

[54] LATCH DEVICE

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[58] Field of Search 292/126, 128, 100, 118, 292/134, DIG. 31, DIG. 49, 200, 226

[56] References Cited

UNITED STATES PATENTS

3,455,590 7/1969 Zerfoss 292/128

FOREIGN PATENTS OR APPLICATIONS

4,441 9/1910 United Kingdom 292/126

Primary Examiner—Robert L. Wolfe

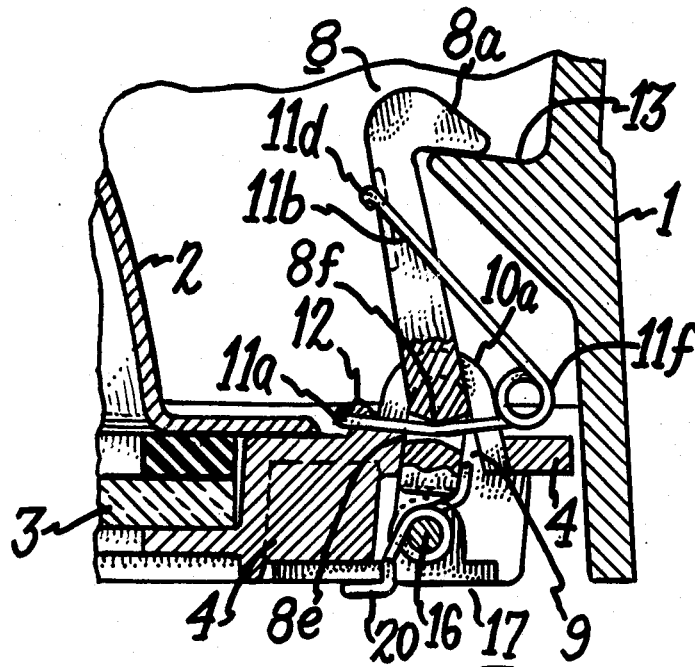
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[57]

ABSTRACT

A latch device for street lighting luminaires for latching a refractor closure to the luminaire housing. The device comprises a catch on the housing, a slot formed in the closure adjacent to the catch in the closed assembly, spaced bearing means integrally formed in the closure on opposite ends of the slot, a lever extending through the slot and formed integrally with a hook portion on the interior side of the closure engageable with the catch. The lever is formed intermediate its ends with opposite laterally projecting shoulder portions separably engaging the spaced bearing means for rocking therein about a pivot axis. A coil spring engages the lever and the closure for retaining the lever in engagement with the bearing means and for urging it in a rotary direction about the pivot axis for holding the hook portion in yieldable engagement with the catch. The lever has a hinged extension arm at its outer end and spring means to hold the extension arm in retracted position when not in use.

8 Claims, 7 Drawing Figures



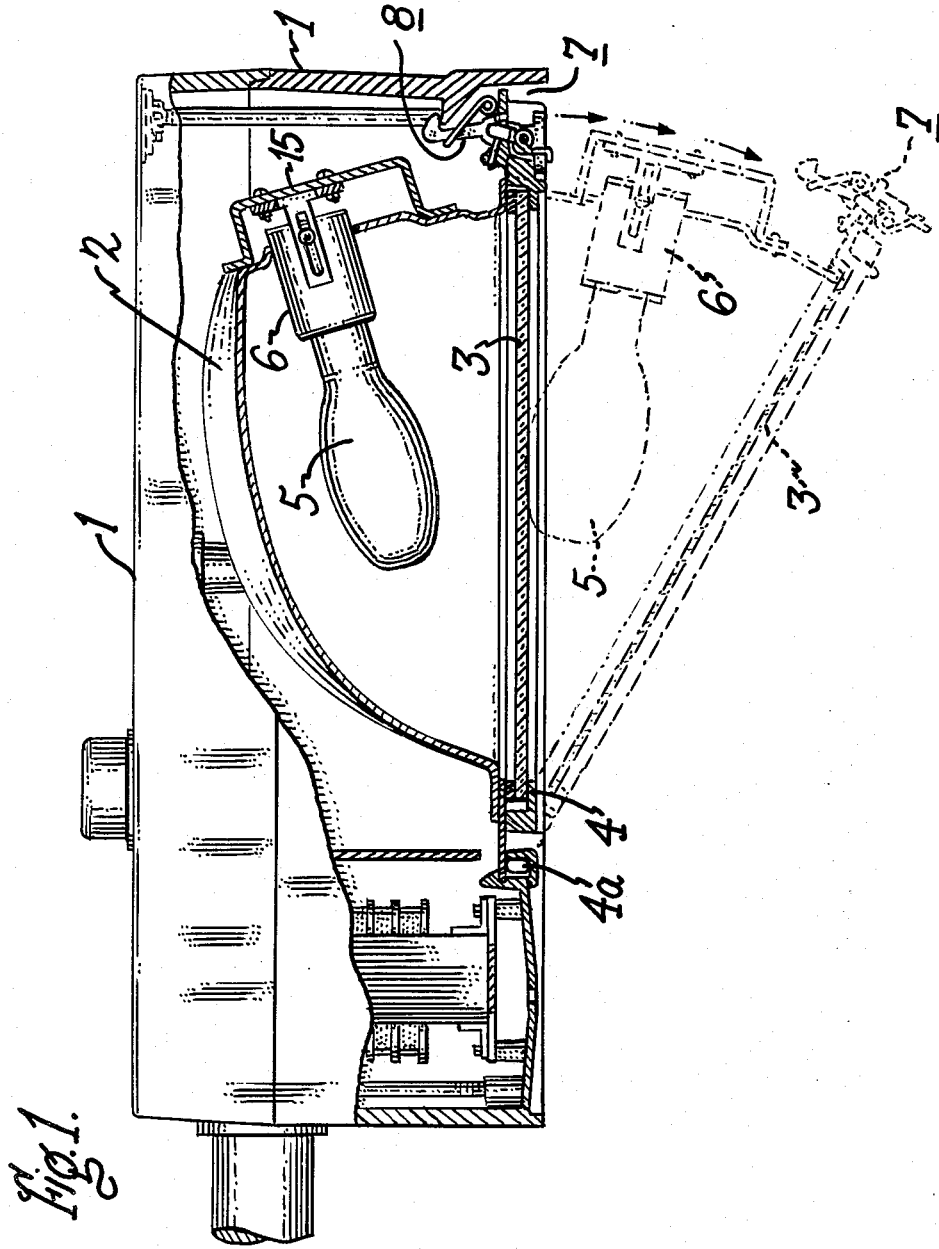
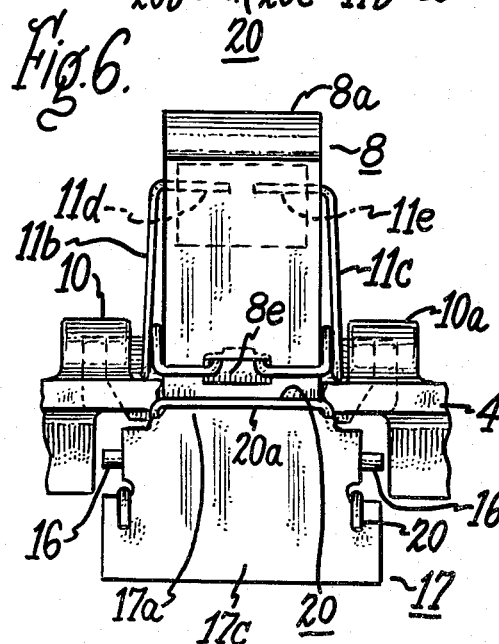
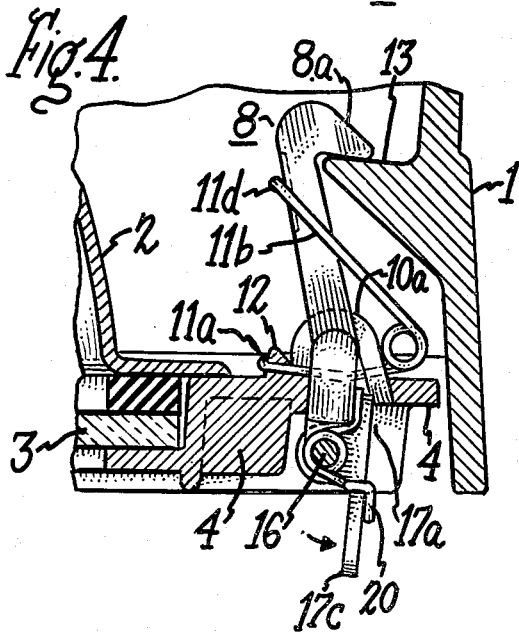
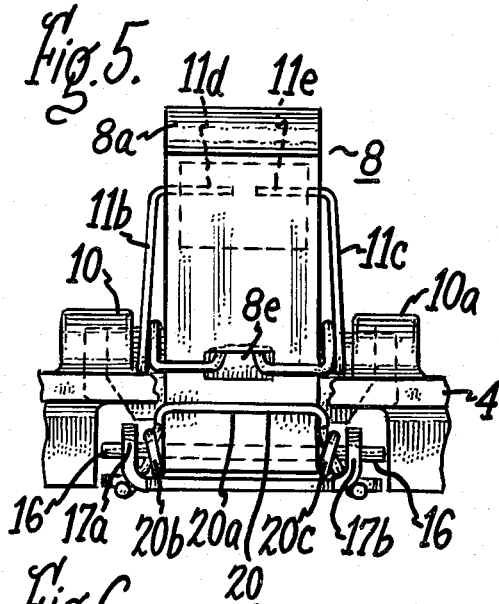
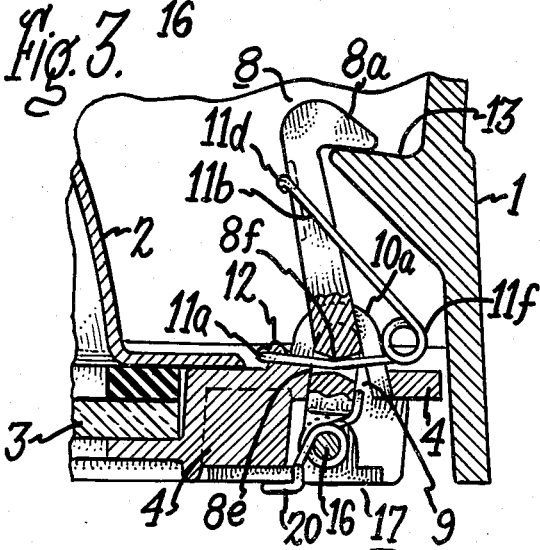
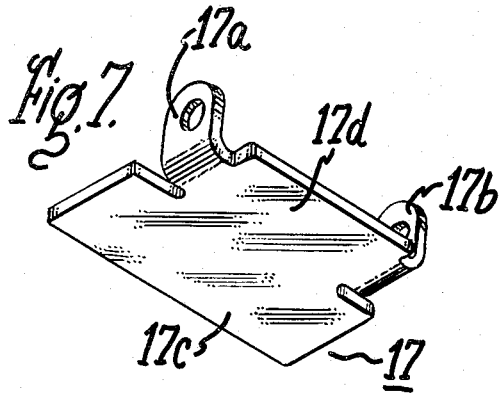
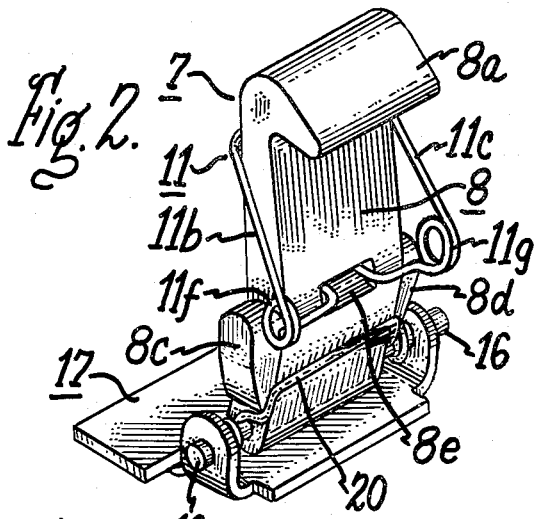


Fig. 1.



LATCH DEVICE

The present invention relates to a latch device, and more particularly to a latching mechanism adapted for releasably fastening a closure to a luminaire housing.

This invention is an improvement on the latch device disclosed in U.S. Pat. No. 3,455,590 - Zerfoss, issued July 15, 1969 and assigned to the same assignee as the present invention.

It is an object of the invention to provide an improved latch device which has a minimum of parts, is readily and economically manufactured and installed, is simple and rugged in construction, and is reliable in operation for securely fastening the parts of a closure assembly together while being easily manipulated for opening and closing the same.

It is a particular object of the invention to provide a latch device of the above type for the refractor closure assembly in a luminaire wherein the latch device has a retractable operating member for improved appearance of the luminaire.

Other objects and advantages will become apparent from the following description and the appended claims.

With the above objects in view, the present invention in one of its aspects relates to a closure device comprising, in combination, a housing having an opening, closure means for closing the opening, and latch means for releasably securing the closure means to the housing comprising a catch on the housing, first bearing means on the closure means defining a bearing axis, a lever having opposite ends and having second bearing means intermediate its ends engaging the first bearing means for turning about the bearing axis, the lever having a hook portion at one end engageable with the catch, first spring means for urging the lever about the bearing axis for holding the hook portion in yieldable engagement with the catch, tab means pivotally secured to the lever at the other end thereof, the tab means being turnable to an operative projecting position forming an extension of the lever for operating the same and turnable to an inoperative retracted position away from its projecting position, and second spring means for urging the tab means into its inoperative retracted position.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is an elevational view, partly in section, of a luminaire embodying the invention;

FIG. 2 is a perspective view of a latch device constructed in accordance with the invention;

FIG. 3 is an elevational view, partly in section, of the latch device showing the lever extension tab in inoperative, retracted position;

FIG. 4 is a similar view showing the extension tab in operative, extended position;

FIG. 5 is a front elevational view of the latch device with the lever extension tab in retracted position;

FIG. 6 is a front elevational view of the latch device with the lever extension tab in operative, extended position; and

FIG. 7 is a perspective view of the extension tab of the latch lever.

Referring now to the drawings, and particularly to FIG. 1, there is shown a street lighting luminaire in which the invention is embodied and which comprises an upper housing 1 adapted to be mounted at its rear

end on a suitable support so as to extend horizontally over the roadway, as shown. Arranged within housing 1 is an optical assembly comprising a concave reflector 2 closed at its bottom by light transmitting cover 3 mounted in frame 4 suitably secured in sealing relation to the bottom rim of reflector 2. Lamp 5 is arranged within the optical enclosure formed by reflector 2 and transparent cover 3 and is removably secured at its base to lampholder or socket 6, which in turn is adjustably secured to cap member 15 covering an aperture in reflector 2 through which the lamp and socket assembly may be withdrawn for maintenance service. Closure frame 4 is hingedly connected at its rear end to housing 1 by suitable hinge means 4a. Frame 4 is releasably attached at its front end by latch mechanism 7 constructed as more fully described hereinafter. Upon release of latch 7, the optical assembly may be swung downwardly as a unit about hinge 4a, as shown in interrupted lines, to provide access to the assembly for relamping or other servicing operations.

It will be understood that the particular structure of the optical assembly shown forms no part of the present invention.

Latch mechanism 7 comprises an operating lever 8 (see FIG. 2) integrally formed at its upper end with hook 8a, and having at its lower end a transverse passage in which is received pivot pin 16 projecting at opposite sides thereof (see FIG. 5). As seen in FIGS. 3 and 4, lever 8 extends vertically through slot 9 in refractor retaining frame 4 so that its lower end projects exteriorly below the slot. Intermediate its ends, lever 8 is formed with laterally projecting shoulders 8c, 8d which have convexly curved upper bearing surfaces. Frame 4 is formed at opposite ends of slot 9 with hollow bearing bosses 10, 10a in which shoulders 8c, 8d of the lever are received. The undersides of bearing bosses 10, 10a have concave bearing surfaces complementary to the convex bearing surfaces of lever shoulders 8c, 8d. Lever 8 is held in assembly with frame 4 by retaining spring 11, which, as shown in FIGS. 2, 3 and 5, has a somewhat U-shaped configuration including a bight portion 11a, spaced arms 11b, 11c extending at an angle to the bight portion and having inwardly bent free ends 11d, 11e, and coiled intermediate portions 11f, 11g. In the assembly, bight portion 11a of the spring extends through aperture 8e in lever 8 (see FIG. 2) and is looped over projecting lug 12 on frame 4 so as to be anchored thereon (see FIG. 3). Spring coils 11f, 11g are thus on the front side of lever 8, and arms 11b, 11c extend therefrom upwardly on opposite sides of lever 8 clasping the latter therebetween so that the bent end portions 11d, 11e hook around the rear surface of lever 8. Spring 11 thus serves as the sole means for retaining lever 8 in engagement with bearing bosses 10, 10a.

As seen best in FIG. 2, the upper interior surface of aperture 8e in lever 8 has a downwardly projecting ridge 8f which engages bight portion 11a of the spring. Ridge 8f thus forms a fulcrum or pivot axis about which lever 8 may rock when operated as described below.

By virtue of the arrangement and structure described, spring 11 urges lever 8 upwardly so that its shoulders 8c, 8d bear against the curved undersides of bearing bosses 10, 10a, and also urges lever 8 in a clockwise direction as viewed in FIG. 3 about ridge 8f, which extends along a pivot axis coinciding approximately with the centers of curvature of bearings 10, 10a. In the closed position of frame 4, hook 8a of the

latch lever thus yieldably engages catch 13 which is formed by a boss on housing 1, and refractor frame 4 is thereby releasably locked in the closed position. When frame 4 in open position is pushed upwardly toward the closed position, the front edge of hook 8a rides upwardly on the underside of catch 13 which is inclined to the direction of the path of closing movement and lever 8 is urged counterclockwise against the action of spring 11, until finally hook 8a snaps over the rear edge of catch 13 to the locking position shown in FIG. 3. When frame 4 is in open position, the turning of latch lever 8 in a clockwise direction by spring 11 is limited by the lower (exterior) portion of the lever abutting frame 4 at its rear side. Accordingly, hook 8a is retained in the proper position for contacting and riding up on catch 13 as described.

In accordance with the present invention, a retractable extension tab 17 is pivotally attached to the lower end of lever 8 to provide sufficient length of the lever to conveniently operate the latch when needed, and, when the lever is not in use, to move into retracted position substantially along the plane of the closure frame closely adjacent thereto, thus providing improved appearance of the luminaire. As seen in FIG. 7, tab 17 comprises a flat plate formed with opposite apertured ears 17a, 17b projecting from one side of tab 17 between a grip portion 17c and a contact portion 17d. As seen in FIGS. 2-6, tab 17 is mounted at the lower end of lever 8 by means of pivot pin 16 projecting through ears 17a, 17b and with spring 20 arranged thereon in such manner that it urges extension tab 17 into retracted position along the underside of closure frame 4 as shown in FIGS. 3 and 5. Spring 20 includes a central bight portion 20a which extends across the front of lever 8 and opposite coil portions 20b, 20c in which the opposite ends of pivot pin 16 are inserted. The free ends of spring 20 extend over and bear on the front side of grip portion 17c of the extension tab (see FIG. 6).

The arrangement is such that when the closure frame 4 is in closed position, as seen in FIG. 3, tab spring 20, by urging tab 17 in clockwise direction, yieldably holds it in retracted, inoperative position lying flush along the bottom of frame 4 below slot 9. When it is desired to unlatch the closure in order to lower the optical assembly as indicated in FIG. 1, extension tab 17 is turned counterclockwise about pivot pin 16 as shown in FIG. 4 until the contact portion 17b of the tab overlaps and engages the lower front portion of lever 8 on the side of the pivot axis away from the bottom end of lever 8. In this position, tab 17 thus forms an operative extension of lever 8 which thereby serves as a handle and is easily grasped even by a gloved hand. When tab 17 is then pulled forwardly, it forces a corresponding counterclockwise turning of lever 8 about its fulcrum on bearings 10, 10a, thereby moving hook 8a rearwardly off catch 13 to allow the front end of closure 4, with its associated optical assembly, to drop downwardly away from housing 1.

In the closing operation, closure frame 4 is pushed upwardly until hook 8a snaps over catch 13 as previously described, and extension tab 17 is retained by action of spring 20 in inoperative retracted position transverse lever 8 and lying along the bottom of closure frame 4 in such closed latched position of the luminaire, as shown in FIG. 3. As will be seen, extension tab 17 in its retracted position substantially covers the downwardly opening cavity in frame 4 in the region of

the latch, thereby hiding from below most of the latch and the cavity.

There is thus provided by the invention an improved latch device for luminaires which is simple in construction and readily assembled, is conveniently operated for opening and closing a luminaire closure, and wherein the latch device has an unobtrusive exterior appearance in the closed position and avoids the use of projecting parts which may be damaged during handling and shipment.

While the present invention has been described with reference to particular embodiments thereof, it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the scope of the invention. Therefore, the appended claims are intended to cover all such equivalent variations as come within the true spirit and scope of the invention.

I claim:

1. A closure device comprising, in combination, a housing having an opening, closure means for closing said opening, and latch means for releasably securing said closure means to said housing comprising a catch on said housing, first bearing means on said closure means defining a bearing axis, a lever having opposite ends and having second bearing means intermediate its ends engaging said first bearing means for turning about said bearing axis, said lever having a hook portion at one end engageable with said catch, first spring means for urging said lever about said bearing axis for holding said hook portion in yieldable engagement with said catch, tab means pivotally secured to said lever at the other end thereof, said tab means being turnable to an operative projecting position engaging and forming an extension of said lever for operating the same and turnable to an inoperative retracted position away from said projecting position and disengaged from said lever, and second spring means for urging said tab means into said inoperative retracted position.

2. A device as defined in claim 1, said tab means comprising a plate member having a gripping portion, a contact portion and pivot bearing means between said portions defining a pivot axis, said contact portion in said operative projecting position of said tab means engaging said lever on the side of said pivot axis away from said other end of said lever.

3. A device as defined in claim 2, said plate member in said inoperative retracted position lying substantially along the plane of said closure means and closely adjacent thereto.

4. A closure device comprising, in combination, a housing having an opening, closure means for closing said opening, and latch means for releasably securing said closure means to said housing comprising a catch on said housing, first bearing means on said closure means defining a bearing axis, a lever having opposite ends and having second bearing means intermediate its ends engaging said first bearing means for turning about said bearing axis, said lever having a hook portion at one end engageable with said catch, first spring means for urging said lever about said bearing axis for holding said hook portion in yieldable engagement with said catch, tab means pivotally secured to said lever at the other end thereof, said tab means being turnable to an operative projecting position forming an extension of said lever for operating the same and turnable to an inoperative retracted position away from said project-

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ing position, and second spring means for urging said tab means into said inoperative retracted position, said tab means comprising a plate member having a gripping portion, a contact portion and pivot bearing means between said portions, said contact portion engaging said lever in said operative projecting position of said tab means, said second spring means bearing against said lever and said plate member on opposite sides of said pivot bearing means.

5. A device as defined in claim 4, including a pivot pin interconnecting said lever and said plate member at said pivot bearing means, said second spring means having coil portions extending around said pivot pin.

6. A device as defined in claim 1, said closure means having front and rear ends and being movably secured at its rear end for movement between closed and open positions relative to said housing, said closure means

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being formed with a slot at its front end, said first bearing means comprising spaced bearings formed in said closure means at opposite ends of said slot, said lever extending through said slot and formed intermediate its ends with opposite laterally projecting shoulder portions engageable with said spaced bearings for rocking therein about said bearing axis.

7. A device as defined in claim 6, said first spring means having opposite ends respectively engaging said lever and said closure means and being the sole means to retain said lever in engagement with said first bearing means.

8. A device as defined in claim 1, said closure means formed with a downwardly opening cavity in the region of said latch means, said tab means substantially covering said opening in said retracted position thereof.

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