

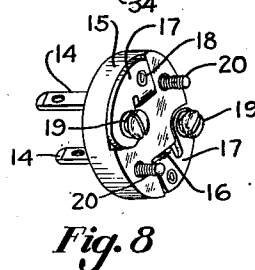
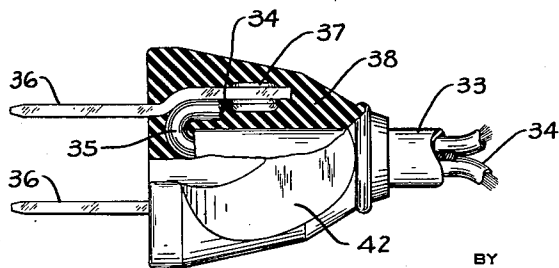
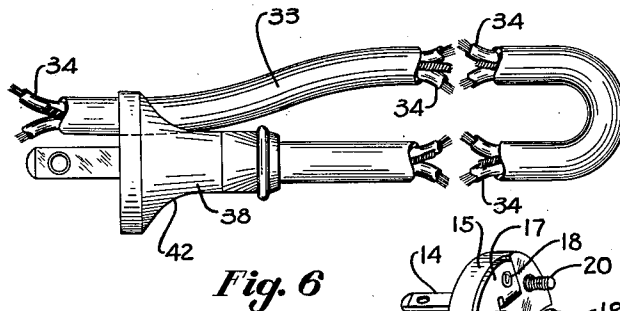
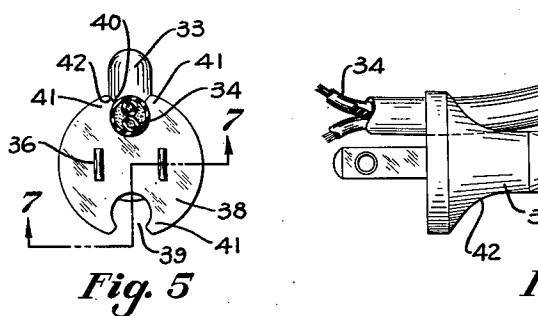
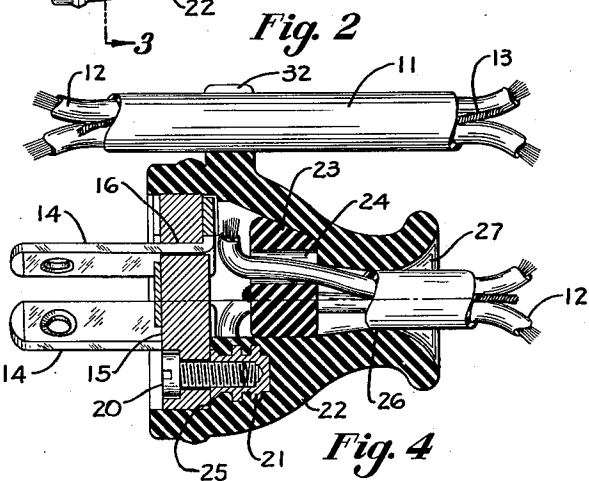
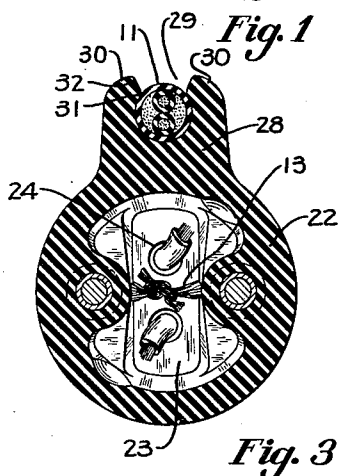
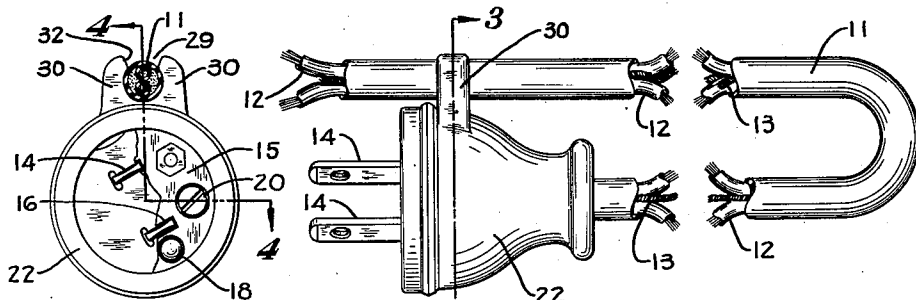
Dec. 5, 1939.

O. J. NELSON

2,182,446

ELECTRICAL CONNECTOR

Filed April 26, 1935



INVENTOR

Oscar J. Nelson

Harry S. Dunmore

ATTORNEY

UNITED STATES PATENT OFFICE

2,182,446

ELECTRICAL CONNECTOR

Oscar J. Nelson, North Canton, Ohio, assignor to
The Hoover Company, North Canton, Ohio, a
corporation of Ohio

Application April 26, 1935, Serial No. 18,352

4 Claims. (Cl. 173—361)

This invention relates to electrical connecting devices, and more particularly to terminal fittings for the flexible conductor cables in common use, which fittings are frequently known at attachment plugs and provide a structure by which the conductor or conductors of such flexible cable may be conveniently and quickly attached to, or detached from, the conductor or conductors of a companion fitting, such as a "wall outlet," to establish electrical connection therebetween. The outer portions of such terminal fittings are necessarily formed of insulating material, except for exposed contacts electrically connected to the conductors which are usually in the form of projecting parallel blades which are adapted to be inserted through slots into engagement with contacts in the companion fitting. Such terminal fittings are subject to severe compression and impact strains when they are not engaged with the outlet fitting, by reason of being dropped upon floors, by having heavy weights placed upon them, by careless handling of the cable to which they are attached which results in impact of the fitting with other objects, and in many other ways. It is therefore highly desirable that such fittings be so constructed as to withstand both impact and compression strains without impairment, and for this purpose the body portion of such fittings is frequently formed of soft rubber, or similar resilient and distortable material.

Many electrical devices are provided with a conductor cord having a terminal fitting of this kind, so that such devices may be temporarily connected to an electrical outlet, and when the device is not in use the conductor is frequently coiled and is supported by, or near, such device. It is desirable that, during such periods of disuse of an electrical device, the terminal fitting of its conductor cable be kept off of the floor, where it might be injured, and be supported so as to minimize the danger of its being subjected to impact with objects.

One of the objects of the present invention is to provide simple and effective means for supporting a terminal fitting or attachment plug. A further object is to provide means for detachably mechanically attaching a terminal fitting to any portion of its conductor cable. A still further object is to provide a terminal fitting with attaching means by which it may be supported, which means are of simple and durable construction and entail a minimum of manipulation to attach the fitting to, or detach it from, its support.

Still further objects of the invention and fea-

tures of novelty will be apparent from the following specification describing two embodiments of the invention which are illustrated in the accompanying drawing, in which:

Fig. 1 is a view in front elevation of a plug embodying the invention, showing the plug as mechanically attached to its cable;

Fig. 2 is a view in side elevation of the structure shown in Figure 1;

Fig. 3 is an enlarged view in transverse section, taken on line 3—3 of Fig. 2;

Fig. 4 is an enlarged view in longitudinal section, taken on line 4—4 of Fig. 1;

Fig. 5 is a view in front elevation of a modified form of plug embodying the invention, the parts of said plug being permanently molded together;

Fig. 6 is a view in side elevation of the structure shown in Figure 5;

Fig. 7 is a view in longitudinal section, taken on line 7—7 of Fig. 5; and

Fig. 8 is a view in perspective of certain of the parts of the structure shown in Figs. 1 to 4.

In general, the invention comprises providing the body of an electrical attachment plug with a notch adapted to receive the conductor cable and being no larger than such cable, the marginal opening, or throat, of such notch being narrower than the diameter of the cable. It will be evident that, with this construction, the cable may be forced into the notch, either by spreading the notch or compressing the cable, or both, as the parts are forced together. The plug may thus be supported and held out of the way and not left to drag about on the floor or to bump into other objects, impact with which might injure such object or the plug, or both. The cables of electrical devices are frequently coiled upon projections on such device, for storage when the device is not in use, and in such case a plug embodying the present invention can be engaged with one turn of the cable not only to hold the plug in a safe position but also to prevent the cable from unwinding.

In the embodiments of the invention illustrated in the drawing herewith, the notch is formed in the body of the plug or attachment fitting. In Figs. 1 to 4, there is shown a conductor cable 11 containing a twisted pair of insulated stranded conductors 12 and a pair of filler cords 13, of cotton or other suitable material, twisted with the conductors, the conductors and the cords being covered with a suitable insulating and wear-resisting covering of soft rubber, or similar material, to form a conductor cable which is substantially round in cross section, which is very flexible, and

which can be distorted slightly by radial compression.

The structure illustrated in Figs. 1 to 4 and Fig. 8 is a plug of the assembled type, the parts thereof being detachably secured together in order to facilitate assembly upon a conductor cable, as well as repair or replacement. In such structure, contact blades 14 are held rigidly in spaced parallel relation by a disc 15 of insulating material, the blades 14 passing through holes 16 in the disc 15 and having their rear portions 17 bent against the rear surface of the disc and secured in place by rivets 18 which pass through the disc and such portions 17. In order to connect the conductors 12 electrically to the respective contact blades 14, the portions 17 are threaded to receive screws 19, by which the bared ends of the conductors may be held thereto. Screws 20 are also passed through the disc 15 from the front and are threaded into anchor members 21 embedded in a cover 22 of molded insulating material, to hold the disc 15 and its contacts assembled in such cover. A strain relief member 23, which may be formed of rubber or any other suitable material is located within the cover 22 to the rear of the disc 15, and is provided with openings 24 therethrough to receive the conductors 12, the cords 13 being passed around the member 23, and knotted as shown in Fig. 3. It will be understood that such structure prevents any tendency toward impairment of the electrical connection of the conductors to the contact blades by endwise strains on the cable, since such strains are transmitted directly to the cover 22, through the strain relief member.

As shown the cover 22 is roughly frusto-conical in shape, widened at the front end to receive the disc 15, which is clamped against an annular inner seat 25 in the cover by the screws 20. At its rear end the cover 22 is formed with an opening 26 which receives the conductor cable and communicates with the enlarged recess in which the disc 15, strain relief member 23 and other parts are housed. The rear portion of the cover 22 is preferably flared outwardly away from the cable-receiving opening 26 to form an annular rounded surface 27 in order to prevent sharp bending of the conductor cable.

The cover member 22 may be conveniently formed of any suitable molded insulating material such as vulcanized rubber or other rigid compound of that nature, but is preferably formed of molded soft rubber or similar yieldable material in order to preclude injury by impact with other objects. In accordance with the present invention, the cover 22 is provided with a laterally extending projection 28, preferably integral with the cover, having a notch 29 therein so as to form outwardly extending fingers 30 which are so spaced circumferentially that the conductor cable can be forced between them and will be frictionally held in the notch. The ends of the fingers 30 are preferably curved slightly toward each other, so that the notch 29 is circular in shape for about 270 degrees to form a throat 31 narrower than the diameter, and then flaring outwardly, as shown at 32, to facilitate entry of the cable into the notch. It will be understood that, if the cover 22 and the projection 28 are formed of rigid material, the width of the throat 31 must be such that the cable 11 can be compressed sufficiently to enter it. If the projection 28 is formed of soft rubber, or similar material, the throat 31 can be wider because the fingers 30 can be bent apart to facilitate entry of the cable, and the resilience of both

the cable and the fingers 30 can be relied upon to hold the parts engaged.

In Figs. 5 to 7 the invention is illustrated in a plug of soft rubber molded permanently upon the conductor cable. Such plug is formed by removing the insulation of a conductor cable 33 at its end to bare the insulated conductors 34, the insulation being also removed from the ends of such conductors so that they may be reversely bent, as shown at 35, in Fig. 7, and electrically connected to contact blades 36 by rivets 37, or in any desired manner. In constructing such a structure, the parts are held in their proper relationship and the plug body 38 of soft rubber is molded about them. The molded plug body 38 is provided, as shown in Figs. 5 to 7, with two diametrically positioned notches 39 spaced circumferentially between the contact blades 36. Such notches 39, as in the modification shown in Figs. 1 to 4, are substantially circular for about 270 degrees, with a throat 40 between fingers 41, the end faces of which flare outwardly as shown at 42. It will be apparent that only a single notch could be provided, if desired. The rear portion of the plug body as shown is of rectangular shape in cross-section, the wide flattened surfaces 42 curving outwardly to meet the edge of the front face of the plug which is preferably circular except for the intersection by the notches. In the construction shown the provision of two notches facilitates attachment of the plug to, or detachment from, the bight of the conductor cable, since one notch can be widened through distortion of the plug body by squeezing together circumferentially the fingers at the sides of the other notch.

It will be apparent that, in either modification, the plug can be readily attached to any convenient part of the conductor cable, and that the clamping effect of the fingers 30, or 41, will be sufficient to hold the plug from sliding lengthwise of the cable and to hold the plug from accidental displacement from the cable. The structure is simple and inexpensive to manufacture, and affords a readily usable and effective means of holding the plug in such a way as to prevent uncoiling of the cable and minimize the danger of impact of the plug with other objects.

What is claimed is:

1. A terminal contact fitting for an insulated cable containing an electric conductor, comprising a contact member electrically connected to the conductor, a body of insulating material connected to and supporting said contact member, and a pair of outwardly extending fingers carried by said body spaced throughout their length by a distance no greater than the diameter of the cable and adapted for detachable clamping engagement with said cable.

2. A terminal contact fitting for an insulated cable containing an electric conductor, comprising a contact member electrically connected to the conductor, a cover of insulating material enclosing the connection between the conductor and said contact member, said cover being formed of soft rubber and having an integral portion thereof formed with an open notch of such width as to grip said cable frictionally to secure said fitting detachably to said cable.

3. A terminal contact fitting for an insulated cable containing an electric conductor, comprising a contact member electrically connected to the conductor, a body of resilient insulating material surrounding the conductor and supporting said contact member, said body having portions integral therewith and spaced to form an open

marginal notch in which the cable may be yieldably and clampingly engaged.

4. A terminal contact fitting for an insulated cable containing an electric conductor, comprising a contact member electrically connected to the conductor and a body of insulating material connected to and supporting said contact member,

said body having inherently resilient fingers thereon spaced to form a notch adapted throughout its depth to receive said cable with the walls of said notch in clamping engagement with said cable.

OSCAR J. NELSON.