

Feb. 13, 1945.

C. A. WOODWARD

2,369,630

ELECTRICAL CONTACT DEVICE

Filed Dec. 10, 1942

Fig. 1.

Fig. 2.

Fig. 3.

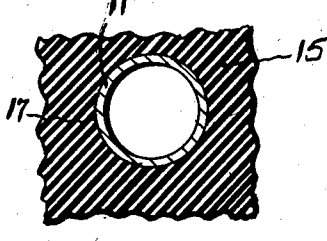
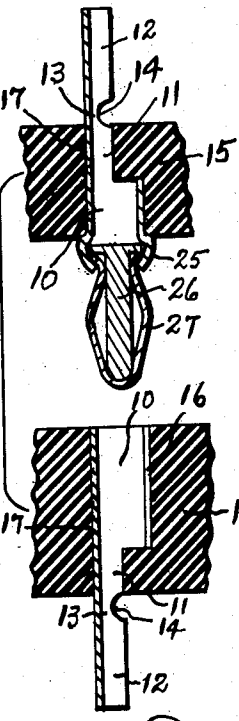
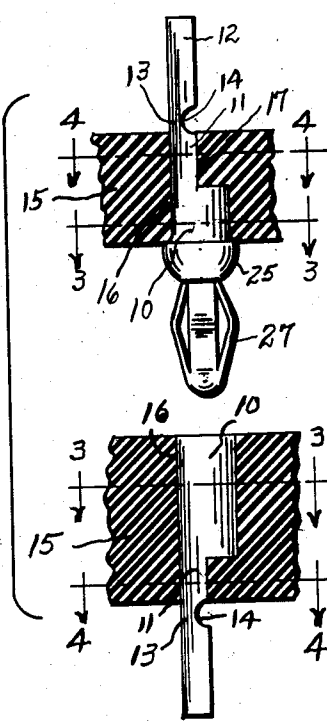


Fig. 4.



Fig. 5.

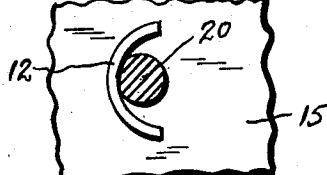


Fig. 6.

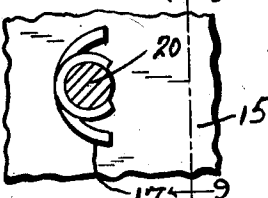


Fig. 7.

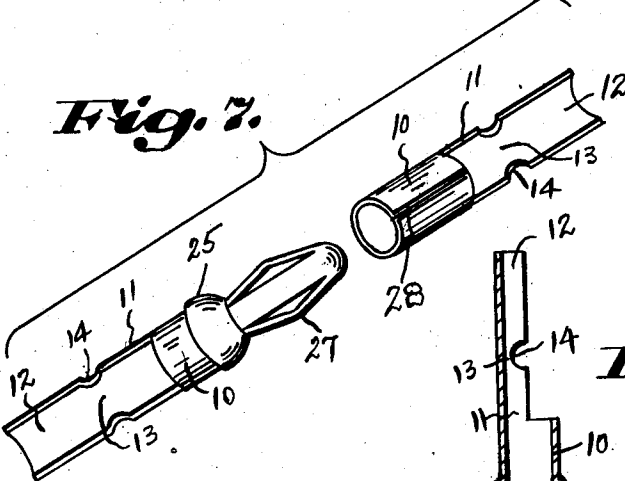


Fig. 8.

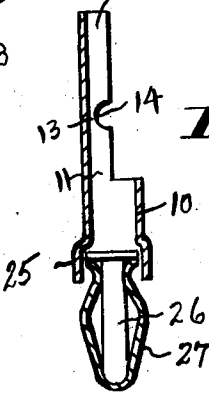
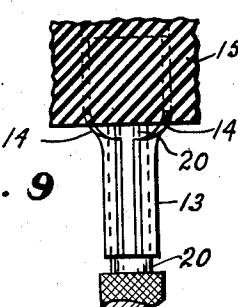


Fig. 9



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UNITED STATES PATENT OFFICE

2,369,630

ELECTRICAL CONTACT DEVICE

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Application December 10, 1942, Serial No. 468,530

1 Claims. (Cl. 173—363)

The present invention relates to improvements in electrical contact devices such as plug and socket devices, and aims generally to improve the construction of such devices.

One of the primary objects of the invention is to provide a plug or socket device which is of extremely simple construction and which will effect a very efficient electrical connection.

A further object of the invention is the provision of an electrical contact, such as a plug or socket device, which may be readily mounted in its support, with a minimum amount of labor, and which, if damaged in use, may be replaced in the field with merely the aid of a pair of pliers.

A further object of the invention is the provision of an improved plug or socket device of such construction that the electrical conductor may be easily and as efficiently connected thereto.

Further objects and advantages of the invention will be apparent to those skilled in the art, from a consideration of the following description, reference being made to the accompanying drawing illustrating a preferred embodiment thereof.

In the drawing:

Fig. 1 is a side elevation of an improved plug and socket embodying the invention, the plug and socket being mounted in their respective supports which are illustrated in section;

Fig. 2 is a similar view with the plug and socket member illustrated in section;

Fig. 3 is a transverse sectional view of the plug or socket as taken on either of the lines 3—3 of Fig. 1;

Fig. 4 is a similar view as taken on either of the lines 4—4 of Fig. 1;

Fig. 5 is a top plan view of the plug or socket device illustrating an electrical conductor in place relative thereto and prior to connecting the device thereto;

Fig. 6 is a similar view after the plug or socket has been connected to the conductor core;

Fig. 7 is a perspective view of the form of plug or socket embodying the invention;

Fig. 8 is a disassembled sectional view illustrating the manner of employing the invention in the construction of a plug device of the banana-pin type; and

Fig. 9 is a section taken on the line 9—9 of Fig. 6 to show the manner of attaching the conductor to the terminal portion.

Referring to the drawing, I have for purposes of illustration shown the invention as applied to plug members of the so-called banana-pin type wherein the plug member has a resilient cage at-

tached to a core, though it will be appreciated that the invention is not restricted to such types of plugs.

The plug and socket may be substantially identical in their mounting portions and each comprises a closed body portion 10, preferably cylindrical in shape and of relatively less length than the thickness of the insulating support in which the device is to be mounted. The body portion 10 is joined at one end by a crescent shaped extension portion 11, preferably semi-circular in shape and preferably of a radius equal to the radius of the cylindrical portion 10, and this semi-circular portion 11 is connected to a terminal portion 12 by means of a weakened or frangible portion 13 of less peripheral length than the semi-circular portion.

The body of the plug or socket above described may be made in any convenient manner. Advantageously, it may be made from a section of a drawn tube cut to desired length. The tube may be punched or drilled transversely at the point where it is desired to establish the weakened portions 13 and then sawed transversely at the point 25 to establish the body portion 10 of desired length. The opposite end of the tube may then be slit diametrically to remove a semi-cylindrical section beyond the cylindrical portion, thus leaving the semi-circular portions 11 and 12 connected by the semi-circular notches 14 formed by the previously drilled or punched transverse holes. This establishes the weakened portion 13.

The distance from the remote and cylindrical portions 10 to the center of the notches 14 is preferably equal to the thickness of the insulating support 15 in which the part is to be mounted, as is illustrated in Figs. 1 and 2. Thus, as the plug or socket is mounted in its insulating support 15 the notches 14 are disposed partly within the support.

The insulating support 15 is suitably apertured to receive the plug or socket device and preferably the apertures thereof comprise a bore 16 preferably cylindrical extending into the support from one face thereof a distance equal to the length of the cylindrical portion 10 of the plug or socket to be mounted therein. A crescent-shaped slot 17 preferably semi-circular extends into the support from the opposite face thereof and joins the cylindrical bore 16. The radii of the bore and slot are the same and they are coaxial so that the superimposed walls lie in a common plane.

The plug or socket device is assembled in the insulated support merely by inserting the semi-

circular end into the cylindrical bore 16 and then into the bore 17, until the cylindrical portion 10 of the device is housed in the bore 16, with the end of the portion 10 engaging the bottom of the bore 16 to prevent movement of the device in one direction. In this position the semi-circular notches 14 lie partly within and partly outside of the support. The sides of the semi-circular terminal portion 12 may then be distorted out of the plane of the portion 11 and the bore 17, which will prevent the displacement of the plug or socket devices out of the support in the opposite direction.

The distortion of the sides of the terminal portion 12 to prevent displacement of the plug or socket from the support, as above described, advantageously may be effected as incidental to the operation of attaching a conductor core to the device, as illustrated in Figs. 5 and 6. Conveniently a bare conductor core 20 is laid within the semi-circular terminal portion and the sides thereof are bent around the core (Figs. 6 and 9) with a suitable instrument, as a pair of pliers. The sides of the portion 12 are thus bent out of alignment with the crescent-shaped slot 17 (Fig. 6) preventing displacement of the device from the support and being clamped against the core provides a good electrical contact therewith, as shown in Fig. 9.

Should either the plug or socket device become damaged in use, it may readily be removed and replaced by a new one, by a workman in the field, by merely bending the terminal portion 12 back and forth to break it off at the weakened or frangible portion 13. The cylindrical portion 10 and the semi-circular portion 11 may then be removed by merely withdrawing them from the bore 16. A new device may then be inserted in the support and connected to the conductor core as above described.

In making a plug device according to the invention, a tubular blank may be made on an lathe, the end of the blank being turned to a cylindrical shape of diameter 16 and the other end of the blank being turned to a cylindrical shape of diameter 17. The blank is then cut into sections of length 11 and 12. The section of length 12 is then bent into a semi-circular shape of radius 14 and the section of length 11 is bent into a semi-circular shape of radius 14. The two sections are then joined together at the frangible portion 13.

The device is then inserted into the support 16 and the conductor core 20 is inserted into the semi-circular terminal portion 12. The sides of the terminal portion 12 are bent around the conductor core 20 with a pair of pliers, as shown in Fig. 9. This bending of the sides of the terminal portion 12 around the conductor core 20 prevents displacement of the device from the support and provides a good electrical contact between the terminal portion 12 and the conductor core 20.

The device is then ready for use. It may be used as a plug device or as a socket device. As a plug device, it is inserted into the support 16 and the conductor core 20 is inserted into the semi-circular terminal portion 12. As a socket device, it is inserted into the support 16 and the conductor core 20 is inserted into the semi-circular terminal portion 12. The device is then ready for use.

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eyeletting machine having an enlarged flanged end 25 at one end of the portion 10 as illustrated in Fig. 8. This flanged end may be crimped around a headed core 26 and surrounding cage 27, as employed in the case of banana type plugs. The tubular blank used for making the socket member may, if desired, be slotted as at 28, so that the enclosed body portion 10 has yieldable sides to yieldably receive the plug.

It will be seen that the contacts, either the plug or socket device, according to the invention, are extremely simple in construction and economical in cost of manufacture, and may be quickly installed and removed for replacement by even unskilled mechanics in the field.

While I have illustrated and described my improved contacts as having cylindrical and semi-cylindrical portions, it will be apparent that the invention is not restricted to the use of such shapes, as square, elliptical and other shapes may be employed if desired. Furthermore the invention is not to be restricted to the specific details shown and described but includes as well equivalents as defined in the following claim.

I claim: 1. An electrical contact device comprising an insulating support formed with a bore extending only partly therethrough from one face thereof, a relatively narrow slot extending into said support from the opposite face to a depth to join said bore throughout a portion only of its periphery, a metal contact device having a portion extending into said bore and an extension portion corresponding to the shape of said slot, said extension portion being of a length exceeding the depth of said slot so as to extend beyond a face of said support, the sides of said extended portion being bent longitudinally thereof around a conductor core and thereby out of alignment with said slot to establish electrical connection for said contact and to secure said contact in said support.

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