

[54] LATCH DEVICE

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[51] Int. Cl.....E05c 5/04

[58] Field of Search.....292/247, 257, 258, 288, 113, 292/DIG. 49, DIG. 42, 71

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[57] ABSTRACT

Latch device for street lighting luminaires for latching a refractor closure to the luminaire housing. Latch lever arm extending through opening in front of closure member has latch spring detachably connected to it. The spring engages an integrally formed catch on the front surface of the luminaire housing. The lever arm has pivot pins cooperating with spaced upper and lower journal bearings formed on the closure member. The lever arm can be removed through the inner side of the closure member only after the latch spring is detached from the lever arm.

10 Claims, 7 Drawing Figures

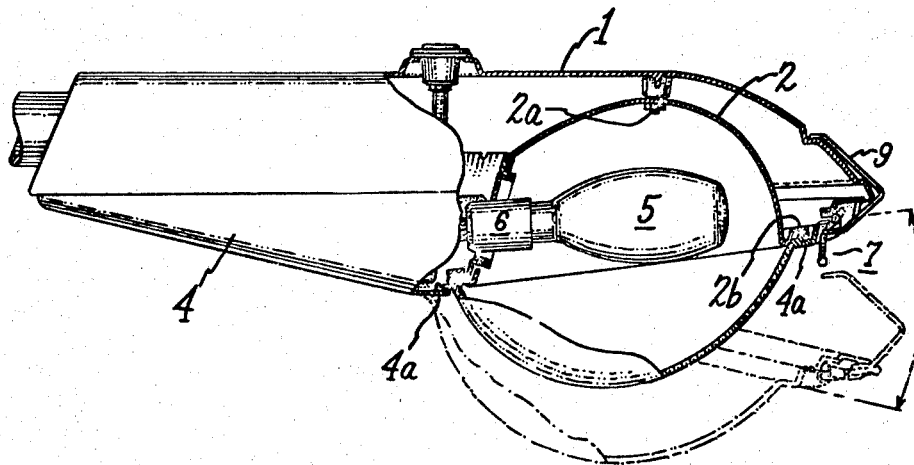
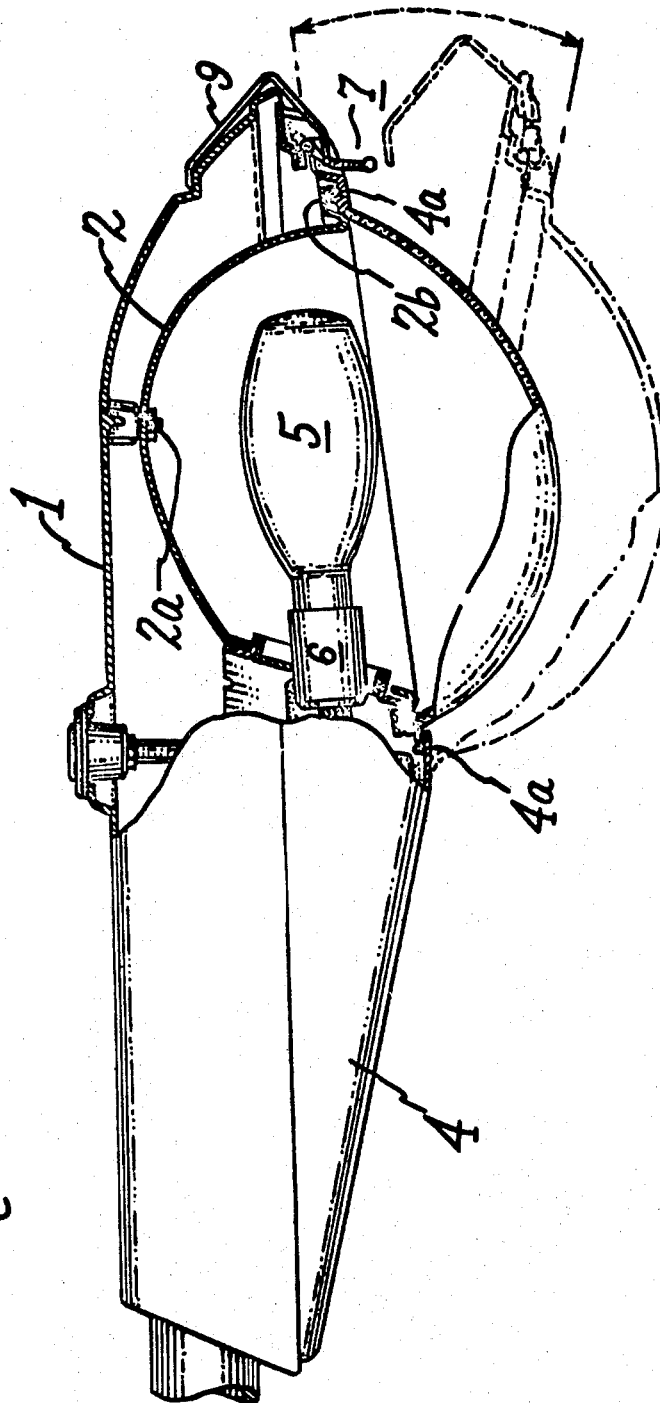


Fig. 1.



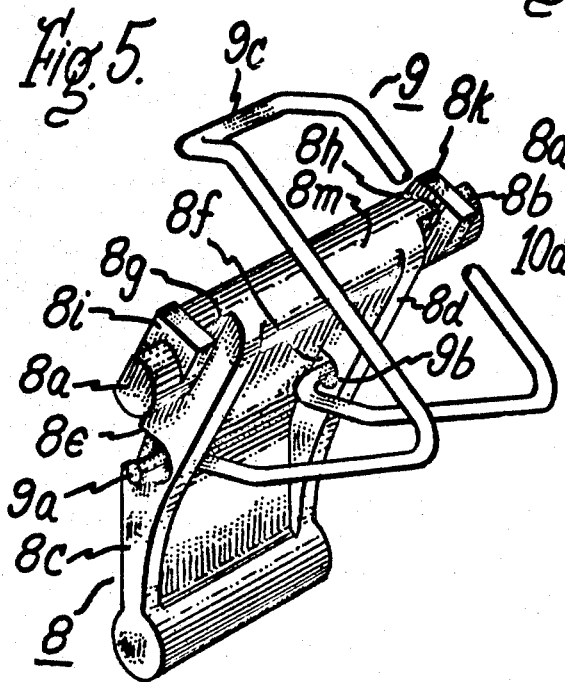
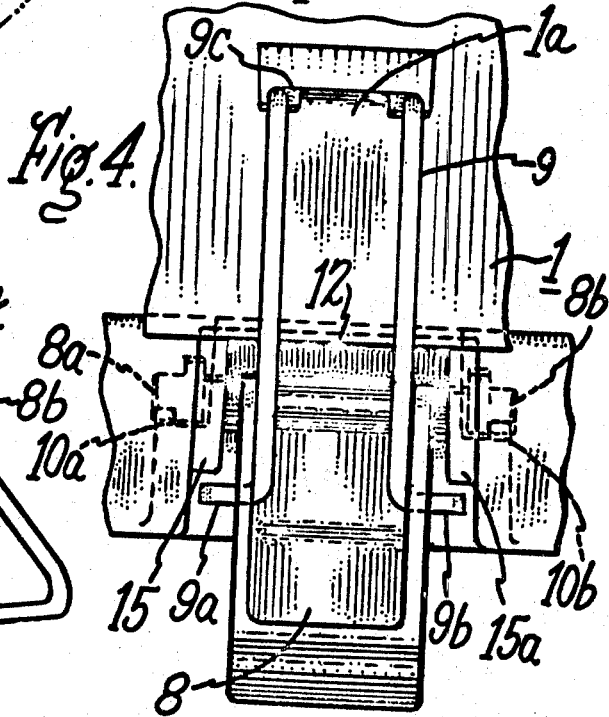
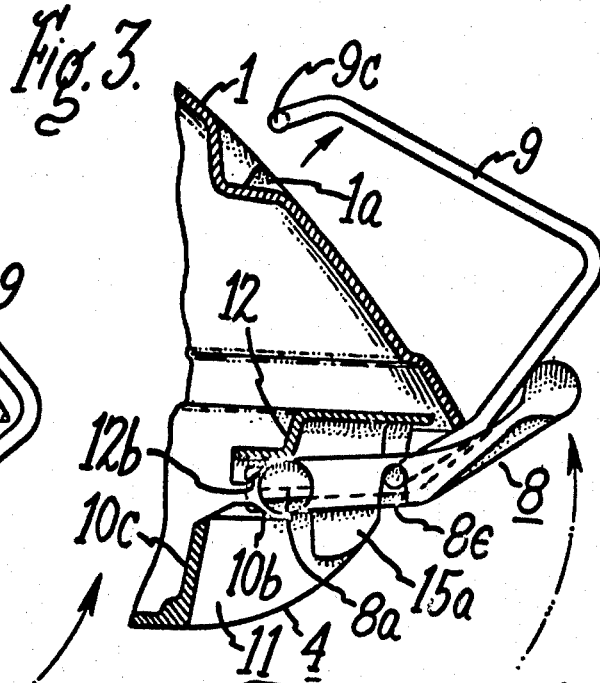
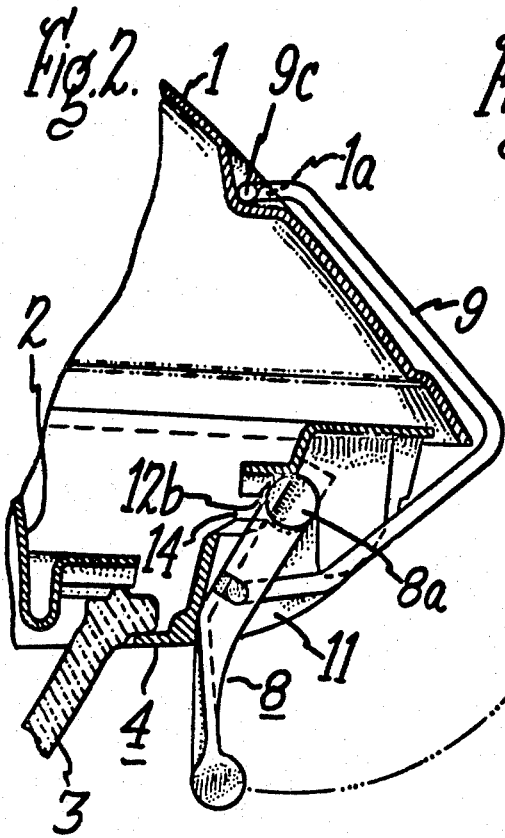


Fig. 6.

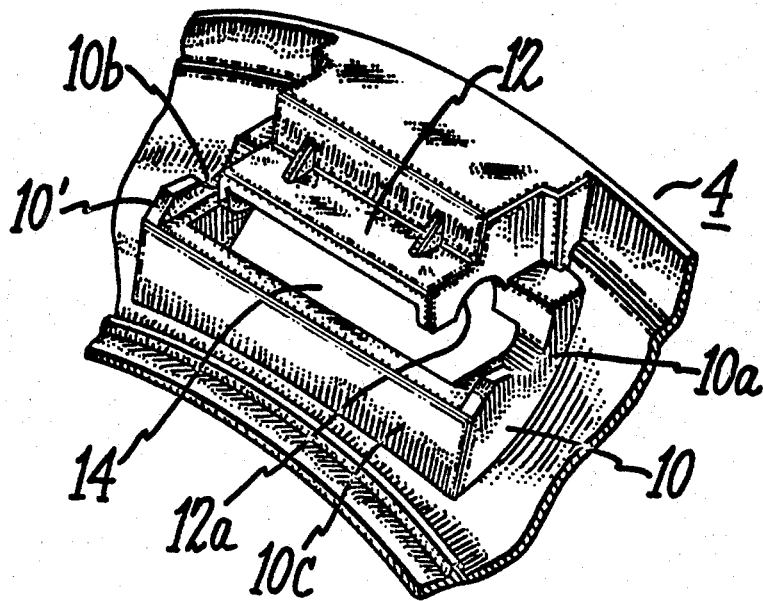
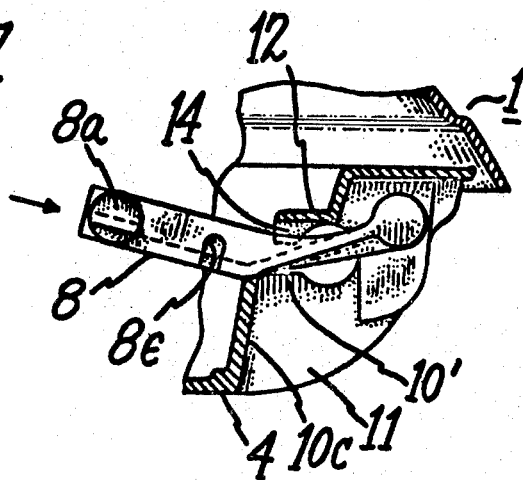


Fig. 7.



## 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.

It is an object of the invention to provide a latch device which has a minimum of parts, is readily and economically manufactured and installed, is simple and rugged in construction, and reliably and securely fastens 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 street lighting luminaire.

Another object of the invention is to provide a latch device of the above type wherein no fastening hardware is required to hold the assembly together.

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

With the above objects in view, the present invention relates in a preferred embodiment to a closure device comprising a housing, closure means movably secured to the housing for movement between closed and open positions relative to the housing, and latching means for releasably securing the closure means to the housing in closed assembly, the latching means comprising a catch on the housing, upper and lower journal bearing means formed on the closure means defining a pivot axis and each comprising spaced journal bearings, the upper and lower journal bearing means defining a laterally extending opening therebetween, a lever having one end thereof formed with opposite laterally projecting pivot pins, the pivot pins arranged in the journal bearings in separable engagement therewith, the lever being turnable about the pivot axis between latched and unlatched positions and being movable through the opening when in unlatched position for assembly to and disassembly from the closure means, and elongated spring means pivotally secured at one end to the lever and engageable at its other end with the housing catch, the spring means being movable into latched and unlatched positions upon turning of the lever about the pivot axis in snap-over-center movements.

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 an enlarged detail view, partly in section, of the front portion of the FIG. 1 luminaire showing the latching device of the invention in latched position;

FIG. 3 is a similar view showing the latching device in unlatched position;

FIG. 4 is a front elevational view of the latching device and associated closure assembly in latched position;

FIG. 5 is a perspective view of the latching lever member and associated spring member;

FIG. 6 is a perspective view of the front end portion of the closure member as viewed from the inside; and

FIG. 7 is a detail view partly in section of the front portion of the closure arrangement showing the manner of assembling the latch arm.

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 elongated upper housing 1 mounted at its rear end on a horizontal support. Arranged within the front portion of housing 1 is a concave reflector 2 which has a specular interior reflecting surface facing downwardly towards the bottom of housing 1, and is suitably secured, as by screws 2a or other means, to the housing. Lamp 5 is arranged within reflector 2 and threadably secured at its base end to lampholder 6. The bottom of housing 1 is closed by closure member 4 which is formed at its front end with a retaining frame 4a in which refractor 3 is mounted. Closure member 4 is hingedly connected at its rear end to housing 1 by suitable hinge means (not shown) for opening and closing movement relative to the housing. Closure member 4 is releasably attached at its front end by latch mechanism 7 constructed in accordance with the present invention, as more fully described hereinafter. Upon release of latch 7, closure member 4 with refractor 3 retained therein may be swung downwardly about its hinge connection at its rear end, as indicated by the interrupted lines, to provide access to the interior of the luminaire housing for re-lamping or other servicing operations. Upon closing refractor closure 4 and latching it to housing 1, refractor 3 is brought into tight sealing engagement with the gasketed flange 2b of reflector 2.

In accordance with an embodiment of the invention, there is provided a latch mechanism 7 comprising an operating lever arm 8 (see FIG. 5) integrally formed at its upper end with oppositely projecting pivot pins 8a, 8b and side flanges 8c, 8d having openings 8e, 8f intermediate their ends for respectively receiving the free ends 9a, 9b of a bent generally U-shaped latch spring 9. Between pins 8a, 8b, lever arm 8 is formed with an intermediate journal portion 8m. The end portions of pins 8a, 8b have flat rear surfaces, and those portions of pins 8a, 8b outwardly adjacent to flanges 8c, 8d have flat front faces 8g, 8h. Pins 8a, 8b are further formed with angular projections 8i, 8k spaced inwardly from the ends of the pins.

Closure member 4 is formed at its front end with a recessed portion 11 for receiving, retaining, and defining operational limits of latch lever 8. Outer journal bearings 10a and 10b (see FIG. 6) are formed in bearing bosses 10, 10' at opposite sides of recess 11 in closure member 4 for receiving the ends of opposite pins 8a, 8b, thus retaining lever arm 8 (see FIG. 4). A lower ledge 10c extends between bearing bosses 10, 10' as seen best in FIG. 6. An upper ledge 12 formed integrally with closure 4 extends above lower ledge 10c parallel thereto and spaced therefrom so as to define an elongated laterally extending opening 14. The ends of ledge 12 which are formed with inner journal bearings 12a, 12b are spaced inwardly of bosses 10, 10', the arrangement being such that both inner and outer journal bearings have a common axis.

Upper housing 1 is recessed in its front end and is formed therein with an integral ledge or catch 1a (see FIGS. 3 and 4). In the installed, latched position of latch mechanism 7 as seen in FIG. 2, lever arm 8 is arranged extending downwardly below closure member 4 with its pivot pins 8a, 8b engaging journal bearings 12a,

12b and journal portion 8m engaging the underside of ledge 12, and with the bight portion 9c of spring 9 in engagement with catch 1a. In being moved to this latching position, lever arm 8 is snapped over center, so that spring 9 resiliently holds housing 1 and closure member 4 in firmly closed assembly.

To release the latch, lever arm 8 is turned in the direction of the arrow shown in FIG. 2 so as to release spring 9 from housing catch 1a as shown in FIG. 3 and permit closure 4 to be swung downwardly to open position. During such turning of lever arm 8, the curved portions of the pivot pins opposite flat surfaces 8g, 8h respectively rotatably bear on upper (inner) journal bearings 12a, 12b, and intermediate journal portion 8m bears on the lower surface of ledge 12, as is evident in FIGS. 2 and 3.

In the assembly of lever arm 8 with closure member 4, projections 8i, 8k on lever arm 8 formed between the pin bearing surfaces are arranged outwardly adjacent the outer ends of ledge 12, so that during the turning movement of lever arm 8, projections 8i, 8k serve as guides or retaining means for holding lever arm 8 against substantial lateral shifting relative to ledge 12.

To assemble the latching mechanism, lever arm 8 with spring 9 removed is inserted as shown in FIG. 7 from the inside of closure member 4 through opening 14 between ledge 12 and ledge 10c in the direction indicated by the arrow. The cut-away flat surfaces at the ends of pins 8a, 8b and the similar cut-away pin surfaces 8g, 8h permit the lever pin portion to clear the upward projections of bosses 10, 10' and the downward projections at the end of ledge 12 so that lever arm 8 may be moved into operative position as shown in FIG. 3. When lever arm 8 is thus installed, spring 9 is readily assembled therewith by pressing together the free ends of the spring and inserting them in recesses 8e, 8f in the lever arm flanges 8c, 8d. With spring 9 thus in place, lever arm 8 cannot be disassembled from closure member 4, since any attempt to move arm 8 back into closure member 4 when in the position shown in FIG. 3 will result in the free ends of spring 9 coming into contact with stop bosses 15, 15a formed at opposite sides of recess 11 in closure member 4 (see FIGS. 3 and 4). Only by first removing spring 9 from lever 8 can the latter be moved back into closure member 4 for disassembly therefrom. In such reverse movement of lever arm 8, the latter must be in the position shown in FIG. 3 to enable its cut-away pin surfaces to clear the projections of bosses 10, 10' and ledge 12 as previously described, so that lever arm 8 can be entirely removed.

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.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A closure device comprising, in combination, a housing, closure means movably secured to said housing for movement between closed and open positions relative to said housing, and latching means for

releasably securing said closure means and said housing in closed assembly, said latching means comprising a catch on said housing, upper and lower journal bearing means formed on said closure means defining a pivot axis and each comprising spaced journal bearings, said upper and lower journal bearing means defining a laterally extending opening therebetween, a lever having one end thereof formed with opposite laterally projecting pivot pins, said pivot pins arranged in said journal bearings in separable engagement therewith, said lever being turnable about said pivot axis between latched and unlatched positions, said lever being movable through said opening when in unlatched position for assembly and disassembly from said closure means, and elongated spring means pivotally secured at one end to said lever and engageable at its other end with said housing catch, said spring means being movable into latched and unlatched positions upon turning of said lever about said pivot axis in snap-over-center movements.

2. A device as defined in claim 1, the journal bearings of said upper journal bearing means being laterally spaced from the journal bearings of said lower journal bearing means.

3. A device as defined in claim 1, the journal bearings of said upper journal bearing means being spaced laterally inwardly from the journal bearings of said lower journal bearing means.

4. A device as defined in claim 1, said spring means being detachably secured at said one end to said lever, and stop means on said closure means adjacent said lever for preventing movement of said spring means through said opening with said lever, whereby disassembly of said lever from said closure means is enabled only after detachment of said spring means therefrom.

5. A device as defined in claim 3, said lever at said one end having projecting retaining means arranged outwardly adjacent said upper journal bearings.

6. A device as defined in claim 5, said projecting pivot pins having recessed end portions for clearing said lower journal bearing means when said lever is moved through said opening in unlatched position.

7. A device as defined in claim 6, said pivot pins having recessed portions inwardly of said end portions for clearing said upper journal bearing means when said lever is moved through said opening in unlatched position.

8. A device as defined in claim 1, said catch comprising a projection integral with said housing.

9. A device as defined in claim 1, said elongated spring means being in bent generally U-shaped form having a bight portion engageable with said housing catch and having laterally extending free ends detachably connected to said lever and projecting laterally therefrom, and stop means on said closure means adjacent said lever for preventing movement of said spring means through said opening with said lever, whereby disassembly of said lever from said closure means is enabled only after detachment of said spring means therefrom.

10. A device as defined in claim 9, said stop means comprising surface means arranged in the path of said projecting free ends of said spring means in movement of said lever toward said opening in unlatched position.

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