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M. R. ANDERSON ET AL

3,064,123

LUMINAIRE

Filed Feb. 29, 1956

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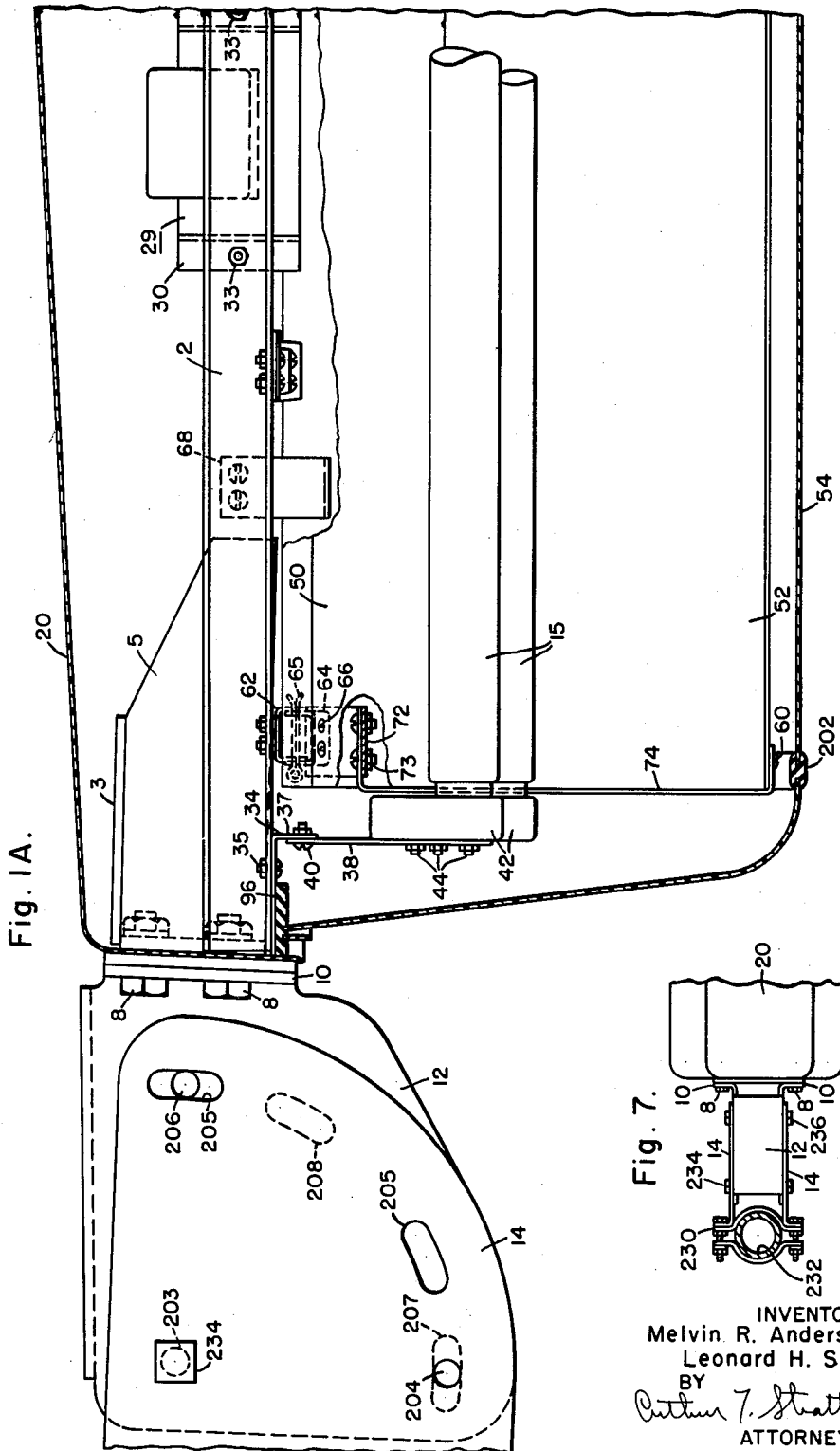


Fig. 1A.

Fig. 7.

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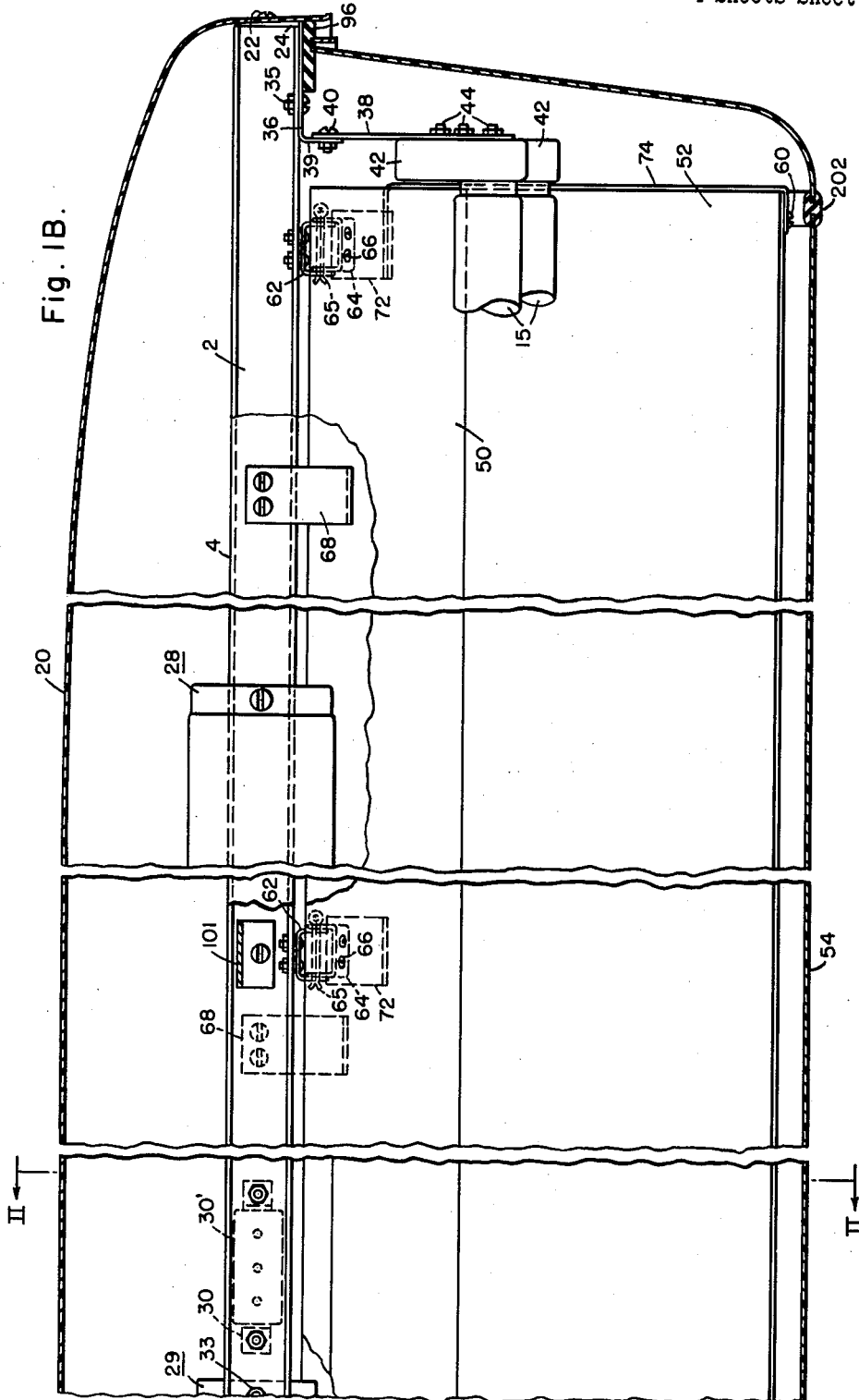
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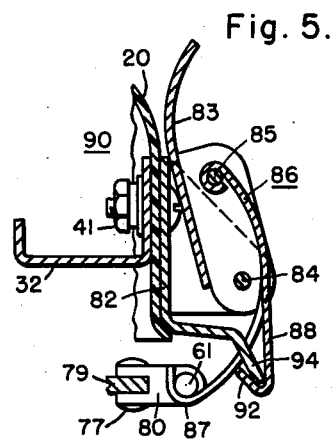
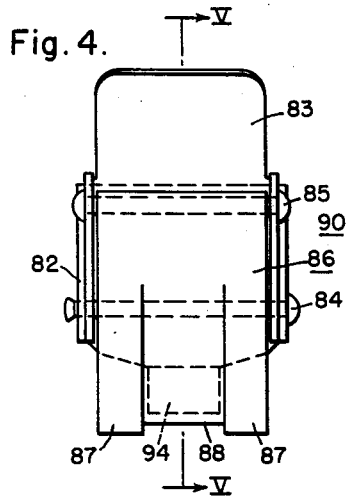
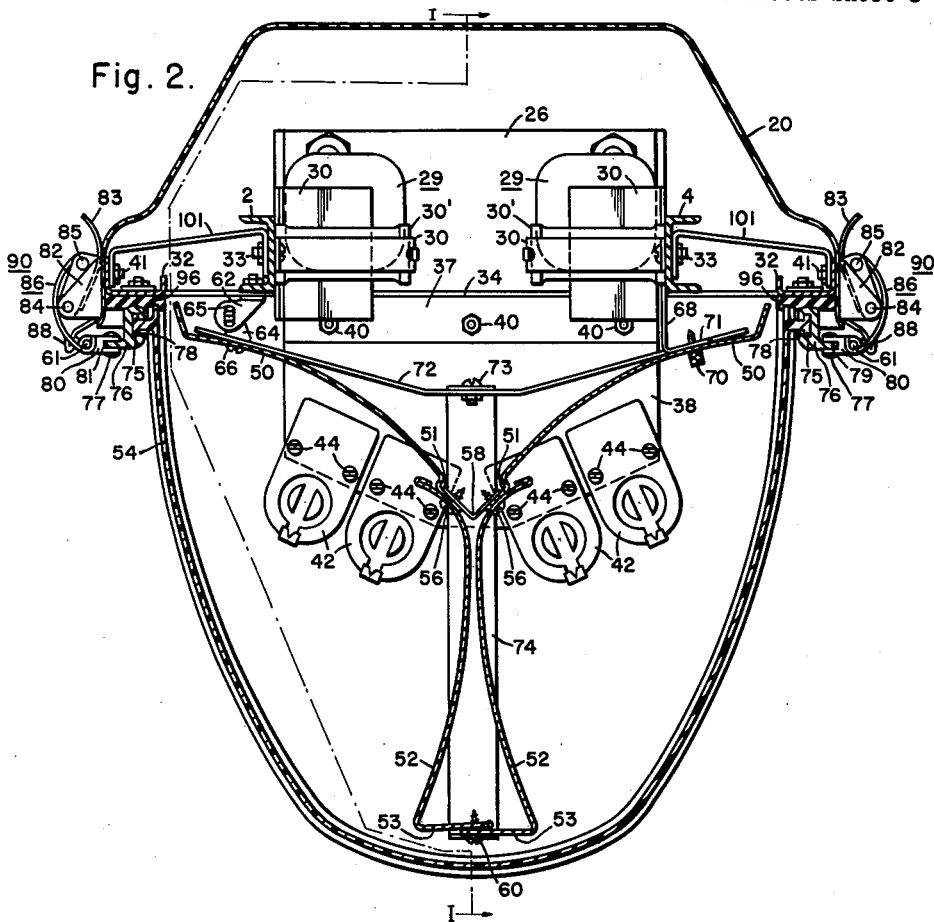
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Fig. 3.

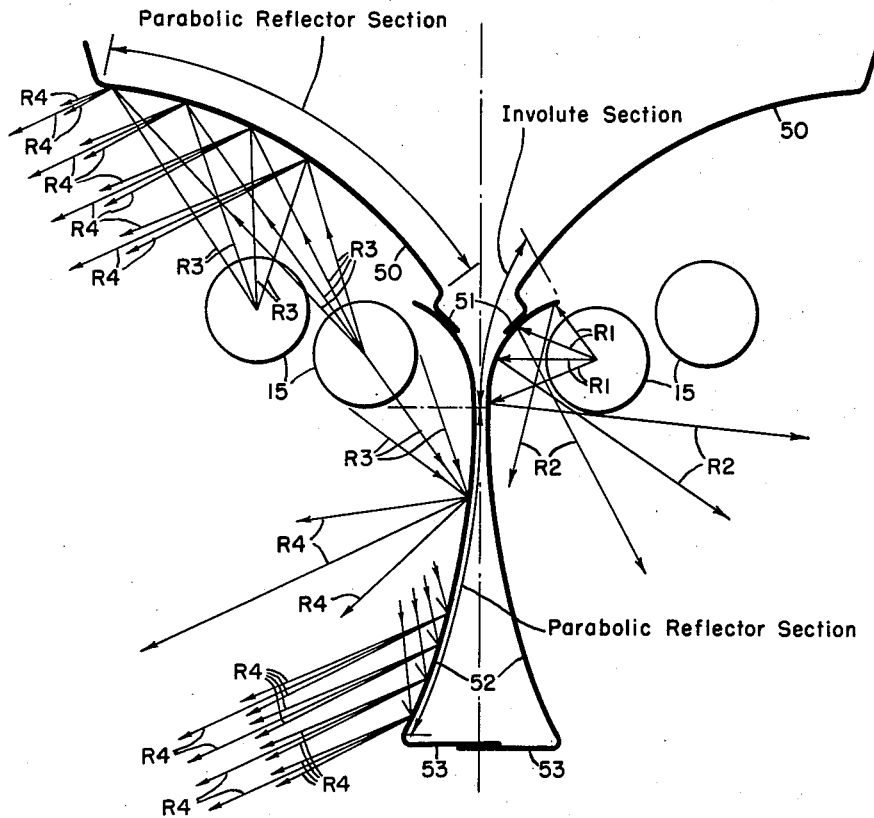
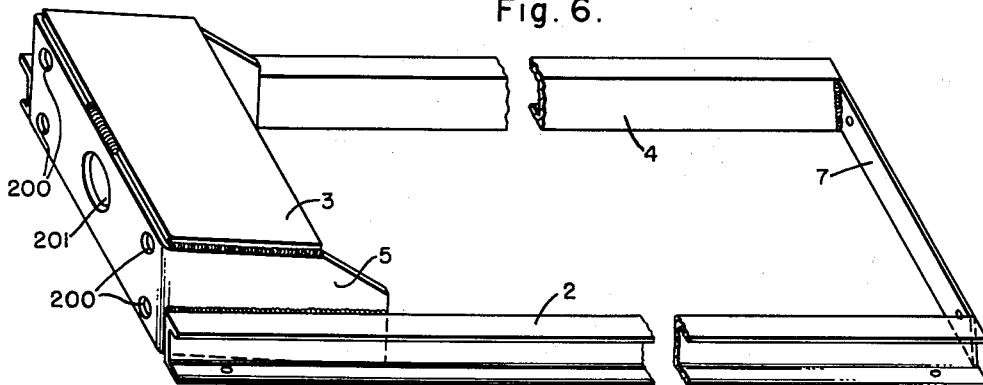


Fig. 6.



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3,064,123
LUMINAIRE

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14 Claims. (Cl. 240—25)

Our invention relates generally to luminaires, and more particularly to an elongated fluorescent street lighting luminaire.

At the present time there are various commercial fluorescent street lighting luminaires on the market which, due to the length of the fluorescent lamps normally employed therein, has necessitated elongated housings and covers in order to enclose the fluorescent lamps. Such elongated housings and covers must be separated or the cover removed during various types of maintenance operations, which operations heretofore have been difficult to accomplish. One method of permitting access to the luminaire has been by hinging the cover to the housing adjacent the supported or "curb" end of the luminaire, which has been unsatisfactory due to the difficulty in lowering and raising a long cover at the elevated heights at which such luminaires are normally located. Still another method of releasing the cover from the housing has been by providing latching members at the sides of the luminaire which have been of the type that upon release of the latching members on one side of the luminaire the latching members on the other side are also released. Such a method of removal of the cover is unsatisfactory in view of the fact that upon reassembly it is necessary to work from both sides of the luminaire in order to latch the assembly together.

Some prior luminaires of this type have provided a smooth curvature reflector which has been unsatisfactory due to the trapping of light between the reflector and the lamp. Inasmuch as the lamps are quite long and the reflector is adjacent the entire length of the lamp, such trapping of the light substantially reduces the light output from the luminaire.

The mounting of elongated fluorescent luminaires for street lighting purposes is substantially always accomplished by securing one end of the luminaire at an elevated height above the area to be illuminated. In view of the length of the luminaires, such a method of mounting causes severe bending stresses to be developed within the main structural supporting member. In some cases the luminaire housing is the main structural member which must have sufficient rigidity to withstand normal load conditions. In view of these requirements, relatively heavy housings are necessary which has added materially to the cost of the luminaire and which has made installation of the luminaires difficult. Still other luminaires have employed additional guying means for support which has added to the installation and maintenance cost. Also due to such elevated heights of installation it is desirable that all maintenance operations may be quickly and readily accomplished in a relatively simple manner which does not require, as much as possible, the use of tools.

Accordingly, one object of our invention is to provide a new and improved elongated luminaire having a latch assembly at each of its sides which also functions as a fixed hinge when in the latched or closed position.

Another object of our invention is to provide a new and improved luminaire having a novel form of reflector for obtaining an improved light distribution from a source of light.

Another object of our invention is to provide a new and improved elongated luminaire adapted for mounting at one of its ends which utilizes an elongated support ex-

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tending substantially the entire length thereof to which all components are secured.

Still another object of our invention is to provide a new and improved elongated luminaire having a cooperable housing and cover which are held together by a plurality of latching members at each side thereof, each of which latching members has integral means for preventing opening thereof when the latching means on the opposite side are released.

A more specific object of our invention is to provide a new and improved elongated luminaire having a cooperable housing and cover which are held together by a plurality of latching members at each side thereof, each of which latching members includes a spring biased pivot support for the cover when the latching means on the opposite side are released.

Still another object of our invention is to provide a new and improved luminaire having a reflector which is generally of a parabolic curvature and which is provided with an intermediate portion of another curvature to prevent trapping of light between the intermediate portion and a lamp adjacent thereto.

A more specific object of our invention is to provide a new and improved luminaire having a reflector which is generally of a parabolic curvature and which is provided with an intermediate portion having an involute curvature to prevent trapping of light between the intermediate portion and a lamp adjacent thereto.

Still another more specific object of our invention is to provide a new and improved elongated luminaire which is adapted to be supported at one of its ends comprising a main structural frame of a high strength material to which all components of the luminaire are secured including a lightweight plastic housing and cover.

These and other objects of our invention will become more apparent from the following description when taken in conjunction with the following drawings, in which:

FIGURE 1A is a cross-sectional view of the supported end of a luminaire constructed in accordance with the principles of our invention, taken substantially along the lines I—I of FIG. 2 with portions of the interior components of the luminaire broken away;

FIG. 1B is a cross-sectional view of the free end of a luminaire constructed in accordance with the principles of our invention, taken substantially along the line I—I of FIG. 2 with portions of the interior components of the luminaire broken away;

FIG. 2 is a cross-sectional view of the luminaire shown in FIGS. 1A and 1B, taken substantially along the lines II—II of FIG. 1B;

FIG. 3 is a diagrammatic representation of the reflector utilized in the luminaire shown in FIGS. 1A, 1B and 2 and which shows the relationship of the lamps therewith;

FIG. 4 is an elevation view of a hinge and latch mechanism constructed in accordance with the principles of our invention;

FIG. 5 is a cross-sectional view of a hinge and latch mechanism shown in FIG. 4, taken substantially along the lines V—V thereof;

FIG. 6 is a perspective view of the supporting frame of the luminaire as shown in FIGS. 1A, 1B and 2; and

FIG. 7 is a top plan view of the supported end of the luminaire shown in FIG. 1A.

Referring to FIGS. 1A, 1B, 2 and 6, it will be noted that a luminaire constructed in accordance with the principles of our invention comprises an elongated one-piece rectangular main structural frame having elongated side members 2 and 4 which are joined together at each of their ends by laterally extending end members 5 and 7. The side members 2 and 4 and the end members 5 and 7 of the main structural frame may be formed from any suitable material having sufficient strength for the pur-

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poses hereinafter described; however, a high strength material such as steel is preferred for such members so that they may readily be secured together to form a strong frame in any suitable manner, such as by welding. As shown, the end member 5 is located at the "curb" or supported end of the luminaire and is of a U-shape with its arms secured to the side members 2 and 4, respectively, so that its bight portion is in alignment with the ends of the side members 2 and 4 adjacent thereto. The bight portion of the end member 5 extends upwardly from the members 2 and 4 and is provided with both suitable laterally and vertically spaced openings 200 so that it may be bolted by means of nut and bolt assemblies 8 to integral laterally spaced and extending end plates 10 on a movable support 12. A cross brace 3, of suitable material such as steel, may be secured in any suitable manner such as welding to the upper edges of the arms of end member 5 to provide additional rigidity to end member 5.

Referring to FIGS. 1A and 7, the support 12 is U-shaped with the end plates 10 extending laterally outward from the free ends of the arms of the support 12. A pair of plates 14 are also provided which are located closely adjacent the outer side of the arms of the support 12 respectively. The supports 12 and plates 14 may be formed from any suitable material, such as steel, having sufficient structural strength so that the plates 14 may be secured, in any suitable manner such as by a clamp 230, to a fixed support 232. Each arm of the support 12 and each plate 14 is provided with a circular opening 203 adjacent their upper sides and the support 232 through which any suitable releasable securing means, such as a pivot bolt and nut assembly 234, may be inserted so that the support 12 may be moved pivotally with respect to the plates 14.

Each plate 14 is also provided with a circular opening 204 substantially vertically (FIG. 1A) below opening 203, and a pair of arcuately spaced arcuately elongated slots 205, the arcuate centers of which are spaced the same distance from the center of opening 203 as is the center of opening 204. In a similar manner each arm of the support 12 is provided with a circular opening 206 in alignment with the upper slot 205 in plates 14, an arcuately elongated slot 207 in alignment with openings 204 in the plates 14, and an elongated slot 208 spaced arcuately from the upper slots 205 in the plates 14 the same number of degrees as the slots 207 are spaced from the lower slots 205. As will become apparent herein, all the above-identified slots 205, 207, and 208 and openings 206 and 204 are all spaced the same radial distance from the center of the openings 203 and are all of a size to receive suitable securing means such as bolts and nut assemblies 236, only one of which is shown in FIG. 7, in the same manner as the openings 203. Further, it will be noted that the openings 206 and 204 are located centrally of the upper slots 205 and slots 207, respectively. Thus, as shown in FIG. 1A, such securing bolts will pass through the aligned openings 203, the aligned openings 204 and slots 207, and the aligned openings 206 and upper slots 205. By releasing all of such bolts, the support 12 may be pivotally moved about the pivot bolt extending through openings 203 so that the horizontal position of the luminaire may be adjusted within the limits of the slots 207 and the upper slots 205. By removing the bolts from the openings 204 and 206 and elevating the entire luminaire slots 207 and 208 will become aligned with the lower and upper slots 205, respectively, at which time the supports 12 and 14 may be again secured together by means of the securing bolts 236. It will be noted that by such openings and slots in the arms of the supports 12 and 14 the position of the luminaire may be adjusted within both large and small angles. Also it is obvious that if desired other combinations or lengths of slots and openings may be provided to obtain varying degrees of elevation. Further

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individual securing means may be employed rather than through extending bolts. Supports 12 and 14 may be provided with aligned approximately central openings similar to opening 201 located centrally in the bight portion of the end member 5 so that electrical conductors may be passed therethrough to the supported luminaire.

The luminaire as shown is adapted to support four longitudinally extending 72 inch long fluorescent lamps 15; however, it will be realized that the principles of our invention are applicable to luminaires supporting other types and lengths of elongated lamps. In view of the 72 inch lamp length for the luminaire as shown, the side members 2 and 4 must have sufficient cross section so as to be capable of supporting the luminaire when subjected to the normally expected field conditions. A standard U-shaped structural steel channel having a web of 1½ inches and a flange height of ¾ inch has been found to be satisfactory for such purposes when mounted with the web extending substantially parallel to a vertical plane passing through the longitudinal center of the luminaire. The flanges of the side members 2 and 4 extend laterally outwardly from the web portions and away from each other.

The upper portion of the luminaire comprises an elongated, rather shallow, inverted dished housing 20 which has the lower edges of its sides located slightly below the lower flanges of the side members 2 and 4. The front end of the housing 20 is secured to the front end member 7 of the main structural frame by providing the front member 7 with spaced openings for receiving suitable securing means, such as machine screw and nut assemblies 22. It will also be noted that the "curb" end of the housing 20 is located between the plates 10 of support 12 and the bight portion of the end member 5, and is provided with aligned clearance openings so that the housing 20 may be secured therebetween by the bolts 8. In order to minimize the loading on the side members 2 and 4, the housing 20 is formed from a lightweight corrosion and weather-resistant material, such as a one-piece laminated structure of a reinforced plastic material, such as plies of fiber glass impregnated with a polyester resin, such as methylmethacrylate.

The various components for controlling the fluorescent lamps in the luminaire are supported from the side members 2 and 4 and are located in the housing 20, in order that they may be protected from various elements. Although various well known and standard control elements are located within the housing 20 only the supporting of the ballast 28 and the filament transformers 29 are of particular importance due to the weight of the magnetic laminations utilized therein. As shown in FIG. 2, a capacitor 30' of well-known construction, is secured to each of the side members 2 and 4 by means of a suitable frame 30, of standard steel strap, which encircles the stacked laminations of the filament transformers 29 and is secured to the members 2 and 4 by means of bolt and nut assembly 33. Inasmuch as the filament transformers 29 are located the same longitudinal distance from the supported end of the luminaire and are each of the same size and weight, the loading of the side members 2 and 4 will be uniform so as to prevent any torsional distortion of the main structural frame. The ballasts 28 are similarly secured to the members 2 and 4, respectively, the same distance from the supported end of the main frame for the same reason. Although not shown, it is to be realized that suitable electrical conductors may be located within the housing 20 and connected to the filament transformers 29, ballasts 28 and the other electrical control elements located within the housing 20.

As shown, the lower part of the sides of the housing 20 are spaced outwardly from the side members 2 and 4 and are supported by means of generally U-shaped auxiliary side members 32 which extend along their inner surfaces along the entire length thereof. The side members 32 are spaced outwardly from the side members 2 and 4 and are supported in this position by means of

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longitudinally spaced laterally extending end plates 34 and 36 which have an end flange secured to the opposite end members 5 and 7 of the main structural frame, respectively, in any suitable manner such as by being bolted thereto. The side members 32 and the end plates 34 and 36 may be formed of any suitable material having sufficient structural strength, such as heavy gauge aluminum sheet. The end plates 34 and 36 are also secured to the lower flange of each side member 2 and 4 in any suitable manner, such as by machine screw and nut assemblies 35. The laterally extending outer edges of each plate 34 and 36 are formed to a contour so as to be closely received within the inner surfaces of the ends of the housing 26.

The end plates 34 and 36 are provided at their inner edge with downwardly extending legs 37 and 39, respectively, to which a lamp holder plate 38 is secured in any suitable manner, such as by bolt and nut assemblies 40, so that the lamp holder plates 38 extend laterally below the side members 2 and 4. As shown, the lower edge of each lamp holder plate 38 extends downwardly from the outer side toward the center of the plate 38 so that the center of the plate 38 will be on approximately the plane of the longitudinal center of the assembled luminaire. Each lamp holder plate 38 is provided with suitably located spaced openings so that lampholders 42 may be secured thereto in the well-known manner, such as by means of bolt and nut assemblies 44 extending there-through. The lampholders 42 on each side of each plate 38 are at an angle with respect to the horizontal plane of the luminaire, as shown, so that the lampholders 42 closest to the center of the luminaire are located below the lampholders 42 spaced further away from the center of the luminaire. With such location of the lampholders 42 better light distribution may be obtained from the luminaire as described hereinafter. It is obvious that the lampholders 42 on the spaced lampholder plates 38 must be spaced longitudinally apart a proper distance and in alignment with each other in order to receive a standard length fluorescent lamp therebetween. Bi-pin type of lampholders 42 of well-known construction are shown for supporting fluorescent lamps having spaced terminal pins at each of their ends; however, it is obvious that other types of lampholders may be secured to the lampholder plates 38 in order to support other types of lamps.

In order to provide a better light distribution from the lamps 15, we have provided a new and improved form of reflector which comprises a number of individually formed reflector parts which extend longitudinally between the lampholders 42 and are formed from any suitable reflecting material, such as polished aluminum. Such individual forming of the various parts of the composite reflector has been only for the purpose of providing a low cost reflector; however, if desired, fewer pieces or one piece could be fabricated into the desired shape. As more clearly shown in FIG. 3, the composite reflector comprises a pair of upper reflectors or sections 50 which, except for the extreme ends thereof, are parabolic in form and diverge upwardly with their upper ends being spaced apart a distance somewhat greater than the lateral spacing of the side members 2 and 4. The lower ends of the upper reflectors 50 are located closely adjacent each other and each is engaged by the upper end of a lower reflector or section 52. As shown, the upper end of each lower reflector 52 has a cross section which is involute in form and which blends into a parabolic section at its lower end which extends generally vertically downward. The parabolic section of the lower reflectors 52 is substantially longer than the involute section thereof.

It will particularly be noted that each of the upper and lower reflectors 50 and 52 are identical in form, respectively, and are located so as to be symmetrical with relation to a vertical plane passing centrally between the upper and lower reflectors 50 and 52, as shown in FIG. 3.

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As previously described, the lampholders 42 are angularly disposed with relation to a horizontally extending plane, and accordingly, the representation of the lamps 15 in FIG. 3 are similarly angularly disposed. Thus, as shown, the lower lamps 15 are located closely adjacent the involute sections of the lower reflectors 52, respectively, so that the light rays R1 emanating from such lamps and traveling inwardly toward the involute sections will strike the involute sections and be reflected away from the lower lamps 15 along various paths indicated as R2. Due to the reflecting characteristics of such an involute section, the light rays R1 impinging thereon will be reflected away from the adjacent lamp 15 which is closest to the reflector so that no light rays R2 will be trapped between the lower lamps 15 and the involute sections. It is not necessary to make a similar provision for the upper lamps 15 because they are far enough away from the reflector that entrapped light does not become a problem.

Other light rays such as R3 emanating from all the lamps 15 which impinge upon either of the parabolic sections of the reflectors 50 and 52 will be reflected as rays R4 from the parabolic sections of the upper and lower reflectors 50 and 52 in the well-known manner. It will also be noted that by forming the upper and lower reflectors 50 and 52 as separate parts, the involute sections of the lower portions 52 may have their free end extending outwardly a substantial distance beyond the lower end of the upper reflectors 50. If desired, the upper reflectors 50 may be elevated upwardly from the lamps 15 by providing the lower end of the upper reflectors 50 with a downwardly extending knee portion 51 for engaging the upper surface of the involute sections. Inasmuch as the involute sections extend over such knee portions 51 of the upper reflectors 50, the lack of a proper reflecting surface or curvature on the knee portions 51 will not interfere with the efficient distribution of the reflected light rays from the lamps 15.

Referring to FIGS. 1A and 1B, it will be noted that the composite reflector is located below the side members 2 and 4 and extends longitudinally between the opposed faces of the lampholders 42 so that the ends of the composite reflector are located closely adjacent to the opposed faces of the lampholders 42. By so locating the composite reflector, the entire light emitting portions of the lamps 15 may be controlled, as previously described, and yet the reflector may be moved downwardly across the opposed faces of opposed lampholders 42 after the lamps 15 have been removed in the customary manner.

Referring to FIG. 2, it will be noted that the knee portions 51 of the upper reflectors 50 are secured to the lower reflectors 52 by any suitable securing means, such as sheet metal screws 56 extending through the involute sections of lower reflectors 52, to threadedly engage a one-piece generally V-shaped clip 58 which extends across the upper surface of the knee portions 51 of the lower reflectors 50. In order to obtain a rapid and fairly rigid assembly of the upper and lower reflectors 50 and 52, the screws 56 may be of the self-tapping type. The lower ends of the lower reflectors 52 are secured together in any suitable manner such as by providing inwardly extending legs 53 at the lower end of each of the lower reflectors 52 which may be secured together in any suitable manner, such as by standard sheet metal screws 60.

In order that the composite reflector may be supported so as to be easily maintained, a number of longitudinally spaced U-shaped supports 62 are secured by their bight portions to the lower flange of the side member 2 in any suitable manner such as by being bolted thereto. The supports 62 are pivotally connected in any suitable manner such as by pins 65 to the arms of a movable U-shaped link 64, the bight portion of which is secured to the upper end of the upper reflector 50 located below support 2 in any suitable manner such as by machine screw and nut assembly 66.

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In a similar manner, a number of longitudinally spaced supports **68** are secured to the side member **4**, each of which is provided with an integral flange which extends above the upper surface of the other upper reflector **50**. The other upper reflector **50** may then be secured to the supports **68** in any suitable manner. In order to provide for a rapid connecting and disconnecting of the composite reflector, a knurled headed screw **70** is utilized which threadedly engages a speed nut **71** mounted on the flange portion of each of the supports **68**. Thus, it will be noted that upon releasing of the knurled headed screws **70** from the upper reflector **50**, the composite reflector may be pivotally moved about the supports **62** to permit access to the electrical control devices such as ballasts **28** mounted on the sides of the main structural frame.

Although the composite reflector, as described, will function with the structure heretofore described, it is desirable to provide it with cross bracing. Thus, as shown, a cross brace **72** is provided at each end and centrally of the composite reflector, each of which extends laterally between the upper reflectors **50**. Each cross brace **72** is secured to the upper reflectors **50** located below the side member **2** by the same means previously described for securing the reflector **50** to the link **64**, and the other end of the cross brace **72** is secured to the other upper reflector **50** by any suitable means such as machine screw and nut assemblies (not shown). Inasmuch as the cross brace **72** extends between the upper reflectors **50**, it is necessary that the supports **68** be offset from the braces **72**. The cross brace **72** is also dished inwardly between the upper portions **50** so as to obtain a somewhat resilient bracing member. It has further been found to be desirable to provide a vertically extending brace **74** at each end of the composite reflector which, as shown, is generally U-shaped having inwardly extending arms for engaging the cross brace **72** at one end and the inwardly extending arms **53** of the lower reflectors **52** at the other end. Each brace **74** may be easily secured to the lower inwardly extending legs **53** by means of the sheet metal screw **60** while the upper arm of the brace **74** may be secured to the cross brace **72** in any suitable manner, such as by means of machine screw nut assembly **73**. A hand tempered aluminum has been found to be satisfactory for the links **62** and **64**. Similarly, the braces **72** and **74** and supports **68** are preferably formed from sheet steel.

The lower open portion of the housing **20** is adapted to be closed by means of an elongated dish shaped cover **54** which may be formed from any suitable light weight weather resistant material having sufficient optical clarity so as to readily transmit light without any appreciable distortion, such as a polymethylmethacrylate plastic. If desired, cover **54** may be formed by extruding a generally U-shaped central portion and molding dish-shaped light diffusing end sections which have outer edges which may be butted against opposite ends of the central portion. A generally H-shaped molded connector **202** is located between the butting edges of each end member and the central portion of the cover so that a one piece cover can be obtained by fusing or cementing the end members and the central portion to the connector **202**. As shown, each side of the central portion of the cover **54** is provided adjacent its upper edge with an integral T-shaped support **75** which extends outwardly so that the cross bar portion is generally parallel to the sides of the cover **54**. A generally rectangular elongated side rail **76**, formed from any suitable material having sufficient structural strength such as aluminum is provided for supporting the cover by means of the T-shaped supports **75**. Each side rail **76** has a T-shaped slot **78** extending longitudinally there-through, with the cross bar portion approximately parallel to one side of the rail **76** and with its stem being open toward one side of the rail **76**. The slots **78** are of a size to closely receive the T-shaped supports **75** therein so that the side rails **76** may be secured to the cover **54** by merely being slipped endwise over the supports **75**.

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Each side rail **76** is also provided with an integral flange **79** which extends outwardly from the lower edge of the side rail **76** on the side opposite from that in which the open end of the slot **78** is located; that is, outwardly from the side members **2** and **4**.

In order that cover **54** may be removably secured below the main structural frame, a plurality of spaced latching mechanisms **90** are located at each side of the housing **20**. Each latching mechanism is cooperable with a separate support **80** which is rigidly secured to the flanges **79** of the side rails **76**.

As shown the separate support **80** comprises a generally rectangular body having an open end slot **81** extending inwardly from one side of the body portion. Slot **81** is of a size so as to closely receive a part of the flange **79** therein and is secured to the flange **79** in any suitable manner, such as by means of rivets **77** extending therethrough. The support **80** is also provided with a circular pin **61** which extends outwardly from each of its sides so as to be approximately parallel to each side rail **76**. Although the support **80** and the pin **61** may be formed from any suitable material, for our purposes an aluminum body for support **80** has been found to be satisfactory with a stainless steel pin **61** being secured in an opening in the support **80** by means of an interference fit.

Each latching mechanism **90** (FIGS. 4 and 5) comprises a generally U-shaped fixed link **82** which is secured to the outer side wall of the housing **20** in any suitable manner such as by means of machine screw and nut assemblies **41** extending through the bight portion thereof and engaging an upwardly extending leg of the side members **32** located inwardly of the housing **20**. The fixed link **82** is secured so that its arms extend laterally outwardly from the sides of the housing **20**. An elongated handle **83** is provided which is generally U-shaped and of a size so that its arms are closely received between the arms of the fixed link **82**. For ease in operation, the bight portion of the handle **83** is elongated to extend upwardly beyond its arms. One end of the arms of the handle **83** is pivotally secured to the arms of the fixed link **82** at a point spaced outwardly from the housing **20** in any suitable manner so that the handle **83** is pivotally supported thereby. As shown a pivot pin **84** of any suitable material such as a copper rivet is utilized which extends through such arms. The other end of the arms of the handle **83** is also provided with a pivot pin **85** similar to the pin **84** extending therebetween. An elongated curved spring link **86** is pivotally secured to the pivot pin **85** in any suitable manner such as by being wrapped therearound so that upon pivotal movement of the handle **83**, the spring link is also pivotally movable.

As shown, the spring link **86** is arcuately curved so that its concave side faces the side of the housing **20** adjacent thereto. The spring link **86** is proportioned so that its ends form an over-center toggle with respect to the pivot pin **84**. Thus, as shown the upper end of the spring link **86** is located at one side of the pin **84** while the lower end of the spring link **86** is located on the same side but below the pin **84**. In order to pivotally support the pin **61**, the lower or free end of the spring link **86** is reversely bent to provide a seat **87** having a curvature engageable with the pin **61**. Inasmuch as the support **80** is located between the ends of the pin **61**, it is necessary to provide the spring link **86** with a central lanced portion **88** so that the outer end of the support **80** located between the two seats **87** does not engage the spring link **86**.

It will be noted that the lanced portion **88** is also utilized to lock the latching mechanism **90** with the fixed link **82**. Accordingly, the spring link **86** is formed from a resilient material having sufficient structural strength such as sheet stainless steel. Sheet stainless steel has also proven to be satisfactory for use in the handle **83** and the fixed link **82**. As shown the free end of the lanced portion **88** is provided with a reversely bent hook **92** which

is of a size and shape to closely receive the end of an outwardly extending latch member 94 therein. The latch member 94 is formed integral with the bight portion of the fixed link 82 and extends initially downwardly from the housing 20 and has its free end bent downwardly so as to be engageable within the hook portion 92 of spring link 86. As shown (FIG. 5) the point of engagement of latch member 94 with hook 92 in the latched position is located on the same side of pivot pin 84 as the pivotally supported end of link 86 to form an over-center toggle with respect to pivot pin 84. It will also be noted that at the latched position (FIG. 5) the portion of the latch 94 adjacent link 82 is located adjacent the upper side of the support 80 so that when support 80 is located between the seats 87, pins 61 cannot be removed accidentally from the seats 87, due to interference of the support 80 with the outwardly extending portion of the latch 94.

Although not shown, a latch mechanism 90 is secured at each side of housing 20 and preferably a latch mechanism 90 is secured adjacent each end of the housing 20 at each of its sides and a third latching mechanism 90 is located centrally therebetween. Inasmuch as the latching mechanisms 90 are cooperable with the pin 61 of the supports 80, it is obvious that three supports 80 must be secured to the flange 79 of the side rails 76 in alignment with the latch mechanisms, respectively. Also, if desired in order to provide additional bracing of the latching mechanisms 90, a generally U-shaped cross brace 101 may be provided, preferably at each latch mechanism 90, which extends between the web of the supports 2 and 4 and the upwardly extending part of the side members 32. The arms of each cross brace 101 may be secured to the side member 32 by any suitable means such as nut and bolt assemblies 41 and to the web of supports 2 and 4 by means of assemblies 33. By means of the latching mechanisms 90, the cover 54 is held in engagement with the lower surface of the side members 32. If desired and as shown, a gasket 96 of any suitable weatherproof resilient material, such as neoprene or rubber may be located on the lower surface of the side members 32 which is engaged by the upper edges of the side rails 76 and the cover 54. The gasket 96 may also extend laterally between the side members 2 and 4 on the lower surface of the supports 34 and 36 so as to be engaged by the upper edges of the ends of the cover 54.

The operation of the over center latching mechanism is quite simple. Referring to FIG. 5, it will be noted that without the cover 54 the latching mechanism will be held in its locked position. Thus, as the handle 83 moves from its open position toward its closed position, the free end of latch member 94 will engage its cooperable hook 92 before the pivot point 85 is in its over center position. After such engagement occurs the free end of latch member 94 functions as a pivot point so that further closing movement of handle 83 to its over center position causes spring link 86 to become stressed. Due to such stressing of spring link 86 the handle 83 is positively held in its closed position and accordingly seats 87 may freely pivotally support the support 80. In order to support the cover 54 below the main structural frame, it is only necessary that the seats 87 engage their cooperable pins 61 when the latching mechanisms 90 are in their open position and thereafter moving the latching mechanisms 90 to their closed position whereby the upper edges of cover 54 are drawn into firm engagement with the gasket 96. In actual practice, the cover 54 engages the gasket 96 prior to the latched position of handle 83 in order to obtain a slight compression of the gasket 96. Movement of handle 83 to its latched position causes seats 87 to be displaced slightly downwardly due to the stress developed in spring link 86. However, due to the resiliency of gasket 96 such downward movement of seats 87 does not break the seal between the upper edges of cover 54 and gasket 96. Once cover 54 has been so secured it may easily be re-

leased at either of its sides in order to accomplish various maintenance operations such as electrical repair and reflector cleaning by merely releasing the latching mechanisms at one side of the main structural frame and letting the cover 54 pivot about pins 61 pivotally supported by the latching mechanisms 90 on the other side of the main structural frame. In view of the length of each luminaire, the release of either side of the cover 54 is particularly desirable as both sides of the composite reflector may easily be cleaned.

As indicated due to the close proximity of the outwardly extending portion of latch 94, the engagement of pins 61 therewith at the other side prevents accidental removal of the cover 54 during the period it is pivotally held along one of its sides. Further, as the closed latching mechanisms 90 are biased in the closed position, it is unnecessary to perform any operation on the unlatched side of the housing 20 in moving the cover to its closed position. With the cover in its open position, the composite reflector may easily be moved aside after removal of the lamps 15 to gain access to the electrical control components supported by the side members 2 and 4. Such purpose is easily accomplished by removing the knurled screws 70 along one side of the composite reflector and permitting the reflector to pivot about the supports 62 and 64 as previously described.

Having described a preferred embodiment of our invention in accordance with the patent statutes, it is desired that the invention be not limited to the specific construction shown and described, inasmuch as it is apparent that modifications thereof may be made without departing from the broad spirit and scope of our invention. Accordingly, it is desired that the invention be interpreted as broadly as possible and that it be limited only as required by the prior art.

We claim as our invention:

1. An elongated luminaire comprising, a rigid elongated rectangular structural framework, electrical control elements secured to said framework, an elongated lightweight reflector located below said framework having one of its side portions pivotally secured to one side of said framework and its opposite side portion releasably secured to the other sides of said framework, an elongated inverted lightweight cup-shaped housing of weather resistant material secured to said framework so as to have its major portion located thereabove, latching mechanisms supported by said framework adjacent the outer surfaces of said housing, an elongated cup-shaped lightweight cover having side portions pivotally engageable by said latching mechanisms, respectively, to clamp said cover in fixed relation with respect to said framework with said reflector being located between the sides thereof, and supporting means for said luminaire secured solely to one end of said framework.

2. A luminaire comprising, an elongated support, an elongated cup-shaped cover having its longitudinally extending free edges engageable with said support, means for supporting said cover in engagement with said support, an elongated reflector secured to said support and located within said cover, said reflector having its ends spaced inwardly of said cover, means secured to said support for supporting lampholding means at each end of said reflector, said reflector having at least one cross section comprising, a parabolic section extending substantially from each its ends with an involute section located therebetween, said reflector being formed from two identical halves symmetrically disposed with relation to a plane passing longitudinally therebetween, each of said halves comprising said parabolic section extending toward said plane substantially from each of its ends with said involute section located therebetween, and said lampholding means being adapted to support a plurality of lamps adjacent each of said identical halves at least one of which is adjacent said involute section.

3. An elongated luminaire comprising, spaced elon-

gated supporting members joined at least at opposite ends thereof, supporting means secured to an end of said supporting members for supporting them in a generally horizontally extending plane, an elongated cup-shaped cover receiving said supporting members and supported thereon, electrical control elements also received in said cover in the space between said supporting members and secured thereto, downwardly extending lampholder brackets secured to said supporting members adjacent opposite ends thereof, an elongated reflector located beneath said supporting members and supported therefrom, an elongated transparent generally cup-shaped door for the open bottom of said cover, latch mechanisms at opposite sides of said luminaire for releasably latching said door to said cover, and said latch mechanisms at each side having portions releasably pivotally connecting said door to said cover so that the latch mechanisms at either side may be released to permit the cover to be pivotally supported by the pivotal connecting portions of the latch mechanisms at the other side of said luminaire.

4. An elongated luminaire comprising, spaced elongated supporting members joined at least at opposite ends thereof, supporting means secured to an end of said supporting members for supporting them in a generally horizontally extending plane, an elongated cup-shaped cover receiving said supporting members and supported thereon, electrical control elements also received in said cover in the space between said supporting members and secured thereto, downwardly extending lampholder brackets secured to said supporting members adjacent opposite ends thereof, an elongated reflector located beneath said supporting members and supported therefrom, an elongated transparent generally cup-shaped door for the open bottom of said cover, latch mechanisms at opposite sides of said luminaire for releasably latching said door to said cover, said latch mechanisms at each side having portions releasably pivotally connecting said door to said cover so that the latch mechanisms at either side may be released to permit the cover to be pivotally supported by the pivotal connecting portions of the latch mechanisms at the other side of said luminaire, means on a movable part of said pivotal portions of each latch mechanism engaging a portion fixed with respect to said cover at the latched position of each latching mechanism to positively prevent release of said pivotally connected portions when said latch mechanisms are at their latched position, but movable to a disengaged position when said latch mechanisms are released where they do not interfere with release of said pivotally connected portions.

5. An elongated luminaire comprising, spaced elongated supporting members adapted to be supported at an end to extend generally horizontally, means rigidly securing the outer and inner ends of said supporting members together supporting means at the inner end comprising a rigid U-shaped member having legs rigidly secured to said supporting members, respectively, and a plate-like bight portion spanning the inner ends of said supporting members, at least one supporting plate secured to the bight portion of said U-shaped member and located in a vertical plane extending outwardly therefrom in overlapping relation with another supporting plate adapted to be rigidly mounted on a support, means pivotally connecting said plates at one point on a transverse axis, a number of spaced openings through said plates located to be aligned at different relative angular positions of said plates, means inserted in aligned ones of said spaced openings for maintaining said luminaire at a predetermined position, an elongated cup-shaped cover receiving said supporting members and supported thereon, electrical control elements also received in said cover in the space between said supporting members and secured thereto, downwardly extending lampholder brackets secured to said supporting members adjacent opposite ends thereof, an elongated reflector located beneath said

supporting members and supported therefrom, an elongated transparent generally cup-shaped door for the open bottom of said cover, and means for releasably securing said door to said cover.

6. An elongated luminaire comprising, a rigid elongated horizontally disposed structural framework, electrical control elements secured to said framework, an elongated reflector secured to said framework and located therebelow, an elongated inverted cup-shaped housing secured to said framework adjacent ends thereof and located over the top of said framework with its sides spaced from said framework, crossbraces between said framework and the sides of said housing to support intermediate side portions of said housing, latching mechanisms supported by said crossbraces adjacent the outer surfaces of said housing, an elongated cup-shaped cover having side means engageable by said latching mechanisms, respectively, to clamp said cover in fixed relation to said housing with said reflector being located between the sides thereof, compressible gasket means located between opposing edges of said housing and cover and supporting means for said luminaire secured to an end of said framework.

7. An elongated luminaire comprising, a rigid elongated horizontally disposed structural framework, electrical control elements secured to said framework, an elongated reflector secured to said framework and located therebelow, an elongated inverted cup-shaped housing of a light weight weatherproof plastic material secured to said framework adjacent ends thereof and located over the top of said framework with its sides spaced from said framework, cross-braces between said framework and the sides of said housing to support intermediate side portions of said housing, a rigid flange member secured to at least the opposite side edges of said housing, latching mechanisms supported by said cross-braces adjacent the outer surfaces of said housing, an elongated cup-shaped cover having side means engageable by said latching mechanisms, respectively, to clamp said cover in fixed relation to said housing with said reflector being located between the sides thereof, compressible gasket means located between said flange member and the side edges of said cover, and supporting means for said luminaire secured to an end of said framework.

8. An elongated luminaire comprising, a rigid elongated horizontally disposed structural framework, electrical control elements secured to said framework, an elongated reflector secured to said framework and located therebelow, an elongated inverted cup-shaped housing of a light weight weatherproof plastic material secured to said framework adjacent ends thereof and located over the top of said framework with its sides spaced from said framework, cross-braces between said framework and the sides of said housing to support intermediate side portions of said housing, a rigid flange member secured to at least the opposite side edges of said housing, latching mechanisms supported by said cross-braces adjacent the outer surfaces of said housing, an elongated cup-shaped cover of a light weight weatherproof plastic material having rigid side rails secured thereto engageable by said latching mechanisms, respectively, to clamp said cover in fixed relation to said housing with said reflector being located between the sides thereof, compressible gasket means located between said flange member and said side rails and supporting means for said luminaire secured to an end of said framework.

9. A luminaire adapted to be generally horizontally disposed, said luminaire comprising an elongated support, an elongated cup-shaped cover having its longitudinally extending free edges engageable with said support, said cover being at least partially light-transmitting, means for supporting said cover in engagement with said support, an elongated reflector secured to said support and located within said cover, said reflector having its ends spaced inwardly of said cover, means secured to said support for

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supporting lampholders adjacent each end of said reflector, said lampholders secured to said last mentioned means, said reflector comprising, a pair of upper sections which are parabolic in form and diverge upwardly but are closely adjacent each other at their lower ends, a lower section the upper end of which is involute in form and the lower end of which is parabolic in form, elongated light sources mounted in said lampholders and located closely adjacent the involute portion of said lower section so that light rays from said source impinging on said involute portion will be reflected away from said sources and will not be entrapped between said sources and said involute portion.

10. A luminaire adapted to be generally horizontally disposed, said luminaire comprising an elongated support, and elongated cup-shaped cover having its longitudinally extending free edges engageable with said support, said cover being at least partially light-transmitting, means for supporting said cover in engagement with said support, an elongated reflector secured to said support and located within said cover, said reflector having its ends spaced inwardly of said cover, means secured to said support for supporting lampholders adjacent each end of said reflector, said lampholders secured to said last mentioned means, said reflector being formed from two identical halves symmetrically disposed with relation to a plane passing longitudinally therebetween, each of said halves comprising, an upper section parabolic in form and diverging upwardly, an intermediate section having a pair of surfaces involute in form, and a lower section having a pair of surfaces parabolic in form, elongated light sources mounted in said lampholders and located closely adjacent the involute sections so that light rays from said source impinging on said involute section will be reflected away from said sources and will not be entrapped between said sources and said involute section.

11. A luminaire adapted to be generally horizontally disposed, said luminaire comprising an elongated inverted dish-shaped housing, an elongated dish-shaped cover, said cover being at least partially light-transmitting, means for releasably securing said housing and said cover together, an elongated reflector disposed in said cover, at least a portion of said reflector comprising an upper section parabolic in form, an intermediate section involute in form, and a lower section parabolic in form, lampholding means attached to said luminaire and located closely adjacent the involute section, and a light source adjacent said involute section and mounted in said lampholding means so that light rays from said source impinging on said involute section will be reflected away from said source and will not be entrapped between said source and said involute section.

12. A luminaire adapted to be generally horizontally disposed, said luminaire comprising an elongated inverted dish-shaped housing, an elongated dish-shaped cover, said cover being at least partially light-transmitting, means for releasably securing said housing and said cover together, an elongated reflector disposed in said cover, at least a

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portion of said reflector comprising an upper section parabolic in form and a lower section involute in form, lampholding means attached to said luminaire and located closely adjacent the involute section, and a light source adjacent said involute section and mounted in said lampholding means so that light rays from said source impinging on said involute section will be reflected away from said source and will not be entrapped between said source and said involute section.

13. A luminaire comprising, an elongated inverted dish-shaped housing, an elongated dish-shaped cover, said cover being at least partially light-transmitting, means for releasably securing said housing and said cover together, an elongated reflector disposed in said cover, at least a portion of said reflector comprising a section parabolic in form and a section involute in form, lampholding means attached to said luminaire and located adjacent the involute section, and a light source adjacent said involute section and mounted in said lampholding means so that light rays from said source impinging on said involute section will be reflected away from said source and will not be entrapped between said source and said involute section.

14. A luminaire for an elongated light source, said luminaire comprising an elongated inverted dish-shaped housing, an elongated dish-shaped cover, said cover being at least partially light-transmitting, means for releasably securing said housing and said cover together, an elongated reflector disposed in said cover, at least a portion of said reflector comprising a section parabolic in form and a section involute in form, lampholding means attached to said luminaire for locating said elongated light source adjacent said involute section so that light rays emitted from said source and impinging on said involute section will be reflected away from said source and will not be entrapped between said source and said involute section.

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