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2,439,947

SOLDERLESS CONNECTOR FOR ATTACHMENT TO ELECTRICAL CONDUCTORS

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Fig. 1.

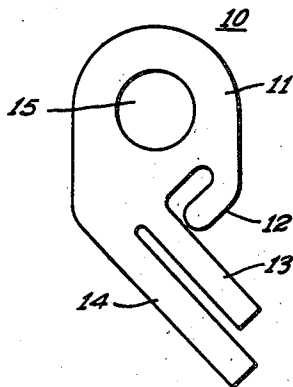


Fig. 2.

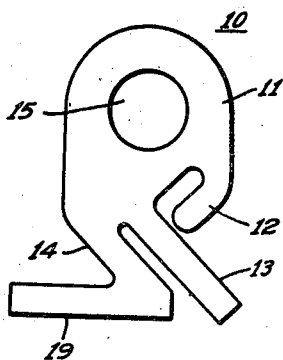


Fig. 3.

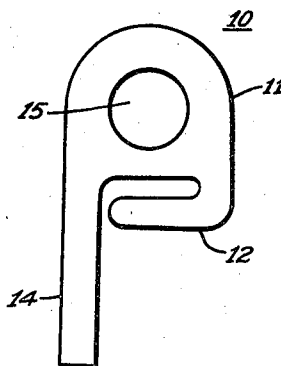


Fig. 1a.

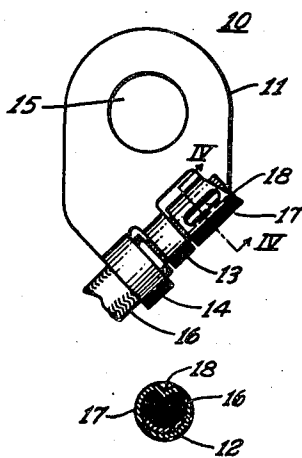


Fig. 2a.

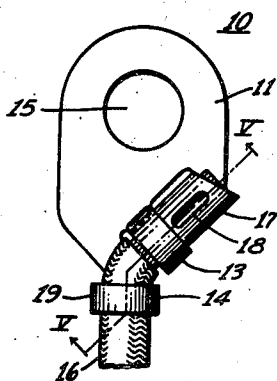


Fig. 3a.

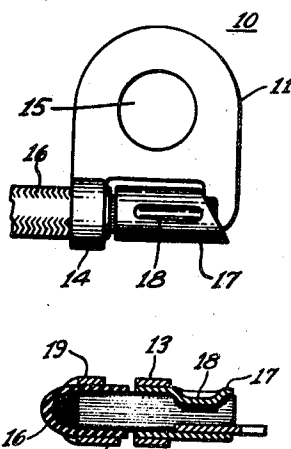


Fig. 4.

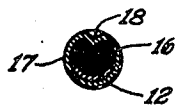


Fig. 6.

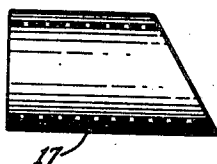
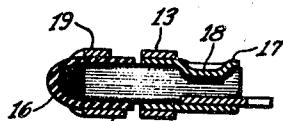


Fig. 5.



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SOLDERLESS CONNECTOR FOR ATTACHMENT TO ELECTRICAL CONDUCTORS

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5 Claims. (Cl. 173-269)

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My invention relates, generally, to connectors and, more particularly, to solderless connectors of the type described in Patent No. 2,275,163 which are suitable for removably attaching electric wires to binding posts and the like.

An object of my invention, generally stated, is to provide an improved connector of the solderless or pressure type which shall be simple and efficient in operation and which may be economically manufactured and installed.

A more specific object of my invention is to provide an improved connector of the type described in the aforesaid patent No. 2,275,163.

Another object of my invention is to decrease the distance from the center of the connecting stud to the insulation of the cable or wire, as compared with prior connectors.

A further object of my invention is to provide for gripping the insulation of the wire by means formed integrally with the connector.

Still another object of my invention is to provide a connector with which the wire may be placed either at an angle to or parallel to the longitudinal axis of the connector.

A still further object of my invention is to provide for mechanically strengthening a connector of the solderless type.

Other objects of my invention will be explained fully hereinafter or will be apparent to those skilled in the art.

In accordance with my invention, the overall length of a connector when installed is reduced by disposing the contact tongue at an angle to the longitudinal axis of the connector. The connector may be provided with an extension or finger which engages the wire or a tubular sleeve on the tongue to reinforce the tongue and another finger for gripping the insulation of the wire.

For a fuller understanding of the nature and objects of my invention, reference may be had to the following detailed description, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a view, in plan, of a connector embodying my invention;

Fig. 2 is a view, in plan, of a modified form of the connector;

Fig. 3 is a view, in plan, of another modification of the connector;

Figs. 1a, 2a and 3a are views, similar to Figs. 1, 2 and 3, respectively, showing a wire secured to the connector;

Fig. 4 is a view, in section, taken along the line IV-IV of Fig. 1a;

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Fig. 5 is a view, in section, taken along the line V-V of Fig. 2a; and

Fig. 6 is an enlarged view, in plan, of a tubular sleeve for the contact tongue of the connector.

Referring to the drawing, and particularly to Fig. 1, the connector 10 shown therein comprises an eyelet portion 11, a contact tongue 12 and a pair of fingers 13 and 14 formed integrally with the eyelet portion 11. The connector may be punched from sheet material, preferably soft copper, and, as shown most clearly in Fig. 4, the contact tongue 12 is of a trough shape.

With a view to decreasing the overall length of the connector and thereby decreasing the distance from the center of the stud, to which the eyelet 11 may be attached, to the end of the insulation on the wire, the contact tongue 12 is disposed at an angle to the longitudinal axis of the connector. Thus, as shown in Fig. 1a, the distance from the center of an opening 15 in the eyelet 11 to the insulation on a wire 16, which is secured to the connector, is relatively short, as compared with the corresponding distance in previously known connectors of the present type. Furthermore, the wire 16 may be brought into the connector at an angle, which is an advantage when the connector is utilized for connecting the wire to a terminal block of the type utilized in the construction of switchboard panels and control desks.

In order to reinforce the contact tongue 12, a finger 13 is formed integrally with the eyelet portion 11. As shown in Figs. 1 and 1a, the finger 13 is disposed perpendicularly to the longitudinal axes of the tongue 12 and the wire 16 and may be wrapped around the wire, thereby mechanically strengthening the connector and preventing breakage of the tongue from the eyelet portion 11.

With a view to further strengthening the connector and also preventing the insulation on the wire from becoming frayed after it is secured to the connector, an additional finger 14 is also integrally formed with the eyelet member 11. As shown in Fig. 1, the finger 14 is slightly longer than the finger 13 and is parallel to the finger 13. The finger 14 may be wrapped around the wire to grip the insulation in the manner shown in Fig. 1a.

A tubular or cylindrical sleeve 17, illustrated in Fig. 6, is disposed on the trough-shaped tongue 12. The sleeve 17 is preferably made from a relatively hard metal, such as hard drawn copper or bronze. In order to increase the contact area between the tongue 12, the wire 16 and the sleeve 17 without increasing the overall dimensions of

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the connector, one end of the sleeve 17 may be cut on a bias, thereby making opposite sides of the sleeve substantially the same length as corresponding sides of the tongue 12.

In order to secure the wire 16 to the connector, the insulation is first removed from the end of the wire. The wire is then inserted into the sleeve 17 on the tongue 12 with the shoulder of the insulation abutting the finger 13. The sleeve 17 is then crimped by means of a suitable tool to form a depression 18 in the sleeve 17. In this manner, the wire 16 and the sleeve 17 are securely held on the tongue 12.

The finger 13 may then be wrapped around the wire 16, thereby reinforcing the tongue 12 as well as increasing the electrical contact area of the connector. The finger 14 may then be wrapped around the insulation on the wire, thereby gripping the insulation to prevent it from becoming frayed.

In the modification of the invention illustrated in Figs. 2, 2a and 5 the finger 14 is provided with an extension 19 for engaging the insulation on the wire 16. The extension 19 may be disposed at a right angle to the longitudinal axis of the connector. In this manner, the wire 16 may be brought into the connector parallel to and substantially on the longitudinal axis of the connector, as shown in Fig. 2a.

Also, the length of the sleeve 17 may be increased sufficiently for the finger 13 to be wrapped around the sleeve instead of directly around the wire. Thus, the wrapping of the finger 13 around the sleeve 17 may be done when the connector is manufactured and prior to the installation of the wire.

In the modification shown in Figs. 3 and 3a, the tongue 12 is disposed at a right angle to the longitudinal axis of the connector. As shown in Fig. 3a, the wire 16 may be brought into the connector at a right angle to the longitudinal axis of the connector. The connector shown in Figs. 3 and 3a is commonly known as a "flag" type and may be utilized where it is desired to have the bolt or stud hole 15 alongside of the wire 16. As shown, the length of the tongue 12 and the sleeve 17 is increased and the finger 13 is omitted. The finger 14 functions to prevent breakage of the tongue and to grip the insulation on the wire.

From the foregoing description, it is apparent that I have provided an improved connector which may be utilized for attaching a wire to a terminal stud or bolt and which may be readily manufactured and easily secured to the wire. The present connector is particularly suitable for use where the space available for making a wiring connection is limited.

I do not desire to be restricted to the particular forms or arrangements of parts herein shown and described, since it is evident that they may be changed and modified without departing from the spirit and scope of my invention as defined in the appended claims.

I claim as my invention:

1. An electrical connector comprising, an eyelet portion, a contact tongue formed integrally with the eyelet portion, a sleeve disposed on the contact tongue, the longitudinal axis of said contact tongue being disposed at an angle to the longitudinal axis of the connector, and a finger formed integrally with the eyelet portion, the longitudinal axis of said finger being disposed substantially at a right angle to said contact tongue.

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2. An electrical connector comprising, an eyelet portion, a contact tongue formed integrally with the eyelet portion, a sleeve disposed on the contact tongue, the longitudinal axis of said contact tongue being disposed at an angle to the longitudinal axis of the connector, a finger formed integrally with the eyelet portion, the longitudinal axis of said finger being disposed substantially at a right angle to said contact tongue, and an additional finger formed integrally with the eyelet portion.

3. An electrical connector comprising, an eyelet portion, a contact tongue formed integrally with the eyelet portion, a sleeve disposed on the contact tongue, the longitudinal axis of said contact tongue being disposed at an angle to the longitudinal axis of the connector, a finger formed integrally with the eyelet portion, the longitudinal axis of said finger being disposed substantially at a right angle to said contact tongue, and an additional finger formed integrally with the eyelet portion, said additional finger being disposed substantially parallel to the first-named finger.

4. An electrical connector comprising, an eyelet portion, a contact tongue formed integrally with the eyelet portion, a sleeve disposed on the contact tongue, the longitudinal axis of said contact tongue being disposed at an angle to the longitudinal axis of the connector, a finger formed integrally with the eyelet portion, the longitudinal axis of said finger being disposed substantially at a right angle to said contact tongue, and an additional finger formed integrally with the eyelet portion, said additional finger having a portion disposed substantially parallel to the first-named finger and an extension disposed substantially at a right angle to the longitudinal axis of the connector.

5. An electrical connector comprising, an eyelet portion, a contact tongue formed integrally with the eyelet portion, a sleeve disposed on the contact tongue, the longitudinal axis of said contact tongue being disposed at a right angle to the longitudinal axis of the connector, and a finger formed integrally with the eyelet portion, said finger being parallel to the longitudinal axis of the connector.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
731,400	Worthington	June 16, 1903
1,067,702	Wiegand	July 15, 1913
2,239,878	Clayton	Apr. 29, 1941
2,279,915	Cram	Apr. 14, 1942
2,374,413	Carlson	Apr. 24, 1945

FOREIGN PATENTS

Number	Country	Date
516,672	France	Dec. 9, 1920