Dec. 5, 1967 D. A. COHEN 3,356,840

ELECTRIC LIGHT FIXTURE MOUNTING

Filed Jan. 30, 1967 2 Sheets-Sheet 1

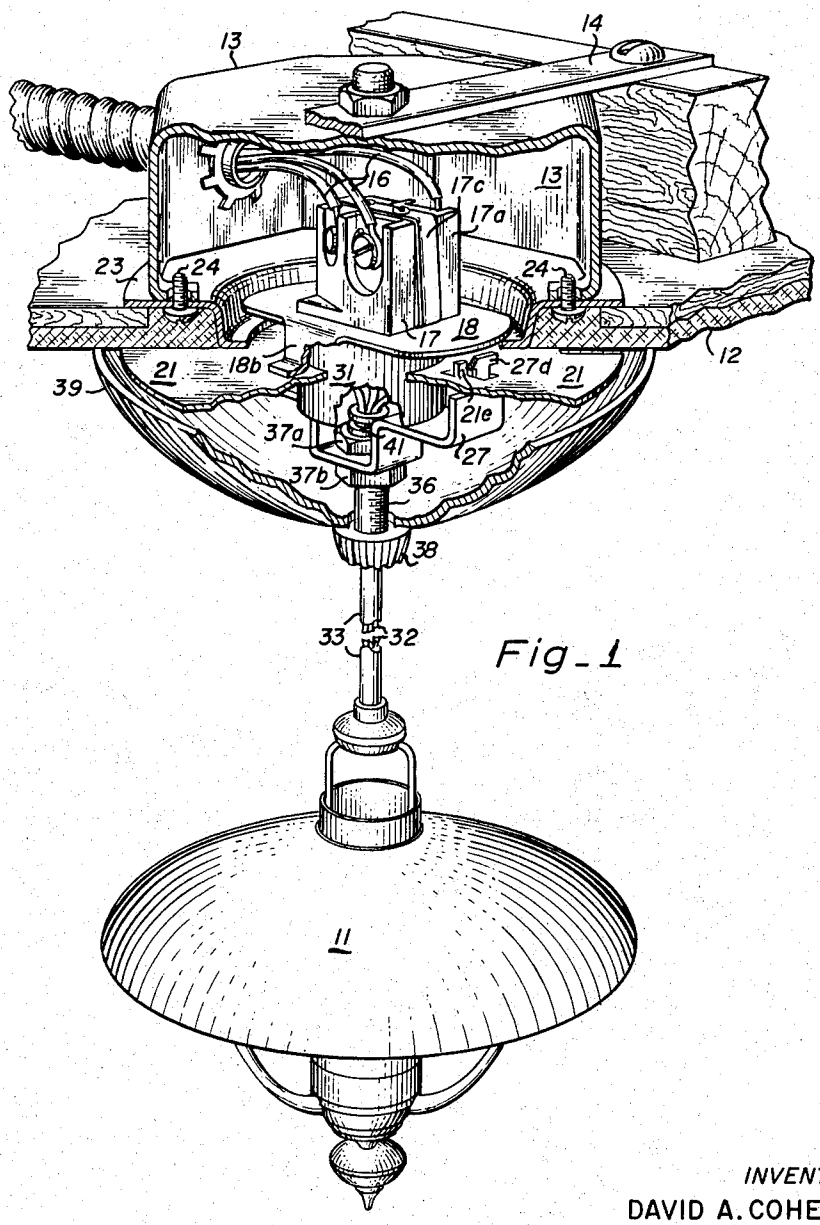


Fig. 1

INVENTOR
DAVID A. COHEN

BY Harvey J. Lombard

ATTORNEY

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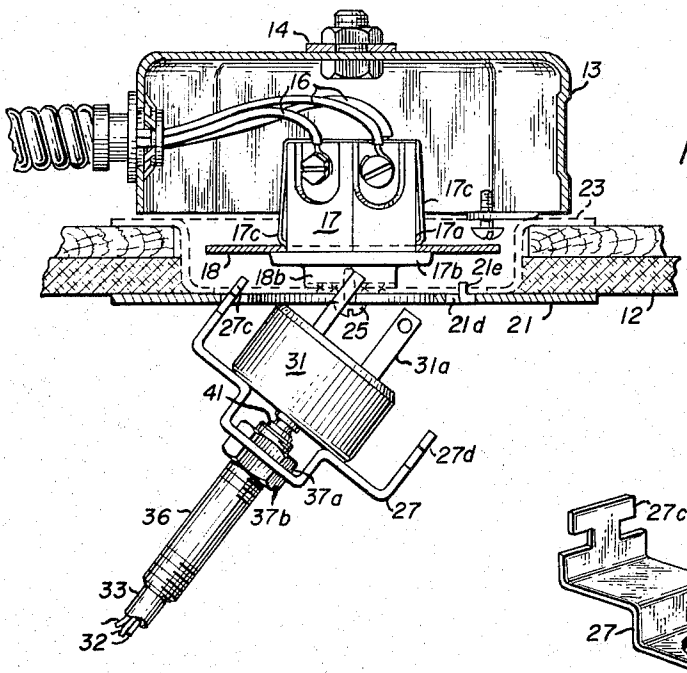


Fig_2

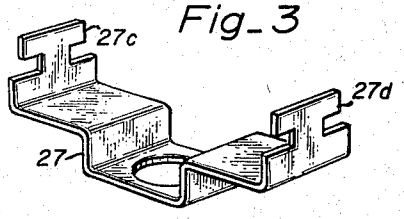


Fig_3

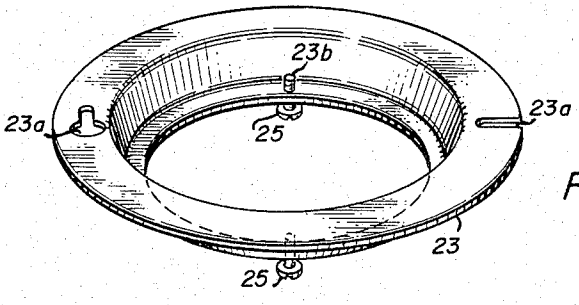


Fig_4

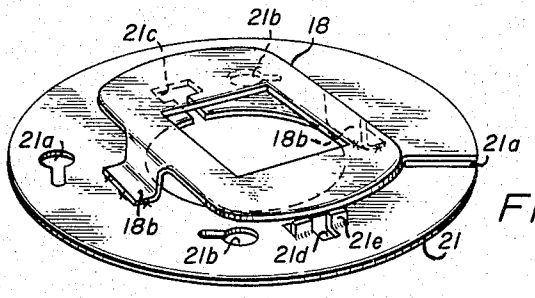


Fig_5

INVENTOR
DAVID A. COHEN
BY Harvey S. Lambert
ATTORNEY

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ELECTRIC LIGHT FIXTURE MOUNTING

David A. Cohen, 744 Foothill Drive, San Mateo, Calif. 94402

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5 Claims. (Cl. 240—78)

ABSTRACT OF THE DISCLOSURE

A light fixture mounting structure employing a releasable yoke member to detachably secure a fixture to an outlet box. A receptacle is recessed within the box on a riser member, and a plug member carried by the yoke member and connected to the fixture is inserted into the box to make electrical connections. The yoke member releasably engages the box cover to support the plug and fixture, and the riser member prevents the ends of the yoke member from contacting wiring within the box.

Related applications

This application is a continuation-in-part of my copending application, Ser. No. 535,439, filed Mar. 18, 1966.

Background of the invention

This invention relates in general to electric light fixture mountings, and relates more particularly to such mountings by means of which light fixtures may be easily installed and removed.

In the above-identified application, there is disclosed a light fixture mounting structure which permits the easy installation and removal of light fixtures from wall and ceiling outlets. That light fixture mounting structure employs a yoke member which supports a male plug element connected to the fixture and engageable with a female receptacle outlet in the box. The yoke member is releasably engaged with a cover on the outlet box to permit easy installation and removal of the fixture, and when the yoke member is engaged with the outlet box cover, it serves the dual functions of mechanically supporting the fixture and preventing any rotation or other undesired movement of the plug in the receptacle. This structure permits the installation and removal of light fixtures without requiring the splicing and unsplicing of wires or the use of large canopies to hide the connections, as required in the prior art devices.

Summary of the invention

The structure of the present invention is an improvement on my above device which retains all the advantages of that device while providing several additional desirable features. In accordance with this invention, a riser member is employed to position the female receptacle within the outlet box, and this riser is constructed so that the receptacle is recessed within the outlet box, rather than having its surface flush with the outer surface of the box as in my prior device. By having the receptacle recessed within the box, this permits the plug to be inserted at least partly within the box for making connection with the receptacle. This, in turn, results in less of the plug extending or protruding from the outlet box and permits the yoke member, which supports the plug, to be made shallower so that all types of fixture canopies may be employed, even those with a very shallow depth. An additional function of the riser member is to cover the ends of the yoke member which extend through the cover or adapter plate on the outlet box, to prevent these ends from coming into electrical contact with the wires in the box.

In the preferred form of the invention, the riser member is secured to the cover or adapter plate for the outlet box and extends somewhat above it into the box. The female receptacle is secured to the riser member so as to position the electrical receptacle openings over the central opening in the adapter plate. The receptacle is thus recessed within the outlet box, and the plug may be inserted through the central opening in the adapter plate to engage the receptacle, with a portion of the plug disposed within the outlet box. The yoke member is then releasably engaged with special openings in the adapter plate to firmly hold the plug in the receptacle and to support the fixture. The riser member extends over the ends of the yoke which protrude through the openings in the adapter plate, thus preventing these ends from making electrical contact with wiring within the outlet box.

The present invention may be employed with any suitable type of fixture, including cord-hung or chain-hung. If a cord-hung fixture is employed, the fixture will be provided with a cord restrainer which is supported by the yoke member and which serves to remove any strain from the wires in the plug. If a chain-hung fixture is utilized, the yoke member is provided with a hook to receive the end of the chain. Similarly, the present invention may be employed in fixtures with or without plastering rings.

It is therefore an object of this invention to provide an improved lighting fixture mounting which is easily installed and removed and which results in a compact structure.

It is an additional object of the present invention to provide a lighting fixture mounting employing a yoke member which is detachably secured to an adapter plate cover on an outlet box having a female receptacle recessed therein, the yoke member supporting an electrical plug which extends into the outlet box to mate with the receptacle when the yoke is positioned by extending the ends thereof through openings in the adapter plate.

It is a further object of this invention to provide a lighting fixture mounting employing a yoke member which is detachably secured to an outlet box cover carrying a riser member which positions a female receptacle in recessed position within the outlet box, the yoke member supporting an electrical plug which extends into the outlet box to mate with the receptacle when yoke is positioned by extending the ends thereof through openings in the cover.

It is an additional object of the present invention to provide a lighting fixture mounting employing a yoke member which is detachably secured to an outlet box cover carrying a riser member which positions a female receptacle in recessed position within the outlet box, the yoke member supporting an electrical plug which extends into the outlet box to mate with the receptacle when the yoke is positioned by extending the ends thereof through openings in the cover, the riser member extending beyond the ends of the yoke member to prevent contact of the ends with the wiring the outlet box.

Brief description of the drawings

Objects and advantages other than those set forth above will be apparent from the following description when read in connection with the accompanying drawings, in which:

FIGURE 1 is a perspective view, partly in section, showing the details of the mounting structure of this invention used to suspend a ceiling lighting fixture;

FIGURE 2 is a side view, partly in section, of the mounting structure, illustrating the hinging action of the yoke member;

FIGURE 3 is a perspective view of the yoke member;

FIGURE 4 is a perspective view of a plastering ring which may be employed with the present invention; and

FIGURE 5 is a perspective view of the riser member and adapter plate of the mounting structure.

Description of the preferred embodiment

Referring to FIGURE 1, the invention is illustrated in connection with mounting a light fixture **11** on a ceiling **12**. Ceiling **12** may be provided with a conventional junction or outlet box **13**, as shown, which is secured to ceiling **12** and rafters by any suitable means, such as by a strap **14** extending across adjacent rafters. Electrical power is supplied into box **13** by conductors **16** which are connected to a suitable power source (not shown). Conductors **16** are connected within box **13** to a receptacle **17** having openings therein for the insertion of the prongs of an electrical plug. Receptacle **17** may be of any suitable type, such as one having three openings therein for receiving a three prong plug.

Receptacle **17** is mounted on a riser member **18** which locates the receptacle in a recessed position within box **13**. As best shown in FIGURE 5, riser member **18** has a generally planar surface having an opening therein for receiving receptacle **17**. Riser member **18** is also provided with a pair of downwardly extending legs or tabs **18***b* which support the riser member on an adapter plate **21**. Legs **18***b* may be secured to adapter plate **21** by any suitable means, such as spot welding or the like.

Adapter plate **21** supports riser member **18** and receptacle **17**, and is secured to the outlet box in any suitable manner. If a plastering ring is employed in mounting the fixture, as is required under the electrical codes in some areas, this ring will be secured to the outlet box, and the adapter plate in turn will be secured to the plastering ring. In the illustrated embodiment, such a plastering ring **23** is assumed to be used. As shown, ring **23** is secured to outlet box **13** by screws **24** (FIGURE 1) which extend through openings **23***a* (FIGURE 4) in the ring and engage corresponding threaded openings in box **13**. The lower end of ring **23**, which is flush with the ceiling surface on which the fixture is to be mounted, is provided with threaded openings **23***b* (FIGURE 4) to receive screws **25** which pass through corresponding openings **21***b* (FIGURE 5) in adapter plate **21** to secure the adapter plate, as well as riser **18** and receptacle **17**, to the plastering ring and outlet box **13**.

On the other hand, when no plastering ring is employed, outlet box **13** will be mounted so that its lower edge is flush with the ceiling surface, and adapter plate **21** will be secured directly thereto by screws **24** extending through openings **21***a* in the adapter plate and engaging the threaded openings in box **13**.

Receptacle **17** is secured to riser member **18** in any suitable manner, such as by making the receptacle of a two-part construction. This may take the form of an upper portion **17***a* and a lower portion **17***b* which is detachably secured to the upper portion. Lower portion **17***b* is slightly larger than the rectangular opening in riser member **18**, and when member **17***b* is tightened to member **17***a*, the receptacle is clamped to riser **18** between member **17***b* and ribs **17***c* on upper member **17***a*.

Referring now to FIGURE 3, this invention provides a yoke member **27** which serves the dual functions of mechanically supporting the fixture relative to box **13** and of firmly positioning the electrical plug which mates with receptacle **17** in box **13**. Yoke **27** is of the general shape shown in FIGURE 3 and is provided at each end with upwardly extending tab or tip portions **27***c*, **27***d* having a T-shape. These tip portions cooperate with corresponding openings **21***c*, **21***d* (FIGURE 5) in adapter plate **21** to provide a locking action for the yoke. The width of the head of the T-shaped portion **27***c* is such that it will not pass through the large portion of the opening **21***c*. Thus, when tip portion **27***c* is inserted through the narrow portion of opening **21***c*, the head portion of the tip will act to hold the yoke at that end.

The width of the head of the T-shaped portion **27***d* is such that it will pass through the corresponding head of the T-shaped slot **21***d*. By making yoke **27** of a material having a suitable resilience or spring, and by designing it such that the distance between tips **27***c*, **27***d* is slightly larger than the distance between openings **21***c*, **21***d*, it will be seen that a locking action is provided. That is, tip **27***c* is first inserted in opening **21***c* through the narrow shank portion thereof. Then tip **27***d* is pressed inwardly sufficiently to allow it to pass through the head of the T-shaped slot **21***d*.

In the preferred form of the invention illustrated in the drawings, opening **21***d* is provided with upstanding lugs **21***e* as shown (FIGURE 5) which extend above the adapter plate and serve to more firmly lock tip **27***d* of yoke member **27** in opening **21***d*. After tip **27***d* is inserted through opening **21***d*, it is raised above lugs **21***e*, and the pressure on the yoke is then released. This causes the end of the yoke to spring outwardly with the shank of the T of tip **27***d* sliding in the corresponding shank of the T of slot **21***d*. It will be seen that lugs **21***e* prevent tip **27***d* from being dislodged from opening **21***d* by accident or inadvertence. However, the yoke may be easily removed by lifting tip **27***d* above lugs **21***e* and then pressing the end of the yoke inwardly until it overlies the T-shaped portion of opening **21***d* so that the tip **27***d* may then be pulled downwardly to free it from opening **21***d*.

In addition to the above supporting action, the yoke member also positions and supports the electrical plug which cooperates with receptacle **17**. This plug may be of any suitable type, such as a plug **31** having prongs **31***a* which are adapted to extend into the openings in receptacle **17**. As seen in FIGURE 2, plug **31** has electrical conductors **32**, surrounded by an insulating sheath **33**, connected thereto internally and extending therefrom to fixture **11**. Conductors **32** preferably have sufficient slack in the adjacent plug **31** to permit plug **31** to be inserted into receptacle **17** when yoke **27** is in the released position shown in FIGURE 2.

After insertion of plug **31** in receptacle **17**, yoke **27** may be swung upwardly from the position of FIGURE 2 to the locked position described above and shown in FIGURE 1. The depth of yoke **27** is selected relative to the height of plug **31** so that even though the plug is not physically secured to the yoke, when the yoke is in the locked position shown in FIGURE 1, the yoke firmly supports and positions the plug in receptacle **17**, preventing any rotation or other undesired movement of the plug.

Yoke **27** also carries a threaded nipple **36** which extends downwardly therefrom and is secured to the yoke by a pair of locknuts **37***a*, **37***b*. Nipple **36** may be provided with a bushing **38** (FIGURE 1) which engages the lower nipple threads to clamp a canopy **39** against ceiling **12** after installation of the fixture.

In the illustrated embodiment, it is assumed that a cord-hung fixture is to be employed. In this situation, a cord restrainer **41** may be employed. As is well-known in the art, cord restrainer **41** is crimped to, or otherwise secured to, conductors **32** and their outer covering **33** to relieve these conductors of any mechanical strain in plug **31**. Cord restrainer **41** is physically supported by yoke member **27**, such as by having an enlarged portion which seats on the top of locknut **37***a*. Yoke member **27**, by supporting cord restrainer **41**, thus supports the weight of the fixture, which is secured to conductors **32** and insulation **33**.

In the case of a chain-hung fixture, it will be clear that yoke member **27** may be provided with a hook or the like to receive a link of the fixture chain for supporting the fixture, while the electrical conductors pass through nipple **36** for connection to the fixture.

Installation of the fixture hanger of this invention is as follows, assuming that an adapter plate **21**, riser mem-

ber **18** and receptacle **17** are in place. Tip **27***c* of yoke member **27** is inserted in slot **21***c* of adapter plate **21**, and prongs **31***a* of plug **31** are inserted into the corresponding openings in receptacle **17**. Yoke **27** is then moved upwardly about the hinge formed by tip **27***c*, and tip **27***d* is then inserted into opening **21***d* as described above to firmly lock yoke **27** and the fixture to box **13** and to firmly clamp plug **31** in position relative to receptacle **17**. Bushing **38** may then be advanced on nipple **36** to clamp canopy **39** against ceiling **12** to conceal box **13** and yoke **27**.

Removal of the fixture is correspondingly simple and is accomplished by backing off bushing **38** to lower canopy **39** and then pressing upwardly and inwardly on the one side of yoke **27** to free tip **27***d* from slot **21***d*, as described above, and then dropping that end of the yoke clear of adapter plate **21**. Plug **31** may then be removed from receptacle **17**, and the entire assembly removed by removing tip **27***c* from opening **21***c*.

It will be seen that the use of the riser member of this invention permits receptacle **17** to be recessed within box **13** so that plug **31** may extend into box **13** to make electrical connections. This, in turn, results in less of plug **31** extending outside box **13** so that yoke **27** may be made shallower, thus permitting the use of shallower canopies. Additionally, it will be seen that riser member **18** extends beyond the ends or tips **27***c*, **27***d* of yoke **27** as they extend through openings **21***c*, **21***d* in adapter plate **21**. This is effective to prevent these ends **27***c*, **27***d* from inadvertently coming into electrical contact with any of the wiring **16** within box **13**.

Thus, the present invention provides all of the advantages of the invention of my above-identified application in permitting easy installation and removal of light fixtures, and the present invention has the additional advantages of producing a shallower mounting and of providing protection against inadvertent electrical contact within box **13** by the ends of the yoke member **27**.

While the above detailed description has shown, described and pointed out the fundamental novel features of the invention as applied to various embodiments, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. Apparatus for mounting an electrical fixture from an outlet box, comprising:

an adapter plate adapted to fit over said box;

a riser member secured to said adapter plate and disposed in said box;

an electrical receptacle secured to said riser member and recessed within said box;

a yoke member releasably engaging said adapter plate;

an electrical plug member for mating with said receptacle in said box, said plug member being disposed above said yoke member and being separable therefrom when said yoke member is disengaged from said adapter plate to permit connection and disconnection of said plug member in said receptacle;

said plug member being supported by said yoke member in at least a partially recessed position in said box when said yoke member is engaged with said adapter plate to maintain good electrical contact between said plug member and said receptacle;

means electrically connecting said plug member to the electrical fixture; and

fixture supporting means carried by said yoke member for supporting the electrical fixture when said yoke member is engaged with said adapter plate, said yoke member being releasable from said adapter plate to permit disconnection of said plug member from said receptacle and removal of said fixture.

2. Apparatus in accordance with claim **1** in which said riser member has a planar surface generally parallel with and spaced from said adapter plate and is provided with a central opening for receiving said receptacle.

3. Apparatus in accordance with claim **2** in which the ends of said yoke member extend through openings in said adapter plate to engage said adapter plate, and said riser member extends beyond said ends of said yoke member to prevent said ends from making electrical contact with wiring within said box.

4. Apparatus in accordance with claim **3** in which said openings in said adapter plate have T-shapes, and said ends of said yoke member have a T-shape to releasably engage said openings in said adapter plate.

5. Apparatus in accordance with claim **1** including a plastering ring secured to said box, said adapter plate being secured to said plastering ring.

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NORTON ANSHER, *Primary Examiner.*

G. M. HOFFMAN, *Assistant Examiner.*