W. A. HALL.

OUTLET BOX.

APPLICATION FILED APR. 27, 1912.

1,132,087. Patented Mar. 16, 1915.

Fig. 1,

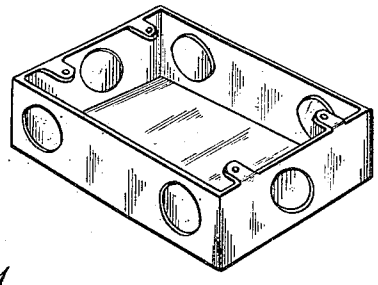


Fig. 2,

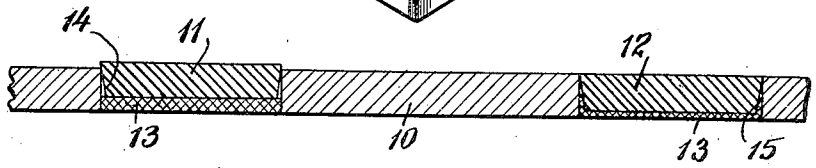


Fig. 3,

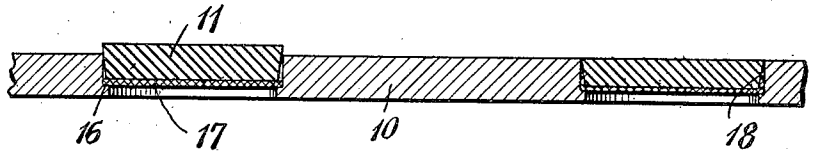


Fig. 4,

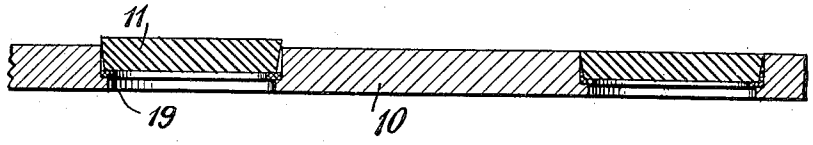


Fig. 5,

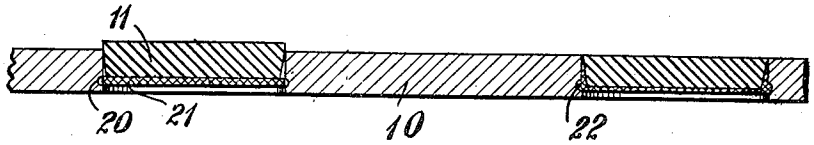
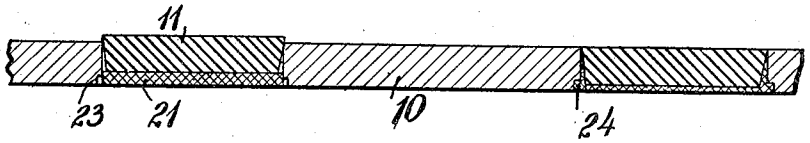


Fig. 6,



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OUTLET-BOX.

1,132,087. Specification of Letters Patent. Patented Mar. 16, 1915.

Application filed April 27, 1912. Serial No. 693,630.

To all whom it may concern:

Be it known that I, WILLIAM A. HALL, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Outlet-Boxes, of which the following is a specification.

This invention relates to outlet-boxes of the type commonly employed in installing electric wiring in buildings.

More particularly, the invention relates to boxes of this type known as "knock-out" boxes, the walls of which are so formed as to permit of readily removing a disk or other shaped section of the wall so as to provide an opening leading to the interior of the box through which the end of a conductor may be inserted.

The invention is directed to the provision of an improved form of outlet-box having knock-outs provided in the wall thereof, which may be readily removed and so constructed that the wall of the box is watertight notwithstanding the provision for knock-outs in the wall.

On account of the manner in which outlet-boxes are employed, the locations in which they are mounted and the fact that the boxes inclose exposed parts carrying electric current, it is highly important that the walls of such outlet-boxes be watertight. At the same time it is important that knock-outs be provided in the walls of such outlet-boxes so that as many conductors as are desired may be led into the box at various points around the wall of the box. It has heretofore been proposed to make these knock-out outlet-boxes from cast metal and to provide circular depressions in the walls of a box defining the knock-outs, the material at the bottom of each of these depressions being so thin that it may be readily ruptured in order to remove the knock-out and thus provide an opening. This construction, however, has always been objectionable because of the fact that the removal of the knock-out from a cast metal box leaves a rough edge of metal around the opening which interferes with properly joining the outlet-box and conduit, and furthermore, permits moisture to enter. Outlet-boxes have also been made of sheet-metal, the knock-outs being provided by cutting disks of metal from the walls of the boxes and wedging or otherwise holding these disks in their openings. With this construction, an opening may be readily provided by striking a blow upon a disk and thus forcing it out of its opening. Knock-out boxes so constructed, however, are open to the objection that they are not watertight. The cutting of the metal of the wall of the box all the way through provides a narow space into which moisture may enter and corrode the metal of the box-wall and knock-out disk at the junction between them. This invention is directed to the provision of an improved form of knock-out outlet-box, either of sheet-metal or cast-metal, wherein the junction between the box-wall and knock-out disk is watertight. In accordance with the invention a filling is provided about the edges of the knock-outs and between those edges and the walls of the openings in which the knock-outs lie, which fills the spaces so as to make the joints at these points so tight as to preclude the entrance of moisture into the interior of the box through the joints about the knock-outs.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of a sheet-metal outlet-box and Figs. 2 to 6 are sectional views through a wall of the box illustrating methods which may be employed in the construction of the knock-outs.

Referring first to Fig. 1, an outlet-box is shown in this drawing made from sheet-metal, preferably by forming the bottom and the four sides of the box from a single piece of sheet-metal. The walls of the box are provided with knock-outs in the usual or any suitable manner. In the present instance, the knock-outs are shown as cut from the walls of the box by a stamping operation so that the knock-out is entirely severed from the wall and thereafter each knock-out is forced back into its opening in the wall of the box so as to become wedged therein. It will be understood, however, that the knock-outs may be otherwise formed without departing from the spirit of my invention, as for instance, by cutting each disk from the wall of the box around a large portion but less than the whole of the periphery of the disk.

Referring now to Fig. 2, a wall of the box is shown at 10 having provision for two knock-outs 11 and 12 therein. A disk is

cut from the wall 10 of the box so as to become entirely disconnected therefrom. This same disk may be again inserted in the opening thus formed to provide a removable closure for the opening. Preferably, however, a disk of thinner metal is employed for closing the opening in the wall 10. Such a disk is shown at 11. When inserting this disk in the opening in wall 10, a disk 13 of a metal which is substantially softer than the metal of the wall 10 and disk 11, as for instance, lead composition, is placed in the opening in wall 10 with one face thereof abutting against one face of the disk 11. Preferably the disk 11 is provided with a tapered peripheral surface, as shown at 14. The parts being assembled thus, the disks 11 and 13 are subjected to pressure tending to force them together, as a result of which the soft metal 13 is forced into the space between the peripheral surface of disk 11 and the edge of the opening in wall 10. The application of the pressure is preferably such as to cause the disk 11 to become flush with one side of the wall 10 and the soft metal 13 to become flush with the other side of that wall. The positions of the parts, after being subjected to pressure thus, are shown at the right of Fig. 2 wherein it will be seen that the exposed face of the disk is flush with one side of the wall 10 and the soft metal 13 has been forced into the space between the tapered peripheral surface of disk 12 and the edge of the opening in wall 10, as shown at 15. When the parts have been forced into the position shown at the right of Fig. 2, the knock-out will be held tightly in its opening in wall 10 but may be readily removed therefrom by striking it lightly but moisture will not enter the box through the joint about the disk 12 because of the provision of the filling 15 of soft metal.

Fig. 3 illustrates a construction which may be employed in making a cast-metal knock-out outlet-box which is waterproof. The construction shown in this figure is the same as that shown in Fig. 2 except that the opening through the wall 10 is of smaller diameter at one end than at the other so that a ledge 16 is provided within the opening. In assembling the parts, a disk 17 of soft metal of a diameter corresponding to the diameter of the larger portion of the opening in wall 10 is placed in that opening against the ledge 16 and the smaller end of the disk 11 is then inserted in the opening and moved into contact with disk 17. These parts are then subjected to pressure which forces the disk 11 inwardly so that its outer face becomes flush with the face of wall 10 and so that the soft metal 17 is compelled to fill in the space between the peripheral surface of disk 11 and the wall of the opening, as shown at 18, the parts being then in the positions illustrated at the right of Fig. 3.

Fig. 4 illustrates a construction similar in all respects to that shown in Fig. 3 except that a ring or annulus 19 of the soft metal is employed instead of the disk 17 shown in Fig. 3.

Fig. 5 illustrates another construction which may be employed in accordance with which a circumferential groove is provided in the wall of the opening provided for the reception of the knock-out disk 11. This groove is shown at 20. The disk 11 and the disk 21 of soft metal, after being assembled as shown at the left of Fig. 5, are subjected to pressure which forces the disk 11 inwardly. As this occurs, the soft metal 21 is forced into the groove 20 as shown at 22 so as to make the joint between the disk and the wall of the box watertight.

In Fig. 6, the opening in the wall of the box is countersunk at one end, as shown at 23. The knock-out 11 and the disk 21 of soft metal are assembled as before and subjected to pressure whereupon the soft metal is forced into the countersink 23, as shown at 24.

In all of the constructions herein shown and described either cast-metal or sheet-metal may be employed and the advantages incident to the use of both or either retained, these including the provision of an opening having a smooth surface on the removal of the knock-out. In each case, however, the joint between the knock-out and the wall of the opening in which it lies is a watertight joint by reason of the provision of a filling of soft metal or other suitable substance in this joint.

It will be understood that the invention herein described is applicable to various forms of boxes of the general type of that illustrated in the drawing which type I have designated by the general term "outlet box." Within this term I include boxes for making electrical connection to a fixture which are classed as out-let boxes when using that term in its strict sense, and also junction-boxes and other forms of boxes into which electrical conductors are led. In view of the general application of the invention to all these types of boxes, I do not consider myself limited in any way as to the type of box in which this invention is employed.

Having described my invention, what I claim as new therein and desire to secure by Letters Patent of the United States is:

1. A metallic outlet-box having one side thereof provided with an opening therethrough, and a ledge in the wall of said opening, a filling of compressible, non-absorbent material resting upon said ledge and extending around the walls of said opening as a lining therefor, between said ledge and a face of the side of the box, and a knockout disk having a tapered periphery seated in

said opening upon said filling with its periphery wedged into close water-tight contact with the edge portions of said filling, the outer face of said disk being flush with the said face of the side of the box, substantially as set forth.

2. A metallic outlet-box having one side thereof provided with an opening therethrough, and a ledge in the wall of said opening, a filling of compressible, non-absorbent material comprising a disk-like base portion resting upon said ledge and an edge portion extending from the periphery of said base portion around the walls of said opening as a lining therefor, between said ledge and a face of the side of the box, and a tapered knockout disk seated in said opening upon the base portion of the filling and with its edges wedged into close water-tight contact with the edge-portion of the filling, substantially as set forth.

3. A metallic outlet-box having one side thereof provided with an opening therethrough, a filling of compressible, non-absorbent material comprising a base portion of slight thickness extending across the opening, between the two faces of the said side of the box, and an edge portion extending from the periphery of said base portion around the walls of said opening as a lining therefor, between the base portion and one face of the side of the box, and a tapered knockout disk seated in said opening upon the base portion of the filling and with its edges wedged into close water-tight contact with the edge portions of the filling, substantially as set forth.

This specification signed and witnessed this 25 day of April, 1912.

WILLIAM A. HALL.

Witnesses:
PETER S. O'HARA,
LEWIS MILTON.