

March 9, 1943.

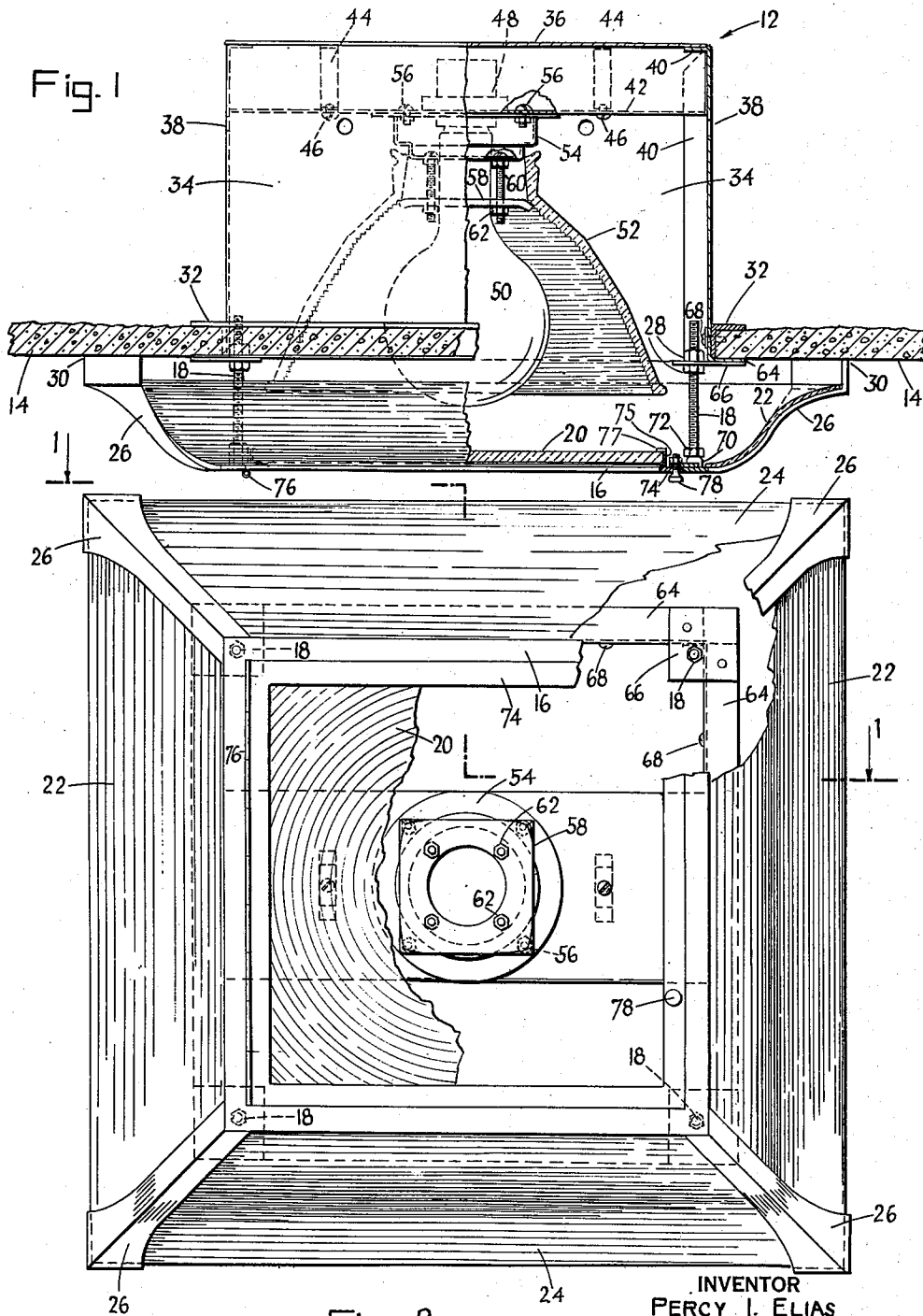
P. I. ELIAS

2,313,131

LIGHTING FIXTURE

Filed Feb. 26, 1941

4 Sheets-Sheet 1



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Fig. 3

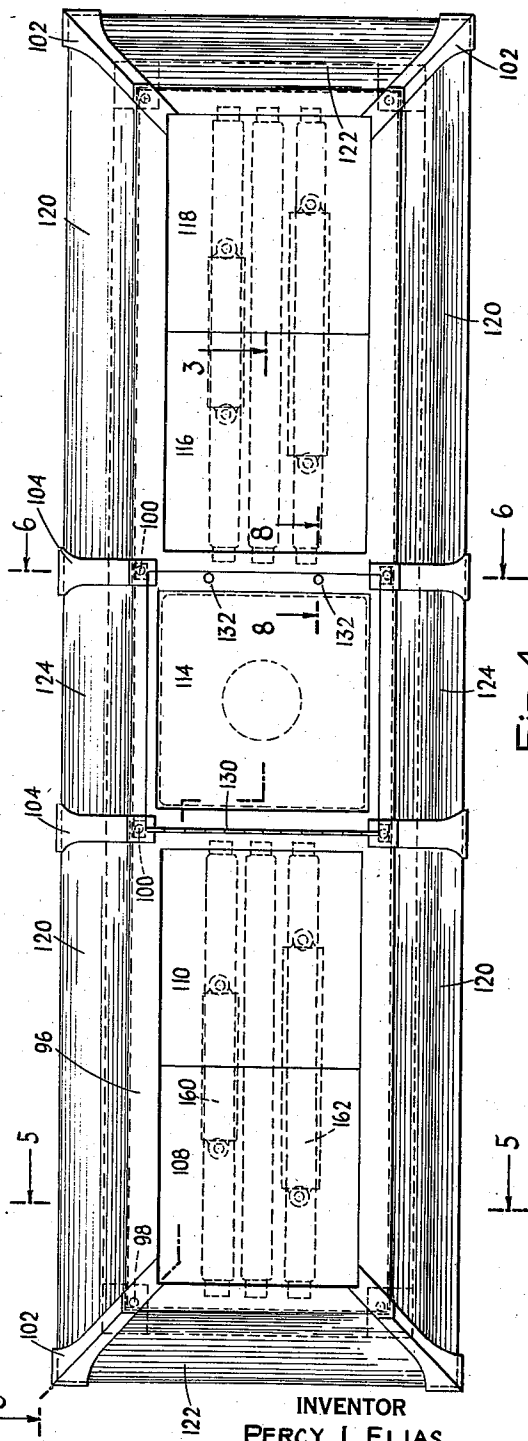
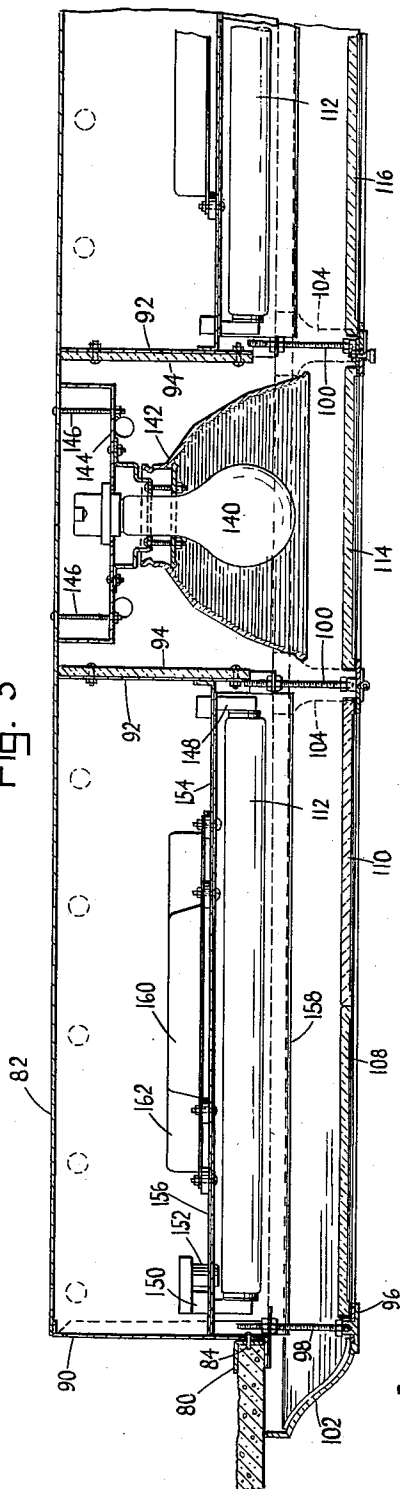


Fig. 4

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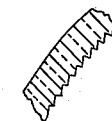
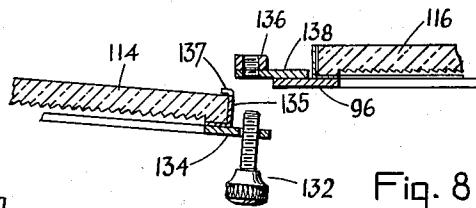
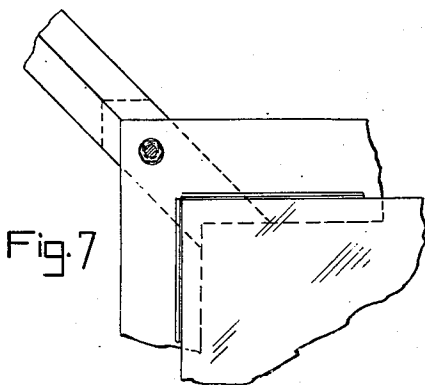
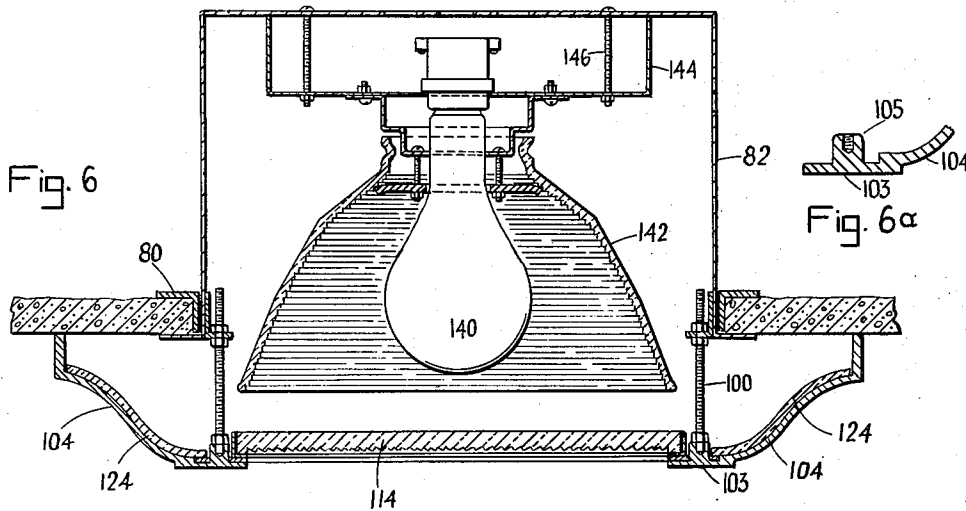
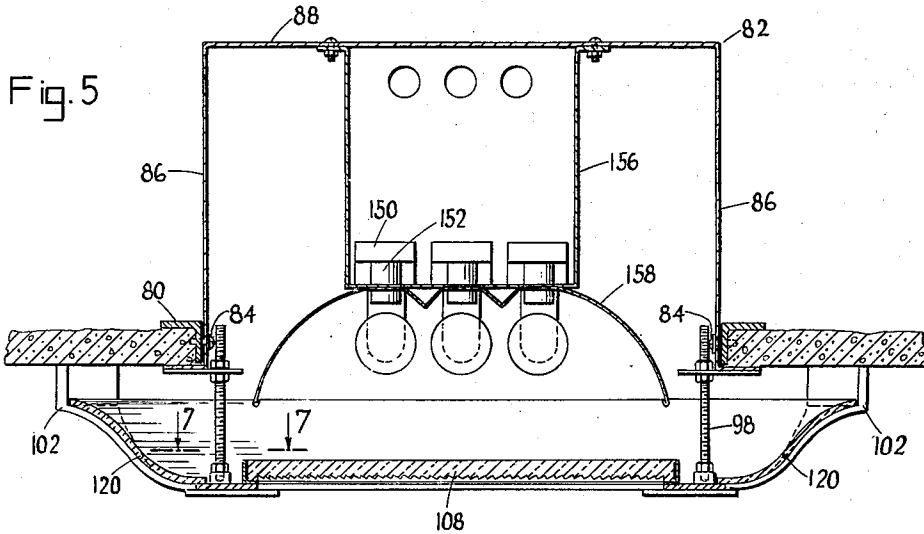
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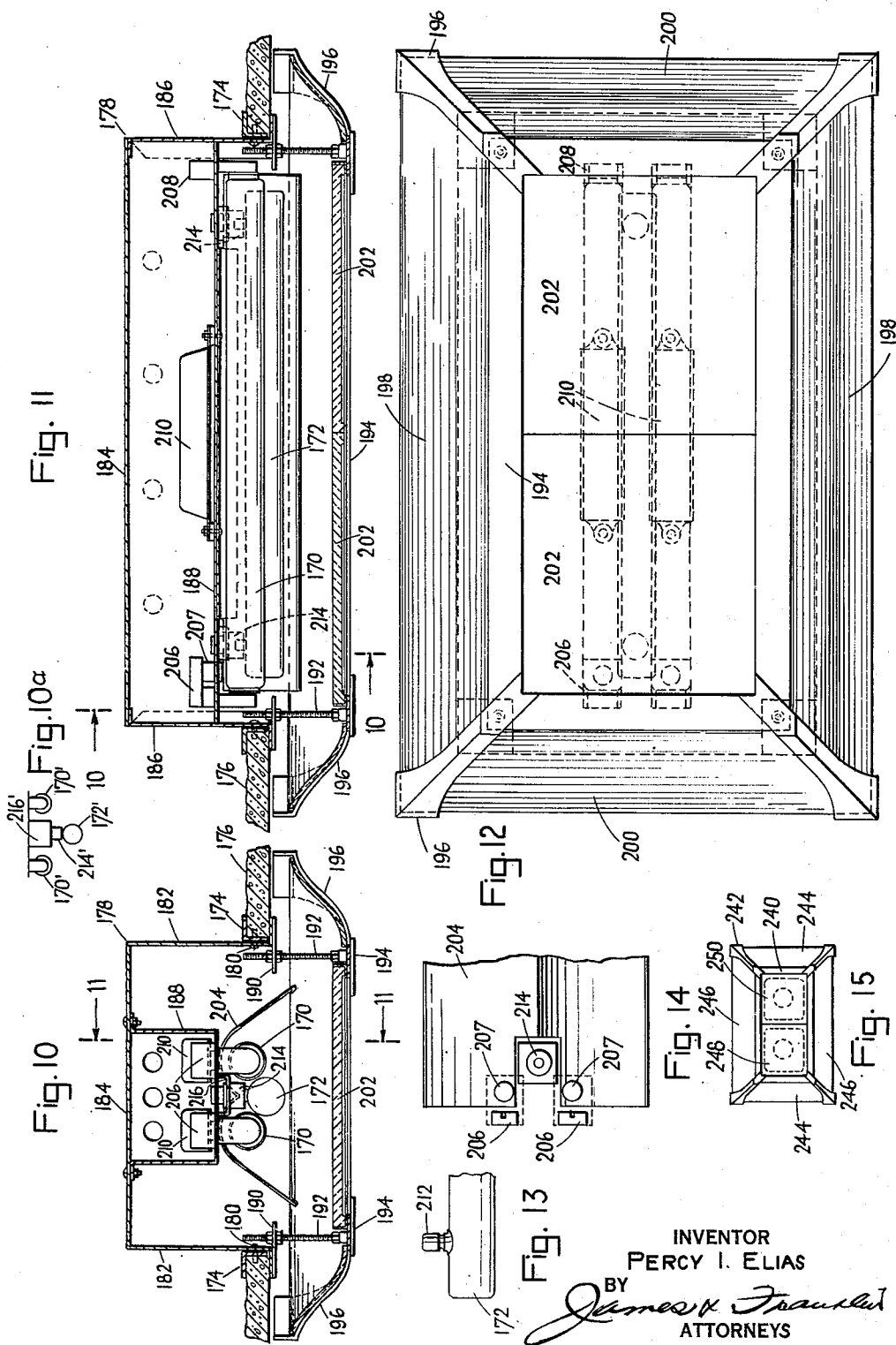
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LIGHTING FIXTURE

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2,313,131

LIGHTING FIXTURE

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Application February 26, 1941, Serial No. 380,613

16 Claims. (Cl. 240—78)

This invention relates to lighting fixtures.

The primary object of my invention is to generally improve lighting fixtures. A more specific object is to improve overhead fixtures of the recessed type, and in accordance with the present invention the fixtures are nearly but not wholly recessed, and no attempt need be made to fit accurately or tightly against the ceiling. However, the lower part of the fixture is made adjustable relative to the upper part of the fixture, so that the relation between the exposed part of the fixture and the ceiling may be adjusted to compensate for ceilings which are not true.

In accordance with a further feature and object of the invention, the fixture is given a novel appearance by the provision of side glasses which extend outwardly and upwardly from the main bottom lens, thus increasing the illuminated area and the apparent size of the fixture.

Still another object of the invention is to provide lamp fixtures of the specified character which are adapted to be used with fluorescent lamps or with filament lamps, or a single fixture may be used to carry lamps of both types so as to obtain a better color for use in stores and other places, by adding the red light from the filament type lamp to compensate for the red deficiency of the fluorescent light. The filament lamp employed for this purpose may be of either the bulb type or the tube type.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, my invention consists in the lighting fixture elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings, in which:

Fig. 1 is a partially sectioned elevation through a lamp fixture embodying features of my invention;

Fig. 2 is a bottom plan view with the parts partially cut away;

Fig. 3 is a longitudinal section through a fixture employing fluorescent tubes and a bulb filament lamp, said section being taken in the plane of the line 3—3 of Fig. 4;

Fig. 4 is a bottom plan view of the same;

Fig. 5 is a transverse section taken in the plane of the line 5—5 of Fig. 4;

Fig. 6 is a transverse section taken in the plane of the line 6—6 of Fig. 4;

Fig. 6a is a fragmentary section explanatory of a detail;

Fig. 7 is a horizontal section drawn to enlarged

scale, and taken in the plane of the line 7—7 of Fig. 5;

Fig. 8 is a section drawn to enlarged scale, and taken in the plane of the line 8—8 of Fig. 4;

Fig. 9 is a fragmentary section through one of the side glasses;

Fig. 10 is a transverse section through a modified fixture employing fluorescent and filament lamps of the tube type, said section being taken in the plane of the line 10—10 of Fig. 11;

Fig. 10a is a fragmentary view explanatory of a detail;

Fig. 11 is a longitudinal section taken approximately in the plane of the line 11—11 of Fig. 10;

Fig. 12 is a bottom plan view of the same fixture;

Fig. 13 is a side elevation of one end of a filament lamp of the tube type;

Fig. 14 is a bottom plan view showing the lamp holders at one end of the fixture, with the lamps removed; and

Fig. 15 is a bottom plan view of a fixture employing multiple bulb-type filament lamps.

Referring to the drawings, and more particularly to Figs. 1 and 2, the lighting fixture comprises a sheet metal box 12 recessed into a ceiling, the exposed face of which is indicated at 14. A lens frame generally designated 16 is suspended beneath the ceiling by means of hanger bolts 18 located at the corners of box 12 and frame 16. The lens frame 16 carries a lens 20 of suitable type, a well-known commercial example being the "Holophane Controlens." The resulting exposed sides above the lens are substantially closed by four side glasses 22 and 24. These are supported by metal corners 26 which are supported solely at their lower ends, these being brazed or otherwise rigidly secured to the stationary portion of the lens frame 16. It will be understood that by appropriately adjusting the nuts 28 on hanger bolts 18, the frame 16 may be raised or lowered until the upper ends 30 of the corners 26 just reach the ceiling 14, and this result may be obtained despite unevenness or other irregularities of the ceiling. If desired, the adjustment may be made such as to keep the lens frame 16 approximately level for if the ceiling is low at one corner only, the corner piece 26 at the corner may be drawn hard against or even imbedded slightly into the ceiling. Usually the electrician simply draws the corner piece to the ceiling, and in any event, because of the threaded and adjustable nature of the hanger bolts 18, the fit of the exposed part of the fixture relative to the ceiling may be readily

adjusted according to the particular circumstances arising in each case.

The side glasses 22 and 24 preferably terminate well below the upper ends 30 of the corners 26, as is clearly shown in Fig. 1 of the drawings. The spacing between the glass and the ceiling may be, say, one half inch. Strangely enough, the most important advantage is in apparently preventing leakage of light around the fixture. When the glass is attempted to be brought to the ceiling a perfect fit cannot be obtained. One part may fit, and another not. At the latter parts light escapes, and because of the contrast the poor fit is conspicuously noticeable from below, and detracts from the appearance of the installation. With a large intentional space as here taught, there is a uniform leakage of light (the opening is exposed to only indirect and diffused light), so that to an observer below, the fixture appears to fit the ceiling correctly.

The clearance over the side glasses has the structural advantage of making the fixture independent of irregularities in the ceiling, particularly those which may be localized between corners. Also it provides effective ventilation for the fixture. Because of the nature of the reflector employed with the lamp, no direct light escapes above the side glasses, and the cut-off around the fixture is apparently sharp and definite.

Considering the structure in greater detail, a main support frame 32 is embedded in the ceiling 14, preferably by the builder when erecting the building. This support frame 32 is preferably made of angle iron, the vertical leg of which defines a square or rectangular opening in the ceiling for reception of the box 12. The frame is supplied to the builder by the electrical contractor, and is held by hooks or wires going up to the main angle irons of the floor above, the ceiling being a "hung" ceiling. Metal or wire lath is held in the same way, the lath being at the level of the horizontal leg of the angle iron frame. The plaster is applied beneath the lath.

The box 12 is preferably made of three pieces of sheet metal, one piece being bent to form side walls 34 and a top wall 36. The other two pieces constitute end walls 38, the edges of which are flanged inwardly at 40 and spot-welded or otherwise secured to the sheet metal sides and top. The top of the box is further provided with a wiring trough 42 held in position by suitable spacers 44 and screws 46.

In the specific fixture here shown, the wiring trough carries a lamp socket 48 for the reception of the threaded base of a conventional lamp bulb 50. The wiring trough also carries a mounting to hold a reflector 52 which, in this case, is a square glass reflector of suitable character such, for example, as that known commercially as Holophane #3774. This is used with a bottom lens known commercially as Holophane #774. The combination of reflector and lens is designated as Holophane #2774. The spacing between reflector and lens is preferably that recommended by the manufacturer, but it should be noted that a desired relation is also sought with the side glasses, the lower edge of the reflector coming down as far as the upper edge of the side glasses, to prevent escape of direct light above the side glasses.

The support for the reflector consists of a preferably drawn cup-like sheet metal member 54 secured to the wiring trough by bolts 56. A square piece of metal 58 is adjustably suspended

therebeneath by means of bolts 60 and nuts 62. The center of plate 58 is, of course, apertured to freely receive the lamp 50, and the corners of the plate 58 may be bent downwardly slightly to conform to the reflector 52. The bolts 60 are preferably permanently held in position by lock nuts tightened immediately beneath the cup 54, so that the reflector 52 may be applied or removed by tightening or releasing the lower nuts 62.

The lower edge of the box may, if desired, be bent outwardly to form a flange 64 which limits insertion of the box into the ceiling space. The corners of the box are provided with small plates 66 for the hanger bolts 18, these plates being riveted, welded, or otherwise secured to the flanges 64 of the box.

The box as so far described is assembled complete, except for the bulb 50 and reflector 52, and is inserted in the ceiling in assembled condition. It is secured in position by means of screws 68 passing horizontally through the box near its lower edge and threadedly received in the vertical part of the angle iron frame 32.

The lens frame 16 is manufactured complete with the corners 26 and bosses 70 into which the hanger bolts 18 are screwed, these bosses preferably being cast integrally with the corner pieces. The corner pieces 26 are brazed to the corners of the frame. The bolts 18 are locked in the bosses by means of lock nuts 72. The frame assembly is then added to the fixture by passing the upper ends of the hanger bolts through the corner plates 66. The side glasses 22 may be slipped into place from the outside, while the frame is in a low position. The bolts are made extra long for this purpose. They are then tightened by nuts 28. The reflector 52 and bulb 50 may be added through the bottom space or frame while the bottom lens 20 is open.

In the particular case here illustrated in which the fixture is comparatively small, it being intended to receive only one lamp bulb with a single lens therebeneath, the lens is preferably carried in a sub-frame which is hingedly mounted on the main or stationary frame 16 previously referred to. Specifically, the frame 74 is hinged at 76 and is provided with thumb screws 78 at its opposite edge for securing the sub-frame in closed position. It will be understood that by releasing the screws 78, the lens and sub-frame 74 may be swung downwardly for relamping or cleaning the fixture. The lens is held by a thin rim 75, welded to sub-frame 74, and having lugs or tabs 77 bent over the top of the lens.

It will be understood that suitable holes may be provided in the box 12, one or another of which may be used for connection of the electric wiring cable supplying current to the lamp. The wiring to the lamp socket is not shown in the drawings.

In Fig. 15 I show a similar fixture, but of rectangular outline for use with two lamp bulbs, reflectors and lenses. The box, not shown, is rectangular. The frame 240 has corners 242 brazed thereto. These support two short side glasses 244, and two long side glasses 246. The lamps are indicated by the dotted circles, and the reflectors by the dotted squares. The lenses 248 and 250 are simply disposed edge to edge in a lens support frame 240, which is a fixed frame. No hinged part is needed, as one lens is raised and slid back over the other for relamping, etc.

A still larger fixture employing both fluorescent and filament type lamps is illustrated in Figs. 3-9 of the drawings. As before, a main

support frame made of angle iron is preliminarily imbedded in the ceiling, this being indicated at 80 in Figs. 3, 5, and 6. A sheet metal box 82 is recessed into the ceiling and is secured to the support frame 80 by means of screws 84, substantially as previously described. As before, the box is preferably made of three pieces of sheet metal, one piece being bent to form the sides 86 (Fig. 5) and top 88, and the other two pieces being flanged and constituting the ends 90 (Fig. 3). When, as in the present case, the fluorescent and filament lamps are in separate compartments, these compartments are preferably separated by sheet metal partitions indicated at 92, and lining walls 94 may be provided at the partitions 92, to insulate the end compartments from heat generated by lamp 140.

The fixture is provided with a rectangular lens frame 96 supported at its corners by suitable hanger bolts 98. Because of the extreme length of the present fixture, the lens frame 96 may, if desired, be additionally supported by intermediate hanger bolts 100. As before, the lens frame 96 is provided with outwardly projecting rigidly mounted corners 102.

The nature of the corner piece is more clearly shown in Fig. 6a, which is a longitudinal section taken in elevation through the lower part of the corner piece and shows how the corner piece 104 is provided with an extension 103 over which the frame 96 (not shown in Fig. 6a) is to be brazed or otherwise secured. The frame has a hole through which the boss 105 passes, and said boss is drilled and tapped to receive the lower end of the hanger bolt 98 (not shown in Fig. 6a). When, as in the present case, the fixture has intermediate hanger bolts, it may be provided with corresponding intermediate support straps 104. The present lamp has end compartments containing fluorescent tubes, and a center compartment containing a filament lamp bulb 140. The intermediate hanger bolts 100 and support straps 104 are preferably located between compartments, as is clearly shown in Fig. 4 of the drawings.

The specific bottom lens 114 here employed for the lamp 140 is the same as those previously referred to, and is 12" x 12" in size. The lenses beneath the fluorescent lamps are substantially 11" x 12" in size, and may be of the type known commercially as Holophane 11F12. Two such lenses are disposed end to end, as is indicated at 108 and 110 for one end compartment of the fixture, the fluorescent tubes 112 being of the twenty-four inch size. Two lenses 116 and 118 are used for the other end compartment.

The side glasses comprise four relatively long pieces 120, each with one end beveled and one end square, two shorter end pieces 122 each with both ends beveled, and two short intermediate pieces 124 each with square ends. All of these pieces are readily inserted in the fixture, particularly while the lens frame 96 and corners 102 and straps 104 have not yet been drawn up to final position by tightening the nuts on the hanger bolts. The bottom lenses 108 and 110 are readily applied or removed by momentarily overlapping the same or lifting one over the other while biasing the lens to angular position. By overlapping the lenses and moving them to the center of the compartment the ends are opened for access to the ends of the fluorescent tubes, to engage or disengage them from the holders. By sliding the superposed lenses to one

side, the fluorescent tubes may be removed and replaced.

Thus the lens frame 96 may be a simple stationary frame for the end compartments, or for any fixture in which two or more lenses are used in edge to edge relation as here illustrated. The center lens, being a single lens of larger size, is preferably hinged, the hinge being indicated at 130, and the thumb screws for holding the same closed being indicated at 132. This arrangement is shown in greater detail in Fig. 8 in which lens 116 is shown resting on stationary lens frame 96, while lens 114 is carried on hinged frame 134, the latter being provided with thumb screws 132 threadedly received in stationary nuts 136 welded or brazed to stop pieces 138 which, in turn, are welded or brazed to the main stationary frame 96. Lens 114 is held by rim 135 welded to frame 134 and having bent tabs 137, as was described in connection with Figs. 1 and 2.

The socket for the filament lamp bulb 140 and the mounting for the square glass reflector 142 may be substantially the same as that previously described, although in the present case the wiring box 144 is four-sided and is secured in place by bolts 146. The fluorescent tubes 112 are carried by conventional lamp holders 148 and 150 (Fig. 3), the latter differing from the former in having a socket for a removable starter 152. The lamp holders are carried by and project downwardly through the bottom wall 154 of a wiring trough 156, best shown in Fig. 5. A sheet metal reflector 158 is secured directly beneath the wiring trough 156, and the lamp holders in the structure here illustrated project downwardly through the reflector as well as the wiring trough. However, it will be understood that if desired the reflector structure may be simplified by shortening the reflector, so that it extends only between the lamp holders.

In the specific case here illustrated, each end compartment is provided with three collaterally disposed fluorescent tubes. It will be understood, however, that a lesser or greater number of tubes may be employed, depending upon the amount of illumination wanted. The accessories for the fluorescent lamps, particularly the ballast units, are located in the wiring trough, and in the specific case here shown, there are two units in each end compartment, a small unit 160 and a large unit 162, one corresponding to one of the three tubes and the other corresponding to the remaining two tubes. Three individual small units may, of course, be employed.

As was previously explained, the bottom glass in any of the forms of the invention here illustrated is preferably a lens, this being indicated by the serrations in Figs. 5, 6, and 8, and by the circular lines in Fig. 2. It should also be understood that the side glasses are preferably appropriately fluted for proper refraction of light, this being indicated by the horizontal and vertical lines in Figs. 2 and 4, and also being shown in the section of Fig. 9. The side glasses may have a so-called "Mississippi rib" or be any fluted or opal or other glass which will break up and diffuse light.

Still another form of the invention is illustrated in Figs. 10-14 of the drawings. In this case, the fixture combines fluorescent and filament lighting, but all of the lamps are tubular. Specifically, there are three tubes, the side tubes 170 being fluorescent and the center tube 172 being a filament lamp. It may, for example, be the known commercial type made by Filament Tubes,

Inc. of Buffalo, New York. Referring to Fig. 10, attention is called to the fact that the filament tube 172 is preferably mounted substantially lower than the fluorescent tubes 170, so that a substantial part of the direct and reflected illumination from the fluorescent tubes passes through the filament tube 172. Filament tubes of this type are available both frosted and clear, and I prefer and recommend that a clear rather than a frosted tube be used, so as to permit free passage of illumination from tubes 170 through tube 172.

I have found that if tube 172 is kept at the height of tubes 170, a red component is obtained which is not well mixed with the fluorescent light. A red streak or line can be seen running down the center of the bottom lenses when looking up at the fixture from below. A similar result is obtained if the filament tube 172 is lowered close to the bottom lenses 202. But at a median point, such as that shown in Fig. 10, or that shown in Fig. 10a, or points therebetween, a large amount of the fluorescent light flows through the filament tube, and the lights are mixed, and no separate red streak can be seen on the lenses at all. This benefit has also been tested by colorimetric measurements.

The location of tube 172 in Fig. 10 is such that the angle of a plane extending from the axis of tube 172 to the axis of tube 170, with respect to the horizontal, is about thirty degrees, and in Fig. 10a the angle between a plane including the axis of the tube 172' and the axis of tube 170', and the horizontal, is about forty-five degrees.

The fixture itself comprises a main angle iron support frame 174 embedded in the ceiling 176 as before described. A sheet metal box 178 is recessed into the ceiling and is secured to frame 174 by screws 180. As before, the box 178 is made of a piece of sheet metal bent to form sides 182 and top 184, the box being completed by flanged ends 186 (Fig. 11). A wiring trough 188 is secured to the top 184 of the box, said trough extending longitudinally of the box. Support plates 190 are formed at the corners of the flanged lower edge of the box, said plates carrying the hanger bolts 192. These, in turn, support a stationary lens frame 194, said frame having corner pieces 196 projecting rigidly outwardly therefrom. Two long side glasses 198 and two short side glasses 200 are provided, all with appropriately beveled ends. These are readily slid into place before the lens frame 194 and corners 196 are pulled up to the ceiling by the nuts on hanger bolts 192. Incidentally, these need not be pulled up tight, and some clearance is indicated in Figs. 10 and 11. There are two bottom lenses 202 arranged end to end, and they are readily applied or removed by preliminarily partially overlapping one over the other. The side glasses and bottom lenses are preferably appropriately fluted as previously described. A sheet metal reflector 204 is located over the lamp tubes, this reflector being secured directly to the bottom of the wiring trough. As before, fluorescent lamp holders 206 and 208 are mounted in the wiring trough and project downwardly there-through. In the present case the reflector is short enough to be located between the lamp holders, as is clearly shown in Figs. 11 and 14. Removable starters are indicated at 207. Ballast units for the lamps are shown at 210, these being located, as usual, in the wiring trough.

It will be understood that if the fixture is intended solely for fluorescent lamps, the structure here disclosed may be employed exactly as

so far described, but omitting the filament tube 172 and the sockets or holders for the same. It will also be understood that, in the present case, the tubes are twenty-four inch tubes, but that thirty-six inch tubes may be used by appropriately lengthening the fixture, and in such case three of the bottom lenses may be employed, instead of two as here shown.

The filament tube 172 (Fig. 13) is provided with an upwardly projecting metallic post 212 at each end, said posts being received in suitable sockets 214 (Figs. 10, 11, and 14). These sockets are mounted on metal brackets or hangers 216 which, in turn, are secured to the bottom of the wiring trough, the purpose of the hangers 216 being to lower the filament tube 172 to desired low elevation, as previously described.

It is believed that the construction and method of installation, as well as the many advantages of my improved lighting fixture, will be apparent from the foregoing detailed description thereof. It will also be apparent that while I have shown and described my invention in several preferred forms, many changes and modifications may be made in the structures shown without departing from the spirit of the invention as sought to be defined in the following claims.

I claim:

1. A ceiling fixture comprising a box to be recessed into a ceiling, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said lens frame having a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, a bottom lens carried by said lens frame, a wiring trough at the top of said box, a socket for a lamp bulb secured to said trough, a reflector surrounding said lamp bulb and carried by holding means secured to said trough, and a hinge at one edge and fastening means at the opposite edge of said lens frame, whereby said fixture may be opened at the bottom.

2. A ceiling fixture comprising a box to be recessed into a ceiling, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said hanger bolts extending down to said lens frame, side glass pieces supported by said corner pieces, said side glass pieces approaching but not touching the ceiling, a bottom lens carried by said lens frame, a wiring trough at the top of said box, a socket for a lamp bulb secured to said trough, a reflector surrounding said lamp bulb and carried by holding means secured to said trough, the lower edge of the reflector extending downwardly at least as far as the upper edge of the side pieces, and a hinge at one edge and fastening means at the opposite edge of said lens frame, whereby said fixture may be opened at the bottom.

3. A ceiling fixture comprising an anchor frame built into a ceiling, a box recessed into the ceiling and secured to the anchor frame, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said lens frame having

a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, one or more bottom lenses carried by said lens frame, partitions dividing said box into compartments, wiring troughs in said compartments at the top of said box, lamp holders on the trough in one of said compartments for holding one or more fluorescent lamps, and a lamp holder on the trough in another compartment for holding a filament type lamp bulb.

4. A ceiling fixture comprising an anchor frame built into a ceiling, a box recessed into the ceiling and secured to the anchor frame, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said hanger bolts extending down to said lens frame, side glass pieces supported by said corner pieces, said side glass pieces approaching but not touching the ceiling, one or more bottom lenses carried by said lens frame, partitions dividing said box into compartments, wiring troughs in said compartments at the top of said box, lamp holders on the trough in one of said compartments for holding one or more fluorescent lamps, a lamp holder on the trough in another compartment for holding a filament type lamp bulb, a reflector around said fluorescent lamps, and a reflector around said bulb, the lower edges of said reflectors coming down at least as far as the upper edge of said side pieces.

5. A ceiling fixture comprising a box to be recessed into a ceiling, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said lens frame having a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, and one or more bottom lenses carried by said lens frame.

6. A ceiling fixture comprising an anchor frame built into a ceiling, a box recessed into the ceiling and secured to the anchor frame, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said lens frame having a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but being spaced from the ceiling, and one or more bottom lenses carried by said lens frame.

7. A ceiling fixture comprising an anchor frame built into the ceiling, a box recessed into the ceiling and secured to the anchor frame, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said hanger bolts extending down to said lens frame, side

glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but being spaced from the ceiling, one or more bottom lenses carried by said lens frame, one or more lamps in said box, and a reflector in said box, the lower edge of the reflector coming down at least as low as the upper edge of the side glass pieces.

8. A ceiling fixture comprising a box to be recessed into a ceiling, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said lens frame having a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, a bottom lens carried by said lens frame, a wiring trough at the top of said box, a socket for a lamp bulb secured to said trough, and a reflector surrounding said lamp bulb and carried by holding means secured to said trough.

9. A ceiling fixture comprising a box to be recessed into a ceiling, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said hanger bolts extending down to said lens frame, side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but being spaced from the ceiling, a bottom lens carried by said lens frame, a wiring trough at the top of said box, a socket for a lamp bulb secured to said trough, and a reflector surrounding said lamp bulb and carried by holding means secured to said trough, the lower edge of the reflector extending downwardly at least as far as the upper edge of the side pieces.

10. A ceiling fixture comprising a box to be recessed into a ceiling, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said lens frame having a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, one or more bottom lenses carried by said lens frame, a wiring trough extending longitudinally at the top of said box, an elongated reflector secured to the bottom of said trough, holders projecting downwardly through said trough for fluorescent lamp tubes, and lamp accessories secured in said trough.

11. A ceiling fixture comprising a box to be recessed into a ceiling, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said hanger bolts extending down to said lens frame, side glass pieces supported by

said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but not touching the ceiling, one or more bottom lenses carried by said lens frame, a wiring trough extending longitudinally at the top of said box, an elongated reflector secured to the bottom of said trough, the bottom edge of said reflector coming down at least as far as the upper edge of said side pieces, holders projecting downwardly through said trough for fluorescent lamp tubes, and lamp accessories secured in said trough.

12. A ceiling fixture comprising an anchor frame built into a ceiling, a box recessed into the ceiling and secured to the anchor frame, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said hanger bolts extending down to said lens frame, side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but being spaced from the ceiling, one or more bottom lenses carried by said lens frame, a wiring trough extending longitudinally at the top of said box, an elongated reflector secured to the bottom of said trough, the bottom edge of said reflector coming down at least as far as the upper edge of said side pieces, holders projecting downwardly through said trough for fluorescent lamp tubes, and lamp accessories secured in said trough.

13. A ceiling fixture comprising a box to be recessed into a ceiling, said box being open at the bottom, relatively long hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said lens frame having a shape and size comparable to that of the open bottom of the box, said hanger bolts extending down to said lens frame, outwardly and upwardly sloping side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, one or more bottom lenses carried by said lens frame, partition means dividing said box into compartments, wiring troughs in said compartments at the top of said box, lamp holders on the trough in one of said compartments for holding one or more fluorescent lamps, and a lamp holder on the trough in another compartment for holding a filament-type lamp bulb.

14. A ceiling fixture comprising an anchor built into a ceiling, a box recessed into the ceiling and secured to the anchor frame, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured

solely at their lower ends, said hanger bolts extending down to said lens frame, side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but not touching the ceiling, one or more bottom lenses carried by said lens frame, a wiring trough extending longitudinally at the top of the box, lamp holders on said trough for holding fluorescent lamp tubes, lamp holders on said trough for holding a filament type lamp tube in order to produce a mixed light, the lamp holders for the filament tube being so disposed as to hold said tube at a point substantially lower than the fluorescent tubes, and a reflector around all of said lamp tubes, the lower edge of said reflector coming down at least as far as the lowermost tube and as far as the upper edge of said side pieces.

15. A ceiling fixture comprising a box to be recessed into a ceiling, hanger bolts depending from the corners of said box, a lens frame and outwardly and upwardly projecting corner pieces supported below the ceiling by said hanger bolts, said corner pieces being secured solely at their lower ends, said hanger bolts extending down to said lens frame, side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but being spaced from the ceiling, a wiring trough extending longitudinally at the top of the box, lamp holders on said trough for holding two fluorescent lamp tubes, lamp holders on said trough for holding a filament type lamp tube between said fluorescent tubes in order to produce a mixed light, the lamp holders for the filament tube being so disposed as to hold said tube at a point lower than the fluorescent tubes such that the elevation angle between tubes is from 30° to 45° from horizontal, and a reflector around all of said lamp tubes, the lower edge of said reflector coming down at least as far as the lowermost tube and as far as the upper edge of said side pieces.

16. A ceiling fixture comprising a box recessed into a ceiling, a lens frame spaced below said box and having outwardly and upwardly projecting corner pieces extending from the lens frame to the ceiling, said corner pieces being secured solely at their lower ends, side glass pieces supported by said corner pieces, said side glass pieces being unframed and unsupported along their upper edges, said side glass pieces approaching but not touching the ceiling, a bottom lens carried by the lens frame, a lamp in said box and a reflector in said box, the lower edge of the reflector coming down at least as low as the upper edge of the side glass pieces, whereby indirect illumination but not direct illumination is permitted to escape around the fixture between the side glass pieces and the ceiling.

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