

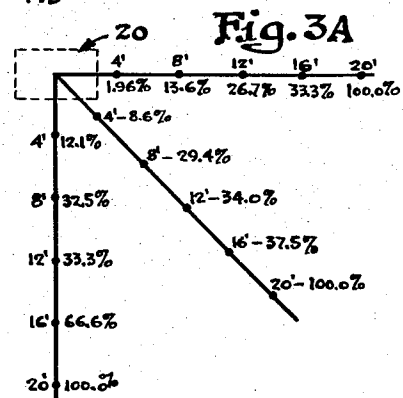
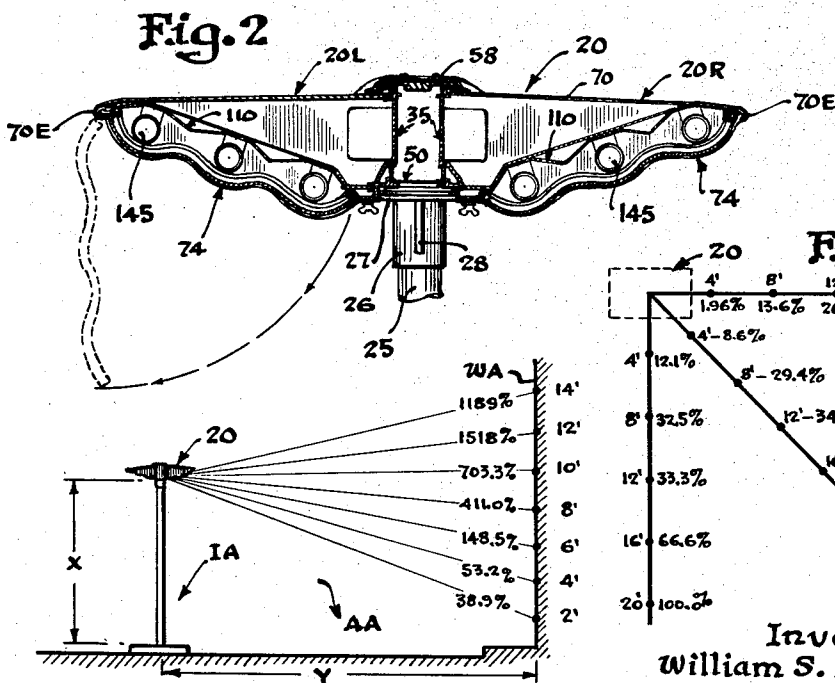
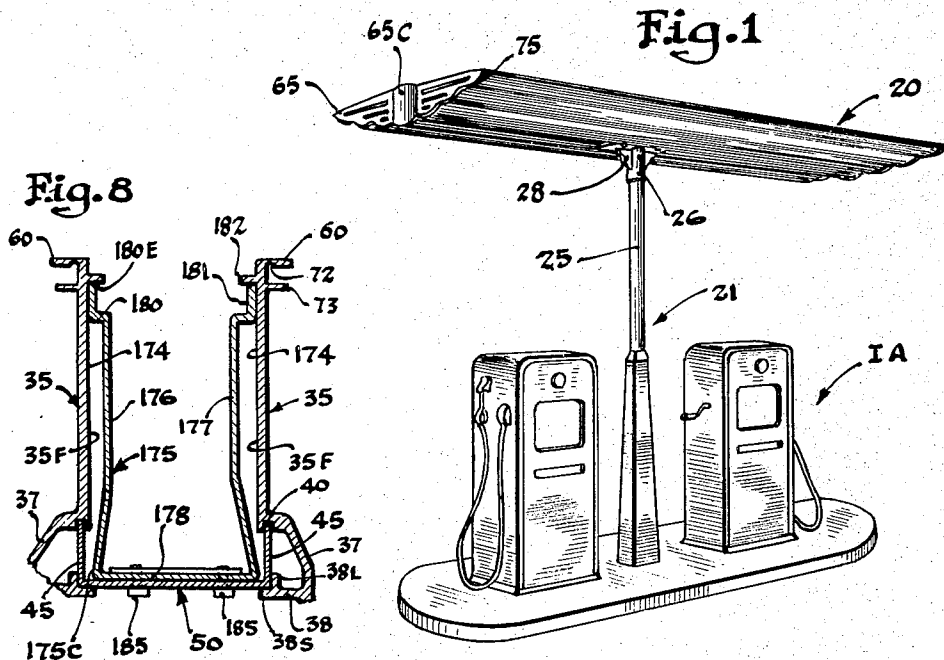
Nov. 24, 1959

W. S. AKELY ET AL
OUTDOOR LIGHTING FIXTURES

2,914,657

Filed May 2, 1957

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

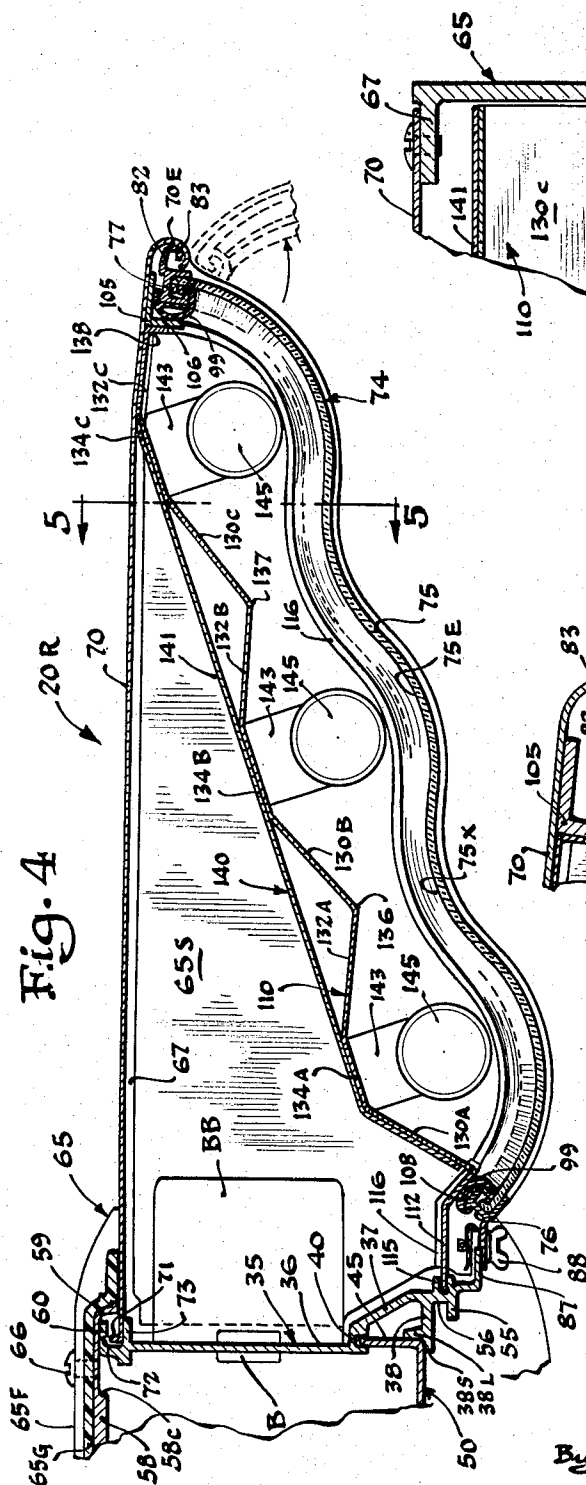


Fig. 4

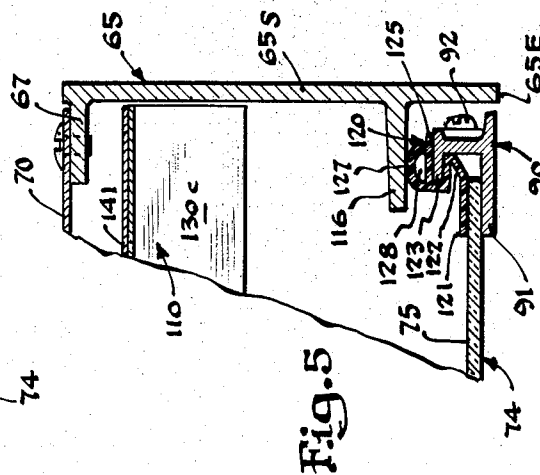


Fig. 5

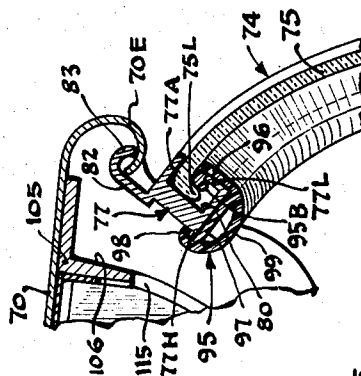


Fig. 7

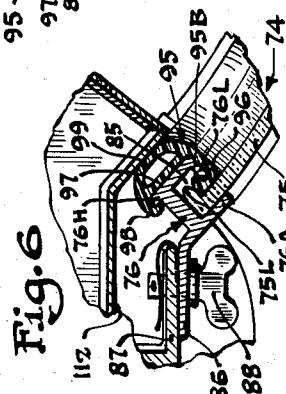


Fig. 6

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2,914,657

OUTDOOR LIGHTING FIXTURES

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8 Claims. (Cl. 240—3)

This invention relates to lighting fixtures and more particularly to lighting fixtures for outdoor installation for illuminating service station areas and the like.

One of the accepted methods for illuminating outdoor apron areas as at a service station is by strategically placed fluorescent lighting fixtures. These produce excellent area lighting and eliminate the glare of floodlights; and the primary object of the present invention is to develop to a maximum extent the available quanta of light afforded by lamps in an outdoor lighting fixture of such nature.

Another object of the present invention is a low level reflective type fixture, for service stations or the like, having a luminous panel and a reflector behind the panel so configured and arranged as to spread light from fluorescent lamps or the like for a substantial horizontal distance and also for a substantial vertical distance. Thus, under the present invention, wide area lighting is achieved without the necessity of having resort to strategically located floodlights having the disadvantages mentioned above. The installation of the present invention is relatively inexpensive and easy to service and maintain, and such advantageous features of the present invention constitute further objects herein.

Another object of the present invention is a fixture which is so constructed that a plurality thereof can be easily connected in tandem or end to end relation in those instances where the outdoor area to be illuminated is of relatively great extent. Thus, under the present invention it is possible to illuminate effectively and in an inexpensive manner an outdoor area of great extent merely by strategically locating in tandem relation along a selected line as many fixtures of the present invention as are predetermined to illuminate a particular area of given extent.

Another object of the present invention is a compound reflector of extended length and configured to afford a plurality of similar individual reflectors which in effect are arranged in an ascending order. The arrangement is to be such that each individual reflector includes a plurality of reflective surfaces arranged somewhat as the two sides and top of a trapezoid with each such trapezoid at a different height. The arrangement can also be viewed as a single reflector with repetitious surfaces angled to reflect light downwardly, rearwardly and forwardly. It has been found that by this arrangement vertical and horizontal areas can be more greatly illuminated by significant multiples in comparison to conventional fixtures. Moreover, it is an object of the present invention to associate a source of light in an advantageous relation with each individual reflector, and to further associate with the reflector a luminous panel of generally sinusoidal shape so that the reflector and panel together afford a concave-convex reflective and transmissive housing about each source of light contributing to a highly effective lighting.

Other objects of the present invention are to enable a fixture to be easily serviced and maintained and to be

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expeditiously assembled from relatively inexpensive extruded cast and rolled parts.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principle thereof and what we now consider to be the best mode in which we have contemplated applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a view of a service station island to be illuminated under the present invention;

Fig. 2 is a somewhat simplified elevation of a fixture of the present invention illustrating the way in which luminous panels associated with complemental assemblies thereof can be opened;

Figs. 3 and 3A are schematic views showing the order of enhanced illumination achieved under the present invention;

Fig. 4 is a sectional view of elements associated with a fixture assembly of the present invention;

Fig. 5 is a detail sectional view on an enlarged scale taken on the line 5—5 of Fig. 4;

Fig. 6 is a detail sectional view showing the way in which the inner end of the light transmissive plate of the fixture unit is releasably clamped in place;

Fig. 7 is a detail sectional view showing the relation that prevails at the outer end of the plate when the plate is opened; and

Fig. 8 is a detail sectional view of the coupler.

In Fig. 1 of the drawing there is illustrated an island area IA of a service station to be lighted by a fixture 20 constructed along the lines of the present invention and supported by a post or standard 25. As shown in Fig. 3 the island area IA is surrounded by the apron area AA, and the fixture 20 is supported at a height X assumed to be nine feet. The light from the fixture 20 is cast toward a wall area WA removed Y distance from the center line of the island area assumed to be twenty feet. In Fig. 3, radial lines are drawn from the right-hand fixture unit to points on the wall area WA at designated heights, and the percentage of light intensity increase achieved by the instant fixture as compared to a conventional fixture is designated at such points, both fixtures having been equipped with identical lamps. Likewise, in Fig. 3A, light intensity increase in a horizontal sense for the area AA is shown.

Thus, under the present invention there is achieved, in a manner to be described hereinafter, a marked increase of illumination of the wall area WA at a two foot level and a fifteen hundred percent increase at twelve feet. At points twenty feet outward of the fixture 20, illumination of the apron AA is increased by one hundred percent in comparison to conventional installations as shown in Fig. 3A. These unique achievements of the present invention render it unnecessary to depend upon any other source of light for illuminating the wall area WA or the intermediate apron area.

The fixture 20 is supported on the post or pole 25, Fig. 1, by an adapter 26 which is of course complementary to the configuration of the pole 25. The adapter 26 in turn includes a relatively short flat plate 27, Fig. 2, at the upper end thereof, and this plate is reinforced by webs 28 disposed between the plate 27 and the main collar or sleeve of the adapter 26.

The fixture 20 includes left and right hand fixture assemblies 20L and 20R, Fig. 2. These fixture assem-

blies are complementary so as to facilitate paired assembly and produce equal lighting on areas outwardly of either side of the island 1A, but a single fixture assembly as 20R can of course be used advantageously as the detailed description below will demonstrate. The main support and member for joining the left and right hand fixture assemblies is afforded by a pair of complementary extruded aluminum center bars 35, Fig. 2, one being illustrated in detail in Fig. 4. Thus, the right hand fixture assembly 20R includes a bar 35 which can be viewed as the base at the inner or rear end of the fixture assembly 20R. A like bar 35 is associated with the corresponding left hand fixture assembly 20L as will be apparent from Fig. 2.

The bars 35 include channels and flanges for various purposes to be described hereinafter, and it may be mentioned at this point that each such bar 35 includes a vertical web 36, Fig. 4, which at its lower edge is flared outwardly at 37 to afford what might be termed a bottom strip displaced outwardly of the plane of the web 36. The side strip 37 at its lower edge includes an inwardly directed extension 38 having a shoulder 38S and a vertical lip 38L disposed between the shoulder 38S and the side strip 37.

Each center bar 35 is thickened at the merge point between the web 36 and the beveled side strip 37 as shown in Fig. 4, and a channel 40 is formed at the underside of this thickened section, the arrangement being such that the channel 40 is parallel to and aligned with the shoulder 38S. Such arrangement of the channel 40 and the shoulder 38S defines a slot adapted to receive, respectively, the upper edge and lower corner of the flange 45 of a generally U-shaped steel bottom plate or bar 50, Figs. 2 and 4, which serves in part to join together and stabilize the complementary channel members 35 as best shown in Fig. 2, the bottom bar 50 being secured to each center bar 35 by suitably placed welds. It will be recognized that the U-shaped bottom bar 50 can be easily slid into the receiving slots therefor afforded by the center bars 35 and then welded in place. As will be explained hereinafter, another pair of such center bars can be coupled in end to end or tandem relation to the center bars 35. In other words, the particular construction of the center bars 35 enables fixtures as 20 to be easily arranged in tandem end to end relation.

Each center bar or strut 35 includes an elongated lip 55 spaced below the flange 38 so as to afford a channel or slot 56 between the flange 38 and the lip 55, and the channel thus afforded between the respective channel members 35 is adapted to receive slidably therein a slide shoe associated with the plate 27 of the adapter 26. This particular type of connection between the fixture 20 and the support or standard including the adapter 26 enables the fixture 20 to be located in a selected position relative to an upright standard as 21, and this is of importance in those instances where one or more fixtures as 20 are associated in tandem relation as mentioned above.

It will be appreciated that the respective center bars 35 are spaced and rigidified by the bottom plate 50. The channel members 35 are connected at their upper edges by an extruded aluminum cover plate 58, Fig. 4. The cover plate 58 is flat and elongated in nature and is provided with a thickened center section 58C as will be observed in Fig. 4, and at the outer edges thereof is formed with depending side lips 59 which are adapted to fit down over the upper edges of the center bars 35. The cover plate 58 is adapted to be secured by machine screws or the like at the opposite side edges thereof to flanges as 60, Fig. 4, formed at the upper edges of the center bars 35.

As was mentioned above, the center bars 35 and the couplers 50 and 58 associated therewith represent the main base support or weight bearing structure from

which the respective lighting elements or sections 20L and 20R are in effect cantilevered. To this end, relatively large cast aluminum end caps 65, Figs. 1 and 4, are afforded at opposite ends of the center support structure 35 and include solid flanges 65F, Fig. 4, which are fastened to the upper face of the cover plate 58 by machine screws 66, Fig. 4, or the like. Each of the end caps 65 includes an ornamental removable center portion 65C, Fig. 1, which shrouds and conceals the opposed open ends of the center supports 35. By removing the center portion 65C, the center struts or supports 35 are exposed to enable a plurality of the fixtures 20 to be joined end to end as mentioned above.

Each of the end caps includes elongated forwardly extending sides 65S of generally triangular shape. A flange 67 is formed along the upper edge of the side of each end cap on the inner face thereof, and a rolled aluminum plate 70 is fastened to the upper faces of the flanges 67 as shown in Fig. 5 so as to afford a top housing plate for each section of the fixture. It will be further observed in Fig. 4 that the top plate 70 at the inner edge adjacent each member 35 is provided with a vertical lip 71 adapted to fit in an elongated recess 72 provided at the underside of the flange 60 of each member 30. Spaced below and parallel to each flange 60 is a flange 73 integral with the related center member 35, and as shown in Fig. 4 the flange 73 serves as a support ledge for the inner portion of the top plate 70. A gasket 65G is interposed between the flange 65F of each end cap and the opposed portion of the cover plate 58.

It will be seen from what has been described thus far that the fixture in the present instance is easily assembled from complementally related rolled or sheet, cast and extruded aluminum parts so that there is no rusting, and the assembly and replacement of parts is greatly facilitated which is of importance in outdoor fixture installation. Thus, the center supports or struts as 35 are connected as a pair by the bottom plate 50. The top housing plate 70 can be easily slid in place and secured to the sides of the end caps. The top plate 70 together with the sides of the end caps afford, respectively, the top and side walls of relatively large fixture housings on opposite sides of the two center supports 35. Lamps and reflectors, as will be explained, are mounted as fixture units in the housings, and the outer or front edge of each top plate 70 is utilized to hinge a luminous panel.

Thus, as shown in Fig. 4, the housing top plate 70 at the outer or front edge thereof is rearwardly and then upwardly rounded at 70E to afford hinge means for a removable, light transmission bottom enclosure plate 74 which completes a dust-proof housing about lamps and reflector units to be described. The plate 74 thus represents the bottom wall of a housing assembly which includes the top and side walls described above. The plate 74 includes a light transmissive sheet or panel of translucent extruded acrylic plastic 75 or like material having desirable luminous characteristics, and the plate 74 is adapted to be releasably held in the closed position indicated in Fig. 4 in a manner to be described hereinafter. Upon release of the securing means for the plate 74, the latter is adapted to be opened as shown in Fig. 7 to enable access to be had to the interior of the housing.

The bottom housing plate or wall further includes a pair of extruded aluminum end frame strips 76 and 77, Figs. 6 and 7 respectively, which are parallel to the center support 35 and which correspond substantially in length to the spacing between the end caps 65 that are associated with a particular fixture element as 20R. As shown in Fig. 4, the end strip 77 represents the outer or front end of the plate 74, and this strip includes a generally U-shaped channel 80, Fig. 7, which faces downwardly when the plate 74 is closed. The strip 77 also includes a forwardly extended flange 82 as viewed in Fig. 4, and this flange includes a rearwardly bent hook portion 83 which is curved opposite to the end 70E of the top plate 70 so

as to afford a clasp hinge enabling the plate 74 to be suspended freely from the end 70E of the top plate 70 when the plate 74 is opened as shown in Fig. 7.

The end strip 77 at the inner or rear end of the plate 74 likewise includes a generally U-shaped channel 85, Fig. 6, and this channel faces in a general forward and downward direction when the plate 74 is in its closed position as shown in Fig. 6. The end strip 76 includes a rearwardly extending relatively wide flange 86, and the upper side of this flange is adapted to abut an elongated toe 87 which is formed in forwardly extending relation on the center support beneath the ledge 55. Conventional winghead fasteners 88 are provided at opposed extremities of the flange 86 of the rear end strip 76, and these fasteners when tightened draw the flange 86 tight against the underside of the toe portion 87 of the center bar 35 to secure the panel 74 in its closed position.

As will be observed particularly in Fig. 4, the translucent sheet or panel 75 is corrugated in a sinusoidal fashion for reasons to be pointed out hereinbelow. It should be further pointed out that the lower edges 65E of the end cap side walls 65S are corrugated in a complementary fashion which is particularly apparent in Fig. 1.

It will be recognized that the end strips 76 and 77 represent edge framing for the luminous sheet or panel 75. This framing further includes a pair of aluminum side strips as 90, Fig. 5, each having a lower flange 91 on which corresponding side edges of the luminous panel 75 are adapted to repose, and it will be realized that the side strips 90 are corrugated in a sinusoidal fashion complementary to the shape of the panel 75. The side frame strips 90 are secured to end extremities of the end frame strips 76 and 77 by machine screws 92.

The rear and front marginal edge portions of the luminous sheet are adapted to fit in the channels 85 and 80 respectively of the rear and front end strips 76 and 77 while engaging respective ledges 76A and 77A thereof. As shown in Figs. 6 and 7, the rear and front edges of the panel 75 disposed in the channels 85 and 80 of the end strips 76 and 77 are provided with inturned lips 75L, and the end strips 76 and 77 each include lips 76L and 77L respectively which project outwardly in a direction opposite that of the corresponding lips of the luminous panel 75. The complementary pairs of lips thus afforded are slightly spaced one from the other, and a bead 95B of an extruded vinyl plastic gasket 95 is disposed tightly between each such pair of lips to thereby weather and dustproof the plate 74 and allow for thermally induced contraction and expansion as will be more apparent from the description to follow.

Thus, the gasketing 95 further includes a wall 96 adapted to engage the outer faces of the lips 76L and 77L, a wall 97 adapted to engage flange surfaces on the strips 76 and 77 opposite and parallel to the ledges 76A and 77A, and a bead 98 adapted to engage heel elements as 76H and 77H on the strips 76 and 77 which extend normal to the ledges 76A and 77A. The gasketing 95 also includes a rounded portion 99, Fig. 7, spaced from the wall 97 in each instance, and the portion 99 is adapted to tightly engage an abutment surface rigidly mounted in the housing as will be described. Gasketing is also provided for the side frame strips 90 as will be described.

The abutment surface mentioned above as being adapted to be engaged by the rounded gasketing is in part represented by an L-shaped strip 105, Fig. 4, secured to the top housing plate just rearwardly of the hinge element 70E so as to afford a downwardly extending abutment 106 which, when the bottom plate 74 is closed as shown in Fig. 4, is engaged by the rounded gasket surface 99, Fig. 7, associated with the front frame strip 77. The abutment surface which is engaged by the rounded surface 99 of the gasketing associated with the rear frame strip 76 is represented by an inclined surface 108, Fig. 4, of a reflector plate 110 (which will be described

in more detail hereinafter) and extending rearwardly from the incline 108 is a substantially horizontal rear flange 112 which fits into an elongated horizontal slot afforded by spaced parallel lips as 115 formed on the lower portion of the center support member 35 between its beveled surface 37 and its lower flange 87. The portions 108 and 112 of the reflector plate 110 are backed up by complementally shaped rear portions of flanges 116 formed on the sides 65S of the two end caps as 65 associated with the fixture element as 20R, and as shown in Fig. 5, the flanges 116 are spaced from the lower edges 65E of the end cap 65 and project inwardly of the housing at right angles to the planes of the side walls 65S. Moreover, the flanges 116 are configured complementally to the sinusoidal shape of the luminous panel 75 as shown in Fig. 4.

The lower faces of the flanges 116 are adapted to be engaged by gasketing 120, Fig. 5, associated with the side frame strips 90. Thus, as was mentioned above, the side edges of the luminous panel 75 repose on the upper faces of flanges 91 of the side strips 90. The gasketing 120 includes an angled lower wall 121, Fig. 5, which engages the corresponding marginal portion of the panel 75 opposite the portion reposing on the flange 91, and the portion 121 of the gasket 120 is of serpentine shape at 122 so as to fill the channel space between the flange 91 of the side strip 90 and a somewhat shorter flange 123 on the side strip 90 parallel to and spaced from the flange 91 as shown in Fig. 5. The gasket 120 further includes a top wall 125 which engages the face of the flange 123 which is directly opposite the flange 116 of the side wall 65S. It will be observed, however, that the top or inner flange of the side strip 90 as viewed in Fig. 5 is spaced below the lower face of the flange 116 of the side wall 65S, and this space is adapted to be filled by a rounded portion 127 of the gasket 120 so as to afford a tight seal between each side strip 90 and the opposed portion of the related flange as 116. It will be realized that the rounded portion as 127 of each section of gasketing is spaced from the opposed wall of the gasketing as 125 to afford an air space 128, Fig. 5, and this same relation prevails in the gasketing 95 as can be seen in Figs. 6 and 7 to thereby afford gasketing of enhanced sealing characteristic.

Under the present invention, the desirable pattern and attributes of illumination mentioned above in connection with Fig. 3 are achieved by a novel arrangement of reflector units and lamps together with the sinusoidal shape of the luminous panel 75. Viewing a fixture assembly as 20L or 20R in the present instance as one wherein the housing therefor described above extends forwardly from the vertical support represented by the post structure 21, Fig. 1, the reflector 110, Fig. 4, is configured and arranged to afford a plurality of individual reflector units arranged in ascending planes proceeding from rear or inner limits adjacent the center member 35 toward outer or front limits adjacent the end of the fixture housing most remote from the center member 35. Thus, the fixture housing is generally triangular in shape as viewed in Fig. 4 so that the center member 35 can be viewed as the base at the rear thereof with the hinge structure 70E—83 at the apex or front of the triangular housing. When so considered in reference to the housing thus oriented, the reflector 110, of rolled aluminum, extends generally forwardly and upwardly proceeding from the flange 112 thereof which is associated with the center member 35 in the manner described above.

The reflector 110 is divided into a plurality of individual reflector units having rear reflective walls or surfaces 130A, 130B, and 130C. Thus, three reflector units are afforded in the present instance, but it will be appreciated that two or more such units may be provided. As shown in Fig. 4, the reflective sides 130A, 130B, and 130C are, in that order, disposed in forwardly progressing planes and are inclined from the vertical so as to

face downwardly as well as forwardly. Moreover, the angle of inclination from the vertical of the respective surfaces 130A, 130B, and 130C is of an increasing order, that is, the outer or front reflective side 130C is more horizontal than is the rear or inner surface 130A.

The individual reflector units also include front reflector sides 132A, 132B, and 132C, and these reflective sides are, in that order, disposed in ascending planes as viewed in Fig. 4 and are substantially parallel one to the other. The front reflective sides for the most part face downwardly but have a slight rearward disposition. It will be seen that the sides as 130A and 132A of a particular reflector unit diverge downwardly when the housing is oriented as defined above, and in the present instance the surfaces as 130A and 132A defining a reflector unit are joined at their spaced upper edges by a web or bight portion so that there are three such joining web portions 134A, 134B, and 134C disposed in a common ascending plane. These joining web portions also embody reflective facings so that each of the reflective units thus described can be also viewed as affording downwardly facing substantially concave reflectors.

The reflector sheet 110 is a continuous one-piece member so that the intermediate reflector unit having the sides 130B and 132B is joined at an apex to the opposed reflective sides 132A and 130C of the rearwardmost and forwardmost reflector units respectively. The apices thus established are indicated at 136 and 137, and these apices can be viewed as the lowermost edge lines of the front reflective sides 132A and 132B, and when so considered the front reflective side 132C will also have a lowermost edge line 138. Thus it will be seen that the lower edges of the front reflective sides 132A, 132B, and 132C terminate at ascending lines in that order.

Associated with reflector 110 is a socket plate 140, Fig. 4, having a generally flat back 141 which engages the webs as 134A at spaced points and is adapted to be secured thereto in any suitable fashion. The socket plate 140 is adapted to support conventional sockets 143 for the ends of as many fluorescent lamps 145 as there are reflector units, namely, three in the present instance. The sockets 143 as shown in Fig. 4 are so angled and positioned as to support the lamps 145 substantially in centered position between the opposed walls as 130A and 132A of a particular reflector unit, and moreover the arrangement is such that the lamps 145 are disposed in ascending order one above the other.

It was stressed that the luminous panel 75 is of sinusoidal shape, and it will be recognized from Fig. 4 that the arrangement and orientation of the panel 75 relative to the reflector units is such that the inner concave portions 75E of the panel 75 are opposite the lamp supports 143 whereas the inner convex areas 75X of the panel 75 are opposite the intermediate apices 136 and 137 of the reflector plate 110. It will be immediately recognized that the sinusoidal shape of the luminous panel 75 increases the luminous area thereof in contrast to a flat panel. Moreover, it will be further realized that points within the concave areas 75E of the panel 75 receive light quanta of substantially equal intensity inasmuch as such points are substantially equally spaced from opposed radiating surfaces of the lamps 145.

It was mentioned above the center struts 35 are so configured and arranged that when a pair thereof are joined back to back by means including the bottom plate 50, such pair of joined struts can be coupled to another pair, and referring to Fig. 8 of the drawings this is achieved primarily by having resort to the relative large spacing afforded between the opposed inner faces 35F of the center support 35. This spacing is of sufficient dimension to define a channel 174 slidably receiving a coupler bar or plate 175, and the coupler 175 will have opposed end portions reposing in the channel areas as 174 of the two pairs of center supports 35 that are to be coupled. Thus, the coupler 175 is a one-piece struc-

tural part generally U-shaped in section so as to have opposed vertical sides 176 and 177 joined at their lower edges by an integral web 178. The upper ends of the sides 176 and 177 of the coupler are off-set outwardly at 180 and relatively short vertical extensions 181 are integral with the off-sets 180. The spacing and arrangement is such that the free ends 180E of the extensions 180 engage inwardly projected shoulders 182 of the center supports 35 each defining part of a channel or slot for the related one of the coupler extensions 181, while the lower corners 175C of the coupler 175 repose in the complementary inner corner areas of the bottom plate 50 which likewise define channels.

The sides of the coupler 175 are bowed inwardly away from the opposed side of the struts 35 so as to clear bosses B, Fig. 4, associated with the wiring and the ballast boxes BB for the lamps 145. Apertures are formed at selected spaced points in the web 178 of the coupler 175 and these are adapted to be brought in to registry with like apertures formed in the bottom plates of the two fixtures as 20 that are to be coupled in tandem relation. Bolts 185, Fig. 8, are adapted to be passed through such registered apertures to secure the coupler in place, and it will be appreciated that incidental to the assemblage of such tandem arrangements the opposed end caps 65C, Fig. 1, of each fixture as 20 that is to be coupled are removed to expose the large channel areas 174, Fig. 8, of the two fixtures that are to receive the opposed ends of the coupler 175.

It will be seen from the foregoing that a fixture unit as 20R of the present invention includes a housing having side and top walls afforded by the side and top plates 65 and 70 which can be considered as cantilevered on a main center support as 35, and the center support 35 is provided with channel means as afforded by the slot 40 and the ledge 38L to enable a spacer or tie member as 50 to be slidably fitted therein and joined to two such fully complementary center supports or struts 35 to thereby integrate a pair of fixture assemblies as 20L and 20R in left and right hand back-to-back relation in a multiple fixture 20. Moreover, by interposing a coupler 175 as 20 including a pair of left and right hand fixture units or assemblies, another fixture can be in effect spliced to the first-named pair.

The housing thus afforded further includes a removable bottom wall represented by the plate 74 including a luminous panel 75. The luminous panel 75 is of sinusoidal shape to enlarge and enhance the light transmissive characteristics thereof, and the arrangement is such that the panel 75 ascends in an inclined plane in a direction proceeding from the base or rear of the housing toward the outer extremity thereof. Likewise, the compound reflector 110 and the lamps 145 are arranged in such ascending order so that the respective rear reflective sides 130A, 130B, and 130C cast light forwardly and upwardly as indicated in Fig. 3 to illuminate vertical surfaces as WA removed a relatively great distance Y, Fig. 3, from the point of installation of the fixture of the present invention. Further, the front reflective sides 132A, 132B, and 132C of the individual reflector units direct substantial quantities of light downwardly and somewhat rearwardly to effectively illuminate an intermediate outdoor apron area as AA, Fig. 3.

Hence while we have illustrated and described a preferred embodiment of our invention, it is to be understood that this is capable of variation and modification, and we therefore do not wish to be limited to the precise details set forth, but desire to avail ourselves of such changes and alterations as fall within the purview of the following claims.

We claim:

1. In a lighting fixture of the kind described, means affording a housing for a reflector and a plurality of lamps, and means for mounting said housing on a main

vertical support to extend substantially horizontally outwardly of said support in a forward direction, said fixture further including in reference to said housing when mounted as aforesaid: a reflector within said housing and extending forwardly from a point adjacent rear or inner limits of said housing to a point adjacent front or outer limits of said housing, said reflector including a plurality of individual reflector units each having spaced downwardly divergent rear and front reflective sides, said reflector front sides being disposed respectively in spaced apart ascending planes proceeding in a forward direction and having lower edges disposed respectively along spaced apart ascending lines proceeding in a forward direction, said reflector rear sides being disposed respectively in forwardly progressing planes, means in said housing for supporting a corresponding plurality of lamps in substantially centered position between the rear and front reflective sides of said reflector units and in ascending relation proceeding in a forward direction, a light transmissive panel mounted on said housing beneath said lamp support means, and said panel being generally sinusoidal in shape and having a corresponding plurality of inner concave areas substantially aligned with said lamp support means and joined by inner convex areas disposed between said lamp support means.

2. In a lighting fixture of the kind described, means affording a housing for a reflector and a plurality of lamps, and means for mounting said housing on a main vertical support to extend substantially horizontally outwardly of said support in a forward direction, said fixture further including in reference to said housing when mounted as aforesaid: a reflector within said housing and extending forwardly from a point adjacent rear or inner limits of said housing to a point adjacent front or outer limits of said housing, said reflector including a plurality of individual reflector units each having spaced downwardly divergent rear and front reflective sides, said reflector front sides being disposed respectively in spaced apart ascending planes proceeding in a forward direction and having lower edges disposed respectively along spaced apart ascending lines proceeding in a forward direction, said reflector rear sides being disposed respectively in forwardly progressing planes, means for supporting a corresponding plurality of lamps in substantially centered position between the rear and front reflective sides of said reflector units and in ascending relation proceeding in a forward direction, a sinusoidally shaped light transmissive panel mounted on said housing below said lamp support means, said panel having a corresponding plurality of concave inner portions in individually centered alignment with respect to said reflector units, said concave portions being joined by convex portions in individually centered alignment with adjacent edges of respective pairs of said reflector units, and a center support for the rear of said housing having means defining a channel for insertion therein of a coupler plate.

3. In a lighting fixture of the kind described, means affording a housing for a reflector and a plurality of lamps, and means for mounting said housing on a main vertical support to extend substantially horizontally outwardly of said support in a forward direction, said fixture further including in reference to said housing when mounted as aforesaid: a reflector within said housing and extending forwardly from a point adjacent rear or inner limits of said housing to a point adjacent front or outer limits of said housing, said reflector including a plurality of individual reflector units each having spaced downwardly divergent rear and front reflective sides, said reflector front sides being disposed respectively in spaced apart ascending planes proceeding in a forward direction, and having lower edges disposed respectively along spaced apart ascending lines proceeding in a forward direction, said reflector rear sides being disposed respectively in forwardly progressing planes, means for supporting lamps in substantially centered position between

the rear and front reflective sides of said reflector units and in ascending relation proceeding in a forward direction, a center strut at the base or rear of said housing means, said center strut having an open-ended longitudinal slot therein and a shoulder element disposed in spaced transverse alignment with respect to said slot, a spacer channel engageable with the slots and shoulders of two such housings to couple the two housings as a pair in back to back relation, said center strut having other means defining, with another such strut and said spacer, a channel, a coupler mounted within said channel and extending outwardly thereof into the corresponding channel of another such pair of housings to mount said housing pairs in tandem end to end relation, a light transmissive plate having side and end frames affording channels and a sinusoidally shaped luminous panel of translucent plastic having edges disposed in channels of said frames, said panel having a corresponding plurality of concave inner portions in individually centered alignment with respect to said reflector units, said concave portions being joined by convex portions in individually centered alignment with adjacent edges of respective pairs of said reflector units, a gasket extended about said frame and engaging marginal portions of said panel, said housing including a top housing plate, said light transmissive plate being hinged to the front edge of said top housing plate, releasable means for holding said light transmissive plate in closed position on said center strut, and abutment surfaces in said housing engageable by said gasket when said plate is closed.

4. In a lighting fixture of the kind described, means affording a housing for a reflector and a plurality of lamps, and means for mounting said housing on a main vertical support to extend substantially horizontally outwardly of said support in a forward direction, said fixture further including in reference to said housing when mounted as aforesaid: a reflector within said housing and extending forwardly from a point adjacent rear or inner limits of said housing to a point adjacent front or outer limits of said housing, said reflector including a plurality of downwardly concave reflector units arranged in ascending relation proceeding in a forward direction and each having spaced rear and front reflective sides, means for supporting a corresponding plurality of lamps in substantially centered position between the rear and front reflective sides of said reflector units and in ascending relation proceeding in a forward direction, and a sinusoidal light transmissive panel mounted on said housing below said lamp supports, said panel having a corresponding plurality of concave inner portions in individually centered alignment with respect to said reflector units, said concave portions being joined by convex portions in individually centered alignment with adjacent edges of respective pairs of said reflector units.

5. In a lighting fixture of the kind described, means affording a housing for a reflector and a plurality of lamps, and means for mounting said housing on a main vertical support to extend substantially horizontally outwardly of said support in a forward direction, and said fixture further including in reference to said housing when mounted as aforesaid: a reflector within said housing and extending forwardly from a point adjacent rear or inner limits of said housing to a point adjacent front or outer limits of said housing, said reflector including a plurality of downwardly concave reflector units arranged in ascending order proceeding in a forward direction and each having spaced rear and front reflective sides, means for supporting a corresponding plurality of lamps in substantially centered position between the rear and front reflective sides of said reflector units and in ascending relation proceeding in a forward direction, a sinusoidal light transmissive panel mounted in said housing below said lamp supports, said panel having concave inner areas disposed substantially opposite said reflector units, and a center support for the rear of said housing having

a longitudinal channel therein, and a coupler plate engaged in said channel and engageable in the corresponding channel of a similar housing to join the housings in back to back relationship.

6. A lighting fixture comprising: a pair of elongated support struts of extruded aluminum, each having an open-ended longitudinal slot therein; a pair of housings individually affixed to respective ones of said support struts and supported thereby in cantilever manner; a pair of reflectors, individually mounted within respective ones of said housings and each affording a plurality of downwardly and outwardly facing reflector units; means for supporting a corresponding plurality of lamps in centered alignment with said reflector units in each of said housings; a pair of shoulder elements, formed integrally with respective ones of said struts and extending longitudinally thereof in transverse spaced relation to said slots in said struts; and an elongated channel-shaped spacer having a pair of leg portions engaged in said strut slots and a bight portion engaged with said shoulder elements to join said struts and said housings in a rigid, unitary lighting fixture having a central channel comprising said two struts and said spacer.

7. A lighting fixture assembly comprising: a pair of elongated support struts of extruded aluminum, each having an open-ended longitudinal slot therein; a pair of housings individually affixed to respective ones of said support struts and supported thereby in cantilever manner; a pair of reflectors, individually mounted within respective ones of said housings and each affording a plurality of downwardly and outwardly facing reflector units; means for supporting a corresponding plurality of lamps in centered alignment with said reflector units in each of said housings; a pair of shoulder elements of substantially L-shaped cross-section, formed integrally with respective ones of said struts and extending longitudinally thereof in transverse spaced relation to said slots in said struts; an elongated channel-shaped spacer having a pair of leg portions and engaged in said strut slots and a bight portion engaged with said shoulder elements to

join said struts and said housings in a rigid, unitary lighting fixture having a central channel comprising said two struts and said spacer; and a channel-shaped coupler disposed within one end portion of said channel in engagement with said struts and said spacer and extending therefrom into engagement with the central channel of a second similar fixture to join said fixtures in end-to-end tandem assembly.

8. A lighting fixture comprising: a pair of elongated support struts each having an open-ended downwardly facing longitudinal slot therein; a pair of housings individually affixed to respective ones of said support struts and supported thereby in cantilever manner; a pair of reflectors, individually mounted within respective ones of said housings and each affording a plurality of downwardly and outwardly facing reflector units; means for supporting a corresponding plurality of lamps in centered alignment with said reflector units in each of said housings; a pair of horizontally extending shoulder elements, affixed to respective ones of said struts and extending longitudinally thereof in spaced relation to said slots in said struts; and an elongated coupler having a pair of leg portions engaged in said strut slots and a bight portion engaged with said shoulder elements to join said struts and said housings in a rigid, unitary lighting fixture having a central channel comprising said two struts and said coupler.

References Cited in the file of this patent

UNITED STATES PATENTS

2,334,005	Hoeveler	Nov. 9, 1943
2,335,735	Campan	Nov. 30, 1943
2,569,518	Deutsch et al.	Oct. 2, 1951
2,625,646	Goebel	Jan. 13, 1953
2,800,574	Belbes et al.	July 23, 1957

FOREIGN PATENTS

616,075	Great Britain	Jan. 17, 1949
902,529	Germany	Jan. 25, 1954