Dec. 25, 1962 M. RELICH 3,070,691

RECESSED LIGHT FIXTURE WITH CONCEALED HINGE AND LATCH

Filed April 14, 1961

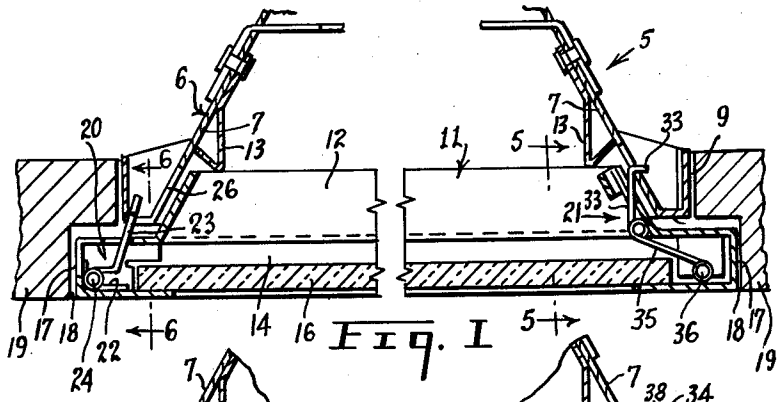


Fig. 1

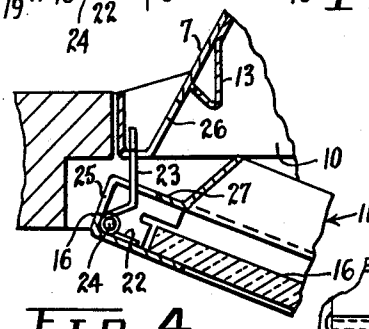


Fig. 4

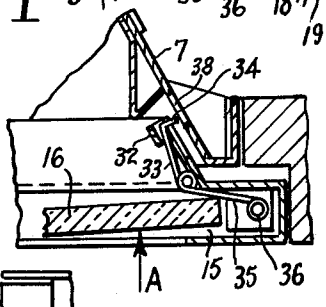


Fig. 2

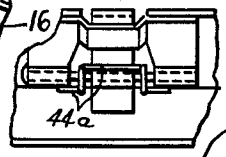


Fig. 9

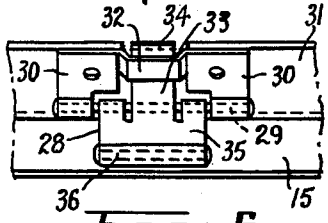


Fig. 5

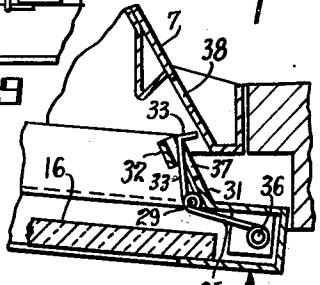


Fig. 3

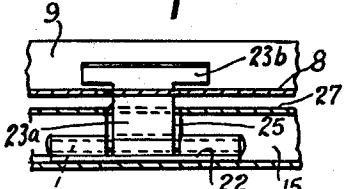


Fig. 6

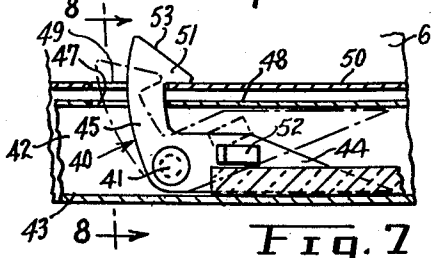


Fig. 7

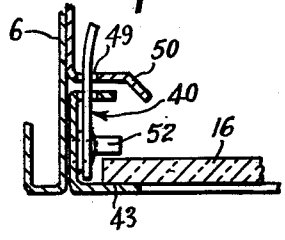


Fig. 8

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RECESSED LIGHT FIXTURE WITH CONCEALED HINGE AND LATCH

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This invention relates to light fixtures and particularly to light fixtures which are fitted into recessed ceiling openings so that the lower surface of the fixture is flush with the under surface of the ceiling, and in which both hinges and latches holding the glass face frame of the fixture in place, are concealed from view.

The present day trend is to have lighting fixtures recessed into openings in the ceiling so as to present a surface flush with the surface of the ceiling. This trend has presented difficulties in concealing both hinges and latches from view and the further difficulty in providing a hinge structure which will permit the glass face frame to be pivoted to an open position without having to provide an excessive gap between the hinged side of the fixture and the adjacent edge of the opening in the ceiling. Most known types of hinges cause the edge of the frame adjacent the hinge to move in a generally horizontal plane outwards towards the edge of the ceiling opening and if a sufficiently large gap is not provided around the fixture, the frame will press into the relatively soft material of the ceiling and cause it to break up.

The present invention consists essentially in the provision of improved hinge and latch assemblies which are completely concealed within the fixture and which will permit the glass face frame to be pivoted into its open position while maintaining a minimum gap between fixture and ceiling opening. The concealed latch is displaced from its locking position to the unlatched position by simply raising the glass in its supporting frame while the concealed floating hinge permits the glass face frame to move slightly away from the adjacent edge of the ceiling opening as the frame is pivotally lowered at its latching side to gain access to the interior of the fixture for maintenance purposes.

The primary object of the invention is to provide a lighting fixture which can be recessed into an opening of minimum size in a ceiling and without visible hinges or latches.

A further object of the invention is to provide a concealed latch mechanism which can be operated by pushing upwards on the glass front of the fixture.

A further object of the invention is to provide a concealed hinge mechanism which will permit the hinged side of the glass holding frame to move away from the adjacent edge of the ceiling opening as the frame is lowered on its latching side.

A further object of the invention is to provide a lighting fixture in which the glass holding frame can be reversed about a horizontal plane and fitted into the fixture.

These and other objects of the invention will be apparent from the following detailed description and the accompanying drawings in which:

FIG. 1 is a vertical transverse section of a portion of the lighting fixture according to the invention showing the concealed hinge and latch holding the glass cover frame in the fixture.

FIG. 2 is a partial vertical section of the latching mechanism in the unlatched position to permit lowering of the glass cover frame.

FIG. 3 is a view similar to FIG. 2 showing the glass cover frame partly lowered.

FIG. 4 is a partial vertical section of the floating hinge mechanism with the glass cover frame in a lowered position.

FIG. 5 is a partial vertical section of the latching mechanism taken on the line 5—5 of FIG. 1.

FIG. 6 is a partial vertical section of the hinge mechanism taken on the line 6—6 of FIG. 1.

FIG. 7 is a partial vertical section of a modified form of latching mechanism.

FIG. 8 is a partial vertical section of the latching mechanism taken on the line 8—8 of FIG. 7.

The lighting fixtures to which the present invention can be applied may be of either the incandescent or fluorescent type in which the fixture is fitted into a recessed ceiling opening. That part only of the fixture adjacent the ceiling opening and containing the hinge and latch mechanism, which is the subject of the present invention, is described and illustrated.

Referring to the drawings, the lower portion of the lighting fixture is generally shown at 5 and consists of a housing 6 secured by well known means to the ceiling structure, not shown. The housing 6 has side walls 7 whose lower edges are turned outwardly at 8 and then upwardly at 9 to form a reinforcing trough about the downwardly facing opening 10 into which the glass face frame 11 fits. The side walls 7 of the housing 6 are preferably flared outwardly and downwardly in the manner shown in FIG. 1.

The upper portion 12 of the glass face frame 11 is in the form of a skirt projecting upwardly into the opening 10 of the housing 6 to rest against the stops 13 on the walls 7. The lower portion 14 of the glass face frame 11 is in the form of an open rectangular frame projecting outward horizontally from the lower edge of the upper portion 12. This lower portion is of channel section forming an inwardly facing peripheral recess 15 and a seat for the sheet of translucent material 16 such as glass. The vertical height of the recess 15 is such that the sheet 16 has limited movement for a purpose which will be described later.

The outer surfaces 17 of the lower portion 14 is a relatively close fit within the opening 18 in the ceiling 19 to provide a minimum of clearance around the fixture.

The glass face frame 11 is supported in the housing 6 by means of the floating hinge 20 and the latch 21, both of which are concealed from view from the under side of the fixture 5. The floating hinge 20 consists of a fixed leaf 22 and a floating leaf 23, joined together by the hinge pin 24. The fixed leaf 22 is secured to the lower inner surface of the channel recess 15. The floating leaf 23 is of T shape with the horizontal portion 23*b* being remote from the hinge pin 24. The vertical leg 23*a* is offset in a direction away from the leaf 22 and is projected through a slot 25 in the adjacent wall of the channel recess 15 and through the slot 26 in the adjacent lower portion of the housing 6. The outer ends of the horizontal portion 23*b* of the leaf 23 rest on and are free to pivot on the portion 8 of the housing 6 on either side of the slot 26. The slot 25 is cut partly in the upper surface 27 and in the vertical surface 17 of the channel recess 15 to permit maximum pivotal movement of the frame 11 about the hinge pin 24 while the frame is suspended on the free floating leg 23*b* of the hinge.

The latch assembly 21 is biased to move into locking engagement with the housing 6 and consists of the offset member 28 hinged at its mid point on the hinge pin 29. The hinge pin 29 is supported by the hinge plates 30 which are secured to the wall 31 of the upper portion 12 of the glass support frame 11 in a position which locates the hinge pin 29 in alignment with the junction of the

wall 31 with the upper adjacent surface 27 of the channel 15. The hinge plates 30 are joined together by an offset member to form a keeper plate 32 for the latch member 28. The upper portion 33 of the latch member 28 is offset in a direction away from the keeper plate 32 to form a latching hook 34. The lower offset portion 35 of the member 28 is weighted at 36 to bias rotation of the latching hook 34 in a clockwise direction as seen in FIG. 1.

An open ended slot 37 in the wall 31 adjacent the latching hook 34 of the latch permits the latch to pass through the wall 31 and the latch hook 34 to engage with the lower edge of the slot 38 in the adjacent wall 7 of the housing 6.

Both hinge assembly 20 and latch assembly 21 are concealed within the structure of the glass face frame 11 and when the cover frame is latched in place there is no visible means of unlatching or removing the frame from its housing 6. At the same time, the narrow gap between edges of the cover frame and the edges of the opening 18 in the ceiling does not permit of access to the interior of the fixture in an attempt to operate the latch.

In order to unlatch the glass face frame 11 from the housing 6, it is necessary to push up on the glass 16 in the direction of the arrow A in FIG. 2. The glass contacts the weighted portion 35 of the latch, forcing it upwards and at the same time rotating the latch hook 34 anti-clockwise out of engagement with the lower edge of the slot 37. Due to the angle of the wall 7, the frame 11 can move down and to the right so that the hinge end of the frame can swing clear of the adjacent edge of the ceiling opening while suspended by the hinge leaf 23*b* and rotating in its hinge pin 24.

In order to replace the frame 11 in the housing 6, it is only necessary to push up on the frame in the direction of the arrow B as seen in FIG. 3. The end of the latch hook 34 rides up on the inside of the angled surface of the wall 7 until it reaches the slot 37 when the weight 36 causes the latch to rotate clockwise, allowing the latch hook 34 to engage with the lower edge of the slot 37 and lock the frame 11 to the housing 6. The floating hinge assembly 20 permits the movement of the frame in a generally horizontal direction while the frame is being pushed up into place.

A modified form of concealed latch assembly is shown in FIGS. 7 and 8. In this modified form of the latch mechanism, the latch 40 is pivoted at 41 to the side wall 42 of the glass face frame 43 and has a horizontally extending member 44 whose lower edge lies generally parallel with the lower horizontal wall of the channel frame 43. The vertically disposed member 45 of the latch 40 extends through the slot 47, in the top wall 48 of the channel frame 40 and through the slot 49 in the member 50 of the fixture housing 6. The member 45 terminates in a latching hook 51 and is normally biased to be held in engagement with the top surface of the member 50 by the weight of the member 44. A bracket 52 is secured to the side of the latch member 44. This bracket is contacted when the glass 16 is pushed upwards in the manner shown in FIG. 2 thereby rotating the latch 40 into the position shown in chain dot lines in FIG. 7 to permit the glass face cover 43 to be lowered.

When the glass face cover 43 is being raised by pushing on the frame from below, the angled edge 53 of the latch contacts the adjacent edge of the slot 49 causing the latch to rotate into the chain dot position shown in FIG. 7 to allow the latch to pass up through the slot 49. The weighted member 44 will then rotate the latch into its locking position. The weighted member 28 as seen in FIG. 5 or the member 44 seen in FIG. 7 may be replaced by a spring 44*a* as in FIG. 9, biasing the latch 21 into locking engagement with the housing 6.

In lighting fixtures or the like having hinge and latch mechanism as above described, the fixture can be fitted with any number of hinge and latch assemblies depending on the size of the fixture and the weight of the glass cover frame. The hinge and latch assemblies need not be disposed directly opposite each other as shown in FIG. 1 but could be offset from each other. Where the hinge and latch assemblies are disposed offset from each other, it would be of advantage to provide an additional set of slots 26 and 37 in the housing 6 in order that the glass cover frame 11 could be reversed in the fixture. This is of particular advantage where the fixture is located close to a wall or column in a building.

In fixtures having latch and hinge assemblies as above described, the outside appearance of the fixture is greatly enhanced by elimination of external hinges, latches, light leaks by the close fitting of the fixture into the ceiling opening. The ease by which the glass face frame can be opened or closed without the use of tools greatly increases the speed and efficiency in servicing the lighting fixture.

What I claim is:

1. A concealed hinge and latch mechanism for light fixtures and the like in which the fixture is recessed within a ceiling opening, the said fixture comprising a housing, an open rectangular frame and a sheet of translucent material supported in the said frame, a hinge supporting said frame on said housing, the said hinge having one leaf thereof secured to said frame and having a second leaf in floating engagement with said housing, and a latch securing said frame to said housing, the said latch being pivotally mounted within said frame on the side thereof opposite to said hinge, the said latch being extended on one side of its pivot mounting to form a housing engaging latch member and extended on the opposite side of its pivotal mounting to form a weighted member disposed in proximity to the adjacent inward facing surface of the said sheet of translucent material, the said weighted member biasing the latch member into locking engagement with the said housing and, on upwards movement of said sheet of translucent material relative to said frame, rotating the said latch member about its pivot and out of engagement with said housing.

2. A concealed hinge and latch mechanism for light fixtures and the like in which the fixture is recessed within a ceiling opening with minimum clearance between fixture and the edge of the ceiling opening, the said fixture comprising a housing, an open rectangular frame and a sheet of translucent material supported in the said frame, the said frame being formed of channel section providing an inwardly facing peripheral recess within which the said sheet of translucent material is seated and permitting a small movement of the sheet in a direction at right angles to the plane of the sheet, a hinge supporting said frame on said housing, the said hinge having one leaf thereof secured within the channel of said frame and having a second leaf in floating pivotal engagement with said housing, and a latch securing said frame to said housing, the said latch being pivotally mounted within said frame on the side thereof opposite to said hinge, the said latch being extended on one side of its pivot mounting to form a housing engaging latch member and extended on the opposite side of its pivotal mounting to form a weighted member extending within the adjacent portion of the channel in proximity to the adjacent inward facing surface of said sheet of translucent material, the said weighted member biasing the latch member into locking engagement with the said housing and, on upwards movement of said sheet of translucent material within its channel seat, rotating the said latch member about its pivot and out of engagement with said housing.

3. A concealed hinge and latch mechanism for light fixtures and the like in which the fixture is recessed within a ceiling opening with minimum clearance between fixture and the edge of the ceiling opening the said fixture comprising a housing having outwardly and downwardly flaring side walls to a rectangular opening, an open rectangular frame and a sheet of translucent mate-

rial supported in the said frame, the said frame having a lower portion formed of channel section providing an inwardly facing peripheral recess within which the said sheet of translucent material is seated and permitting a small movement of the sheet in a direction at right angles to the plane of the sheet and an upper portion forming a skirt having walls projecting upwardly and inwardly within the rectangular opening of the housing, the said skirt being joined to the upper inner peripheral edge of said lower portion of the frame, a hinge supporting said frame on said housing, the said hinge having a leaf thereof secured within the lower portion of the frame and having a second leaf in floating pivotal engagement with said housing, and a latch located within said fixture securing said frame to said housing, the said latch being pivotally mounted at the juncture of the lower and upper portions of said frame on the side thereof opposite said hinge, the said latch being extended upwards from its pivot mounting and through a slot in the said upper portion of the frame to form a housing engaging latch member, and extended in a horizontal direction into the adjacent channel recess of the lower portion of the frame, the said horizontally directed portion of the latch being weighted to bias the said latch member into locking engagement with said housing and, on upwards movement of the said sheet of translucent material within its channel seat, rotating the said latch member about its pivot and out of engagement with said housing.

4. A concealed hinge and latch mechanism as set forth in claim 1, in which the second mentioned leaf of the hinge is projected through a slot in the frame, permitting the said frame to move from a horizontal position to a vertical position.

5. A concealed hinge and latch mechanism as set forth in claim 1, in which the second mentioned leaf of the hinge is T shaped and is projected through a slot in the said housing with the outer ends of the top horizontal member of the T resting in floating engagement with the housing on either side of the slot.

6. A concealed hinge and latch mechanism as set forth in claim 5 in which the said T shaped leaf of the hinge is free to oscillate on the housing permitting the said frame to swing clear of the adjacent wall of the ceiling opening as the frame is opened from the housing.

7. A concealed hinge and latch mechanism as set forth in claim 1, in which the said frame has a lower portion projecting outwardly of the lower edge of said housing and an upwardly projecting skirt projecting into the said housing when the frame is in latched engagement with the housing.

8. A concealed hinge and latch mechanism as set forth in claim 7, in which the lower portion of the frame is of channel section forming a peripheral seat for the said sheet of translucent material and into which the weighted member of the latch is projected.

9. A concealed hinge and latch mechanism as set forth in claim 7, in which the said latch is pivoted at the junction of the lower portion of the frame and its upwardly projecting skirt and a slot in the skirt permits the latch member to pass through the skirt into latching engagement with the housing.

10. A concealed hinge and latch mechanism as set forth in claim 7, in which the housing is provided with a slot whose lower end is adjacent the upper end of the latch member and into which the latch member projects for engagement with the housing.

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