

Dec. 3, 1929.

L. M. HAUSMANN
ELECTRICAL FITTING
Filed April 13, 1922

1,737,718

Fig. 1.

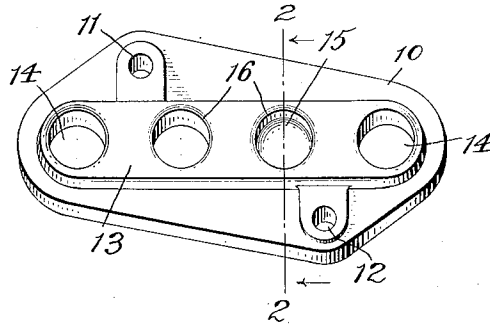


Fig. 2.

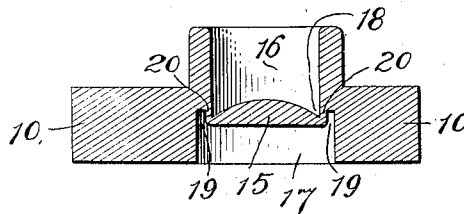


Fig. 3.

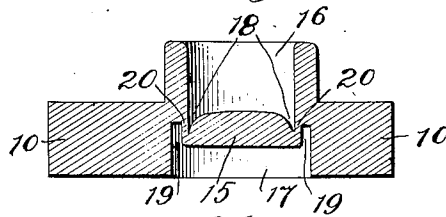


Fig. 4.

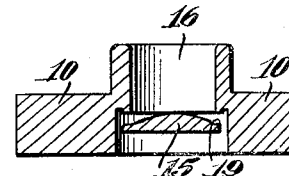
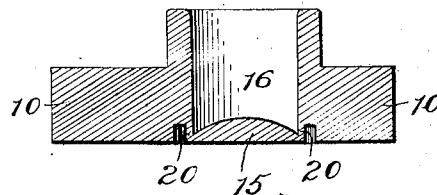


Fig. 5.

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UNITED STATES PATENT OFFICE

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ELECTRICAL FITTING

Application filed April 13, 1922. Serial No. 552,217.

My invention relates to electrical fittings and it has particular relation to devices of the character described wherein a severable portion, commonly known as a knock-out, is provided which can be removed by comparatively little effort to uncover a hole which it closes.

More particularly my invention is directed to the provision of a readily removable knock-out in a porcelain or other molded fitting or formed device of like character. Such fittings are extensively used in the electrical art where electric wires enter or leave devices enclosed in sheet or cast iron boxes, and also where such wires enter or leave iron conduit pipes. These porcelain fittings are also used as covers for the cast iron fittings which are in turn screwed onto iron pipes. Of course, when these porcelain covers are placed on the conduits the number of wires which may enter the same is unknown. A number of holes are therefore formed in the fitting, these holes being closed by a knock-out portion which extends across the hole and is joined to the body of the fitting by a readily-ruptured web.

My invention may be applied to devices of the above character with particular advantage when the same are formed from a brittle or frangible substance such as porcelain or other similar material. Inasmuch as there is a great variation in the thickness of porcelains, I have found that it is substantially impossible to form the hole-closing knock-out in such manner that it will be uniform in thickness throughout a number of devices. This difficulty arises because of the impossibility of controlling the ram on the punch press to such an extent that the thickness of the knock-out will not vary. It is obvious therefore that the simple formation of a knock-out portion whereby the web joining the same to the body of the fitting extends in a direction coplanar with the knock-out portion itself results in webs of such varying thickness that the desired degree of uniformity throughout a large number of manufactured fittings is lacking.

I propose therefore to form a knock-out in a fitting of the above character in such man-

ner that the web joining the same to the body of the fitting will be of uniform thickness and will be unaffected by unavoidable changes or variations in the material from which the fitting is made. To this end I propose to make the web extend in a direction perpendicular to the plane of the knock-out or in other words parallel to the axis of the opening which said knock-out closes. When a fitting is provided with a knock-out and web of this character, the thickness of the knock-out portion itself may vary quite considerably and yet the web be so uniform and constant in thickness that substantially the same force will serve to remove knock-outs from any of the fittings. Obviously, the provision of such a web is of considerable manufacturing importance as well since it eliminates the necessity for holding the thickness of the knock-out portion within very small limits, it being apparent that the maintenance of such limits for the ram or press which is used to manufacture the fitting presents questions of considerable difficulty in the control of said press.

Again the provision of a web which extends parallel to the axis of the hole results in a very satisfactory plane of cleavage for the knockout. That is, the fracture of the web, which occurs when the knockout is removed from the fitting, takes place in a plane parallel to the cross section of the hole, or perpendicular to the axis of the hole. In no other knockout with which I am familiar, in a device of the character of that of the present invention, is such a line of fracture eventuated. As hereinafter pointed out the inner surface of the hole through which the wire is passed in close contact with the sides of the fitting, is entirely free from burrs or other sharp imperfections extending toward the axis of the hole, which result when the web is severed on a fracture line which extends parallel to the axis of the hole. This, therefore, is an added advantage of my invention which is productive of very desirable results and which cannot be obtained in knockouts heretofore used in connection with any material with which I am familiar.

Other advantages incident to the use of

my invention will be better understood from a consideration of the following description of a fitting embodying the same taken in connection with the accompanying drawing in which:

Figure 1 is a perspective view of a fitting embodying my invention;

Figs. 2 and 3 are elevational sectional views taken on the line 2—2 of Fig. 1;

Fig. 4 is an elevational sectional view corresponding to those of Figs. 2 and 3, and illustrating a modified form of fitting wherein a knock-out embodying my invention is employed; and, Fig. 5 is an elevational sectional view illustrating the manner in which the fracture, whereby the knockout is removed from the body, takes place along a predetermined plane.

Referring now more particularly to the drawings, an electric fitting comprises a base portion 10, having screw holes 11 and 12 therein whereby said fitting may be secured to any desired receptacle or other electrical device. The central portion 13 of the body is elevated and is provided with a plurality of holes 14 which pass through the fitting and accommodate, when said holes are operative, one or more electric wires. When offered for sale these holes are usually closed by a knock-out portion 15, it being observed that all of the holes in the fitting have had the knock-outs therein removed with the exception of the third hole from the left-hand end of the fitting. After the number of wires which are to pass through the fitting is determined, the corresponding number of knock-outs are removed by a slight blow against said portions, the knock-outs being so formed that such a blow ruptures the web which joins said knock-outs to the body of the fitting and allows the former to be severed from the body by a very clean cut.

Referring now more particularly to the sectional views, the manner in which I form the web of the above described knock-out so that the latter may vary widely in thickness without at all affecting the thickness of the web, will be seen. In these figures, it will be observed that, as initially formed, the hole comprises two opposed recesses 16 and 17. These recesses are preferably formed by rams or presses which have annular peripheral rings extending beyond their normal length whereby annular grooves 18 and 19 extend beyond the normal depths of the cavities 16 and 17, respectively, and thereby form a thin cylindrical web 20. In Fig. 2 I have shown a relatively thin knock-out as being joined to the body by a web formed in such manner, while in Fig. 3 a very much thicker knock-out, resulting probably from some unavoidable defect in material, is joined to the body by a web which is substantially of the same thickness as that shown in Fig. 2. I find that such uniformity of web structure is substan-

tially impossible to obtain when fittings of this character are manufactured in any other manner, that is when the web is not extended in substantially parallel relation to the axis of the hole which is closed by the knock-out.

From the above description, it will be observed that a knock-out possessing marked advantages is eventuated because of the forming of the fitting. I find that almost any variation in the thickness of the knock-out portion can occur without at all affecting the ease with which the disk 15 may be knocked out, in case it is desired to use the hole for the passage of an electric wire. It will be observed that one of the essential features is the formation of the opposed grooves so that they overlap each other or so that one groove overlaps a portion of the opposed recess to form a thin cylindrical web.

In order to further illustrate the adaptability of my invention to fittings of various types, I have shown in Fig. 4 the manner in which a fitting may be provided with a knock-out having a web of the above-described desirable and advantageous character when it is desired that the hole extend from one side through substantially the entire thickness of the fitting. Here it will be observed that recess 16 extends practically to the other side of the fitting. It is therefore only necessary to form an annular groove in the opposite side of the fitting, this groove extending of course far enough to overlap the bottom of the recess 15 to form the web 20. In this connection also, any thickness of the disk 15 can be had without the fragility of the web 20 being at all affected.

Again, as will be noted from a consideration of Fig. 5, the piece 15 in either case is removed from the body by a fracture which extends parallel to the cross sectional area of the hole. If, therefore, there should be any sharp burrs or other imperfections occasioned by the separation of the knockout from the body, such imperfections will not extend into the hole and cut or otherwise mar whatever wire or cable may be passed thru the hole. As heretofore indicated, this is an advantage of my improved fitting which is very desirable since it permits the rapid threading of wires thru these holes without the necessity of careful attention to prevent cutting of the insulation on such wire by imperfections left when the knockout is removed.

From the above description, those skilled in the art will appreciate that such knock-outs possess marked advantages. This follows because the use of the same makes it possible to provide fittings formed from all sorts of materials with knock-outs which are uniformly easily removable. And moreover this is true even though the fitting may be formed from a material such as porcelain,

which is notoriously hard to hold within close limits because of its inherent variable qualities.

While I have described but one form of device embodying my invention and have moreover indicated only one possible manner of forming the same by utilizing two opposed punches, it is obvious that the advantages of the same may be secured by those skilled in the art through many other forms and methods of manufacture, and I do not desire therefore that my invention be limited, except by the showing of the prior art and the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the U. S. is:

1. A fitting embodying a knockout portion, and a web connecting said portion with the body of the fitting, said web being formed by recesses extending axially of the knockout from opposite faces of the body of the fitting and at least as far as a common plane perpendicular to the axis of the knockout and said web when so formed lying between the outer faces of the fitting.

2. A fitting embodying a knockout portion closing a hole through said fitting, and a web connecting said portion with the body of the fitting, said web being formed by annular grooves of different diameters extending in a direction substantially parallel to the axis of said hole from opposite faces of said fitting and at least as far as a common plane perpendicular to the axis of said hole.

3. A fitting embodying a wall portion, a knockout portion, and a web portion therebetween, all integrally formed, said knockout portion being removable by rupturing said web portion to leave an opening through said wall portion, said web portion being formed by two coaxial holes of different diameters extending from opposite sides of said wall portion, and an annular ring-like opening extending from the larger hole in axially overlapping relation to the smaller hole.

4. The method of press-molding frangible electrical fittings from fictile material so as to produce knockouts attached to the fittings by knockout webs of uniform thickness in each of the various fittings which consists in press-forming concentric recesses in opposite sides of the article at least one of which recesses comprises an annular groove axially overlapping the other recess.

5. A fitting having a hole therethrough, a knockout portion extending across and normally closing said hole, and a web joining said portion to the body of the fitting, said fitting being formed with two opposed concentric recesses extending axially of said hole, the knockout portion extending between the two, said recesses comprising grooves overlapping axially to form said web.

6. A fitting having a hole therethrough, a knockout portion extending across and nor-

mally closing said hole, and a web joining said portion to the body of the fitting, said hole being formed by two coaxial recesses extending inwardly from opposite faces of the body of said fitting, one of said recesses comprising a groove axially overlapping the other of said recesses to form said web, the latter being thereby formed to extend substantially parallel to the axes of said recesses and be of uniform thickness in several fittings irrespective of the variations in thickness of said knockout portions of said several fittings.

7. In a body of frangible fictile material, a knockout closing a hole through said body and joined to the latter by a relatively short frangible web, said web lying within said hole and between the outer facial planes of said body and extending from said body to said knockout in a direction parallel to the axis of said hole whereby the fracture thereof occurs in a surface parallel to the cross section of said hole.

8. A body provided with a hole, said hole in said body formed by recesses extending from opposite sides of said body, and a knockout member closing said hole and connected to the remainder of the body by a web formed by axially overlapping grooves extending from the aforesaid recesses forming said hole.

9. A press-molded fitting of porcelain or the like having a hole therethrough, a knockout portion extending across said hole, and a web joining said portion to the fitting, said web being formed by extending a groove in axially overlapping relation to, and coaxially of, said hole.

10. An electrical fitting formed of insulating material and having a hole therethrough, a knockout closing said hole and attached to said fitting by a web, said web being frangible to permit the removal of said knockout and extending from said fitting to said knockout in a direction substantially parallel to the axis of said hole, whereby the rough edges resulting from fracture of said web project only in such direction.

11. An electrical fitting formed of insulating material and having a hole therethrough, a knockout closing said hole and attached to said fitting by a frangible web, said web lying wholly within the faces of said fitting and extending from said fitting to said knockout in a direction substantially parallel to the axis of said hole, whereby the rough edges resulting from fracture of said web project only in such direction.

12. An electrical fitting formed of insulating material and having a hole therethrough, a knockout closing said hole and attached to said fitting by a web, said web being formed by axially overlapping annular grooves of different diameters extending inwardly substantially perpendicularly from opposite faces of said fitting and being frangible whereby it may be ruptured to

permit the removal of said knockout from said hole.

13. An electrical fitting formed of insulating material and having a hole there-
5 through, a knockout closing said hole and attached to said fitting by a web, said web being formed by axially overlapping co-axial grooves extending inwardly substan-
tially perpendicularly from opposite faces of
10 the fitting and said web lying wholly between the outer faces of the fitting.

In witness whereof, I have hereunto sub-
scribed my name.

LEMUEL M. HAUSMANN.

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