3,215,969
MEANS FOR SECURING FIXTURES TO BUSWAY
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The instant invention relates to electrical fixtures in general and more particularly to a novel means for connecting electrical fixtures to a busway. A busway is a form of continuous outlet cable comprising a plurality of elongated bus bars disposed within an elongated housing and extending parallel to the longitudinal axis of the housing. One surface of the housing is provided with a longitudinally extending slot through which contact means are insertable to engage the bus bars. The contact means in question are usually carried by an insulated member secured to an electrical fixture which is to be energized by electrical securement to the busway. It is essential that the fixture also be mechanically secured to the busway.

In the prior art the mechanical securement has been achieved by providing one or more spring brackets which engage the busway housing. With this arrangement it is only spring pressure which prevents accidental release of the mechanical securement. Quite often mechanical shocks imparted to the busway supporting members are sufficient to break the mechanical securement between fixture and busway.

In order to overcome this problem the instant invention provides a device which includes a cam lock. This lock comprises a member which enters the busway housing slot at the time electrical contact is made and is so positioned that the motion required to break the mechanical securement provided by the brackets cannot take place while this member is disposed within the busway housing. For dismounting of the fixture the cam lock is merely moved, against the force of a biasing spring, in a direction to withdraw this member from the busway housing. Thereafter the required conventional dismounting movement of the fixture may be effected.

For mounting of the fixture the cam lock member need not be considered. That is, the cam surface of this member is engaged by the busway housing while the mechanical securement is taking place. This engagement between busway housing and cam lock member moves the member against the force of its biasing spring so that the member will not interfere with mounting of the fixture. At the time electrical contact takes place the cam lock member is no longer engaged by the busway housing so that member is free to be moved by its biasing spring into the busway housing and thereafter prevent accidental dismounting of the fixture.

Accordingly, a primary object of this invention is to provide a novel arrangement for securing an electrical fixture to a busway. Another object is to provide a novel arrangement of this type in which the mechanical securement between fixture and busway cannot be broken accidentally.

Still another object is to provide an arrangement of this type in which a locking member is provided which cooperates with a formation of the busway housing to prevent accidental dismounting of the fixture.

A further object is to provide an arrangement of this type including a cam lock member biased to locking position with this member being automatically moved from locking position as the fixture is being mounted to the busway.

A still further object is to provide an arrangement of this type in which the same hand used for dismounting the fixture is also used to operate the cam lock.

These, as well as other objects of this invention shall become readily apparent after reading the following description of the accompanying drawings in which:

FIGURE 1 is an end view of a busway showing a lighting fixture mounted thereto by the novel mounting means comprising the instant invention.

FIGURE 2 is a side elevation, partially cross-sectioned of the fixture and mounting means illustrated in FIGURE 1 with the fixture dismounted from the busway.

FIGURE 2a is an end view of the busway with the fixture dismounted therefrom.

FIGURE 3 is an exploded perspective of the elements illustrated in FIGURE 1.

Now referring to the figures. Busway 10 is of a type described in detail in United States Patent 2,929,044, issued March 15, 1960, with J. S. Herrmann et al. as inventors, entitled "Universal Trolley Duct Connecting Means." Briefly, busway 10 comprised elongated housing 11 and longitudinally extending elongated bus bars 12, 13 disposed within housing 11. Housing 11 is of generally rectangular cross-section with the top and bottom walls thereof including internal depressions which receive the longitudinally extending edges of bus bars 12, 13. It is noted that insulating members 14, 15 are interposed between bus bars 12, 13 respectively and housing 11.

The bottom wall of housing 11 comprises inwardly turned lips 16, 17 and a longitudinally extending slot 18 defined by the space between the free ends of lips 16, 17. Slot 18 is wider than the narrow dimension of plug unit extension 19, but is narrower than the long dimension of extension 19 so that extension 19 may be entered into housing 11 only when base 25 is properly oriented. Further, the space between mounting legs 23 of brackets 21, 22 is great enough so that housing 11 may fit therebetween as extension 19 is being inserted into housing 11.

Extension 19 constitutes a portion of insulating member 26 comprising plug unit 20. Unit 20 also includes bus bar engaging contacts 27, 28 extending outwardly from extension 19 at the ends thereof. Contacts 27, 28 are connected, internally of member 26, to insulation covered conductors 29, 30 respectively. Conductors 29, 30 extend through nipple 31 of conventional swivel unit 32 mounted internally of conically shaped lamp shade 33 and are connected to the appropriate terminals of lamp receiving socket 34 (FIGURE 2). The connection of swivel unit 32 to shade 33 is described in detail in my U.S. Patent 2,974,220 issued March 7, 1961, entitled "Enclosed Swivel Lighting Fixture."

Insulating member 26 rests upon four supporting surfaces 35 formed internally of hollowed base member 36. Rivets 37 secure mounting leg 24 of bracket 21 to side wall 38 of member 36 while rivets 39 secure mounting leg 24 of bracket 23 to side wall 40 of member 36 with side walls 38 and 40 being opposite one another. Four screws 41 pass through clearance apertures 42 at the corners of cover plate 43 and are received by threaded apertures 44 internally of base 25 for securing of cover plate 43 to member 36. Cover plate 43 includes a centrally located rectangular aperture 45 through which extension 19 projects. As should be apparent to those
skilled in the art, securement of cover plate 43 also secures plug unit 20 to base 25. Cam lock 50 includes sheet-like member 51 slidably mounted to end wall 49 of base member 36. Member 50 includes integrally formed ear 52 which is in engagement with one end of compression spring 53 whose other end is located by projection 55 and is seated upon ledge 54. Seat 54 is part of internal formation 56 of the member 36 which formation serves as a guide for cam lock member 51 being received by slot 57 thereof. Rivet 59 extends from member 51 through aperture 60 (FIGURE 2) in end wall 49 and acts as a stop to limit upward movement of cam lock member 51. Member 44 includes locking extension 62 which extends through cover plate slot 63 externally of base 25. Extension 62 includes cam surface 64 whose function will be fully explained hereinafter. Spring 53 normally maintains cam lock member 51 in the extended or locking position illustrated in FIGURE 1. For mounting and engaging plug base 30 to busway 10, extension 19 is moved into housing 11 through slot 18 thereof until cover plate 43 abuts lips 16, 17. Thereafter base 25 is rotated clockwise for approximately 90° about a vertical axis. At the end of this rotational movement downward protrusions 71, 71 at the free ends of brackets 21, 22 are disposed within longitudinally extending depressions 72, 72 in the outer surface at the top of housing 11. In addition, contacts 27, 28 are in electrical engagement with bus bars 12, 13 respectively. It is noted that brackets 21, 22 are constructed of resilient material. With protrusions 71 in depressions 72 brackets 21, 22 are slightly deflected to provide firm securement. During the 90° clockwise rotation of base 25, cam surface 64 of cam lock member 51 engages one or the other of lips 16, 17, in this case lip 16, causing member 51 to be moved downward against the force of biasing spring 53. This permits cam lock member extension 62 to move beneath housing 11. At the conclusion of the 90° rotation of base 25 extension 62 is positioned in alignment with slot 18 so that spring 53 is then effective to move member 51 upward into locking position. In this position the engagement between extension 62 and the free end of lip 16 prevents counterclockwise rotation of base 25 about the vertical axis.

For intentional dismounting of lamp shade 33 it is necessary to engage the outer end of rivet 59 and move cam lock member 51 downward to a position where the free end of extension 62 is below lip 16. In this position of cam lock member 51 base 25 may be rotated counterclockwise for dismounting of shade 33. It is noted that the outside end of rivet 59 is so positioned that with base 25 grasped in one hand, rivet 59 may be manipulated with the thumb of that hand. This is particularly advantageous when a workman is at the top of a tall step ladder. Under these conditions he may grasp the step ladder with one hand, so as not to lose his balance, and the remaining free hand will be sufficient to enable him to dismount lamp shade 33. Although there has been described a preferred embodiment of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited, not by the specific disclosure herein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A device for removable mounting of an electrical unit to a busway having an elongated narrow bottom opening extending along substantially its entire length, which comprises:
   (a) a hollow base for positioning adjacent said housing;
   (b) a plug unit carried by said base and including
      (1) an insulated extension having a first dimension greater than the width of the bottom opening of the housing and a second dimension at right angles to said first dimension, and
      (2) a compression spring fixedly secured at one tending outwardly from said insulated extension;
      (c) bracket means fixed to said base for mechanically securing device to said busway including at least one pair of oppositely projecting arms for engaging the outer periphery of said housing; and
      (d) a locking means for maintaining said device secured to said busway, including
         (1) a member slidably mounted on said base for movement between said first locking position and a second release position, and including a cam element for entering and engaging said housing, when said member is mounted in its first, locking position,
         (2) a compression spring fixedly secured at one end of said base biasing said member into said first locking position thereof; and
         (3) stops means extending through said base and fixed to said member, said stop means being moveable by said member to a first position, corresponding to the first, locking position of the member, and being manually moveable to a second position corresponding to the second, release position of said member.

2. In combination, a busway and a device for removably mounting an electrical unit thereto, which comprises:
   (a) a busway including an elongated housing defining at least one external channel extending parallel to the longitudinal axis of said housing and having a relatively narrow bottom opening extending along substantially its entire length, the housing containing a plurality of elongated bus bars insulated from one another and extending parallel to the longitudinal axis of the housing;
   (b) a hollow base disposed adjacent said housing;
   (c) a plug unit carried by said base and including
      (1) an insulated extension having a first dimension greater than the width of the bottom opening of the housing and a second dimension at right angles to said first dimension, said extension being positioned within said housing with said first dimension transverse thereof, and
      (2) a plurality of bus bar engaging contacts extending outwardly from said insulated extension and engaging said bus bars;
      (d) bracket means fixed to said base and mechanically securing said device to said busway including at least one pair of oppositely projecting arms extending around the periphery of said housing transverse to the longitudinal axis thereof, each of said projecting arms including a protrusion engaging one of the longitudinally extending channels defined by said housing; and
   (e) a locking means for maintaining said device secured to said busway, including:
      (1) a member slidably mounted on said base remote from the longitudinal axis of said housing for movement between a first locking position and a second release position, and including a cam element disposed in and engaged with said housing, when said member is mounted in its first, locking position, and disposed without and free of engagement with said housing, when said member is disposed in its second, release position,
      (2) a compression spring fixedly secured at one end of said base biasing said member into said first, locking position thereof; and
      (3) stops means extending through said base and fixed to said member, said stop means being
movable by said member to a first position, corresponding to the first, locking position of the member and being manually movable to a second position corresponding to the second, release position of said member;
said member, when in its locking position, extending into said housing between the edges of the narrow bottom opening thereof and thereby preventing pivotal movement of said device to permit dismounting thereof and, when in its release position, facilitating withdrawal of said device from engagement with said busway.

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