Dec. 31, 1940. A. L. MARTINEK 2,226,869

TERMINAL RECEPTACLE

Filed June 21, 1937

Fig. 1.

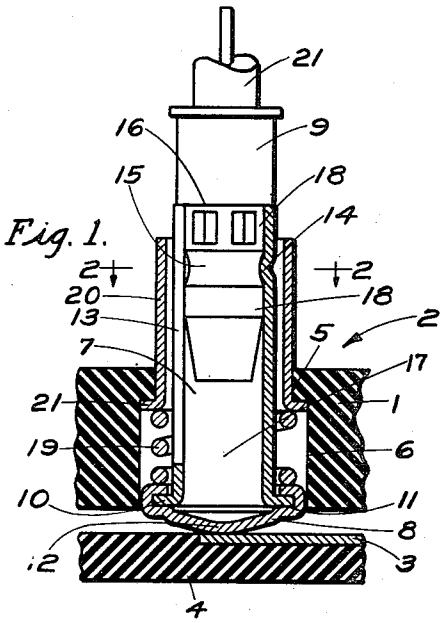


Fig. 3.

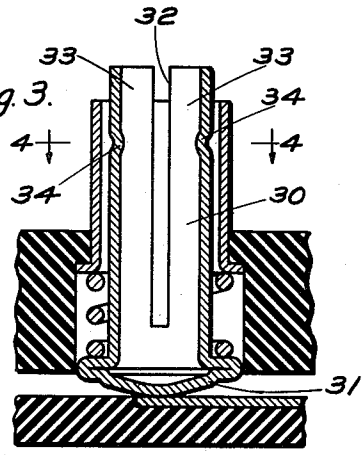


Fig. 2.

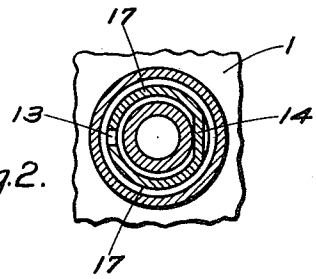


Fig. 4.

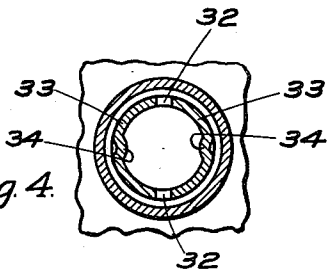
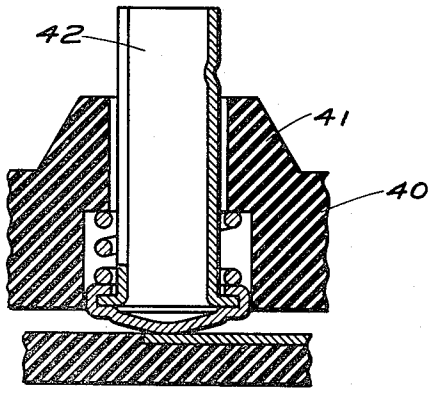


Fig. 5.



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TERMINAL RECEPTACLE

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7 Claims. (Cl. 200—166)

This invention relates generally to electrical connection means, and more particularly, to what might be termed a receptacle formed to provide contact means at one extremity and integral resilient receiving means adjacent the other extremity.

One object of the invention is to provide an electrical connection means including a helical spring operable to urge the connecting means in a predetermined direction so that the contact thereon will engage a contact plate forming part of a switch or other electrical device, and means whereby to guard and limit the expansion of the extremity forming the terminal receiving means.

Another object of the invention is to provide an electrical connection means of the character just referred to, in which the guard means is held and maintained in a predetermined relation with respect to the terminal receiving means through the agency of said helical spring.

A further object of the invention is to design and construct an electrical connection means comprised of a single piece of metal; and in one modification provide means on the support for the connection means whereby to limit the expansion of the extremity forming the terminal receiving means.

A still further object of the invention is to provide an electrical connection means, that is simple in design, durable, and, one that can be economically manufactured on a commercial scale.

Various other objects and advantages of the invention will be apparent after considering the description hereinafter set forth in connection with the drawing hereunto annexed.

Referring to the drawing wherein the various parts of the invention are illustrated and designated by numerals;

Figure 1 is a vertical view, partly in section, of the preferred embodiment of the invention;

Figure 2 is a section taken substantially on line 2—2 of Figure 1;

Figure 3 is a vertical sectional view, of a modified form of the invention;

Figure 4 is a section taken substantially on line 4—4 of Figure 3;

Figure 5 is a vertical view, partly in section, of another modification of the invention.

Referring to the preferred embodiment of the invention illustrated in Figures 1 and 2 of the drawing, 1 represents a block of insulating material which, if desired, may form a part of a stationary switch cover, and 2, generally designates the electrical connection means resiliently mounted thereon, and is provided with an enlarged contact adjacent its lower extremity adapted to electrically engage a metal contact plate 3 carried by an insulating member 4, the latter two being moveable as a unit in relation to a number of electrical connection means.

The block 1 is provided with a compound aperture consisting of an opening 5 and a recess 6, larger than opening 5, and as clearly shown the connection means 2 is mounted in said compound aperture.

The connection means 2, as here shown, is preferably in the form of a metal tubular cylindrical member 7, termed a receptacle, and is provided with an enlarged contact 8 at its lower extremity, and its upper extremity is formed in a manner whereby to receive and resiliently retain a terminal 9 of the character shown. The lower end of the receptacle 7 is provided with an annular outwardly extending flange 10 and the circular contact 8 is preferably secured thereto by providing a seat 11 therein, and turning over the peripheral edge of the contact upon the flange 10. The contact is also preferably provided with a convex portion 12 that is adapted to engage the contact plate 3.

The upper extremity of the receptacle is preferably provided with a longitudinal slot 13 in the wall thereof whereby to impart the desired resilient effect. A detent 14 is formed in the wall opposite the slot 13, and is set back from the upper end of the receptacle a predetermined distance so that the detent 14 will cooperate with the cove 15 provided in the terminal when the shoulder 16 on the terminal abuts the end of the receptacle. In other words, the distance from the detent to the end of the receptacle substantially corresponds to the distance from the center of the cove 15 to the shoulder 16 on the terminal. The upper extremity of the receptacle is thus made resilient, and the wall portions 17 expand and contract when a terminal such as 9 is inserted into the receptacle. The said portions 17 in effect function to urge the cove 15 in the terminal into cooperation with the detent 14, and the lands 18 on the terminal against that portion of the receptacle adjacent the detent.

A helical compressible spring 19 is located in the recess 6 of the compound aperture and surrounds the receptacle 7 in a manner whereby to urge the receptacle in a predetermined direction so that the contact thereon will electrically engage the contact plate 3. The diameter of the

recess 6 is such that the contact 8 is guided thereby.

In many instances, undue strain is placed upon the upper extremity of the receptacle to an extent whereby it no longer properly receives and resiliently retains a terminal, and in order to avoid this condition a tubular guard member 20 is arranged about the upper extremity of the receptacle. As clearly shown, the guard extends through the opening 5 in the block 1 and is provided with an angular annular flange 21, arranged in the bottom of the recess 6, and through the agency of the helical spring 19, the guard is maintained in a predetermined relation with respect to the upper extremity of the receptacle 7. The diameter of the guard 20 is such that the upper extremity of the receptacle may freely expand when a terminal is inserted therein, but when any undue strain is placed upon the upper extremity of the receptacle such as by an accidental pull on the conductor 21, to which the terminal is connected, the guard 20 will limit the expansion of the portion 17 of the upper extremity, as well as protect and prevent injury or damage thereto. The guard 20, if so desired, may be constructed of insulating material in order to insulate and prevent the upper extremity of the receptacle from coming in contact with some other electrical connection.

Referring to the modification of the invention shown in Figures 3 and 4, the principles of design and construction are substantially the same as the preferred form of the invention above shown and described, except for a few important distinctions. As herein shown, the receptacle 30 is of a one piece construction and the lower extremity is provided with an integral enlarged contact 31, and the upper extremity of the receptacle is made resilient by providing a pair of longitudinal slots 32, diametrically arranged. By providing slots 32 in the receptacle, the upper extremity thereof is provided with a pair of spaced apart parallel resilient portions 33, which will expand and contract when a terminal is inserted into the receptacle. A detent 34 is provided adjacent the center of each of the portions 33, and are preferably set back a predetermined distance from the upper end of the receptacle as above referred to. In this modification, the portions 33 forming the upper extremity of the receptacle, in effect, function in a manner whereby to create two forces acting directly toward each other, with the detents 34 cooperating with the cove in the terminal. In other words, the detents cooperate with the cove, and the lands on the terminal are engaged by the spaced apart portions 33. It is to be understood that if found desirable the detents provided on either of the receptacles shown may be formed adjacent the margins of the slots.

Referring to the modification of the invention disclosed in Figure 5, it will be evident that the principles of design and construction substantially correspond to the modifications above referred to, but as here shown, the guard is omitted, and in lieu thereof the block 40 of insulating material is provided with an annular upstanding circular boss portion 41 that is adapted to protect the upper extremity of the receptacle 42 and limit the expansion thereof.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of the invention; and therefore, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts, herein shown and described.

What I claim and desire to secure by Letters Patent is:

1. Electrical connection means, including a block of insulating material, an opening and a recess provided in said block, a tubular member extending through said opening and recess, an enlarged contact provided adjacent the inner extremity of said member, a helical spring surrounding said member to engage said contact means to urge said member in a predetermined direction, the opposite extremity of said member being provided with resilient portions including a detent whereby to receive and detachably retain a terminal of the snap type, and a guard surrounding said tubular member provided with means engaged by said spring whereby to maintain said guard in a predetermined relation with respect to the outer extremity of said tubular member.

2. Electrical connection means, including a block of insulating material, an aperture provided in said block, a tubular member extending through said aperture and provided with a contact at one extremity thereof, a helical spring surrounding said member adapted to urge said contact thereon against a contact plate, the opposite extremity of said member being provided with resilient portions including a detent whereby to receive and resiliently retain a terminal of the snap type, and means carried by said block whereby to limit the expansion of said resilient portions.

3. Electrical connection means including in combination, a support of insulating material, an opening and a recess provided in said support, a tubular member extending through said opening and said recess, an enlarged contact provided adjacent the inner extremity of said member and arranged in said recess, resilient means operatively related to said member whereby to urge same in a predetermined direction, the opposite extremity of said member being provided with resilient portions including a detent whereby to detachably retain a terminal of the snap type adapted to be inserted axially into said tubular member, and a guard associated with said tubular member whereby to prevent undue expansion of said resilient portions when a terminal is inserted, one end of said guard being caught within said recess.

4. Electrical connection means, including mounting means of insulating material having an opening therein, a tubular member extending through said opening, a contact provided adjacent the inner extremity of said member, at least a resilient portion including a detent provided adjacent the outer extremity of said member whereby to detachably retain a terminal of the snap type, a guard substantially surrounding said tubular member, and spring means for urging said member in a predetermined direction and said guard in a predetermined relation with respect to the outer extremity of said tubular member.

5. Electrical connection means, including a block of insulating material, an opening and a recess provided in said block, a tubular member extending through said opening and recess, an enlarged contact provided adjacent the inner extremity of said member, a helical spring surrounding said member to engage said contact means to urge said member in a predetermined

direction, the opposite extremity of said member being provided with at least a resilient portion including a detent whereby to detachably retain a terminal of the snap type, and a guard surrounding said tubular member provided with means engaged by said spring whereby to maintain said guard in a predetermined relation with respect to the outer extremity of said tubular member.

6. Electrical connection means, including a mounting of insulating material having an aperture, a tubular member extending through said aperture and provided with a contact at one extremity, the opposite extremity of said member being provided with at least a resilient portion including a detent whereby to resiliently retain a terminal of the snap type, a guard substantially surrounding said member, abutment means provided on said guard, and spring means engaging and urging said contact and said abutment means in spaced apart relation whereby said contact is adapted to be pressed against a contact plate and said guard is maintained in a predetermined relation with respect to the outer extremity of said member.

7. Electrical connection means including in combination, a support of insulating material, an opening and a recess provided in said support, a tubular member extending through said opening and said recess, an enlarged contact provided adjacent the inner extremity of said member and arranged in said recess, resilient means operatively related to said member whereby to urge same in a predetermined direction, the opposite extremity of said member being provided with at least a resilient portion including a detent whereby to detachably retain a terminal of the snap type adapted to be inserted axially into said tubular member, and a guard associated with said tubular member whereby to prevent undue expansion of said resilient portion when a terminal is inserted, one end of said guard being caught within said recess.

ALOIS L. MARTINEK.