

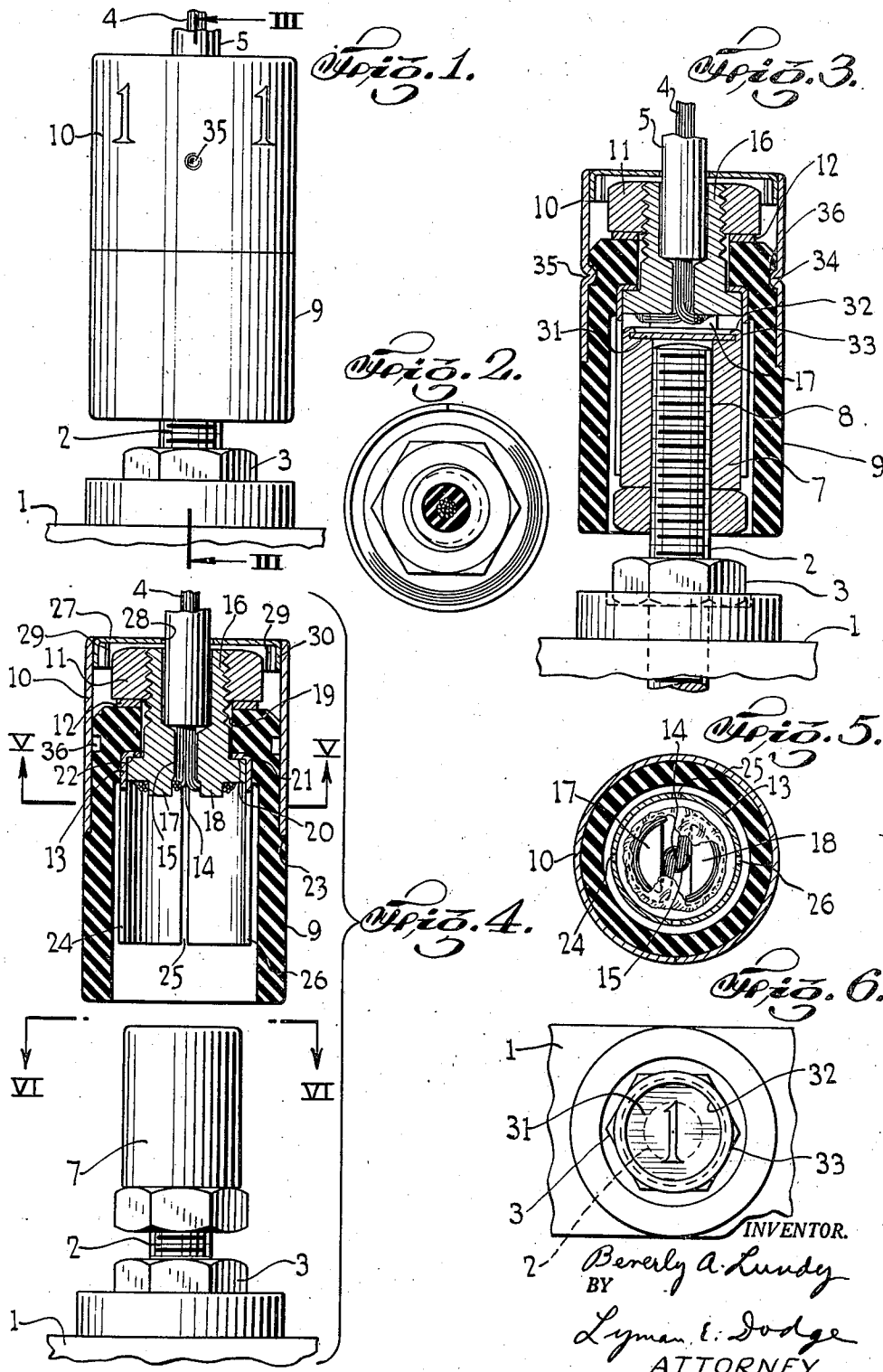
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ELECTRICAL CONNECTOR

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ELECTRICAL CONNECTOR

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1 Claim. (Cl. 173-269)

This invention relates to electricity, especially conductors, and more particularly terminals.

A principal object of this invention is to provide a readily detachable connector such that all parts will be protected by insulation in such wise that any object bearing thereagainst will not be placed in electrical contact with the conducting parts thereof.

Other objects and advantages will appear as the description of the particular physical embodiment selected to illustrate the invention progresses, and the novel features will be particularly pointed out in the appended claim.

In describing the invention in detail and the particular physical embodiment selected to illustrate the invention reference will be had to the accompanying drawing and the several views thereon, in which, like parts are designated by like characters throughout, and in which:

Figure 1 is an elevational view of a device embodying my invention in place on a binding post; Fig. 2 is a top plan view of the device as shown by Fig. 1 with a top covering disc removed; Fig. 3 is a cross sectional view of the device as shown by Fig. 1 on the plane indicated by the line III-III, viewed in the direction of the arrows at the ends of the line; Fig. 4 is an exploded view of the device as shown by Fig. 1 with some parts in section; Fig. 5 is a cross sectional view on the plane indicated by the line V-V of Fig. 4, viewed in the direction of the arrows at the ends of the line; Fig. 6 is a cross sectional view on the plane indicated by the line VI-VI of Fig. 4, viewed in the direction of the arrows at the ends of the line.

In Fig. 1, 1 designates any suitable or appropriate base or support for a binding post 2. This binding post, as used in many arts, for instance the railway signal art, is standard, and therefore, uniform in its dimensions and threading. It may be secured in any appropriate manner to the base 1.

These binding posts are very frequently assembled on one support in large numbers and on very close spacing. The usual spacing is one inch on centers.

In many situations, especially in the railway signal art, it is quite often necessary to remove the conductors connected to binding posts, as 2, for various reasons, such as the replacement of relays, or the testing of circuits. The multiplicity of conductors that are released, in certain situations, affords ample opportunity for improper electrical contact between conductors removed from binding posts and also affords ample

opportunity for errors in replacing the conductors upon the proper binding posts.

In order to provide a solution for the difficulties, above pointed out, applicant's device has been provided with the intention of supplying a means by which conductors may be readily separated from the binding posts with which they are electrically connected and, when separated, cannot make electrical contact one with the other, and furthermore, bear indicia corresponding with indicia upon the binding posts so that they may be readily properly replaced.

Electrical connection is made to binding post 2 in any suitable or usual manner. The conductor to be electrically connected to binding post 2 is designated 4. This conductor, as usual, has an outer insulated covering 5.

In order to electrically connect conductor 4 to binding post 2 in accordance with my invention, I first place a plug 7 on binding post 2. This is best done by forming plug 7 with a through bore 8 in which an internal thread is formed matching the external thread on the binding post 2. This plug 7 is made of any suitable or appropriate electrical conducting material, such as brass or copper.

My invention provides a removable shell 9 which, when in use, is positioned over and entirely encloses the plug 7. This bushing 9 is made of any suitable or appropriate insulating material, such as a phenolic condensation product.

In order to suitably assemble the shell 9 with its several component parts in condition to be placed upon the plug 7, I first place, on the conductor 4, the metallic sleeve 10 together with nut 11, washer 12, shell 9 and sleeve 13. These may be slipped up along the conductor out of the way so as not to interfere with the further manipulation. I then bare the end of conductor 4 to produce the end 14. This end is passed through the orifice 15 in a bushing 16 and then, as it is preferably a stranded cable conductor, the strands are divided and part of them are wrapped around a projection 17 on a bushing 16 and part on the projection 18 on the bushing 16 and then they are preferably securely soldered to the bushing 16, making a firm and permanent mechanical and electrical contact with the bushing 16.

After the electrical conductor is properly secured to bushing 16, the parts are then brought into position, that is, the sleeve 13 is pushed up into the shell 9 and the bushing 16 is passed through the orifice 19 of the shell 9 and then the washer 12, being positioned on top of the shell 9, the nut 11 is screwed onto the bushing

16 until it bears firmly against the end of the shell 9, so that the shoulder 20 of bushing 16 forces the flange 21 of sleeve 13 firmly against the shoulder 22 of shell 9 securing all parts firmly together. The sleeve 10 is then put into position bearing against the shoulder 23 of shell 9.

The sleeve 13 is made of a suitable electrical conducting material, as is the bushing 16 so that a circuit may be completed from conductor 4 to sleeve 13.

The sleeve 13 is preferably slitted in one or more places as at 24, 25 and 26, and is made of an internal diameter such that it fits nicely but with somewhat of a spring pressure over the plug 7 so that when the shell 9 carrying all of the parts is forced down to position, as shown in Figs. 1 and 3, electrical connection is made between conductor 4 and binding post 2.

If at any time it is desired to test the circuit, the wire or conductor 4 is grasped and, upon being pulled upwardly, removes the shell 9 and its associated parts from the plug 7, so that an electrical test may be made by connection to plug 7 which will not include the conductor 4, and an electrical test may also be made by making electrical connection to sleeve 13 without including the binding post 2 and plug 7 in the tested circuit.

After the testing, the parts are placed in the position as shown by Figs. 1 and 3 by simply pushing the shell 9 and its associated parts down into position on plug 7.

When the shell 9 is in position on the plug 7, there are no parts thereof which are not suitably protected against an undesired circuit connection by adjacent connectors, but if considered desirable a flanged disk 27 may be inserted in the top of the sleeve 10 to prevent any metallic parts from touching bushing 16 and nut 11. This flanged disk 27 is provided with an orifice 28 to receive the conductor 4 and is preferably formed with slits as 29 in the flange 30 to facilitate its entrance into sleeve 10 and resiliently hold it therein.

As it is contemplated that these connectors shall be used in situations where a large number of them will be positioned in very close relationship, one with the other, and where confusion may well occur, provision has been made to identify the parts so that they may be properly put together after having been separated. To this end, the sleeve 10 is provided with suitable indicia, such as numerals, as the numeral 1, shown in Fig. 1. The binding post to which this particular connector corresponds is also indicated in any suitable or appropriate manner, but especially by providing a disk, as 31, best shown in Figs. 3 and 6. This disk 31 has indicia thereon corresponding to the indicia in the sleeve 10, in this case the numeral 1. The disk is attached to the plug 7 in any suitable or appropriate manner, but preferably by spinning over a portion, as 32, of the plug 7 on to the top of the disk 31,

thereby holding the disk 31 securely in place. In order to form plug 7 so that it may best be spun over at the top, a slight depression is made in the top of the plug 7 leaving a thin wall 33 extending up from the top of the plug all around the top thereof.

In order to best hold the sleeve 10 in place on shell 9, the sleeve is bent inwardly as at 34 and 35 and the shell 9 is provided with a channel 36 extending entirely around it, so that the bent-in portions, as 34 and 35 of the sleeve 10 may spring at the channel and hold the sleeve 10 in place.

Although I have particularly described one particular physical embodiment only of my invention, nevertheless, I desire to have it understood that the form selected is merely illustrative but does not exhaust the possible physical embodiments of the idea and means underlying my invention.

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

A device for electrically connecting a conductor to a binding post, including, in combination: an insulating shell, said insulating shell formed with an end wall formed with a through bore, a metallic shell positioned within the insulating shell and adapted to be pushed down over a cylindrical plug bearing identifying indicia electrically connected with a binding post, said shell formed with an end wall formed with a through bore; a metallic bushing formed with a through bore and shoulders and externally screw-threaded; a threaded nut for engagement with the thread of the bushing whereby the bushing may be passed through the through bore in the end wall of the insulating shell and the shoulders thereof bearing against the end wall of the metallic shell, the metallic shell may be held firmly in position by the application of the nut to the bushing and whereby a bared conductor may be passed through the bore of the bushing, means to attach the conductor to the bushing electrically; and a sleeve adapted to be passed down over the insulating shell for protecting the nut and bushing and bearing identifying indicia.

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