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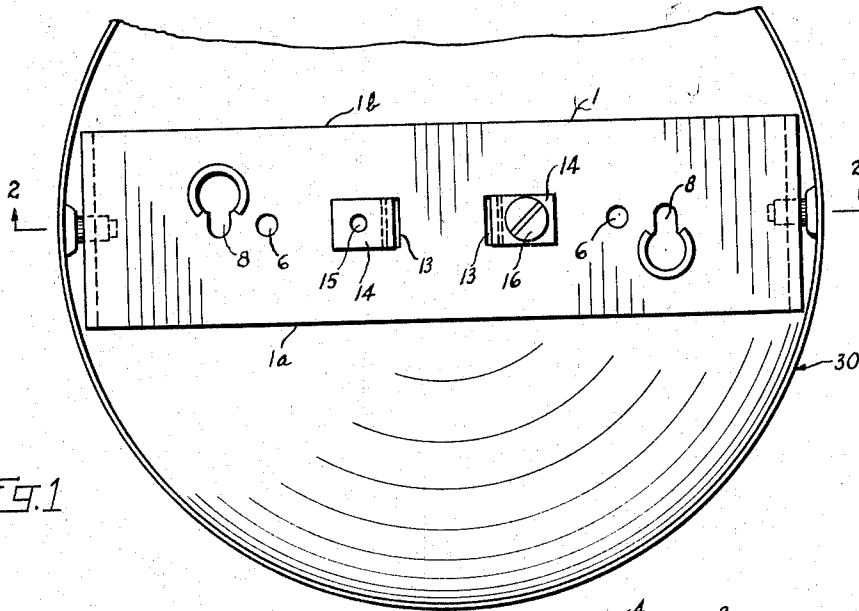
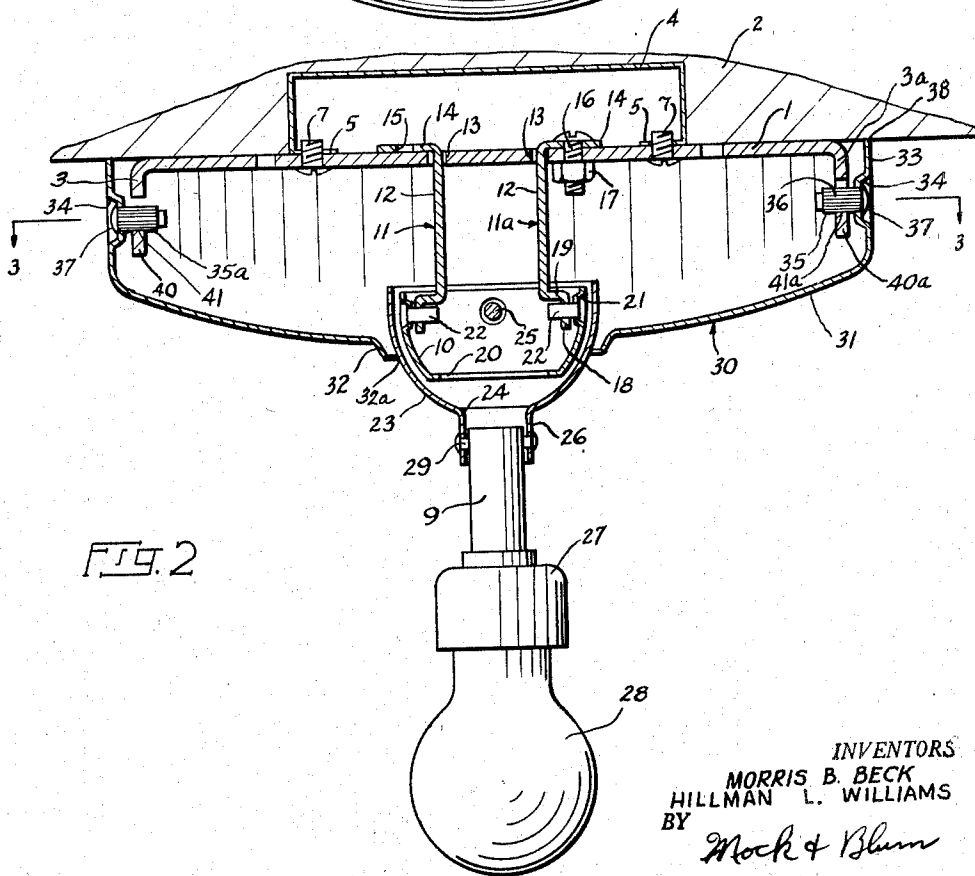
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**2,907,545**

## HANGER DEVICE FOR LAMP FIXTURES

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2 Sheets-Sheet 1



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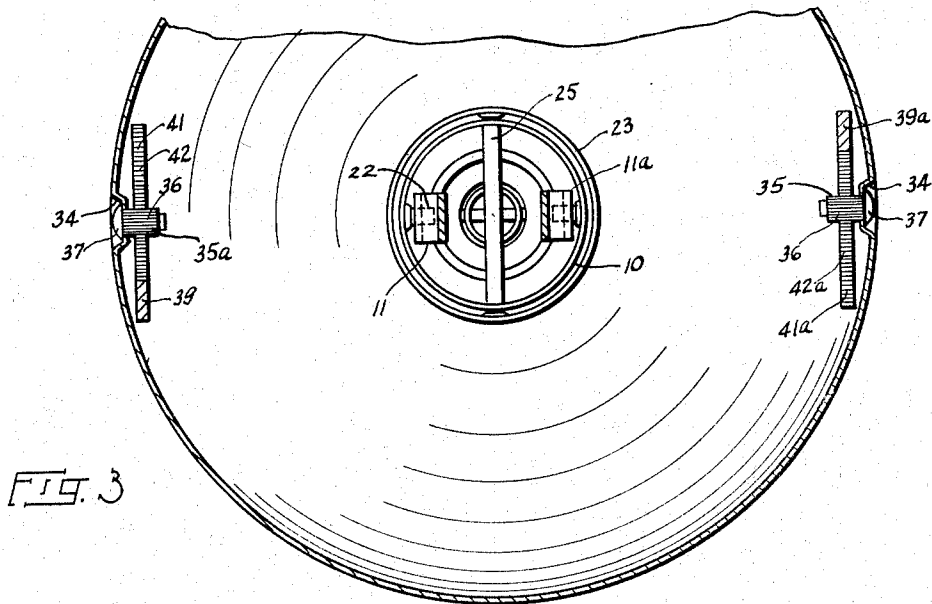
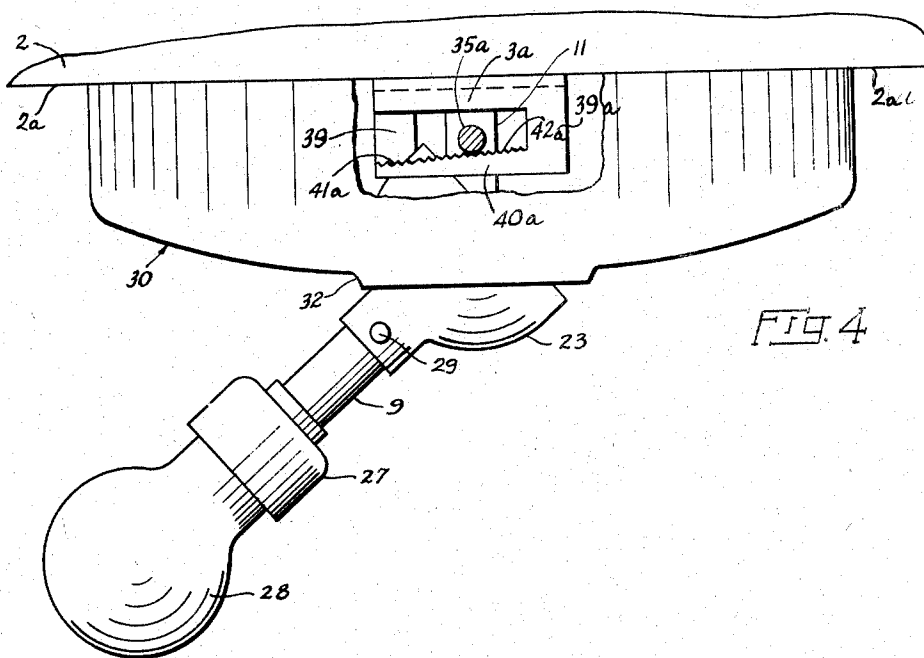
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## HANGER DEVICE FOR LAMP FIXTURES

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3 Claims. (Cl. 248—343)

Our invention relates to a new and improved combination hanger device for hanging or suspending a lighting fixture from a ceiling or other overhead support.

Even if intended to be planar and horizontal, the bottom face of a ceiling is often not truly planar and horizontal. Also, in many cases, the bottom face of a ceiling is intentionally inclined to the horizontal plane, by an angle of as much as 45°. As a result, when a conventional hanger is used for supporting a lighting fixture from a ceiling, the stem of such fixture is not located in the true desired vertical position.

According to one feature of this invention, the stem of the lighting fixture is connected to a supporting plate, by improved connecting means which include a universal joint, so that the stem of the lighting fixture is free to assume the true vertical position. These connecting means and the supporting plate can be quickly and conveniently assembled at the place of installation, with the only tool necessary being a screwdriver to tighten one screw and nut. The entire combination device can be shipped in unassembled form from the factory to the place of installation.

According to another feature of our invention, the combination device includes a canopy which can be easily and accurately assembled with the supporting plate at the place of installation, without the use of tools.

Numerous additional objects and features of this invention are disclosed in the annexed description and drawings, which disclose a preferred embodiment thereof. The invention is not limited to the details of said preferred embodiment.

Figure 1 is a top plan view of the improved combination hanger device in assembled form.

Fig. 2 is a vertical lateral section on the lateral line 2—2 of Fig. 1, showing the device assembled with an outlet box and the ceiling.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

Fig. 4 is a side elevation of Fig. 2, with representation of a part of the canopy omitted.

The drawings are substantially to scale and show the positions of the parts in the final assembly.

For convenience of illustration, the bottom face 2a of the ceiling 2 is shown as being accurately planar and horizontal. As above noted, said bottom ceiling face 2a is often uneven instead of being truly planar, and said bottom ceiling face 2a may be both uneven and inclined to the horizontal plane.

The supporting plate 1 is of rectangular shape. It has a front lateral edge 1a and a rear lateral edge 1b.

At its laterally opposed ends, the supporting plate 1 is integral with respective depending and planar flanges 3a—39a—40a and 3—39—40. These flanges are in vertical transverse planes in their positions of Fig. 2. As later explained, these flanges serve to hold the canopy

These flanges have identical shapes.

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As shown in Fig. 4, the flange 3a—39a—40a has an upper transverse arm 3a, a vertical connecting arm 39a, and a transverse bottom arm 40a. These transverse arms are in transverse horizontal position when the plate 1 is in the horizontal position of Fig. 2. A recess is thus provided in said flange. Said recess is open at one end, namely, at the free end of bottom arm 40a.

Said bottom arm 40a has an upper toothed edge 41a, which has teeth 42a. Said upper toothed edge 41a is inclined upwardly from the free end of bottom arm 40a.

As viewed in Fig. 2, the free end of arm 40a and the open end of the respective recess, are at the front end of bottom transverse arm 40a and hence at the front end of flange 3a—39a—40a.

As viewed in Fig. 2, the recess of the other flange 3—39—40 is open at the rear end of said flange. The toothed edge 41 corresponds to toothed edge 41a.

Hence the toothed edge 41a is upwardly inclined from front to rear, and the toothed edge 41 is upwardly inclined from rear to front. These inclinations are equal.

The plate 1 and its flanges can be made by cutting and bending a single sheet of flat metal.

Fig. 2 shows one type of conventional outlet box 4, which has bottom inturned lateral flanges 5, which are flush with the bottom face 2a of ceiling 2.

Plate 1 has two identical vertical cylindrical bores 6 whose centers are on a lateral line which is parallel to the lateral edges 1a and 1b, of plate 1. Said lateral line of said holes or bores 6 is equally transversely spaced from edges 1a and 1b.

The threaded shanks of vertical screws or bolts 7 can be passed through said holes 6 and through corresponding threaded holes of flanges 5, in order to fix plate 1 to flanges 5.

In order to fix the plate 1 to another well-known type of outlet box, said plate 1 is provided with standard keyhole bores 8.

The supporting plate 1 is provided with rectangular transverse openings or slots 13. The combination device includes identical and laterally spaced brackets 11 and 11a. For convenience these are designated as first bracket 11 and second bracket 11a. Each said bracket has a planar arm 12. Said arms 12 are perpendicular to plate 1. Said arms 12 are in vertical and transverse planes in Fig. 2. Each said bracket 11 and 11a has a top planar and lateral flange 14, which has a vertical opening 15. These flanges 14 abut the top face of plate 1 in the final assembly.

Each said bracket 11 and 11a has a bottom angular extension, which consists of a planar and lateral arm 19 and a planar transverse arm 18.

The flanges 14 can be easily inserted through the slots 13, to assemble the brackets 11 and 11a with plate 1, in the position shown in Fig. 2. The slots 13 are made sufficiently wide for this purpose. The respective slot 13 and flange 14 of the second bracket 11a provide second connecting means for bracket 11a.

Such assembly of plate 1 and brackets 11 and 11a may be at the place of installation of the combination. More conveniently, the flange 14 of first bracket 11 is fixed to the upper face of plate 1 at the factory, as by welding, in the final assembly position of bracket 11 relative to plate 1. The welded connection between first bracket 11 and supporting plate 1 exemplifies first fixing means.

The flange 14 of bracket 11a is finally fixed to plate 1 by second fixing means which consist of a bolt 16 and a clamping nut 17. This can be done at the factory or at the place of installation. The arm 12 of bracket 11a is tiltable relative to plate 1, when these parts 1 and 11a are assembled, if bolt 16 is removed or loosened to a loose position. The width of slots 13 is greater than the thickness of arms 12, so that bracket

11a has a limited turning movement around a horizontal transverse axis relative to plate 1, when the flange 14 of bracket 11a is located above plate 1 and bolt 16 is removed or loosened. The shank of bolt 16 extends through a hole 15 and through a vertically aligned hole of plate 1. The shank of bolt 16 may fit closely or loosely in the respective hole 15 of the respective flange 14. If there is such loose fit, the nut 17 can be moved down from tight fixing position or clamping position, while retaining nut 17 on the threaded shank of bolt 16. The arm 12 of bracket 11a can then be turned or tilted relative to plate 1, around said horizontal transverse axis, towards the other bracket 11 while retaining nut 17 on bolt 16. This can be done for conveniently assembling the inner joint cup 10 of the universal mount of the stem 9, with the lateral pivot pins 22 of brackets 11 and 11a. After said inner cup 10 has been thus assembled with brackets 11 and 11a, the arm 12 of bracket 11a can be moved to its final assembled position of Fig. 2, and the clamping nut 17 can then be turned to clamp bracket 11a in its final assembled position to plate 1.

Said inner joint cup 10 has an upstanding wall which optionally has the shape of a part of a sphere. The bottom wall of cup 10 is flat and has an opening 20.

The upstanding wall of inner cup 10 has lateral inwardly bent projections 21, which are provided with circular bores which have a common lateral axis, which is horizontal in Fig. 2.

A lateral pivot pin 22 is provided at each projection 21. The head of each pivot pin 22 is located in the recess of a respective projection 21. The head of each pivot pin 22 is fixed to the outer face of inner cup 10. The cylindrical shanks of pivot pins 22 extend laterally inwardly into inner cup 10. Said shanks of pivot pins 22 have a common lateral axis, which is horizontal in Fig. 2.

Said cylindrical shanks of pivot pins 22 also extend through and fit closely and turnably in cylindrical bearing bores of the vertical transverse arms 18 of brackets 11 and 11a; so that inner cup 10 can turn freely around a lateral axis relative to brackets 11 and 11a.

As above noted, the first bracket 11 may be optionally fixed rigidly and permanently to supporting plate 1, at the factory where the parts of the combination device are made or assembled by means which are conveniently designated as first fixing means. The bracket 11a may be assembled at the factory with plate 1, by means of bolt 16 and nut 17. As above noted, the shank of bolt 16 may have a loose fit in the respective bore 15 and even in the respective aligned bore of plate 1, and each arm 12 may have a loose fit in the respective slot 13. By loosening the clamping nut 17, while retaining it on bolt 16, the arm 12 of bracket 11a may be tilted laterally towards arm 12 of bracket 11. One pivot pin 22 of inner cup 10 can be inserted through the respective bearing bore of bracket 11. When bracket 11a is thus tilted towards bracket 11, the bearing bore of bracket 11a clears the respective pivot pin 22, which is the right-hand pivot pin 22 in Figure 2.

The bracket 11a is then turned from its temporarily tilted position in which it is tilted toward bracket 11, to the final position of bracket 11a of Fig. 2, thus inserting said right-hand pivot pin 22 of Fig. 2 through the bearing bore of bracket 11a. The clamping nut 17 can then be moved to its final clamping position of Fig. 2.

This provides an easy and convenient turnable assembly between the inner cup 10 and the supporting plate 1.

The arms 12 may be sufficiently resilient to spring bracket 11a towards bracket 11, in order turnably to assemble inner cup 10 with brackets 11 and 11a by means of pivot pins 22 and 22a.

When the assembled, inner cup 20 can turn easily relative to brackets 11 and 11a, around a lateral axis which is horizontal, when the parts are in the position of Fig. 2.

The outer joint cup 23 also has an upstanding wall which optionally has the shape of a part of a sphere. These upstanding walls of inner cup 10 and outer cup 23 may optionally have a close turning fit. The walls of cups 10 and 23 may be spaced from each other. The wall of outer cup 23 has a bottom circular opening 24, and a depending, integral, cylindrical sleeve or extension 26, which is shown in the vertical position in Fig. 2.

Said inner cup 10 has a horizontal and transverse pivot pin 25, which fits closely and turnably in and extends through transversely aligned bores of inner cup 10. The axis of pivot pin 25 is shown in the horizontal and transverse position in Fig. 2. Said horizontal and transverse axis of pivot pin 25 intersects the common lateral axis of the pivot pins 22 of the inner cup 10.

The protruding ends of the cylindrical pivot pin 25 also extend through corresponding holes of outer cup 23. The ends of pivot pin 25 are fixed to the wall of outer cup 23, as by swaging or in any other manner. The outer cup 23 may thus abut inner cup 10, or these cups may be held spaced from each other by pin 25.

Outer cup 23 can thus turn freely relative to inner cup 10, around a horizontal transverse axis. The outer cup 23 cannot turn around a vertical axis relative to inner cup 10.

The stem 9 of the lighting fixture is fixed non-turnably to the cylindrical extension or sleeve 26 of outer cup 23, by means of a rivet 29, so that stem 9 cannot turn around its axis relative to the outer cup 23. The details of the lighting fixture are not shown. For the purposes of this invention, it is sufficient to show a screw lamp-socket 27 which is fixed rigidly to stem 9, and a bulb 28 which can be screwed into and out of socket 27. The lamp-socket and lamp may be of the bayonet-joint type, or any other suitable type.

Since the sleeve 29 is non-turnable around its axis and stem 9 is rigidly and non-turnably fixed to sleeve 29, the lamp or lamps 28 may be inserted into and removed from the lighting fixture, without turning the stem 9 about its axis. It often requires considerable turning force to unscrew a bulb from its socket in the fixture. In conventional lighting fixtures, the stem of the fixture is screwed into position, or it is held in position by a nut. This results in unscrewing or loosening the stem of the fixture, when considerable turning force is exerted to unscrew or otherwise remove a bulb by a turning force. This disadvantage is eliminated in the invention, in addition to providing a universal connecting joint for the stem 9 of the fixture, so that stem 9 can turn freely to a vertical position, even if plate 1 is not in the true horizontal position which is shown in the drawings. The arms 12 are always perpendicular to plate 1. Hence, if plate 1 is not truly horizontal, the arms 12 are not truly vertical. However, since the cups 10 and 23 are freely turnable around respective axes which intersect and are in the same transverse plane and are perpendicular to each other, the weight of the lighting fixture always turns the stem 9 of said fixture to true vertical position.

The canopy 30 has an upstanding cylindrical wall 33, and a bottom wall 31. Said bottom wall 31 is shown as having an arched shape, but it may have any shape. Said bottom wall 31 has a neck 32, which has a circular opening 32a.

When the parts are in final assembly position, as shown in Fig. 2, the outer cup 23 fits turnably in opening 32a.

Said upstanding cylindrical canopy-wall 33 has laterally aligned depressions 34, which have respective bores. These bores have a common lateral axis, which is in the horizontal position in Fig. 2. Said common lateral axis of said bores of depressions 34, intersects and is perpendicular to the axis of the cylindrical canopy-wall 33. Said axis of cylindrical canopy-wall 33 is shown in the vertical position in Fig. 2.

Knurled pins 35a and 35, whose shanks 36 have lateral

ribs or flutes, also have heads 37 which are located in depressions 34. Said heads 37 are preferably and optionally fixed to the walls of the depressions 34, so that said pins 35a and 35 are non-turnable relative to canopy-wall 33.

These shanks 36 are cylinders which have ribs or flutes which are parallel to the common axis of said shanks 36.

In order to assemble the canopy 30 with said depending flanges 3—39—40 and 3a—39a—40a, after plate 1 has been fixed in position, the canopy 30 is moved upwardly, until its pins 35a and 35 register with the open ends of the transverse recesses of said flanges. The canopy 30 is then turned around its vertical axis, until its pins 35a and 35 enter the open ends of said recesses. This causes the pins 35a and 35 to contact initially with the lower ends of the toothed edges 41 and 41a, or adjacent said lower ends. As the turning movement of canopy 30 around the axis of its wall 33 is continued, the pins 35a and 35 move along said toothed edges, upwardly relative to the bottom face 2a of ceiling 2, until the entire upper circular edge of canopy 30 is pressed against face 2a of ceiling 2, if said face 2a is accurately planar. The upper circular edge of canopy 30 is in a single transverse plane. The combination of the toothed edges 41 and 41a, which are inclined reversely upwardly, and the ribbed shanks 36 or pins 35 and 35a, thus provides a wedge action which securely clamps the upper edge of canopy 30 against the ceiling face 2a, even if said face 2a is inclined to the horizontal plane. Since a part of plate 1 abuts the ceiling face 2a, the proper location of the canopy to ceiling face 2a is assured.

The upper faces 41 and 41a constitute cam-surfaces, which act upon the pins 35a and 35, to force said pins and the canopy upwardly.

The teeth 42a may be ratchet teeth which are inclined towards the closed end of the respective recesses.

The invention is not limited to the use of teeth and fluted shanks 36. By making the shanks 36 of soft metal, they can be slightly deformed to provide a tight frictional fit upon the arms 40 and 40a.

In addition to the complete combination, the invention also includes the sub-combinations and the respective parts of the combination. The supporting plate 1 may be a supporting member of any shape, and it may be held or located in any position. Hence the invention is not limited to the assembly of the combination with the ceiling of a room.

The flanges of plate 1 need not be parallel, and numerous other changes, omissions, substitutions and additions can be made in the disclosed embodiment, without departing from the scope of the invention.

In one broad aspect of the invention, it includes a supporting member of any shape, which has arms or flanges which are parallel or non-parallel, and which extend from the same side of said supporting member, said arms or flanges being exemplified by 3—39—40 and 3a—39a—40a, said arms or flanges being open at opposed ends thereof, said arms or flanges having cam-means for forcing the canopy in the direction of said supporting member.

The cam-walls 41a and 41 are defined as being those walls of the respective recesses which are remote from the plate 1 or other supporting member.

We claim:

1. A combination mount for the stem of a lighting fixture, said mount comprising in combination a supporting plate which has laterally opposed ends and which is adapted to be fixed to a ceiling, a first bracket and a second bracket which have respective first and second arms which depend from said plate between the laterally opposed ends of said plate, said first and second arms being spaced laterally from each other below said plate, said first bracket having a first top end which is fixed to said supporting plate by first fixing means, said second

bracket having a second top end which is connected to said supporting plate by second connecting means and second fixing means, said second fixing means being manually adjustable to a loose position and to a tight fixing position, said second arm being laterally tiltable at said second connecting means towards said first arm when said second fixing means are in said loose position, said second arm being rigidly fixed to said plate by said second fixing means when said second fixing means are in fixing position, said arms having laterally aligned bores at their lower ends, a universal joint which includes a hollow inner joint member and an outer hollow joint member, said inner joint member being located within said outer joint member, said lower ends of said arms and said laterally aligned bores thereof extending into said inner joint member below the top thereof, said inner joint member having laterally aligned pivot pins which extend turnably through said bores, said second arm being sufficiently laterally tiltable towards said first arm to separate said bore of said second arm from the respective pivot pin when said second fixing means are in said loose position, said outer joint member being turnably connected to said inner joint member by a transverse pivot pin, and a stem fixed to said outer joint member below said pivot pin.

2. A combination mount according to claim 1 in which said supporting plate has transversely disposed flanges depending from the laterally opposed ends of said supporting plate, each of said flanges having a front edge and a rear edge, said flanges having transversely disposed recesses, one recess having an opening at a front edge of one flange, the other recess having an opening at the rear edge of the other flange, a bottom wall of each recess being inclined from the respective opening upwardly toward said plate, a canopy which has an upstanding wall and which has a bottom wall which has a bottom opening, said upstanding wall having lateral and laterally aligned canopy pins which are insertable into said recesses through the respective front and rear openings thereof, said pins being in contact with and having means fixing said canopy pins to said bottom recess wall, said bottom recess wall being sufficiently long and being sufficient upwardly inclined relative to said plate to abut the upper edge of said canopy against the bottom face of said plate by turning said canopy about the axis of said upstanding wall, said outer joint member extending turnably about its transverse pivot pin through said bottom opening.

3. A device for supporting a lighting fixture from a ceiling wherein there is a ceiling recess having an outlet box therein, said device comprising a substantially flat plate having upper and lower faces with the upper face of said plate in abutment with the portion of the ceiling surrounding the recess therein, means to secure said plate to the outlet box, said plate having laterally opposed ends and having depending flanges at said laterally opposed ends, said flanges being transversely disposed relative to said plate, each said flange having a front edge and a rear edge, said flanges having transversely disposed recesses, one recess having an opening at a front edge of one flange, the other recess having an opening at the rear edge of the other flange, a bottom wall of each recess being inclined from the respective opening upwardly toward said plate, said inclined walls each having transverse teeth and having substantially the same angle of inclination to said plate, a hollow canopy, knurled lateral pins mounted on said canopy and extending laterally into the hollow thereof and positioned thereon one each for cooperation with one each of said recesses so that rotation of said canopy relative to said plate will cause the knurled pins to ride up the inclined toothed surfaces of their respectively engaged recesses to move the canopy towards the plate, a pair of laterally spaced and transversely disposed slots in said plate, a bracket extending through each slot

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substantially perpendicularly from the lower face of said plate, means to secure each bracket to the plate, said slots being of sufficient area to permit the bracket extending therethrough to pivot laterally relative to said plate, axially aligned bores at the bottom of each bracket, a hollow inner joint cup, a pair of lateral and laterally spaced pivot pins fixed to said inner joint cups and extending laterally towards each other, each pivot pin being mounted in one each of said bores to enable said inner cup to pivot turnably relative to said brackets, an outer joint cup surrounding said inner joint cup, axially aligned bores in said outer and inner cups having their axis normal to the axis of the bores in said brackets, a supplemental pivot pin extending through said bores in said outer and inner cups and secured at its ends to said outer cup, an opening in said canopy, said outer cup

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having a portion extending through said opening, a sleeve in the bottom portion of the outer cup, and a stem non-rotatably fixed in said sleeve.

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