Sept. 29, 1964 R. P. PETROSKE 3,150,907

ELECTRICAL CONNECTOR

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Fig. 1

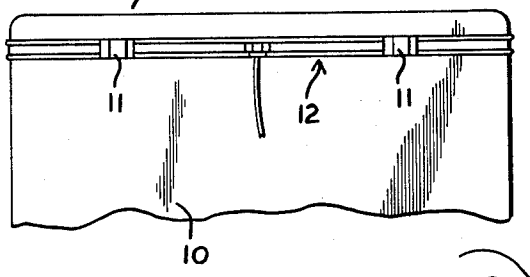


Fig. 2

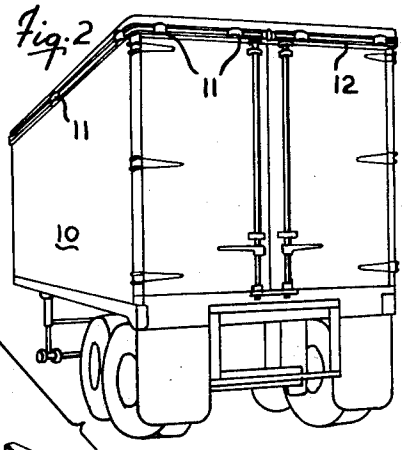


Fig. 3

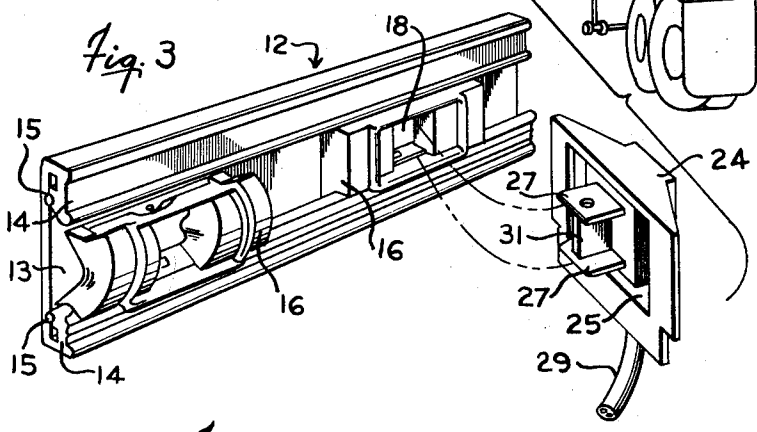


Fig. 4

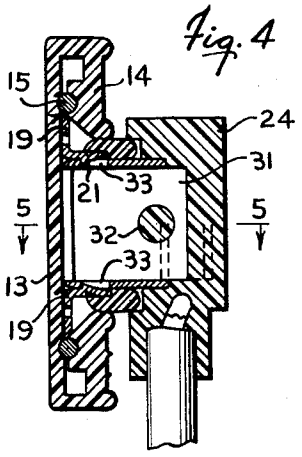


Fig. 6

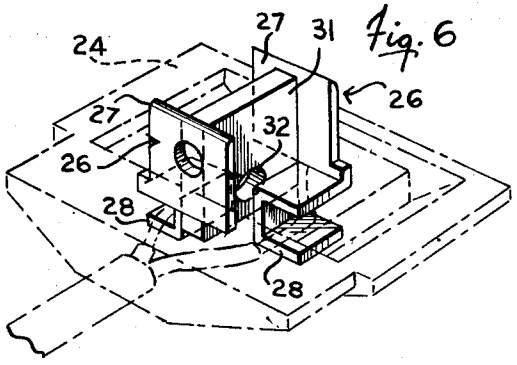
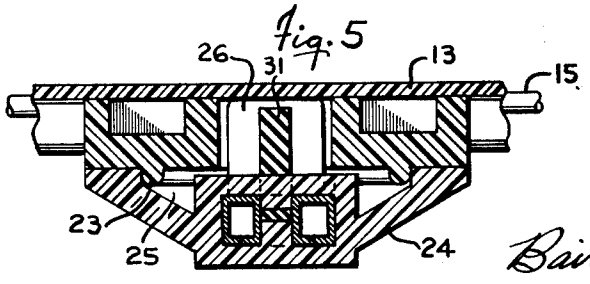


Fig. 5



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Fig. 7

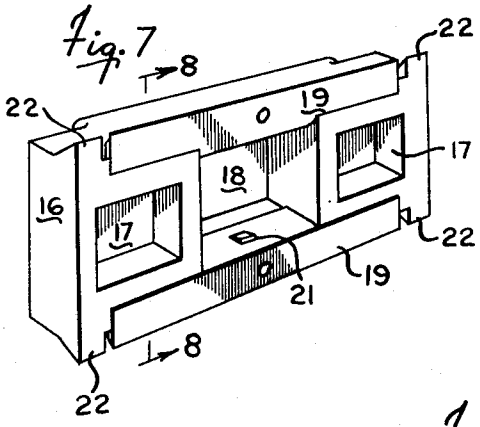


Fig. 8

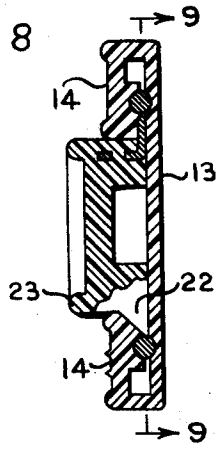


Fig. 9

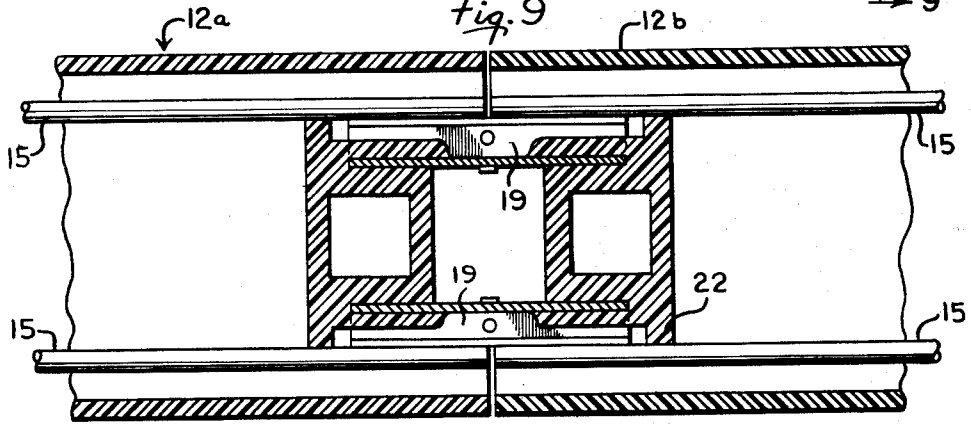
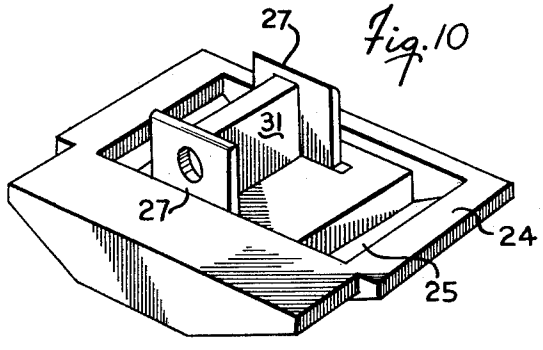


Fig. 10



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ELECTRICAL CONNECTOR

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Filed July 10, 1962, Ser. No. 208,792
10 Claims. (Cl. 339—61)

This invention relates to electrical connectors and more particularly to a connection for use with a conductor strip of the type used for mounting identification and clearance lamps on truck and trailer bodies, and the like.

A system has been developed in recent years for mounting such lamps on truck and trailer bodies employing a conductor strip in the form of flat insulated strip having inwardly turned side flanges beneath which conductors are supported. Such strips are secured to desired locations on the truck or trailer bodies and signal lamps are mounted thereon through clips which make electrical contact with the conductors.

The present invention relates to a connector for connecting power supply leads to the conductor strips and for interconnecting adjacent sections of conductor strips and has for one of its objects the provision of a simple and inexpensive connector which can easily be applied to conductor strips and which provides good electrical contact with the conductors thereof.

Another object is to provide a connector in which a resilient connector member is snapped into the conductor strip and a plug is inserted in an opening in the connector member to secure it against accidental removal and to press the conductor members thereof into firm contact with the conductors in the conductor strip.

According to a feature of the invention, the plug may include contacts connected to power leads to contact conductor members in the connector member and through them establish electrical connection to the conductors in the conductor strip. Preferably the contacts and conductor members are formed with interengaging latch parts to hold the plug securely in place in the connector member.

Another object is to provide a connector in which electrically conducting parts of the connector member and plug member are effectively sealed against the ingress of water or other foreign material.

According to a feature of the invention, the plug is in the form of an insulating cap having a recess therein to receive a raised sealing bead on the connector member and the connector member includes integral resilient sealing wedges beyond the ends of the conductor members therein to seal against the insulating material of the conductor strip.

The above and other objects and features of the invention will be more readily apparent from the following description when read in connection with the accompanying drawings, in which:

FIG. 1 is a partial view of a truck or trailer body showing a conductor strip installed thereon with a connector according to the invention attached thereto;

FIG. 2 is a partial perspective view of a trailer equipped with a conductor strip according to the invention;

FIG. 3 is a partial enlarged perspective view illustrating the manner of application of the connector of the present invention to a conductor strip;

FIG. 4 is a sectional view through the assembled conductor strip and connector;

FIG. 5 is a transverse section on the line 5—5 of FIG. 4;

FIG. 6 is a perspective view of the plug or cap member of the invention with the insulating parts thereof shown in dot-dash lines;

FIG. 7 is a perspective view of the connector member looking from the inside thereof;

FIG. 8 is a section on the line 8—8 of FIG. 7 with a portion shown in elevation;

FIG. 9 is a sectional view on the line 9—9 of FIG. 8 showing the manner of use of the connector member for connecting adjacent sections of a conductor strip; and

FIG. 10 is a perspective view of a plug member used with the connector member of FIG. 9.

As illustrated in FIGS. 1 and 2, the present invention is adapted to be used with conventional truck or trailer bodies, as indicated at **10**, for mounting lamps, as shown at **11**, in various locations thereon as required by regulations and usage. For this purpose, a conductor strip, indicated generally at **12**, is secured around the upper part of the truck or trailer body with the lamps **11** mounted thereon and supplied with power therethrough, as more particularly described and claimed in the patent to Morgan, No. 3,109,598, dated November 5, 1963. The present invention provides a connector for connecting power leads to the conductor strip **12** and which may also be utilized to connect adjacent sections of conductor strip, as explained more fully hereinafter.

The conductor strip which, per se, forms no part of the present invention, as best seen in FIG. 3, comprises a flat strip **13** of insulating material with inwardly turned flanges **14** at its opposite edges. The strip may be extruded of any suitable type of insulating material, such as rubber compounds, polyvinyl chloride, or similar plastic materials which are relatively strong and are relatively good insulators. Conductors, such as copper wires **15**, are supported beneath the flanges **14** in such a way that their sides are exposed through a relatively narrow gap, as best seen for example in FIG. 4, for engagement by contact members on the lamps **11** and on the connectors of the present invention.

A complete connector, according to the invention, comprises a resilient connector member which can be snapped in place in a conductor strip and a plug member which fits into an opening in the connector member. The connector member, as seen for example in FIG. 7, comprises a body **16** of a relatively soft resilient material, such as rubber, neoprene, or the like, which can be molded relatively easily and which is readily deformable. The body is of generally rectangular outline with a flat bottom surface which is preferably recessed, as shown at **17**, adjacent its ends to leave a relatively thin outer web which can be flexed easily. In the central part the body is open, as shown at **18**, to receive the plug member, as described hereinafter. A pair of L-shaped conductor strips **19** are molded into the body to extend along the opposite edges thereof with each strip having flat base flanges lying in the plane of the bottom of the connector member and projecting outwardly away from each other and with parallel spaced side flanges which are embedded in the rubber-like material of the body to secure the conductor strips in place. Each conductor strip is also preferably formed with an outwardly projecting lug **21** tapering from the top thereof to the bottom to latch the plug member in place in the connector member, as described hereinafter.

It will be noted that the molded resilient body of the connector member projects beyond the ends of the conductor strips **19** and terminates in sealing wedge portions **22** which project outwardly in registration with the base flanges of the conductor strips **19**. These sealing wedges are formed to be of a size and shape to fit under the edge portions of the flanges on the conductor strip **12** to seal against ingress of water or other foreign materials. For sealing against the cap or plug member, the conductor member is formed on its outer surface with an outwardly extending bead **23** which extends completely around the opening **18** therein for sealing engagement with a cooperating recess in the cap member.

To install a connector member in a conductor strip **12** the sides of the connector member are squeezed together to flex the body portion thereof, as seen at the left side of FIG. 3. In this flexed condition the conductor strips **19** can fit between the inwardly turned flanges **14** of the conductor strip. When the connector member is released, it will spring back to its flattened position, as shown at the right side of FIG. 3 and as shown at the left of FIG. 4, with the base flanges of the conductor strips **19** extending beneath the side flanges **14** of the conductor strip **12** into contact with the conductors **15**. It will be seen that this operation can be performed easily and quickly without requiring the use of any tools.

The connector is completed by a plug member which comprises a cap **24** molded of a relatively hard insulating material, such as polyvinyl chloride. The cap is of a size to extend over the connector member and is formed on its inner surface with a recess **25** of a size and shape to receive the outwardly extending bead **23** of the connector member. When the cap is assembled on the connector member the bead will fit into the recess therein, as best seen in FIG. 5, to seal the cap and connector member together against the ingress of water or other foreign materials.

The cap includes a pair of spaced contacts **26** which may be identical and which are molded into the insulating material of the cap. This construction is best seen in FIG. 6 wherein it will be seen that each contact **26** includes an outwardly extending blade portion **27** with the blades lying in spaced parallel relationship with each other and with a U-shaped base portion **28** which is molded into the body of the cap to secure the contacts in place therein. When the plug is to be used for connecting a conductor strip to a source of power a cord **29** may be molded into the plug with the conductors therein soldered or otherwise suitably secured to the base portions **28** of the contacts before the insulating body material **24** is molded around them. When the plug is to be used with a connector for interconnecting adjacent sections of conductor strip, as shown in FIGS. 9 and 10, the cord may be omitted.

The contacts **26** are held in properly spaced relationship with each other by a spacer block **31** formed of a relatively hard insulating material which fits between the contacts, as shown in FIGS. 4 and 6. The spacer block is preferably preformed and molded into the cap **24** simultaneously with the contacts for which purpose it is preferably provided with an opening **32** therethrough through which the insulating material may flow and bond to itself to secure the spacer in place. Additionally, the contact strips **27** are formed with latching openings **33** therein to interengage with the projecting lugs **21** in the manner shown in FIG. 4.

With a connector member in place in a conductor strip, as shown at the right in FIG. 3, a plug may be assembled therewith by pressing the contact strips **27** and spacer block **31** into the opening **18** in the connector. When the plug is pressed securely into place, the projecting lugs **21** will snap into the openings **33** in the contact strips **27** and will hold it securely against any possibility of accidental removal. This latching action may be given any desired force up to the point where it is necessary substantially to destroy the plug or connector member to remove the plug. When the plug is in place, as described above, it will seal against the connector member to prevent ingress of water or other foreign materials and will further press the conductor strips **19** of the connector member away from each other to insure good electrical contact with the conductors **15** in the conductor strip.

Use of the connector to connect different sections of a conductor strip is shown in FIG. 9 wherein adjacent sections of conductor strip are indicated at **12***a* and **12***b* with their ends in alignment. A connector member, as described above, may be assembled in the end portions of the two strips overlapping the joint therebetween so that

the conductor strips **19** thereof span the joint and establish good electrical contact with the conductors **15** on opposite sides thereof. A plug, as shown in FIG. 10, which is identical with the plug described above except for omission of the cord, is then assembled with the connector member. With the plug in place the conductor strips **19** of the connector member are held firmly in engagement with the conductors **15** and the parts are secured in the conductor strip sections against any possibility of accidental removal. It will be noted that in both cases the wedge members **22** of the connector member fit closely into the inwardly turned flanges **14** of the conductor strip and seal against these flanges and against the base **13** of the conductor strip to prevent ingress of water or other foreign materials to the ends of the conductor strip **19**. The possibility of shorting or failure of the connector whether used to connect the conductor strip to power leads or to connect adjacent sections of conductor strip is thus minimized.

While two embodiments of the invention have been shown and described herein, it will be understood that they are illustrative only and not to be taken as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. A connector for a conductor strip having spaced inwardly turned side flanges and a pair of conductors supported beneath the side flanges respectively, said connector comprising a pair of L-shaped conductor strips mounted in spaced parallel relationship with base flanges on the strips lying in a common plane and extending outward away from each other, and resilient insulating material connecting the strips and being flexible to enable the strips to be moved resiliently toward each other, the base flanges being insertable under the side flanges of a conductor strip when the resilient insulating material is flexed and moving outwardly into contact with the conductors when the resilient insulating material is released, the insulating material extending in the form of thin wedges parallel with and beyond the ends of the base flanges to seal against the side flanges of the conductor strip.

2. A connector for a conductor strip having spaced inwardly turned side flanges and a pair of conductors supported beneath the side flanges respectively, said connector comprising a pair of L-shaped conductor strips mounted in spaced parallel relationship with base flanges on the strips lying in a common plane and extending outward away from each other, and resilient insulating material connecting the strips and being flexible to enable the strips to be moved resiliently toward each other, there being an opening in the resilient insulating material between the strips, and a plug fitting into the opening and engaging the strips to hold them separated.

3. A connector for a conductor strip having spaced inwardly turned side flanges and a pair of conductors supported beneath the side flanges respectively, said connector comprising a pair of L-shaped conductor strips having side and base flanges and mounted with their side flanges in spaced parallel relationship and with their base flanges lying in a common plane and extending outward away from each other, and resilient insulating material connecting the strips and being flexible to enable the strips to be moved resiliently toward each other, there being an opening in the resilient insulating material between the side flanges in which the side flanges are exposed, a plug fitting into the opening including spaced contacts engaging the side flanges respectively, and a body of insulating material supporting the contacts and closing the opening.

4. The connector of claim 3 in which the side flanges and the contacts are formed with interfitting parts which interengage when the plug is inserted in the opening to hold it against accidental removal.

5. A connector for a conductor strip having spaced inwardly turned side flanges and a pair of conductors supported beneath the side flanges respectively, said connec-

tor comprising a pair of L-shaped conductor strips mounted in spaced parallel relationship with base flanges on the strips lying in a common plane and extending outward away from each other, and resilient insulating material connecting the strips and being flexible to enable the strips to be moved resiliently toward each other, there being an opening in the insulating material between the strips, an integral upstanding bead around the opening, a cap fitting over the opening and formed with a recess to receive the bead, and a plug on the cap fitting into the opening to hold the strips apart.

6. A connector for a conductor strip having spaced inwardly turned side flanges and a pair of conductors supported beneath the side flanges respectively, said connector comprising a pair of L-shaped conductor strips mounted in spaced parallel relationship with base flanges on the strips lying in a common plane and extending outward away from each other, and resilient insulating material connecting the strips and being flexible to enable the strips to be moved resiliently toward each other, there being an opening in the insulating material between the strips, an integral upstanding bead around the opening, a cap fitting over the opening and formed with a recess to receive the bead, a pair of spaced contacts carried by the cap projecting into the opening in contact with the strips respectively, and an insulating block between the contacts holding them separated.

7. A connector comprising a generally rectangular body of resilient insulating material, a pair of L-section conductor strips having spaced side flanges embedded in

the body at opposite sides thereof and base flanges extending outward from the body at one face thereof, the body having a central opening therein between the side flanges of the conductor strips, and a plug fitting in the opening including contacts to contact the conductor strips respectively.

8. The connector of claim 7 in which the side flanges and contacts are formed with interengaging parts which interengage when the plug is inserted in the opening to latch it against accidental removal.

9. A connector comprising a generally rectangular body of resilient insulating material, a pair of L-section conductor strips having spaced side flanges embedded in the body at opposite sides thereof and base flanges extending outward from the body at one face thereof, the body having a central opening therein between the side flanges of the conductor strips, an integral upstanding bead around the opening, a cap of insulating material fitting over the body, the cap having a recess therein sealingly receiving the bead, and spaced contacts carried by the cap extending into the opening in contact with the side flanges of the conductor strips respectively.

10. The connector of claim 9 in which the cap includes an insulator block between the contacts holding them spaced apart.

References Cited in the file of this patent

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3,089,042 Hickey et al. ---------- May 7, 1963