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A. R. JUBENVILLE
ELECTRICAL CONNECTOR
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2,578,360

FIG. 1

FIG. 2

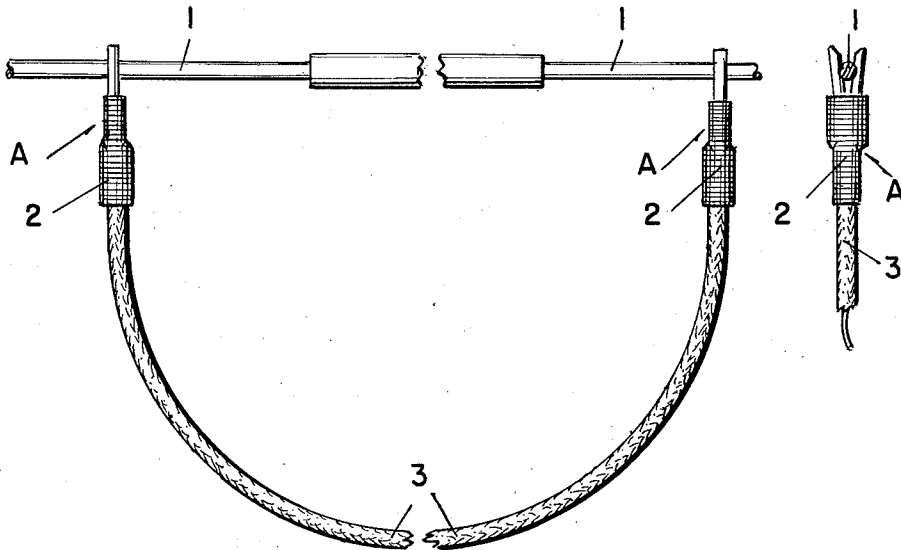


FIG. 3

FIG. 4

FIG. 5

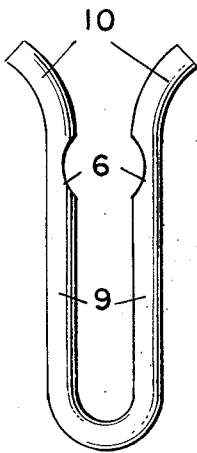
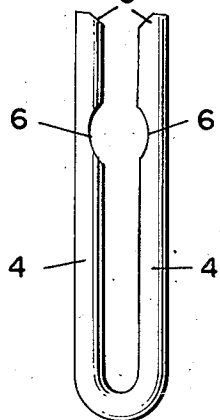
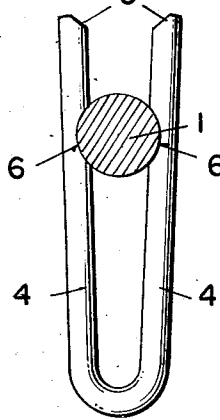
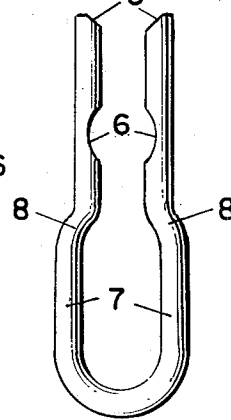


FIG. 6

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ELECTRICAL CONNECTOR

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1 Claim. (Cl. 24-261)

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This invention relates to electrical connectors and more particularly to that type known in the art as a speed clip.

In many types of electrical and radio devices used in training, there is the need for a device for making quick and positive mechanical and electrical connections to terminals of various characters and such connections must have good conductivity. Such connections especially in instruction fields must be capable of rapid assembly and disassembly while at the same time maintaining a high efficiency.

It is an object of the present invention to provide an electrical connector meeting the above requirements and overcoming deficiencies in prior connectors or clips such as high cost of manufacture, high rate of breakage, poor connections and conductivity, and slow assembly and disassembly of circuits when utilizing hitherto known types of clips.

A further object of this invention is to provide a clip for making electrical connections on posts and the like which clip is economical to manufacture and which due to its construction from springy material and the other features incorporated therein allows of quickly connecting various electrical components such as can be mounted on training panels and which components terminate for example at brass posts.

It is another object of the present invention to provide a clip connector which may easily be connected to a terminal without the necessity of removing other connectors on the same terminal.

A still further object of the present invention is to provide a spring-type clip connector constructed of a yoke-type spring having a milled notch therein for ensuring a large area of contact between the clip and a terminal to which applied.

Still another object of this invention is to produce a clip connector requiring a small amount of space and which can be "stacked" one above the other on a terminal.

Other and further objects and advantages of the present invention will be apparent from the following detailed description of preferred embodiments of the invention when taken together with the drawings wherein:

Fig. 1 is a plan view of a terminal showing the application of the present clip;

Fig. 2 is a view taken at right angles to one of the clips in Fig. 1 showing the connector applied to a terminal;

Fig. 3 is a top plan view of one type connector before application to a terminal and not connected to the conductor.

Fig. 4 shows the clip of Fig. 3 applied to a terminal.

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Fig. 5 is a view in plan of another embodiment of the clip; and

Fig. 6 is a plan view of a further embodiment of the clip.

When assembling electrical circuits for various types of work such as radios or training panels for classroom instruction work various terminals must be utilized in the various circuits whereby additional components may be connected thereto. For purposes of illustration in Fig. 1 of the drawings a terminal post has been shown which is circular and preferably comprised of a good conducting material such as brass. This terminal 1 has not been shown as applied to any specific circuit or device but merely illustrates a possible application of the present invention. The speed clip connector of the present invention generally designated A is formed from round spring wire preferably of brass or Phosphor bronze in order to ensure good conductivity of the clip. As can readily be seen from Figs. 1 and 2 of the drawings the clip is connected to any type of wire 3 preferably insulated. The point of connection between the clip and the conductor is covered by an insulating jacket 2 which is provided to prevent undesirable contact at the heel of the clip and also prevents sharp bends at the junction to eliminate breakage of said conducting wire.

The clip in itself as has previously been set forth is constructed of round spring wire which has been bent to form two extending arms 4 which extend approximately parallel to one another. In this bending process the wire retains its springiness due to the inherent kinetic energy of a yoke-type spring such as is formed in the present application. The inner edges of the arms 4 at the free ends thereof in the embodiment shown in Figs. 3 and 4 are beveled or chamfered such as at 5 in order to facilitate the easy application of the clip on the terminal 1.

With the clip having the two arms in the relationship shown in Fig. 3 a notch 6 is milled in each interior side of the arm and which notch is milled to have a diameter equal to the diameter of the terminal 1 when in the applied position as shown in Fig. 4. Due to this construction the curvature of each notch 6 will when the clip is applied to the terminal correspond with the curvature of the terminal providing thereby a good contact between the elements.

The clip may be connected to the conductor 3 by soldering or the like by any process which does not remove the spring temper from the wire of the clip. Subsequently after this soldering is completed the jacket 2 can be applied by sliding over the junction point of the clip and the

conductor. This construction of the clip due to the inherent springiness of the material used and the provision of the milled notch of a given diameter corresponding with the diameter of the terminal post when the clip is applied thereto provides a strong gripping action of the clip and due to the flattened surface formed in the notch ensures a good mechanical and electrical contact between the clip and the terminal post.

In the embodiment shown in Fig. 5 a bend between the two arms 7 of larger radius than that of Fig. 3 is provided. This design due to the bends formed at 8 gives the desired gripping effect but in order to facilitate production procedure in the forming process the larger radius bend is utilized. This construction also removes the possibility of breakage in the manufacturing and also retains a greater amount of springiness in the wire due to the smaller bend made therein. The remaining features in this embodiment are similar to that disclosed in Fig. 3.

Fig. 6 shows a further embodiment which may be utilized in the clip connectors having the same advantages but in this construction the free ends of the arms 9 are not chamfered or beveled but are flared outwardly in order to provide a guide for the easy application of the clip on a terminal. This construction can be used in those instances where space is not of the essence. The design of the end portions as in Fig. 3 are desirable in small spaces since considerably less area is required for their application.

It is not considered necessary to set forth the details of the dimensions of the various portions of the clip since it will readily be apparent that various changes can be made therein as long as the notch is milled to such dimensions that upon being applied to a terminal a sufficient area of contact will be maintained due to the similarity in curvature and dimensions of the notch and the terminal.

The different types of clips disclosed in the drawings after being connected to the conductors or wires can be easily and readily applied to a terminal by sliding the clip down over the end of the terminal which for this purpose should be rounded whereby the arms of the clip are spread and the milled notches will slide down on the terminal.

Due to the beveled edges 5 and the flared ends 10 the clip may also be applied at right angles to the terminal by merely applying pressure to spread the arms until the terminal becomes seated in the notch. In like manner the clip may be easily and readily removed from the terminal by sliding the clip up and off the terminal post or by a pull on the clip at any angle to the post. In addition the removal of the clip from the terminal may be realized by using the lever action of the clip or wire using the joint as a fulcrum thereby breaking the clip off the terminal post.

In many types of electrical circuits especially when used for training purposes such as on training panels as many as thirty connecting wires are used with a clip on each end. In order to release this large number of clips when utilizing the device of the present invention a very small amount of time is necessary since the wires can be removed very easily. If each wire was connected to a terminal post by soldering or by clips heretofore used the time element would be tremendously increased. Due to the construction of the present clip the contacts may be readily and

easily stacked, that is, returning several wires to a common ground and many other two or more contact points so essential to radios, electronics, and general electrical wiring procedures. In the event of a wrong connection being effected it is possible to remove the incorrect connecting member by merely pulling from the post at a convenient angle. The remaining clips can then be pushed down the post to again make room at the top.

It has been found desirable in manufacturing these clips and using them in connection with training panels to utilize dimensions for the post or terminal of not substantially less than .125 inch and round brass wire of approximately not less than .050 inch. The milled notch will then be given a diameter of .125 inch when in applied position so as to correspond with the dimensions of the post. In this construction an area of contact is developed assuring a positive connection of a minimum of 5,000 circular mills area. Due to the contact area and contact pressure a very effective contact is provided and there is no possibility of arcing.

Actual use of these clips has shown that they will effectively carry up to 20 amperes of electricity with no detrimental effects as regards the clips' function. Under the actual test conditions approximately 7,000 contacts were made between a given clip and a given post with no effect detrimental to the function of the clip.

Other variations and modifications will be readily apparent to those skilled in the art to which this invention pertains and without departing from the scope of the present invention as determined by the claim appended hereto.

I claim:

An electrical connection for attachment to a round terminal post and the like comprising a single piece of spring metal wire, said wire being bent to form two substantially parallel arms when in unassembled relation, a formed circular shaped notch in each said arm, said notches being formed on facing sides of said arms, said notches having substantially straight parallel faces at right angles to the longitudinal axis of the arms, the arcs of said notches having equal radii greater than one half the distance between the deepest portions of said notches in said unassembled relation whereby in assembled relation said arcs form portions of the periphery of the same circle of equal cross section with the post and said notches contact said post over a substantial area of surface in intimate contact therewith.

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