

July 23, 1957

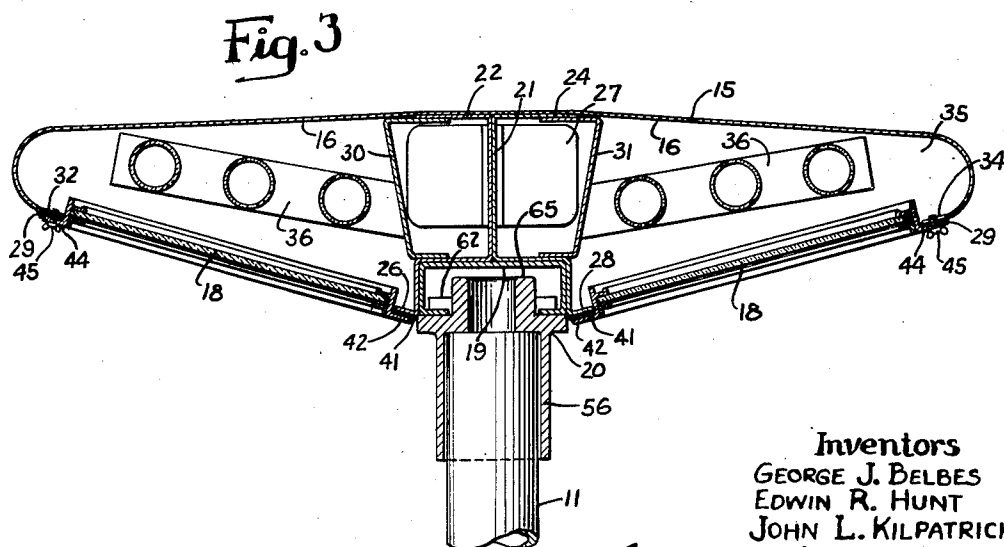
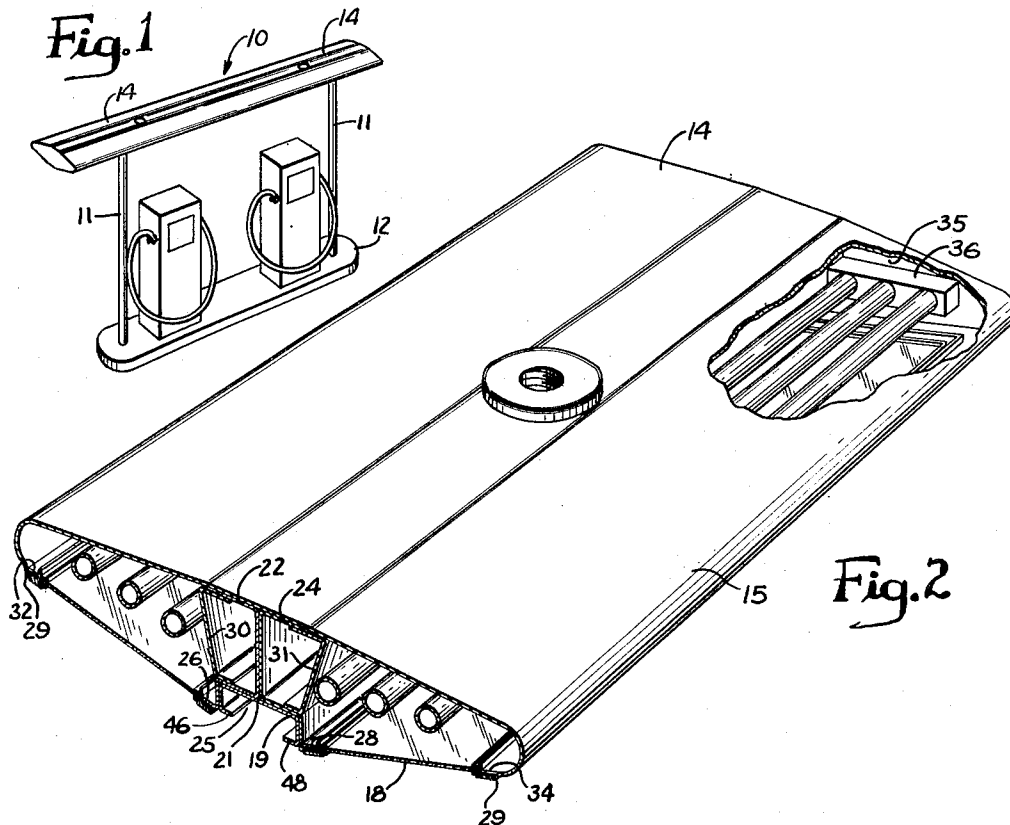
G. J. BELBES ET AL

2,800,574

MOUNTING FOR ELECTRIC LIGHTING FIXTURES

Filed June 29, 1953

3 Sheets-Sheet 1



Inventors
 GEORGE J. BELBES
 EDWIN R. HUNT
 JOHN L. KILPATRICK
 by: *Carson, Peterson & Hubbard, Wolfe*
 Attys.

July 23, 1957

G. J. BELBES ET AL

2,800,574

MOUNTING FOR ELECTRIC LIGHTING FIXTURES

Filed June 29, 1953

3 Sheets-Sheet 2

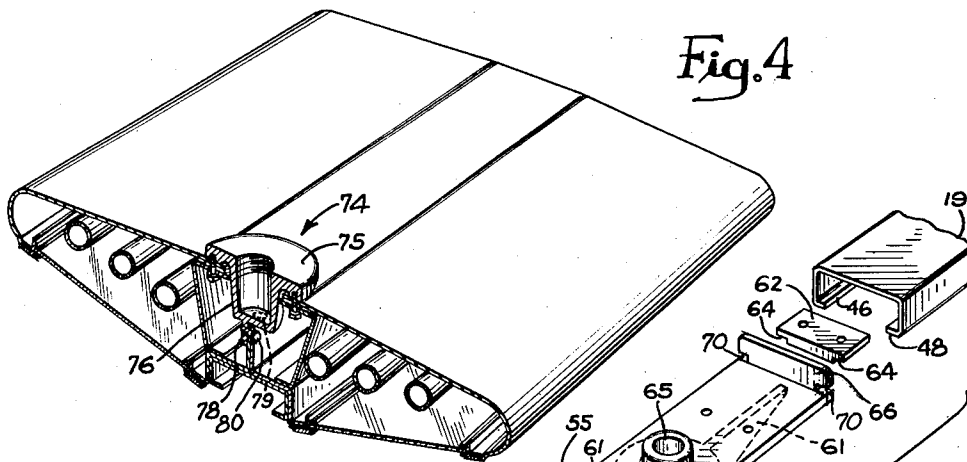


Fig. 4

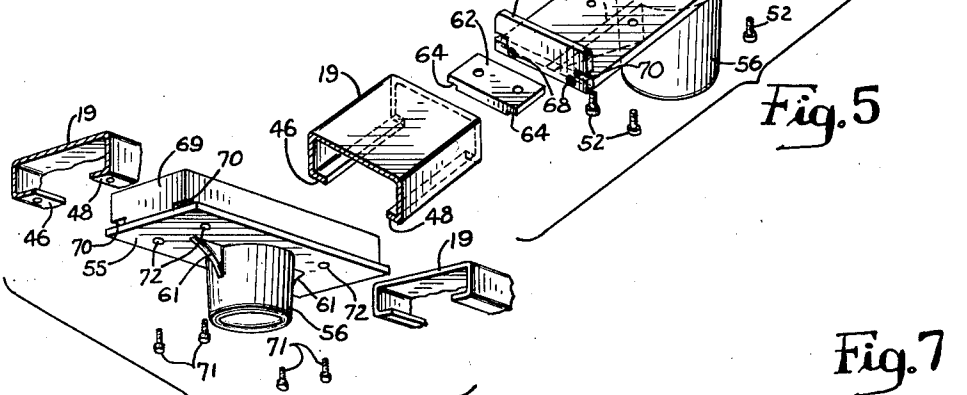


Fig. 5

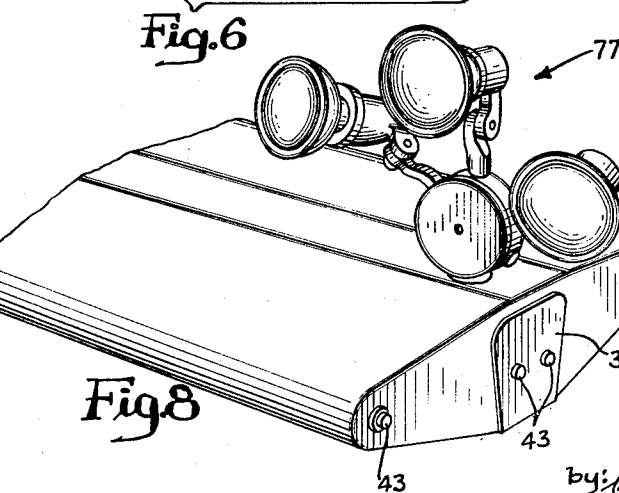


Fig. 6

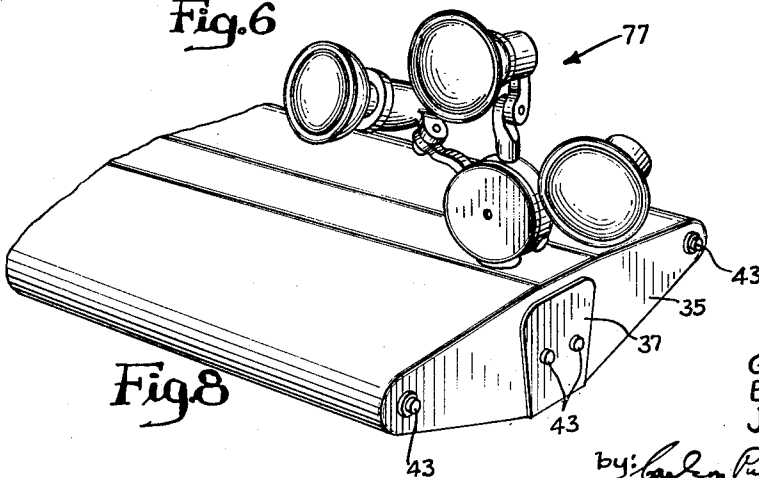


Fig. 8

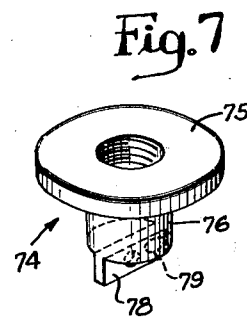


Fig. 7

Inventors
GEORGE J. BELBES
EDWIN R. HUNT
JOHN L. KILPATRICK

by: *Charles R. Patten* *Walter H. Wolf*
Attys.

July 23, 1957

G. J. BELBES ET AL

2,800,574

MOUNTING FOR ELECTRIC LIGHTING FIXTURES

Filed June 29, 1953

3 Sheets-Sheet 3

Fig. 9

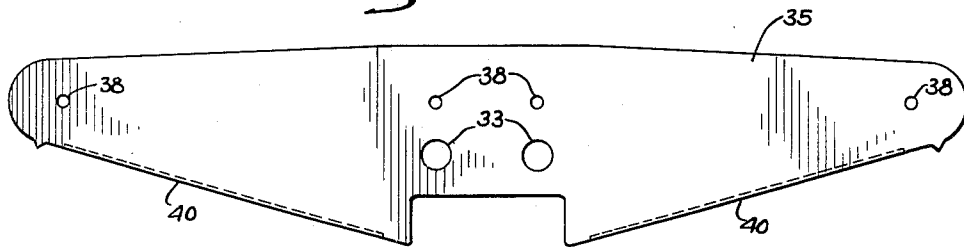


Fig. 12

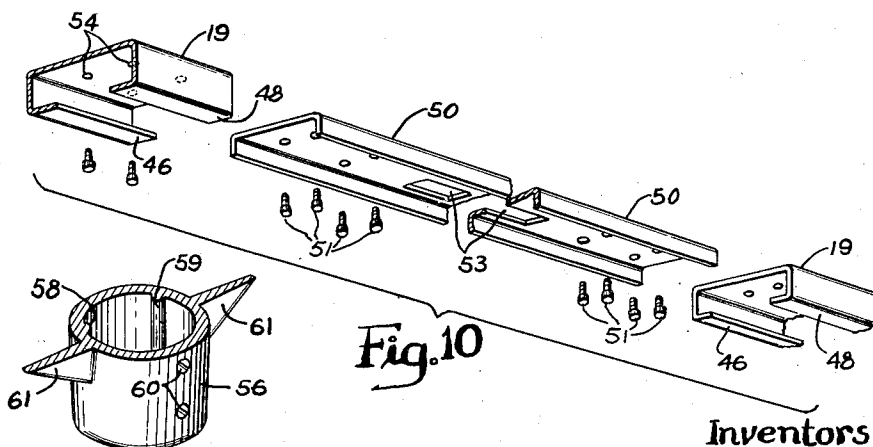
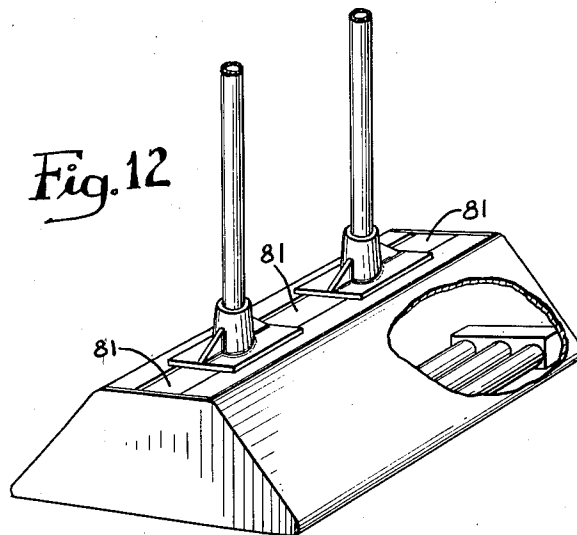


Fig. 11

Inventors
GEORGE J. BELBES
EDWIN R. HUNT
JOHN L. KILPATRICK

by: *Carlson, Padgett, Hubbard & Webb*
Attys

1

2,800,574

MOUNTING FOR ELECTRIC LIGHTING FIXTURES

George J. Belbes, Cicero, and Edwin R. Hunt, Forest Park, Ill., and John L. Kilpatrick, Red Bank, N. J., assignors, by mesne assignments, to Compco Corporation, Chicago, Ill., a corporation of Illinois

Application June 29, 1953, Serial No. 364,834

10 Claims. (Cl. 240—3)

The present invention relates to lighting fixtures and has particular although not exclusive utility as applied to fixtures employed in illuminating large outdoor areas, for example in filling stations, drive-in eating establishments, and the like.

The illumination of large outdoor areas presents new problems heretofore not encountered in the more conventional types of illumination. It particularly requires specially designed lighting fixtures which because they must illuminate larger areas without the benefit of reflection from the walls and ceilings of enclosures, must be larger and have unique light diffusing means capable of suitably illuminating specific areas such as, for example, a filling station island, without however necessitating the use of excessive electric power. Furthermore, because the fixtures are themselves larger and further because of prevalent outdoor conditions, especially wind and the like, the fixtures must be sturdier, particularly as to their supporting means. Hence, they must be designed and constructed with structural reinforcement means.

Moreover, since in many installations the supporting poles or similar means are already in position, adjustable adaptors such as pole fitters slidably positioned for varying spacing adjustment between poles, must be incorporated into the lighting fixture.

It is therefore an important object of this invention to afford a lighting fixture designed to meet all of the requirements indicated hereinabove.

One object of the present invention is to provide a lighting fixture having an improved and simplified arrangement for mounting it by standards located with such various spacings between them as may be dictated by existing facilities at the installation.

More particularly, it is an object to provide a long fixture for fluorescent or similar tubular lamps which embodies means for mounting it on adjustably spaced supports with the latter arranged either as uprights beneath the fixture or as suspensions above it.

A related object is to afford a lighting fixture having sturdy supporting means of structural steel-shape construction which together with novel sliding pole fixtures, afford both adjustable supporting means for the fixture and suitable reinforcement to prevent distortion or displacement due to the increased weight of the larger size fixture. Such construction is further designed to admirably withstand even the severest buffeting of strong winds prevalent in some localities.

A further object is to provide a lighting fixture which is sufficiently weatherproof for outdoor use, yet is of light construction and capable of prefabrication for final installation in a simple manner, and if desired, in a variety of lengths.

Still another object is to afford a lighting fixture having means for so diffusing the light as to attain the maximum lighting efficiency over the largest possible area. An object relating thereto is to direct the light rays outwardly

2

and downwardly through a flat diffusion lens positioned in a plane substantially 15 degrees above a true horizontal plane.

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

Figure 1 is a perspective view showing the illuminating fixture of the invention in a typical installation over a gasoline filling station pump island.

Fig. 2 is a perspective view of the illuminating unit partially sectioned to show portions of the internal structure.

Fig. 3 is a transverse cross-sectional view of an illuminating unit showing the internal construction as well as the mounting support.

Fig. 4 is a fragmentary sectional perspective view of the details of the mounting support for the illuminating fixture of the invention.

Fig. 5 is an exploded perspective view showing the mechanism for mounting the lighting unit to its support.

Fig. 6 is an exploded perspective view showing an alternative form of mechanism for mounting the lighting unit to its support.

Fig. 7 is a perspective view of a spotlight mounting fixture for positioning in the illuminating unit as shown in Figs. 2 and 4.

Fig. 8 is a perspective partial view of the lighting unit showing a spotlight cluster in its mounted position, and also the free end cover plate.

Fig. 9 shows in plan view the lighting unit end plate.

Fig. 10 is a perspective exploded view showing the mounting channel coupling construction.

Fig. 11 is a perspective partial section showing that portion of the mounting construction which couples with the support poles.

Fig. 12 is a perspective partially sectional view showing an elongated lighting unit in a suspended rather than supported installation such as that exemplified in Fig. 1.

Although a particular embodiment of the invention has been shown and described in some detail herein, there is no intention to thereby limit the invention to such details of the embodiment. On the contrary, the intention is to cover all modifications, alternative embodiments, usages and equivalents as fall within the spirit and scope of the invention as expressed in the appended claims.

In the present instance the invention has been shown as embodied in a filling station illumination unit 10 such as that displayed in Fig. 1. The construction is of sufficient flexibility so that pre-existing standards or supports 11 located on the filling station island 12 or elsewhere can be utilized to mount the lighting fixture 10. The fixture itself is comprised of a number of self-contained lighting units 14 which are manufactured in predetermined lengths, fifty or one hundred inch lengths, for example. The upper portion of the units is fashioned of sheet metal into a one-piece housing 15, the under surface of which serves as a reflector 16. Diffusion panels 18 are located on the underside of the unit and effect the closure of that area. A long section of formed channel 19 is permanently fixed to the base of the units. This channel 19, in turn, is adjustably secured to a shoe 20 which is located as a cap on the standard or support 11.

Referring to Figs. 2 and 3, it will be seen that the central support member, actually the backbone of the lighting unit, is in the shape of a modified I-beam 21, the construction of which is formed of sheet metal halves 22, 24 spot-welded back to back. A downwardly opening trough 25 is formed at the base of the I-beam, the lower edges of the trough 25 being bent outwardly into flanges 26, 28. Holes (not shown) are provided at suit-

ably spaced intervals along the central section of the I-beam in order to mount the ballast unit 27 or other electrical unit necessitated by the type of lighting employed within this fixture. Side plates 30, 31 are, in turn, provided in order to close off the ballast unit 27 and other wiring within the central section of the unit so that no bare wires or other electrical contact points are exposed when the unit is opened for inspection, cleaning or replacing burned out lighting units. Knockout plates (not shown) are provided at predetermined intervals along the base of the I-beam in order to allow entry for the wires required to supply each unit.

Although in the embodiment chosen for illustration, the structural support means is shown as comprising the channel 19 together with the I-beam 21, it should be apparent that other longitudinally extending structural means may be substituted therefore. Hence, it is intended that the term "structural support means" include equivalent structures.

A housing 15, preferably of one-strip sheet metal construction, overlies each individual lighting unit. It is formed in a bilaterally symmetrical pattern for affixation to the top of the centrally located I-beam. The housing 15 slopes downwardly from the center toward its outer edges to provide for adequate drainage. At the very edges the housing is curled down and inwardly presenting a flanged edge 32, 34 which points downwardly toward the I-beam base flanges 26, 28. It has been found desirable to locate these two flanges along a line inclined at fifteen degrees from the horizontals. The reason therefor will become apparent as the description proceeds. A drip shield 29 is formed in the housing adjacent the outer flange 32, 34 for the purpose of directing the flow of rainwater directly downward at that point.

End panels 35, illustrated in Fig. 9, provide the closure at the end of each unit. Socket units 36 are fastened to the inner portion of the end panels serving to operatively mount the fluorescent tubes. In this case a plurality of fluorescent tube sockets are illustrated. Wire lead-in ports 33 are pre-punched in the end panels 35 within the space which will be covered by the I-beam central section. In addition, mounting holes 38 are provided for bolting adjacent end panels back to back. In order to protect the terminal end units from weathering through these holes and ports, an end plate 37 (see Fig. 8) is provided for the terminal end panels, such end plate 37 covering the wire lead-in ports 33 and bolted in place through the central holes. Dummy bolts 43 are placed in the outer bolt holes 38 of the end panels and gasketed suitably for complete weatherproofing. It is contemplated that the end plate 37 can bear particular design or configuration desired by the manufacturer or purchaser for ornamental purposes. The lower edge of the end panel is formed with an inwardly turning flange 40.

Complete enclosure and waterproofing of the light unit is effected when the diffusion plates 18 are mounted between the I-beam base flanges 26, 28 and the housing outer flanges 32, 34. Piano hinges 41 are mounted on the I-beam base flanges 26, 28 for connection to the inner longitudinal edge 42 of the diffusion plate 18. At the outer edge 44 the diffusion plate 18 is mounted to the housing flange by screw fastener units 45 with winged nuts or other suitable external grips which are hooked to the housing so that upon unfastening the diffusion plate for opening, the fasteners remain securely fixed to the housing, thereby preventing inadvertent loss when dropped by the operator. All around gasketing is provided on the perimeter of the diffusion panel to complete the weatherproofing seal of the lighting unit. It will be seen that the diffusion panel, by virtue of the relationship between the I-beam base flange and housing ledge, is mounted at a preferred angle sloping fifteen degrees upwardly from the horizontal. As the rays of light emanating from the fluorescent tubes pass through these inclined diffusion

panels, they are directed downwardly and outwardly over a substantial area without however being excessively diffused to the point that efficient light intensity is sacrificed.

Attention is now directed to those novel features of the fixture construction which comprise the most important parts of the invention. To furnish a slidably adjustable mount for the lighting unit a continuous channel 19 has been provided so proportioned as to fit within the trough 25 formed at the base of the I-beam 21. The channel 19 may be of various pre-selected lengths, not necessarily conforming to the length of any of the lighting units themselves. In a commercial embodiment the mounting channel 19 is formed from three-sixteenths inch sheet metal with a double bend on each edge, thereby presenting inwardly turned flanges 46, 48 at the lower portion of the channel. At predetermined intervals along the upper portion of the mounting channel recesses have been provided in order to overlap the knockout plugs at the base of the central I-beam to provide ingress for the necessary wiring. Mounting channel joints 50, of a width less than the inner dimension of the mounting channel, but having recesses 53 as has the mounting channel, are provided for coupling joints of pre-selected channel lengths where extremely long lighting fixtures will be erected at the site. Conventional bolts 51 placed at suitable intervals along the channel joint and mounting channel effectuate the continuous joint.

The entire completed channel is affixed to the lighting unit by means of machine screws 52 fastened from the outside into tapped holes 54 in the mounting channel. In this way the mounting channel is securely fixed to the lighting unit itself, and for final assembly need only be secured to the mounting supports.

Alternative constructions of the mounting means have been illustrated in Figs. 5 and 6. Referring first to Fig. 5, the mount comprises a shoe base and locking means, which furnish the adjustable connection between the mounting standard or support 11 and the assembled light unit 10. The shoe base 55, shown here as a casting, presents a generally rectangular flat face supported on a downwardly projecting sleeve 56 at its central portion. As illustrated in Fig. 11, the sleeve 56 is provided with two longitudinal ribs 58, 59 running the length of the sleeve and set screws such as 60, the ribs and set screw locations forming an equilateral triangle on the sleeve circumference. Supporting ribs 61 extending laterally from the central sleeve reinforce the cast construction. Holes have been conveniently located on the base of the shoe which have been tapped to receive locking screws 52. Lock plates 62 drilled and tapped on centers dimensioned concentrically with the locking screw holes in the shoe base plate have been provided for locking the shoe to the mounting channel 19 of the lighting unit. Suitable lateral recesses 64 at the base of the lock insure the lighting unit against motion laterally and upwardly, any lateral motion being halted by the vertical recess shoulder and upwardly by the horizontal shoulder of the locking plate recess. It will be appreciated that a lead hole 65 of sufficient diameter has been provided through the mounting shoe central portion in order to adequately allow for lead-in wires through the mounting channel recesses and I-beam knockout plugs into the ballast unit of the lighting fixture. In order to seal off the open area containing the lead-in wires above the mounting shoe base, mounting shoe end plates 66 have been provided for affixation to the ends of the mounting shoe base. It will be noted that the configuration of these end plates is the same as the internal silhouette of the mounting channel. The end plates are held in place by machine screws 68 supported in pretapped holes in the ends of the mounting shoe base.

The above described mounting means enables the shoe base 55 with its depending pole sleeve 56 to be freely moved longitudinally within the channel 19 to any posi-

5

tion necessary to align and mount the sleeve over the top of the pre-installed pole 11. The screws 52 are then tightened thereby clamping the channel flanges 46 and 48 between the lockplate 62 and the shoe base 55. The fixture is then supported by means of the sturdy structural members, i. e. the channel 19 and the I-beam 21.

An alternative embodiment of the mounting shoe is illustrated in Fig. 6. Its construction includes a sleeve base adapter 56 which is supportedly connected to a base shoe 55 reinforced at the connection with corner ribs 61. The lock is achieved, however, by means of the shaped lock block 69 mounted atop the base 55. Slots 70 are undercut at the edge portion of lock block 69 and mounting shoe end plates 66 and are adapted to receive the channel flanges 46 and 48. When the channel 19 is slipped in place on the mounting shoe illustrated in Fig. 6, it is locked in place by means of set screws 71 which are led through pretapped holes 72 in base 55 thereby lockingly engaging flanges 46, 48.

Frequently, in lighting units of this general description it has been found advantageous to provide for floodlighting and other lighting facilities, thereby affording an auxiliary lighting source. Such an installation is shown in Fig. 8. In the particular embodiment of the invention shown here a spotlight adapter 74, illustrated in Fig. 7, in the form of a casting, has been provided for insertion into the upper portion of the lighting unit. The casting comprises an upper collar 75, internally threaded base 76, and a locating shoulder 78. The spotlight adapter is tapped with a standard pipe thread at its upper central portion to fit any standard lighting fixture adapter unit. At the lower portion or base of the spotlight adapter cup a lead-in port 79 has been left to adequately provide passage for necessary wiring. The locating shoulder 78 is tapped to receive a mounting bolt 80 for affixation with the vertical section of the central I-beam. Mounting the spotlight adapter naturally necessitates recessing the central I-beam at suitable positions along the length of the lighting unit. In practice, the spotlight adapter is mounted centrally in the shorter lighting units and adjacent the ends of the longer units. Should the purchaser not desire to utilize the spotlight adapter, a spotlight adapter cover plate (not shown) drilled on a radius with holes concentric to the mounting holes of the spotlight adapter can be used with suitable gasketing to weatherproof the factory-located holes for the spotlight adapter. Should the user subsequently desire to mount the spotlight cluster 77, he need merely remove the plate and insert the adapter and wire it for operation.

One of the objects of the invention is to provide supporting means for elongated lighting fixtures which are adjustably spaced for mounting either in a suspended or a supported position. As illustrated in Fig. 12, the mounting means employed in the invention can be used when a typical elongated lighting unit is suspended from a ceiling or other high support. In order to seal the unit for such suspended use, cover plates 81 have been provided for positioning over the now upwardly facing trough 25 to prevent it from collecting dust, moisture, loose particles of dirt, and the like.

In assembling the light fixture at the installation site, a number of lighting units of sufficient length to cover the particular area is first selected. Thereafter, sufficient lengths of mounting channel 19 are procured and joined together with the mounting channel joint plates 50 to a length coextensive with that of the assembled units. The mounting shoes 55 are then fixed into position over the supports by means of the set screws 60 provided on each mounting shoe sleeve 56. At this time the location of the lead-in wires is determined, and the necessary knock-out plugs in the base of the I-beam 21 of each unit are removed to provide ingress for the necessary wiring. The mounting channel 19 is then placed in position over the mounting shoe base 55, and after the wires have been

6

led through the mounting shoe wire lead-in hole, the mounting shoe is locked in position. Then, the lighting units 14 are erected one by one, placed into position on the mounting channel, securely fixed in place by means of the screws along the side of the central I-beam base box, and further locked against separation by bolting their respective end plates together. The necessary wiring may be placed in position at this time. The end plates 35 are finally bolted into position. The diffusion plates 18 are then lowered by releasing the fastening elements at their outer edges, and the lighting elements installed. In final assembly the entire unit presents a pleasing continuing effect adaptable to any given mounting arrangement, and inexpensively fabricated from standard sheet metal units.

We claim as our invention:

1. A fluorescent lighting fixture comprising, in combination, a longitudinally extending I-beam constituting the supporting backbone of the fixture and having a base presenting a downwardly facing trough with out-turned flanges at the edges of such trough, a sheet metal housing of generally flat configuration, extending along the top of said I-beam and fixed thereto, the lateral edge portions of said housing being curled downward and inward to present flanges in opposed spaced relation to those on said I-beam base, diffusion panels mounted between the opposed flanges on said housing and I-beam base, and means for supporting elongated lamps above such panels along opposite sides of the I-beam.

2. An elongate lighting fixture comprising, in combination, a longitudinally extending central I-beam and having a base presenting a downwardly opening mounting trough with out-turned flanges at the edges of such trough, a sheet metal housing of generally flat configuration extending along the top of said I-beam and supported thereby, a fixture adapter channel flanged at its base for mounting against the bottom of said I-beam, diffusion panels mounted between the opposed flanges on said housing and I-beam base, and means for supporting elongated lamps above such panels at opposite sides of the I-beam.

3. A fluorescent lighting fixture comprising, in combination, a longitudinally extending I-beam, the base of which defines a downwardly opening trough, outwardly disposed flanges at the edges of said trough, a sheet metal housing fixed above said I-beam and supported thereby, a reflecting surface on the under surface of said housing, diffusion panels positioned below said reflecting surface, the I-beam trough flanges and outer edges of said sheet metal housing being spaced apart and disposed for mounting the diffusion panels therebetween.

4. A lighting fixture comprising, in combination, a longitudinally extending I-beam having a base of downwardly facing trough-like form, a housing extending bilaterally from the top of the I-beam, diffusion plates forming the closure between the housing and I-beam base, a downwardly facing channel with inwardly turned flanged edges provided with means for fixed mounting within said I-beam base, a shoe which is slidably engaged by said channel, attachment means on such shoe for connection thereof to a support, and a clamping member removably secured to the shoe effecting a lock between the support and lighting fixture.

5. A lighting fixture comprising, in combination, a longitudinally extending I-beam, the base of which defines a downwardly facing longitudinal trough, outwardly turned flanges at the edges of said I-beam base, a housing extending bilaterally from the top of the I-beam curled under at the edges to present a ledge, diffusion plates forming the closure between the housing ledge and I-beam base flange, a downwardly facing mounting channel with intumed edge flanges provided with means for fixed mounting within said I-beam base, a shoe slidably engaged by said channel, attachment means on such shoe for connection thereof to a support, and means for remov-

ably securing such shoe in positioned relationship with the mounting channel.

6. The fluorescent lighting fixture of claim 1 in which the flanges of the I-beam base are positioned on a plane sufficiently lower than said housing flanges so that each of said diffusion panels is disposed in an inclined plane of substantially 15° from a true horizontal plane and sloping upwardly from the mid-point of the fixture.

7. In an outdoor lighting fixture of the character described, an elongated housing supported by a plurality of central structural-shape members, said members comprising an I-beam, a downwardly opening trough formed at the base of said I-beam and a downwardly opening channel having inwardly turned flanged edges positioned within said trough, support pole fittings slidably mounted in said downwardly opening channel and clamping means for locking said support pole fittings into immovable position about said inwardly turned flanged edges.

8. The fixture of claim 7 in which said pole fittings comprise a combined shoe plate and shoe, the marginal edges of said flanges clamped between said clamping means and said shoe plate.

9. The fixture of claim 7 in which side plates are affixed to said I-beam to afford a pair of enclosures, said enclosures adapted to house in waterproof condition the wiring and electrical components of the fixture.

10. The fixture of claim 8 in which said clamping

means comprises a plurality of lock plates positioned in spaced relationship one with the other above said shoe plates, a plurality of bolts positioned to affix said lock plates to the shoe plate, the marginal edges of said lock plates positioned on said channel flanges whereby said flanges are clamped between said lock plate and shoe plate when said bolts are tightened.

References Cited in the file of this patent

UNITED STATES PATENTS

191,058	Johnson	May 22, 1877
740,347	Wood	Sept. 29, 1903
844,367	Knape	Feb. 19, 1907
911,611	Rendall	Feb. 9, 1909
1,682,693	Day	Aug. 28, 1928
1,714,298	Davidson	May 21, 1929
2,269,165	Rutledge	Jan. 6, 1942
2,327,552	Poehling	Aug. 24, 1943
2,328,445	Francis	Aug. 31, 1943
2,330,507	McCabe	Sept. 28, 1943
2,347,113	King	Apr. 18, 1944
2,526,074	Guth	Oct. 17, 1950
2,545,307	Pretzer	Mar. 13, 1951

FOREIGN PATENTS

623,992	Great Britain	May 26, 1949
---------	---------------	--------------