March 8, 1955 H. C. DOANE 2,703,872

ELECTRICAL CONNECTOR

Filed May 15, 1952

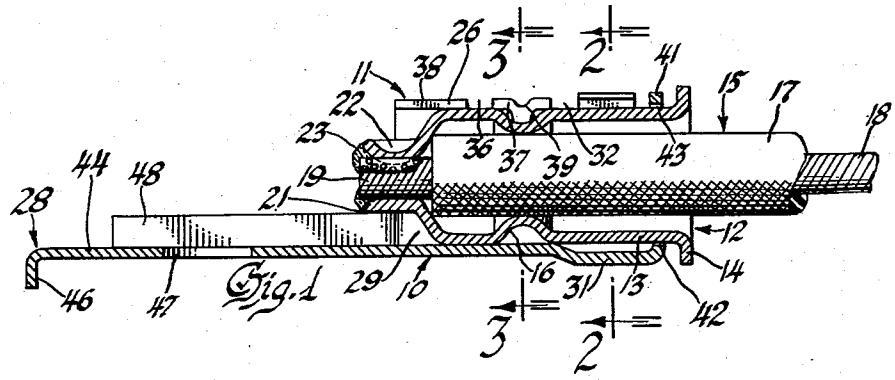


Fig. 1

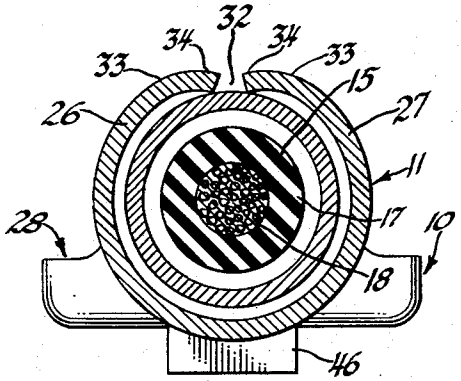


Fig. 2

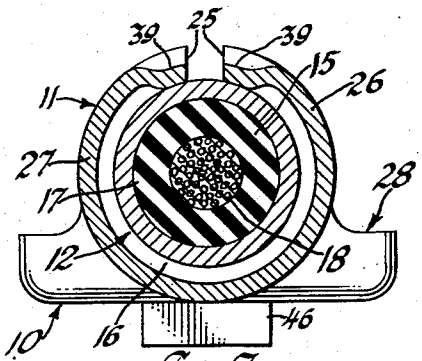


Fig. 3

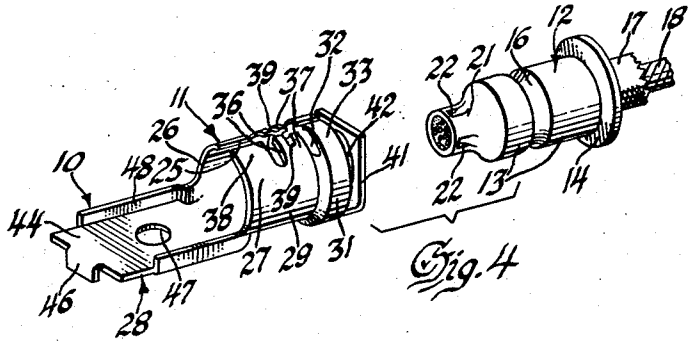


Fig. 4

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ELECTRICAL CONNECTOR

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2 Claims. (Cl. 339—258)

This invention relates to electrical connectors for use with wiring harness employed in the electrical systems of automotive vehicles and for other purposes.

An object of the invention is to provide an electrical connector including a resilient receptacle capable of expanding to receive an electrically conductive plug but provided with means for limiting the expansion thereof to prevent injury to the receptacle when the insulated conductor associated with the plug is jerked or pulled laterally with a greater than normal force.

In the drawing:

Figure 1 is a longitudinal sectional view of an electrical connector embracing the principles of the invention.

Figure 2 is a transverse sectional view illustrating the connector shown by Figure 1 in the plane of line 2—2 on Figure 1.

Figure 3 is a transverse sectional view illustrating the connector shown by Figure 1 in the plane of line 3—3 on Figure 1.

Figure 4 is an exploded view of the electrical connector illustrated by the preceding figures and showing the receptacle and plug in disassembled relation.

In the drawing the electrical connector **10** comprises a resilient electrically conductive receptacle **11** and an electrically conductive plug **12**. The plug **12** comprises a cylindrical or tubular part **13** having an outwardly flanged end **14** and being annularly contracted intermediate the ends as is indicated at **16**. The inner surface of the annularly contracted part **16** is adapted to receive and to support the exterior surface of a wire **15** formed by an insulated sheath **17** surrounding an electrical conductor **18**. The end of the conductor **18** projects beyond the sheath **17** as is indicated at **19** and there is secured within the contracted end **21** of the plug **12** by radially inwardly extending indentations indicated at **22**. The conductor end **19** also is secured within the reduced or contracted end **21** by the application of solder indicated at **23**.

The receptacle **11** is formed by laterally and inwardly bending the opposite edges **26** and **27** of a resilient electrically conductive strip indicated at **28** The laterally bent ends **26** and **27** are formed in such a way as to provide a cylindrical part **29** of approximately the same diameter as the cylindrical part **13** of the plug **12** and a cylindrical part **31** adjacent the end of the receptacle **11** and somewhat larger than the cylindrical part **29**. The enlarged cylindrical part **31** provides an expanded entrance to the cylindrical part **29**. The ends **26** and **27** are spaced as is indicated at **25** and are formed in such a way as to provide oppositely disposed slots **32** extending inwardly from the edges between the cylindrical parts **29** and **31**. The slots **32** form oppositely disposed fingers **33** having depressed ends **34** adapted to project inwardly in such manner as to be engaged and to be expanded outwardly by the cylindrical part **13** of the plug **12** when the plug **12** is inserted in the receptacle **11**. The cylindrical part **29** also has oppositely disposed slots **36** formed in the edges **26** and **27** intermediate the opposite ends of the cylindrical part **29**. The slots **36** form oppositely disposed pairs of intermediate fingers **37** and end fingers **38**. The intermediate fingers **37** are formed at the ends to provide detents **39** which project inwardly thereof in such a manner as to extend within the annular depression **16** which is formed within the plug **12**.

The detents **39** when extending within the annular depression **16**, resiliently retain the plug **12** within the receptacle **11** for all normal operational purposes. However, when it is desired to remove the plug **12** from the

rectpacle **11** to break the electrical connection provided by the connector **10**, then it is only necessary to pull outwardly on the insulated wire **15** until the fingers **37** expand sufficiently to allow the detents **39** to become disengaged from the annular depression or slot **16**. It will be apparent from Figure 2 that the inwardly depressed ends **34** of the fingers **33** will tend resiliently to retain the plug **12** in normally operative position within the receptacle **11**. However, the wire **15** may sometimes be pulled laterally with a force that might be great enough to bend the fingers **33** or to distort the entire receptacle **11**. In order to insure against injury of this kind the strip **28** is provided with a laterally bent end indicated at **41**. The laterally bent end **41** is disposed in spaced relation to the outer end of the receptacle **11** and is provided with an opening **42** which is of a size somewhat smaller than the cross-sectional area of the cylindrical part **31** of the receptacle **11** but somewhat larger than the cross-sectional area of the cylindrical part **29** of the receptacle **11**. The opening **42** therefore will receive the plug **12** in such a way as to provide an annular clearance indicated at **43** extending entirely around the plug and within the opening **42**. It will be apparent that the opening **42** now will limit the movement of the plug **12** to the extent of the clearance **43** so that it will be impossible to injure the receptacle by pulling the wire **15** laterally until the fingers and strip ends forming the receptacle **11** are bent out of shape.

The strip **28** also is formed in such a way as to provide a relatively flat securing part **44** having a laterally bent locating tongue **46** formed at one end thereof. An opening **47** also is formed in the securing part **44** for receiving a screw or other securing means by which the receptacle may be secured to a terminal block having a slot for receiving the locating tongue **46**. The part **44** also has laterally bent stiffening edges or flanges **48** along the opposite sides thereof and extending to the laterally bent ends **26** and **27** for the purpose for reinforcing the receptacle **11** so that the securing part **44** will not be bent when the wire **15** is pulled laterally.

I claim:

1. An electrical connector comprising a resilient electrically conductive strip having the opposite edges thereof bent laterally and toward one another to provide an expansible terminal receptacle, said recetacle being adapted to receive an electrically conductive terminal plug internally thereof and to electrically contact the exterior surface of said plug, said strip also having a laterally bent end extending transversely across and in axially spaced relation to said laterally bent opposite edges at the end of said receptacle, said laterally bent end being provided with an opening therein for receiving said plug and for limiting the expansion of said strip edges forming said receptacle.

2. An electrical connector comprising a resilient electrically conductive strip having the opposite edges thereof bent laterally and inwardly to provide a cylindrical opening adjacent one end of said strip, said receptacle being expanded outwardly in all directions adjacent the outer end of said cylindrical opening to provide an enlarged entrance to said receptacle, said strip ends being slotted in opposite directions adjacent said receptacle entrance to provide oppositely disposed fingers adjacent the entrance end of said receptacle, said fingers being depressed inwardly at the ends thereof to resiliently engage a cylindrical electrically conductive plug adapted to be received within and electrically contacted by the portion of said receptacle beyond said entrance end, said strip being formed to provide a laterally bent end extending transversely across and in axially spaced relation to the entrance end of said receptacle, said laterally bent end having an opening formed therein in axial alignment with the part of said receptacle beyond said entrance end.

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