July 15, 1969 R. W. ZERFOSS 3,455,590

LATCH DEVICE

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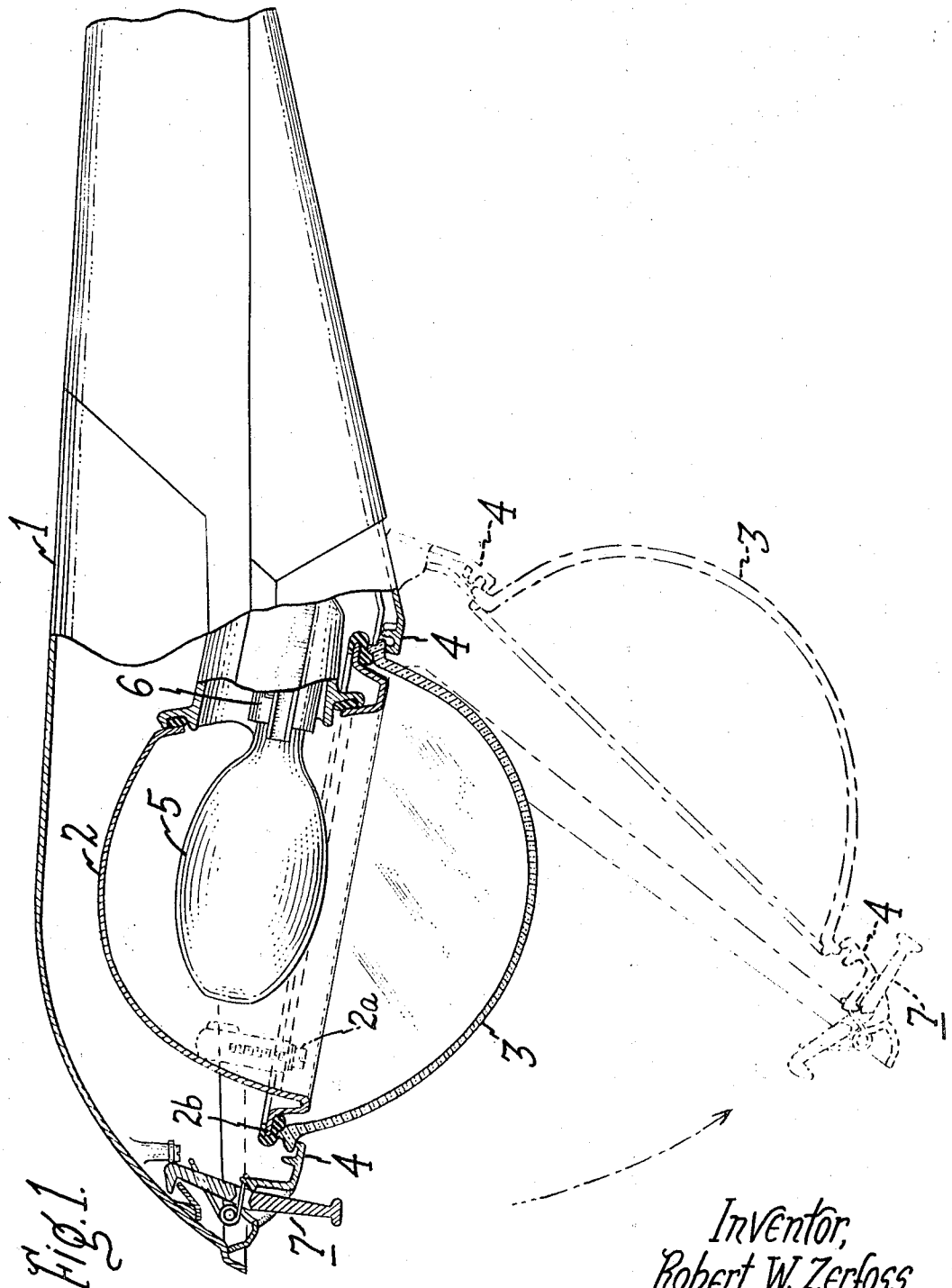


Fig. 1.

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Fig. 2.

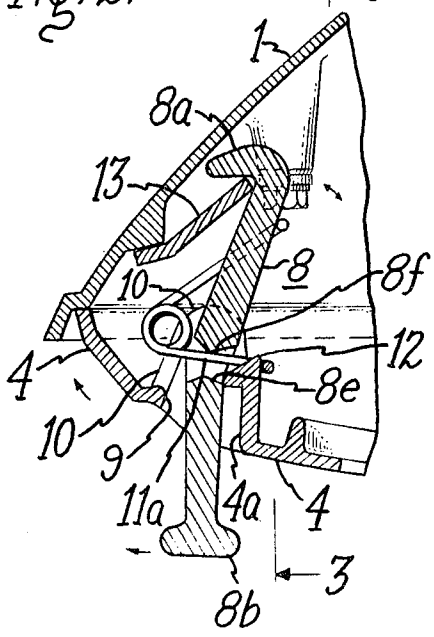


Fig. 3.

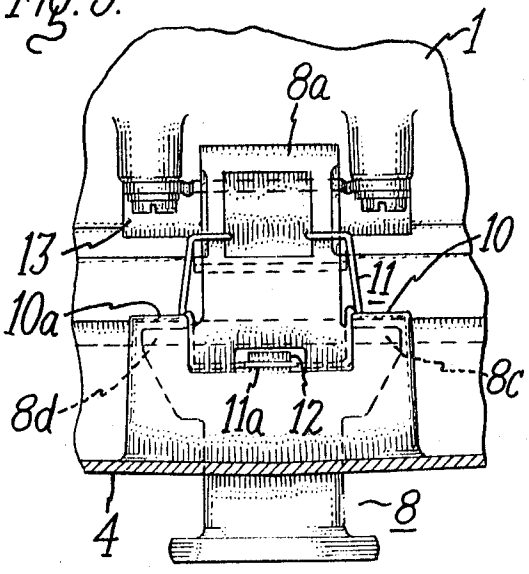


Fig. 6.

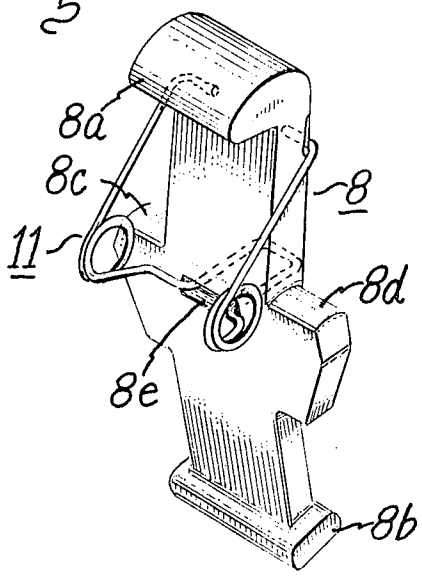
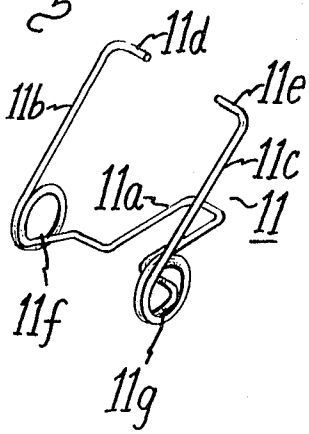


Fig. 7.



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Fig. 4.

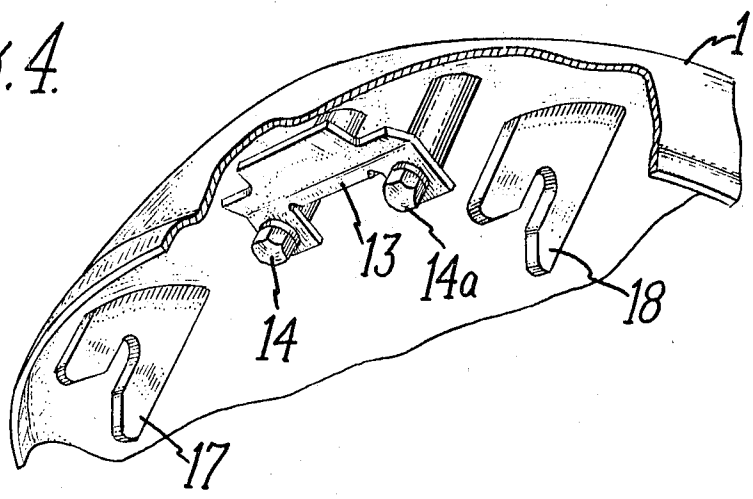
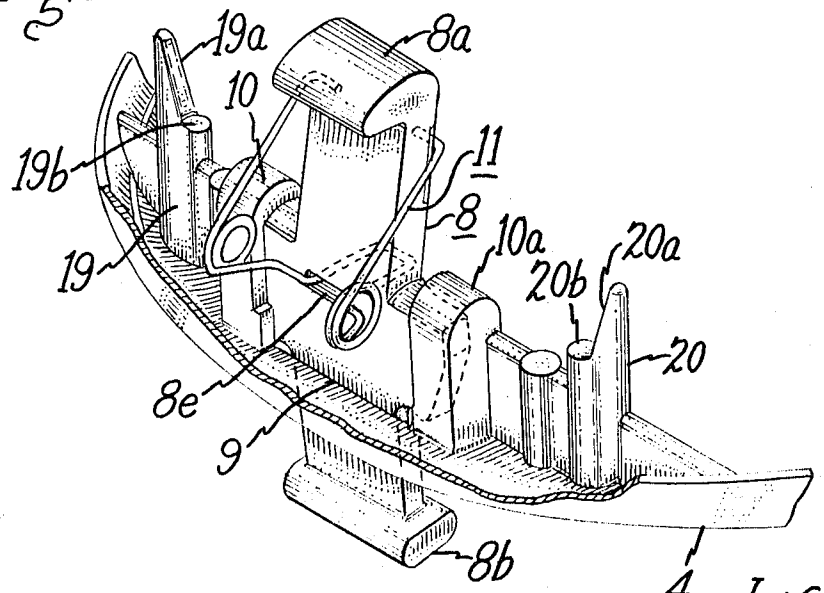


Fig. 5.



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United States Patent Office

3,455,590

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3,455,590

LATCH DEVICE

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Filed July 5, 1966, Ser. No. 562,688
Int. Cl. E05c 19/10
U.S. Cl. 292—128 9 Claims

ABSTRACT OF THE DISCLOSURE

A latch device for street lighting luminaires for latching a refractor closure to the luminaire housing comprises a catch on the housing, a slot formed in the closure adjacent 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 being formed intermediate its ends with opposite laterally projecting shoulder portions separably engageable with the spaced bearing means for rocking therein about a pivot axis, and spring means having opposite ends respectively engaging the lever and the closure for retaining the lever in engagement with the bearing means and urging it in a rotary direction about the pivot axis for holding the hook portion in yieldable engagement with the catch.

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 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 street lighting 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 relates in a preferred embodiment to a closure device comprising a housing, a closure member secured at one end to the housing for movement between closed and open positions relative to the housing, and latching means for releasably securing the closure member and the housing together in closed assembly, the latching means comprising a catch on the housing, the closure member having a slot formed therein adjacent the catch in the closed assembly and being formed at opposite ends of the slot with integral bearings, a lever extending through the slot in the closure member, the lever having a hook portion at its upper end engageable with the catch and formed intermediate its ends with opposite laterally projecting shoulder portions engaging the bearings for rocking therein about a pivot axis, the lever having an aperture passing therethrough intermediate its ends, and spring means passing through the aperture and engaging the lever at one end and the closure member at the other end, the spring means retaining the lever in engagement with the bearings and urging it in a rotary direction about said axis for holding the hook portion of the lever in releasable engagement with the catch.

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

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

FIGURE 2 is an enlarged detailed view of the front portion of the FIGURE 1 luminaire showing the latching device of the invention;

FIGURE 3 is a rear view of the latching device taken along the line 3—3 of FIGURE 2;

FIGURE 4 is a perspective view, partly broken away, of the front interior portion of the luminaire housing shown in FIGURE 1;

FIGURE 5 is a similar view of the lower closure member showing the latch mechanism;

FIGURE 6 is a front perspective view of the lever member with spring assembled thereon; and

FIGURE 7 is a perspective view of the spring shown in FIGURE 6.

Referring now to the drawings, and particularly to FIGURE 1, there is shown a street lighting luminaire in which the invention is embodied and which comprises an elongated upper housing **1** adapted to be mounted at its rear end on a suitable support by conventional means with its longitudinal axis substantially horizontal. 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 **2***a* or other means, to the housing. Lamp **5** is arranged within reflector **2** and threadably secured at one end to a suitable lampholder **6**. The housing opening is closed by a bowl-shaped light transmitting globe or refractor **3** mounted in a ring-shaped retaining frame **4** which is hingedly connected at its rear end to housing **1** by suitable hinge means (not shown). Frame **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**, refractor ring **4** with refractor **3** retained therein may be swung downwardly about its hinge connection at its rear end, as shown by the interrupted lines, to provide access to the interior of the luminaire housing for relamping or other servicing operations. Upon closing refractor ring **4** and latching it to housing **1**, refractor **3** is brought into tight sealing engagement with the gasketed flange **2***b* of reflector **2**.

In accordance with the invention, latch mechanism **7** comprises an operating lever **8** (see FIGURES 2 and 6) integrally formed at its upper end with hook **8***a* and at its lower end with flange **8***b*, and intermediate its ends with opposite laterally projecting shoulders **8***c*, **8***d* which have convexly curved upper bearing surfaces. As seen in FIGURE 5, lever **8** extends vertically through a slot **9** in refractor retaining frame **4** which is formed at opposite ends of the slot with hollow bearing bosses **10**, **10***a* in which shoulders **8***c*, **8***d* of the lever are received. The undersides of bearing bosses **10**, **10***a* have concave bearing surfaces complementary to the convex bearing surfaces of lever shoulders **8***c*, **8***d*. Lever **8** is held in assembly with frame **4** by retaining spring **11**, which, as more clearly shown in FIGURE 7, has a somewhat U-shaped configuration including a bight portion **11***a*, spaced arms **11***b*, **11***c* extending at an angle to the bight portion and having inwardly bent free ends **11***d*, **11***e*, and coiled intermediate portions **11***f*, **11***g*. In the assembly, bight portion **11***a* of the spring extends through aperture **8***e* in lever **8** (see FIGURE 2) and is looped over projecting lug **12** on frame **4** so as to be anchored thereon. Spring coils **11***f*, **11***g* are thus on the front side of lever **8** and arms **11***b*, **11***c* extend therefrom upwardly on opposite sides of lever **8** clasping the latter therebetween so that the bent end portions **11***d*, **11***e* hook around the rear surface of lever **8**.

As seen best in FIGURE 2, the upper interior surface of aperture **12** in lever **8** is bevelled as shown to provide

a downwardly projecting ridge **8***f* which engages bight portion **11***a* of the spring. Ridge **8***f* 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 **8***c*, **8***d* bear against the curved undersides of bearing bosses **10**, **10***a*, and also urges lever **8** in a counterclockwise direction as viewed in FIGURE 2 about ridge **8***f*, which extends along a pivot axis coinciding approximately with the centers of curvature of bearings **10**, **10***a*. In the closed position of frame **4**, hook **8***a* of the latch lever thus yieldably engages catch plate **13** which is secured to housing **1**, as by screws **14**, **14***a* or the like, 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 **8***a* rides upwardly on the underside of catch plate **13** which is inclined to the direction of the path of closing movement and lever **8** is urged clockwise against the action of spring **11**, until finally hook **8***a* snaps over the rear edge of catch plate **13** to the locking position shown in FIGURE 2. When frame **4** is in open position, the turning of latch lever **8** in a counterclockwise direction by spring **11** is limited by the lower (exterior) portion of the lever abutting the wall **4***a* of frame **4** at its rear side. Accordingly, hook **8***a* is retained in the proper position for contacting and riding up on catch **13** as described.

To open refractor frame **4** from the closed position, lever **8** is simply grasped at its lower flanged end **8***b* and pulled forwardly until hook **8***a* clears the edge of catch plate **13**, so that the front end of frame **4** can drop downwardly away from housing **1**. The length of lever **8** is preferably such, as shown in FIGURES 1 and 2, that its lower portion extends sufficiently below the frame **4** to serve as a handle which is readily grasped and operated even by a gloved hand.

To ensure proper alignment of the refractor closure frame **4** with housing **1** during the closing operation, there are provided (see FIGURE 4) spaced bifurcated members **17**, **18** projecting downwardly from the interior surface of the housing on opposite sides of catch plate **13**, and correspondingly arranged upwardly projecting members **19**, **20** on frame **4** which are formed with inwardly facing inclined guide surfaces **19***a*, **20***a* and horizontal stop surfaces **19***b*, **20***b*. As the front end of frame **4** approaches the front end of housing **1** in the closing operation, surfaces **19***a*, **20***a* move along the outer surfaces of members **17**, **18**, respectively, and guide frame **4** into proper lateral alignment so that stop surfaces **19***b*, **20***b* enter the tapered slots of members **17**, **18**. At the same time, the latter slots guide members **19**, **20** into proper alignment along the longitudinal axis of housing **1**. Stop members **19***b*, **20***b* are arranged to engage the bottoms of the slots in member **17**, **18** after hook **8***a* of the latching lever has snapped into locking position, thereby providing a positive stop for the closing action after latching has taken place.

There is thus provided by the invention an improved and simplified luminaire latching device which has a minimum of parts, is readily made and assembled, is rugged in construction and reliable in operation, and is easily operated for opening and closing the luminaire for necessary maintenance service.

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. Accordingly, therefore, I wish to have it understood that I intend herein to cover all such modifications as fall within the true spirit and scope of my 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 having opposite ends and movably secured at one end 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 together in closed assembly, said latching means comprising a catch on said housing, a slot formed in said closure means at its opposite end adjacent said catch in the closed assembly, spaced bearing means integrally formed in said closure means at opposite ends of said slot, a lever extending through said slot and formed integrally with a hook portion on the interior side of said closure means engageable with said catch and a handle portion on the exterior side of said closure means, said lever being formed intermediate its ends with opposite laterally projecting shoulder portions separably engageable with said spaced bearing means for rocking therein about a pivot axis, and 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 bearing means and to urge it in a rotary direction about said pivot axis for holding said hook portion in yieldable engagement with said catch.

2. A device as defined in claim **1**, said lever having an aperture passing therethrough intermediate its ends, said spring means comprising an elongated spring member bent intermediate its ends to form two portions extending at an angle to each other, one portion extending through an aperture in said lever from one side to the other side thereof and engaging said closure means on said other side, the other spring portion extending on said one side toward said hook portion and engaging said lever, said hook portion projecting from said one side toward said catch, whereby said spring member urges said hook portion toward said catch.

3. A device as defined in claim **2**, said spring member at said bent portion being formed in a coil.

4. A device as defined in claim **2**, said spring member having a bent generally U-shaped form, said one portion comprising a bight portion extending through said aperture and said other potrion comprising spaced arms bent angularly relative to said bight portion and arranged with said lever therebetween.

5. A device as defined in claim **4**, said closure means having lug means adjacent said other side of said lever aperture, said bight portion of said spring member being looped around said lug means.

6. A device as defined in claim **2**, said catch comprising a plate member fixed to said housing in the path of said hook portion of said lever during closing movement of said closure means, said plate member being inclined to the direction of said path and having a rear edge extending transverse to said path, whereby during said closing movement said lever hook portion yieldably rides on said plate member until it snaps over and engages said rear edge in locking position.

7. A device as defined in claim **1**, each said spaced bearing means comprising a hollow boss projecting from the interior surface of said closure means and having a concavely curved bearing surface on its interior, said lever shoulder portions being received in said hollow bosses and having convexly curved bearing surfaces complementary to and rotatably engaging said respective concavely curved bearing surfaces.

8. A device as defined in claim **2**, said lever being formed in said aperture therein with a ridge engaging said spring portion therein, said lever being turnable about said ridge as a pivot axis.

9. A device as defined in claim **2**, said housing having a reflector and a lamp mounted therein, said closure means comprising a ring-shaped frame having a bowl-shaped light transmitting globe mounted therein and

enclosing said reflector and lamp in the closed position of said closure means.

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U.S. Cl. X.R.

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