Aug. 25, 1942. A. E. HANSON 2,294,085

SAFETY ELECTRICAL COUPLINGS

Filed Oct. 21, 1940 2 Sheets-Sheet 1

Fig. 1.

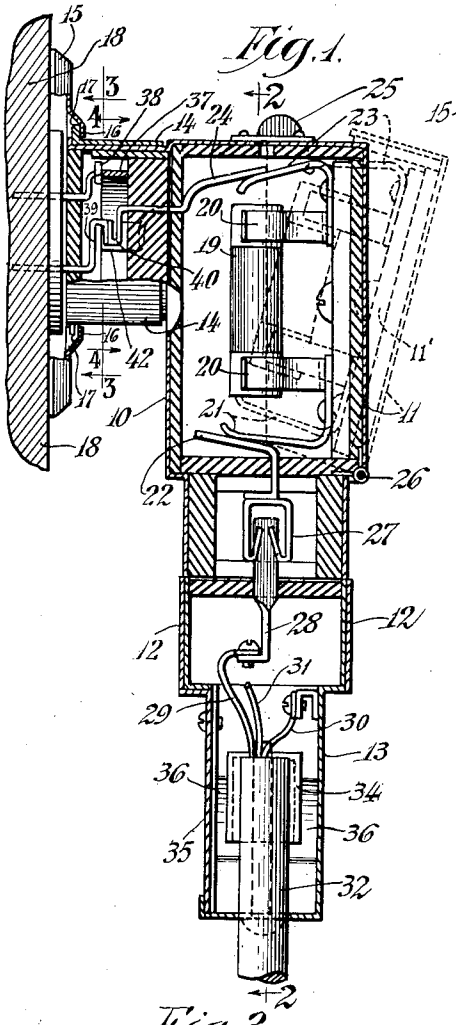


Fig. 2.

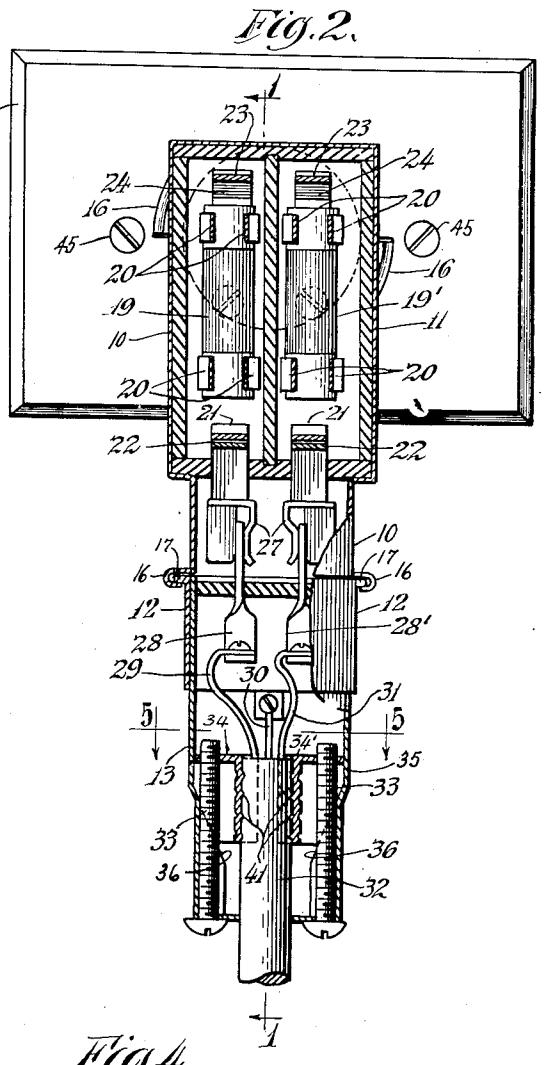


Fig. 3.

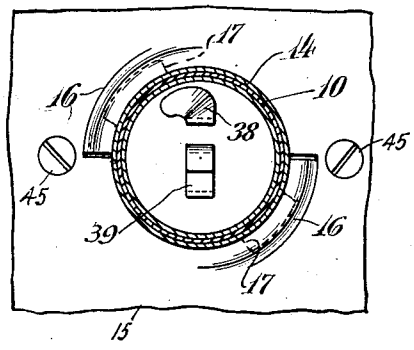


Fig. 4.

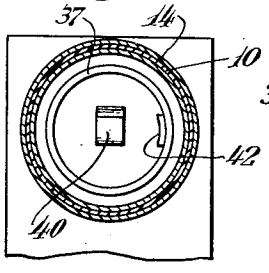
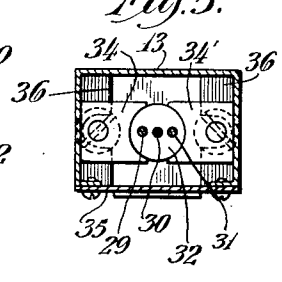


Fig. 5.



Inventor:
Anton E. Hanson
By Wm. G. Blomstrom,
His Attorney.

Aug. 25, 1942. A. E. HANSON 2,294,085

SAFETY ELECTRICAL COUPLINGS

Filed Oct. 21, 1940 2 Sheets-Sheet 2

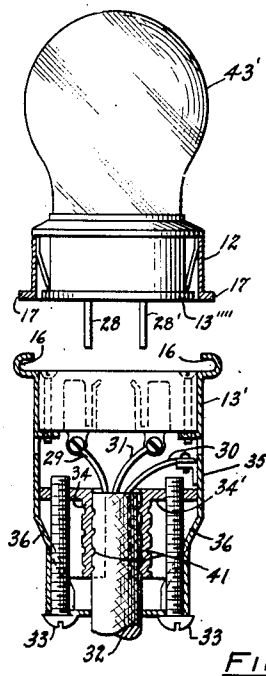


FIG. 7

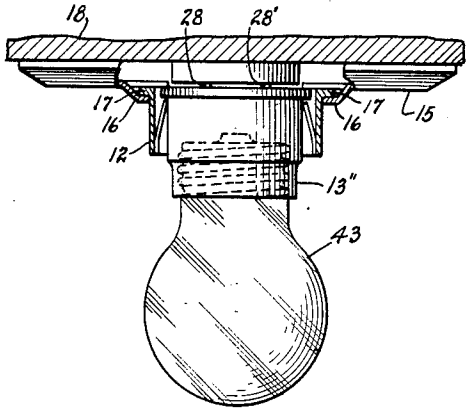


FIG. 6

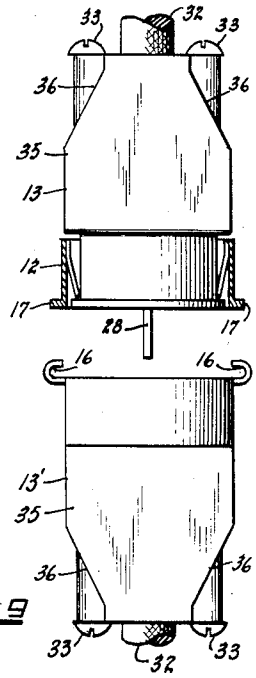


FIG. 9

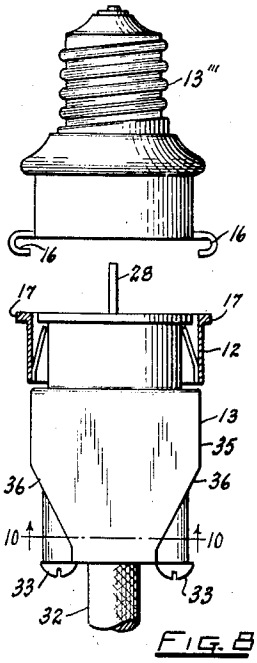


FIG. 8

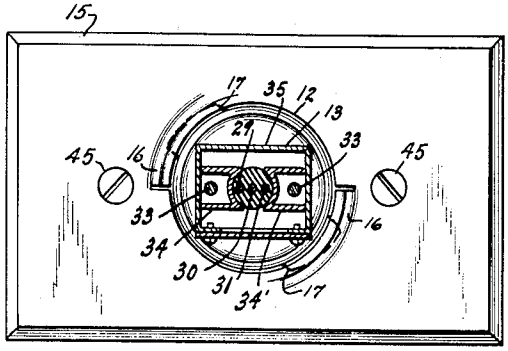


FIG. 10

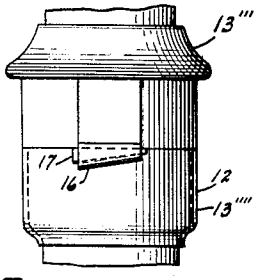


FIG. 11

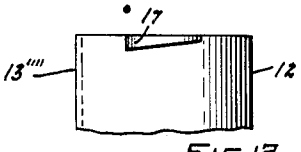


FIG. 12

Inventor:
Anton E. Hanson
BY Thos. G. Blomstrom
HIS ATTORNEY.

Patented Aug. 25, 1942

2,294,085

UNITED STATES PATENT OFFICE

2,294,085

SAFETY ELECTRICAL COUPLINGS

Anton E. Hanson, Chicago, Ill.

Application October 21, 1940, Serial No. 362,099

4 Claims. (Cl. 173—334)

This invention relates in general to safety electrical couplings, but more particularly it has reference to safety interchangeable interlocking electrical couplings, and one of the important objects of the invention is to provide a simple and effective safety coupling means for electrical fuse receptacles by which the electrical terminals thereof may readily be disconnectedly secured to the terminals of various kinds of electrical receptacles in such a manner as to insure against the danger of the fuse receptacle terminals and a variety of electrical receptacle terminals becoming disengaged from each other. And a further important object of the invention is to provide an additional safety feature in electrical fuse receptacles which provides for the insertion or renewal of fuses in the said receptacle without there being any danger to the person while performing this operation of being burned, or of there being formed any short circuits.

A further important object of the invention is to provide the safety coupling means to screw or lamp sockets, and wall-plate receptacles or sockets, and to correlative screw sockets and plug receptacles.

And a further important object of the invention is to provide plug and socket receptacles with safety interlocking correlative coupling means.

These and other objects of the invention may be better understood from the illustrations in the accompanying drawings, and more fully described in the following specification, and more particularly pointed out in the appended claims.

In the several illustrations in the accompanying drawings—

Figure 1 is a sectional view taken on the plane 1—1, of Fig. 2, and shows a fuse box in which the improvements of the invention are embodied;

Figure 2 is a sectional view taken on the plane 2—2, of Fig. 1;

Figure 3 is a sectional view taken on the plane 3—3, of Fig. 1;

Figure 4 is a sectional view taken on the plane 4—4, of Fig. 1;

Figure 5 is a sectional view taken on the plane 5—5, of Fig. 2;

Figure 6 is a part sectional view of the coupling means as applied to an electrical wall-plate receptacle and a sectional view of the coupling means as applied to an electrical screw or lamp socket;

Figure 7 is a sectional view showing an electrical plug and a socket receptacle being provided with the safety coupling means embodying the invention; and shows also, as in the lower portion of Figures 1 and 2, a method or means by which the insulation of, in this case, a three-wire electrical conductor may be securely fastened, as by clamping, in the receptacle abovementioned;

Figure 8 is an exterior view of an electrical screw-ended socket and a plug receptacle being provided with the safety coupling means embodying the invention; a portion of the coupling means being shown in section;

Figure 9 is an exterior view of an electrical plug and a socket receptacle being provided with the safety coupling means embodying the invention; a portion of the coupling means being shown in section;

Figure 10 is a sectional view taken on the plane 10—10, of Fig. 8, of an electrical plug receptacle being provided with the safety coupling means embodying the invention, and shows the method by which the same may be securely locked to an electrical plate receptacle; and,

Figures 11 and 12 are exterior views showing the safety coupling means as embodying a form of the invention.

In the several illustrations similar characters refer to similar parts throughout the several views.

To further describe an important safety feature of the invention it may be here stated that the electrical fuse receptacle, designated by the reference character 10, is provided with an hinged closure 11, which is provided with an insulation plate 11'. Upon the plate 11', is mounted electrical fuse clips 20, the lower ones being provided with resilient metallic contact terminals 21, and the upper ones with similar contact terminals 23. The closure 11, being in its closed position the terminals, 21 and 23, frictionally engage, respectively, resilient metallic contact terminals 22 and 24.

On opening the closure 11, to the position indicated by dotted lines in Fig. 1, the terminals 21 and 23, become detached, respectively, from the terminals 22 and 24, causing the continuity of the electrical conductor disposed through the receptacle to be broken; and, on further opening of the closure 11, the electrical fuses, 19 and 19', may be removed and others inserted in the clips instead. Since the opening of the closure 11, causes the terminals 21 and 23, to become automatically detached from their respective terminals 22 and 24, thereby breaking the continuity of the said conductors which are disposed through the receptacle, would preclude any danger of a

short circuit, or of a person being shocked, while removing or inserting fuses. From the above it may be readily understood that fuses, 19 and 19', may neither be removed from, nor replaced in, the clips 20, until the closure 11 is fully opened and the circuit broken; therefore, the person performing this operation will be, as before stated, safe from any danger of being burned, shocked, or of causing a short circuit.

As a further and important safety feature of the invention it may be pointed out that correlative electrical fittings, or preferably termed receptacles, such, for instance, as a combined plug, socket, and fuse receptacle 10, a plug receptacle 13, a socket receptacle 13', an internally screw threaded or lamp socket 13'', in which is screwed an incandescent lamp 43, a combined screw threaded plug and socket 13''', and a plug receptacle 13'''', in which an incandescent lamp 43', may be rigidly secured, and a plate or socket receptacle 15 (the receptacle 10, being provided, at its upper end, with plug-in terminals 38 and 39, and at its lower end with socket terminals 27), are each, with the exception of terminals 27, 38, and 39, provided with correlative interlocking annular segmental helical cam members such as, for instance, groove cams 16, and lug cams 17. The cams, as here illustrated, could be considered as likened onto segmental portions of a two-pitch screw-thread; however, they could be of any other multi-pitch screw-thread.

The upper end of receptacle 10, and the receptacles 13, 13'', and 13'''', are each provided with a revoluble sleeve upon which is formed the said cam lugs 17. The revoluble sleeve 14, being designated for receptacle 10, while that of 12 is designated for receptacles 13, 13'', and 13''''. The lower end of receptacle 10, and the receptacles 13', 13''', and plate receptacle 15, are each provided with groove cams 16, which are adapted to receive and cooperate with the cam lugs 17, of a correlative fitting or coupling in the manner of a screw-bolt and its associated nut on giving the same an axial twist, or until the correlative receptacles or couplings have become snugly engaged or attached to each other whereby to prevent the couplings from being separated through any undue longitudinal strain upon them.

The revoluble sleeve provides a very important feature of the invention in that it permits the attachment of correlative electrical receptacles, such as those above-mentioned, to each other in the usual manner and then, therewith, clamping them together by means of the correlative interlocking cams as formed thereon and on the respective associated receptacle in the manner as described above.

Referring to Figure 1, it will be noted that the closure 11 is hingedly secured at its lower end, as at 26; being so hinged permits of the same being opened downwardly whereby to obtain better accessibility to the fuses, 19 and 19', mounted thereon. The fuses, 19 and 19', being installed in their respective clips 20, and the closure 11 being in its closed position, the terminals 21, and the terminals 22, which extend from socket terminals 27, become frictionally engaged to each other, and, as well, do the terminals 23, and the terminals 24, which extend from, respectively, electrical conductors 40 and 42, which are, in turn, connected with, respectively, plug-in terminals 39, and with plug-in terminal 38, through the medium of conductor ring 37, form electrical conductors throughout the receptacle 10.

Referring to sectional views Figures 1, 2, 5, and 10, it will be seen that the lower portion of receptacle 13 is formed with rectangular walls 35, two opposite sides of which being inclined downwardly toward each other as 36, so as to form opposing inclined planes against which a pair of clamping jaws, 34 and 34', which have corresponding inclined sides, operate toward each other to firmly grip the surface of the insulation covering, in this case, of a three-wire electrical conductor or cable 32, when being drawn down by means of screws 33. Two of the wires, 29 and 31, being the main conducting wires, while the third wire 30, forms a ground connection. The terminals 29 and 31, being connected, respectively, to plug-in terminals 23 and 28', but the ground wire 30 is connected to the wall of the receptacle. It will be noted that the inner wall of jaws, 34 and 34', have corrugations or bumps 41, formed thereon which, when the jaws are forced, by means of the screws 33, into clamping position against the insulation, become imbedded into the insulation so as to more firmly grip the cable and prevent any danger of the same from being pulled out from the clamping jaws.

As will be noted in Figures 1 and 6, plate 15 may be fastened, as by means of screws 45, to a wall or fixed place 18.

Having thus described the invention it can be readily understood that the minor details of its construction may be altered without departing from the scope and spirit of the invention, and without losing any of its attendant advantages. Therefore, what is claimed is desired to be secured by Letters Patent.

I claim:

1. In combination, a pair of interconnectable safety electrical couplings, one of the pair comprising a dual purpose electrical coupling, the said coupling providing a compartment having an hinged closure therefor, an insulation plate carried by the said closure on its inner side, the same having an arrangement of fuse clips mounted thereon, the said coupling being provided at one of its ends with a revoluble annular sleeve having annular helical cam lugs disposed thereon, and having at its opposite end annular helical cam grooves disposed thereon, and one of the ends of said coupling comprising a plug-in end, and the end opposite thereof comprising a plug-receiving end, the said plug-receiving end being adapted to be detachably interlocked to the other of said pair of electrical plug receptacles, the same having an annular revoluble sleeve revolubly secured at one of its ends, the said sleeve being provided with annular helical cam lugs, and the said receptacle having an arrangement of annular helical cam grooves disposed thereon at its other or opposite end.

2. In combination, a pair of interconnectable co-relative safety electrical couplings, one of the couplings thereof comprising a double-ended electrical coupling, one end thereof comprising a plug-in end and the other end thereof comprising a plug receiving end, the said plug-in end of the coupling having an annular sleeve revolubly mounted thereon, the said sleeve being provided with annular helical cam lugs, and the said plug receiving end of the coupling being provided with annular helical cam grooves, and the other of said pair of couplings adapted to receive a plug coupling, the said plug coupling being provided with concentric helical cam grooves, the said cam lugs on said sleeve being adapted to be removably secured into co-operative relation to the said cam grooves on the said other coupling

whereby to draw the said couplings toward each other and form rigidly interlocked electrical couplings.

3. The combination in a dual purpose interlocking electrical coupling, of an interlocking electrical coupling having a plug-in end, and a plug-receiving or socket end, one of the ends of the coupling having an annular revoluble sleeve disposed thereon, the said sleeve being provided with annular helical locking cams, the other or opposite end of the coupling having an arrangement of annular helical cam grooves disposed thereon, the said coupling providing a compartment having an hinged closure therefor, the said closure having an insulation plate secured thereto on its inner side upon which is securely mounted electrical fuse clips, and an arrangement of electrical conductors suitably disposed throughout the said coupling, the said conductors being adapted to be disconnected whereby to break the electrical circuit on opening the said closure for the purpose of renewal or exchange of fuses being mounted in said clips.

4. The combination in one of a pair of interconnectable safety electrical couplings comprising a dual purpose electrical coupling, the said coupling having at one of its ends an annular revolvable sleeve mounted thereon, the said sleeve having annular helical cam lugs disposed thereon, and the said coupling having a pair of screw-operated electrical cable clamping jaws slideably mounted therein at its other or opposite end, means provided in said coupling for grounding one of the wires of a three-wire electric cable being secured between the said jaws, and the said cam lugs being adapted to engage corresponding annular helical cam grooves being disposed on a corelative safety electrical coupling whereby to draw the two couplings into interlocked rigid engagement to each other.

ANTON E. HANSON.