

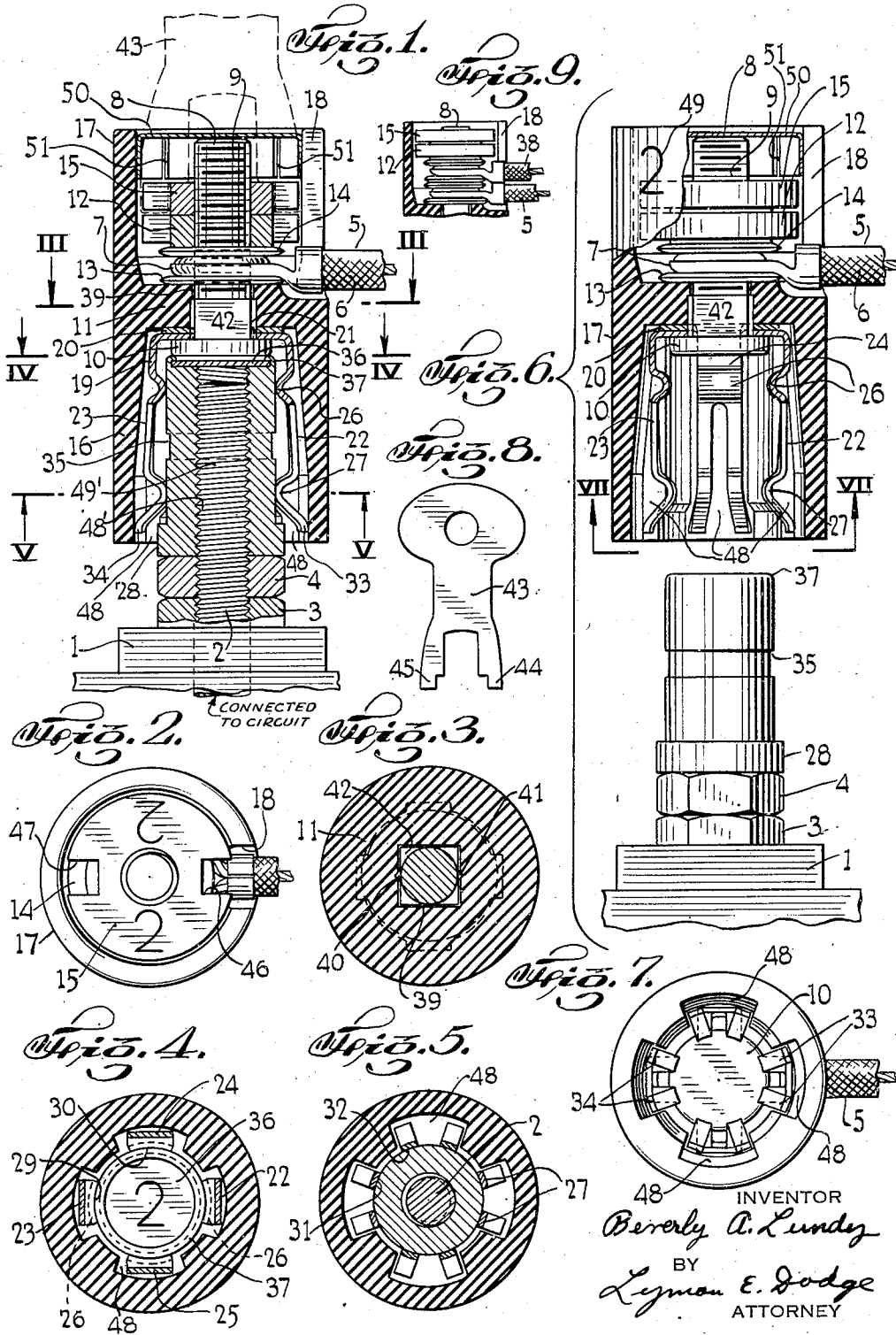
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CONNECTOR

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CONNECTOR

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1 Claim. (Cl. 173—324)

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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 character throughout, and in which,

Figure 1 is a vertical sectional 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 cap 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 a cross-sectional view of the device as shown by Fig. 1 on the plane indicated by the line IV—IV of Fig. 1, viewed in the direction of the arrows, at the ends of the line. Fig. 5 is a cross-sectional view of the device as shown by Fig. 1 on the plane indicated by the line V—V, viewed in the direction of the arrows at the ends of the line; Fig. 6 is an exploded view, showing, in elevation, a readily removable portion of my connector, and below, a portion of my connector which is permanently attached to a desired binding post; Fig. 7 is a bottom plan view of the removable portion of the device as shown by Fig. 6 viewed in the direction of the arrows VII—VII; Fig. 8 is a view of a key used with my invention; Fig. 9 is a fragmentary view illustrating the adaptability of my device for securing more than one conductor thereto.

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 thread-

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ing. It may be secured in any appropriate manner to the base 1 and usually includes a binding nut 3 and a check nut 4 and is connected in any suitable or appropriate manner to some circuit.

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.

The conductor, forming part of a circuit, which is to be electrically connected to the binding post 2 is indicated by 5. In the form shown, it is covered with an insulated material 6 and is provided at the end with an eyelet 7 made of metallic material and firmly electrically connected with the conducting wire within the insulated material 6 of the conductor 5. The eyelet 7 receives the metallic binding stud 8. This stud is provided with a screw thread 9 and with an enlarged head 10. The stud projects through an intermediate wall 11, so that as the head 10 is on one side of the wall and the eyelet 7 is on the other side of the wall a jam nut 12 may be threaded onto the stud 8 and securely jam the eyelet 7 toward the upper surface of the intermediate wall 11 and so hold it securely in place. Applicant's preferred construction is to place a metallic washer 13 below the eyelet 7 and a metallic washer 14 above the eyelet 7 and after turning nut 12 home, applying check nut 15 to stud 8

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to prevent the loosening of nut 12 so that all parts will be held firmly together.

The intermediate wall 11 is a portion of a shell of insulated material having two hollow spaces or cavities therein, one formed by the skirt 16 depending from intermediate wall 11 and the other formed by the upstanding skirt 17 rising from intermediate wall 11. The skirt 17 is slotted as at 18, to form a conductor receiving opening communicating with the upper cavity to allow the conductor 5 to extend into the hollow space formed by skirt 16. In the hollow space formed by skirt 16, two metallic spring members are positioned, 19 and 20. Each of these spring members is provided with an orifice having a flat side, preferably a square orifice, as at 21, and are placed over the stud 8, resting on the enlarged shoulder 10 thereof, and positioned between the head 10 and the lower surface of the intermediate partition 11 so that when eyelet 7 is tightly secured, the springs 19 and 20 are also tightly secured and due to the square orifice cannot rotate about the stud 8.

The spring members 19 and 20 have depending portions, as 22 and 23, on 19, and 24 and 25, on 20. These depending portions rest in longitudinal grooves, as 48, best shown in Fig. 5, and are each formed with inturned corrugations. One of these corrugations, as 26, is disposed in proximity to head 10, the other, as 27, is disposed in proximity to the lower open end of skirt 16. All of these corrugations, when the connector is in place, bear against cylindrical plug 28 and the surfaces bearing on the plug 28 of the spring members 19 and 20 are arcuate, as shown at 29 and 30 in Fig. 4, and 31 and 32 in Fig. 5, so that good mechanical and good electrical contact is secured.

The lower ends of the depending portions of spring members 19 and 20, as at 33 and 34, are bent outwardly sufficiently to bear against the inner surface of the wall of skirt 16 so that the spring members 19 and 20, especially at the contacting surfaces, as 31 and 32, are spring pressed firmly against plug 28.

The plug 28 is generally cylindrical in form and is uniform in diameter except in the intermediate portion. A part 35 is formed, in the nature of a circumferential groove, which is slightly less in diameter than the remainder of the plug.

The upper end of the plug bears indicia. This is preferably in the form of a thin disk 36 positioned on the top of the plug and held in place thereon by forming a relatively thin skirt 37 at the upper end of the plug and then after pressing the disk 36 in place crimping or spinning the skirt over onto the disk to hold the disk in place. The disk, before being put in place, has the indicia suitably inscribed thereon in any usual or desired manner, preferably by stamping, and the indicia may be any desired indicia, such as a digit or number, as numeral 2. This indicia on the plug 28 will correspond with a like indicia on the jam or check nut 15, as shown in Fig. 2, or alternatively or in addition, like indicia on the shell, as at 49.

The skirt 17 and the slot 18 are made of such dimensions that instead of connecting one conductor only, as to stud 8, two or more may be connected, as shown in Fig. 9, in which 38 designates a second conductor which may be connected along with conductor 5 to stud 8.

In assembling the device, the spring members 19 and 20 are placed over stud 8 and then stud

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8 with the spring members are inserted through the lower end of skirt 16 and the stud is pressed through the bore 39 in the intermediate wall 11 until it arrives in position as shown in Fig. 1. In order that it will be retained in this position while placing the conductor eyelet 7 thereon, it may be cemented in place, or a couple of ribs, as 40 and 41, are formed on the squared part 42 of the stud 8 which are pressed into the insulated material of the shell whereby the stud is temporarily held in place while washer 13 is first placed thereon, then eyelet 7 is placed thereon, then washer 14, and after nut 12 has been put in place, check nut 15 is put in place. Each of these nuts 12 and 15 being threaded down by means of the key 43 which is provided with depending lugs 44 and 45 to fit into the notches, as 46 and 47, respectively, of the nuts, although, of course, it is not desired to exclude the use of nuts 12 and 15 of such size that a socket wrench may be used thereon.

The plug 28 is internally threaded, as at 48', to cooperate with a thread 49' on the binding post 2, and is screwed down thereon into the position as shown in Fig. 1. When the parts are positioned as shown in Fig. 6, the shell together with the associated parts is then pushed down into place upon the plug 28 until it reaches the position as shown in Fig. 1.

In order to more completely protect the electrical conducting parts, a covering shell 50 may be inserted into the top of the hollow skirt 17. This covering shell may be made of any well known appropriate insulating material, and have slots as 51 in its depending skirt so that it may be held in skirt 17 by its natural spring.

If at any time it is desired to remove the conductor 5 from electrical connection binding post 2, the insulated shell on the conductor binding shell is grasped and the shell pulled upwardly off the plug 28. When the shell is pulled upwardly, the bends 27 of the spring members drop into circumferential groove 35 and necessitates a harder pull to complete the motion of the shell off the plug 28. This is done because it may happen that a slight pull upon conductor 5 may displace the shell but when the projections 27 drop into the grooves 25 a very decided pull is necessary to entirely remove the shell from plug 28 so that the groove 35 acts on a safety catch. This may be dispensed with if not desired.

When the shell together with its associated parts is removed from the plug 28, the plug 28 is then free to apply any test point thereto to ascertain the condition with respect to the circuit connected therewith and a test point may also be applied to stud 8 to ascertain the condition of the circuit of which conductor 5 forms a part. While the shell is removed from the plug, it may be swinging about and coming in contact with other objects but all of the electrical conducting parts are well protected by the shell so that no undesired electrical circuit will be formed.

After the shell with its associated parts has been removed from the plug 28, there is no necessity for remembering which shell and the conductor connected thereto should be associated with which binding post because it is merely necessary to inspect the check nut 15 at the top of the shell and the indicia at the top of the plug 28 and then place like indicia together.

The inbent portion 26 of the dependent spring members not only assists in making good electric contact with the plug 28, but it also assists

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in steadying and keeping the insulating shell properly lined up so that its outer surface is in a line substantially parallel with the surface of the binding post 2 so that the shells have no tendency to wobble about on the binding posts.

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 threaded binding post, including, in combination: a cylindrical plug screw threadedly attached to a threaded binding post; an insulating shell formed with an upper cavity and a lower cavity separated by a wall formed with a through bore, and also formed with a conductor receiving opening communicating with the upper cavity in the form of a slot extending longitudinally of the shell and extending to the top face thereof; a headed threaded metallic stud positioned in the bore with the threaded portion above the said wall and the headed portion below the said wall; means including threaded nuts engaging the threaded metallic stud posi-

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tioned in the upper cavity to mechanically and electrically attach an electrical conductor to the stud and means positioned entirely in the lower cavity electrically connected to the stud for making mechanical and electrical contact with the said plug.

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