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F. H. EDWARDS
ELECTRICAL CONNECTOR

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Fig. 1

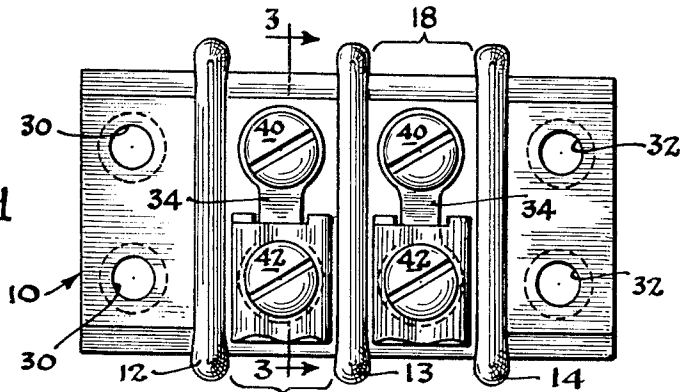


Fig. 2

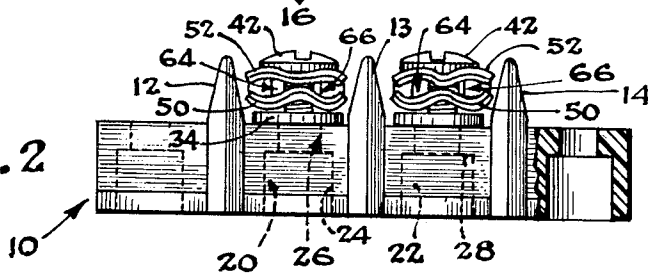


Fig. 4

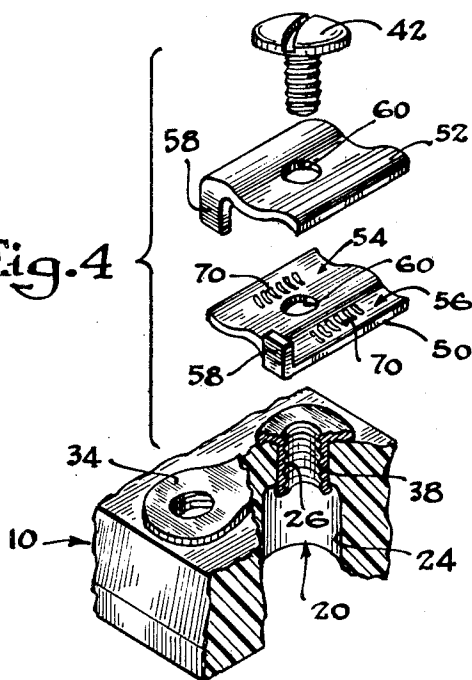
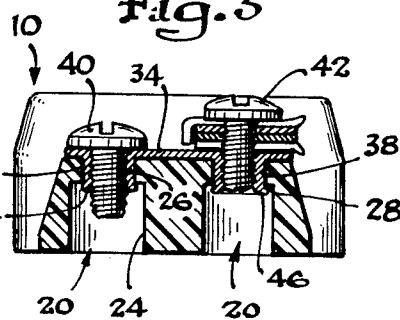


Fig. 3



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ELECTRICAL CONNECTOR

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1 Claim. (Cl. 339-198)

The present invention relates to an electrical connector and more particularly it relates to an improved electrical connector having identical clamp plates providing for quick, efficient connection of electrical conductors.

Electrical connectors of the conventional type employing a simple screw connection require bending of the conductors to be connected for the most efficient electrical connection. This is a laborious and time-consuming feature. In addition the conductor may slip from under the screw head of the terminal when the screw is being turned down to secure the conductor to the terminal. Such connectors are generally unsatisfactory although they are usually the least expensive of the many types of connectors. Another type of connector currently employed involves plastic caps having brass (or other suitable electrically conductive material) threaded inserts affixed therein in which connectors are adapted to receive electrical conductors in threaded relation. The latter type of connector, however, is relatively expensive to manufacture in that expensive screw machinery is required in the production of the threaded insert for the plastic caps. Additionally, there is the problem of assembly of the threaded insert and plastic cap and the difficulty of rigid connection therebetween. These plastic cap connectors, further, are not especially suited for mounting in multi-terminal relation on a common base. They are most conveniently utilized when free of restraint since the conductors must be twisted to thread them into the cap and form the electrical connection therebetween.

In the preferred form of the present invention a multi-terminal connector may be provided within a suitable insulating block, each of the terminals comprised of a pair of identical clamp plates, each pair of clamp plates adapted to receive one or more electrical conductors to form an electrical connection therebetween.

It is, accordingly, a general object of the present invention to provide an improved electrical connector having a pair of identical clamp plates in mating relation adapted to receive electrical conductors therebetween.

An additional object of the present invention is to provide an improved multi-terminal connector having cooperating clamp plates effective to define spaced parallel conductor-receiving openings and having protruding portions each of which is effective in relation to the other.

A further object of the present invention resides in the provision of an improved electrical connector having a pair of mating plates wherein the electrical interconnection of two separate electrical conductors is realized by insertion of the conductors between the plates of the connector and urging the plates into secure electrical contact with the conductors.

An additional object of the present invention resides in the provision of an improved electrical connector having a pair of identical plates disposed in mating relation, said plates having mating conformations adapted to cooperatively receive electrical conductors.

Still a further object of the present invention is to provide an improved electrical connector having an insulating base and a pair of mating identical clamp plates, is economical to manufacture and that allows efficient and rapid connection of electrical conductors thereto.

An additional object of the present invention resides in the provision of an improved electrical connector wherein

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an efficient electrical connection may be realized without the use of solder, tape or special tools.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claim. My invention itself, however, together with further objects and advantages thereof, will best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a top plan view of a connector employing the terminals of the present invention;

FIGURE 2 is an elevation of the connector of FIGURE 1, partly in section;

FIGURE 3 is a side view, partly in section, taken along lines 3-3 of FIGURE 1; and

FIGURE 4 is an exploded view of one terminal of the connector.

Referring more particularly now to FIGURES 1 and 2 of the drawings, there is shown an insulating base of phenolic resin or the like, indicated generally at 10. A plurality of upstanding, spaced insulating barriers 12, 13 and 14 are integrally formed with the base 10. The spaced insulating barriers 12, 13 and 14 are beneficial for several reasons including the provision of a greater insulated resistance path between the terminals located therebetween, and the provision of means to contain loose wires within the terminal area defined by the spaced barriers and to prevent said loose wires from inadvertently falling upon the adjacent terminal post and causing a direct short between adjacent terminals.

The spaces between said barriers, as noted above, generally define terminal receiving areas, indicated generally by the reference numerals 16 and 18. Each of the terminal areas is provided with a pair of spaced openings 20 and 22, respectively. Each of the openings within the terminal spaces is comprised of a large diameter opening 24 and a smaller diameter opening 26 with the interface between the adjoining large and small openings defining a shoulder 28.

A pair of spaced openings 30 and 32 are preferably provided adjacent the ends of the insulating block to conveniently provide a means for fastening the insulating block, and the terminals associated therewith, to a suitable terminal board.

An electrically conductive member 34 is provided in each of the terminal spaces 16 and 18. The member 34 establishes an electrically conductive path between each of the spaced pairs of openings 20 and 22. The member 34 is provided with depending portions 36 and 38 in mating spaced relation with the openings 20 and 22 in the terminal receiving spaces 16 and 18, respectively. Each of the depending portions 36 and 38 is internally threaded and adapted to threadedly receive threaded terminal posts 40 and 42, respectively.

As shown more clearly in FIGURE 3 of the drawings, the depending portions 36 and 38 of the member 34 are nonremovably affixed within the openings 20 by the flaring portions 44 and 46, respectively, of the portions. On assembly the member 34 is placed on the terminal receiving area 16 with the depending portions 36 and 38 extending into the openings 20 of the insulating block 10. A suitable flaring tool is then inserted into the openings 20 from the bottom portion of the insulating block 10 through the large diameter openings 24 and urged into flaring contact with the bottom periphery of the depending portions 36 and 38, respectively. The bottom periphery of each of the depending portions 36 and 38, respectively, is accordingly flared outwardly and into abutting contact with the shoulder 28 at the interface of the large and small diameter openings 24 and 26, respectively. In this assembly the member 34 is prevented from moving

out of relation with the terminal receiving area and is nonremovably affixed thereto.

A pair of identically shaped electrically conductive clamp plates 50 and 52 are illustrated in FIGURE 4 of the drawings. In this illustrative form each of the clamp plates 50 and 52 is shaped to define a pair of grooves, identified generally on plate 50 as 54 and 56, respectively. An upstanding ear 58 is provided at one end of one of the grooves to serve as a positive stop for the electrical conductor inserted therein when the plates 50 and 52 are in cooperative mating relation. The ear 58 protruding from each facing contour extends into juxtaposed relation with the mating clamp plate in overlapping relation to thereby prevent rotation of the clamp plates with respect to each other. Each of the grooves 54 and 56 is provided with a series of serrations adapted to nonremovably grasp the electrical lead when the plate 50 and 52 are urged into vice-like engagement with electrical leads (not shown) inserted therebetween. An opening 60 is provided in the central portion of each of the plates 50 and 52, respectively. The threaded terminal post 42 is inserted into and through each of the openings 60 in the plates 50 and 52, respectively, and is threadedly engaged within the threaded internal portion of the depending portion 38 of the electrically conductive member 34. It can readily be seen that this method of assembly or mounting of the plates provides a feature of adjustability thereto.

As shown more clearly in FIGURE 2, with the plates 50 and 52 in cooperative mating relation a pair of open conductor receiving spaces, indicated generally at 64 and 66, are defined. Said spaces 64 and 66 are adapted to receive electrical conductors (not shown) in electrically conducting relation with the respective plates 50 and 52. Each of the grooves 54 and 56 of each of the plates 50 and 52 are flared at the wire receiving end to facilitate insertion of the conductors therein.

It can readily be seen that loosening of the threaded terminal post 42 will permit the upper plate 52 to be moved to greater spaced relation with respect to the lower plate 50, thus, allowing for easier insertion of the electrical conductors therebetween. When the conductors are inserted into the wire receiving spaces 64 and 66, their inward movement is stopped upon coming into contact with the ear 58 present at the back terminal of each of the shafts. The threaded terminal post 42 is then screwed into the threaded internal portion of the depending portion 38 to urge the plates 50 and 52 into vice-like grasping relation with the electrical conductors therebetween. The conductors are prevented from being easily withdrawn from between the plates due to the vice grip on the conductors and due to the serrated portions 70 present in each of the grooves. The serrations 70 are in the form of upstanding barriers and are adapted to be urged into the electrical conductors, upon the application of suitable vice-like pressures to grasp the conductors tightly and prevent their withdrawal from the spaces 64 and 66.

It can readily be appreciated that the clamp connector of the present invention is economical to manufacture and easy to use.

The clamp connector of the present invention consists, essentially, only of a pair of stamped plates. The clamp plates are identical in construction, each defining a generally sinuous outline to define one half of the plurality of interrupted wire receiving spaces presented by a cooperative mating pair of clamp plates. It should be observed that any number of wire receiving grooves may

be provided in any plate; however, in the most conventional form there will be provision for but two conductors.

The connector of the present invention is simple to use.

There is no requirement for complete removal of the terminal for connection of conductors thereto, as is shown in prior art. The threaded terminal post need only be loosened to permit separation of the mating clamp plates 50 and 52 and to provide adequate separation for the insertion of conductors between said clamp plates. When the conductors are in place, the threaded terminal post is threaded into the threaded internal opening of the electrically conductive element to urge the mating clamp plates into closer relation and to define a vice-like gripping of the electrical conductors interposed therebetween. In this manner an electrical connection is presented between each of the electrical conductors and the mating plates. Further advantages are apparent, for example, in that no special tools are required in the use of the connector described herein; no solder is required to complete the connection and no tape is necessary to wrap exposed conductors. A screwdriver is the only piece of equipment required for use of the connector.

While I have shown and described a specific embodiment of the present invention it will, of course, be understood that other modifications and alternative constructions may be used without departing from the true spirit and scope of this invention. I therefore intend by the appended claim to cover all such modifications and alternative constructions as fall within their true spirit and scope.

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

An improved electrical connector adapted to receive electrical conductors comprising:

an insulating base having a pair of spaced openings therein;

an electrically conductive member extending continuously between said pair of openings to define an electrical path therebetween, said member having a pair of spaced depending portions adapted to be received in said openings, said depending portions having conformations adapted to affix said portions within said openings thereby to rigidly attach said member to the insulating base, each of said depending portions being internally threaded;

a threaded terminal post adapted to be threadedly received with each of the internally threaded depending portions; and

a pair of identical electrically conductive clamp plates adapted to be received on said member in face to face electrically conductive relation by one of said threaded terminal posts, said plates having mating sinuous facing contours defining, in use, a pair of elongated conductor-receiving spaces straddling the terminal post and each having an ear protruding from said facing contour at an end thereof and extending to juxtaposed relation with the other plate, when in use.

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