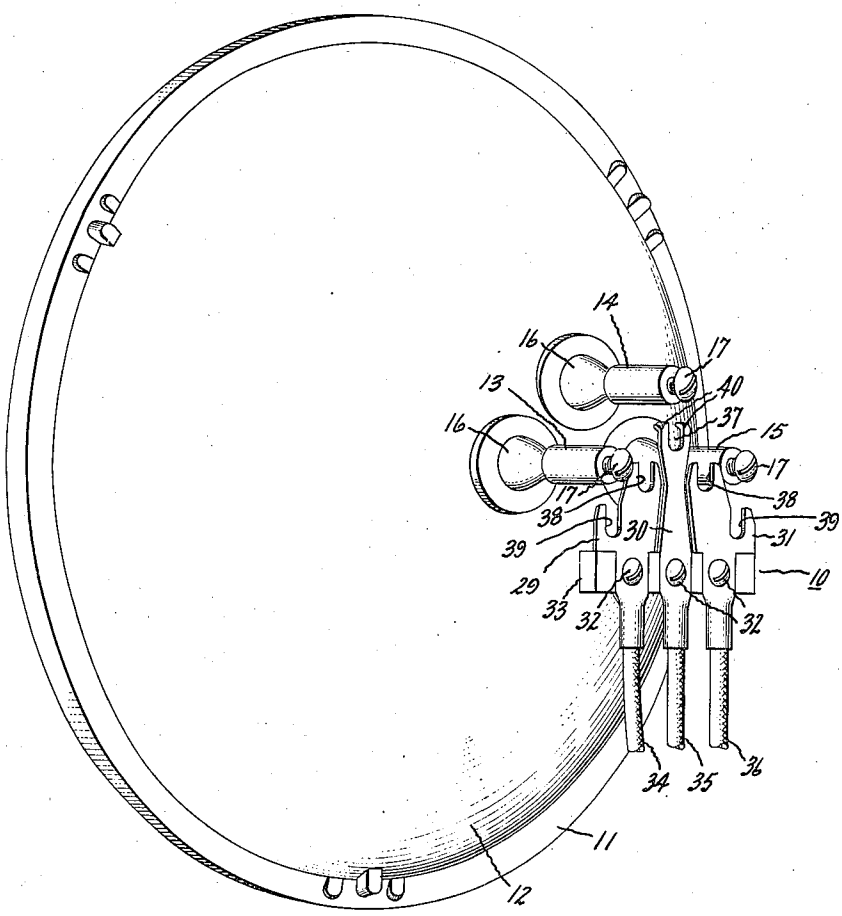
Nov. 25, 1941. W. M. JOHNSON ET AL 2,264,040

ELECTRICAL TERMINAL AND CONNECTOR STRUCTURE

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Fig. 1.



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Fig. 2.

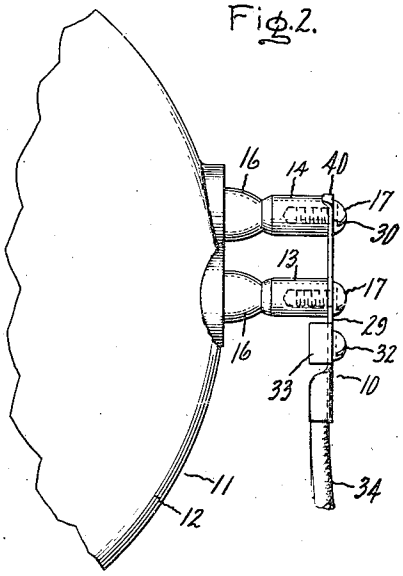


Fig. 3.

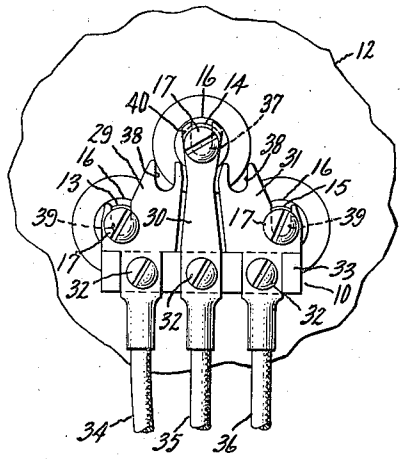


Fig. 4.

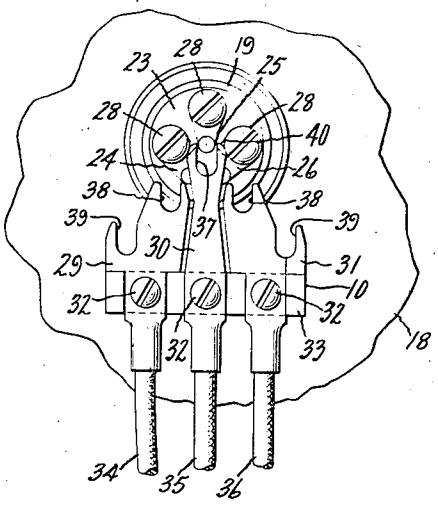
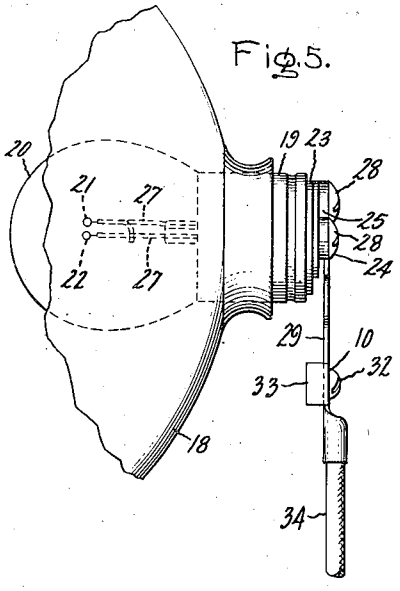


Fig. 5.



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UNITED STATES PATENT OFFICE

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ELECTRICAL TERMINAL AND CONNECTOR STRUCTURE

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Application July 12 1939, Serial No. 284,072

4 Claims. (Cl. 173—324)

Our invention relates in general to electrical connectors for connecting current supply wires to the terminal elements of an electrical device. The invention is particularly applicable to a terminal and connector construction 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 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 of 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 sufficiently 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 on 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 a specie thereof and from the accompanying drawings 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 side view of the connector showing the same attached to the lamp shown in Fig. 1; Fig. 3 is a front view of the connector likewise showing the same attached to the lamp shown in Fig. 1; Fig. 4 is a front view of the connector illustrating the same in position preparatory to its attachment to a metal reflector lamp; and Fig. 5 is a side elevation of the connector showing the same attached to a metal reflector lamp.

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 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 filaments (not shown) which are connected by leading-in wires 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 filaments. 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 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. The three terminal posts 13, 14 and 15 are provided with threaded holes, extending longitudinally of the lamp axis, into which attachment or binding screws 17 are threaded.

Fig. 4 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 18 secured to the base 19 of a small electric incandescent lamp 20, such as by soldering. The said lamp is provided with a pair of filaments 21, 22, and the metal reflector 18 is secured to the lamp in definite optical relationship to such filaments. The end of the lamp base 19 is provided with an insulating member or disc 23 of suitable material, such as "Bakelite," to which three contact members 24, 25 and 26 are secured. The filaments 21, 22 are connected by leading-in wires 27 to the lamp contacts 24, 25 and 26, the contact 24 being common to both filaments. Like the contact posts 13, 14 and 15 on the glass reflector lamp shown in Fig. 1, the three contact members 24, 25 and 26 are each provided with a threaded hole, extending longitudinally of the lamp axis, into which attachment or binding screws 28 are threaded.

The connector 10 for co-operation with the terminal contacts of both the lamps described above comprises a group of three elongated plate-shaped contact prongs or fingers 29, 30 and 31 secured by screws 32 to a block 33 of suitable insulating material, such as fibre or "Bakelite." The said prongs are mounted on the insulating member 33 so as to lie side-by-side in a common plane and extend in the same general direction. The three prongs 29, 30 and 31 are connected at corresponding ends to the current supply wires 34, 35 and 36 respectively, prong 29 being connected to the common lead wire 34. The opposite ends of the contact prongs are suitably slotted so that they may be slid under the heads of either the binding screws 17 or the binding screws 28. For this purpose, the intermediate or central contact prong 30 is provided with a single slot 37, while the two side prongs 29 and 31 are each provided with two slots consisting of an inner slot 38 and an outer slot 39. All of these slots extend parallel to each other and longitudinally of said prongs. As shown particularly in Figs. 1 and 3, the two outer slots 39 in the side contact prongs 29 and 31 are spaced the same distance from the single slot 37 in the intermediate prong 30 as that of the side lamp terminals 13 and 15 from the intermediate terminal 14. Likewise, as shown in Fig. 4, the two inner slots 38 in the side contact prongs 29 and 31 are spaced the same distance from the single slot 37 in the intermediate prong 30 as that of the binding screws 28 in the two side lamp terminals 24 and 26 from the screw in the intermediate terminal 25.

To attach the connector 10 to the glass reflector lamp (Figs. 1–3), the intermediate slot 37 and the two outer slots 39 are first aligned with the three terminals 13, 14 and 15 of the lamp, and the three contact prongs 29, 30 and 31 then slid between the said terminals and the heads of the binding screws 17 thereon. By tightening the said screws 17, the connector is thus firmly secured to the lamp. Similarly, to attach the connector 10 to the metal reflector lamp (Figs. 4 and 5) the intermediate slot 37 and the two inner slots 38 are first aligned with the three binding screws 28 on the lamp, whereupon the three contact prongs are slid under the heads of such screws and the latter then tightened to firmly secure the connector to the lamp.

It is thus evident that by the provision of the two slots 38, 39 in each of the two side contact prongs 29 and 31, the connector 10 according to our invention will co-operate interchangeably with the glass reflector lamp shown in Figs. 1 to 3 and the metal reflector lamp shown in Figs. 4 and 5. The binding screws 17 or 28, as the case may be, securely clamp the connector bus bars and the lamp terminals 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. Furthermore, by providing two or more of the connector contact prongs with two or more slots, the connector can be adapted to co-operate interchangeably with a variety of different binding or terminal post arrangements.

It is obvious that, in order to slide the connector contact prongs 29, 30 and 31 under the heads of the binding screws 17 or 28, the latter have to be loosened somewhat. To provide a temporary securing means serving to hold the connector 10 in correct assembled position on the lamp terminals while the binding screws are being tightened, the slotted end of the intermediate contact prong 30 is bent over to provide two lips 40, 40 which are adapted to hook over the lamp terminals and engage the cylindrical side portions thereof, as shown in Figs. 2 and 5. In this manner, the person attaching the connector to the lamp has both hands free to work with, one to hold the lamp and the other to operate a screw driver to tighten the binding screws 17 or 28.

The connection means described hereinabove is simple in construction and can be manufactured at relatively low cost. Furthermore, even though the connector 10 provides a positive and reliable contact with the lamp terminals, 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.

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

1. An electrical connector comprising a member of insulating material, and a plurality of elongated plate-shaped contact prongs secured to said insulating member in side-by-side relation so as to extend approximately in the same direction, one of said prongs having one of its ends provided with a longitudinally extending slot, and each of a pair of prongs on opposite sides of said one prong having a corresponding end provided with at least two longitudinally extending slots in predetermined side-by-side relationship.

2. An electrical connector comprising a member of insulating material, and a group of three elongated plate-shaped contact prongs secured to said insulating member in side-by-side relation so as to lie in the same plane and extend approximately in the same direction, the intermediate prong of said group of prongs having one of its ends provided with a longitudinally extending slot, and each of the two side prongs of said group

of prongs having a corresponding end provided with at least two longitudinally extending slots.

3. An electrical connector comprising a member of insulating material, and a group of three elongated plate-shaped contact prongs secured to said insulating member in side-by-side relation so as to lie in the same plane and extend approximately in the same direction, the intermediate prong of said group of prongs having one of its ends provided with a longitudinally extending slot, and each of the two side prongs of said group of prongs having a pair of longitudinally extending slots comprising an inner and an outer slot, the said inner slots being symmetrically located with respect to the single slot in the intermediate prong, and the said outer slots also being symmetrically located with respect to the said single slot in the said intermediate prong.

4. An electrical connector comprising a member of insulating material, and a group of three elongated plate-shaped contact prongs secured to said insulating member in side-by-side relation so as to lie in the same plane and extend approximately in the same direction, the intermediate prong of said group of prongs having one of its ends provided with a longitudinally extending slot, and each of the two side prongs of said group of prongs having a corresponding end provided with a pair of longitudinally extending slots comprising an inner and an outer slot, the said inner slots being symmetrically located with respect to the single slot in the intermediate prong, and the said outer slots also being symmetrically located with respect to the said single slot in the said intermediate prong, the slotted end of said intermediate prong being provided at its extremity with engagement means adapted to engage the side of the co-operating terminal post and temporarily suspend the connector thereon, said engagement means comprising a relatively small lug extending substantially at right angles to the plane of said plate-shaped intermediate prong.

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