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HINGE AND LATCH DEVICE

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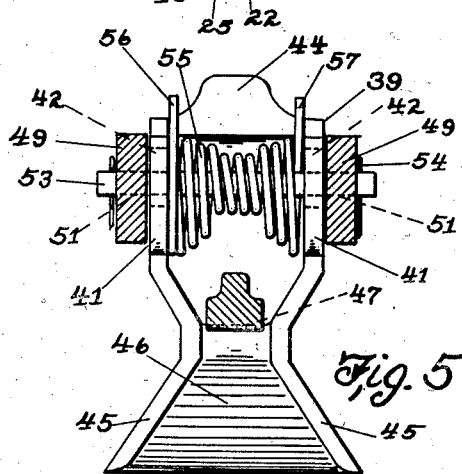
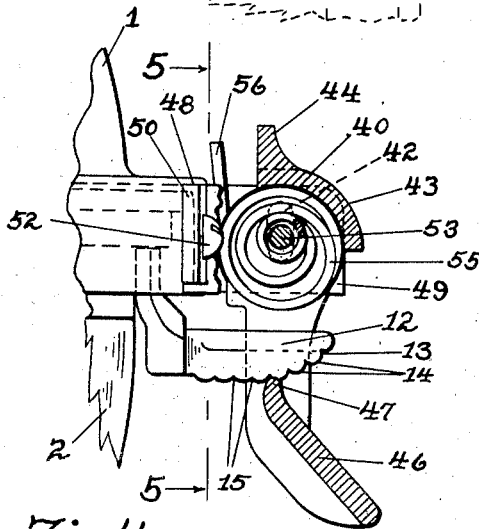
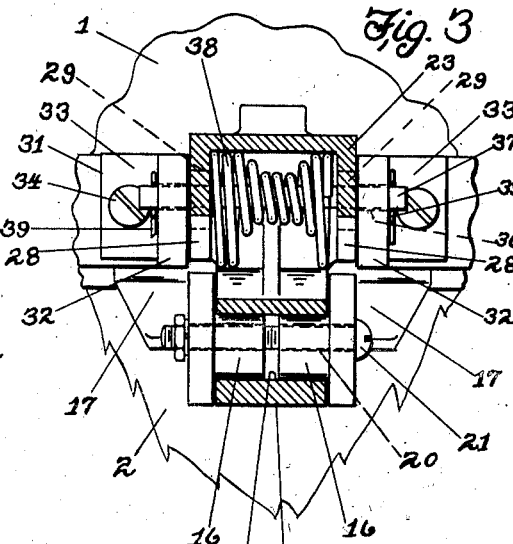
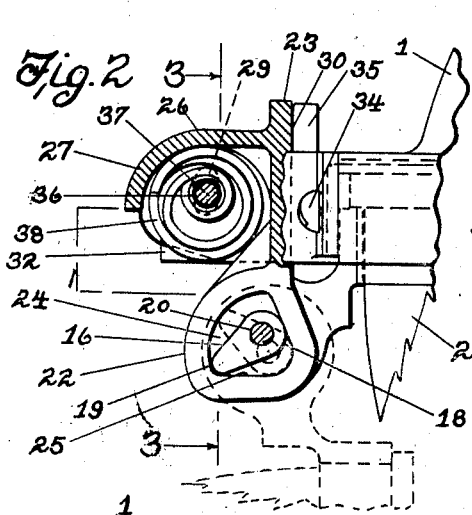
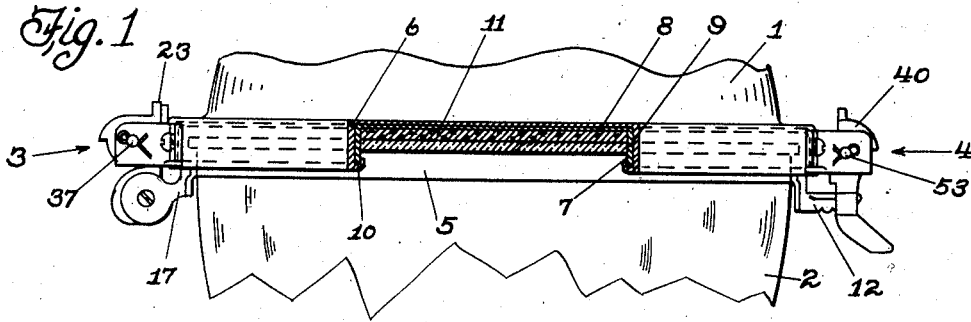


Fig. 4

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# UNITED STATES PATENT OFFICE

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## HINGE AND LATCH DEVICE

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4 Claims. (Cl. 16—179)

This invention relates to improvements in hinge and latch devices.

Luminaires, especially closed type street lighting luminaires, commonly comprise a hood which houses an electric lamp socket, a reflector mounted in any convenient manner in the hood, and a glass globe secured to the reflector.

When the lamps are damaged they are replaced by moving the globe to unlatched position. Such work is performed at times by the workman standing on the ground, at a distance from the luminaire greater than arm's length. When the globes are damaged or require cleaning the damaged globes are replaced or the tarnished globes are cleaned.

To facilitate this work it is necessary to provide a proper attaching device by which the globe is easily moved by means of an operating stick to a position where the damaged lamp may be replaced. It is also desirable to eliminate any damage by the globe to the reflector gasket during the globe closing operation. It is further desirable to secure uniform pressure at all points between the globe and the gasket both during and after the globe latching operation.

Therefore, it is an object of this invention to provide for a street lighting luminaire, hinge and latch devices each pivotally mounted on the reflector for movement in a direction approximately parallel to the vertical axis of the unit, which movement is adapted to compensate for dimensional variations between the cooperating parts of the luminaire, thereby insuring proper alignment between the reflector and the globe in its closed position and prevent damaging stresses and strains on the luminaire parts.

Another object is to provide biased hinge and latch devices adapted to allow automatic adjustment between the globe and reflector and insure uniform contact of the parts and positive sealing of the unit.

Still another object is to provide a latching device biased into locking position and acting in an approximately parallel direction relative to the vertical axis of the luminaire to insure proper sealing relationship between the globe and reflector.

A further object is to provide a hinge device which is cammed in a direction parallel to the vertical axis of the luminaire during the last few degrees of the globe closing operation, thereby moving the globe into position without tearing or crimping the gasket.

A still further object is to provide a hinge device comprising a pair of separable elements

which may be readily manipulated to facilitate removal of the globe from the unit in an easy and quick manner.

Yet another object is to provide an automatic latch device having a combined camming and latching portion so arranged as to provide a contact between the globe and reflector, which is progressively increased as the latch moves to locked position, thereby insuring positive sealing action between the parts and facilitate replacement of parts at a distance from the luminaire greater than arm's length.

In the drawing:

Fig. 1 is a fragmentary view, partly in section, of a closed type street luminaire embodying the improved hinge and latch devices.

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

Fig. 3 is a view taken on the line 3—3 of Fig. 2.

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

Fig. 5 is a view taken on the line 5—5 of Fig. 4.

Like parts are designated by the same reference numerals throughout the several views.

Fig. 1 shows, fragmentarily, a closed type street luminaire comprising a hood (not shown) to which a reflector 1 is attached (attachment not being shown) in any convenient manner. A glass globe 2 is secured to the reflector 1 by means of a hinge device designated generally by the numeral 3, a latch device designated generally by the numeral 4, and the globe band 5.

The reflector 1 is provided at its lower end with a flange 6. A reinforcing angle ring 7, having a horizontal portion 8 and a vertical portion 9, is mounted within the flange and held therein by spinning the lower end of the flange over the ring at 10. A cork gasket 11 is secured in any convenient manner, as by glue, to the under side of the ring portion 8.

The globe band 5 comprises a single length of suitable thin gauge, flat metal provided with a latching prong 12 secured to the band in any convenient manner, as by countersunk rivets not shown.

The prong 12 is provided with a camming surface 13 having a series of arcuate portions 14 which provide a plurality of locking notches 15, the function of which will be described hereinafter.

The free ends of the band are each provided with a cam-like pivot 16 integral with a supporting structure 17 secured to the band ends by any convenient means as by countersunk rivets (not shown).

It may be noted that each cam-like pivot 16 is formed to provide two pivot bearing surfaces 18 and 19. The forward pivot bearing surface 18 has a greater radius of curvature than the pivot bearing-surface 19 immediately to the rear thereof. Apertures 20 extend through the pivots 16 adjacent the bearing surface 18 in axial alignment with each other and receive therethrough a bolt 21 adapted to hold the band 5 in place about the globe 2 by drawing the free ends of the globe band toward each other and at the same time adapted to facilitate mounting of the cam-like pivots in the pivot housing 22.

The pivot housing 22 comprises the lower part of the hinge casting 23. The housing 22 is provided with a cam-like opening 24 extending there-through and adapted to provide a bearing surface 25 upon which the cam-like pivots 16 may rotate.

The upper portion of the hinge casting 23 is provided with a spring housing 26 having a downwardly curved upper member 27, side members 28 provided with apertures 29 elongated in a direction parallel to the vertical axis of the luminaire and in axial alignment to each other, and a flat, smooth-surfaced front member 30 extending downwardly into the pivot housing 22.

A U-shaped hinge supporting member 31 having spaced parallel legs 32 extending outwardly from a base member 33 is secured to the flange 6 of the reflector 1 by means of bolts 34 extending through the base member 33 into the vertical portion 9 of the ring 7. A guide means 35 extends upwardly centrally of the base member 33 and operates as a guiding surface over which the smooth surface of the front member 30 moves laterally. Each leg 32 is provided with an aperture 36 in axial alignment with the other and receives therein a pivot pin 37 upon which is mounted the casting 23 and a double conical spring 38, which spring is protected against direct weathering by the spring housing 26. The pin 37 is held against removal by means of cotter keys 39.

It will be noted that the double conical spring 38 is wound for a few turns intermediate its ends, in close proximity to the pin 37, and then spirals conically toward each end. By providing the spring in this manner it is possible to bias the lateral movement of the casting 23 on the pin 37 about the elongated openings 29 in a comparatively simple, effective, and efficient manner.

Figs. 4 and 5 show the latching device 4 which comprises a casting 40 having a pair of spaced parallel legs 41, provided with apertures 42 elongated in a direction parallel to the vertical axis of the luminaire and in axial alignment with each other, and an accurately shaped cross member 43 joining each leg and extending upward into a stop means 44 adapted to limit the outward rotational movement of the latch.

The legs 41 converge downwardly toward a narrow spacing and then diverge downwardly and rearwardly to form a pair of guide ribs 45.

Intermediate the ribs 45 an inclined guide-way 46 is provided, which extends upwardly between the ribs to the narrow spacing and terminates in a locking surface or bar 47.

A U-shaped supporting member 48 comprising a pair of spaced parallel legs 49 extending outwardly from a base member 50 and provided with axially aligned apertures 51 is mounted on the flange 6 diametrically opposite the hinge member 3 by means of bolts 52.

The casing 40 is pivotally mounted on a pin 53 extending through the apertures 51 and elongated

apertures 42, all in axial alignment with each other. The pin is held in place by means of cotter keys 54.

A double conical spring 55, formed in a manner described with reference to the spring 38, is mounted on the pin 53 between the legs 41 with one end 56 of the spring being biased against the base member 50 and the other end 57 of the spring being biased against the cross member 43.

It may be noted that the latch member 40 is provided with a rotational movement about the pin 53 and a lateral movement relative to the pin 53, both movements being biased by the conical spring 55.

The band 5 is mounted adjacent the upper edge of the globe 2 and the two cam-like pivots 16 are brought together within the pivot housing 22 and secured therein by means of the bolt 21. It may be noted that the globe pivots about the pivot bearing surface 18 on the pivots 16 in its open position as shown in Fig. 2 by the broken lines.

As the globe is moved toward latching position the pivot bearing 19 moves arcuately downward to the lower portion of the bearing surface 25 of the pivot housing 22. At this point in the closing operation the edge of the globe adjacent the hinge 3 has moved to a point a short distance below the gasket 11. From this point the movement of the globe is about the pivot bearing 19 and further movement causes the hinge and globe to rapidly rise in a direction approximately parallel to the vertical axis of the luminaire into closed position, thereby preventing tearing or crimping of the gasket by the edge of the globe, which would otherwise happen if the globe were pivoted about a single axis throughout its closing operation.

During the closing operation the prong 12 on the band 5 is brought in contact against the lower portion of the inclined guide-way 46 between the ribs 45 and forces the casting 40 to pivot outwardly until the end of the prong 12 clears the locking bar 47.

As the camming surface of the prong clears the bar 47 the latch is biased by the spring 55 into locked engagement with one of the notches 15.

It may now be noted that the upper edge of the globe is automatically adjusted into proper sealing relationship with the gasket 11 by the lateral movement of the hinge 3 and latch 5 about the pins 37 and 53 respectively. The lateral movement is biased by reason of the spiral formation of the springs 38 and 55.

It may also be noted that an operator, located a considerable distance from the luminaire, may disengage the globe from the reflector by moving the latch casting 40 outwardly by means of an operating stick placed against the lower edge of the guide-way 46. After the globe has moved by gravity into open position the damaged lamp may be replaced, using well known means for this operation, and then moving the globe into locked position again by pressing arcuately upwardly against the under side of the prong 12 adjacent the globe.

From the foregoing description it is apparent that the objects of this invention have been accomplished by providing hinge and latch devices for a luminaire, each including a member pivotally mounted on a pivot means carried by said luminaire and a biasing means mounted on said pivot means adapted to provide lateral movement of said hinge and latch devices relative to said pivot means, thereby providing automatic adjustment between the reflector and globe; and

by providing said hinge and latch devices with a camming means adapted to prevent tearing and crimping of the gasket and secure positive contact between the parts.

I claim:

1. Attaching means for drawing a first and a second member towards each other in sealing relation, said means comprising a pin carried by said first member, hood means relatively movable with respect to said pin, a helical spring surrounding said pin and having one portion in closely coiled relation to said pin and having another portion contacting said hood means and spaced from said pin, and cam means for moving said hood means to stress said spring by moving said other portion of said spring transversely of said pin.

2. Attaching means for drawing a first and a second member towards each other in sealing relation, said means comprising a pin carried by said first member, hood means relatively movable with respect to said pin, a helical spring surrounding said pin and having one portion in closely coiled relation to said pin and having another portion contacting said hood means and spaced from said pin, and cam means for moving said hood means to stress said spring by moving said other portion of said spring transversely of said pin, said cam means having two portions, one portion of said cam means being on said hood and the other portion of said cam means being carried by said second member.

3. Attaching means for drawing a first member and a rockably mounted second member towards each other in sealing relation, said means comprising a hinge, one portion of which includes a pin carried by said first member and a slidable element sliding on said pin and spring means therebetween, the other portion of said hinge comprising a cam element carried by said second member, the slidable element of said hinge having a triangulated opening within which said cam element is located, said cam element cooperating with a wall of said triangulated opening to yieldingly force said first and second members towards each other when said second member is rocked in one direction.

4. Attaching means for drawing a first and a second member towards each other in sealing relation, said means comprising a pin carried by said first member, a rocking and sliding member rockably and slidably carried by said pin, spring means between said pin and said rocking and sliding member, said spring means comprising a spiral spring having one portion in closely coiled relation to said pin and another portion spaced from said pin and contacting said rocking and sliding member, and cam means one portion of which is carried by said second member and the other portion of which is carried by said rocking and sliding member.

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