

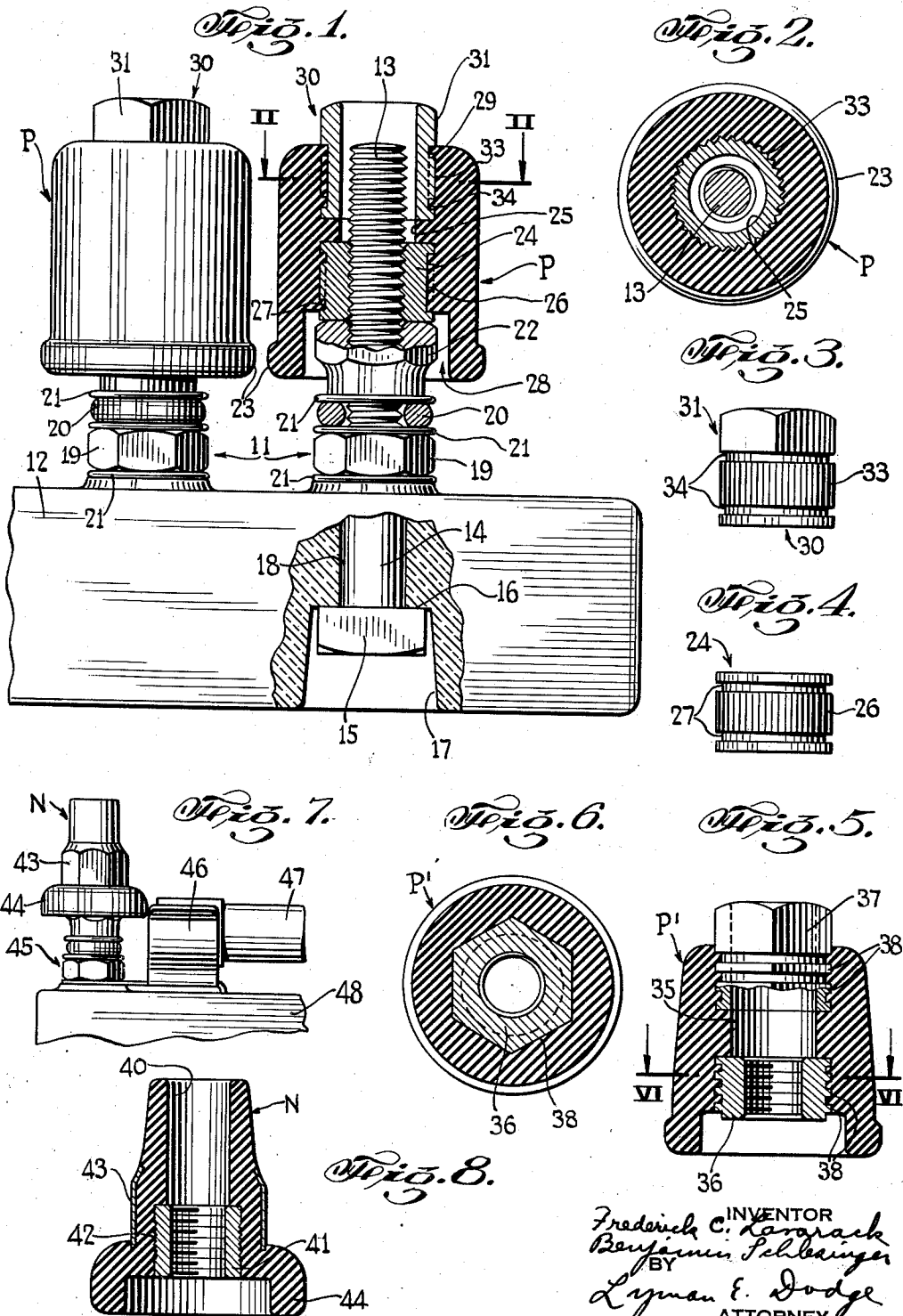
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INSULATED BINDING NUT

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INSULATED BINDING NUT

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1 Claim. (Cl. 173—259)

This invention relates to binding posts or terminals for establishing electrical connections with relay and other instruments, especially where a plurality of such instruments are installed in close juxtaposition, and more particularly where a multiplicity of posts are associated in a bank of instruments.

When relay posts, for example, are so disposed, if a tool or other metal object such as a stout wire or rod happens to fall against two or more of the exposed free ends of the metal binding posts, as they are at present constructed and installed, it frequently occurs that undesired cross connections are established between the circuits in which the posts are connected, and sometimes serious accidents have resulted from such crosses.

At the present time, no convenient means to avoid the above danger is available, notably for the reason that it is very undesirable to interfere with ready access to the individual binding posts and the instruments with which they are associated as, for example, for purposes of inspection, repairs and replacements.

On this account, neither the complete enclosure of the banks of posts, as by boxes, is regarded as desirable, nor the provision of screens which must be removed before access can be had to the instruments.

Under such conditions, it is an object of the present invention to provide a means applicable readily to the threaded free end of an existing binding post, by which that post is immediately protected against contact therewith by a metal object of a size likely to bridge the space between that post and other posts or other exposed metal parts of instruments included in any electrical circuit comprised within the system to be protected.

Another object of the invention is to provide for each post, or for as many of them as may require such protection, a protective device having an entity separable from the post, and which can be readily installed by the use of the customarily available tools, such as keys, wrenches or pliers, without special preparation.

Still another object is to provide such a protector in the form of a body of insulating material with an adequate dielectric characteristic, and to impart additional sturdiness to this device by the provision of metal reinforcements some of which are so disposed as to be engaged by any metal tool used in the installation of the protector, while other reinforcements support mechanical strains encountered in use, the gen-

eral object of these last named fitments being to avoid fracture of the insulating medium and to prolong the life and usefulness of the protector.

Other features and advantages of the novel protector will appear as the disclosure of the particular physical structure selected to illustrate the invention progresses.

In the accompanying drawing, like characters of reference have been applied to corresponding parts throughout the several views composing the drawing, in which:

Figure 1 is a view in elevation of a pair of binding posts in a typical installation, fitted with two protective insulating nuts in the construction of which the present invention has been embodied, one of the nuts being shown in vertical section; Fig. 2 is a fragmentary detail view in horizontal section on the line II—II of Fig. 1, this view being taken in the direction indicated by the arrows at the end of the line; Fig. 3 is a detail view in side elevation of a metal bushing of the form shown as part of the protector structure illustrated in Figs. 1 and 2; Fig. 4 is a similar detail view of another bushing component, taken separately; Fig. 5 is a view in vertical section of a modification of the protector device; Fig. 6 is a view in horizontal section taken on the line VI—VI of Fig. 5, viewed in the direction indicated by the arrows at the end of the line; Fig. 7 is a view similar to Fig. 1, showing a modified form of protector embodying the invention as applied to an electrical fuse assembly; Fig. 8 is a vertical sectional detail of the protector device as shown in Fig. 7 but taken separately, and on a larger scale.

In the now preferred embodiment of the invention selected for illustration and description, the parts designated respectively by the reference characters 11, in general, are electrical terminals mounted upon an insulating base 12 which may form part of an instrument panel, and as such terminals are usually of identical structure it is sufficient to describe that shown in section in Fig. 1, as illustrative of its type, in the application of the invention thereto.

Each terminal 11 may desirably comprise, as does that shown in the sectional part of Fig. 1, a threaded post 13, which is constituted in this instance by the free end of a bolt 14, the head 15 of which is engaged with a shoulder 16 of a recess 17 in the bottom of base 12, while the shank lies in a bore 18 of the base.

Above the base is provided the usual assembly of nuts and washers by which the post is secured to the base, and by which the bared portion 20

of a conductor is bound electrically and mechanically to the post. A nut 19 is run down the post against the base, with a washer 21 therebetween and a nut 22 is also run down along the post to bind the loop 20 of the bared conductor against the abutment afforded by the upper surface of the nut 19, washers 21 being usually interposed as shown, to avoid frictional displacement of the wire by the necessary rotation of the nut 22.

The structure thus far described is conventional, and ordinarily the free threaded ends 13 of these terminal posts are exposed, so that any piece of metal falling against two adjacent unprotected posts, such as those shown, is likely to cause a dangerous cross-connection.

In pursuance of the present invention, we provide a protector device for such terminal posts 13, preferably one for each, these protectors being designated generally by the reference character P, and preferably they will be of uniform contour, so that for a given size two such protectors will approach each other very closely throughout their extent, and more particularly at their lower extremities, as shown at 23, where they have ribs that may be as near each other as a sixteenth of an inch.

Being so near, it is practically impossible for a tool or other piece of metal, such as a rod, or even a wire, to penetrate below the level of the insulating bodies and contact with two of the binding regions 11 at the same time, and thus the danger of cross-connections is completely avoided, for all practical purposes.

The insulating bodies P may be supported in proper position by any suitable means, of which one convenient form is illustrated at the right hand side of Fig. 1. For this purpose, a nut 24 is imbedded in the material constituting the walls of the bore 25 which is of sufficient diameter to fit easily over the threaded terminal 13 of the post. The nut 24, as shown best in Fig. 4, may have a serrated periphery 26 and circumferential grooves 27 to interlock with the material of the insulating body P, which latter may desirably be made of a fictile resinous material, such as "Bakelite", moulded to shape.

The bore 25 is shown as enlarged at 28 so that the effect is that of a petticoat large enough to receive the nut 22, and thus the protector P may be run down until the nut 22 is engaged by the bottom of the nut 24, and the latter acts as a lock nut, aiding to maintain the binding action upon the wire 20. The protective efficiency of the ribs 23 is likewise the better for their disposition down over the nut 22. The protector replaces the lock nut usually provided on a binding post, as well as serving its intended purpose of providing a means for protecting the binding post from contact by metal objects.

In order to make it easy to screw the protector P tightly into the position illustrated, a metal bushing 30 is moulded into the material of the walls of the bore, as within the mouth 29, at the free end thereof, and this bushing may have a non-circular portion 31 exposed beyond the mouth of the insulating body so that a wrench, key or pliers may be applied to operate the protector, without injury thereto.

The periphery 33 of the bushing 30, as shown separately in Fig. 3 and in section in Fig. 2 is

serrated, and may have circumferential grooves 34 to aid anchorage of the bushing in the body of insulating material.

A modified form of protector is illustrated in Figs. 5 and 6, which embodies however the components above described and carries into effect the underlying idea of means by which the present invention is characterized.

In Fig. 5 a somewhat conical shape is given to the insulating body P' and in its bore 35 a polygonal nut 36 and a polygonal bushing 37 replace the nut 24 and bushing 30 of the Fig. 1 construction, but act in the same manner to effect the intended purpose, viz., to prevent relative rotation between the body P' and its bushing and nut respectively while the protector is being screwed home by the use of a tool applied to the projecting polygonal end 37. The circumferential ribs 38 on each of these elements within the bore prevent coaxial displacement thereof in the body of insulating material.

In Figs. 7 and 8, another modification is illustrated comprising a nipple-shaped insulating body N having a bore 40 into the lower end of which is molded a nut 41 with knurled periphery 42. Upon the waist of this body a metal sleeve 43 of polygonal contour is fitted, as illustrated clearly in Fig. 7, thus furnishing a better grip surface for the application of a tool, and preventing any likelihood of injury to the insulating material.

Below the waist portion 43 an integral skirt 44 of insulating material projects to such an extent that it may be utilized to bridge the space between the post 45 of the terminal and the neighboring clip 46 in which a fuse 47 is shown as supported, in the present instance. In this case, the protector nozzle N presents connection between the post on which it is placed and the adjacent post (not shown) by an object falling thereon in such a manner as, ordinarily, to cross-connect the posts.

Although we have particularly described one particular physical embodiment of our invention and explained the operation, construction and principle thereof, nevertheless, we desire to have it understood that the form selected is merely illustrative, but does not exhaust the possible physical embodiments of the idea of means underlying our invention.

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

As a new article of manufacture, an insulating body having an axial bore adapted to fit over the free threaded end of an electrical terminal post of the class provided with at least one binding nut screwed upon said post, for securing a bared conductor part near the base of said post, said body having an enlargement at one end in its bore adapted to receive said binding nut, and also having fixed in said bore a nut adapted to be engaged with said binding nut when screwed home, said binding nut face terminating the enlargement in the bore, and a bushing fixed non-rotatively in the other end outer mouth of said bore, and having a non-circular portion extending beyond said mouth to receive a tool.

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