forming an air chamber attached to the upper end of said tubular member and having a port opening to the atmosphere underlying a rain shedding portion of said shroud structure, a lower rain shedding shroud structure forming an air chamber attached to said tubular member in spaced relation to said upper shroud member and having a port opening to the atmosphere underlying a rain shedding portion of said lower shroud structure, and a light transmitting wall attached at its ends to said shroud structures in spaced relation to said tubular member to define a lamp chamber with said shroud structures and tubular

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member; means in said lamp chamber for supporting a plurality of fluorescent lamps; lamp ballasts in said tubular member between said shroud structures; and openings formed in said frame structure providing air flow passageways from the air chambers in said shroud structures to said lamp chamber and the interior of said tubular member whereby said lamp chamber and ballasts are cooled by separate air streams flowing from the lower to the upper of said shroud structures through said lamp chamber and tubular member.

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