Jan. 23, 1934. H. A. CALDERWOOD 1,944,706

KNOCK-OUT

Filed April 24, 1931

Fig. 1

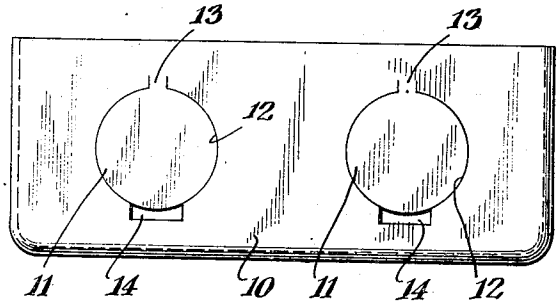


Fig. 2

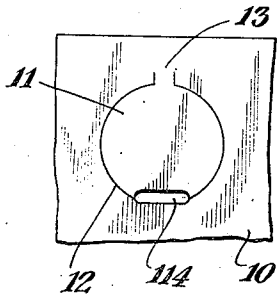


Fig. 3

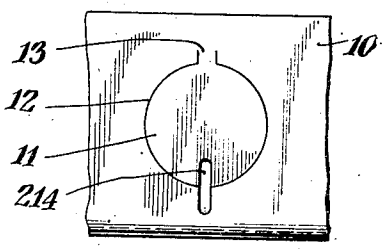


Fig. 4

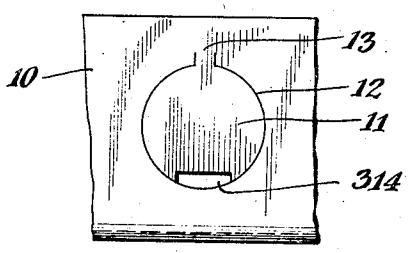
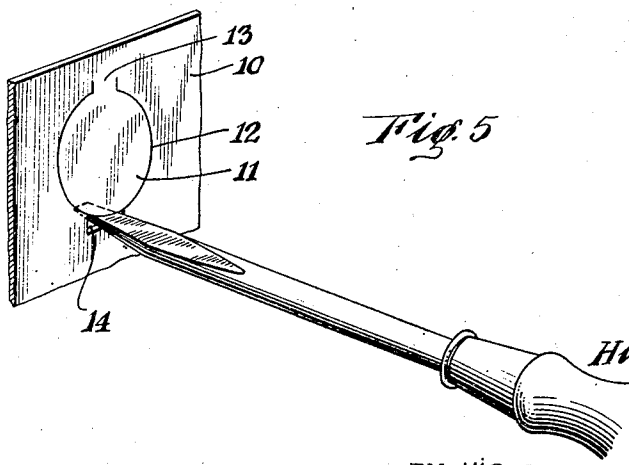


Fig. 5



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1,944,706

KNOCK-OUT

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Application April 24, 1931. Serial No. 532,409

1 Claim. (Cl. 247—26)

This invention relates to electrical apparatus. More specifically the invention relates to protective means for such apparatus and from a still more specific viewpoint, the invention relates to so-called pry-outs or knock-outs.

Among other objects the invention has for its purposes to provide arrangements in which the knock-outs may be readily and quickly removed if and when desired and which are, nevertheless, held securely in their protective positions up to the time that they are removed.

Other objects and advantages will appear as the invention is hereinafter disclosed.

Referring to the drawing which illustrates what I now consider preferred physical embodiments of the invention:

Fig. 1 is an elevational view of a knock-out box embodying one form of my invention.

Figs. 2, 3 and 4 are fragmentary detail elevations illustrating modified forms of the invention.

Fig. 5 is a fragmentary detail perspective view showing how a knock-out of the type shown in Fig. 1 may be removed.

Referring to the drawing, the box wall, 10, constructed of suitable metal or other protective material, is shown provided with a plurality of knock-outs 11 formed by punching out the greater part of the periphery as indicated at 12; the punching being preferably through the entire thickness of the wall of the box. Each of the knock-outs 11 is shown provided with an intact portion 13 which connects it integrally with the wall of the box preferably in the plane of the wall 10 until the knock-out is removed.

For the purpose of removing the knock-out, the wall 10 of the casing or box is shown provided in Fig. 1, with a cut away portion or slot 14, in this instance shown wholly outside the area of the adjacent knock-out but communicating with the opening left by the knock-out after it has been removed.

When it is desired to remove the knock-out of the type shown in Fig. 1, a screw driver or similar tool is inserted into the corresponding slot 14 as shown in Fig. 5 and then operated as a lever about the lower edge of the slot 14 as a fulcrum so as to pry the knock-out 11 outwardly with respect to the plane of the box or casing wall 10 so that the intact portion 13 is, or may be, readily ruptured. Depending upon the nature of the material of which the wall 10, knock-out 11 and intact portion are constructed, the intact portion 13 may be ruptured merely by the prying out operation just described or, if the intact portion is more resistant it may be necessary to bend the pried-out disk 11 back and forth one or more times with respect to the wall of the box 10 so as to rupture the intact portion.

After any knock-out has been removed the opening that is left may be employed in the usual manner to receive a rigid or flexible conduit for electrical wires or conductors, or other device or appliance.

The invention is susceptible to modification. Thus, in Fig. 2, the slot 114 for receiving the screw driver or other removing tool, is not, as in the case of Fig. 1, wholly in the wall 10 of the box or casing but lies, in part, within the boundary of the knock-out or pry-out 11. In the form shown in Fig. 2 the tool-receiving slot 114 lies partially outside of the periphery of the disk 11 (i. e. partially in the box wall 10), and partially within or inside the periphery of the disk 11 (i. e. within the boundary of the pry-out). The construction and operation of the form of invention shown in Fig. 2 will be clear in view of the foregoing description of Fig. 1 supplemented by the description of Fig. 2 just made.

In Fig. 3 the construction and operation are the same as in the case of Fig. 1 and Fig. 2 except for the following differences. In this case (Fig. 3), the slot 214 which is adapted to receive the bit or blade of the screw driver or other removing tool is so disposed as to be substantially radial with respect to the disk 11 but otherwise it is similar to the form shown in Fig. 2 in that it overlaps the boundary or periphery of the disk 11. In this case (Fig. 3) in order to remove the knock-out, the screw driver blade, after insertion into the slot 214, engages the lower end of the slot 214 as a fulcrum with the lower edge of the screw driver blade in contact with this fulcrum and the upper edge of the screw driver blade is employed to engage the knock-out and pry it outwardly. In certain cases this construction is especially advantageous in that the blade of the screw driver or other removing tool is less likely to be bent or deformed in the knock-out removing operation.

Still another modification is illustrated in Fig. 4, which shows a construction otherwise similar to those shown in Figs. 1, 2 and 3, except that in Fig. 4 the slot 314 for receiving the bit or blade of the screw driver or other removing tool, is located wholly within the boundary or periphery of the disk or knock-out 11. The operation in removing this knock-out is quite similar to that set forth above in connection with Fig. 1 and needs no further description.

It will be understood, of course, that the vari-

ous slots 14, 114, 214 and 314 extend completely through the wall 10 and/or the disk 11 so that the blade or bit of the screw driver or other removing tool may be inserted therethrough to such an extent as to give the desired purchase or leverage.

In accordance with the provisions of the patent statutes, I have herein described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiments thereof, but I desire to have it understood that the apparatus disclosed is only illustrative and that the invention can be carried out by other means. Also, while it is designed to use the various features and elements in the combinations and relations described, some of these may be altered and others omitted and some of the features of each modification may be embodied in the others without interfering with the more general results outlined, and the invention extends to such use within the scope of the appended claim.

What I claim is:

In an electric protective means, a casing having a pry-out in a wall thereof, said pry-out being provided with an opening for the reception of a prying tool whereby said pry-out may be pried loose from said wall, said pry-out being defined by a portion of the circumference of a circle, said opening being disposed partly within and partly without said circle, said opening being elongated and having its long dimension lying substantially radially with respect to said circle.

HUGH A. CALDERWOOD.