May 12, 1936. C. A. B. HALVORSON 2,040,690

STREET LIGHTING UNIT

Original Filed Jan. 19, 1934

Fig. 1.

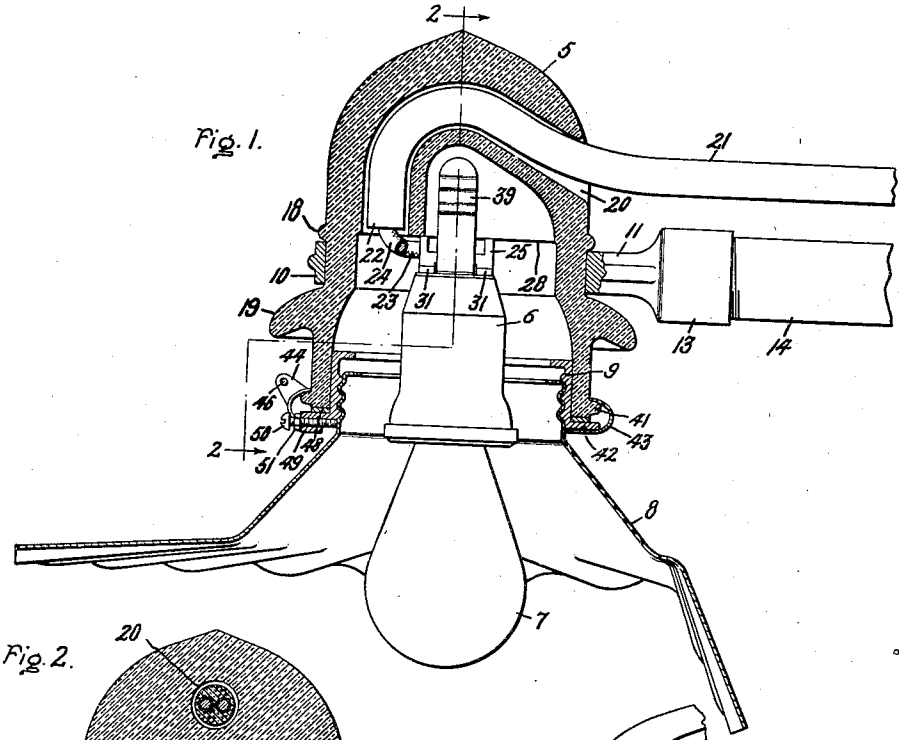


Fig. 2.

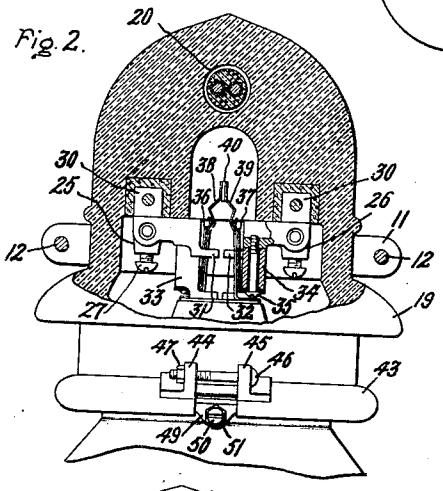


Fig. 3.

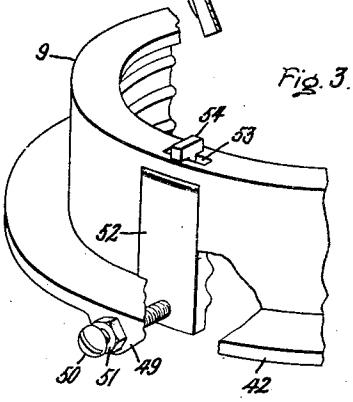


Fig. 4.

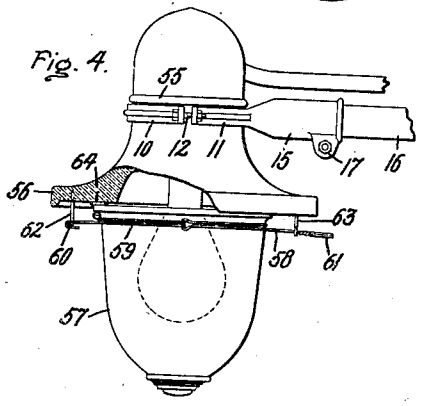
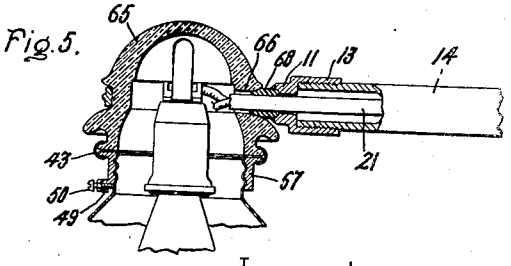


Fig. 5.



Inventor:
Cromwell A. B. Halvorson,
by Harry E. Dunham
His Attorney.

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UNITED STATES PATENT OFFICE

2,040,690

STREET LIGHTING UNIT

Cromwell A. B. Halvorson, Lynn, Mass., assignor to General Electric Company, a corporation of New York

Application January 19, 1934, Serial No. 707,246
Renewed December 11, 1935

10 Claims. (Cl. 240—25)

My invention relates to lighting units for street lighting and similar purposes, and has for its principal object the provision of an improved design and arrangement of parts for such units.

Lighting units of the above type generally consist of an insulator suspended from a suitable bracket and having attached to its lower end a lamp, a globe and a reflector or other light-modifying means. The weight of these parts is, therefore, entirely supported by the insulator, which means that tensional strains are set up in the insulator material. Furthermore units of this type are subjected to lateral strains due to the whipping of the suspended unit by winds. Since insulators are made usually of ceramic material or glass, which is fragile and relatively weak when placed under tension, the insulators have to be made relatively large to carry the weight of the lamp and the light-modifying means and to resist breakage due to this whipping action. Another object of my invention is, therefore, to so arrange the parts of the lighting unit that the insulator will not be subjected to tensional strains nor to lateral strains caused by the whipping action of winds.

Another object of my invention is to provide an adjustable reflector support whereby standard reflectors provided with screw collars and light-directing elements may be properly adjusted and locked into position.

Another object of my invention is to provide an improved street lighting unit wherein all connections and uninsulated parts are entirely within the insulator body of the unit.

My invention will be better understood from the following description, when considered in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the accompanying drawing, Fig. 1 is a sectional view, of a lighting unit built in accordance with my invention; Fig. 2 is a sectional view taken along line 2—2 at right angles to the sectional view of Fig. 1; Fig. 3 is a fragmentary view of the reflector supporting collar showing a modified reflector locking means, and Figs. 4 and 5 illustrate modifications of the unit.

Fig. 1 illustrates a lighting unit comprising a body 5, a receptacle 6 and a lamp 7 supported therein and a reflector 8 with a reflector supporting sleeve 9 attached to the lower edge of the body 5.

The body 5 is made of a ceramic material, such as porcelain, which has been found to be most practical for this use because of its electric insulation property and because of its ability to stand up under all weather conditions. Its only drawback has been its low resistance to tensional strains. For this reason the insulators used heretofore in street lighting units of this type have had to be enlarged way beyond the necessary electric insulation strength to withstand the tensional strains placed upon them by supporting them at one end and by adding the usual glassware and reflectors at the other end.

I overcome this first difficulty by supporting the body 5 intermediate its ends by a supporting ring comprising semi-annular members 10 and 11 which are fastened to each other by bolts 12 to form a complete ring. The member 11 may be provided with a threaded sleeve 13 which may be threaded onto a supporting arm 14 or it may be provided with a split sleeve 15 which may be clamped to an arm 16 by a bolt 17 as illustrated in the modification Fig. 4.

The body 5 of the lighting unit comprises an insulator made of ceramic material preferably porcelain being generally cup-shaped. It is provided on its outer surface with an annular beading 18 and a rain-shield flange 19. The beading and flange are spaced from each other equal to approximately the width of the members 10 and 11 which surround the insulator and thereby securely hold it.

As stated above, the body is generally cup-shaped and mounted with the open end facing downwardly. This body is further, in accordance with my invention, provided with an arc-shaped conduit 20 passing through a thickened portion at the top of the insulator. It is so shaped that the section of the conduit, adjacent the outer opening, slopes upwardly so that this opening is well below the highest point in the arc, thereby preventing rain water from reaching the inside of the casing. The conduit slopes upwardly to the highest point from the exterior and then bends downwardly to the inside of the insulator, the last part being practically perpendicular. This conduit is made large enough to accommodate a two conductor cable 21, together with high voltage insulation 22 surrounding both conductors 23 and 24, the ends of which are locked into terminals 25 and 26 respectively by means of screws 27. This construction thereby provides a continuous high voltage insulation of the conductors into the terminal chamber inside of the insulator. This is of special advantage in that it provides a long leakage path for the high voltage currents used for series street lighting. The insulation on the individual conductors need

only withstand the voltage drop across one lamp and is therefore commonly referred to as the low voltage insulation. This insulation alone is insufficient, outside of the insulator 5, to protect the unit against current flowing to ground.

Another advantage of this arcuate conduit is that since the outside cable insulation is practically of the same diameter as the cable conduit, the cable becomes wedged in the conduit and thereby anchors the cable therein. The cable is generally brought downward to the lamp from a cross-arm located above the lighting unit. The conduit then bends it upwardly and down again so as to form substantially a letter S. Any pull upwardly, or horizontally, along the mast arm, wedges the cable against the upper edge of the conduit entrance and against the inside of the bend in the insulator, and prevents this pull being transmitted to the terminals. The connection to the terminals is thereby protected and it becomes unnecessary to provide a pin-type insulator immediately outside of the lighting unit to anchor the cable and prevent the terminal connections being broken by a pull on the cable caused by high velocity winds or other causes.

Inside of the insulator on a downwardly facing surface 28, the terminals 25 and 26 are fastened with lugs 30 which are cemented into holes molded in the surface 28. The terminals are further provided with guiding lugs 31 and 32 and extension lugs 33 and 34 which are attached to the terminals 25 and 26 respectively by screws 35 and are also provided with guiding lugs. Spring clips 36 and 37 are attached to the extension lugs by screws and extend upwardly between the guiding lugs, being biased toward each other. The socket 6 provided with prongs 38 and 39 is supported by the spring clips 36 and 37 engaging the prongs 38 and 39. A film cut-out device 40 is placed between the prongs to separate them when the lamp in the socket is functioning and to provide a shunt circuit around the lamp when the lamp burns out.

This construction so far described creates only compression strains in the insulator walls since the entire weight of the cable, terminals, lamp and socket are supported by the insulator above the supporting collar. This construction brings the weight of the unit near to the supporting collar and in fact distributes the weight on both sides of the support whereby the whipping action, mentioned above, is practically eliminated and breakage of the insulator is minimized. The insulator can consequently be made considerably smaller than heretofore, or a considerably more reliable unit can be built if the size of the unit is not objectionable.

At the lower end of the insulator I provide a novel reflector fastening means. The insulator is provided at its lower end with a beading 41. The threaded sleeve 9 is provided with a horizontal flange 42 which has an outside diameter equal to that of the beading 41. This flange is engaged by a U-shaped split ring 43. This ring engages the beading 41 and the flange 42. Two lugs 44 and 45 are attached respectively to the ends of the ring and a bolt 46 with nut 47 may be used to draw the ends together. When these ends are drawn together, the flange 42 is drawn tightly against the surface of the body 5, to which a felt washer 48 may be attached. With this arrangement it is possible to turn the reflector until it is tightly seated in the sleeve and then to adjust the position of the reflector 8 and the threaded sleeve 9 by loosening the bolt 46 and then turning the reflector and sleeve until the proper position is found and then locking the sleeve into this position by tightening the bolt. This reflector can then be subsequently removed for cleaning or other purposes and can again be inserted with assurance that it will always be seated in the proper position.

I also provide means for locking the reflector into the sleeve 9. In Fig. 1, I have illustrated a lug 49 on the flange 42 which is drilled and tapped to accommodate a screw 50. The ring 43 and sleeve 9 are so arranged with respect to each other that the head of the screw 50 will be located between the ends of the split ring. When the reflector 8 is seated in the sleeve, it is only necessary to turn the screw to lock the reflector in the sleeve. A nut 51 may be used to lock the screw 50 in place.

In Fig. 3, I have shown a modification of the locking means in which a section 52 of the sleeve 9 is hinged in any convenient manner, such as for example by a slot 53 and T hinge 54 as illustrated and which is pressed against the reflector collar by the screw 50 pressing against the lower end of this section.

In Fig. 4, I have illustrated a modification of my unit in which the casing is bell-shaped having a beading 55 surrounding the outer surface and having the members 10 and 11 surrounding the unit below this beading. In this modification, as in the above-described unit, the body or casing is supported intermediate its ends and the strains set up due to this support are distributed through the body of the insulator. The casing is provided with a flange 56 against the lower surface of which a diffusing globe 57 is attached by means of any convenient globe holder 58. The globe holder herein shown comprises a wire ring 59, a hinge 60 and a handle 61. The hinge 60 engages a wire loop 62 projecting from the lower surface of this flange 56 and the handle 58 engages a hook 63, also projecting from the lower surface of the flange 56. The wire hinge and handle 58 are so designed that the globe 57 is pressed against a felt washer 64 on the lower surface of the flange 56.

In Fig. 5, I have illustrated another modification of my invention. In this modification the body 65 differs from the body 5 in that the cable conduit 66 is placed opposite the supporting sleeve 13 and in that the reflector supporting sleeve 67 is mounted to extend outside the body 65. The cable 21 with its high voltage insulation extends through the supporting pipe 14, sleeve 13 and supporting collar 11, through a resilient bushing 68 into the conduit 66. The resilient bushing, preferably of rubber, provides a watertight connection between the clamp and the insulator body 65 for the cable 21.

The sleeve 67 is similar to sleeve 9 except that the boss 49 and locking screw 50 are located at the end of the sleeve opposite to that at which the supporting flange is located. In attaching the sleeve 67 to the body 65, the clamp 43 engages the beading and the flange as in Fig. 1, but the sleeve extends below the body 66. The insulator 65 may be made correspondingly shorter than the insulator body 5.

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

1. In a street lighting unit, the combination of a body of insulating material provided with a terminal chamber, means for supporting said body comprising a collar surrounding said body intermediate its ends, a cable conduit in said body

extending from above said support on one side of said body into said terminal chamber on the opposite side of said body, cable terminals attached to the walls of said chamber above said supporting means, a lamp socket attached to said terminals, and an adjustable reflector support mounted on the edge of said body below said supporting means.

2. In a street lighting fixture, the combination of a casing having an open end provided with a beading, a reflector provided with a threaded collar arranged to extend into said casing, a threaded sleeve arranged to engage the said collar and provided with a flange arranged to engage the end of said casing, means operable from outside of said casing for locking said reflector in said sleeve, and means engaging said beading and said flange for adjustably fastening said sleeve in said casing.

3. In a street lighting fixture, the combination of a casing having an open end provided with a beading, a reflector provided with a threaded collar arranged to extend into said casing, a threaded sleeve for engaging the said collar and provided with a flange arranged to engage the end of said casing, means for locking said reflector in said sleeve comprising a section thereof hinged at one end to the sleeve and a screw mounted in said flange and operable from the outside of said casing to press said section against said reflector collar, and means for adjustably fastening said sleeve in said casing comprising a split collar arranged to engage said beading and said flange and means for drawing the ends of said collar towards each other.

4. In a lighting unit, the combination of a bell-shaped housing of insulating material, supporting means for said housing comprising a collar surrounding said housing intermediate its ends and means cooperating with the surface of said housing engaging said collar, a cable conduit having its entrance above said supporting means, and light-modifying means attached to the lower end of said housing.

5. In a street lighting fixture, the combination of a casing having an open end provided with a beading, a threaded sleeve provided with a flange arranged to engage the end of said casing, a reflector provided with a threaded collar arranged to extend into said sleeve, means for locking said reflector in said sleeve, and means engaging said beading and said flange for adjustably fastening said sleeve to said casing.

6. In a street-lighting unit, the combination of an insulating body provided with a terminal chamber, means for supporting said body, terminals mounted in said chamber, a cable conduit extending upwardly into said body and arcuately down into said terminal chamber, and a cable extending through said conduit to said terminals and having its outside insulation diameter substantially equal to that of the conduit whereby said cable becomes anchored in said conduit.

7. In a lighting unit, the combination of a housing of insulating material, supporting means for said housing comprising a collar surrounding said housing intermediate its ends, interengaging means between the surface of said housing and said collar, a cable conduit having its entrance above said supporting means, and light-modifying means at the lower end of said housing.

8. In a street lighting unit, the combination of a body of insulating material provided with a terminal chamber, means for supporting said body comprising a collar surrounding said body intermediate its ends, a cable conduit in said body extending fom above said support on one side of said body into said terminal chamber on the opposite side of said body, cable terminals attached to the walls of said chamber, and a lamp socket attached to said terminals.

9. In a street lighting unit, the combination of a body of insulating material provided with a terminal chamber, means for supporting said body, terminals in said chamber, and a cable conduit extending upwardly into said body and arcuately down into said terminal chamber, said conduit having a diameter substantially equal to the diameter of a cable for said unit whereby the cable becomes anchored therein when said unit is wired.

10. In a street lighting unit, the combination of a body of insulating material provided with a terminal chamber, means for supporting said body comprising a collar surrounding said body intermediate its ends, terminals attached to the walls of said chamber above said supporting means, a lamp socket attached to and supported by said terminals, a cable conduit having its entrance above said supporting means, and light-modifying means attached to the lower end of said body.

CROMWELL A. B. HALVORSON.