

[54] WIRE CONNECTOR MEANS FOR VEHICLE LAMP

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[22] Filed: Nov. 30, 1973

[21] Appl. No.: 420,646

[52] U.S. Cl. 339/95 D; 339/97 L; 339/119 L;
339/258 R

[51] Int. Cl. H01r 9/12

[58] **Field of Search** 339/97 R, 97 L, 10, 119 L,

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Primary Examiner—Roy Lake

Assistant Examiner—E. F. Desmond

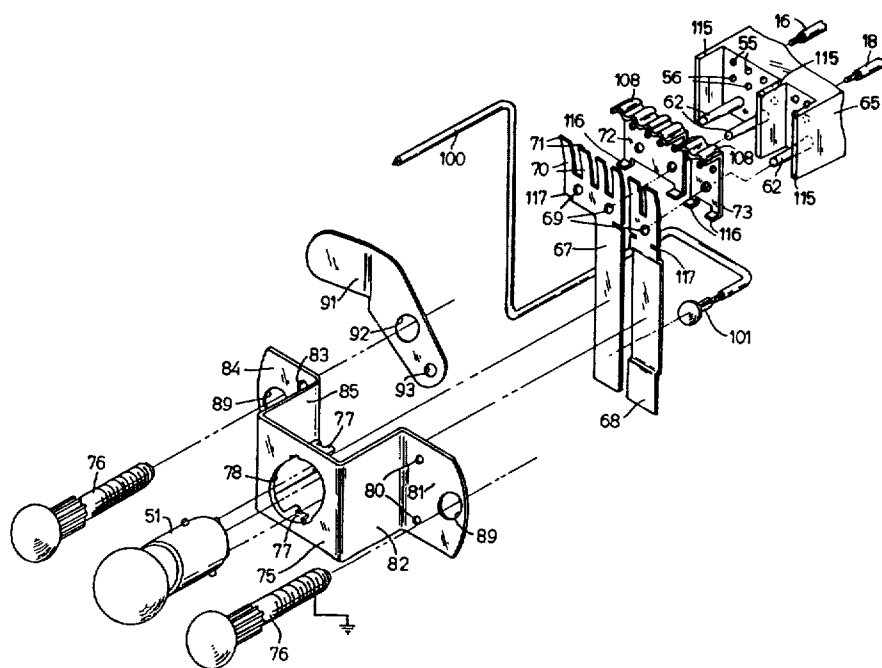
Attorney, Agent, or Firm—James E. Nilles

[57] **ABSTRACT**

A vehicle lamp comprises an insulated housing having

walls which define a cavity wherein a bulb is mounted. Wire connector means are provided to enable releasable connection of external wires to the bulb and, if necessary, to each other. Such means comprise a row of wire receiving openings in a wall of the housing and an adjacent row of wire releasing openings. A rigid electrically conductive L-shaped contact plate is rigidly secured within the housing and comprises a base portion having a row of wire receiving holes and a row of wire releasing holes in registry with the corresponding openings in the housing. The contact plate further comprises a rigid free-standing upright portion which has a row of wire guide grooves therein, each of which is aligned with an edge of a wire receiving hole in the base portion. A resilient electrically conductive contact member (electrically connected to the bulb) is electrically and mechanically connected to the contact plate and has a plurality of curved resilient free end tongues for releasably trapping the bare ends of the external wires inserted in the grooves against the contact plate. Each tongue has a straight sharp terminal edge which is normally disposed against the upright portion on either of an associated groove therein, but which is displaceable by the bare end of the wire inserted through a wire receiving opening in the housing and through a corresponding wire receiving hole in the contact plate. Each inserted wire normally makes electrical contact with its associated contact plate and contact member.

20 Claims, 25 Drawing Figures



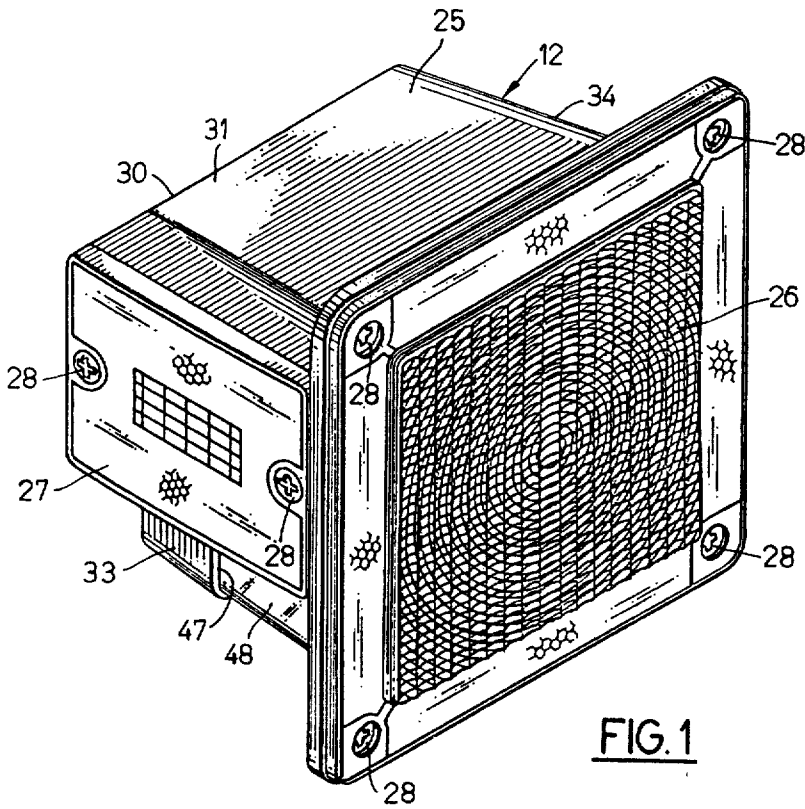


FIG. 1

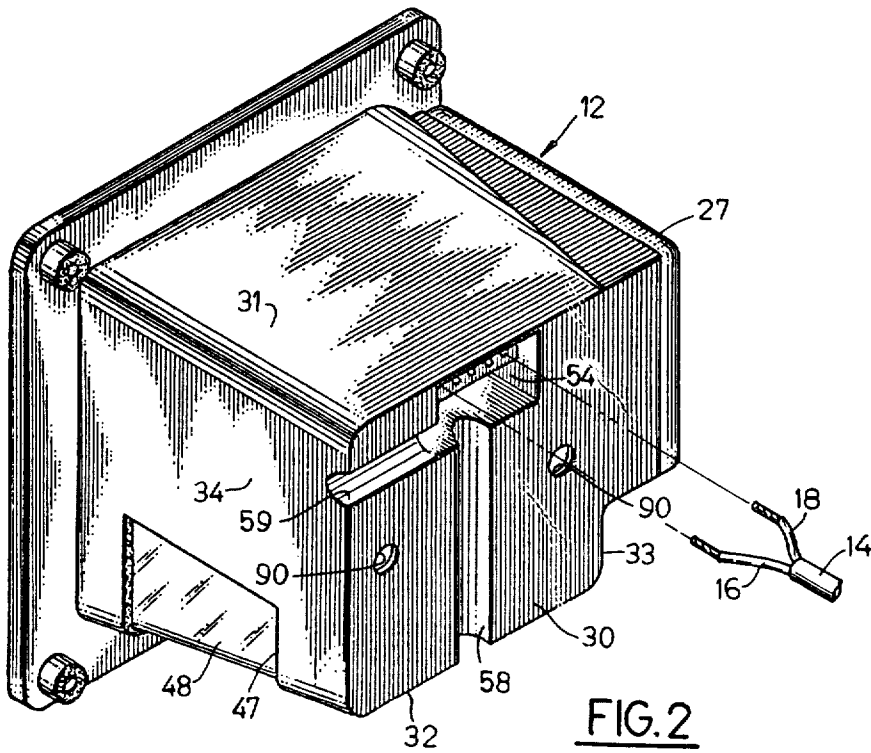


FIG. 2

FIG. 3

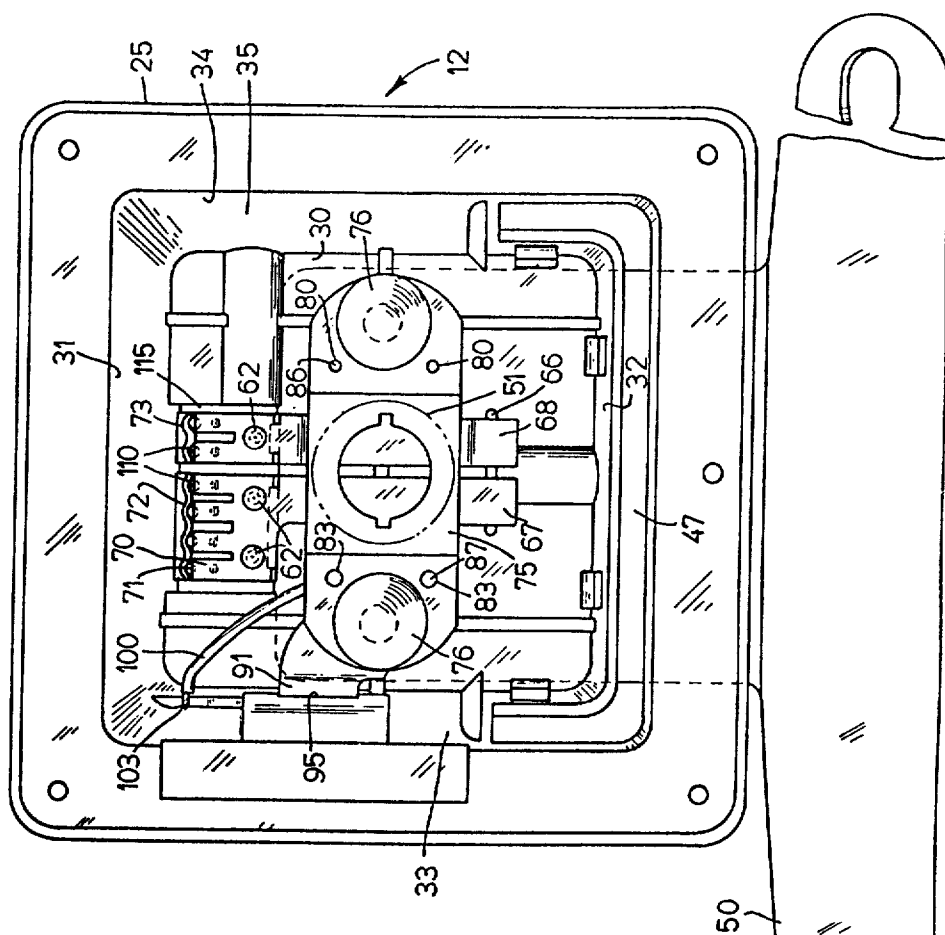
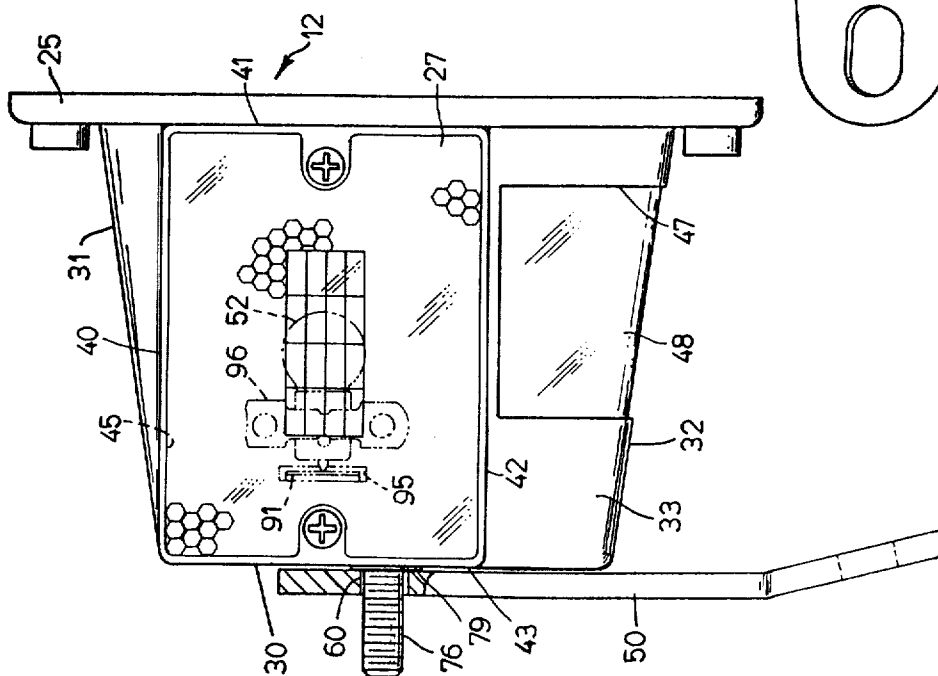


FIG. 4



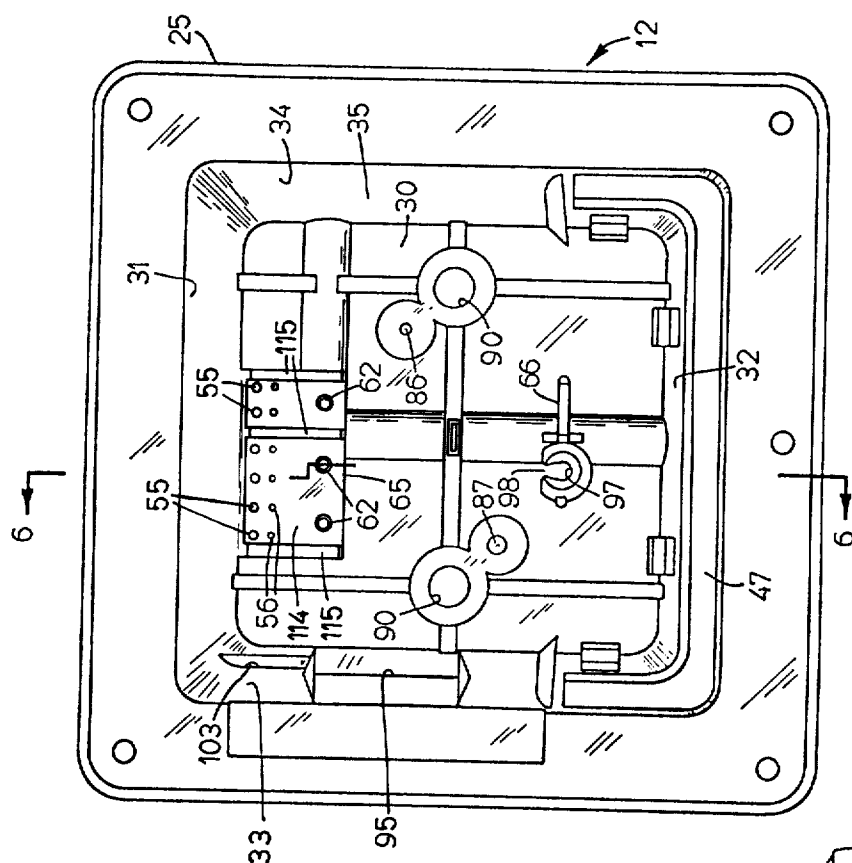


FIG. 5

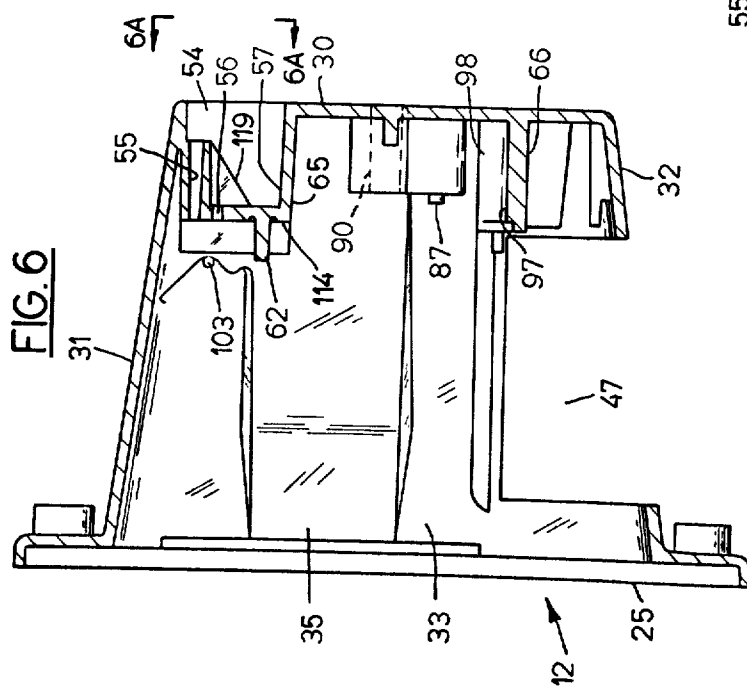


FIG. 6

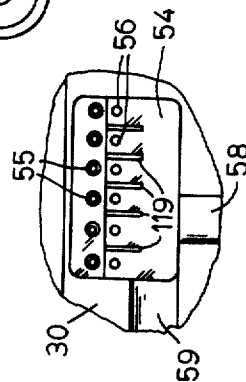
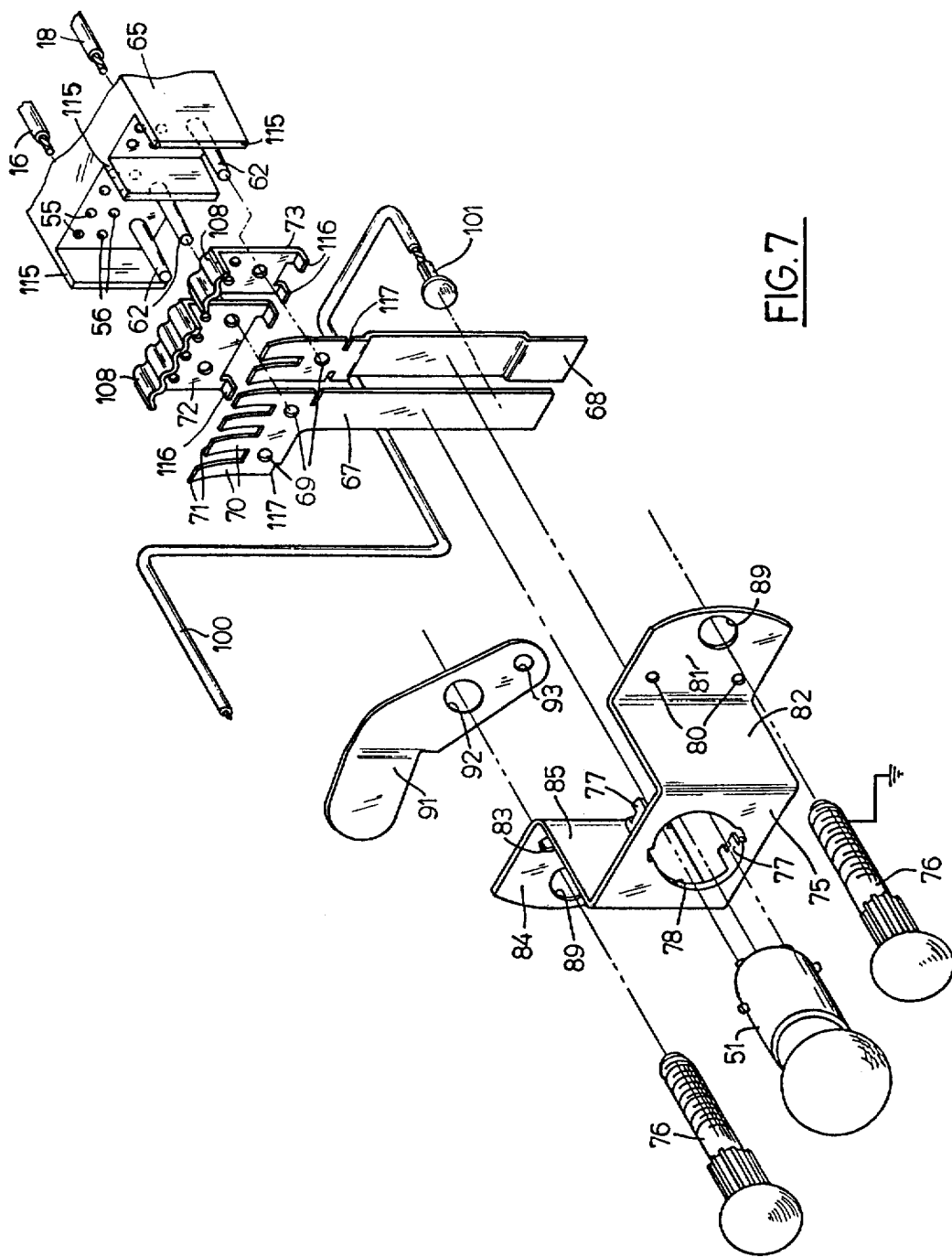


FIG. 6A



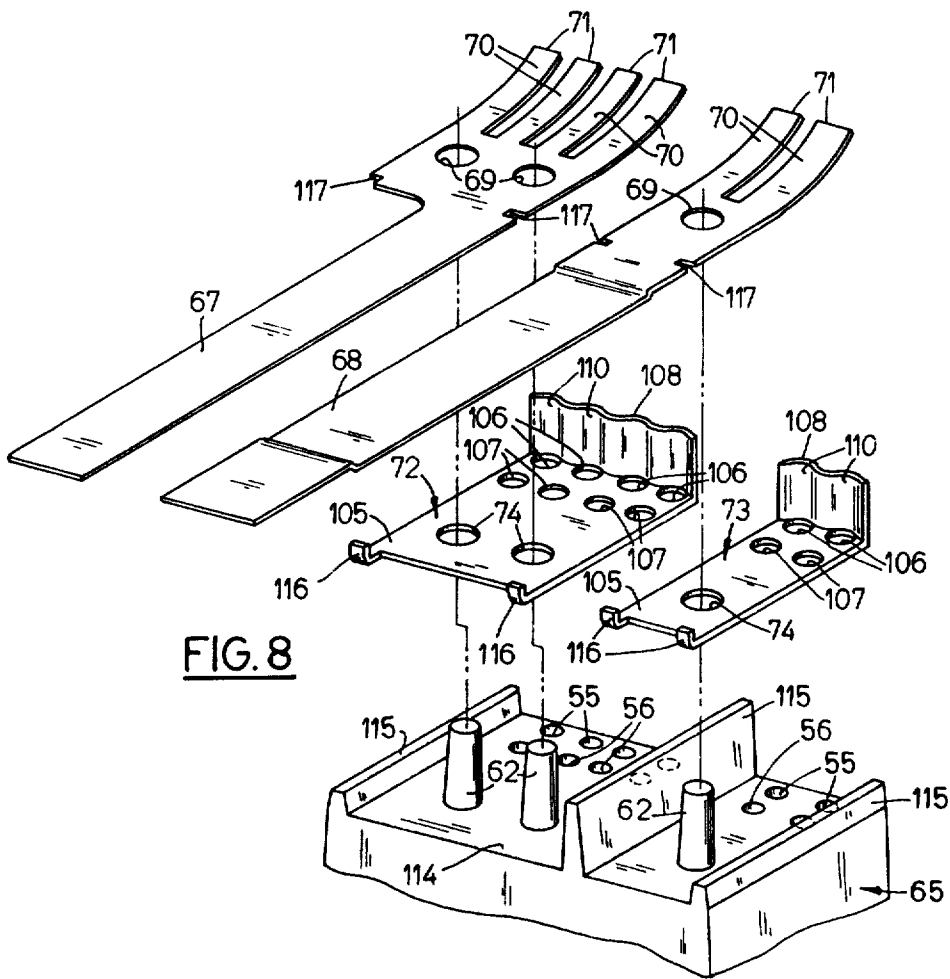


FIG. 8

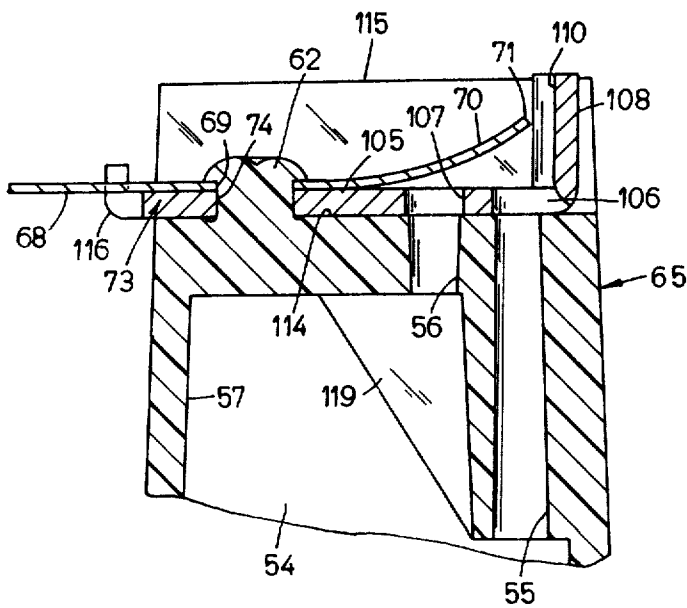
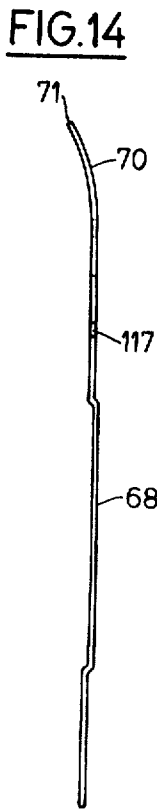
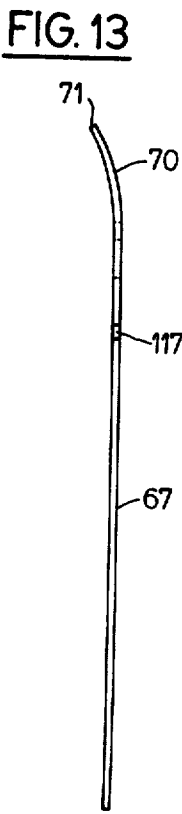
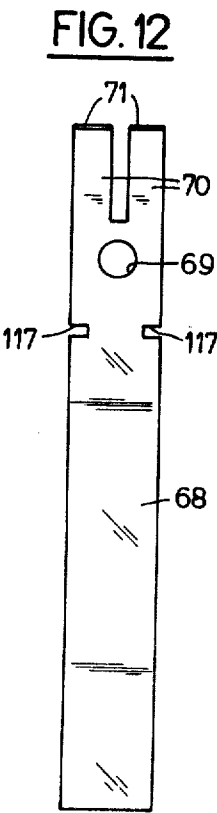
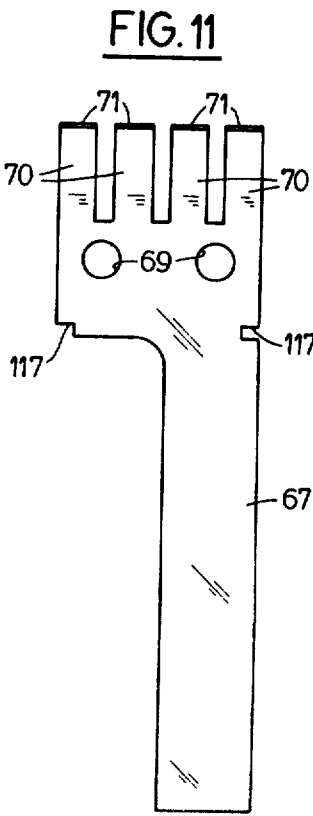
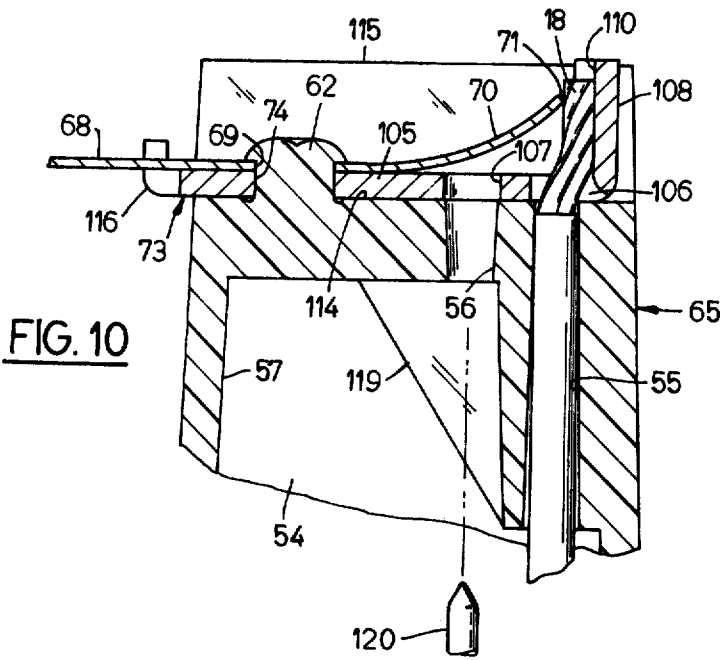


FIG. 9



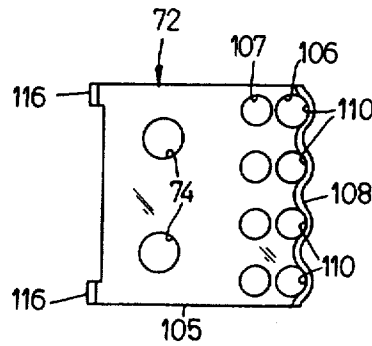


FIG. 15

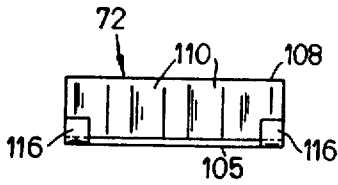


FIG. 16

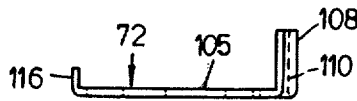


FIG. 17

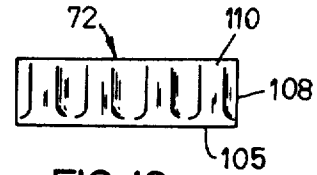


FIG. 18

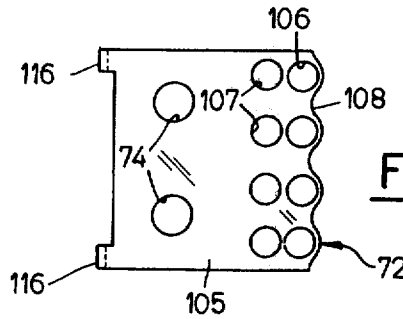


FIG. 19

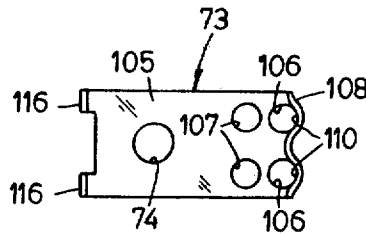


FIG. 20

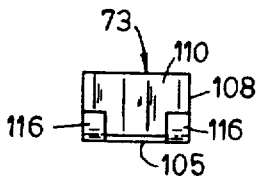


FIG. 21

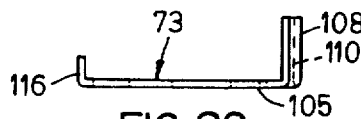


FIG. 22

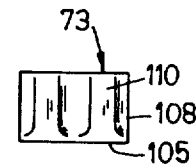


FIG. 23

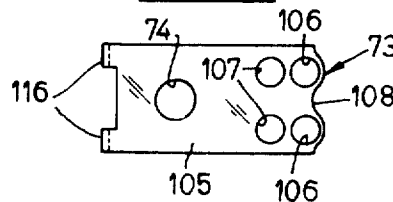


FIG. 24

WIRE CONNECTOR MEANS FOR VEHICLE LAMP

BACKGROUND OF THE INVENTION

1. Field of Use

This invention relates to wire connector means for lamps used on vehicles, such as trailers or the like.

2. Description of the Prior Art

Federal, state and local regulations and industry standards require various types of vehicles, such as trailers, to have lamps at certain locations thereon to provide prescribed lighting signals and functions. For example, certain types or sizes of trailers require lamps at or near the left and right rear corners which serve as tail lights, stop lights, turn signals and side marker lights, and it is permissible to combine the several functions in a single lamp at each rear corner. U.S. Pat. No. 3,739,168, issued June 12, 1973 to Ploeger for "Vehicle Lamp And Terminal Therefor" discloses a lamp of the latter character. The lamp disclosed in that patent comprises an insulated housing having one cavity wherein a double filament bulb is mounted and another cavity on a side thereof wherein a single filament bulb is located and suitably colored lenses are provided for each cavity. Such lamps require several electric wires from the towing vehicle to be connected thereto and it is convenient to provide press-in type wire connector means in the lamp to facilitate wire connection. The press-in type wire connector means used in some prior art lamps of this general type comprised a pair of electrically conductive terminal strips secured inside the housing which make contact with the two bottom terminals of the double filament bulb. Each terminal strip terminated in a plurality of bent, resiliently movable finger portions or locking tongues notched at their end edges, each of which was adapted to clamp the bare end of a conductor wire inserted through a wire receiving opening in the housing against a portion of the insulated side wall of the housing to make electrical contact therewith.

The type of arrangement described has several drawbacks from the standpoint of manufacture and use. For example, since each terminal strip was secured in place in the housing during manufacture as by a pressure welding process, it was possible for the sharp end of the metal locking tongue to cut into the relatively soft plastic side wall portion of the housing opposite thereto, and in some instances, either to damage the side wall or to cause the end of the tongue to be disengageable therefrom when a later attempt was made to insert a wire between the end of the locking tongue and the cooperating side wall of the housing. Furthermore, since each tongue served as the sole electrical path between the bare end of a wire and the lamp bulb or other component electrically connected to the terminal strip, any imperfect connection between the end of the locking tongue and the wire could result in a failure of some function of the lamp. An imperfect connection could result from the aforementioned damage to the side wall or could result from uneven flexing characteristics of the locking tongue or from shrinkage of the insulated housing as hereinafter described. For example, the complex configuration of a movable locking tongue wherein several bends were provided in order to position the notched edge thereof properly with respect to the cooperating insulated wall against which it entrapped the wire, tended to result in several pivot or bending points, each having different stress conditions,

and resulted in uneven entrapment forces acting on the bare end of the against. Furthermore, since the wall portion against which the locking tongues entrapped the wires was an integral part of the molded plastic housing, irregular shrinkage of the housing which commonly occurred after molding sometimes resulted in variations in the small tolerances required between the end of the locking tongues and the cooperating wall portion. As a consequence, unpredictable entrapment forces could exist when a wire was finally inserted between the locking tongue and the wall portion. Thus, any particular wire might be too loosely connected and thus be a possible source of electrical failure.

SUMMARY OF THE INVENTION

In accordance with the invention there is provided a vehicle lamp comprising an insulated housing having walls which define a cavity wherein a bulb is mounted and wire connector means are provided to enable releasable connection of external wires to the bulb and, if necessary, to each other. Such means comprise a row of wire receiving openings in a wall of the housing and a parallel adjacent row of wire releasing openings. A rigid electrically conductive L-shaped contact plate is rigidly secured within the housing and comprises a base portion having a row of wire receiving holes and a parallel adjacent row of wire releasing holes overlying and in registry with the corresponding openings in the housing. The contact plate further comprises a rigid free-standing upright portion integral with the base portion which has a row of wire guide grooves therein, each groove being aligned with an edge of an associated wire receiving hole in the base portion. An electrically conductive contact member (electrically connected to the bulb) is electrically and mechanically connected to the contact plate in locked position and has a plurality of regularly curved resilient locking tongues, one for each groove, for releasably trapping the bare ends of the external wires inserted in the grooves against the contact plate. Each locking tongue has a straight sharp terminal edge which is normally disposed against the upright portion of the locking plate on either side of its associated groove, and is displaceable by the bare end of a wire inserted through an associated wire receiving opening in the housing and through an associated wire receiving hole in the base portion of the contact plate. Each inserted wire makes electrical contact with its associated contact plate and locking tongue and, thus, two separate electrical paths are provided between each wire and the contact member. Each wire is releasable from engagement between its locking tongue and the upright portion of the locking plate by means of a releasing tool, such as a stiff wire rod, which is insertable through the appropriate wire releasing opening in the housing wall and the corresponding wire releasing hole in the contact plate to bend the locking tongue out of biasing engagement with its associated wire, which is then withdrawn.

A vehicle lamp having wire connector means in accordance with the invention has several advantages over prior art arrangements. For example, as hereinbefore mentioned, two separate electrical paths are provided for each wire and the possibility of a poor electrical connection for each wire is substantially reduced. Furthermore, the contact member is mechanically locked in a predetermined position on the contact plate, thereby assuring that the straight sharp terminal

edge of each locking tongue assumes a predetermined position with respect to its associated groove. In addition, since each bare wire end is trapped within a groove in the locking plate and is held therein by the biasing action of the resilient locking tongue, the bare wire end cannot be displaced laterally from beneath the end of the locking tongue. Also, since each locking tongue terminates in a sharp straight edge, excellent electrical contact is assured between the locking tongue and the bare wire associated therewith. The regular curve of the resilient locking tongue also assures that constant predetermined biasing forces are exerted by the locking tongue against the associated bare wire and the accurate predetermined placement of the contact member on the locking plate further ensures that these forces are predictable and constant for each locking tongue. Since the contact member is mechanically locked in a predetermined position with respect to the contact plate, there is no danger that variations will occur between the end edge of the locking tongue and the upright portion of the contact plate, as can occur in cases where the end of the locking tongue must cooperate with a potentially shrinkable plastic backup wall. Other objects and advantages of the invention will hereinafter appear.

DRAWINGS

FIG. 1 is a perspective view of the left rear side of a vehicle lamp embodying the invention.

FIG. 2 is a perspective view of the right front side of the lamp shown in FIG. 1.

FIG. 3 is a rear end view of the lamp shown in FIGS. 1 and 2 with the end lens removed.

FIG. 4 is a side view of the lamp shown in FIGS. 1, 2 and 3 with the side lens in place.

FIG. 5 is a view similar to FIG. 3 but with all internal components removed from within the housing.

FIG. 6 is a cross-section view taken on line 6—6 of FIG. 5.

FIG. 6A is a view into a wire receiving recess formed in the exterior of the rear wall of the lamp housing and taken on line 6A—6A of FIG. 6.

FIG. 7 is an exploded isometric view showing the arrangement and relationship of some of the internal components of the lamp.

FIG. 8 is an enlarged exploded isometric view of certain of the components shown in FIG. 7.

FIG. 9 is an enlarged cross section view of wire connector means in accordance with the invention taken on line 9—9 of FIG. 3.

FIG. 10 is a view similar to FIG. 9, but showing a conductor wire associated therewith.

FIGS. 11 and 12 are top plan views of bulb contact members shown at FIG. 8.

FIGS. 13 and 14 are side elevation views of the contact members shown in FIGS. 11 and 12, respectively.

FIG. 15 is a top plan view of a contact plate shown in perspective in FIGS. 7 and 8.

FIGS. 16, 17, 18 and 19 are views of the rear, side, front and bottom of the contact plate shown in FIG. 15.

FIG. 20 is a top plan view of another type of contact plate shown in perspective in FIGS. 7 and 8.

FIGS. 21, 22, 23 and 24 are views of the rear, side, front and bottom of the contact plate shown in FIG. 20.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to the drawings, the numeral 12 designates a vehicle lamp having wire connector means in accordance with the invention. In the embodiment shown, lamp 12 takes the form of a combined tail light, stop light, turn signal indicator light, side marker light and license plate illumination light for disposition at or near the left rear corner of a vehicle, such as a trailer, which is adapted to be towed by a truck or auto. A wiring harness 14 (understood to be connected to the towing vehicle) is provided for connection to lamp 12 and, for example, comprises a tail light feed lead 16 and a stop and blink lead 18.

Lamp 12 comprises a one piece molded plastic insulating housing 25, a molded plastic main lens 26, a molded plastic side lens 27, and suitable fasteners such as screws 28 for securing the lenses to the housing. Housing 25 comprises an end or front wall 30, a top wall 31, a bottom wall 32, a left side wall 33, and a right side wall 34 and these walls cooperate define a cavity 35 within the housing 25 in which a double filament bayonet-type bulb 51 is mounted. Left wall 33 is provided on its exterior side with four smaller side walls 40, 41, 42, and 43 which cooperate to define a cavity 45 on the exterior of the housing 25 in which a single filament bayonet-type bulb 52 is mounted. The side walls 33 and 34 and the bottom wall 32 of housing 25 have a cut-out or opening 47 in which a translucent or transparent, uncolored lens 48 is disposed for emitting light onto a license plate (not shown) which can be secured to a license plate bracket or holder 50. The double filament bulb 51 serves as a tail light, stop light, turn signal and license plate illuminator. The single filament bulb 52 serves as a side marker light.

Wire connector means are provided to enable releasable connection of external wires such as 16 and 18 to energize the bulbs 51 and 52. Thus, the exterior surface of the end wall 30 is provided with a recess 54, defined by an integrally formed raised portion or projection 65 on the interior of end wall 30 of housing 25, and a plurality of wire receiving openings 55 and a plurality of wire releasing openings 56 which are located in the recess and extend entirely through a flat end wall 114 of projection 65 into communication with cavity 35, as hereinafter described in detail. The conductors 16 and 18 in the wire harness 14 are insertable through the openings 55, as hereinafter described. The recess 54 is enlarged or deepened as at 57 to allow space for some slack of the harness wires 16 and 18 at their connection point on housing 25. Transversely disposed grooves 58 and 59 are provided on the exterior surface of end wall 30 and each is in communication with recess 54 and an edge of the end wall. The grooves 58 and 59 provide a space or passage for the harness wires when lamp 12 is secured in place either directly against a surface of a trailer or directly against the license plate holder 50, if the latter is used. License plate holder 50 has a flat upper portion having two holes 60 therein which is adapted to be secured between end wall 30 and a surface of the trailer on which lamp 12 is mounted.

The interior of end wall 30 of housing 25 is provided with the integrally formed raised portion or projection 65, hereinbefore described, which is reinforced by integrally formed ribs 119 in cavity 54, and with another projection 66. These projections 65 and 66 support bulb contact members 67 and 68, as hereinafter de-

scribed, and projection 65 also supports contact plates 72 and 73, hereinafter described. Projection 65, which as FIG. 6 shows is spaced from wall 31 of housing 25, is provided with integrally formed fastening pins or lugs 62 which are deformed as by ultra-sonic welding, pressure welding or other suitable means, as shown in FIGS. 3 and 10, to secure the first and second electrically conductive bulb contact members 67 and 68 and their associated contact plates 72 and 73, respectively in place thereon. The contact members 67 and 68 and the contact plates 72 and 73 are provided with holes 69 and 74, respectively, for receiving the lugs 62. As FIG. 8 shows, end wall 114 is substantially flat so as to provide a firm supporting surface for the bottom of the contact plates 72 and 73 and is also provided with three integrally formed upstanding dividing walls 115 between pairs of which the contact plates 72 and 73 are trapped against rotation. Centrally located dividing wall 115 serves to electrically insulate the contact members 67 and 68 and their associated contact plates from each other.

As FIGS. 7, 8, 9 and 10 show, end wall 114 of projection 65 is provided with a row of wire receiving openings 55 and a parallel adjacent row of wire releasing openings 56. The rigid electrically conductive L-shaped contact plates 72 and 73 are rigidly secured on the flat upper surface of end wall 114 and each plate 72 and 73 comprises a base portion 105 having a row of wire receiving holes 106 and a parallel adjacent row of wire releasing holes 107 overlying and in registry with the corresponding openings 55 and 56, respectively, in wall 114. As FIGS. 16 through 24 show, each contact plate 72 and 73 further comprises a rigid free-standing upright portion 108 integral with and at a right angle to the base portion 105. Portion 108 has a row of wire guide grooves 110 therein and each groove 110 is aligned with an edge of an associated wire receiving hole 106 in the base portion 105. The electrically conductive contact members 67 and 68 (electrically connected to bulb 51) are electrically and mechanically connected to the contact plates 72 and 73, respectively, and to wall 114, by deformation of the lugs 62, as hereinbefore described. Each contact member and its associated contact plate are locked against relative rotation with respect to each other by locking means which take the form of tabs 116 on the corners of the contact plates which engage notches 117 in the edges of the contact members.

The bulb contact members 67 and 68 shown in detail in FIGS. 11 through 14, are preferably formed of electrically conductive, resilient bronze strips which are formed by punching from sheet metal. Contact member 68 is provided with two regularly curved resilient locking tongues 70 and contact member 67 is provided with four regularly curved resilient locking tongues 70. One locking tongue 70 is provided for each groove 110 for releasably trapping the bare end of a wire 18 inserted in a groove 110 against the contact plate 72 or 73, as FIG. 10 shows. Each locking tongue 70 has a straight sharp end edge 71 which is normally disposed against the upright portion of the contact plate on either side of its associated groove, as shown in FIG. 9, and is displaceable, as shown in FIG. 10, by the bare end of a wire, such as wire 18, inserted through an associated wire receiving opening 55 in the housing and through an associated wire receiving hole 106 in the base portion 105 of the contact plate 72 or 73. Each in-

serted wire 18 makes electrical contact directly with its associated contact plate 72 or 73 and directly with its associated locking tongue 70 and thus, two separate electrical paths are provided between each wire 18 and the contact member it is part of. As FIG. 10 shows, each hole 55 is tapered inwardly so that when a wire 18 is inserted therethrough, the insulation on the wire becomes wedged in the hole to reduce the possibility of water droplets from running along the wire and entering through a hole 55.

Each wire 18 is releasable from engagement between its locking tongue 70 and the upright portion 108 of the locking plate 72 or 73 by means of a releasing tool, such as a stiff wire rod, pin or awl 120 shown in FIG. 10, which is insertable through the appropriate wire releasing opening 56 in projection 65 and the corresponding wire releasing hole 107 in the contact plate 72 or 73 to bend the locking tongue 70 out of biasing or wedging engagement with its associated wire 18, which is then withdrawn. In the embodiment shown in FIG. 7, one locking tongue 70 on contact 68 and one locking tongue 70 on contact 67 are used. The others serve as auxiliary terminals available for use with other types of harnesses, wiring schemes or other signaling devices not disclosed in connection with the present invention.

The remote ends of the bulb contact members 67 and 68 are supported on the second projection 66 formed in cavity 35 in housing 25. The central portions of the bulb contact members 67 and 68 are, therefore, spaced from the interior surface of end wall 30 and are resiliently movable toward the end wall to allow for insertion of the double filament bulb 51. This resiliency ensures good electrical contact between the bulb terminals and also assists in maintaining the mechanical connection of the bulb.

Double filament bulb 51 is mounted in cavity 35 in housing 25 by means of a U-shaped, bayonet-type bulb socket strap 75 which is mounted within the cavity 35 by means of two bolts 76. Strap 75 is polarized by two lugs 77 integrally formed thereon adjacent its bulb accommodating hole 78 to receive bulb 51 only one way in a predetermined position. Therefore, means must be provided to ensure that strap 75 is mounted only one way in a predetermined position with respect to the contact members 67 and 68. Such means, for example, take the form of two holes 80 formed in flange 81 of leg 82 of strap 75 and two larger holes 83 formed in the other flange 84 of leg 85 of strap 75. One of each of the holes 80 and 83 are adapted to engage appropriately sized pins 86 or 87, respectively, which are integrally formed on the inner side of end wall 30. It is to be noted that sets of holes 80 and 83 are provided so that strap 75 is adaptable for use in a left hand lamp, such as 12, or a right hand lamp, because in such units the contact members 67 and 68 are reversely disposed. The flanges 81 and 84 of strap 75 are provided with bolt receiving openings 89. Proper location and orientation of the bulb socket strap 75 (and thus double filament bulb 51) is necessary to ensure that the bulb filament is located at the focal point of the lens.

The bolts 76 are of the press-in type and are adapted for insertion through the bolt holes 89 in the flanges of strap 75 and through two bolt holes 90 formed in end wall 30 of housing 25 to secure the bulb socket strap 75 to the housing and also to hold a ground strap 91 in proper position. Press-on washers 79 are provided on

the bolts 76 to prevent them from working loose from the holes 90. Ground strap 91, as FIG. 7 shows, has a bolt receiving hole 92 therein and also has hole 93 therein which is adapted to receive pin 87 hereinbefore described, which prevents its rotation or displacement. The bolts 76 are grounded when attached to the frame of a trailer and also secure lighting unit 12 to the trailer frame or to some appropriate conductive surface thereof. Ground strap 91 extends through a ground strap receiving hole or slot 95 formed in side wall 33 of housing 25 and serves as the base connector for the single filament bulb 52 which is held in position in its cavity 45 by an electrically conductive connector strap 86.

The aforesaid second projecting means 66 on end wall 30 has a stud hole 97 therein transverse to end wall 30 which is disposed beneath the resilient contact member 67. This stud hole 97 has a wire-accommodating slot 98 in the side thereof. A flexible wire 100 is provided for electrically connecting contact member 67 to connector strap 96. A contact stud 101 is secured to one end of the wire 100 and has its shank disposed in the aforesaid stud hole 97. The other end of the wire 100 extends through a wire receiving hole 103 in side wall 33 and into engagement with connector strap 96 for the side marker light. The width of slot 98 communicating with stud hole 97 is narrower than the diameter of the stud hole 97. Therefore, wire 100 is able to extend outwardly through slot 98 but stud 101 is unable to slip through the slot during assembly or during use.

It is apparent from the foregoing description that a vehicle lamp 12 having wire connector means in accordance with the invention has several advantages over prior art arrangements. For example, as hereinbefore mentioned, two separate electrical paths are provided for each wire 18 (through tongue 70 and a contact plate 72 or 73) and the possibility of a poor electrical connection for each wire is substantially reduced. Furthermore, each contact member 67 or 68 is mechanically locked in a predetermined position on its associated contact plate 72 or 73, respectively, by the tabs 116 and notches 117, thereby assuring that the straight sharp terminal edge 71 of each locking tongue 70 assumes a predetermined position with respect to its associated locking plate groove 110. In addition, since the end of each bare wire is trapped within a groove 110 in a locking plate 72 or 73 and is held therein by the biasing action of the resilient locking tongue 70, the bare wire end cannot be displaced laterally from beneath the edge of the locking tongue. Also, since each locking tongue 70 terminates in a sharp straight edge 71, excellent electrical contact is assured between the locking tongue and the bare wire 18 associated therewith. The regular non-compounded curve of the resilient locking tongue 70 also assures that constant predetermined biasing forces are exerted by the locking tongue against the associated bare wire 18 and the accurate predetermined placement of the contact member 67 or 68 on its associated locking plate 72 or 73 further ensures that these forces are predictable and constant for each locking tongue. Since the contact member 67 or 68 is mechanically locked in a predetermined position with respect to its associated contact plate, there is no danger that variations in spacing will occur between the end edge 71 of the locking tongue 70 and the upright portion 108 of an associated contact plate 72 or 73, as can occur in cases where the end of the locking tongue

must cooperate with a potentially shrinkable plastic backup wall.

We claim:

1. As a wire connection means in a vehicle lamp: an insulated housing having walls defining a cavity, at least one of said walls having a wire receiving opening extending therethrough; an electrically conductive contact plate rigidly mounted within said cavity and comprising a base portion and a free-standing portion extending transversely from said base portion in a direction away from said one wall; said base portion being provided with a wire receiving hole in registry with said wire receiving opening and said free-standing portion being provided with a wire receiving groove in alignment with said wire receiving hole in said base portion; an electrically conductive contact member electrically connected to said base portion of said contact plate and having a curved resilient locking tongue extending from said base portion toward said free-standing portion; and means for mechanically securing said contact plate and said contact member to each other and to said housing; said locking tongue terminating in an edge, said locking tongue being resiliently movable to accommodate insertion of a wire through said wire receiving opening and said wire receiving hole and along said groove between said locking tongue and said upright portion and to entrap said wire between said edge and said free-standing portion of said contact plate.

2. A wire connection means according to claim 1 including a wire releasing opening adjacent said wire receiving opening and extending through said one wall, and a wire releasing hole adjacent said wire receiving hole and extending through said base portion, said wire releasing opening and said wire releasing hole being in registry with each other.

3. A wire connection means according to claim 1 including a row of said wire receiving openings, a row of said wire receiving holes, and a plurality of locking tongues on said electrically conductive contact member.

4. A wire connection means according to claim 2 including a row of wire receiving openings, a row of said wire receiving holes, a row of wire releasing openings, a row of wire releasing holes, and a plurality of locking tongues on said electrically conductive contact member.

5. A wire connection means according to claim 1 including a deformable lug integrally formed on said one wall; a lug receiving opening in said base portion of said contact plate, and a lug receiving opening in said contact member, said lug extending through both of said lug receiving openings and being deformed to secure said contact plate and said contact member to each other and to said one wall.

6. A wire connection means according to claim 5 including locking notches formed in the side of said contact member and engaged with tabs formed at the rear edge of said contact plate.

7. As a wire connection means in a vehicle lamp: an insulated housing having walls defining a cavity, at least one of said walls having a first projection integrally formed therein and extending into said cavity; a wire receiving opening extending through said first projection; an electrically conductive contact plate rigidly mounted within said cavity on said first projection and comprising a base portion and a free-standing portion

extending transversely from said base portion in a direction away from said projection; said base portion being provided with a wire receiving hole in registry with said wire receiving opening and said free-standing portion being provided with a wire receiving groove in alignment with said wire receiving hole in said base portion; a second projection in said cavity; and an electrically conductive bulb contact member extending between said first and second projections, said bulb contact member being electrically and mechanically connected to said base portion of said contact plate and having a curved resilient locking tongue extending from said base portion toward said free-standing portion, said locking tongue terminating in an edge, said locking tongue being resiliently movable to accommodate insertion of a wire through said wire receiving opening and said wire receiving hole and along said groove between said locking tongue and said upright portion and to entrap said wire between said edge and said free-standing portion of said contact plate.

8. A wire connection means according to claim 7 including a wire releasing opening adjacent said wire receiving opening and extending through said first projection, and a wire releasing hole adjacent said wire receiving hole and extending through said base portion, said wire releasing opening and said wire releasing hole being in registry with each other.

9. A wire connection means according to claim 7 including a row of said wire receiving openings, a row of said wire receiving holes, and a plurality of locking tongues on said electrically conductive contact member.

10. A wire connection means according to claim 8 including a row of wire receiving openings, a row of said wire receiving holes, a row of wire releasing openings, a row of wire releasing holes, and a plurality of locking tongues on said electrically conductive contact member.

11. A wire connection means according to claim 7 including a deformable lug integrally formed on said first projection; a lug receiving opening in said base portion of said contact plate, and a lug receiving opening in said contact member, said lug extending through both of said lug receiving openings and being deformed to secure said contact plate and said contact member to each other and to said first projection.

12. A wire connection means according to claim 11 including locking notches formed in the side edges of said bulb contact member and engaged with tabs formed at the rear edge of said contact plate.

13. In a lighting unit for attachment to a vehicle: an insulated housing comprising an end wall and a side wall defining a cavity, said end wall having first and second projecting means on the inside thereof and having at least one bolt hole therethrough, said side wall having a ground strap receiving hole therethrough and also having a wire receiving hole therethrough; a row of wire receiving openings and an adjacent row of wire releasing openings extending through said first projecting means; a pair of electrically conductive contact plates rigidly mounted within said cavity on said first projecting means and each comprising a base portion and a free-standing portion extending transversely from said base portion in a direction away from said first projecting means; each of said base portions being provided with a row of wire receiving holes and an adjacent row of wire releasing holes in registry with said wire receiv-

ing openings and said wire releasing openings in said first projecting means, respectively; each of said free-standing portions being provided with a row of wire receiving grooves and each groove being in alignment with one wire receiving hole in said base portion; first and second electrically conductive resilient bulb contact members, each bulb contact member extending between said first and second projecting means, each of said bulb contact members being electrically and mechanically connected to said base portion of one of said contact plates and having a row of curved resilient locking tongues extending from said base portion of said one contact plate toward said free-standing portion of said one contact plate, each of said locking tongues being resiliently movable to accommodate insertion of a wire through an associated one of said wire receiving openings and an associated one of said wire receiving holes and along an associated one of said grooves between the locking tongue and said upright portion; a U-shaped bayonet-type bulb socket strap having at least one flange on a leg thereof, said strap being polarized to receive a bayonet-type double filament bulb in a predetermined position, one of said flanges having a bolt-receiving opening therethrough; a press-in type bolt for insertion through said bolt hole in said flange and said bolt hole in said end wall to secure the bulb socket strap to said housing, a ground strap secured to said bolt and extending through said ground strap hole in said side wall, each of said flanges of said bulb socket strap having an orientation hole therein, one of said orientation holes being larger than the other, orientation pins on said end wall to cooperatively engage said orientation holes, one of said orientation pins being larger than the other, said second projecting means on said end wall having a stud hole therein transverse to said end wall and disposed beneath one of said contact members, said stud hole having a wire-accommodating slot in a side thereof, a bayonet-type bulb connector strap secured to said housing on the exterior of said side wall, a flexible wire for electrically connecting one of said bulb contact members to said connector strap, and a contact stud secured to one end of said wire and disposed in said hole in said second projecting means on said end wall, the other end of said wire extending through said wire receiving hole in said side wall into engagement with said connector strap.

14. A wire connection means according to claim 13 including a pair of deformable lugs integrally formed on said first projection; a lug receiving opening in said base portion of each of said contact plates, and a lug receiving opening in each of said contact members, each of said lugs extending through said lug receiving openings in its associated contact plate and contact member and being deformed to secure its associated contact plate and contact member to each other and to said first projection.

15. A wire connection means according to claim 14 including locking notches formed in the side edges of each of said contact members and engaged with tabs formed at the rear edge of its associated contact plate.

16. As a wire connection means in a vehicle lamp: an insulated housing having walls defining a cavity, at least one of said walls having a wire receiving opening extending therethrough; an electrically conductive contact plate rigidly mounted within said cavity and comprising a base portion and a free-standing portion

extending transversely from said base portion in a direction away from said one wall; said base portion being provided with a wire receiving hole in registry with said wire receiving opening and said free-standing portion being provided with a wire receiving groove in alignment with said wire receiving hole in said base portion, said base portion being further provided with a lug receiving opening; and electrically conductive contact member having a lug receiving opening therein; a deformable lug integrally formed on said one wall and extending through both said lug receiving openings and deformable for electrically and mechanically connecting said contact member to said base portion of said contact plate and for securing said contact plate and said contact member to said wall; said contact member having a curved resilient locking tongue extending from said base portion toward said free-standing portion, said locking tongue terminating in an edge, said locking tongue being resiliently movable to accommodate insertion of a wire through said wire receiving opening and said wire receiving hole and along said groove between said locking tongue and said upright portion and to entrap said wire between said edge and said free-standing portion of said contact

plate.

17. A wire connection means according to claim 16 including a wire releasing opening adjacent said wire receiving opening and extending through said one wall, and a wire releasing hole adjacent said wire receiving hole and extending through said base portion, said wire releasing opening and said wire releasing hole being in registry with each other.

18. A wire connection means according to claim 16 including a row of said wire receiving openings; a row of said wire receiving holes, and a plurality of locking tongues on said electrically conductive contact member.

19. A wire connection means according to claim 17 including a row of wire receiving openings, a row of said wire receiving holes, a row of wire releasing openings, a row of wire releasing holes, and a plurality of locking tongues on said electrically conductive contact member.

20. A wire connection means according to claim 16 including locking notches formed in the side edges of said contact member and engaged with tabs formed at the rear edge of said contact plate.

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