

Feb. 11, 1964

D. S. HENNING

3,120,929

FLUORESCENT LIGHTING FIXTURE

Filed March 31, 1960

2 Sheets-Sheet 1

FIG. 2

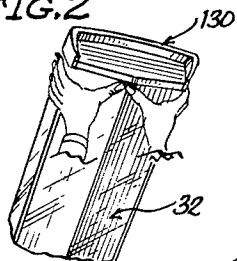


FIG. 1

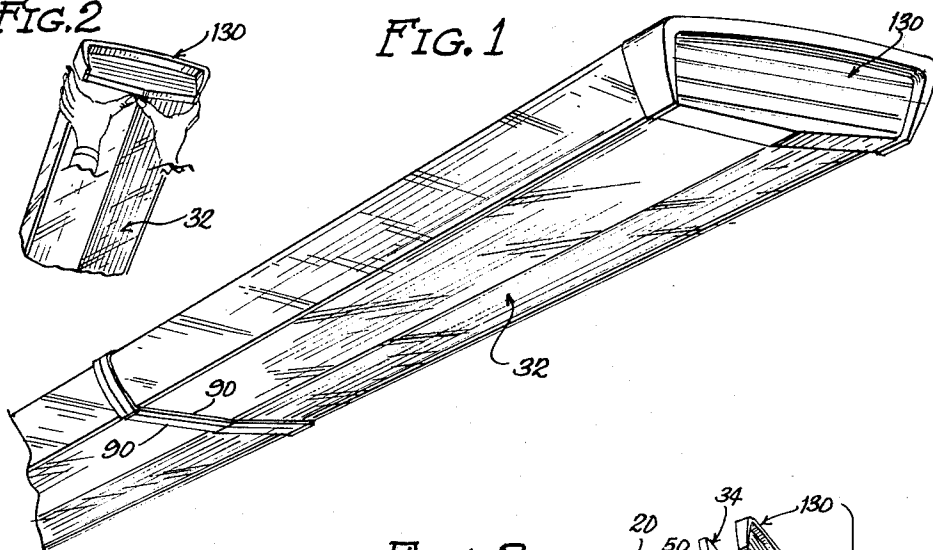


FIG. 3

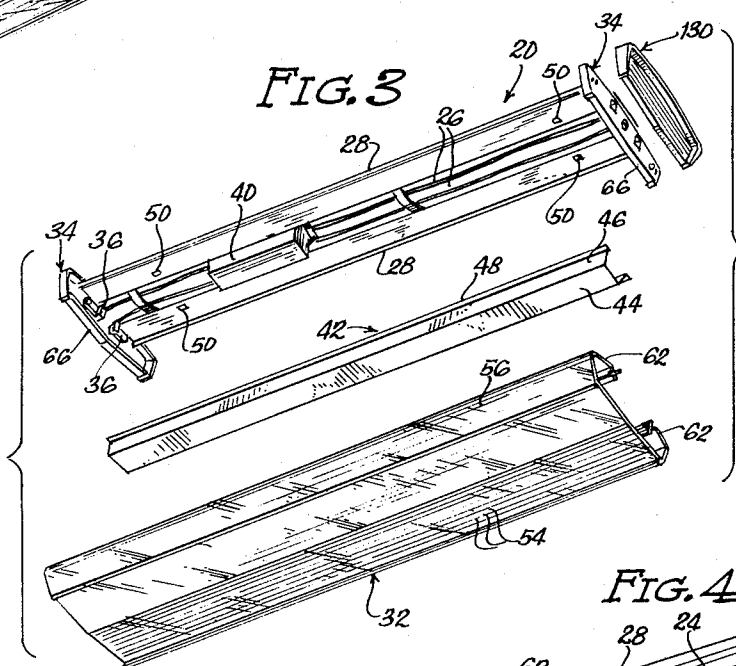


FIG. 4

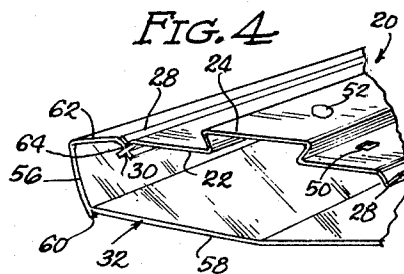
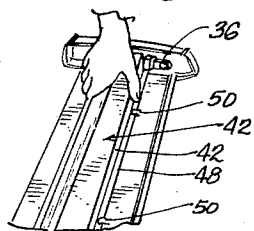


FIG. 5



INVENTOR.
Donald S. Henning
BY
Doms, McDougall, Williams & Hersh
Attorneys

Feb. 11, 1964

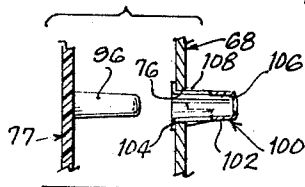
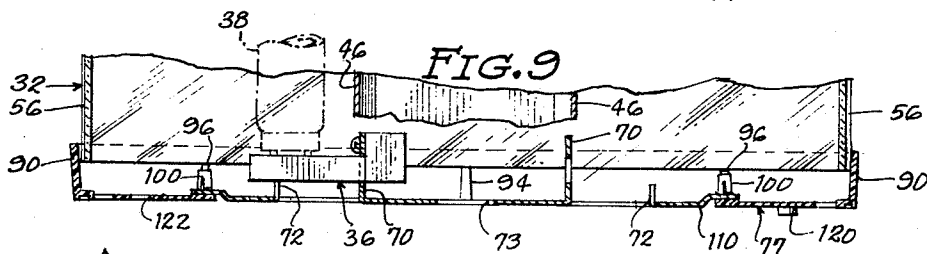
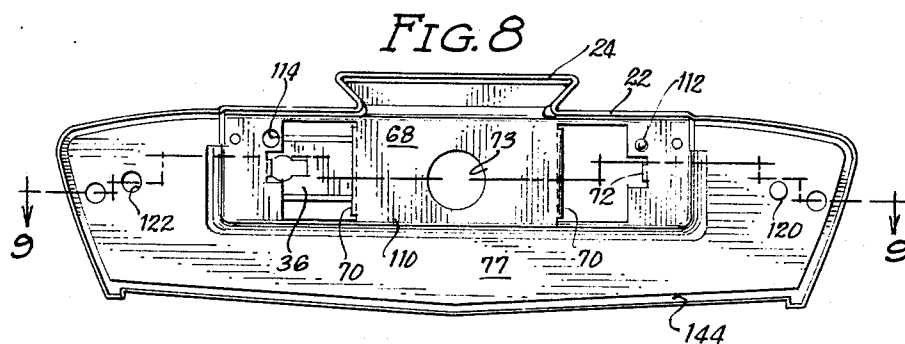
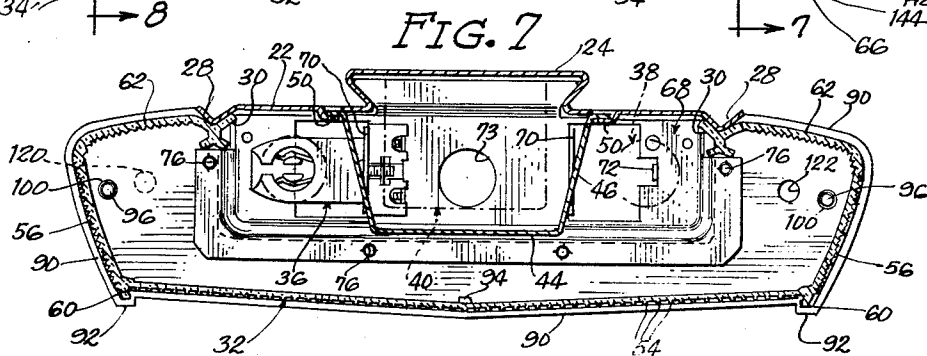
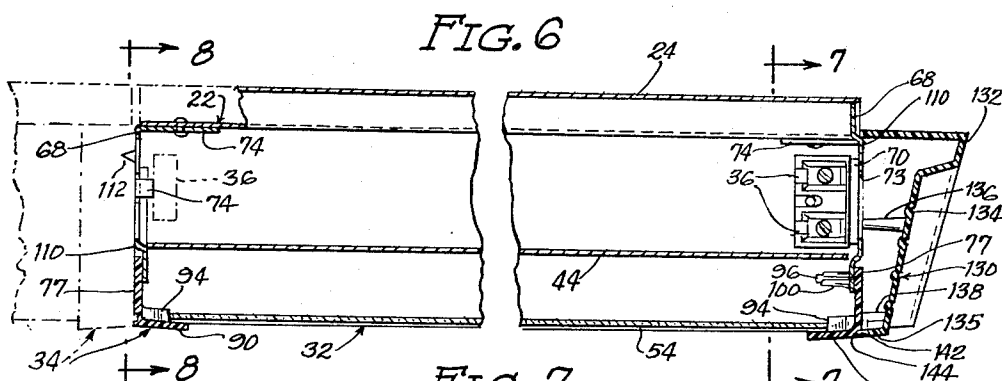
D. S. HENNING

3,120,929

FLUORESCENT LIGHTING FIXTURE

Filed March 31, 1960

2 Sheets-Sheet 2



INVENTOR.
Donald S. Henning

BY

Osma, Mc Dougall, Williams & Kersh
Attorneys

1

3,120,929

FLUORESCENT LIGHTING FIXTURE

Donald S. Henning, Milwaukee, Wis., assignor, by mesne assignments, to Curtis-Electro Lighting, Inc., Chicago, Ill.

Filed Mar. 31, 1960, Ser. No. 19,105

5 Claims. (Cl. 240—51.11)

This invention relates to a fluorescent lighting fixture and more particularly to a new and improved construction in a multiple tube fluorescent lighting fixture adapted to be mounted in various arrangements for room lighting.

It is an object of this invention to produce a fluorescent lighting fixture of improved appearance; which may be easily and efficiently assembled at the station of use of relatively few inexpensive parts and in various arrangements for room lighting and it is a related object to produce a new and improved fluorescent lighting fixture which is simple in construction, easy in operation and repair, attractive in appearance and which can be formed of separated subassemblies to be joined in a simple and expedient manner to form the completed fixture, thereby to expedite fabrication as well as transportation thereof.

These and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawings in which:

FIG. 1 is a fragmentary perspective view of a lighting fixture embodying the features of this invention shown with another in end to end relation;

FIG. 2 is a fragmentary bottom view in perspective of the lighting fixture of FIG. 1 illustrating the means for removal of the translucent cover;

FIG. 3 is a perspective view of the lighting fixture of FIG. 1 with the components separated from their assembled arrangement;

FIG. 4 is a fragmentary perspective view of the wireway and cover of the lighting fixture of FIG. 1 showing their interfitting relation;

FIG. 5 is a fragmentary perspective view of the interior of the fixture showing the assembly of the wireway cover;

FIG. 6 is a sectional view taken lengthwise through the lighting fixture of FIG. 1;

FIG. 7 is a sectional view taken along the line 7—7 of FIG. 6;

FIG. 8 is a sectional view taken along the line 8—8 of FIG. 6;

FIG. 9 is a sectional view taken along line 9—9 of FIG. 8;

FIG. 10 is a sectional view of the fastening means used to join elements illustrated in FIG. 6 of the drawing.

The fixture embodying the features of this invention is fabricated of a plurality of separately pre-assembled parts which can be joined one to another to produce the completed structure. One part comprises the base member 20 in the form of a plate 22 dimensioned to have a length corresponding to the length of the fixture unit and a width less than the width of the fixture unit. The base plate 22, formed of sheet metal, plastic or the like, is formed with an upwardly raised portion 24 midway between the edges and extending substantially throughout the length of the base plate for embodying means for attachment of the base plate to the ceiling and for use as a wireway to conceal the wires 26 and the like electrical connections.

The lateral edges 28 of the base plate are formed to V-shape for nesting in correspondingly V-shaped upper edge portions 30 of the luminaire 32 which will hereinafter be described resiliently to mount the luminaire on the base plate.

The ends of the base plate 20 are provided with ver-

2

tically disposed end plates 34, each of which is provided with lengthwise aligned sockets 36 for mounting fluorescent tubes 38 therebetween. The sockets are disposed outwardly of the central upraised or channel-shaped wireway 24 and inwardly of the V-shaped edges 28 to position the fluorescent tubes in the areas therebetween.

The wiring 26, starting ballast 40, transformers and other electrical connections disposed within the wireways are concealed from view from the underside by means of a wireway cover 42 in the form of a housing having a V-shaped bottom wall 44 extending upwardly and outwardly from the apex at the center for a distance to span the lateral edges of the recessed wireway 24 in the base plate. The V-shaped bottom wall 44 terminates in vertical side walls 46 having flanges 48 extending outwardly from the upper edges thereof. The wireway cover 42 is dimensioned to have a length corresponding to the length of the base plate and means are provided releasably to hold the wireway cover in position of use on the base plate. One such means, illustrated in FIGS. 3 and 7 of the drawings, comprises flanges 48 extending outwardly substantially perpendicularly from the upper edges of the side walls 46 and longitudinally spaced apart tabs 50 struck downwardly from the base plate to provide inwardly extending tongues spaced crosswise one from the other in opposite sides of the recessed wireway by an amount slightly less than the distance between the edges of the flanges 48 so that the flanged edge portions may be resiliently received within said tabs upon inward deflection of the side walls 46 to enable the flange to clear the tabs for displacement therebetween, as illustrated in FIG. 5. Thus the wireway cover 42 can be releasably held in the desired position of use on the base plate to conceal the elements in the wireway without interfering with the fluorescent tubes or the light reflections therefrom.

The base of the recessed wireway 24 is provided with means for mounting onto the ceiling, as by means of hanger rods (not shown) or the like or by means of clamping members adapted to engage the outer walls of the recessed portions (not shown). For this purpose, the base is formed with knockouts 52 to receive the desired hanger elements. Likewise, the side walls of the recessed wireways are inclined inwardly to the base plate to provide means for grasping the side walls for support.

The luminaire 32 may be constructed of any relatively rigid material capable of good light transmission characteristics, such as of glass, plastics or the like, with or without ribs 54 or other embossments. While it is preferred to fabricate the luminaire of sheet stock or extruded or otherwise molded plastic which is light in color and translucent, it will be understood that the sheet of which the luminaire is formed may be clear or of any slight color for better appearance. Since luminaire is adapted resiliently to be supported from the base plate in a manner which calls for some flexure during displacement into and out of position of use, it is preferred to make use of a luminaire formed of a plastic, such as polystyrene, polymethyl methacrylate, polyacrylates and the like which are also resistant to cold flow, warp, or discoloration in use.

For maximum illumination, it is desirable that the fixture be translucent on the bottom side and at least the two side walls thereof. It will be understood that the luminaire may be clear with or without a ribbed or lens construction. For ease of access to the wireway for maintenance, it is desirable that the translucent bottom and side walls be formed of a single member. As a result, the luminaire, embodying the features of this invention, is adapted to extend across the bottom and side portions of the fixture.

In the preferred embodiment shown in FIG. 4, the

3

cross section of the luminaire 32 is essentially quadrilateral having an opening in the top portion. The side walls 56 are sloped downwardly and inwardly to the lateral edges of the bottom wall 58 and they are dimensioned to extend for a short distance beyond the bottom wall to provide a pair of ribs 60 which operate to add strength to the luminaire and to provide resistance from bowing in response to cold flow. The bottom wall 58 is generally of a flattened, or V-shaped construction, the combination of which, coupled with the stiffening ribs 60, operate to facilitate the positioning of the luminaire in the supporting end sections 28 of the base plate. The luminaire is provided with top walls 62 which extend inwardly from the upper edges of the side walls 56 in the direction toward each other but with a spaced relationship between the inner edges corresponding to the spaced relationship between the V-shaped edge portions 28 of the base plate. The top walls 62 are constructed to interfit with the base plate 20 to effect an assembled relationship therebetween. For this reason, the edges 64 of the top wall members 62 are formed to V-shape to correspond with the V-shaped edges 28 of the base plate to receive the latter in nesting relationship therein. When the luminaire is in normal position of use, the V-shaped edges 28 of the base plate are received in fitting relation in the V-shaped edges 64 of the luminaire to effect a grouping relationship therebetween for support while simultaneously providing a sealing relationship therebetween to minimize infiltration of dirt, dust, insects and the like into the unit.

The luminaire is dimensioned to have a length slightly less than the length of the wireway 24 but greater than the distance between the innermost flanges 66 extending inwardly from the edges of the end plates 34, thereby to permit the luminaire to be held in position without further support. The wireway cover 42 may be painted on its outer surface or otherwise constructed of suitable materials to function as a reflector for the fluorescent lamps 38 mounted within the housing.

A pair of socket plates 68 are connected to opposite ends of the wireway 24 in any conventional manner such as by riveting or the like. This assembly is adapted to be made in the prefabrication of the component parts of the fixture so that the completed assembly of the wireway and socket plates may be shipped together to the station of use. Each socket plate 68 essentially comprises a rectangular sheet of rigid material, pierced and die formed to provide a plurality of inwardly extending mounting plates 70 for the lamp sockets 36. Each mounting plate 70 is provided with means for support of the socket therein. The socket plate is also provided with tabs 72 which are adapted to function as stops for the tube sockets 36 and thereby to maintain the sockets in a perpendicular position with respect to the fluorescent lamp mounted therein. This accurate positioning of the sockets 36 operates to maintain a fixed spaced relationship between the sockets in crosswise alignment for better operation of the fluorescent lamps mounted therein.

Each socket plate 68 is further provided with an opening 73 to permit passage of wiring 26 between adjacent lighting fixtures, as when connected in an end to end relation, as illustrated in FIG. 1. A pair of flanges 74 are disposed inwardly from the top of the socket plates for riveting to the base plate 22. A plurality of sleeve openings 76 are provided about the edges of each plate 68 to provide means for mounting an intermediate plate 77 thereto.

The sockets 36 are of a standard construction for receiving the end contacts of the tubes therein. In the illustrated embodiment, the fixture is provided with a pair of sockets mounted in laterally spaced apart relation in each of the plates 68 but, it will be understood, that the fixture may be designed for use of more or less numbers of sockets and associated fluorescent tubes, without departing from the spirit of the invention.

4

Each intermediate plate 77 is joined to its associated socket plate 68 to form a pre-assembled end piece 34. The intermediate plate is preferably formed of a rigid material such as of plastics or metal. It is provided with an inwardly projecting flange 90 about the edges thereof of corresponding in shape to the cross section of the luminaire 32 but of slightly greater span to receive the edges of the luminaire in closely fitting relationship therein. The desired closely fitting relationship also operates to minimize the infiltration of dirt, dust, insects and the like into the fixture housing.

The lower end of the flange 90 is formed with troughs 92 in which the ribs 60 of the luminaire are received in fitting relationship for support. A stop 94 in the form of a raised flange integral with the member 90 operates to engage the luminaire 32 for centering the luminaire lengthwise in the fixture between the end pieces 34. The luminaire is dimensioned to have a length less than the distance between the end plates 34, as previously described, but the length of the luminaire is dimensioned to correspond to the distance between the projections 94 thereby to prevent the luminaire from being inadvertently displaced such that one end might clear the end piece and drop therefrom.

The intermediate plates 77 are also provided with a plurality of inwardly projecting assembly pins 96 which are provided as a means for automatically interconnecting the intermediate plates in their assembled relationship with the socket plate 68. As shown in FIG. 10, a gripping sleeve 100 is inserted into each of the openings 76 in the socket plate 68. Each gripping sleeve is in the shape of a frustum 102 having a lip 104 at the base and a plurality of gripping claws 106 as well as a plurality of expanding arms 108 in the body portion thereof which are displaced outwardly beyond the inner face of the socket plate when the sleeve 100 is inserted through the opening to bring the lips into engagement with the outer wall of the socket plate thereby to effect an assembled relation. The pins 96 of the intermediate plate are adapted to be in endwise alignment with the sleeve in the socket plate so as to effect a gripping relationship therebetween when the pins 96 are inserted into the sleeve member. In response to the insertion of the pin into the corresponding conically shaped sleeve the gripping claws 108 are further spread apart frictionally to engage the peripheral surfaces of the pins, as illustrated in FIG. 6. Since the sleeves 100 are secured to the socket plate 68, insertion of the pins 96 into gripping relationship with the sleeves operates automatically to effect an interconnection between the intermediate plate 77 and the socket plate 68.

An outwardly projecting embossment 110 is provided on each socket plate 68 at a height sufficient to extend flush with the outer surface of the associated intermediate plate 77 thereby to provide continuous grounding between the socket plates of adjacent fixtures when a plurality of such fixtures are mounted in end to end relations as illustrated in FIG. 1. The abutting socket plates of adjacent fixtures may be secured together by any conventional means for reliable operation. Alternate dimples 112 and recesses 114 are embodied in the embossment 110 to permit abutting socket plates of adjacent fixtures to be precisely positioned for accurate alignment in effecting the assembled relation. The intermediate plates 77 are also provided with alternate outwardly projecting pins 120 and openings 122 to facilitate the positioning and the leveling of aligned fixtures.

A decorative outer plate 130 is adapted to be secured to each end of the fixture by attachment to the intermediate plates 77 when the fixtures are individually arranged, otherwise the decorative outer plate is adapted to be applied only to the exposed outer end of aligned fixtures.

The exposed surface of the outer plate 130 may be made decorative and designed for the most pleasing appearance in conformance with the streamlined contours of the re-

5

mainder of the fixture. In the embodiment illustrated in the drawings, the outer plate is formed with an outwardly extending flange 132 about the top and side edges thereof integral with the upper edge of the vertically disposed wall 134 forming the body portion of the outer plate. Such contour operates to reduce the apparent depth of the fixture and also conceals the upwardly projecting wireway 24 of the base member 20. Projecting inwardly from the lower edge of the wall 134 is a rim 135. Also projecting inwardly from intermediate portions of the wall 134 are assembly pins 136 and raised stops 138. The assembly pins 136 are adapted to be received in aligned gripping sleeves 100 provided in suitable openings in the intermediate plate 77 for purposes of automatically effecting an assembly relationship of the outer plate onto the intermediate plate when the pins 136 are inserted therethrough. The stops 138 operate to engage the intermediate plates 77 when properly positioned thereon.

The rim 135 terminates in a flange 142 adapted to be received in a mating groove 144 in the outer face of the intermediate plate 77 when the outer plate is displaced into the assembled relationship on the intermediate plate thereby to provide for continuity in appearance while simultaneously effecting a sealing relationship between the joined edges.

As previously discussed, the fixture embodying the features of this invention may be easily and quickly assembled without the use of highly skilled labor or special tools. The base member 20, the socket plates 68 and the sockets 62 are adapted to be pre-assembled as a single unit. The intermediate plates 77 and the decorative outer plates 130 can be secured in an assembled relationship onto the ends of the wireway by the insertion of the gripping pins 96 and 136 onto the gripping sleeves 100.

The wireway cover 42 is secured in the assembled relationship on the base member by compressing the side walls 46 to displace the flanges 48 for a distance to be received between the tabs 50 such that release of the side walls 46 for return to normal position will operate to effect displacement of the flanges 48 into the tabs, as illustrated in FIG. 5.

The luminaire is assembled by the insertion of one end into one of the intermediate plates 77 within the flange 90 so as to ride over the raised stop 94. The free end of the luminaire may then be raised into alignment with the opposite intermediate plate 77 and displaced endwise in the direction thereof to engage the flange 90 of said latter plate until it abuts the associated stop 94. The previously inserted end of the luminaire then rides off of the stop 94 whereby the luminaire becomes properly located between the stops 94 in the respective end plates.

For disassembly, one end of the luminaire is displaced upwardly, as shown in FIG. 2, to raise the luminaire above the adjacent stop 94. This enables the luminaire to be displaced endwise in the direction of the adjacent end plate whereby the opposite end of the luminaire becomes free of the flange 90. This enables the freed end portion to be displaced downwardly free of the fixture such that the luminaire can then be removed from the fixture for access thereto or for cleaning or repair. The wireway cover 42 may be removed by the application of force onto the side walls to withdraw the flanges 48 from between the tabs 50. With the wireway cover removed, all of the electrical parts and wiring of the fixture will become accessible for maintenance work or repair.

It will be understood that other types of lamps may be employed in the fixture embodying the features of this invention merely by exchange of suitable sockets and shape and dimension of the structure, without departing from the spirit of the invention. Numerous other changes may also be made in the details of construction, arrangement and operation without departing from the spirit of the invention especially as defined in the following claims.

I claim:

1. A lighting fixture comprising a wireway, a pair of

6

socket plates adapted to receive fluorescent tubes connected to said wireway, a pair of intermediate plates fitted over said socket plates and attached outwardly of said socket plates and extending beyond the lateral extent of said wireway at the sides and bottom thereof, interfitting attaching means securing said socket plates and said intermediate plates together, peripheral flanges formed on said intermediate plates and extending inwardly of said fixture, a translucent cover connected about the periphery of said intermediate plates by means of said flanges and surrounding said sockets, and at least one end plate adapted to fit over one of said intermediate plates, and interfitting attaching means for attaching the end plate to said intermediate plate.

2. A lighting fixture comprising a wireway, a pair of lamp socket plates connected to the end of said wireway, a pair of intermediate plates fitted over said socket plates in snap-on relation thereto, a resilient translucent cover extending about the bottom and two sides of said fixture and engaging the wireway and the intermediate plates, a resilient wireway cover, an embossment on the center portion of the socket plate forming a flush fit with the outer face surface of the intermediate plates, a space in each intermediate plate adapted to receive the embossed section of the socket plates, fitting means in each embossment and in the outer surface of each intermediate plate to engage another unit of like construction, a lamp socket and stop lug for a lamp socket on each socket plate, inwardly projecting flanges about the outer edges of each intermediate plate, stops mounted in the bottom of said flanges for engaging and positioning the ends of the resilient translucent cover, said resilient translucent cover containing grooves along its outer lateral edge adapted to provide a fitting relation with correspondingly shaped channels formed along the outer lateral edges of the wireway, said wireway having longitudinally extending downwardly projecting tabs, and flanges along the outer edges of said wireway cover engaging said tabs.

3. The lighting fixture of claim 2 where the socket end plate is provided with gripping recesses and the intermediate plate with lugs receiving said gripping recesses.

4. The lighting fixture of claim 2 which comprises at least one end plate adapted to fit over one of said intermediate plates, and interfitting attaching means comprising projecting members connected to the end plate, and gripping recesses provided to the intermediate plates for attaching the end plate to said intermediate plate.

5. A lighting fixture comprising a wireway, a pair of socket plates connected to opposite ends of said wireway, a pair of intermediate plates fitted over said socket plates, interfitting attaching means comprising a projecting member connected to the intermediate plates and a gripping recess provided to the socket plates for attaching the intermediate plates to the socket plates, a translucent cover of a resilient material fitting between said intermediate plates and extending about at least the bottom and two sides of said fixture engaging the wireway and intermediate plates and of a cross section similar to and slightly smaller than the cross section of said intermediate plates, grooved interfitting means provided to each lateral edge of the cover and to each lateral edge of the wireway to form a seal between the wireway and the cover, an inwardly projecting flange about at least the side and bottom edges of each intermediate plate, a raised stop projecting inwardly above the bottom portions of each of the flanges, each flange projecting inwardly a distance substantially greater than its associated raised stop, said cover being of a length substantially equal to the distance between the innermost projections of said stops to permit removal of said cover from said fixture by deforming said cover to disengage one of said stops and sliding it thereover, a plurality of downwardly extending oppositely opposed tabs provided to said wireway, and a wireway cover including at least a pair of flanges dis-

posed to interfit said opposed tabs to secure the wireway cover to the wireway.

References Cited in the file of this patent

UNITED STATES PATENTS

2,259,152	Claspy	Oct. 14, 1941	5
2,269,182	Claspy	Jan. 6, 1942	

2,291,488
2,348,930
2,463,013
2,523,840
2,817,752
2,864,939
2,926,409

Naysmith	July 28, 1942
Schepmoes	May 16, 1944
Beals	Mar. 1, 1949
Nitardy	Sept. 26, 1950
Florence	Dec. 24, 1957
Bodian	Dec. 16, 1958
Berry	Mar. 1, 1960