Nov. 28, 1972 R. C. PICCOLA 3,704,212

ADJUSTABLE LIGHT FIXTURE FOR U-SHAPED LAMPS

Filed Oct. 22, 1970

FIG. 1

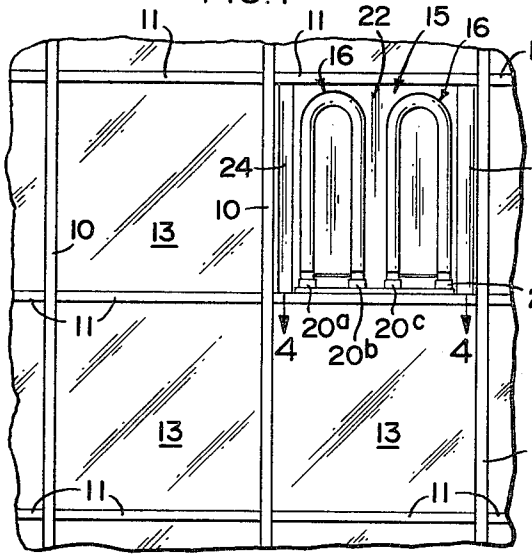


FIG. 2

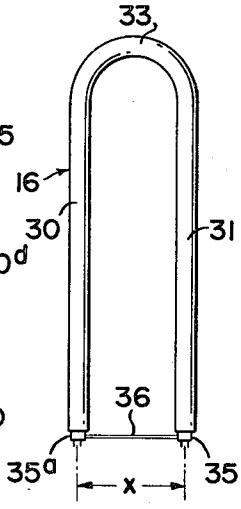


FIG. 3

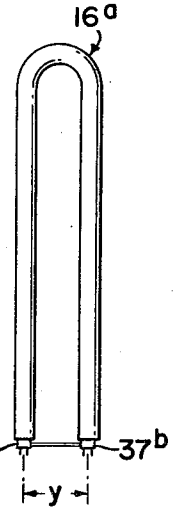


FIG. 4

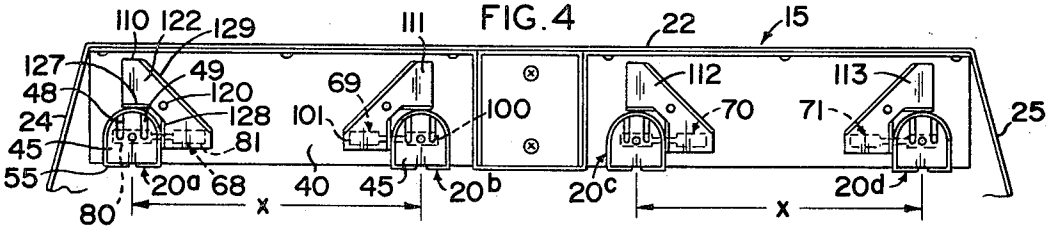


FIG. 5

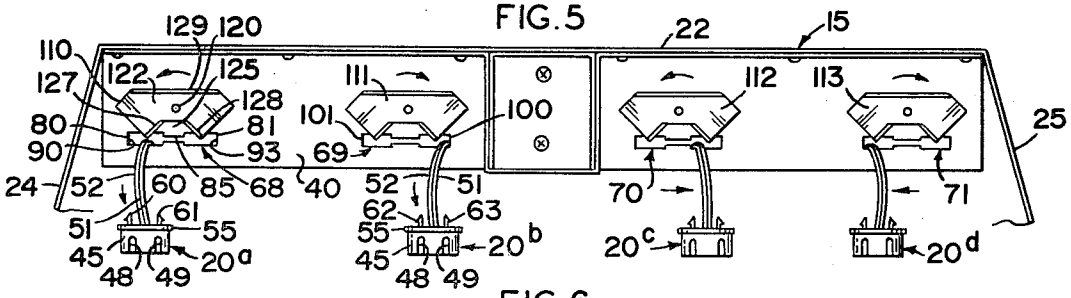


FIG. 6

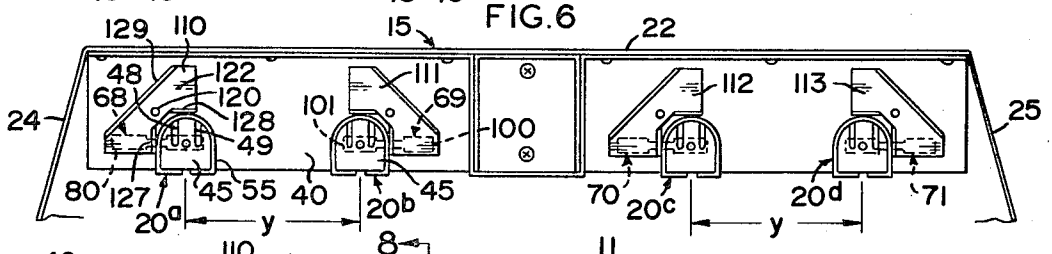


FIG. 7

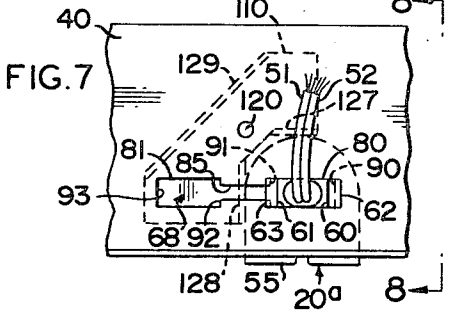
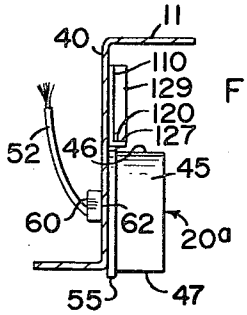


FIG. 8



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United States Patent Office 3,704,212
Patented Nov. 28, 1972

3,704,212

ADJUSTABLE LIGHT FIXTURE FOR U-SHAPED LAMPS

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Filed Oct. 22, 1970, Ser. No. 82,897
Int. Cl. H01r 33/08
U.S. Cl. 240—51.12 5 Claims

ABSTRACT OF THE DISCLOSURE

An adjustable light fixture for U-shaped fluorescent lamps accommodates lamps of different base spacing by providing spaced interconnected slots to receive moveable lamp sockets and moveable closure means to hide unused slots.

BACKGROUND OF THE INVENTION

(1) Field of the invention

The invention finds use in the field of building construction and primarily in the installation of ceiling lighting fixtures or lampholders in suspended grid systems. Such fixtures are designed in modular units which fit into openings of preselected dimensions and are supported on interlocking grid members. The fluorescent lamps held in the fixtures of the invention are U-shaped rather than elongated lengthwise and have twin spaced bases.

Unfortunately, there is a lack of uniformity in the distance between the centerline of the bases of the U-shaped fixtures made by different manufacturers. Rather than have separate fixtures adapted for use with the different lamps, it becomes desirable to have a fixture which can be changed in the field to fit lamps of different base spacing.

At the same time to secure fire-hazard ratings, it becomes necessary to provide some means to cover unused, exposed openings in the fixture.

In addition the speed and ease with which the lamp sockets can be changed to accommodate preselected lamps becomes a marketing consideration.

(2) Description of the prior art

Some of the prior art fixtures have no provisions for altering the socket spacing, and thus the installer is restricted in the selection of lamps.

Other prior art fixtures include a sliding bracket which holds the socket and covers its own opening when going from one position to another. A still further prior art structure requires the complete disconnecting of at least one socket and its movement to a separate slot with subsequent reconnection to the electrical circuit.

The disadvantages of the prior art systems are overcome by the present invention which permits easy relocation of the sockets to accommodate lamps of different distances between their bases.

It is, therefore, an object of the present invention to provide a novel lighting fixture which can easily be adapted to fit U-shaped fluorescent lamps with different base spacings.

It is another object of the present invention to provide a novel lighting fixture which is safe and has a self contained moveable plate for covering an opening which would otherwise expose wiring.

SUMMARY OF THE INVENTION

The present invention is directed toward an adjustable lampholder or lighting fixture for U-shaped fluorescent lamps which can have differently spaced bases. The lampholder has moveable plates which cover otherwise exposed wiring showing through an uncovered slot.

Other features and objects of the present invention will become apparent to those skilled in the art when the present description is considered in the light of the accompanying drawing in which like elements are identified by like numerals and in which:

FIG. 1 is a general plan view of a suspended grid ceiling showing the lighting fixture of the invention with a glass lens removed;

FIGS. 2 and 3 show plan views of fluorescent lamps used with the invention;

FIG. 4 shows an end view of the light fixture of the invention taken along lines **4**—**4** of FIG. 1;

FIGS. 5 and 6 show an end view of the light fixture of the invention similar to FIG. 4 but with the moveable cover plate and the sockets being in stages of adjustment;

FIG. 7 is a rear view of a portion of the invention shown in FIG. 4, and

FIG. 8 is a cross-sectional view of a portion of the light fixture taken along lines **8**—**8** of FIG. 7.

Referring now to the drawing and particularly FIG. **1**, thereof, there is shown a view of a ceiling looking upwardly from below. The ceiling comprises main suspension members **10** with cross-suspension members **11** connected to the main suspension members to form a series of open grids. The suspension members are generally inverted T-shaped in cross-section and are hung from an overhead support by wires or straps. The T-shaped configuration results in a pair of outwardly extending flanges in a horizontal plane with a central vertical web. In the illustrated version, this grid forms square openings into which acoustical panels **13** may be placed. Acoustical panels **13** rest along their outer peripheral areas on the horizontally extending flange portions of the grid members.

In one of the openings a light fixture **15** of the present invention may be supported. Light fixture **15** comprises a pair of fluorescent lamps **16** supported at their bases in sockets **20***a*, **20***b*, **20***c* and **20***d* respectively. A cover **22** overlies the lamps **16** and spans the grid opening. Cover **22** has outwardly and downwardly flairing edges **24** and **25** which are supported on the horizontal flanges of the suspension members **10**.

FIG. 2 shows a typical U-shaped fluorescent bulb **16** which has parallel sides **30** and **31** connected by a bight portion **33** to form a horse-shoe-shaped design. At the free ends of sides **30** and **31** are end caps **35***a* and **35***b* with outwardly extending connector pins adapted to be inserted into sockets **20***a* and **20***b* respectively. A strengthening rod **36** is connected between the end caps **35***a* and **35***b*.

The spacing between the center lines of end caps **35***a* and **35***b* of lamp **16** is designated as "X." This distance may be preselected, as desired, but in current manufacture is generally 6 inches for one standard manufacturer. A similar typical U-shaped lamp **16***a* is illustrated in FIG. 3 for which the distance between end caps **37***a* and **37***b* is different from that of lamp **16**. In the latter case, the conventional distance between end caps **37***a* and **37***b* for another manufacturer is 3⅝ inches and is designated as "Y." The problem is then to provide a lighting fixture which can be easily adjusted to fit either lamp, but in which there is no exposed wiring and which will pass a U.L. Underwriters inspection.

Light fixture **15** has an end plate **40** which forms a vertical closure for one end of the fixture and which serves as a support for lamp sockets **20***a*, **20***b*, **20***c* and **20***d* respectively. The end plate **40** is arranged to hold a pair of lamps **16** or **16***a* and the pairs of sockets **20***a*, **20***b* and **20***c*, **20***d* receive the twin pins of end caps **35***a* and **35***b*. In FIG. 4, the spacing of the sockets **20***a*–**20***d* is such

as to accommodate lamps **16** with spacing "X" between the end caps **35***a*, **35***b*. FIG. 5 shows an intermediate stage in the changing of location of the sockets while FIG. 6 shows the repositioned sockets **20***a*–**20***d* to accommodate lamps **16***a* with spacing "Y" between its end caps **37***a*, **37***b*.

For convenience, only the adjustment of one set of sockets **20***a* and **20***b* will be discussed, with the understanding that the other pair of sockets **20***c* and **20***d* will be adjustable in the same manner. Under some conditions it may even be desirable to change only one set of sockets so each socket is independently moveable.

Sockets **20***a* and **20***b* are conventional porcelain sockets for fluorescent lamps and consist of a porcelain body **45** having a thickness of about ½ inch, a rounded top **46** and a flat bottom **47**. Slots **48** and **49** are molded into the body **45** and spaced the standard distance between the pins of end caps **35***a*–**37***b*. Mounted inside the body and accessible through the slots are metal connectors (now shown) which are crimped or otherwise secured to the ends of insulated wires **51** and **52**. To shield the wire ends and their connections to the metal connectors from contact with the metal end of lamp fixture **15** is a thin plastic shield **55**. Shield **55** may be of rigid plastic such as polystyrene, polypropylene, or polyvinyl chloride polymer. Shield **55** is slightly larger than the porcelain body **45** so that the porcelain body **45** at no time contacts any metal of the lamp fixture **15**. In addition, the sockets **20***a*–**20***d* may be handled safetly because of the insulation effect of the porcelain body **45** and the shield **55**.

In addition, shield **55** has two integral fingers **60** and **61** extending outwardly behind the body **45**. Fingers **60** and **61** are spaced a predetermined distance apart and have outwardly extending projections **62** and **63** to lock the shield, and thus the socket **20***a*, into firm engagement with one of the slots cut into the end plate **40** of light fixture **15**. Fingers **60** and **61** are flexible enough to be moved toward each other to fit into slots, but are resilient enough to move back to their original positions to firmly engage the edges of slots in light fixture **15**. The spacing between the faces of projections **62** and **63** and the rear face of shield **55** is equal to the thickness of the metal of end plate **40**. Thus when socket **20***a* is snapped into engagement with end plate **40** it is held in place by the engagement of projections **62** and **63** with end plate **40**.

In the light fixture **15** there are four slots **68**–**71** cut into the metal end plate **40** to receive sockets **20***a*–**20***d*, respectively. Since the slots are identical in configuration only slot **68** will be described, with the understanding that comparable comments apply to the other slots **69**–**71**.

Slot **68** comprises two rectangular openings **80** and **81** connected by a narrow slot **85**. The size of opening **80** is such that the distance between its edges **90** and **91** is equal to the spacing of fingers **60** and **61** of shield **55**. The height of opening **80** is equal to the height of fingers **60** and **61**. Slot **85** is much narrower than opening **80** so that there is an end of the slot **80** which will receive and lock with finger **61** to hold the socket **20***a* in position. Corresponding opening **81** of slot **68** has edges **92** and **93** to likewise receive fingers **60** and **61** when socket **20***a* is moved over to its alternate position (shown in FIGS. 6 and 7).

Socket **20***a* is completely removeable from opening **80** by compressing fingers **60** and **61** toward each other until projections **62** and **63** are inside of and clear of edges **90** and **91**. Socket **20***a* may then be taken out of opening **80** by a forward pushing movement. Socket **20***a* may be inserted into opening **81** by pushing the socket into engagement therewith. Fingers **60** and **61** engage edges **92** and **93** of opening **81**.

When socket **20***a* is moved from openings **80** and **81**, some arrangement must be made to handle wires **51** and **52** and for this purpose narrow slot **85** is provided. When socket **20***a* is moved from openings **80** and **81**, wires **51** and **52** are moved through slot **85** so that they are directly behind the sockets **20***a* at all times.

Obviously, sockets **20***b*–**20***d* are moveable from the one opening of their respective slots **69**–**71** to another opening of slots **69** and **71** in a like manner.

To recapitulate, FIG. 4 shows sockets **20***a* and **20***b* engage in slots **68** and **69** respectively. Socket **20***a* engages the left-hand opening **80** of slot **68**, while socket **20***b* engages the right-hand opening **100** of slot **69**. In this manner, the maximum spacing between the sockets **20***a* and **20***b* is provided so that lamp **16** with spacing "X" between its end caps **35***a* and **35***b* can be accommodated.

FIG. 6 shows sockets **20***a* and **20***b* locked in the right-hand opening **81** of slot **68** and left-hand opening **101** of slot **69** respectively to provide for the minimum spacing "Y" between the end caps **37***a* and **37***b* of lamp **16***a*.

Up to this point, the manner in which the various slots can be used to adjust the spacing between the sockets for U-shaped lamps of different tube spacing has been fully described. Sockets **20***c* and **20***d* can be similarly placed in the openings in slots **70** and **71**, respectively.

In order to cover the unused opening of each slot when the socket is held in one of the openings, a series of cover plates **110**–**113** are provided, one of said plates for each slot **68**–**71**. Only one such cover plate **110** will be described in detail since the others can be identical and will function in a similar manner.

Cover plate **110** is centrally pivotally mounted with a rivet **120** so that it can assume either of two terminal positions by a pivotal action. In one terminal position cover plate **110** covers opening **80** of slot **68** and in its other terminal position it covers opening **81** of slot **68**. A rotation of 90° will move cover plate **110** from one terminal position to another.

Cover plate **110** comprises a flat main portion **122** having a centrally located hole (not shown) through which a rivet **120** is inserted. Main portion **122** may be considered to be generally triangular in shape with a cut-out section **125** which is in the form of a right angular cut and conforms generally to the size of socket **20***a* so that when in its position shown in FIG. 4 it covers slot **81** but permits socket **20***a* to be seated in slot **80**. Short flanges **127** and **128** are formed outwardly extending from main portion **122** to fit abutting the outer edge of shield **55**. Along the long outer edge **129** of main portion **122** is an upstanding flange which makes the pivotal action of the plate **110** easier to accomplish because it presents a gripping member for one's fingers to hold while performing the pivotal movement of plate **110**.

Plate **110** has such dimensions as to be pivotal within the confines of light fixture **15** and extend over the unused opening of slot **68**. While a particular configuration is illustrated other configurations with the scope of the teachings will be apparent.

In summarizing the function of the present invention, there is provided a light fixture which can easily be adjusted to accommodate U-shaped fluorescent lamps with different base spacings. Spaced slots are provided so that moveable sockets can be easily spaced with respect to each other. The sockets are held in place by fingers integral with an insulating shield. A narrow slot interconnects the socket holding openings to permit the electrical wires to be moved from one slot opening to another without disconnecting the sockets from the wiring.

A rotatable cover plate is provided with a socket receiving opening. The cover plate is rotatable between two terminal positions so as to cover an unused opening of its respective slot.

I claim:

1. An adjustable light fixture for U-shaped lamps having different spacings between their bases comprising a light fixture cover;

at least one end plate connected to said cover;

at least one pair of spaced slots in said end plate, each slot being adapted to mount a lamp socket for receiving one of the lamp bases;

each of said slots having spaced rectangular openings and a narrower slot connecting said spaced openings of each slot;

a pair of pre-wired lamp sockets;

means connected to said sockets for releasably connecting said sockets individually in pre-selected ones of said openings; and

a pair of moveable cover plates pivotally mounted on said end plate,

each of said cover plates being of unitary construction having a central portion pivotally connected to said end plate and two slot covering portions symmetrically located about said central portion,

each of said slot covering portions having at least one edge perpendicular to one edge of the other of said slot covering portions, forming a right angular cut-out portion adapted to conform generally to the outer shape of one of said sockets,

said pivoted connection being on a line perpendicular to and spaced from the center of said narrower slot,

each of said plates being adapted to move between two positions, in each of which positions a different rectangular opening is exposed to receive a corresponding one of said sockets.

2. An adjustable light fixture as recited in claim 1 in which the distance between two of said rectangular openings equals the spacing between the bases of one U-shaped lamp and the distance between another of two of said rectnagular openings equals the spacing between the bases of another U-shaped lamp.

3. An adjustable light fixture as recited in claim 1 in which the spacing between the two nearest openings equals the spacing between the bases of a U-shaped lamp and the spacing between the two most remote openings equals the spacing between the bases of a U-shaped lamp having a different base spacing.

4. An adjustable light fixture as recited in claim 1 in which the rectangular openings are of preselected length and have edge walls and in which said releasable socket connecting means comprises a pair of rearwardly extending resilient fingers spaced a distance equal to the preselected length of said rectangular openings to engage said edge walls.

5. An adjustable light fixture as recited in claim 1 in which each of said cover plates has an outwardly extending flange to facilitate rotation.

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U.S. Cl. X.R.

339—50 R