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2,615,123

CEILING FIXTURE FOR FLUORESCENT LAMPS

Filed Oct. 25, 1947

3 Sheets-Sheet 1

FIG. 1.

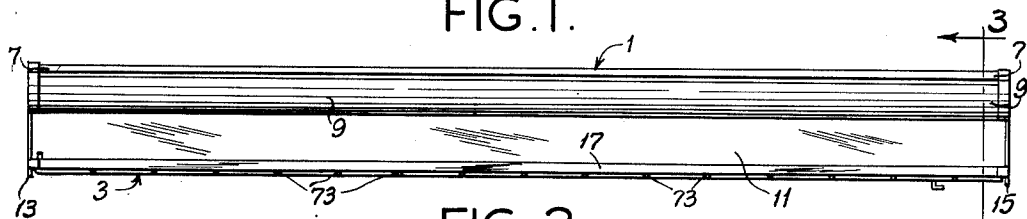


FIG. 2.

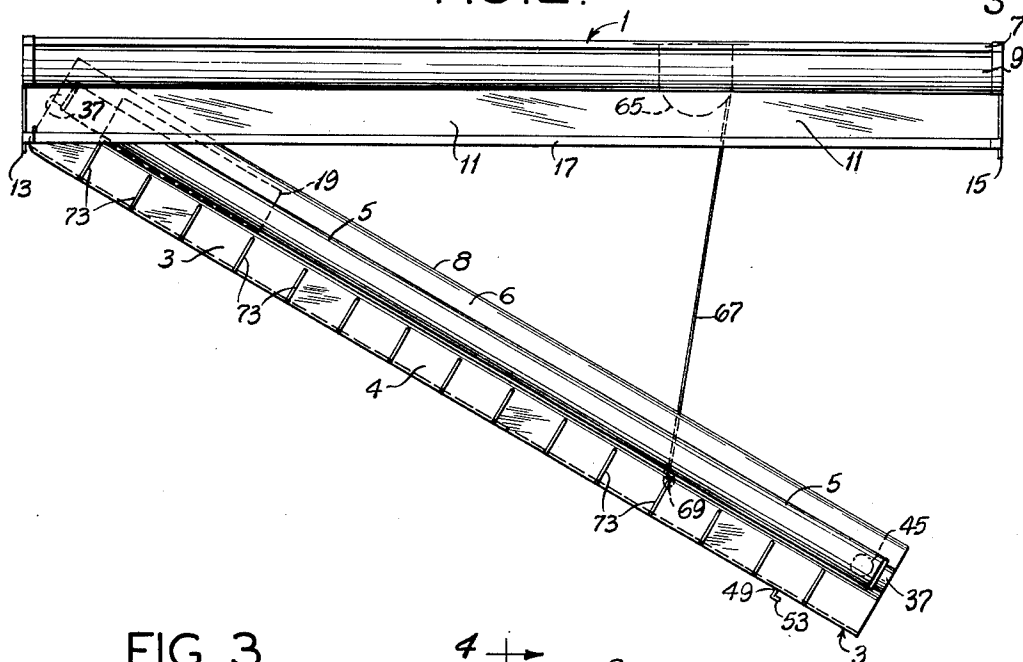
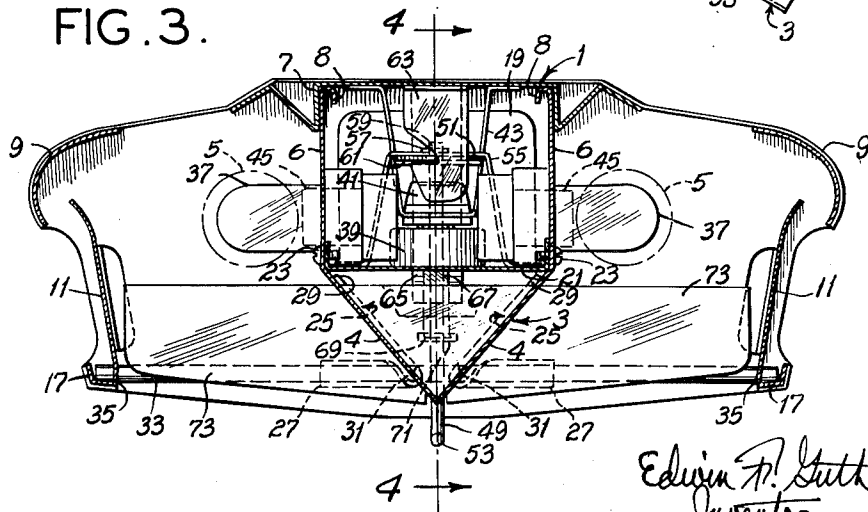


FIG. 3.



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FIG. 4.

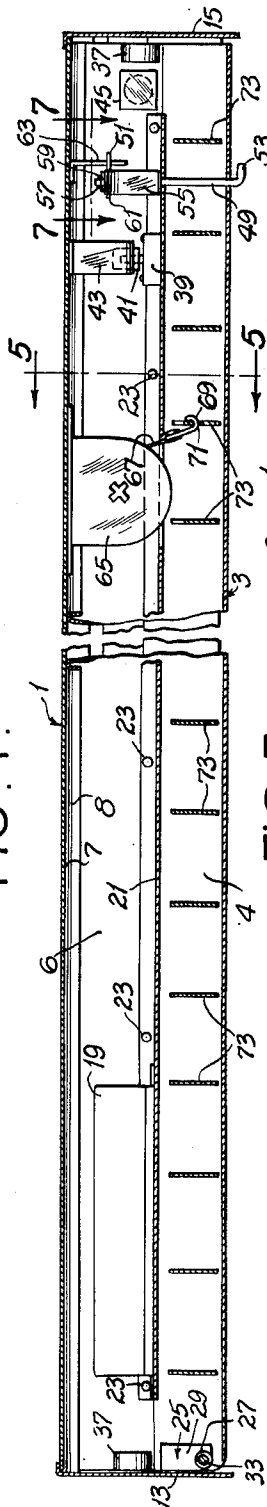


FIG. 5.

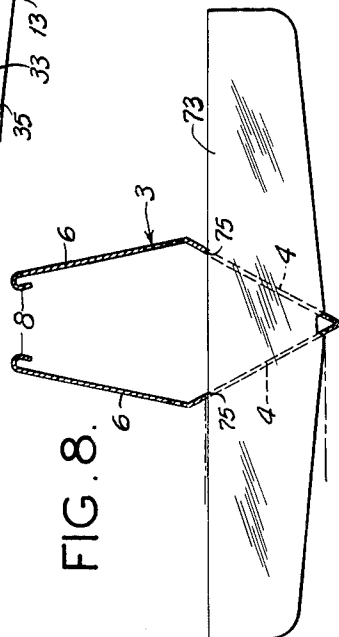
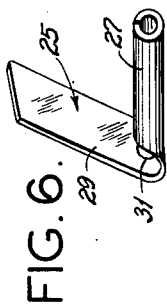
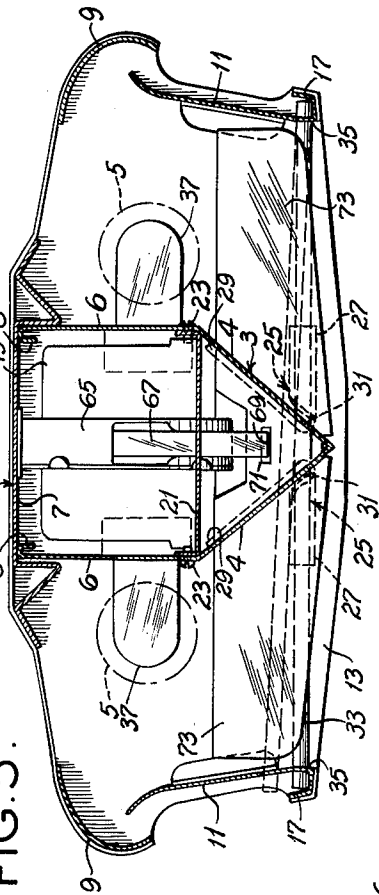


FIG. 8.

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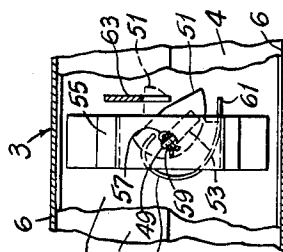


FIG. 7.

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FIG. 9.

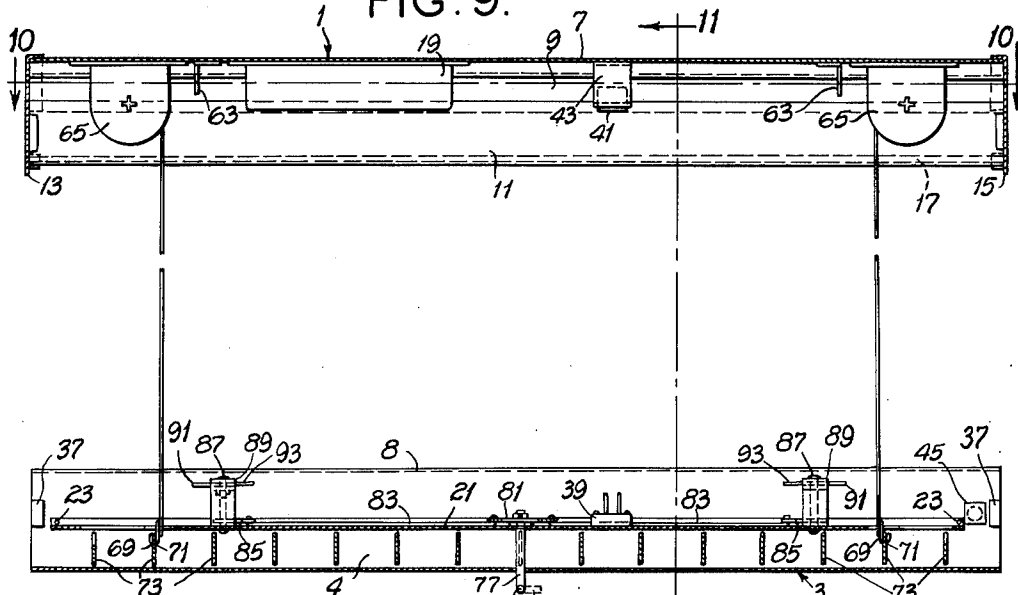


FIG. 10.

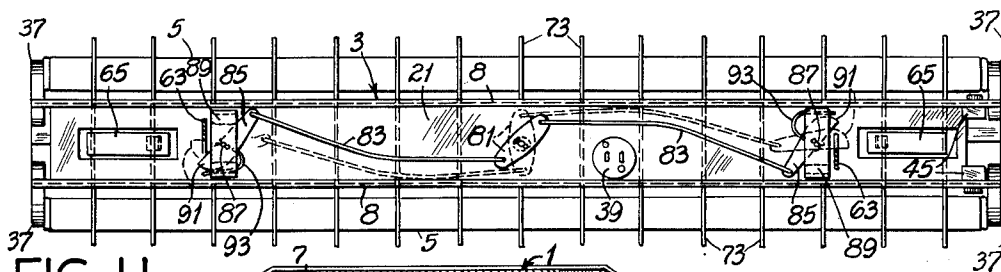
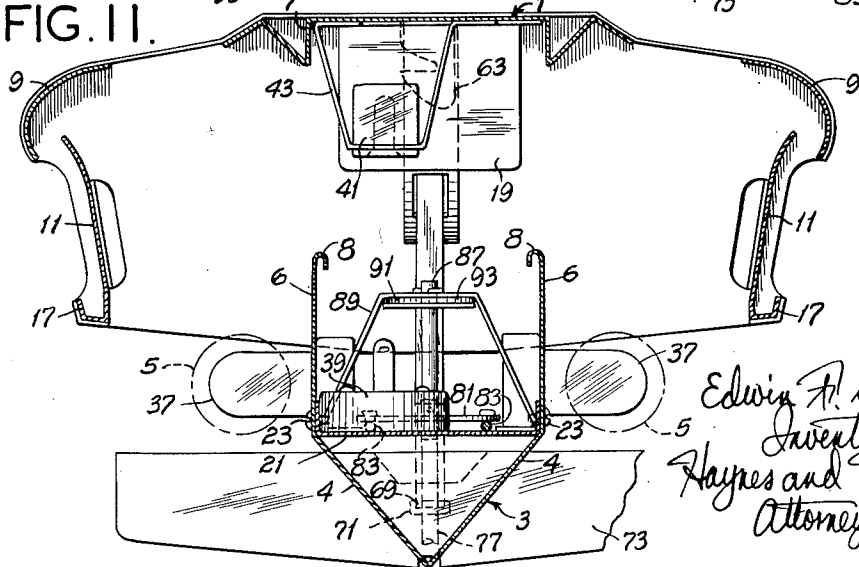


FIG. 11.



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UNITED STATES PATENT OFFICE

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CEILING FIXTURE FOR FLUORESCENT LAMPS

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Application October 25, 1947, Serial No. 782,160

8 Claims. (Cl. 240—51.11)

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This invention relates to lighting fixtures, and more particularly to ceiling fixtures for elongate tubular lamps such as fluorescent lamps.

Among the several objects of the invention may be noted the provision of an improved ceiling fixture for elongate tubular lamps, particularly fluorescent lamps, adapted for servicing from the floor level without necessitating the use of a ladder or the like to reach the fixture; the provision of a ceiling fixture of the class described which includes a counterbalanced lamp holder which may be easily raised or lowered, by a person standing on the floor for removal and replacement of the elongate tubular lamps; the provision of a ceiling fixture of this class the movable portion of which is electrically disconnected when it is moved away from the ceiling; the provision of an improved ceiling fixture from which the lamp holder may be conveniently and completely removed by a person standing on the floor; the provision of a ceiling fixture in which reflecting cross louvres may be conveniently and easily installed or removed; and the provision of a ceiling fixture of the class described which simple and economical in construction and safe and easy to service. Other objects will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which several of various possible embodiments of the invention are illustrated,

Fig. 1 is a side elevation of an improved light fixture of this invention;

Fig. 2 is a side elevation illustrating the lamp holder in a partially lowered position;

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1;

Fig. 4 is a section taken on line 4—4 of Fig. 3;

Fig. 5 is an enlarged section taken on line 5—5 of Fig. 4;

Fig. 6 is an enlarged isometric view illustrating a hinge bearing;

Fig. 7 is an enlarged section taken on line 7—7 of Fig. 4;

Fig. 8 is a view of a cross louvre and a reflector;

Fig. 9 is a view similar to Fig. 4, showing an alternative embodiment of the invention;

Fig. 10 is a section taken on line 10—10 of Fig. 9; and,

Fig. 11 is an enlarged section taken on line 11—11 of Fig. 9.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to Figs. 1-8, a light fixture of this

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invention is shown to include a support, for attachment to a ceiling in any suitable way, in the form of an elongate open-bottomed housing 1. A lamp holder comprising an elongated reflector 3 is pivotally mounted at one end to one end of the housing to be swingable in a vertical plane between a horizontal raised position closing the open bottom of the housing (Fig. 1) and a substantially vertical suspended position. Reflector 3 carries two fluorescent lamps 5. The latter extend parallel to the reflector.

Housing 1 includes a ceiling plate 7 comprising an elongate downwardly opening channel narrower and shallower than the housing extending the length of the housing, top baffles 9, side baffles 11 and two end plates 13 and 15. The end plates are firmly affixed to members 7, 9 and 11 by spot welding or a like process. Side baffles 11 preferably have narrow channels 17 extending upward and outward from the lower edges. Reflector 3 comprises an elongate trough having V-shaped lower side walls 4, and parallel upper side walls 6. The reflector or trough 3 has a width as measured from one side wall 6 to the other corresponding to the width of the ceiling plate or channel 7 and a depth greater than the depth of the channel 7, and is adapted to fit within the housing 1. The upper edges of side walls 6 are bent inwardly to form narrow reentry channels 8. The upper edges of side walls 6 of reflector 3 are engageable with the under side of ceiling plate 7, which is so formed so as to slidably receive reflector 3. An electrical ballast 19 for fluorescent lamps 5 is mounted in the reflector or trough 3, being attached to an elongate pan 21. This pan 21 is supported interiorly by reflector 3 and affixed thereto by means of screws 23.

Side walls 4 have two hinge bearings 25 affixed adjacent one end of reflector 3. These hinge bearings 25 (Fig. 6) comprise a tubular portion 27 and a flat tab portion 29 bent so as to fold back at an acute angle over the tubular section. The tab portion of bearing 25 has a circular aperture 31 coaxial with and of the same diameter as the passage through tubular section 27. These two hinge bearings 25 are affixed, such as by welding to reflector 3 which has an aperture drilled therethrough to match apertures 31, to form a passage for a hinge pintle 33. The outer ends of pintle 33 extend through oval shaped bearing apertures 35 in side baffles 11. The inner edges of channels 17 prevent any horizontal movement of pintle 33 when the fixture is assembled.

Fluorescent lamp sockets 37, of any suitable conventional type, are fixed at the ends of each side wall 6 of the reflector or trough 3 extending generally sideward on opposite sides of the trough. The pair of sockets at opposite ends of the side walls detachably support lamps 5 with

the lamps extending longitudinally adjacent and parallel the side walls.

An electrical connector element 39 is mounted on pan 21 and is adapted electrically to contact a matching electrical connector element 41 mounted on ceiling plate 7 only when the lamp holder is in the raised, ceiling position. Connector 41 is affixed to the underside of ceiling plate 7 by means of a bracket 43. Connector 39 is preferably of the male type while connector 41 is preferably of the female variety. The lamp holder also carries two starter switches 45, mounted on side walls 6. Connector 39 and starter switches 45 are mounted on reflector 3 adjacent the unpivoted end of the lamp holder.

The lamp holder or trough 3 is adapted to be latched in a raised horizontal ceiling position within the housing 1 wherein it is slidably received at its top in channel 7 by a self-closing latch operable by an extension tool held by a person standing on the floor. As illustrated, the self-closing latch comprises a stud 49 extending rotatably through pan 21 and reflector or trough 3 having a flat cam-shaped engagement catch 51 keyed to the upper portion of stud 49 and a control lever 53 extending below reflector 3. An inverted U-shaped bracket 55 is mounted on pan 21 and has an aperture adapted to receive the upper end of stud 49. Vertical movement of this stud is prevented by the use of a cotter pin 57 inserted through an aperture 59 in the upper end of stud 49 above the top surface of bracket 55. Engagement catch 51 is spring biased to a closed position by means of a spring 61. Catch 51 is cooperable with a notched latch plate 63 affixed to and depending from ceiling plate 7. The arrangement is such that stud 49 may be rotated from a latched position with its catch 51 in engagement with latch plate 63 to an unlatched position with catch 51 out of engagement with the notch in latch plate 63 to release reflector 3 to permit it to be swung downward. As catch 51 is biased to a closed position by spring 61 the latch assembly is self-closing because as the lamp holder is moved into the raised, ceiling position catch 51 is forced to an open position by contact with the tapered leading edge of latch plate 63 until, in its uppermost position catch 51 is free to engage the notch in latch plate 63. This action provides a positive lock between housing 1 and the lamp holder when the latter is in its raised ceiling position.

A spring reel unit 65 is affixed to the underside of ceiling plate 7 adjacent to the end containing connector 41 and latch plate 63. The flexible connector or tape 67 of reel 65 is provided with a detachable fastening hook 69 which is engageable with a slot 71 in one of several cross reflecting louvres 73 which are set in a vertical plane and mounted at right angles to the longitudinal axis of reflector 3. Hook 69 is held in its receiving slot 71 by the tension of spring reel 65 but may be easily removed manually.

Fig. 8 illustrates the mounting of light-shielding louvres 73 in reflector 3. The louvres have a diverging lower edge with a rectangular notch in the center. The lower side walls of reflector 3 are provided with vertically cut slots 75 adapted to receive these louvres. The removal and replacement of these louvres 73 will be discussed below.

In a typical installation of the above described light fixture, it is installed about ten feet above the floor. Housing 1, reflector 3 and lamps 5 are about 4 feet long. To lower the reflector and lamps to a servicing position, an extension tool is

employed to engage control lever 53 and thus to turn latch stud 49 from its closed position (catch 51 in engagement with the notch of latch plate 63) to unlatch the lamp holder from housing 1, thus permitting it to be swung downward to its vertical suspended position. The action of spring reel 65 and tape 67 act as counterbalancing means to resist the downward movement of the lamp holder so that there is no danger of free swinging of the lamp holder if the extension tool becomes disengaged from control lever 53. Tape 67 is so tensioned as to permit reflector 3 to be swung to any position intermediate a raised, ceiling position and a lowered, servicing position and thereafter retain such intermediate position. Such an intermediate position of reflector 3 is illustrated in Fig. 2.

In a position where the lamp holder is lowered to its extreme downward or servicing position the lower ends of the lamps are easily within the reach of a person of average height standing on the floor. The lamps may then be removed from sockets 37 for cleaning or replacement and the starter switches may be replaced. If desired the entire lamp holder assembly may be removed for servicing. To do this reflector 3 is tilted or raised thus lifting one or both ends of hinge pintle 33 to a position where it will clear the edge of channel 17. Such a position of hinge pintle 33 as shown in Fig. 5 in dotted lines. Reflector 3 is then moved to one side or the other so that one or both ends of pintle 33 will slide farther through oval aperture 35 to clear channel 17. One end of pintle 33 is thus freed from baffle 11. By reversing the movement of reflector 3 along the then tilted axis of pintle 33, the end remaining in the other aperture 35 is thus removed and the pivoted end of the lamp holder is free of housing 1. To completely disengage reflector 3 from housing 1, hook 69 is detached from slot 71.

The removal of the entire lamp holder from housing 1 renders possible complete electrical and mechanical servicing of the components of the light fixture without the use of a ladder. If desired connector 41 may be used as a service outlet to supply electrical power to any tools or equipment. For complete cleaning of the lamp holder pan 21 may be conveniently removed from the interior of reflector 3 by disengaging screws 23. Louvres 73 may then be easily removed from reflector 3 by compressing the upper edges of side walls 6 together and then raising a louvre 73 and sliding it out of slots 75 in side walls 4 of reflector 3. Fig. 8 illustrates this action. To replace the reflecting louvres the upper edges of side walls 6 are again pressed together and the louvre is slid through slots 75 until the center notch of louvre 73 engages both the bottom edges of both slots 75. When pan 21 is again mounted within reflector 3, it causes the side walls 6 to become parallel and thus positively and snugly locks louvres 73 in slots 75 of reflector 3.

The simplicity of replacing and cleaning the components of the lamp holder without the use of a ladder makes such servicing possible by a person unskilled and unequipped to do such operations normally. The removal of all electrical potentials from the lamp holder as soon as reflector 3 is moved from its raised, ceiling position is a valuable safety feature protecting anyone servicing this light fixture.

The positive action of the latch arrangement and the biasing action of spring reel 65 prevent accidental disengagement of the lamp holder assembly from housing 1. The wide span of hinge

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pintle 33 provides a sturdy yet easily removable hinge assembly.

A second embodiment of the present invention is illustrated in Figs. 9-11. As the majority of components used in this second embodiment are identical with those utilized in the first embodiment described above (Figs. 1-8) they will not be further described.

Two spring reel units 65 are utilized in the embodiment of Figs. 9-11 to support the lamp holder assembly. The use of this second spring reel obviates the use of the hinging arrangement described above in conjunction with Figs. 1-8. To more positively lock the reflector 3 to ceiling plate 7 two self-closing latches are provided. However, instead of a single stud 49 extending through pan 21 and reflector 3, a single control stud 77 is centrally and rotatably mounted on a vertical axis through pan 21 and reflector 3. Stud 77 is provided with a control lever 79 at its lower extremity which projects under reflector 3. The upper end of stud 77 is keyed to a lever arm 81 which is provided with apertures at its outer extremities. These apertures are adapted to receive two links 83. One end of each link 83 is engaged in one aperture of lever arm 81, respectively, and the other end of each link 83 is engaged in an aperture in each of two lever arms 85. Lever arms 85 are each mounted on a stud 87, the upper ends of which are rotatably mounted in brackets 89 and the lower ends of which are rotatably mounted in pan 21. Two engagement catches 91 are keyed to the upper end of each stud 87 and are engageable with latch plates 63. These catches 91 are spring biased to a closed position by springs 93.

Electrical ballast 19 is shown mounted on the underside of ceiling plate 7 in Figs. 9-11, but it is to be understood that it could also be mounted on pan 21 as is illustrated in Fig. 4. The principal reason for having electrical ballast 19 affixed to ceiling plate 7 is to decrease the overall weight of the lamp holder. Electrical connectors 39 and 41 and bracket 43 have been moved off the center line of the pan to provide space for movement of links 83.

To lower reflector 3 of the Fig. 9-11 embodiment, control lever 79 is moved by means of an extension tool from its dotted line position (Fig. 10) to its solid line position, thus simultaneously disengaging catches 91 from latch plates 63. The lamp holder assembly is then pulled downward by means of the extension tool until reflector 3 is at any desired level for servicing operations. The lamp holder can be completely removed by detaching hooks 69 from slots 71. To reengage the lamp holder assembly with housing 1, an extension tool is utilized to push the lamp holder upwards until catches 91 engage their respective latch plates 63. This action locks housing 1 to reflector 3 and connects electrical connectors 39 and 41.

It is to be understood that although the embodiment as illustrated in Figs. 9-11 is particularly useful with rooms which have exceptionally high ceilings, such a light fixture may be used conveniently and advantageously in low ceiling rooms.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in

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the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A ceiling fixture for fluorescent lamps comprising an elongate open-bottomed housing for attachment to a ceiling, said housing having a ceiling plate comprising an elongate downwardly opening channel narrower and shallower than the housing extending the length of the housing, an elongate trough having a width corresponding to the width of the channel and a depth greater than the depth of the channel adapted to fit within the housing, spring reel counterbalancing means connecting the trough to the housing and counterbalancing the weight of the trough and elements carried thereby, the trough having a raised horizontal ceiling position within the housing wherein it is slidably received at its top in the channel and a lowered servicing position, lamp sockets on opposite sides of the trough at the ends thereof for holding elongate lamps extending the length of the trough on opposite sides thereof, an electrical connector element on the trough electrically connected to the sockets, a cooperating electrical connector element fixed within the housing for engagement by the first-mentioned connector element when the trough is in its raised ceiling position, and a latch for latching the trough in its raised ceiling position.

2. A ceiling fixture for fluorescent lamps comprising an elongate open-bottomed housing for attachment to a ceiling, said housing having a ceiling plate comprising an elongate downwardly opening channel narrower and shallower than the housing extending the length of the housing, an elongate trough having a width corresponding to the width of the channel and a depth greater than the depth of the channel pivotally connected at one end to one end of the housing for swinging movement about a generally horizontal axis transverse to the trough and housing between a raised horizontal ceiling position within the housing and a lowered servicing position hanging downward from the pivotal connection for servicing of the fixture from floor level, said trough, in its raised ceiling position, being slidably received at its top in the ceiling plate channel, lamp sockets on opposite sides of the trough at the ends thereof for holding elongate lamps extending the length of the trough on opposite sides thereof, and spring reel counterbalancing means connecting the trough to the housing and counterbalancing the weight of the trough and elements carried thereby.

3. A ceiling fixture as set forth in claim 2, wherein the trough carries light-shielding means under the lamps, said means being located in the bottom part of the housing when the trough is in its raised ceiling position.

4. A ceiling fixture as set forth in claim 2, further comprising an electrical connector element on the trough electrically connected to the sockets, a cooperating electrical connector element fixed within the housing for engagement by the first-mentioned connector element when the trough is in its raised ceiling position, and a latch for latching the trough in its raised ceiling position.

5. A ceiling fixture as set forth in claim 2 wherein the pivotal connection of the trough to the housing is a quick-detachable hinge connection allowing for ready detachment of the trough from the housing.

6. A ceiling fixture as set forth in claim 5 wherein the hinge connection comprises a pintle

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on the trough at one end thereof received at its ends in openings in the sides of the housing, and end stops for the pintle outward of the sides of the housing, the pintle openings extending higher than the stops to permit raising of the ends of the pintle to clear the stops for end-wise shifting of the pintle to disengage it from the openings.

7. A ceiling fixture for fluorescent lamps comprising an elongate open-bottomed housing for attachment to a ceiling, said housing having side walls and end walls and a ceiling plate narrower than the housing comprising an elongate downwardly opening channel extending the length of the housing, an elongate trough of a width corresponding to the width of the channel having a pivotal connection at one end at its bottom to one end of the housing at the bottom of the housing for swinging movement about a generally horizontal axis transverse to the reflector and housing between a raised horizontal ceiling position within the housing and a lowered servicing position hanging downward from the pivotal connection for servicing of the fixture from floor level, said trough, in its raised ceiling position, being slidably received in the ceiling plate channel, lamp sockets on opposite sides of the trough at the ends thereof for holding elongate lamps extending the length of the trough on opposite sides thereof, light-shielding means carried by the trough under the lamps and spring reel counter-balancing means connecting the trough to the housing and counterbalancing the

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weight of the trough and elements carried by the trough.

8. A ceiling fixture as set forth in claim 7 wherein there is an electrical connector element carried by the trough within the trough and a co-operating electrical connector element fixed to the ceiling plate, said elements being engaged when the trough is in its raised ceiling position, and wherein electrical ballast and starter switches are carried within the trough, the connector element carried by the trough, the ballast and starter switches being electrically connected.

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