July 17, 1962 A. M. DAVID 3,045,203

ELECTRICAL SUSPENSION DEVICE

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FIG. 1

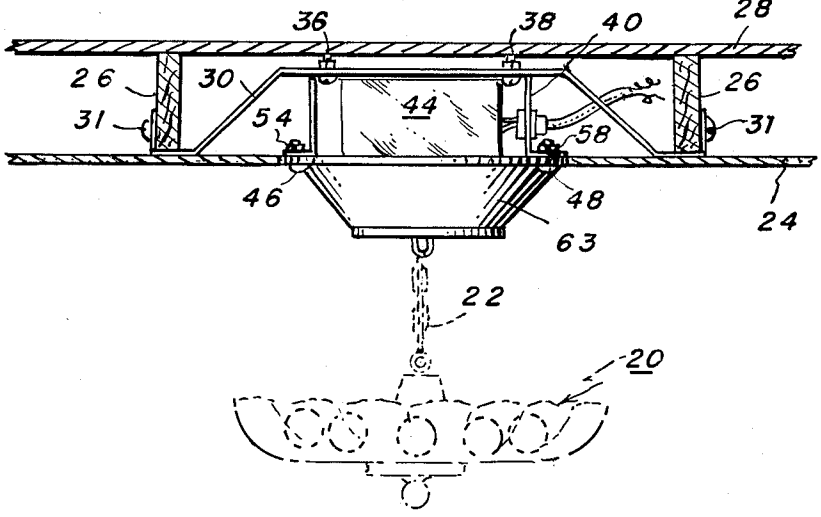


FIG. 2

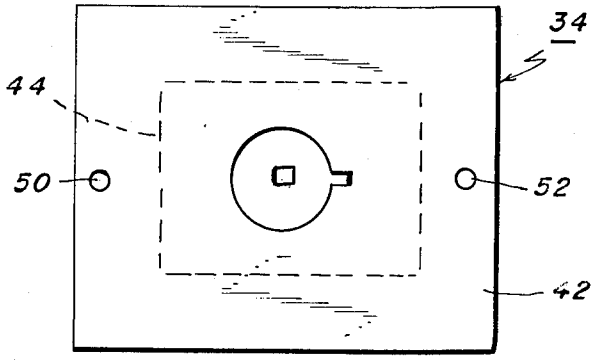


FIG. 3

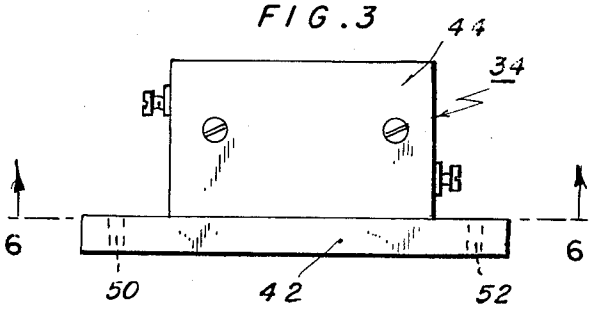


FIG. 4

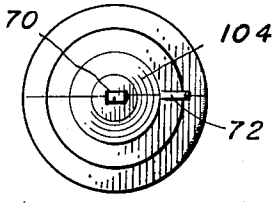
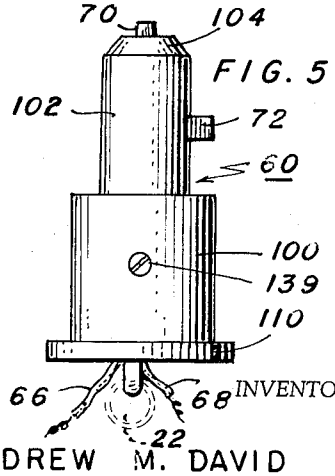


FIG. 5



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FIG. 6

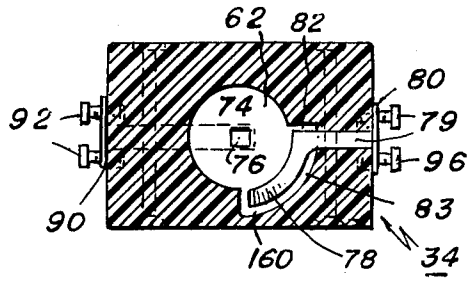


FIG. 7

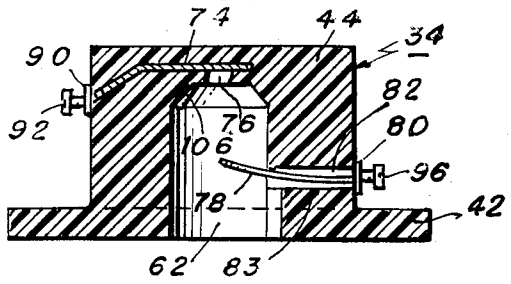
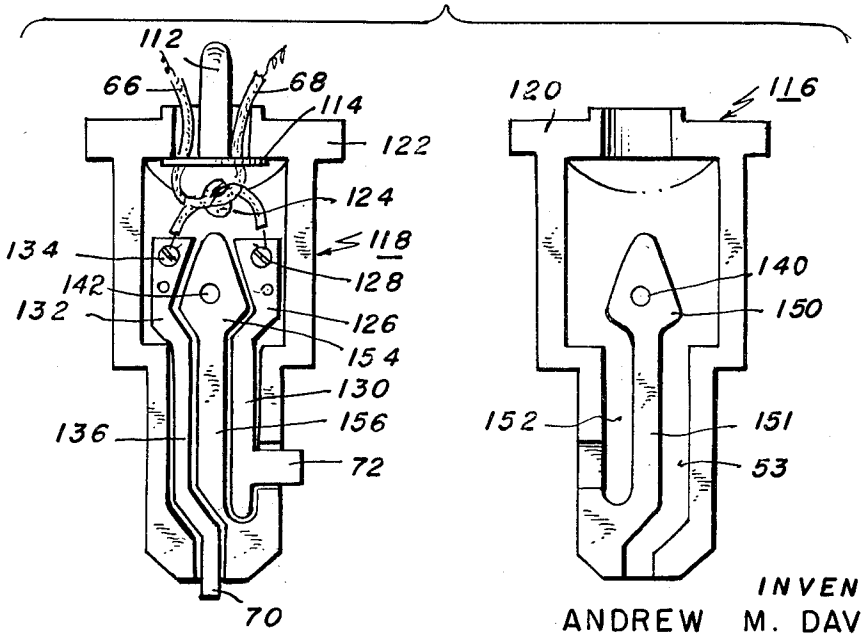


FIG. 8



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3,045,203

ELECTRICAL SUSPENSION DEVICE

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The present invention relates to the suspension of electrical devices from ceilings and other overhead locations. More particularly, the present invention relates to a device for suspending electrical devices from a ceiling or other overhead structure in a readily detachable fashion so as to be speedily replaced upon burning out of the device or other need for replacement.

There is also a safety aspect to the invention in that the device is designed to prevent electrical shock to persons handling the device.

When overhead structures are employed to support electrical fixtures such as lighting chandeliers containing bulbs or tubes, and these bulbs or tubes burn out, it is necessary to replace the tubes or bulbs. Where it is necessary for maintenance men, such as janitors, to enter business offices to make these replacements, their presence for any length of time might interrupt business conferences and cause delay to the business being carried on in the room. Particularly is this true where it is necessary to reach the chandelier, partially disassemble the chandelier and replace the bulbs therein and reassemble and rehang the chandelier. Where lighted chandeliers become dirty, it is also inconvenient to climb a ladder to clean the chandelier particularly if partial disassembly of the chandelier is necessary.

The present invention provides a device for suspending electrical lighting fixtures from the ceiling so that the entire fixture can be readily disconnected from the overhead ceiling and another previously prepared fixture inserted and locked in position in the ceiling. Subsequently, the burned out chandelier can be rejuvenated by replacement of the bulbs in the janitor's rooms without disturbing excessively the business going on in the offices being lighted.

A further object of the invention is to provide a chandelier suspendable from a ceiling by a readily releasable connection.

A further object of the invention is to provide a readily-releasable suspension device.

A further advantage of the invention is that it provides a device for suspending an electrical fixture from a ceiling wherein the device is readily releasable but held tightly by the resilient engagement of electrical contact members.

A further feature of the invention is that it provides apparatus for suspending electrical fixtures from a ceiling wherein no electrical circuit is completed until all the contact members are covered by insulated parts so as to prevent shock to people.

A further object of the invention is to provide an electrical suspension plug that is readily disassembleable and constructed to insulate the two conductor bars from each other.

For a better understanding of the invention and its other objects, advantages and details, reference is now made to the present preferred embodiment of the invention, which is shown, for purposes of illustration only, in the accompanying drawings.

In the drawings:

FIG. 1 is an elevation view of a suspension device according to the invention shown suspending a chandelier from a ceiling;

FIG. 2 is a bottom view of a receptacle that is secured in the ceiling in FIG. 1;

FIG. 3 is a side elevation view of the receptacle shown in FIG. 2;

FIG. 4 is a top plan view of the plug shown in FIG. 5;

FIG. 5 is a side elevation view of the plug that mates with the receptacle shown in FIGS. 2 and 3;

FIG. 6 is a horizontal section view taken along the line 6—6 in FIG. 3 and showing the details of the receptacle;

FIG. 7 is a vertical section view through the receptacle shown in FIG. 3; and,

FIG. 8 is an exploded view of the two complementary halves of the plug shown in FIG. 5.

Briefly stated, the invention includes an electrical connecting and suspending device comprising a receptacle that is fixed in the ceiling or other overhead and a plug which is secured to the suspended fixture and releasably engages the receptacle. The receptacle is provided with a female hole to receive the male plug. A plate contact is located at the end of the receptacle hole to be engaged by an end contact member on the plug. For completion of the electrical circuit and for tightly holding the suspended device connected to the receptacle, the receptacle is provided with an enlarged portion of the hole containing a resilient electrical contact member which pressingly engages a side contact member on the plug to tightly but releasably hold the plug in engagement with the receptacle. To attach the plug to the receptacle, the plug is inserted in the receptacle and then rotated so that the side plug contact member enters the enlarged hole portion.

Referring to the drawings, FIG. 1 shows a chandelier **20** containing a light bulb and suspended by a chain **22** from a ceiling **24** including support braces **26** and a base member **28**. A bracket **30** of general frusto conical shape is mounted above the ceiling **24** and secured to braces **26** by screws **31**. Electrical suspension receptacle **34** is secured to bracket **30** by screws **36** and **38** having associated nuts which engage a generally U-shaped suspension member **40**. The receptacle **34** includes a plate **42** and a block **44** integral with the plate **42** and extending upwardly therefrom. Screws **46** and **48** extend through holes **50** and **52** in the receptacle plate **42** and through mating holes in flanges **54** and **58** of the generally U-shaped member **40** to secure the receptacle in the member **40**.

The chain **22** and accompanying electrical leads extend upwardly from chandelier **20** and are secured at their upper end to a suspension and electrical connecting plug **60**, referring to FIG. 5, which is shaped to be received in a hole **62**, referring to FIGS. 6 and 7, formed in the receptacle **34**.

In FIG. 1, the plug **60** is covered by a frusto-conical shield **63** releasably secured to plate **42**.

Referring to FIG. 5, the two electrical leads **66** and **68** are connected, respectively, to end contact member **70** and rectangular side plug contact member **72**. To complete the electrical circuit when the plug **60** is received in the receptacle **34**, the receptacle is provided with an end electrical contact plate **74**, referring to FIGS. 6 and 7, extending over the end of the diminished aperture **76** formed at the upper end of hole **62**. The receptacle **34** also includes a side contact member **78** that is arcuate and inclined axially of the hole **62** so that the end **79** thereof connected to terminal plate **80** lies adjacent the upper end of arcuate enlarged hole portion or slot **82** formed on the side of hole **62**. A ledge **83** forms the lower surface of slot **82**. The receptacle side contact member **72** extends downwardly along its length around the curve of the hole **62** to a position closer to the lower end or entrance to hole **62**. The contact member **78** is of resilient material so as to pressingly engage the plug side contact member **72** when the plug **60** is engaged in the

receptacle 34. The receptacle end electrical contact plate 74 is connected to a terminal plate 90 having screws 92 attached thereto for connection to one lead of electrical power cable 94, referring to FIG. 1.

Similarly, the terminal plate 80 secured to the side of receptacle 34 has screws 96 attached thereto for connection to the other lead of electrical cable 94.

Referring to FIGS. 4, 5, and 8, the plug 60 includes an enlarged base 100 of circular cylindrical shape, a stem 102 of circular cylindrical shape and smaller diameter than the base 100, and a frusto-conical terminal portion 104 to mate with a frusto-conical surface 106 at the upper end of hole 62 in receptacle 34, referring to FIG. 7. A flange 110 is attached to the lower end of base 100.

The plug 60 is formed in two complementary halves, referring to FIG. 8, and includes a suspension ring 112 having a flange 114 received in the hollow interior of the plug. The plug 60 includes plug half 116 and plug half 118. The ring 112 and the electrical leads 66 and 68 extend through a hole formed by semi-cylindrical openings formed in the end 120 of plug half 116 and the end 122 of plug half 118. The leads are knotted at 124 and the lead 66 is connected to a conductor bar 126 secured by a screw 128 to the plug half 118 and having an arm portion 130 integral with the side contact member 72.

The lead 68 is connected to an electrode 132 secured by a screw 134 to a plug 118. The conductor bar has an arm portion 136 terminating in end contact member 70.

The two plug halves 116 and 118 are held together by a screw 139, referring to FIG. 5, extending through mating holes 140 and 142 formed in the plug halves 116 and 118, referring to FIG. 8.

The plug halves 116 and 118 are hollowed or cutaway to accommodate the leads 66 and 68 and the conductor bars 126 and 132. The plug half 116 includes a generally diamond-shaped raised dividing portion 150 and a longitudinal dividing rib 151 for maintaining electrical insulation between the conductor bars. The conductor bars 126 and 132 are received in troughs 152 and 53 formed on opposite sides of longitudinal dividing rib 151.

Similarly, the plug half 118 includes a generally diamond-shaped raised insulating portion 154 and a longitudinal insulating rib 156 for maintaining electrical insulation between the conductor bars 126 and 132 received in troughs in plug half 118 formed on opposite sides of rib 156.

The plug 60 is inserted in the hole 62 with the side contact member 72 passing through a notch 160, referring to FIG. 6 adjacent to hole 62. The notch 160 communicates both with hole 62 and with arcuate slot 82 formed on the side of said hole. The plug is inserted until the contact member 72 reaches the arcuate slot 82. Then the plug is rotated a quarter turn, or 90 degrees, and the side contact member 72 engages the resilient receptacle contact 78 flexing the contact while the stress therein serves to releasably bind the contact member 72 in the slot 82.

The end contact 70 engages the contact plate 74 and the electrical circuit is completed and the chandelier lighted.

When it is necessary to lower or replace the chandelier, it is merely necessary to grasp the plug 60 after removing the frusto conical shield 63, referring to FIG. 1, turn the plug 60 a quarter turn, and pull downwardly to remove the plug 60 from the receptacle 34.

Thus it will be seen that the invention provides a device for suspending and connecting an electrical fixture wherein the fixture is tightly and safely but releasably suspended from a ceiling.

While a present preferred embodiment of the invention has been illustrated and described, it will be recognized that the invention may be otherwise variously embodied and practiced within the scope of the following claims.

I claim:

1. Apparatus for suspending and electrically connecting fixtures from an overhead structure including a receptacle and a plug releasably mating with said receptacle, said receptacle having a hole formed therein to accommodate said plug, a receptacle end contact member at the end of said hole, said receptacle having a slot formed on the side of said hole, a resilient side receptacle contact member positioned in said slot, said side receptacle contact member extending around said hole and being inclined to the axis of said hole, said slot being dimensioned to permit said receptacle side contact member to flex therein; said plug being formed of disassemblable portions, a pair of conductor bars received between said plug portions, a side plug contact member extending out from the side of said plug at a position to be received in said receptacle slot in engagement with said resilient side receptacle contact member and supported on a portion of said receptacle forming said slot when said plug is inserted in said receptacle hole, said side plug contact member being connected to one conductor bar, an end plug contact member extending outwardly from the end of said plug to engage said receptacle end contact member, when said plug is inserted in said receptacle hole, said end plug contact member being connected to the other conductor bar, said plug having an opening formed in its end remote from said end plug contact member, said opening being adapted to receive electrical leads for attachment to said conductor bars, and suspension means received in said plug at said opening for suspending fixtures from said plug.

2. The invention as set forth in claim 1 wherein said suspension means includes a ring and a flange connected to said ring, said flange being supported within said plug.

3. Electrical suspension apparatus including a receptacle mounted in an overhead structure and a plug releasably mating with said receptacle, said receptacle having a vertical hole formed therein to accommodate said plug, a receptacle end contact plate extending across the end of said hole, said receptacle having an arcuate slot formed on the side of said hole, a terminal plate mounted in said receptacle, a resilient side receptacle contact member having one end fixed to said terminal plate, said side contact member being positioned in said arcuate slot and extending around said hole, said resilient receptacle side contact member being inclined to the axis of said hole, said arcuate slot being dimensioned to permit said receptacle side contact member to flex therein; said plug being formed of disassembleable portions, a pair of spaced conductor bars received between said plug portions, said plug portions being shaped to insulate said conductor bars from each other, one said conductor bar having its end extending out of the upper end of said plug to form a plug end contact member, the other conductor bar including a side plug contact member extending out from the side of said plug at a position to be received in said receptacle slot in engagement with said resilient side receptacle contact member and supported on a portion of said receptacle forming said slot when said plug is inserted in said receptacle hole, said plug having an opening formed in its lower end for receiving electrical leads, said plug having a hollow interior joined to said opening for receiving said leads, means for connecting said leads to said conductor bars, a suspension ring extending downwardly through said plug opening and including a flange received in said hollow space of said plug portions, whereby fixtures can be suspended from said ring.

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