Sept. 22, 1931. H. G. RICHTER 1,824,447

TERMINAL FOR CIRCUIT ELEMENTS

Filed April 27, 1929

Fig. 1.

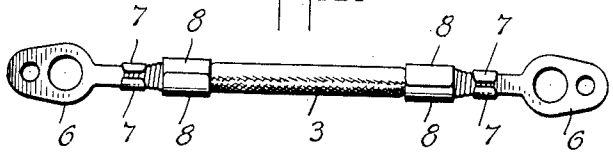


Fig. 2.

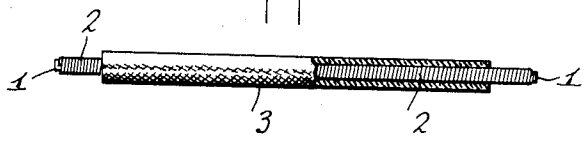


Fig. 3.

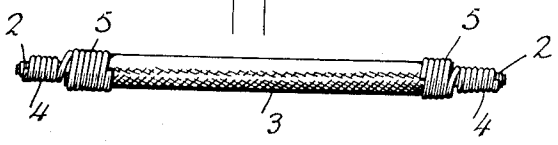
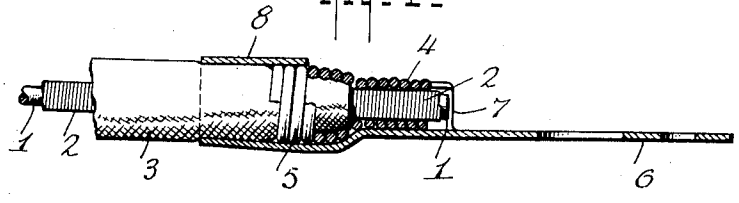


Fig. 4.



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UNITED STATES PATENT OFFICE

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TERMINAL FOR CIRCUIT ELEMENTS

Application filed April 27, 1929. Serial No. 358,730.

My invention relates to certain improvements in applying terminals to circuit wires, circuit elements and the like, and while not limited in its use, has particular application to the terminals of wire-wound high resistance units.

Among the principal objects of the invention may be mentioned the production of a simple, effective and economical means for insuring perfect electrical contact in the application of terminals, which must be applied cold and secured by clamp pressure, without the aid of soldering.

Strict observance of the above requirements is necessary, for example, where the wire of resistance units to which terminals are to be applied, is so very fine it will not withstand either rough treatment or high temperature, to which it is usually subjected when the terminals are soldered.

The particular type of high resistance unit for which the present improvement is specially designed is illustrated and described in United States Letters Patent No. 1,697,416, granted January 1, 1929, to Electrad, Inc., as my assignee.

As described in the patent referred to, the purpose there is to produce a unit of the highest possible resistance value, per inch of length, and to this end, an extremely fine resistance wire is employed, which is spirally wound on a core of insulating material, such as asbestos cord, or like material, with or without a metallic core.

The advantage of using asbestos cord is that the resistance wire, as it is wound thereon, becomes sufficiently embedded in the cord to hold against displacement and also to escape fracture or other injury from rough handling, accidental blows, etc., but as thus constructed, presents considerable difficulty to the successful application of the necessary terminals for connection in circuit. Soldering has proved practically impossible and contact lugs, cold closed on the wire, under pressure, are not entirely successful, as good electrical contact is not always secured.

To remedy this difficulty tests made have shown that if a thin layer of lead or like material is interposed between the above described wire-wound resistance and the cold-closed clamp lugs of the terminals, perfect electrical contact results.

A preferred embodiment of the invention is illustrated in the accompanying drawings but I do not wish to be understood as limiting myself to the same, as various changes may be made therein without departing from the spirit and scope of the invention as outlined in the appended claims.

In the drawings—

Fig. 1 is a view in elevation of a resistance unit constructed in accordance with the present invention;

Fig. 2 is a detail view, with the terminals removed and a portion of the outer insulating covering broken away;

Fig. 3 shows the unit with the lead covering applied to the ends, preparatory to applying the terminals, and

Fig. 4 is a detail view on an enlarged scale of the completed connection, the terminal being shown in section.

Referring to the drawings, 1 represents a suitable core, which may consist of asbestos cord or like material, with or without a copper wire or other metallic center.

Spirally wound on the core 1, there is a resistance wire 2, which, as wound, becomes sufficiently embedded in the yielding surface of the asbestos to be held properly spaced and protected against fracture or other injury from accidental blows, rough handling, etc.

Covering the resistance wire, thus wound, there is an outer protecting envelope or sleeve 3, of insulating material, which terminates short of the ends of the wire leaving such ends exposed, as illustrated in Fig. 2, for attachment of the terminals.

Before the terminals are attached, a covering of lead or other suitable material 4, is applied to the exposed ends of the wire, as best shown in Fig. 3. Preferably a lead sleeve would be used for this purpose, but, owing to the difficulty and cost of producing such sleeves, I employ instead, a comparatively fine lead wire, which is spirally wound over the exposed ends of the resistance wire

projecting from opposite ends of the insulated body portion thereof.

To assist in winding on the lead wire and give it anchorage, the winding is started on the outer insulating covering, as indicated at 5, and continued until the exposed end of the resistance wire is reached and completely covered.

Thus prepared, the resistance unit is ready for the attachment of the terminals 6, 6, which may be of any suitable form but are preferably each provided with two sets of clamp lugs, one set or pair 7, 7, being shaped and spaced to be cold-closed over the lead-covered end of the resistance wire; the other pair 8, 8, being designed to be similarly closed over that portion of the outer insulating envelope covered by the lead wire wrapping.

In closing the clamp lugs to secure the terminals in position, the soft yielding lead is forced into intimate contact with the fine resistance wire, making good electrical contact, without displacing or injuring the wire and completely enclosing the same to further protect it as it is later handled in shipment, sale and use.

As the important advantages of the invention will be apparent from the foregoing description, it will not be necessary to elaborate them in further detail.

Having thus described my invention, what I claim is:

1. A resistance unit comprising a resistor element having a covering of insulation suitably proportioned to leave the ends of the resistor exposed, a winding of soft metal wire covering the exposed ends of the resistor, and terminal clips, each having two pairs of lugs, one pair clamping the insulation covering of the resistor and the other pair clamping the soft metal covered end thereof.

2. A resistance unit comprising a resistor element having a covering of insulation suitably proportioned to leave the ends of the resistor exposed, a single layer winding of soft metal wire closely wound over the ends of the insulation and the exposed ends of the resistor, and terminal clips, each having two pairs of lugs, one pair clamping the soft metal covered end of the insulation and the other pair clamping the soft metal covered end of the resistor.

I affix my signature.

HENRY G. RICHTER.