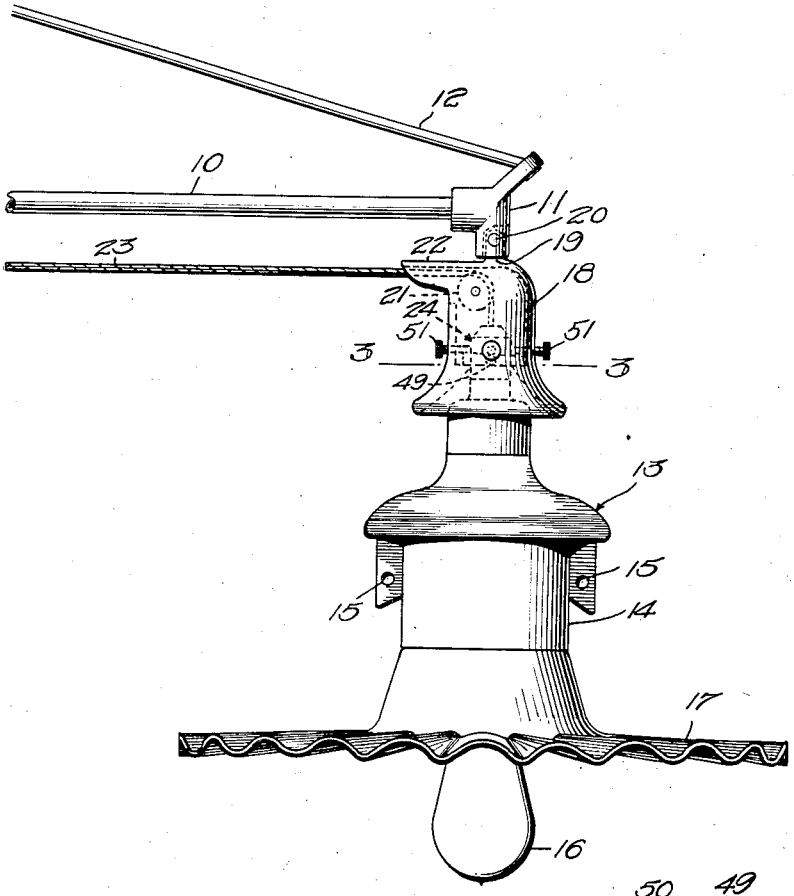
July 17, 1934. H. E. MILLER 1,967,124

SUPPORTING HANGER

Filed Jan. 4, 1933 2 Sheets-Sheet 1

Fig. 1.



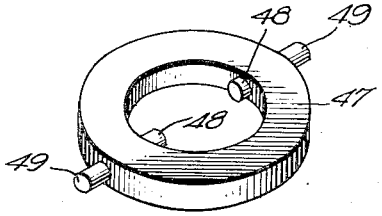


Fig. 2.

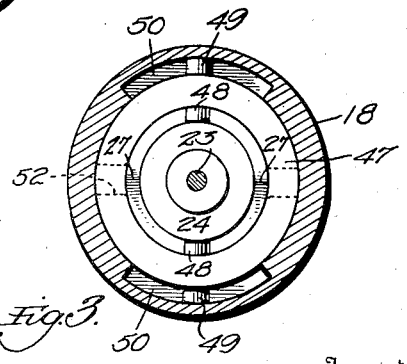


Fig. 3.

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July 17, 1934. H. E. MILLER 1,967,124

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Filed Jan. 4, 1933 2 Sheets-Sheet 2

Fig. 4.

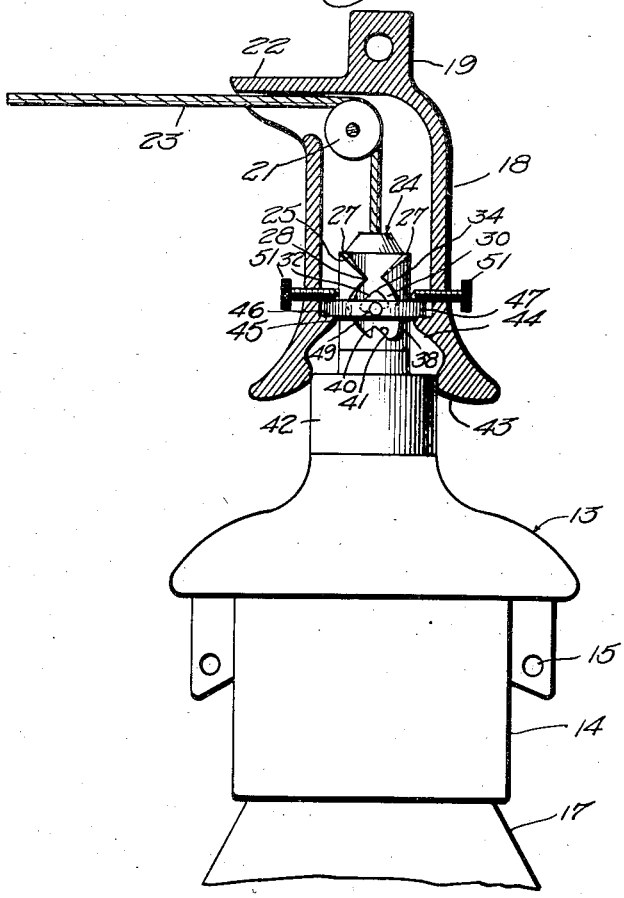


Fig. 5.

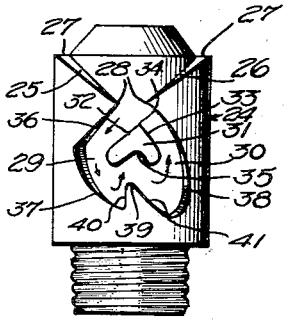
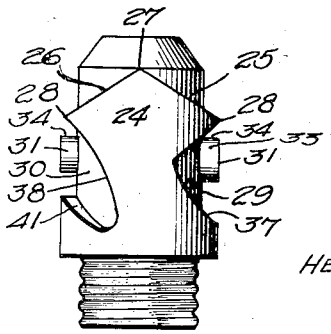


Fig. 6.



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UNITED STATES PATENT OFFICE

1,967,124

SUPPORTING HANGER

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4 Claims. (Cl. 248—25)

This invention relates to supporting hangers, and more particularly to a street lighting fixture.

It is the common practice to support street lighting fixtures from mast or pole arms suspended above a street or road. Such devices must be made accessible for the purpose of examination and repair, and for this reason such devices usually are supported by cables passing around suitable sheaves to permit the lighting fixture to be lowered to the ground. Devices of this character have been open to several objections. For one thing, the means for locking the fixture in position when it is elevated must be automatic and such means usually involves the rotation of the fixture through a substantial arc as it approaches operative position. This rotation of the fixture bends and thus frequently crystallizes and breaks the lead-in wires for the fixture. Moreover, devices of this character often are difficult to operate because of the friction involved in the moving parts, such friction often resulting from the inertia of the relatively heavy lamp structure which tends to prevent it from rotating as it approaches operative position.

An important object of the present invention is to provide automatically operable means for supporting a device such as a street lamp in operative position and for releasing it from such position without effecting rotation of the lamp or other element.

A further object is to provide a device of the character referred to in which friction is reduced to a minimum thus permitting the device to be easily and readily operated.

A further object is to provide supporting means of the character referred to wherein a lifting and lowering cable is connected to the device and wherein the locking means employed is adapted to be locked or unlocked upon an upward pull of the cable.

A further object is to provide supporting and locking means of the character referred to wherein the locking element is relatively small and light and is relatively rotatable with respect to the other elements of the structure to effect the locking and unlocking action without transmitting rotation to the element being supported.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings I have shown one embodiment of the invention. In this showing,

Figure 1 is a side elevation of a street lighting fixture showing the invention applied.

Figure 2 is a detail perspective view of the locking ring,

Figure 3 is a detail section on line 3—3 of Figure 1,

Figure 4 is an enlarged central vertical sectional view through the locking mechanism and associated elements, parts being shown in elevation,

Figure 5 is an enlarged side elevation of the lighting fixture head showing it disconnected from the other elements of the device, and,

Figure 6 is a similar view at right angles to Figure 5.

Referring to Figure 1, the numeral 10 designates the usual mast arm supported by a pole (not shown) and a supporting fixture 11 is mounted at the outer end of the pole. An angular tie rod 12 is connected between the bracket 11 and the upper end of the pole. In a manner to be described, a lamp structure indicated as a whole by the numeral 13 is adapted to be supported beneath the bracket 11. The lamp structure includes a body 14 into which the lead-in wires extend through openings 15, and further includes a light element 16 and a reflector 17. The elements described, per se, form no part of the present invention.

A housing indicated as a whole by the numeral 18 is arranged beneath the bracket 11 and is supported thereby in any suitable manner. In the present instance, the housing 18 is provided with an upwardly extending lug 19 projecting into the lower end of the bracket 11 and connected thereto by a bolt 20. A sheave 21 is rotatable in the housing 18, and the latter may be provided with a shield 22 projecting laterally therefrom above the sheave. A suitable cable 23 extends into the housing 18 beneath the shield 22 and passes around the sheave 21.

The lamp structure includes an upwardly extending head 24 through which the lamp structure is supported in a manner to be described. The head 24 is shaped on diametrically opposite sides in the manner shown in Figure 3. The head 24 is substantially cylindrical and is cut inwardly on opposite sides to form parts of downwardly sloping cam faces 25 and 26. The upper limits of the cam faces 25 and 26 coincide with those of the cam faces of the opposite side, thus forming horizontal joining edges 27 for a purpose to be described. The lower extremities 28 of each pair of cam faces 25 and 26 are spaced apart as shown in Figure 5 for a purpose to be described.

Beneath the cam faces 25 and 26, the head 24 is cut away to form opposite cam grooves 29 and 30 divided centrally by a supporting boss 31. This boss has opposite cam faces 32 and 33 diverging downwardly from an apex 34 which is offset to one side of the space between the lower extremities of the cam faces 25 and 26. The supporting lug 31 is further provided in the bottom thereof with a supporting notch 35. The cam groove 29 is formed by an upper face 36 which diverges downwardly from the adjacent point 28 and by an inwardly curved cam face 37. The cam groove 30 is formed by a cam face 38 which curves outwardly from the adjacent point 28 and then inwardly. The cam grooves 29 and 30 are divided at their lower limits by an upwardly extending guide lug 39. This lug is connected to the cam face 37 by a substantially vertical face 40 and to the lower end of the cam face 38 by a downwardly and outwardly inclined cam face 41.

The lamp structure beneath the head 24 may be of slightly greater diameter than the head as indicated at 42, and the lower end of the housing 18 is open and flared downwardly and outwardly as at 43 to receive the portion 42. Above the flared portion 43, the housing curves inwardly and upwardly as at 44 to form an opening 45 through which the head 24 is adapted to project, as shown in Figure 4. Above the opening 45, the housing is provided with an internal shoulder 46 adapted to support a locking ring 47. The ring 47 is provided with diametrically opposite inwardly projecting lugs or pins 48 operative in connection with the various cams and cam grooves, of the head 24, in a manner to be described. The ring 47 is further provided with diametrically opposite outstanding lugs or pins 49 operative in grooves 50 formed within the housing 18 adjacent the shoulder 46. The ring 47 is free-floating within the housing 18, but its rotation is limited by the extent of the arcuate groove 50. Set screws 51 extend through the housing 18 above the ring 47 to limit the upward movement thereof.

The operation of the device is as follows:

The parts normally occupy the position shown in Figure 4 with the ring 47 supported on the shoulder 46, and with the internal pins 48 resting in the notches 35 of the opposite supporting lugs 31. Thus it will be apparent that the lamp structure is solidly supported by the housing 18. When it is desired to release the lamp structure to permit it to be lowered, the operator will pull on the free end of the cable 23, which is secured to a suitable point on the pole (not shown). In this connection, it will be noted that when the pins 48 are arranged in the notches 35 they will lie to one side of the cam point 39. When the cable is pulled in the manner referred to, the head 24 will be elevated and the pins 48 accordingly will strike the upper portions of the cam faces 41 thus effecting relative rotation between the lamp structure and the ring 47. Since the inertia of the lamp structure is much greater than that of the ring 47, and since the weight of the lamp structure will have been removed from the ring 47, it will be apparent that the ring will revolve within the limits permitted by the arcuate grooves 50. This rotation is sufficient to permit the pins 48 to move out of the plane of the lower limits of the cam faces 33, whereupon the pull on the cable 23 may be released to permit the lamp structure to move downwardly.

Upon downward movement of the lamp structure, it will be apparent that the pins 48 move relatively upwardly through the cam grooves 31 and the cam faces 38 will effect reverse rotation of the ring 47 by engaging the pins 48, and these pins will move toward the space between the cam edges 28 to be released from the head 24. Accordingly the lamp structure may be lowered to the desired extent by the cable 23 to permit any necessary work to be performed thereon. The reverse rotation transmitted to the ring 47 in the manner referred to restores the ring substantially to the position shown in Figure 3 with the pins 49 arranged intermediate the ends of the grooves 50. This position of the ring however, is not essential to the proper operation of the device as will become apparent.

When it is desired to replace the lamp in normal position, the cable 23 is pulled to elevate the lamp structure. If the ring 47 has assumed the position shown in Figure 3 in the manner referred to, the pins 48 should be substantially vertically alined with the spaces between the cam edges 28 to move downwardly therebetween. If the relative rotational positions of the parts has been altered, it will be apparent that the pins 48 will engage the cam faces 25 and 26 to properly position the parts to permit the pins 48 to move downwardly between the edges 28.

As previously stated, the cam edges 34 are offset from the openings between the two sets of cam edges 28, and as the lamp structure is elevated, the relatively downwardly moving pins 48 are caused to enter into and follow the cam grooves 29. The pins 48 engage the cam faces 32 to turn the ring 47 in one direction, after which the pins 48 engage the cam faces 37 to rotate the ring 47 in the opposite direction. The upward movement of the lamp structure is continued until the pins 48 reach the lower limits of the cam faces 37 and lie against the vertical faces 40, whereupon the lamp is lowered by moving the free end of the cable upwardly. The downward movement of the lamp causes the pins 48 to move relatively upwardly into the supporting notches 35, whereupon the lamp structure will be supported in normal position.

It will be apparent that the latching and unlatching operations take place automatically merely by pulling upon the cable 23. While such automatic operation requires relative rotation of the parts, it will be noted that the present construction eliminates the necessity for rotating the lamp structure and effects the desired result through the medium of the floating ring 47. The slight inertia of this ring permits it to rotate freely during the latching and unlatching operations, thus preventing the rotational movement from being transmitted to the relatively heavy lamp structure. Moreover, it will be apparent that the character of the parts and the relatively slight pull necessary for effecting the latching and unlatching operations minimizes the friction between the parts, thus permitting the device to be easily operated. The use of the present invention in connection with street lighting fixtures is important because of the foregoing advantages and because it eliminates the bending and breaking of the lead-in wires and economizes on the overall length of the structure projecting downwardly from the mast arm 10.

While the device has been particularly de-

scribed with respect to street fixtures, it will be apparent that it is not necessarily limited to such use but may be employed at any desired place where quick detachble supporting means is desired between a support and a load carried thereby. For example, the device is equally applicable to hoisting apparatus of various kinds.

Any suitable means may be provided to permit the insertion of the ring 47 into the housing 18. For example, the opening 45 may be enlarged diametrically between the slots 50 to permit the ring to be inserted edgewise into the bottom of the housing 18, as indicated at 52 and as shown in dotted lines in Figure 3.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A device of the character described comprising a vertical support having an opening in its lower end, a structure adapted to be moved upwardly toward said support in end to end relation therewith, a floating ring arranged within the lower end of said support and rotatable about a vertical axis, said support being provided within its lower end with a horizontal shoulder supporting said ring, coacting means carried by said ring and said support for limiting the rotation of said ring, said ring having radial lugs, and a connecting member carried by the upper end of said structure and movable upwardly into said ring through the opening in said support, said connecting member being provided with recesses each adapted to receive one of said lugs to prevent axial separation of said structure from said support, said connecting member having a guide groove engageable with said radial lugs to rotate said ring in one direction and then in the other direction to move said lugs to positions beneath and in alinement with said recesses upon upward movement of said connecting member into said ring, said connecting member being further provided with guide grooves engageable with said lugs upon upward and then downward movement of said structure to rotate said ring first in one direction and then the other to release said lugs from said connecting member.

2. A device constructed in accordance with claim 1 wherein said first and second named guide grooves are arranged in pairs on opposite sides of said recesses, each pair of grooves being provided with a common entrance end above one of said recesses, said connecting member being provided with a pair of downwardly converging cam surfaces terminating at the entrance end of each pair of grooves to direct one of said lugs thereinto, the upper extremity of each cam surface terminating in an edge forming the upper extremity of the next adjacent cam surface.

3. A device of the character described comprising a pair of structures adapted to be arranged in end to end relation, a floating ring carried by one structure and rotatable with respect thereto about its axis, said ring having diametrically opposite radial lugs, a connecting member carried by the other structure and provided with pairs of diametrically opposite entrance and exit cam grooves through which said lugs are adapted to move, each pair of grooves having a common entrance and being divided centrally of their lengths by a stationary supporting lug having its end adjacent said entrance offset therefrom to cause one of said radial lugs to enter the entrance groove of such pair of grooves, the opposite end of each supporting lug having a recess adapted to receive one of the radial lugs to prevent axial separation of said structures, and diametrically opposite cam portions each having a high point intermediate said entrances and sloping toward said entrances to engage said lugs and guide them theretoward.

4. A device of the character described comprising a pair of structures adapted to be arranged in end to end relation, a floating ring carried by one structure and rotatable with respect thereto about its axis, said ring having diametrically opposite radial lugs, a connecting member carried by the other structure and provided with pairs of diametrically opposite entrance and exit cam grooves through which said lugs are adapted to move, each pair of grooves having a common entrance and being divided centrally of their lengths by a stationary supporting lug having its end adjacent said entrance offset therefrom to cause one of said radial lugs to enter the entrance groove of such pair of grooves, the opposite end of each supporting lug having a recess adapted to receive one of the radial lugs to prevent axial separation of said structures, the grooves of each pair terminating at the end opposite their common entrance in a cam projecting toward said recess and offset therefrom to guide the radial lug in said recess to the exit groove of each pair of grooves, and diametrically opposite cam portions each having a high point intermediate said entrances and sloping toward said entrances to engage said lugs and guide them theretoward.

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