

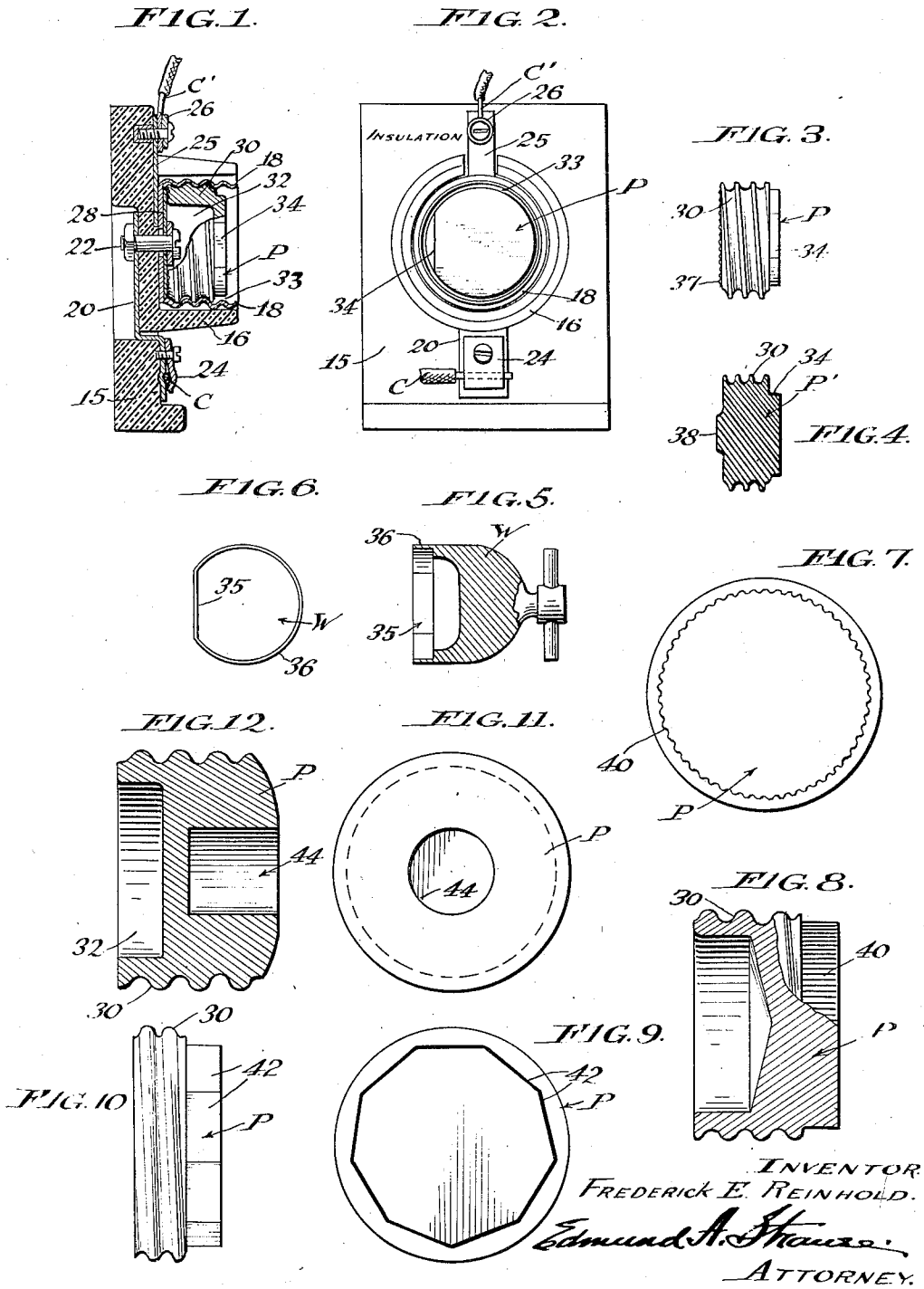
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LOCKING PLUG FOR ELECTRIC CIRCUITS

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LOCKING PLUG FOR ELECTRIC CIRCUITS

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This invention relates to electrical service equipment and more especially to plugs adapted to be locked in position in the sockets of various receptacles, fuse boxes, cut-outs and the like.

Such plugs may be either "dummy" or sealing plugs to seal circuits open when it is desired to discontinue service there-through, or they may be the type to serve as solid through connections for sealing the circuits closed, thereby replacing fuses, for example in the neutral line.

The primary object of the invention is to provide a novel plug of the stated character which cannot be removed from a socket by an unauthorized person or by anyone not provided with a special removing tool therefor.

A further object is to provide such a plug which will require a tool of unusual construction for its removal, the tool being of a type which is not easily duplicated and which could be duplicated only in exceptionally well equipped shops, thus reducing the probabilities of unauthorized removal to a very low minimum.

A further object is to provide a plug which in itself is simple, low in manufacturing cost and adapted to manufacture in one-piece, i. e. integral form.

Another object is to provide a novel sealing plug or dummy adapted to be locked in a receptacle to cut off current and maintain an open circuit so that no power may be obtained through the respective outlet. And still another object is to provide a novel locking plug which may be installed in a socket of a standard cut-out block to maintain the respective circuit closed whereby a solid through connection may be had in the neutral return of a three-wire system.

Briefly stated, the invention in its broad application resides in the combination with a socket of any electrical equipment, of a plug adapted to be screwed into the socket and to be wholly enclosed thereby, the upper

portion of the plug being formed to require a special engaging tool for its removal. In the preferred form, a very thin annular space is provided between the head of the plug and the shell of the socket, so that a very thin-walled socket wrench or the like is required to enter such space to grip the plug. The plug may be a cut-off plug, that is, a dummy to seal the circuit, or it may be a connector to close the circuit by providing a solid through connection. In the former instance it may be provided with a cavity to avoid contact at one point, or it may be of non-conducting material; in the latter instance it will be of conducting material. In either instance, it will be preferably of one-piece construction or the equivalent, no moving parts being provided. The invention resides also in such other novel combinations and features of construction as may be herein set forth.

In the accompanying drawings wherein certain embodiments of the invention are disclosed by way of illustration;

Fig. 1, is a cross section through a standard cut-out showing a sealing plug or dummy of the present invention in operative position in the socket thereof.

Fig. 2, is an elevation of the combined structure of Fig. 1.

Fig. 3, is a side elevation of the sealing plug per se.

Fig. 4, is a section through a similar plug designed however to maintain a through connection in the circuit.

Fig. 5, is a longitudinal section through a special socket wrench required to remove the plugs of Figs. 1 to 4.

Fig. 6, is an end view thereof.

Fig. 7, is a face view of the outer end of a sealing plug provided with a modified forming of engaging head.

Fig. 8, is chiefly a sectional view through the plug of Fig. 7.

Figs. 9 and 10, are similar views of a further modification.

Figs. 11 and 12, are similar views of still another form.

In Figs. 1 and 2, there is shown a standard cut-out block having the usual base 15 of suitable non-conducting material such as porcelain, and equipped with a socket formed by the integral annular enclosing wall 16 which receives the usual threaded metal conducting shell 18. A lead 20 connects the center contact 22 with a terminal clip 24 to secure a conductor —C—, and a second lead 25 connects the shell 18 with the terminal clip 26 which secures another conductor —C'—. An insulating disc 28 at the bottom of the socket provides the required separation in this particular design.

The sealing plug —P— of the present invention is provided with an annular body wall 30 threaded as indicated to enter the screw shell 18, the inner end of the plug having a cavity 32 which overlies and insures against engagement with the center contact 22, whereby, even if the plug were manufactured from conducting material, the circuit cannot be closed. The head of the plug in this form is circular for the greater part of its periphery and has a diameter only very slightly less than the diameter of the shell 18 so as to provide a very narrow annular space between the shell and the head of the plug —P— as indicated at 33.

In order to provide a contacting face for removal of the plug, one side of the head thereof is flattened for a short distance as indicated at 34 in Figs. 1 to 3, and this face 34 is adapted to be engaged by a correspondingly flattened face 35 on the interior of a thin annular wall 36 of a socket wrench —W— seen in Figs. 5 and 6. The thin wall 36 is adapted to be inserted in the narrow annular space 33, the flat faces 34 and 35 engaging in such fashion as will insure the firm installation or the removal of the plug. In order that a very firm engagement may be insured at the bottom of the socket the inner annular face of the plug may be knurled or otherwise roughened at 37 so that it will bite into the insulating disc 28, thus making it almost impossible to loosen a tight plug without the proper wrench.

In Fig. 4, there is shown a plug —P'— which is of conducting material and solid throughout, that is, it has no cavity as does the plug —P—, and the central portion of its inner face is provided with a slightly protruding contact 38 for engagement with the center contact 22. In other respects this plug is the same as the plug —P— and requires the same tool for its installation and removal. In this form, however, a solid through connection is provided in the neutral return, connection between the shell 18 and the center contact 22 being made thereby, and

being insured by reason of the locking feature of the plug.

In Figs. 7 and 8, the head of the plug —P— is modified by fluting or milling as at 40, for which a corresponding wrench would be required. In Figs. 9 and 10, a further modification is disclosed, the enneagon here shown being illustrative of a polygon having a sufficient number of faces 42 so that the spaces therebetween and the shell 18 will be too small to admit pliers, and particularly illustrative of such a configuration where an uneven number of sides is provided so that the non-parallelism of any two sides would make it difficult to employ pliers provided even with very thin noses. The modification of Figs. 11 and 12, discloses a circular bore 44 which will require an expanding tool having means to bind the same in the bore to accomplish removal of the plug.

Plugs of the character here disclosed are especially adapted to manufacture in one-piece which reduces the cost thereof to a small figure. At the same time they may be made of metal or bakelite or other substantially indestructible materials. With the proper tool they may be easily installed and removed, but without it removal is almost impossible. Because of this fact and the fact that it is practically impossible to break them for removal from sockets, the loss by breakage and unauthorized removal will be extremely small. Thus the saving in time, in loss, and in cost of manufacture, represent a great advantage to concerns operating over large territories. This, coupled with the usual saving in current accomplished by avoiding unauthorized removal and replacement of plugs by fuses or the like, and the additional saving accomplished by avoiding meter changes, makes possible a great reduction in service costs, it being necessary, when cutting off service, merely to replace fuses with plugs of the present invention without the necessity of removing the meter or cutting out at the pole, or at the manhole, or other remote place, and the reverse operation when renewing service. Apartment house managers and the like may also protect their own circuits by employing plugs of this type, thereby not only avoiding unauthorized use but being also enabled to give immediate service to new tenants.

It is to be understood that the specific embodiments here disclosed are not to be considered as in any sense limiting my invention, but that they are merely illustrative of its generic nature, and that many variations may be made within the scope of the appended claim by those skilled in the art, without in any way departing from the inventive concept inherent herein.

I claim:

In combination, an electric socket having a screw shell, and a one part screw plug

having a circular head secured in said shell,
the periphery of said head being deformed
and of slightly less diameter than the internal
diameter of said shell and adapted to be en-
gaged by a circular socket tool whose inner
periphery is deformed similar to the periph-
ery of the plug for removing the same from
the shell, the head of said plug being dis-
posed below the rim of the screw shell when
the plug is secured therein to prevent unau-
thorized removal.

In testimony whereof I affix my signature.

FREDERICK E. REINHOLD.

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