

May 27, 1952

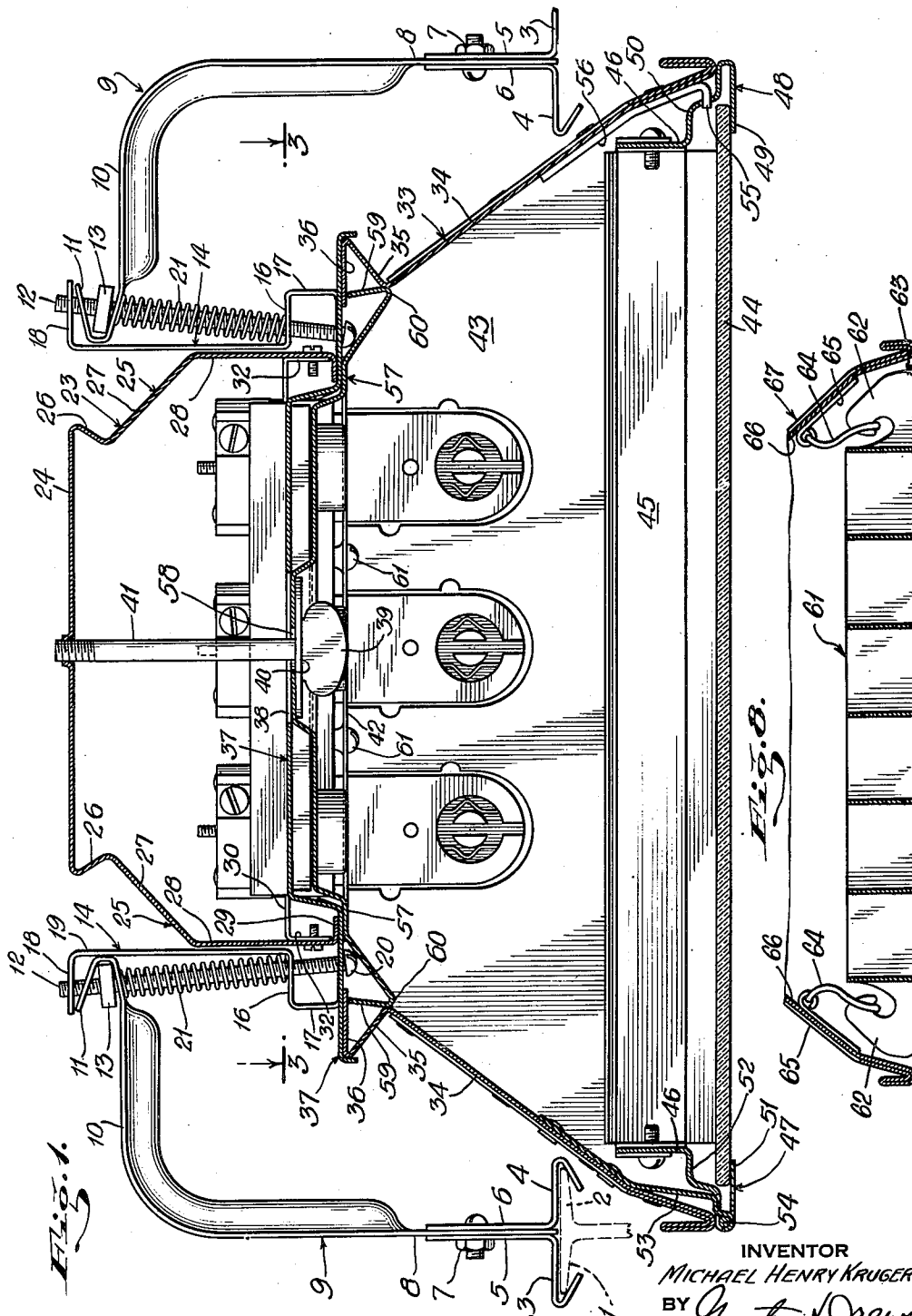
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2,597,875

TROFFER FOR FLUORESCENT LIGHTING FIXTURES READILY
ATTACHED TO THE FRAMEWORK OF A CEILING

Filed June 11, 1948

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

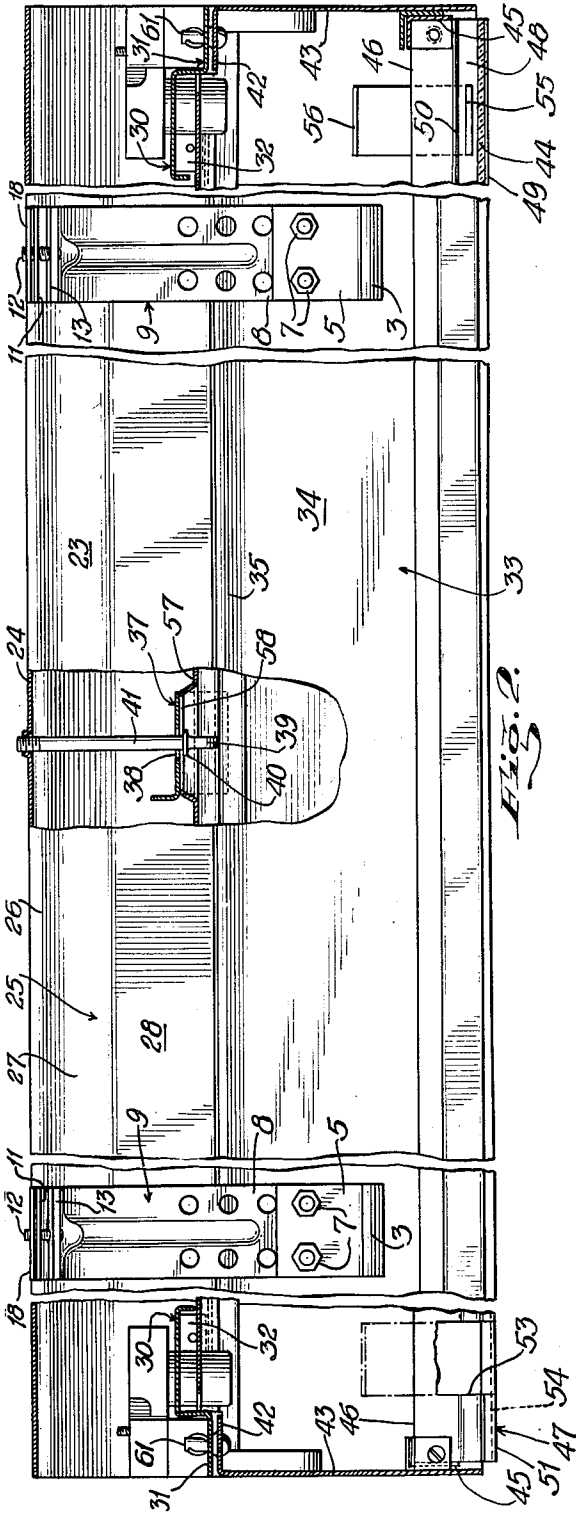


Fig. 1.

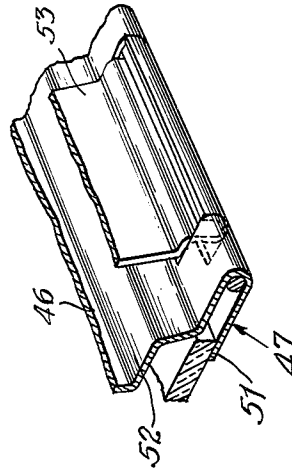
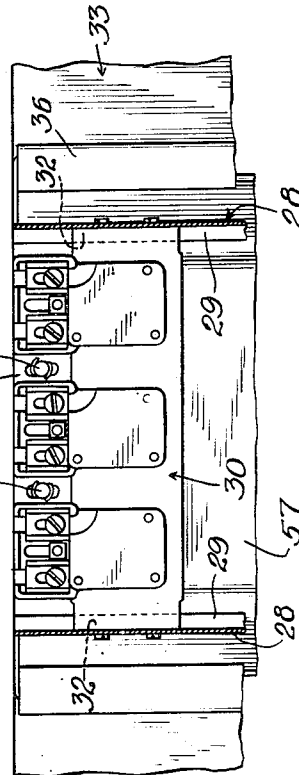


Fig. 2.

Fig. 3.



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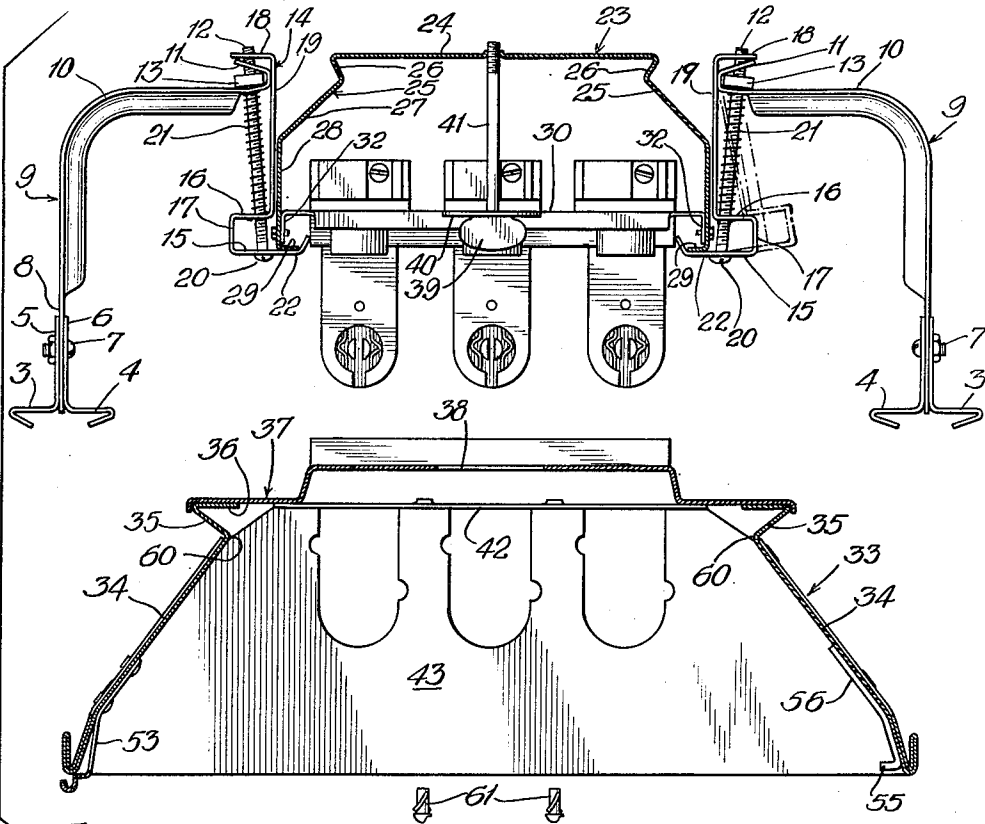


Fig. 5.

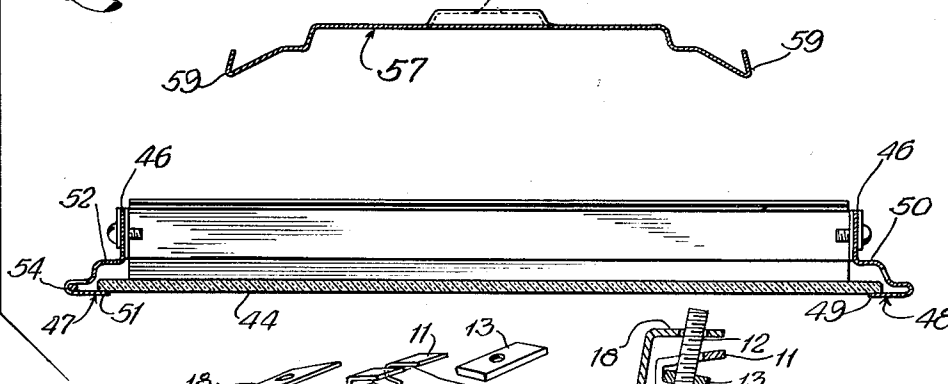


Fig. 6.

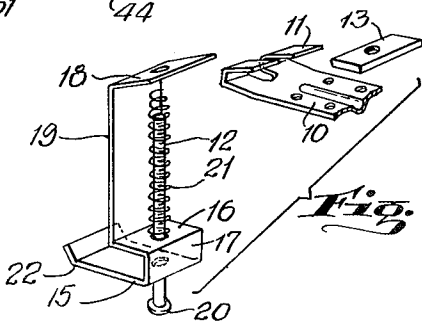


Fig. 7.

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UNITED STATES PATENT OFFICE

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TROFFER FOR FLUORESCENT LIGHTING
FIXTURES READILY ATTACHED TO THE
FRAMEWORK OF A CEILINGMichael Henry Kruger, Malden, Mass., assignor
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Application June 11, 1948, Serial No. 32,334

10 Claims. (Cl. 240—51.11)

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This invention relates to lighting fixtures in general, and more especially to troffers for fluorescent lighting fixtures.

Among the objects of the present invention, it is aimed to provide an improved troffer for a fluorescent lighting fixture which can be readily attached to the framework of a ceiling, and readily adjusted to a predetermined level and angle.

It is still another object of the present invention to provide an improved troffer which can be installed without effort, consisting in installing successive comparatively light weight units to facilitate attachment and adjustment to a comparatively precise position at a minimum expenditure of time and with a minimum requirement of skill on the part of the attendant.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of specific embodiments thereof illustrated in the accompanying drawings, in which

Fig. 1 is a transverse section of the lighting fixture.

Fig. 2 is a fragmental side elevation.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a fragmental perspective showing the connection for the glass enclosure.

Fig. 5 is an exploded view showing in section several of the main units that are successively secured in place.

Fig. 6 is a fragmental side elevation of parts of a connection detail.

Fig. 7 is an exploded view, in perspective, partly broken away of parts of the connection detail shown in Fig. 6.

Fig. 8 is a fragmental transverse section showing another form of light reflecting frame.

In the embodiment shown, for connection to the I beams or T bars of ceiling constructions, and particularly for engaging and gripping the two uppermost oppositely extending webs 1 and 2 of a support, there are provided the gripping arms 3 and 4 formed on the extensions 5 and 6 connected by the connection 7 to the lower extension 8 of the main bracket 9. The inwardly extending arm 10 of the bracket 9 has formed at the end thereof the upwardly inclined and outwardly extending flange 11 with enlarged openings provided in the end portion of the arm 10 and flange 11 constituting overlapping bent portions registering with one another to enable the screw 12 freely to extend therethrough. The flange 11 co-operates with the arm 10 to encapture or anchor the nut 13 screw threadedly connected to the

screw 12, the openings in the flange 11 and arm 10 being large enough as aforesaid freely to permit the screw 12 to pass therethrough. The screw 12 in the present instance, see Fig. 5, extends through the auxiliary bracket 14 which includes an inwardly extending lower web or supporting flange or bent portion 15, a second web 16 spaced from, and substantially parallel to, the web 15 by the intermediate web 17, and a third web 18 spaced from, and substantially parallel to, the webs 15 and 16 by the elongated web portion 19. The webs 15, 16 and 18 constituting overlapping bent portions are provided with openings registering with one another freely or hingedly to receive the threaded shank of the screw 12 and anchor the same freely to move therein, the opening in the web 15 being smaller than the head 20 of the screw 12 so that the web 15 will form an abutment for it. Between the web 16 and arm 10 of the bracket 9, there is interposed a coil spring 21 encircling the threaded shank of the screw 12 so that when the screw 12 is turned in the nut 13, the lower webs 15 and 16 may be adjusted upward or downward, that is, nearer or farther from the arm 10 against the tension of the spring 21. From the foregoing it will thus be seen that the auxiliary bracket 14 is freely movable or rockable relative to the bracket 9 and that any lighting fixture elements supported on the inner extension or ledge 22 of the web 15 may be raised or lowered to a predetermined precise location by the manipulation of the screw 12 with relation to the nut 13 and against the tension of the spring 21 so that at least in an upward direction the lighting fixture will be yieldable to facilitate proper adjustment and handling of the associated parts while assembling them.

After the required number of brackets 9 are positioned on the supporting beams, including the webs 1 and 2, then the same may be slidably moved along the webs 1 and 2 into position to receive the trough-shaped housing 23 which in the present instance has a roof portion 24 extending the length of the lighting fixture, conventional lengths being four feet and eight feet, with the proviso that for a four foot length only two pairs of brackets 9 are preferred, two brackets on each side, and that for an eight foot length, three pairs of brackets 9 are generally preferred, three brackets on each side.

In the present instance, the housing 23 has side wall members 25 including the short shoulder portions 26 adjacent the roof portion 24 intermediate the roof portion 24 and the inclined portions 27, and the inclined portions 27 intermedi-

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ate the shoulder portions 26 and the vertical portions 28, which vertical portions 28 are provided with inwardly extending flanges 29 which in assembled position rest on the inner extensions 22 of the webs 15 of the auxiliary brackets 14. This housing 23 preferably as shown has formed at its ends and in some instances intermittently the end brackets 30, see Figs. 1 and 5, for supporting the conventional lamp sockets and connections for fluorescent lamps. The end brackets 30, see Fig. 2, preferably have webs or flanges 31 extending outwardly in a longitudinal direction, that is, toward the ends of the housing 23, and downwardly extending flanges 32 at their sides secured to the vertical wall portions 28 of the housing 23.

In the act of assembling, the housing 23 is pressed upwardly between pairs of auxiliary brackets 14, in which case the inclined wall portions 27 of the housing 23 will cam the brackets 14 outwardly to engage the vertical wall portions 28 and here due to the normally free movement of the brackets 14 relative to the brackets 9, the extensions 22 are deflected outwardly until they clear the lower ends of the wall portions 28 where the extensions 22 may be pressed inwardly to receive the flanges 29. Thereupon the screws 12 may be turned to aline the sides of the housing 23, as an instance, or to assume whatever other position it is desired. With the auxiliary brackets 14 and associated screws 12 and springs 21, it will be seen that in the course of assembling one or the other side or both of the housing 23 may be pressed upwardly against the tension of the springs 21 without liberating the housing 23, as a result of which the danger of dropping the housing 23, in the act of assembling the lighting fixture, is reduced to a minimum.

After the housing 23 has been properly secured in place, the main reflector 33 may be secured in place. The reflector 33 consists essentially of two downwardly extending and outwardly flaring wall members 34 having at their upper ends the shoulder forming bead 35, substantially V-shaped in cross-section, the upper web 36 of which forms the supporting ledge for the intermediate strap or bridge 37 which in the present instance has a laterally extending slot 38 to receive the wing nut 39 and elongated abutment 40 formed on the rod 41, screw threadedly connected at its upper end to the roof portion 24, see Figs. 1, 2 and 5. In the act of assembling, it is here only necessary to raise the reflector 33 where the slot 38 registers with the abutment 40 and wing nut 39, permit the same to pass through the slot 38 and then turn the wing nut 39 sufficiently so that the strap will be anchored by the abutment 40. Thereupon the spring lock fastener screws 61 may be turned into place connecting the web or flange 42 to the flange 31, the flange 42 extending inwardly from the end wall members 43 which are connected to the wall members 34 of the reflector 33. Thereupon, preferably the screws 12 may be turned to finally aline the sides of the housing 23 with the reflector 33, in turn to aline with the ceiling or to assume whatever other position it is desired. Before inserting the lamps (not shown) in place, the lower end of the housing 23 is closed by a cover plate, such as the plate 57. This plate preferably has a longitudinally extending slot 58, Fig. 1. Consequently, after the reflector 33 has been secured in place, preferably the wing nut 39 and abutment 40 are turned to extend longitudinally and in position to aline with the opening 58 and clear it when the plate 57 is raised into proper

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position, when the wing nut 39 is again turned, preferably at right angles to its second position so that now the abutment 40 will engage the lower face of the plate 57 and anchor it in position.

In some instances, the space between the lower edges of the walls 34 is closed by a light deflecting member, such for instance as a sheet or plate 44 of translucent glass. The plate 44 in the present instance is anchored in a frame having end pieces 45 connected to the upwardly extending flanges 46 of the side pieces 47 and 48. The side piece 48 includes a horizontally extending supporting flange 49 extending at right angles to the flange 46 and connected to the same by the shoulder forming portion 50. The flange 46 of the side piece 47 is connected to the horizontally extending flange portion 51 by the shoulder forming portion 52 which is recessed to receive portions of the strips 53 secured at their upper ends to the inner faces of said wall members 34 and the lower ends of which form journals with the side pieces 47 to receive the pivot pin 54.

The shoulder forming portions 50 have recesses therein to receive the projections 55 formed on the straps 56 secured to the inner face of one of the walls 34 as shown in Fig. 1. The glass enclosure plate 44 is thus pivotally mounted by the pin 54 to the lower edge of one side wall 34 and supported in horizontal position by the cooperation of the projections 55 with the recesses in the shoulder forming portions 50 of the side pieces 48.

The sheet metal strips 53 constitute the spring supports for the hinge formed by the strips 53 and side pieces 47 with the pivot pin 54.

In place of the glass plate 44, see Fig. 8, the egg crate louver frame 61 may be provided, which preferably, as shown in my co-pending application for Patent Ser. No. 32,335 filed simultaneously herewith which issued July 10, 1951 as Patent No. 2,559,640, is provided with hook-shaped formations 62 in vertically extending cross plates 63 to receive the supporting bars at the free ends of the arcuate members 64 pivotally connected at their upper ends to the brackets 65 secured to the inner faces of the downwardly extending outwardly flaring walls 66 of the reflector 67.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. The combination of brackets having upwardly extending arms extending inwardly toward one another, the inner ends of said arms being free, auxiliary brackets having outwardly extending bent portions at their upper ends extending over the inner free ends of said arms, said auxiliary brackets having inwardly extending supporting bent portions at their lower ends, a troffer housing mounted on said supporting bent portions, and means connecting the outwardly extending bent portions to the free ends of said arms to enable movement of said auxiliary brackets relative to said arms.

2. The combination as set forth in claim 1 characterized by the free ends of said arms having faces inclining upwardly in an inward direction, the connecting means including nuts on spring pressed screws cooperating with said faces for resiliently urging the lower ends of said auxiliary brackets inward into engagement with said troffer housing, the connecting means being yield-

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able to enable the auxiliary brackets to be deflected outwardly by said housing when elevating the same into supporting position on said webs.

3. The combination as set forth in claim 1 in which the free ends of said arms have faces inclining upward in an inward direction, and the connecting means include nuts on spring pressed screws connected to the inwardly and outwardly extending bent portions of the auxiliary brackets and to the free ends of said arms to facilitate adjusting the position of said auxiliary brackets and to cooperate with said faces resiliently to urge the lower ends of said auxiliary brackets inward into engagement with said troffer housing, the connecting means being yieldable to enable the auxiliary brackets to be deflected outwardly by said housing when elevating the same into supporting position on said bent portions.

4. The combination as set forth in claim 1 characterized by said housing having inclined faces, and the connecting means including springs for resiliently urging the lower ends of said auxiliary brackets inwardly into engagement with the inclined faces of said housing when said housing is elevated in the process of assembling thereby in turn to deflect said auxiliary brackets outwardly until they clear the lower edges of said housing and then snap into supporting engagement with the lower edges of said housing.

5. The combination as set forth in claim 1 in which lamp sockets extend downwardly from said troffer housing and a reflector is connected to said troffer housing and extends down outside of the lamps connected to said lamp sockets.

6. The combination as set forth in claim 5 in which the reflector has a bridge, and the cover for said housing and said bridge has elongated slots extending at angles to one another but intersecting a common axis, and means for connecting the cover for said housing and said bridge to said housing including a rod screw threadedly connected to said housing and having an elongated abutment and wing nut movable through the slots in said bridge and cover one at a time and anchoring the bridge and cover to said housing by turning said abutment and wing nut out of registration with the slot in said bridge after passing through the same, thereupon to support the reflector, and thereupon registering with and passing through the slot in said cover and after passing through the same being turned out of registration with said latter slot thereupon to anchor said cover in position.

7. The combination of main brackets having upwardly extending arms extending inwardly toward one another, the inner ends of said arms being free, auxiliary brackets having inwardly extending supporting bent portions, a troffer housing including downwardly extending side walls mounted on said supporting bent portions, each of said main brackets having two overlapping bent portions at their inner free ends, each of said auxiliary brackets having two bent portions overlapping its inwardly extending supporting bent portion, the uppermost bent portion of each auxiliary bracket disposed above the two bent portions of an associated main bracket and

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the lower two bent portions of each auxiliary bracket disposed below the two bent portions of its associated main bracket, there being openings in said five overlapping bent portions, a screw extending through said five bent portions with its head abutting against the lower face of the lowermost bent portion of its associated auxiliary bracket, a nut screw threadedly connected to each screw and interposed between the two bent portions of a main bracket, and a coil spring on each screw interposed between the lowermost bent portion of a main bracket and the next lowermost bent portion of its associated auxiliary bracket.

8. The combination of brackets having opposing jaws slidably to grip the opposite edges of a support, said brackets having upwardly extending arms extending inwardly toward one another, the inner ends of said arms being free, auxiliary brackets having outwardly extending bent portions at their upper ends extending over the inner free ends of said arms, said auxiliary brackets having inwardly extending supporting bent portions at their lower ends, a troffer housing including downwardly extending side walls mounted on said supporting bent portions of said auxiliary brackets, a reflector connected to and extending downwardly from said housing, a cover for the lower end of said housing, and means connecting the outwardly extending bent portions of said auxiliary brackets to the free ends of said arms to enable movement of said auxiliary brackets relative to said arms.

9. The combination of brackets having upwardly extending arms extending inwardly toward one another, the inner ends of said arms being free, auxiliary brackets having inwardly extending supporting ledges at their lower ends, a troffer housing mounted on said supporting ledges, and hinge means connecting these auxiliary brackets to the free ends of said arms to enable movement of said auxiliary brackets relative to said arms.

10. The combination of brackets having upwardly extending arms extending inwardly toward one another, the lower ends of the upwardly extending arms formed to receive supporting means and the inner ends of said arms being free, auxiliary brackets hinged to the free ends of said arms and having inwardly extending supporting ledges at their lower ends, a troffer housing mounted on said supporting ledges, and adjustable means to raise or lower the auxiliary bracket relative to said arms.

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