

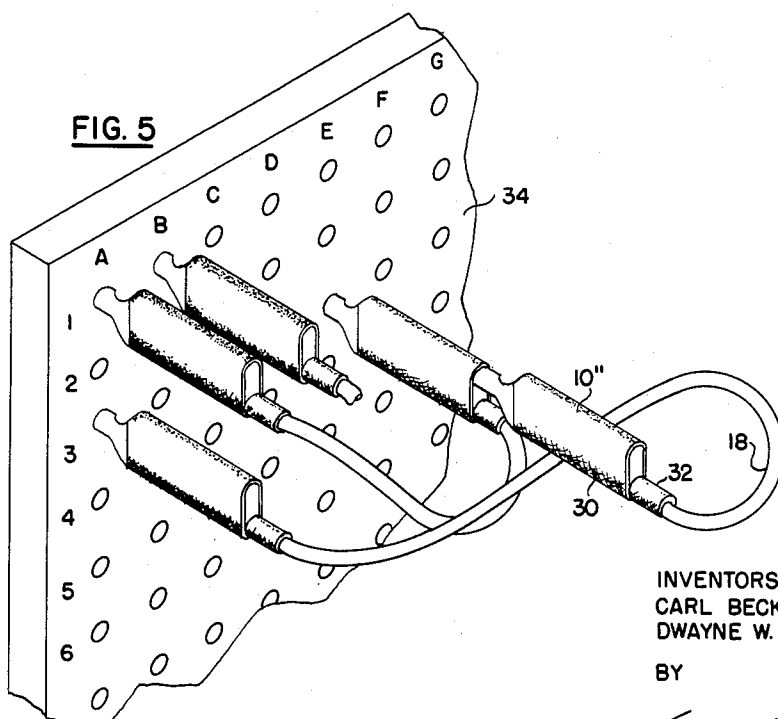
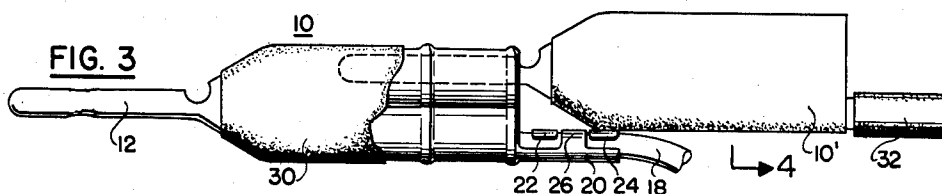
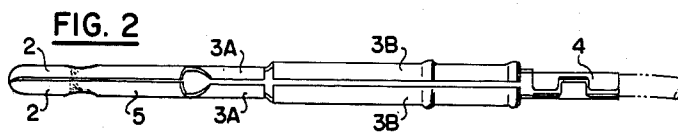
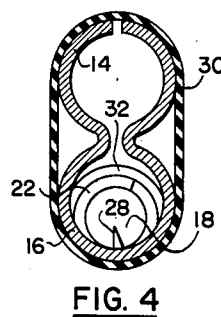
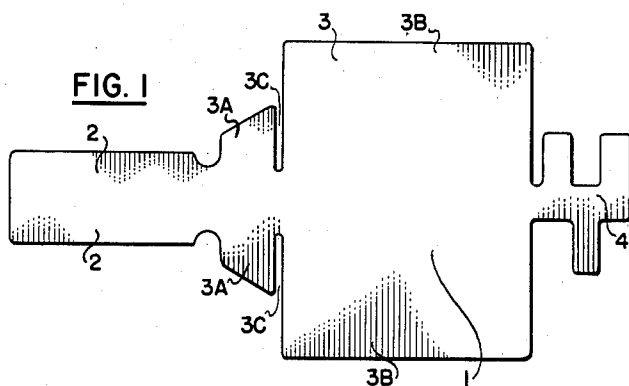
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SOLDERLESS TERMINAL

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SOLDERLESS TERMINAL

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This invention relates to electrical terminals and more particularly to an improved terminal connection for use on plug boards and the like.

Solderless electrical terminals have been employed in the past for many varied applications including program plug boards associated with electronic computers, business machines and the like. The program plug boards usually are provided with a multiplicity of common electrical female receptacles to carry out the programming operation. The exact number of common receptacles provided with any one particular plug board may be an arbitrary choice of the design since it is difficult to foresee the maximum number of such receptacles that may be required for the numerous operations possible with computing machines. Accordingly, a plug board connector is desired that will provide a female receptacle along with its male member thereby allowing the reduction in the number of female receptacles connected to a common point on a program plug board.

It is, therefore, a general object of the invention to provide an improved solderless terminal.

It is another important object of the invention to provide an improved solderless terminal having its own female receptacle.

It is still another important object of the invention to provide an improved solderless electrical connector provided with its own female receptacle constructed as an unitary assembly.

It is still a further important object of the invention to provide an electrical patch cord having an unitary male-female receptacle fixed to opposite ends with the individual female receptacle stacking back axially so as to occupy a minimum of space.

The above and related objects are achieved by providing a solderless terminal unitary assembly having its own female receptacle stacked back on itself axially. The terminal assembly is provided with a pair of substantially circular female receptacles positioned behind one end section of the male member of the assembly. One of the female members of the assembly may be adapted to receive an electrical patch cord or the like.

Other objects and features of advantage of the present invention will be found throughout the following more detailed description of the invention particularly when considered with the accompanying drawings in which like reference characters refer to similar elements:

Fig. 1 is a plan view of a single stamping of light gauge metal before being formed into the shape of the solderless terminal;

Fig. 2 is a plan view of a single stamping of light gauge metal after being formed into the shape of the solderless terminal with a patch cord secured thereto;

Fig. 3 is a side elevation view of the assembly of a pair of terminals and related connections with the insulation of one terminal partially removed;

Fig. 4 is a cross sectional view of the terminal of Fig. 3 taken along the line 4—4;

Fig. 5 is a perspective view of solderless terminals, con-

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structed in accordance with the invention, associated with a programming plug board.

Referring now to Fig. 1 which illustrates a stamping of light gauge electrical conductive material having at least two sets of different rib sections identified by the reference characters 2 and 3 and an end section 4. The rib section 2 may be provided with slits at the free end thereof of spaced approximately equidistant from the center line of same. The rib section 3 comprises the winged tip section 3a and the substantially rectangular portion 3b. The solderless terminal is formed by turning the rib sections 2 upward and inward forming a section 5 of substantially circular cross section, as may be seen in Fig. 2, which can be readily inserted into an appropriate socket-like female receptacle. The flanges 3a and 3b are turned upward and inward to form a pair of socket-like female members 14 and 16 generally of double C or ogee shape, as may be readily seen in Fig. 4. The topmost member 14 is substantially formed by the metal portions to the left and to the right of the sections identified in Fig. 1 as 3C. The member 14 may be of a slightly smaller diameter than the outer diameter of a corresponding male member similar to the section 5. The end section 4 is turned to secure an electrical conductor to the unitary assembly. The opposite faces of the section 4 are turned to substantially interlock and secure a conductor therebetween.

Referring now to Figs. 3 and 4 the structural details of the solderless terminal plug 10 will be more fully explained. The terminal 10 in this instance has a tubular-like shank or male member 12, formed by the section 5, forming one end section and a combined pair of socket-like female members 14 and 16, formed by the section 3, forming the other end section. The female members 14 and 16 are arranged on opposite sides of the longitudinal centerline of the male member 12.

Each female member is arranged to form a substantially circular opening, as best seen in Fig. 2, to receive a male connecting member, one of these female members, in this case the member 12 of another terminal plug. The member 14 may be provided with an inner diameter slightly smaller than the outer diameter of the male member 12 of a similar terminal. The member 14 is shaped to removably receive the male member 12 and yet fit sufficiently well to provide a good electrical connection. The other female member, member 16, is adapted to receive an electrical lead or patch cord 18. The member 16 is provided with an arm 20 having a plurality of fingers such as indicated by the numerals 22, 24 and 26 formed to grip a patch cord 18. The fingers may be crimped over the patch cord to mechanically secure it to the terminal 10. To further aid in securing the patch cord 18 to the terminal a plurality of sharp prong-like elements, such as indicated by the reference character 28 of Fig. 4, may be provided with the arm 20. The elements 28 function to pierce the insulation of the cord 18.

A pair of terminals in the cooperative relationship desired by the invention is illustrated by the combination of the full line views of two terminals 10 and 10' in Fig. 3. A portion of the insulation is removed from the body of the terminal 10 and the end section to which the electrical lead is secured. It is therein observable the simplicity of making a plurality of electrical connections to a common point and still allow a good mechanical and electrical connection.

The solderless terminal 10 may be provided with a resilient insulative band as at 30 in Fig. 4. The band 30 provides an insulative protection to the user of the terminal against an electrical shock. A further protection may be afforded by providing a similar insulation 32 surrounding the arm 20 of the terminal 10.

Each patch cord 18 may be provided with a solderless terminal at opposite ends when used in conjunction with

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a programming plug board such as indicated by the reference character 34. The plug board 34 may be arranged to provide a plurality of common points, in this case six, for each of a multiplicity of different electrical points such as denoted by the letters A through G on the board 34. The program may be such that a group of connections are required to be made over a relatively small area of the board, as illustrated in the upper left hand corner of the plug board 34 in Fig. 5. In these types of applications it becomes easier to make a connection to the female member of a terminal already plugged in than to a female receptacle provided with the plug board, if any. A solderless terminal connection of this type is illustrated by the two terminals 10 and 10' in Fig. 5, the latter being joined to the former in "piggy-back" fashion and projecting in readily accessible relation therefrom. It is readily observable that since the two terminals 10 and 10' stack axially, this improved form of connection occupies a minimum of space laterally, thereby reducing the size of the plug board.

Having, therefore, described detailed embodiments of the invention, setting forth their organization and their mode of operation, those features believed descriptive of the nature of the invention are defined with particularity in the appended claims.

What is claimed is:

1. A plug and socket connector formed of an integral blank of electrically conductive sheet material comprising, a main body portion having a longitudinal center line and complementally shaped with side portions on each side of said center line, each of said side portions being bent in cross section in the form of two semicircles joined one above the other and said two side portions being folded together to form a pair of tubular portions disposed in parallel relationship and one above the other, a tongue portion folded upon itself to form a longitudinally slitted cylindrical portion having its axis extending in the same direction as said tubular portions, said cylindrical portion having an outer diameter such that it may be slidably press fitted into one of the tubular portions of a like connector, an intermediate portion joining said cylindrical portion to said main body portion, said intermediate portion being tapered in form to provide a faired connection between said main body portion and said cylindrical portion, one of said tubular members being formed with an inside diameter smaller than the outside diameter of said cylindrical portion to resiliently retain the cylindrical portion of a like connector, a lug portion extending from the other of said tubular portions in axial alignment therewith but in a direction opposite from said cylindrical portion, and a plurality of finger portions extend in opposite relation from opposite sides of said lug portion and bent over and inwardly in interlocking dovetailed relationship, thereby forming a sleeve out of said lug portion for engaging a lead wire to make a good electrical connection therewith.

2. A plug and socket connector formed of an integral blank of electrically conductive sheet material comprising an enlarged central body portion folded on longitudinal lines thereof to form first and second elongated tubular portions disposed in parallel relationship to one another, a tongue portion extending longitudinally from said central portion and folded to form a hollow cylindrical portion having its longitudinal axis extending in the same direction as said tubular portions, a tapered intermediate connecting portion joining said cylindrical portion to said first tubular portion but offsetting the cylindrical portion with respect to said first portion so that the longitudinal axis of the cylindrical portion extends between said first and second tubular portions, a lug portion extending from said first tubular portion in axial alignment therewith and in a direction opposite said cylindrical portion, a plurality of finger portions extending in alternately staggered rela-

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tion from opposite sides of said lug portion and bent over and inwardly in overlapping relationship to one another thereby forming a sleeve for engaging a lead wire to make a good electrical connection therewith.

3. A plug and socket connector formed from a single blank of electrically conductive sheet material and comprising an enlarged central portion shaped and folded about a longitudinal center line to form two adjoining elongated tubular elements disposed with their axes extending in parallel relation to one another, a tongue portion projecting from one side of the central portion on substantially the center line thereof and folded into a hollow cylindrical element to form a jack plug having its axis extending parallel to those of the tubular elements, and a lug portion projecting from the opposite side of the central portion on substantially the center line thereof and folded into a sleeve for receiving a lead wire for electrical connection to the connector.

4. An electrical plug and socket connector formed of an integral blank of conductive sheet material comprising a body having a pair of sides integrally united with each other along a common line and being complementally shaped in the form of a pair of hollow substantially cylindrical female members, a hollow substantially cylindrical male member protruding from said body and being shaped for insertion in a cylindrical member of a like connector, said female members disposed in parallel relation with each other and arranged on opposite sides of the projected center line of the male member, a tongue portion extending from one of said female members in axial alignment therewith and in a direction away from said male member, and fingers oppositely disposed extending from said tongue portion, and being turned inward, thereby forming a sleeve adapted to secure an electrical lead wire.

5. A plug and socket connector formed of an integral blank of electrically conductive sheet material comprising a body portion folded on a longitudinal center line to form complementally shaped side portions, each of said side portions being bent in cross section in the form of two arcuate channels joined one above the other in the same plane and forming with the two channels of the other side portion a pair of sockets disposed in parallel relation one above the other, and a tongue portion integral with and extending from said body portion and shaped in the form of a hollow cylinder to form a plug for insertion in a socket of a like connector.

6. A plug and socket connector formed of an integral blank of electrically conductive sheet material comprising a body portion having a longitudinal center line and complementally shaped on each side of said center line to provide axial passages defined by said two sides, each of said sides being bent in cross section in the form of two semicircles joined one above the other and said two bent sides being folded together to form a pair of tubular portions aligned in parallel relationship one above the other, a tongue portion integral with and extending longitudinally from said body portion and folded to form a cylindrical portion having its longitudinal axis extending in the same direction as said tubular portions, said cylindrical portion shaped for insertion in one of said tubular portions of a like connector.

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