Dec. 20, 1955 R. L. SMYTHE ET AL 2,727,984

LATCH DEVICE FOR CLOSED TYPE LUMINAIRE

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Fig. 1.

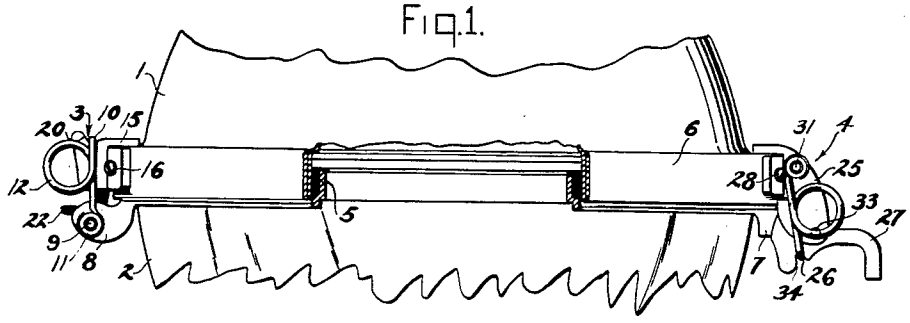


Fig. 2.

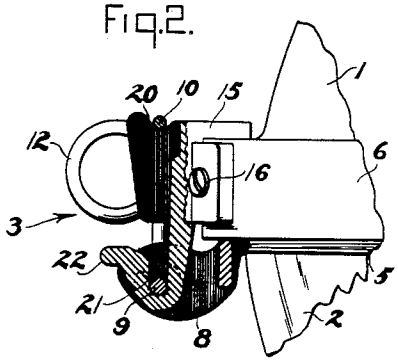


Fig. 3.

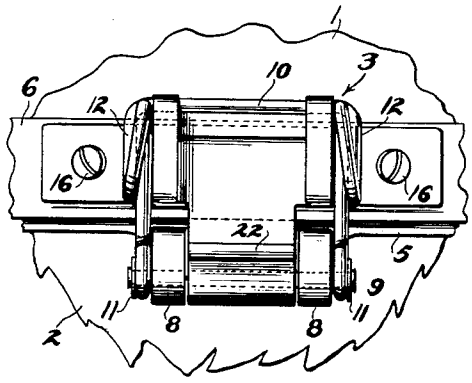


Fig. 4.

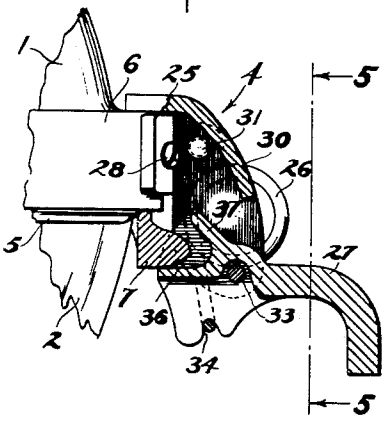
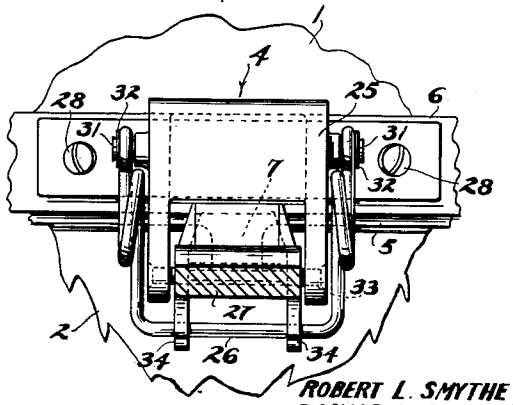


Fig. 5.



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Fig. 6.

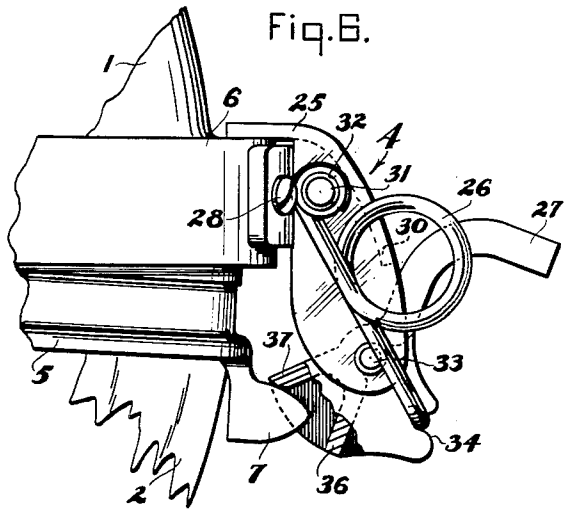


Fig. 7.

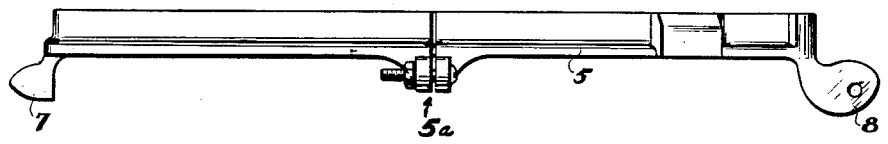
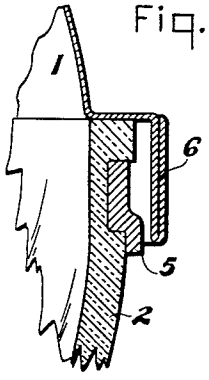


Fig. 8.



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LATCH DEVICE FOR CLOSED TYPE LUMINAIRE

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Application September 11, 1950, Serial No. 184,254

2 Claims. (Cl. 240—147)

This invention relates to improvements in hinge and latch devices for closed type luminaires and the like.

Automatic latching devices for street luminaires are well known. However, such devices do not fulfill all of the needs. For instance, they have not heretofore been strictly automatic, in that they often require adjustments to compensate for vertical variations in the glassware flanges and necessitate additional latching operations. These adjustments have heretofore been made with screws, gasket layers, etc.

It is very important that there be a seal between the reflector and glassware portions of the luminaire in order to prevent bugs, dust, water, etc. from entering the luminaire. Naturally, it is a distinct advantage to provide the necessary seal without gaskets or other special devices.

Also, a good share of the maintenance operations are performed from the street level using operating sticks provided with various adapter tools attached thereto. Heretofore, it has been necessary for the operator to close the unit by pressing against a latch with a special adapter tool. Many operators, in order to expedite matters, prefer to press against the glassware itself, which has often resulted in disalignment of the sealing surfaces and improper latching. In addition to the problem of maintaining a tight seal, disalignment also introduces the problem of increased glassware breakage.

This invention is designed to overcome the above-noted defects, and objects of this invention are to provide a fully automatic latching device for street luminaires and the like, that will permit a tight seal between the globe assembly and the reflector of the luminaire without the necessity of using gaskets, and without requiring special effort to insure a tight seal, and which will secure and maintain uniform pressure at all points along the glassware flange circumference.

Another object of this invention is to provide an automatic, self-aligning latching device for luminaires that will permit maintenance of the luminaire by a workman standing on the ground at a distance from the luminaire greater than arms' length by the use of operating sticks with suitable attachments.

A further object of this invention is to provide an automatic latching device for luminaires that is rigidly secured to the glassware, permitting relatching of the luminaire on completion of maintenance operations by hand pressure applied to the globe portion.

Still another object of this invention is to provide an automatic latching device for luminaires that will permit self-alignment of the luminaire globe within the luminaire without any further adjustments during or after relatching.

A still further object of this invention is to provide an automatic co-acting hinge and latch device for releasably holding two assemblies in sealing relationship where a uniform latching pressure is desired without the necessity for providing sealing gaskets or the like.

In the drawings:

Fig. 1 is a fragmentary view, partly in section, of a

closed type street luminaire embodying the novel hinge and latch device.

Fig. 2 is an enlarged side view, partly in section, showing the hinge device.

Fig. 3 is a front view of the hinge device.

Fig. 4 is an enlarged side view, partly in section, showing the latch device in normally latched position.

Fig. 5 is a front view of the latch device, partly in section, taken on line 5—5 of Fig. 4.

Fig. 6 is an enlarged side view, partly in section, of the latch device, showing the latching lever arm in full open position, and further showing the lower assembly engaging the latch lever immediately prior to movement of the various parts to normally latched position.

Fig. 7 is a side view of the globe retaining band showing the clamping means, pivot support, and latching prong.

Fig. 8 is an enlarged sectional view showing the upper and lower assemblies in sealing relationship.

Fig. 1 shows a closed type street luminaire assembly including a reflector or housing **1** and a glass globe **2** which is supported by a globe retaining band or ring **5**. This lower assembly is secured to the reflector **1** by means of a hinge device designated generally by the numeral **3**, and a latch device designated generally by the numeral **4**.

The reflector **1** is provided at its lower end with an integral flange **6** which is more clearly shown in Fig. 8. The flange is strengthened by forming the lower rim of the reflector substantially twice the length of the finally desired flange height and spinning one layer back upon itself. Other strengthening means may also be used, such as separate backing strips fastened to the flange portion (not shown).

The globe band **5** is preferably cast of a single length of suitable thin gauge, flat metal provided with a latching prong **7** integral with the band, or secured to the band in any convenient manner. The band **5** is mounted adjacent the upper edge of the globe **2** and may be secured to the globe as shown in Figs. 1 and 7. Fig. 7 clearly shows the well-known method, indicated generally by reference character *5a*, of joining the ends of the globe band by means of a machine screw and nut positioned through projecting portions on each of the open ends. Although a split ring is indicated herein, it will be apparent that a retaining band may be provided which is divided into half portions with both sides joined as described above. It will also be apparent that the ring may be of a solid construction (not shown) that may be slipped over the globe **2** and held rigidly to the globe by one of many well-known clamping devices.

Fig. 8 shows the retaining band **5** clamped to the globe **2** with a portion of the globe above the band engaging with the reflector **1**. It will be apparent that a tight seal may be had by other convenient arrangements (not shown) with the retaining band itself engaging the reflector **1**.

The hinge device is clearly shown in Figs. 2 and 3. Pivot supporting members **8** are provided diametrically opposite the latching prong **7**, and are preferably cast integral with the globe band **5**. A pintle pin **9** extends between the pivot supporting members **8**, and is preferably made of tubular material flared at both ends. The pintle pin **9** is suspended from the hinge support spring **10**. The hinge support spring **10** is preferably made U-shaped and extends across the pivot supporting members **8** as shown in Fig. 3. This spring serves both to support the globe assembly and to resiliently bias both the reflector and globe assemblies towards sealing relationship. It will be apparent that the globe may be resiliently supported in other ways not shown herein.

The ends of the pin **9** are flared or peened against the washers **11**. This flaring is made tight enough to hold the spring **10** in a substantially rigid manner extending in a position normal to the band **5**. The spaced arms of

the U-shaped spring 10 are preferably formed with a loop 12, in order to give the spring the desired degree of resiliency. It will be apparent that other means may be provided for giving the supporting arms of the spring the desired degree of resiliency. These have not been shown, but might include winding the arms in a spiral coil or forming them in the shape of a C.

A hinge member 15 is secured to the flange 6 of reflector 1 with screws 16 engaging tapped screw plates or nuts (not shown). The hinge member 15 is provided with notched portions 20. These notches receive and support the crossarm portion of the U-shaped spring 10, permitting easy removal and replacement of the globe assembly. A slot 21 is provided to receive the pintle pin 9 of globe band 5. The lip portion 22 is provided to permit the pin 9 to have easy access to the slot 21 prior to positioning spring 10 in notch 20.

The slot 21 is made of such length that it will permit free guided movement of the pin 9 without permitting the pin to roll past thhe lip portion 22 when the globe 2 is moved to open position as will be hereinafter described.

The luminaire that is shown is substantially circular in design, thus preferaby requiring only one hinge device 3. However, should the engaging surfaces of the luminaire parts be rectangular or of some other non-circular design (not shown), it will be aparent that one or more of the disclosed hinge devices 3 will be necessary for successful operation in conjunction with the hereinafter described latching device.

The latching device will be described with particular reference to Figs. 4, 5 and 6. The device 4 is preferably positioned substantially diametric to the hinge 3 as is shown in Fig. 1, and consists essentially of four parts; the latching prong 7 of globe retaining band 5, the latch support 25, the latch spring 26, and a lever arm 27.

The latch support member 25 is preferably fastened to the flange 6 of reflector 1 with screws 28 engaging with tapped holes in a reinforcing screw plate on the reverse side of said flange (not shown). The latch support member 25 is substantially U-shaped with a stopping web portion 30 integrally positioned between the spaced arms of the member 25. The latch spring 26 is preferably substantially identical to the hinge spring 10, and is fastened to the support member with the arms of the essentially U-shaped spring 26 being fastened to either side of the latch hinge 25 by means of a flared pin 31. Both ends of the pin 31 are flared or peened against the washers 32. A lever arm 27 is pivotally supported by a pin 33 which extends between the spaced arms of the support member 25. The spring 26 is seated in the slotted portion 34 of lever arm 27 normally urging the lever arm in a clockwise direction about the pin 33 as is shown in Fig. 4. The lever arm 27 is further provided with integral latching web portions 36 and 37.

Referring to Fig. 6, it will be seen that the spring 26 is designed and positioned to operate in an over-center manner. Thus, as the lever arm 27 is moved to unlatched position as will hereinafter be described, the spring 26 will act to urge the lever in a counter-clockwise direction.

The novel hinge and latch device operates as follows: The lever arm 27 may be operated by hand or with an adapter tool fitted to the free end of a standard operating stick. Assuming the globe 2 to be in closed position, as shown in Fig. 1, the lever arm 27 is moved in a counter-clockwise direction about the pivot pin 33 until further motion is prevented by the stopping web portion 30. The spring 26 will be simultaneously moved to over-center position where it will urge the arm in a counter-clockwise direction as is shown in Fig. 6. As the arm 27 is moved, the web portion 37 presses downwardly against the latching prong 7 of globe band 5. Simultaneously, the latching web 36 will be moved away from the latching prong 7 and the globe assembly will drop down in a clockwise direction about the hinge 3.

The supporting members 8 are preferably designed as shown in Fig. 2 so that they will collide with the hinge member 15 when the globe 2 swings down to open position. Thus, the support spring 10 will be prevented from disengagement at the notched portion 20 of hinge member 15. It will be apparent that the globe assembly may be easily removed for maintenance care by further clockwise motion about the notched portion 20. This motion will cause the pin 9 to move upwardly out of the slot 21 and over the lip 22. The globe assembly may then be lifted off of the hinge member 15.

The globe may be brought to closed position in either of two methods after repositioning of the pin 9 in the slot 21 and engagement of the support spring 10 with the notch 20. An attachment fitted to the operating stick (not shown) may be abutted against the globe band 5, and the globe assembly pushed upward with the upper shoulder of the latching prong 7 engaging the latching web 37 as is shown in Fig. 6. Increased pressure on the globe assembly will be transferred to the web 37 and accordingly urge the lever arm 27 to latching position as shown in Fig. 4, the prong 7 resting on the web 36. During the latching operation the spring 26 will move over-center from unlatched position as shown in Fig. 6 to latched position as shown in Fig. 4.

The luminaire may also be closed by hand pressure applied to the globe itself. Since the globe 2 is rigidly supported by the globe retaining band 5 as is shown in Fig. 8, and does not in any way float in the retaining band, the upper surface of the globe and the latching prong 7 will move simultaneously to provide a tight, dust-free closure between the globe and the reflector 1 when latching prong 7 is in normally latched position supported by the web 36 of lever arm 27. The hinge spring 10 and the latch spring 26 provide a uniform pressure, forcing the globe band, along with the rigidly held globe 2, in sealing relationship with the under surface of the flange 6 of reflector 1. It will be apparent that no sealing gasket is necessary. Hand pressure against the globe 2 will not in any way move the globe out of the globe retaining band 5. Thus, any possibility of glassware chipping or tilting of the globe in a luminaire will be eliminated. It will be obvious that the globe may be rigidly supported in any of other well-known ways. For instance, the retaining band 5 may be designed to project above the glassware itself (not shown) so that the upper edge of the band will engage the sealing surface of the flange 6 of reflector 1.

Improper latching is prevented by rigidly mounting the globe 2 in the retaining band 5, which is obviously a distinct advantage. It will be apparent from Fig. 6 that should the globe 2 and the retaining band 5 not move as a unit, application of hand pressure to the globe during closing operations might cause the globe to contact the flange 6 prior to engagement of the latching prong 7 with the web 37. This would result in improper latching, disalignment of the globe, and possible breakage of the glassware. The novel hinge and latch device will permit fully automatic latching without the need for additional adjustments subsequent to closure.

The novel device works effectively on all types of street light luminaires, but it is not necessarily limited to this use. It will also be apparent that the novel hinge and latch device may be conveniently adapted to operate on any equipment where an automatic sealing mechanism would be desirable, such as ship hatches and bulkheads, refrigerators, and various types of closures requiring tight seals.

From the foregoing description, it is apparent that the objects of this invention have been accomplished by providing an automatic co-acting hinge and latch device for luminaires and the like, which will insure uniform and adequate sealing pressure to assemblies positioned in sealing relationship.

We claim:

1. In a luminaire comprising a stationary assembly,

a movable assembly and hinge means for pivotally and resiliently supporting said assemblies towards sealing relationship, an automatic latch comprising in combination a latch prong integral with said movable assembly, a latch support member integral with said stationary assembly, a U-shaped spring member having spaced arms and being pivotally suspended by said latch support member at the extremities of said arms, each of said arms including an integral resilient coil portion, a latch lever arm pivotally supported by said latch support member at a point spaced from the spring pivot point, said lever arm being recessed to receive the base portion of said U-shaped spring member at a point eccentric of the pivot point of said lever arm, said latch lever arm having a second recessed portion having spaced inner surfaces adapted to alternatively engage and disengage said latch prong to respectively concurrently draw said assemblies towards sealing relationship and to initially separate the assemblies after sealing on manual operation of said lever arm towards unlatch position.

2. In a luminaire comprising a stationary assembly, a movable assembly and hinge means for pivotally and resiliently supporting said assemblies towards sealing relationship, an automatic latch comprising in combination a latch prong integral with said movable assembly, a latch support member integral with said stationary assembly, a U-shaped spring member having spaced resilient arms and being pivotally suspended by said latch support member at the extremities of said arms, a latch lever arm pivotally supported by said latch support member at a point spaced from the spring pivot point, said lever arm being recessed to receive the base portion of said U-shaped spring member at a point eccentric of the pivot point of said lever arm, said latch lever arm having a second recessed portion having spaced inner surfaces adapted to alternatively engage and disengage said latch prong to respectively concurrently draw said assemblies towards sealing relationship and to initially separate the assemblies after sealing on manual operation of said lever arm towards unlatch position.

References Cited in the file of this patent

UNITED STATES PATENTS

994,427	Ross	June 6, 1911
1,269,467	Leonard et al.	June 11, 1918
1,335,958	Farr	Apr. 6, 1920
1,653,280	Herwig, Jr., et al.	Dec. 20, 1927
1,848,276	Smythe et al.	Mar. 8, 1932
2,309,279	Smythe	Jan. 26, 1943
2,344,327	Runge	Mar. 14, 1944
2,434,241	Craig	Jan. 13, 1948