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ELECTRICAL TERMINAL AND CONNECTOR STRUCTURE

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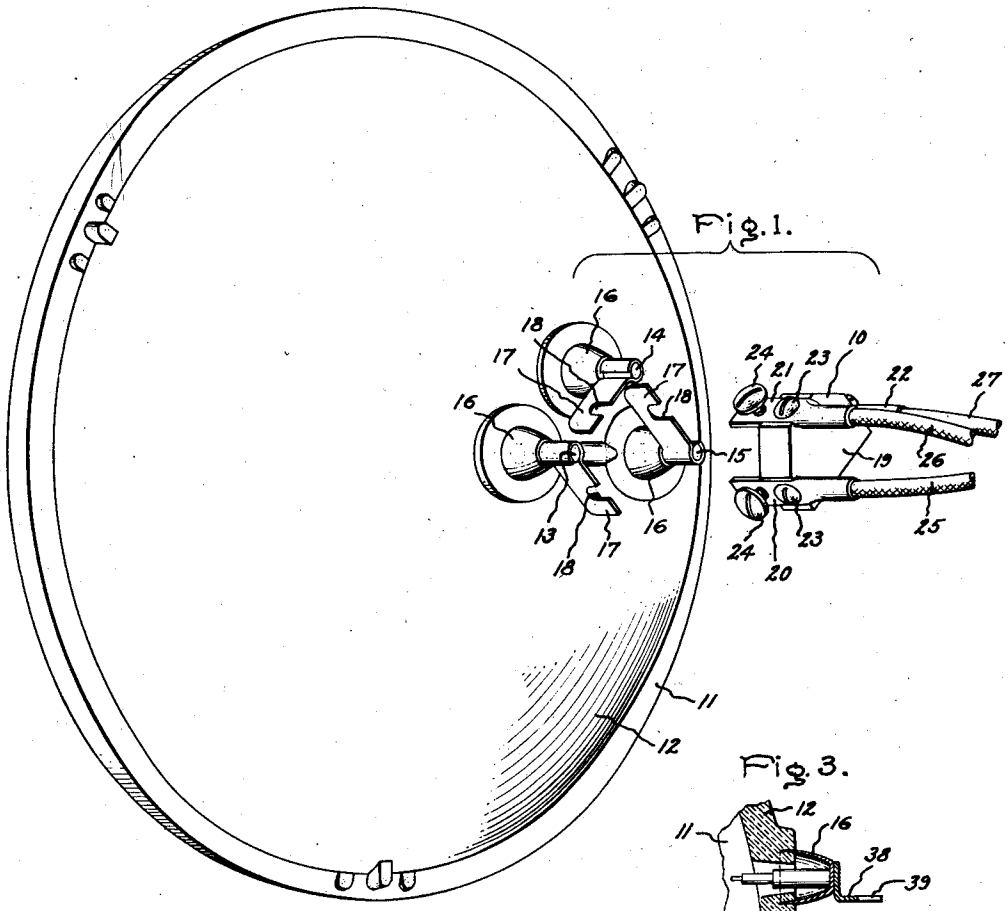


Fig. 1.

Fig. 3.

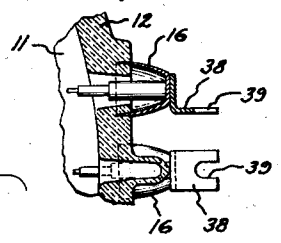
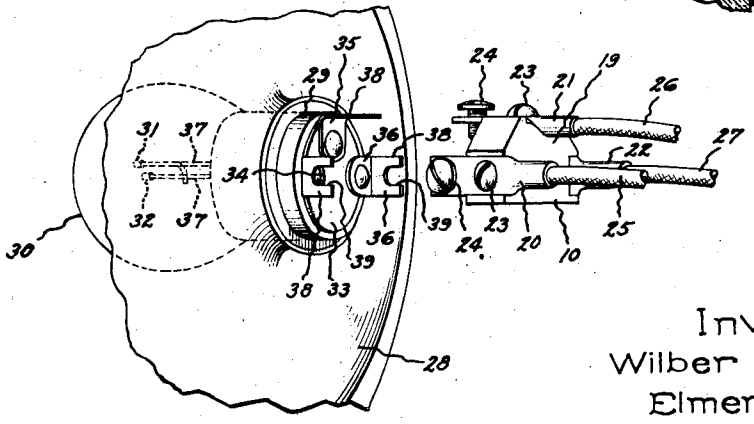


Fig. 2.



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ELECTRICAL TERMINAL AND CONNECTOR STRUCTURE

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4 Claims. (Cl. 176—32)

Our invention relates in general to electrical connectors for connecting current supply wires to the terminal elements of an electrical device. Our invention is particularly adaptable for electrical connectors for relatively high-wattage electric incandescent lamps similar to the type described and claimed in United States Patents Nos. 2,148,314 and 2,148,315, issued February 21, 1939, to Daniel K. Wright.

Reflector lamps similar to that described in the above referred to patents have been proposed for vehicle headlighting purposes. Such lamps comprise a sealed glass envelope, consisting of two pressed glass sections sealed together by fusion, with one or more filaments accurately mounted within the envelope in definite relation to the reflecting surface thereof. As an alternative for such glass reflector lamps, it has also been proposed to use a headlight comprising a metal reflector member to which an electric incandescent lamp is rigidly secured in such a way as to position the filament or filaments within said lamp in definite relation to the reflecting surface of the metal reflector member.

To produce two different types of beams, one for city driving and the other for country driving, each headlight lamp is provided with two separate filaments which are adapted to be operated independently of one another. For this purpose, each lamp is provided with three contacts or terminals, one of which is common to both filaments. However because of the difference in the construction of the glass and the metal reflector lamps, the three terminals of such lamps are, of necessity, located in different relation to one another. For this reason it has been somewhat of a problem to provide suitable connector means for such lamps which will operate interchangeably on either the glass or the metal reflector lamps, and in addition will insure that the proper current supply wires are connected to the proper terminals on the lamp. The problem was further complicated by the fact that, while the connector had to be readily detachable from the lamp to thereby facilitate lamp replacement, still a suffciently positive and reliable contact between the lamp terminals and the connector had to be provided in order to minimize the voltage drop thereat.

One object of our invention is to provide connector means for connecting a plurality of current-supply wires to the terminals of an electrical device, which is simple in construction and can be manufactured at relatively low cost.

Another object of our invention is to provide connector means for connecting a plurality of current-supply wires to the terminals of an electrical device and which provides a positive and reliable contact with said terminals while permitting ready disengagement therefrom.

Still another object of our invention is to provide connector means for connecting three or more current-supply wires to a corresponding number of terminals of an electrical device and which will co-operate interchangeably with two differently constructed electrical devices, the terminals of which are arranged differently.

Further objects and advantages of our invention will appear from the following description of species thereof and from the accompanying drawing in which:

Fig. 1 is a perspective view of the connector means comprising our invention with the connector shown in position preparatory to its attachment to a glass reflector lamp; Fig. 2 is a view similar to Fig. 1 but illustrating instead the connector in position preparatory to its attachment to a metal reflector lamp; and Fig. 3 is a fragmentary vertical sectional view of a modification of the lamp shown in Fig. 1.

Referring to the drawing, Fig. 1 shows the connector 10 comprising our invention in position preparatory to its attachment to a glass reflector lamp of the type described and claimed in the above-mentioned United States Patents Nos. 2,148,314 and 2,148,315. Such lamps comprise a glass bulb or envelope 11 consisting of a pressed glass reflector section 12 and a cover glass section (not shown) sealed together at their rims by fusion. Within the bulb 11 are mounted a pair of light sources or filaments (not shown) which are connected by leading-in wires or conductors to outwardly projecting terminal posts 13, 14 and 15, three such terminal posts being provided in order to permit independent operation of each filament. For this purpose, one of the terminal posts (13) is common to both of the light sources. The terminal posts extend through suitable openings in the reflector section 12, and are secured to said section by means of metallic skirt portions 16 which are preferably made of a metal commercially known as "Fernico" and which are sunk and embedded in the thickness of the glass surrounding said openings. As shown in the drawing, the three terminal posts 13, 14 and 15 extend parallel to the axis of the lamp and are spaced equidistant therefrom and preferably at angles of 90° about said axis so as to be disposed in equilateral triangular formation.

Secured to each terminal post, in further accord with our invention, is a contact member or plate 17. These contact plates, like the terminal posts 13, 14 and 15, are arranged symmetrically about the lamp axis and are disposed in planes extending parallel to the said axis and equidistant therefrom. As is evident from Fig. 1, the contact plates 17 on the diametrically opposite or side terminal posts 13 and 15 extend parallel to each other, while the contact plate 17 on the intermediate post 14 extends in a direction perpendicular to the said diametrically opposite and parallel plates. Each contact plate 17 is provided with a slot 18 extending in the direction of the lamp axis, the said slots being similarly located in the three contact plates.

The connector 10 for co-operation with the contact members 17 comprises a block of insulating material 19, such as fibre or Bakelite, to which three elongated plate-shaped contact prongs or bus bars 20, 21 and 22 are secured by screws 23 in such a manner as to extend parallel to one another. A corresponding end of each bus bar is provided with a threaded hole into which attachment or binding screws 24 are threaded, while the opposite ends are secured to the current supply wires 25, 26 and 27, bus bar 20 being connected to the common lead wire 25. The bus bars 20, 21 and 22 and the binding screws 24 thereon are arranged in the same formation as the lamp contact members 17 and the slots 18 therein, so that when the three binding screws 24 are partially loosened from the bus bars and are aligned with the slots 18 in the lamp contact members 17, the said members may be slid between the bus bars and the heads of the binding screws 24 thereon. The said screws are then tightened to firmly clamp the bus bars to the lamp contacts 17.

Fig. 2 illustrates the connector 10 according to our invention arranged in position preparatory to its attachment to a metal reflector lamp. Such lamps comprise a metal reflector section 28 secured to the base 29 of a small electric incandescent lamp 30, such as by soldering. The said lamp is provided with a pair of filaments 31, 32, and the metal reflector 28 is secured to the lamp in definite optical relationship to such filaments. The end of the lamp base 29 is provided with an insulating member or disc 33 of suitable material, such as Bakelite, to which three contact members 34, 35 and 36 are secured. The filaments 31, 32 are connected by leading-in wires 37 to the lamp contacts 34, 35 and 36, the contact 34 being common to both filaments.

To co-operate with the connector 10 according to our invention, the lamp contacts 34, 35 and 36 are so shaped and arranged as to present rearwardly extending projections or prongs 38 disposed in the same relative formation as the contacts 17 on the glass reflector lamp shown in Fig. 1. In addition, these projections 38, like the contacts 17, are provided with slots 39 similar to the slots 18 to thereby receive the binding screws 24 on the connector. The attachment of the connector to the lamp is accomplished in the same manner as before, the rearwardly extending prongs 38 of the lamp contacts 34, 35 and 36 being slid between the bus bars on the connector and the heads of the binding screws 24 thereon and the said screws then tightened to firmly clamp the contacts and bus bars together.

It is thus evident that by arranging the slotted contacts on the glass reflector lamp of Fig. 1 and the metal reflector lamp of Fig. 2 in the same relative position, the connector 10 according to our invention will co-operate interchangeably therewith. Furthermore, the binding screws 24 securely clamp the connector bus bars and lamp contacts together so as to provide a positive and reliable contact therebetween, thus minimizing the voltage drop at such points of connection. This is of particular importance in view of the relatively low voltage at which the lamps referred to are operated.

The connection means described hereinabove is simple in construction and can be manufactured at relatively low cost. Furthermore, even though the connector 10 is securely connected to the lamp terminals so as to provide positive and reliable contact therewith, still it is readily detachable therefrom so that lamp replacements can be made in a comparatively simple manner. In this connection, the connector according to the invention insures that the proper current-supply wires are connected to the proper lamp terminals whenever such lamp replacements are made.

It will be obvious that the glass reflector lamp of Fig. 1 may be provided with the rearwardly extending prongs 38 shown in Fig. 2, in which case the outwardly extending posts 13, 14 and 15 may be omitted and the said prongs brazed or otherwise secured directly to the ends of the skirts or cups 16, as shown in Fig. 3. In such case, the skirts 16 are not provided with openings for the said posts, and thus form a part of the hermetically sealed envelope or bulb 11. Such a structure obviates the necessity for a brazed hermetic joint between the said posts and skirts.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An electric lamp comprising a glass envelope having a pair of filaments sealed therein, and a terminal structure comprising three metallic cup members arranged at the corners of a triangle at the exterior of said envelope and having their edges fused into a wall of said envelope around openings therein, said cup members being imperforate and thereby hermetically sealing said openings, lead-in conductors within said envelope secured to the interiors of said cup members and electrically connected to said filaments, and three L-shaped prong members each having its base portion secured to the exterior of one of said cup members, the stem portions of said prong members extending outwardly from said envelope substantially parallel to each other for making connection with an electrical connector.

2. An electric lamp comprising a glass envelope having a pair of filaments sealed therein, and a terminal structure comprising three metallic cup members arranged at the corners of a triangle at the exterior of said envelope and having their edges fused into a wall of said envelope around openings therein, lead-in conductors secured to said cups and electrically connected to said filaments, and three L-shaped prong members each supported by its base portion from one of said cup members, the stem portions of said prong members extending outwardly from said envelope substantially parallel to each other for making connection with an electrical connector.

3. An electric lamp comprising a glass envelope having a pair of filaments sealed therein, and a terminal structure comprising three metallic cup members arranged at the corners of

a triangle at the exterior of said envelope and having their edges fused into a wall of said envelope around openings therein, lead-in conductors secured to said cups and electrically connected to said filaments, and three L-shaped prong members supported by their base portions from said cup members and electrically connected one to each of said cup members, the stem portions of said prong members extending outwardly from said envelope substantially parallel to each other for making connection with an electrical connector.

4. An electric lamp comprising a glass enveope having at least one filament sealed therein, and a terminal structure comprising a plurality of cup members at the exterior of said envelope having their edges fused into a wall of said envelope around openings therein, lead-in conductors supported by said cups and electrically connected to said filament, and a plurality of L-shaped prong members corresponding in number to said cup members, said prong members being supported by their base portions from said cup members and being electrically connected one to each of said cup members, the stem portions of said prong members extending outwardly from said envelope substantially parallel to each other for making connection with an electrical connector.

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