April 10, 1956 H. U. SCHOCKETT 2,741,695

RECESSED LIGHTING FIXTURES

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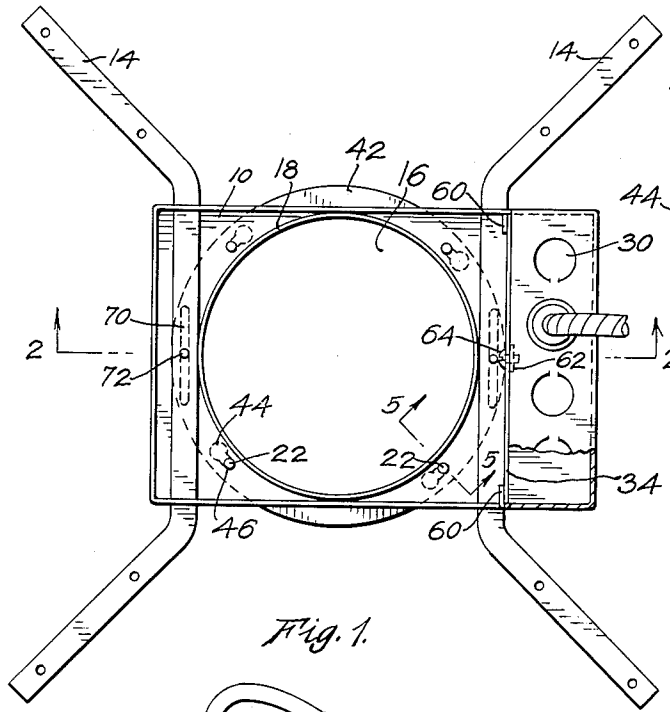


Fig. 1.

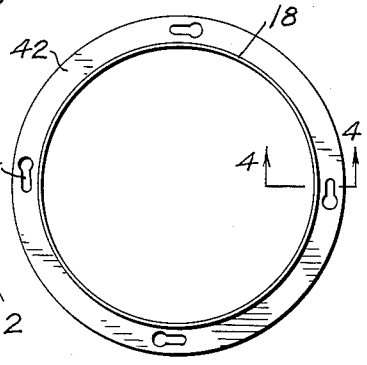


Fig. 3.

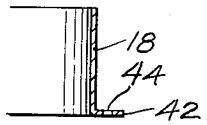


Fig. 4.

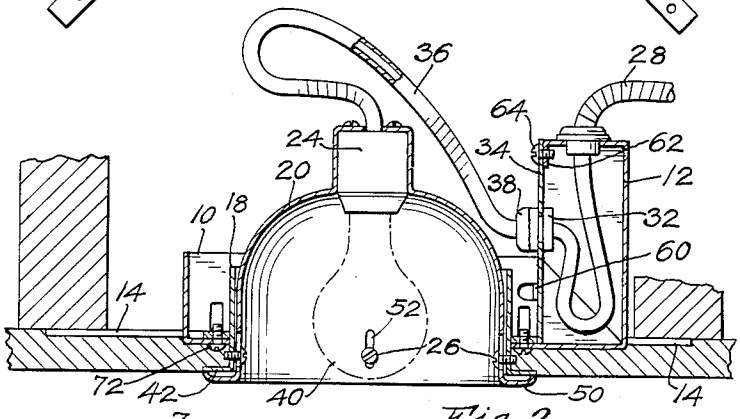


Fig. 2.

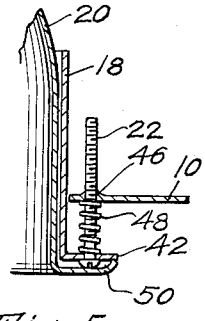


Fig. 5.

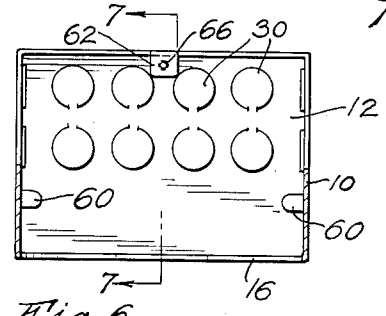


Fig. 6.

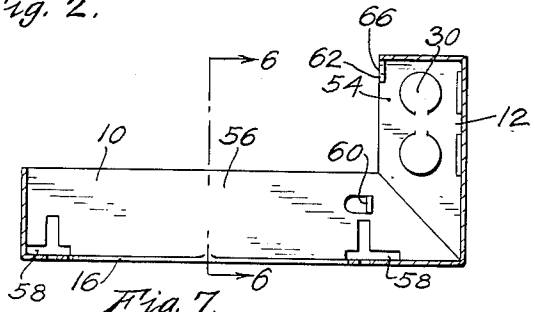


Fig. 7.

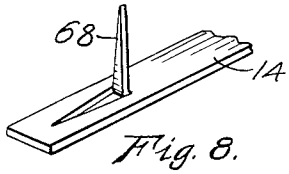


Fig. 8.

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RECESSED LIGHTING FIXTURES

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4 Claims. (Cl. 240—78)

This invention relates to light fixtures and more particularly to recessed light fixtures.

Lighting fixtures recessed behind the wall or above the ceiling are rapidly becoming a common feature in modern home and office building construction. The lamp is customarily held in a reflector which is in turn mounted in a cavity in the wall or ceiling. In many instances a removable transparent cover is fastened over the lamp substantially flush with the surrounding surface. A number of difficulties arise in connection with the installation and repair of recessed light fixtures which are not found with non-recessed fixtures.

One difficulty of utmost importance is the fact that these fixtures become a fire hazard if constructed with the outlet box in close proximity to the base of the lamp. In order to reduce the fire hazard the recessed fixture must be connected to the next outlet box in the system by means of a heavy thermal-insulated conductor which is not customarily used in this type of wiring. Also, the next outlet box in the system may be located a considerable distance away from the recessed fixture and may be inaccessible, especially in older buildings. In a ceiling fixture of the recessed type, the heat radiated and conducted from the lamp to an outlet box positioned over it is sufficient to char the wire for a considerable distance thereby causing a short circuit and a fire.

A second objection to the installation of the conventional recessed light fixture in buildings where the walls and ceilings are already in place is that an opening must be made which is considerably larger than that needed for the reflector and lamp itself in order to get the fixture through. This raises the problem of how to support the fixture above the large opening; and also, the problem of covering the opening once the fixture is in place.

In new construction there is no problem in putting the fixture through the hole in the ceiling because the fixture is mounted between the joists or studs before the ceiling is put in place, however, another problem takes its place. The thickness of ceilings varies widely depending upon whether they are plaster ceilings, dry wall, acoustic, or any one of several other conventional ceiling structures; and therefore, the spacing between the plaster ring and the plaster frame must be carefully adjusted if the fixture is to fit properly. The required adjustment should be made before the ceiling is put in place and it will serve as a guide to the proper thickness of the ceiling. Also, once the adjustment has been made the fixture must be able to withstand the abuse it will receive while the ceiling is being installed.

It is of utmost importance in a fixture of this type that the construction provide ready access to the outlet box and wiring and sufficient room to make whatever inspections and repairs are necessary.

Among the objects of the present invention are to provide a recessed lighting fixture which has the supply wire outlet box in position to be relatively unaffected by heat from the lamp; a recessed light fixture which is prewired for connection into the conventional building wire

systems thus eliminating the necessity of on-the-job installations of thermal insulated conductors; a fixture which may be installed through a wall or ceiling opening substantially the same size as the plaster ring; a recessed fixture which provides a simple and accurate adjustment of the spacing between the plaster frame and plaster ring for both new and old construction; a fixture which has a reflector and lamp unit which may be readily detached to provide access to the supply wire outlet box and wiring; and a recessed light fixture which is simple and inexpensive to manufacture and install, is readily adaptable for use with both new and old building construction, and which retains all the worthwhile features of conventional recessed lighting fixtures.

Other objects will be in part apparent and in part pointed out specifically hereinafter in connection with the description of the drawing which follows; and in which,

Figure 1 is a top plan view of the recessed light fixture of the present invention without the reflector and lamp;

Figure 2 is a transverse section taken along line 2—2 of Figure 1 showing the reflector and lamp connected in place therein;

Figure 3 is a top plan view of the plaster ring;

Figure 4 is a fragmentary transverse section of the plaster ring taken along line 4—4 of Figure 3;

Figure 5 is a fragmentary transverse section taken along line 5—5 of Figure 1 showing the reflector, plaster ring, and plaster frame;

Figure 6 is a view taken in the direction of arrows 6—6 of Figure 7 showing the plaster frame and supply wire outlet box with the box cover removed;

Figure 7 is a longitudinal section taken along line 7—7 of Figure 6 showing the plaster frame and integral supply wire outlet box; and

Figure 8 is a fragmentary perspective view showing one end of the hanger bar slightly modified to form means for fastening the hanger bar to a supporting member.

Referring now in particular to Figures 1 and 2 of the drawing, the recessed light fixture of the present invention will be seen to consist basically of a plaster frame **10** having a supply wire outlet box **12** formed integral therewith on one end. In new construction the plaster frame is suspended between adjacent joists or studs by hanger bars **14**. When used in existing construction the hanger bars are removed and the plaster frame rests on, and is supported by, the ceiling. The plaster frame contains a plaster ring opening **16** of a size and shape to receive any one of a number of different conventional types of plaster rings. The recessed fixture of the present invention may be used equally well as a ceiling or wall fixture; however, in order to simplify the description of the drawing the explanation herein will be confined to the description of a ceiling fixture.

In the preferred embodiment of the invention the plaster ring opening **16**, regardless of shape, extends nearly the entire width of the plaster frame. In practice the plaster frame is dimensioned to receive a particular plaster ring and reflector and one of the most important features of the structure claimed herein is the fact that the plaster frame is only slightly wider than the plaster ring opening. Thus, the entire plaster frame and integral outlet box can be inserted through a hole substantially the same size and shape as the plaster ring. The plaster frame shown in the drawing has been adapted for use with a circular plaster ring **18** and a circular reflector **20**.

Plaster ring **18** is adjustably attached to the plaster frame within the plaster ring opening **16** by means of adjustment screws **22** which will be described in detail in connection with Figure 5. Reflector **20** containing lamp holder **24** is secured within the plaster ring by screws **26** as shown in Figure 2. Flexible or rigid conduit **28** is

connected into supply wire outlet box 12 through openings provided by the knock-outs 30. Conduit 28 is wired into a female plug 32 which is fastened to removable box cover 34 of the outlet box. Thermal insulated flexible conductor 36 connects lamp holder 24 into the lighting system by means of male plug 38. Conductor 36 and conduit 28 may, of course, be connected together directly within supply wire outlet box 12 without the use of the plug connections; however, the construction shown in Figure 2 makes it possible to detach the reflector and lamp holder from the outlet box quite easily. Conductor 36 may be asbestos covered wire or other thermally insulated types which are designed to withstand the heat generated by lamp 40. Shielding the asbestos covered wire with a coil spring made of light wire affords greater flexibility than the use of the conventional armored covering.

In connection with Figures 3 and 4, plaster ring 18 will be seen to have a flange 42 extending outward therefrom and containing a plurality of key slots 44. Flange 42 underlies the portion of the plaster frame surrounding plaster ring opening 16 which contains threaded openings 46 shown in Figures 1 and 5, corresponding to the key slots.

Figure 5 illustrates the manner in which adjustment screws 22 pass upward through key slot openings 44 and into threaded openings 46 to connect the plaster ring and plaster frame together. The circular portion of the key slots is sized to pass the head of adjustment screws 22 so that with the adjustment screws in place within the plaster frame the plaster ring may be connected by merely passing it over the heads of the adjustment screws and turning it clockwise in Figures 1 and 3 until the shank of the screw passes into the narrow portion of the key openings. A compression spring 48 on the shank of the adjustment screws holds the plaster frame and the flange of the plaster ring in spaced relation. Curved flange 50 of the reflector covers the head of adjustment screws 22 when the reflector is in place within the plaster ring as shown in Figures 2 and 5. Relative adjustment between the reflector and the plaster ring is provided by means of elongate openings 52, shown in Figure 2, through which screws 26 pass and are threadedly connected into corresponding openings in the plaster ring.

With particular reference to Figures 6 and 7 wherein the plaster frame and integral supply wire outlet box are illustrated, it will be seen that the outlet box is positioned to one side of the plaster frame away from the direct heat of the lamp. The dead air space between the box cover 34 of the outlet box and the reflector provides adequate insulation for conduit 28 which may be conventional building conduit. If desired, the outlet box may be positioned a greater distance from the reflector than that shown without impairing the utility of the fixture. Conductor 36 which is subjected to the intense heat produced by the lamp is prewired with thermal insulated wire thus eliminating the need for on-the-job wiring with a thermal insulated conductor. The plaster frame and outlet box are formed of a single sheet of metal and bent to form two box-like portions 54 and 56 at right angles to one another. The sides of box-like portion 56, which forms the plaster frame, are provided with slots 58 near each end through which the hanger bars 14 pass. Projections 60 extend inward from box-like portions 56 in position to hold box cover 34 over box-like portion 54 which forms the supply wire outlet box, as shown in Figures 1 and 2. Projection 62 extends downward from the top of box-like portion 54 in position to contact box cover 34. A bolt 64 connects the face plate to the outlet box by threaded engagement within opening 66 in the projection.

Figure 8 illustrates a slightly modified form of hanger bar which is provided with pointed fasteners 68 punched out of the metal for use in securing the hanger bars to the joists. When this construction is used, slots 58 in the plaster frame must be T-shaped as illustrated in Figure 7 in order that the fasteners may pass through.

In connection with Figure 1 it will be seen that the hanger bars have their ends extending outward from the plaster frame at approximately 45 degree angles which enables them to be connected easily to the joists regardless of spacing or the direction in which the joists run with respect to the fixture. The plaster frame is provided with slots 70 through which set screws 72 threadedly connected into the hanger bars may pass in order to provide lateral adjustment of the hanger bars with respect to the plaster frame.

Having thus described the specific features of construction found in the recessed lighting fixture of the present invention, it will be well to consider the manner in which the fixture is installed in order that the utility of these many features may be clearly understood. The installation will be considered first from the standpoint of new construction where there is no existing wall or ceiling structure; and secondly, from the standpoint of existing construction where the walls and ceiling are already in place.

In new construction the plaster frame is suspended between adjacent joists from the hanger bars which are either nailed to the joists or connected thereto by means of the pointed fasteners illustrated in Figure 8 of the drawing. The 45 degree bend in the ends of the hanger bars permits them to be fastened to the underside of the joists regardless of the spacing between the joists or the direction in which the joists run. Lateral adjustment of the plaster frame with respect to the hanger bars may be made by means of the set screws sliding within the slots of the plaster frame. With the plaster frame in place the flexible or rigid conduit from the main lighting system is connected into the supply wire outlet box through female plug 32 in the box cover 34. Adjustment screws 22 and compression spring 48 are already in position within threaded openings 46 in the plaster frame. Plaster ring 18 is passed upward through the plaster ring opening 16 in the plaster frame and fastened in place by means of adjustment screws 22 passing into the key slots 44. Adjustment is then made of the spacing between the plaster frame and the flange of the plaster ring to the desired thickness of the finished ceiling. Compression springs 48 hold these members in spaced relation and prevents the spacing from being altered while the ceiling is put in place. After the ceiling is finished and painted the pre-assembled unit consisting of the reflector, lamp holder, thermal insulated conductor and male plug are placed in the fixture by merely plugging in plug 38 into plug 32 and fastening screws 26 through the reflector openings 52 into the corresponding threaded openings in the plaster ring. Thus the installation is completed in a very short time with a minimum of effort.

In existing construction no hanger bars 14 are necessary. An opening is first cut in the ceiling approximately the same size as the outside diameter of the plaster ring. A flexible conduit 28 may then be brought down through the opening in the ceiling and connected as aforementioned into the supply wire outlet box before the plaster frame is put in place. By turning the plaster frame on end it may then be passed upward through the hole in the ceiling, even the hole is substantially the same size as the plaster ring opening therein. The plaster frame is then adjusted with respect to the opening in the ceiling and the plaster ring fastened in place by means of adjustment screws 22. Flange 42 of the plaster ring and the underside of the plaster frame cooperate to engage opposite faces of the ceiling as shown in Figure 2, and may be adjusted to any ceiling thickness by means of the adjustment screws 22. Again, the pre-assembled lamp holder unit need only be plugged into the outlet box and fastened to the plaster ring to be ready for use.

It is to be understood that the light fixture of the present invention may be readily adapted to many dif-

ferent shapes and sizes of reflector and plaster ring units without hampering its utility in any way.

Having thus described the important features of construction and application found in the present invention it will be seen that many useful objects have been achieved; and therefore, I claim:

1. A recessed lighting fixture particularly adapted to be inserted and suspended within an opening in an existing ceiling comprising: a plaster frame having an elongate base provided with a plaster ring opening extending the width of the base, and integral side walls joining opposite end portions of the base across the plaster ring opening, the plaster frame being adapted to pass through a ceiling opening of substantially the same size and shape as the plaster ring opening and rest on the upper surface of the ceiling with the ceiling opening and plaster ring opening in register with one another; a plaster ring detachably connected to the plaster frame within the plaster ring opening; a reflector detachably connected within the plaster ring; a lamp holder mounted in the reflector; and an electrical conductor connecting the lamp holder to a source of electrical energy.

2. A recessed lighting fixture particularly adapted to be inserted and suspended within an opening in an existing ceiling comprising: a plaster frame having an elongate base provided with a plaster ring opening extending the width of the base, integral side walls joining opposite end portions of the base across the plaster ring opening, and an integral supply wire outlet box at one end of the base spaced from the plaster ring opening, said plaster frame being adapted to pass through a ceiling opening of substantially the same size and shape as the plaster ring opening and rest on the upper surface of the ceiling with the ceiling opening and plaster ring opening in register with one another; a plaster ring detachably connected to the plaster frame within the plaster ring opening; a reflector detachably connected within the plaster ring; a lamp holder

mounted in the reflector; and a thermal insulated electrical conductor connecting the lamp holder and the supply wire outlet box.

3. A plaster frame particularly adapted to be inserted within an opening in an existing ceiling for use with recessed lighting fixtures comprising: an elongate base provided with a plaster ring opening extending the width of the base; integral side walls joining opposite end portions of the base across the plaster ring opening; and means for attaching a plaster ring to the plaster frame within the plaster ring opening; said plaster frame being adapted to pass through a ceiling opening of substantially the same size and shape as the plaster ring opening and rest on the upper surface of the ceiling with the ceiling opening registering with the plaster ring opening.

4. A combined plaster frame and supply wire outlet box for use with recessed lighting fixtures comprising: an elongate rectangular base having a plaster ring opening near one end thereof, the sides of the base being bent upward to form integral side walls bordering the plaster ring opening, the end of the base opposite the plaster ring opening being bent upward to form an integral end wall of the plaster frame and the rear wall of the supply wire outlet box, and the sides and top of the rear wall being bent forwardly in the direction of the plaster ring opening to form the side walls and top wall of the supply wire outlet box; and, a removable cover plate attached to the supply wire outlet box.

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