Sept. 26, 1933. J. LEVIN 1,928,157

ELECTRIC TERMINAL CONNECTION

Filed Nov. 27, 1929

Fig. 2.

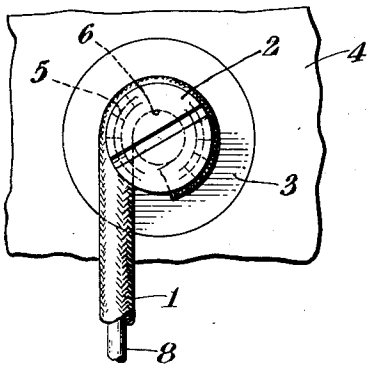


Fig. 1

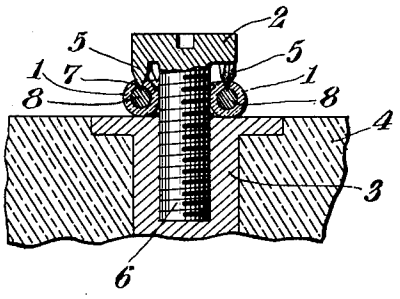


Fig. 3.

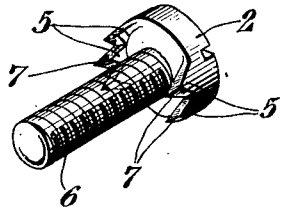


Fig. 4.

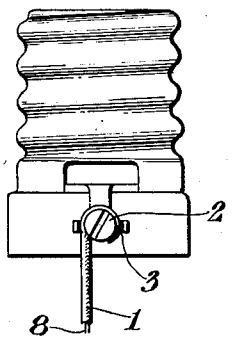


Fig. 5.

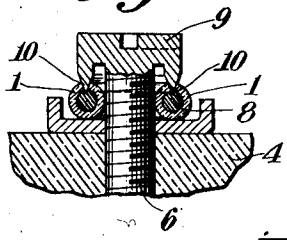


Fig. 6.

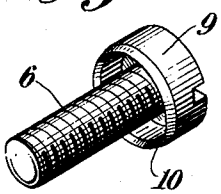


Fig. 7.

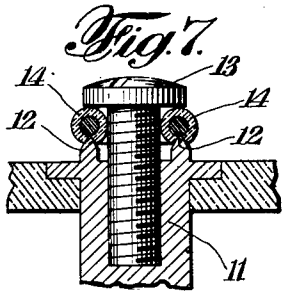
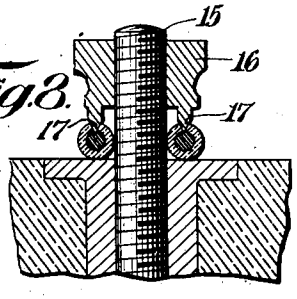


Fig. 8.



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ELECTRIC TERMINAL CONNECTION

Joseph Levin, Brooklyn, N. Y.

Application November 27, 1929
Serial No. 410,192

3 Claims. (Cl. 173—259)

This invention relates to electric terminal connections, and particularly to binding posts of the screw-clamp type for attaching conducting wires to electric instruments.

An object of this invention is to provide a quick and convenient method of electrically connecting a wire to a terminal post without the necessity of splicing, cutting or scraping the wire. Another object is to provide means, in a device of this kind, of firmly securing the wire to the terminal so that it will not become disengaged or slip off. A further object of my invention is to prevent the loosening of the strands at the end of a wire, thereby removing the danger of a stray strand causing a short circuit. Still a further object is to provide against the cutting off of the strands at the end of a wire, which frequently occurs during the process of scraping and which causes a decrease in the current carrying capacity at the end of the conductor. Other and further objects and advantages of my invention will appear from the drawing, and the description hereinafter given.

The ordinary electric terminal connection or binding post contains a pair of complementary wire clamping elements either in threaded engagement with each other, as a post and screw, or connected together by some resilient or yieldable means, a construction frequently found in dry batteries. Clamped between these elements, or secured thereto, is the end of a conducting wire. In order to establish proper electrical contact, the insulation covering the wire must be removed by splicing the end of the wire, cutting off the insulating material, and scraping the wire clean. These operations consume considerable time, and require a certain degree of skill and handiness in the use of tools. With my invention, all this work of splicing, cutting and scraping is obviated, as the wire, with all the insulation thereon, is placed between two complementary wire holding or clamping elements; and when these elements are then tightened, the entire operation of establishing the connection is completed.

The essence of my invention consists of a novel design of wire clamping elements containing cutting edges that penetrate the insulation until contact is made with the metallic conducting wire, the cutting operation being performed at the time the said elements are tightened. Thus the job can be done quickly, and requires no manual or mechanical skill whatsoever.

In the common binding post generally used in sockets, plugs, electric bells, etc., the wire is held in place by its frictional engagement with the clamping elements. It frequently happens that these clamping elements become loose, or that due to the smooth surface of the exposed end of the conductor, the wire slips out, thereby breaking the circuit and possibly causing a short. This cannot happen in my invention, as the cutting edge of the clamping element becomes imbedded in the insulation, so that the end of the conductor is held in place not only by the friction of the comparatively soft and rough surface of the insulation, but also by the positive grip of the said cutting edge.

When splicing and scraping a wire containing many strands, there is always the danger of cutting off some of these fine strands, thereby reducing the cross-sectional area at the end of the wire, and consequently increasing the resistance and decreasing the current carrying capacity at the terminal of the conductor. This may result in the overheating or burning of the end of the wire. Furthermore, if the end of the said multi-stranded wire is not properly twisted around so as to hold the strands in place, some of these strands may become loose and cause a short circuit by coming in contact with an exposed part of the opposite terminal. With my invention, as the insulation at the end of the wire is never removed, the full cross-sectional area is always available, and the strands are all kept in place by the surrounding insulating material.

Referring to the drawing:

Fig. 1 is a fragmentary sectional elevation of one form of my invention.

Fig. 2 is a plan of Fig. 1.

Fig. 3 is a perspective of the terminal screw shown in Fig. 1.

Fig. 4 is an elevation of a socket showing the terminal connection constituting my invention, in position.

Fig. 5 is a fragmentary sectional elevation of a modified form of my invention, showing a screw with a circular cutting edge.

Fig. 6 is a perspective of the terminal screw of Fig. 5.

Fig. 7 is a sectional elevation of another form of my invention, showing the cutting edge on the female contact terminal.

Fig. 8 is a sectional elevation of still another modification of my invention, showing a binding post nut with a cutting edge.

In the drawing, the conducting wire 1 is clamped between a pair of complementary wire holding or clamping elements consisting of the terminal screw 2 in threaded engagement with the female terminal member 3 mounted on panel 4. The

underside of the head of said screw contains a cutting surface comprising the teeth 5, of which there may be just a few, or a sufficient number for distribution around the entire periphery of the head of said screw 2.

To electrically attach the wire 1 to the terminal, the end of the wire, with the insulation thereon, is wound around the post or shank 6 of the said screw 2, which is then tightened with the aid of a screw driver. The cutting edges 7 of the teeth cut into the insulation until contact is made with the metallic conductor 8 within. When the metal is reached by the said cutting edges, the increased resistance to turning of the screw will be an indication that contact has been established.

If it should be necessary to remove the wire and use it again, this can readily be effected, as no material damage has been done to the wire, there being only one or two small cuts in the insulation,—the conductor still being intact and in proper condition for further use.

My invention includes within its scope many different forms and mechanical equivalents some of which are set forth in the drawing, and hereinafter described. One of these modified forms appears in Figures 5 and 6, where the underside of the screw 9 has a circular cutting edge 10, instead of the teeth of screw 2.

Another modification is that shown in Fig. 7, where the stationary female contact element 11 contains the cutting edge 12. The head of the set screw 13, when turned, forces the wire 14 against the said cutting edge, which penetrates the insulation and establishes contact with the metallic conductor.

In Fig. 8 is shown still another modified form of my invention, the terminal post 15 being in threaded engagement with the binding post nut 16, which contains on its under side, the cutting edge 17. When the said nut 16 is turned down until contact is made with the metallic conductor, an electrical connection is established between the conductor and the said terminal post 15.

There are many other mechanical forms not set forth in the drawing and description herein given, that may be embodied in my invention.

What I claim is:

1. In an electric terminal connection, a screw having the underside of its head provided with a plurality of peripherally disposed V shaped blades for cutting into an insulation-covered portion of a contiguous conducting wire of predetermined proportions, the length of said blades being greater than the compressed thickness of the insulation covering, for penetrating the insulation up to the conductor therein.

2. In an electric terminal connection, a pair of wire clamping elements comprising a nut and a binding post adapted for threaded engagement with each other, said nut having its underside provided with a plurality of downwardly projecting V shaped blades for cutting into an insulation-covered portion of a contiguous conducting wire of predetermined proportions, said blades being of sufficient length to penetrate the insulation covering up to the conductor therein for engagement with said conductor.

3. In an electric terminal connection, a threaded terminal post, a pair of coacting conducting elements associated with and electrically connected to said post, threaded means on one of said elements in engagement with said post to permit a varying of the distance between said elements by a manipulation of one of the elements, said elements being normally in spaced relation to each other and being adapted to hold between each other an insulation-covered portion of a single conducting wire wound around said post, one of said elements containing cutting means contiguous to said portion for cutting into the insulation thereon, said cutting means being circumferentially positioned about said post and being of a sufficient length to penetrate the insulation of said wire to engage the conductor therein.

JOSEPH LEVIN.