

Oct. 31, 1933.

R. A. BELL

1,933,304

CONNECTER

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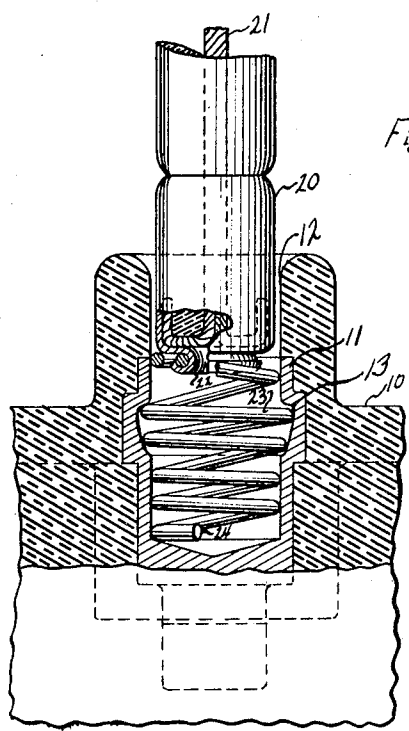


Fig. 1.

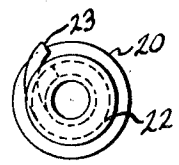


Fig. 2.

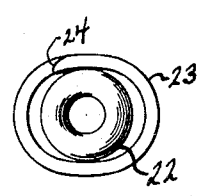


Fig. 3.

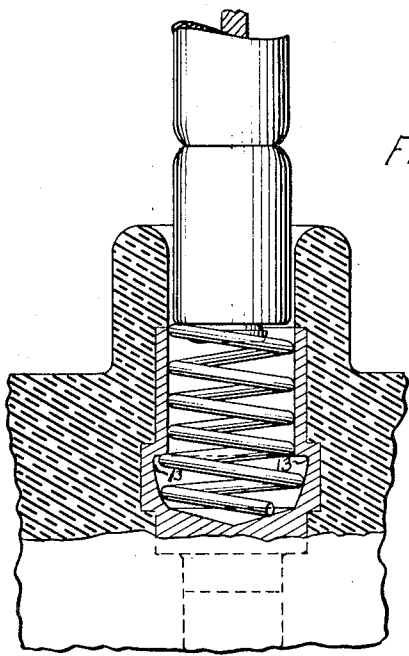


Fig. 4.

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CONNECTER

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2 Claims. (Cl. 173-269)

This invention relates to a connector terminal for electrical conductors. The connector of this invention is particularly adapted for use with female terminals, such for example as are common on the high tension distributor of automotive ignition systems. More particularly the invention relates to a spring connector adapted to accommodate itself to a variety of female connectors of various sizes and proportions, and to form with any a satisfactory tight electrical connection.

Prior to my invention, the flexible conductors have been connected to female terminals of high tension distributors, etc., by a metal cap placed over the end of the conductor and ordinarily having same resilient portion intended to press against the side of the female terminal and often intended also to form a latch member against some recessed part of the female terminal. While this simple type of connector has been acceptable to manufacturers, since they may be purchased in large numbers to fit a particular terminal, the situation has been unsatisfactory with respect to replacements. There is, at the present time, substantial standardization as to the diameter, but little uniformity in the exact design of the female connectors made by different manufacturers. Accordingly, it is difficult, in replacing the conductors, to provide a connector which will give a satisfactory fit with the particular terminal.

Accordingly it is an advantage of my invention to provide a universal connector which may be used with a variety of sizes and with a variety of terminals of different sizes and proportions, and which will form a perfect connection with any of them.

My invention consists broadly in the provision of a coil spring which is slightly larger on at least one diameter than the diameter of the female terminal with which it is to be used. Upon insertion of this connector, and particularly if twisted in the direction in which it is wound, the spring may be attenuated sufficiently to enter easily the female terminal and when released or given a slight twist in the other direction will form a tight contact against the sides of the terminal.

A preferred embodiment of my invention and one modification thereof are shown in the accompanying drawing, in which

Fig. 1 is a side elevation, partly in section, of a connector made according to my invention and mounted within a female terminal.

Fig. 2 is an end view of the connecting fer-

rule with a portion of the spring terminal broken away.

Fig. 3 is an end view similar to Fig. 2, but with the spring portion of the terminal in operative position.

Fig. 4 is a section similar to Fig. 1, showing the use of the connector of my invention with another form of terminal.

In Fig. 1 is shown a portion of a distributor cap 10, into which is molded a female terminal 11 open at the top through a throat 12 in the distributor cap. A recess 13 in the terminal 11 is provided to serve as a latch for holding the connector against accidental separation from the terminal.

The connector in this case consists of a ferrule 20 crimped at its upper edge about an insulated conductor 21. The ends of the conductor are bared and bent back over the insulation so as to contact with the inside of the ferrule 20. The end of the ferrule is constricted and bent over as shown at 22, to secure the spring 23 to the ferrule.

The end of the spring 23 is preferably turned slightly inward, as shown at 24, in order to prevent the sharp edge from digging into the side of the terminal 11 if the connector should be twisted the wrong way.

As shown in Fig. 3, the spring 23 in the preferred embodiment is flattened slightly to an elliptical shape. In this way one diameter of the coil spring is enlarged at the expense of the other, and thereby a perfect spring pressed contact may be secured in a terminal of larger diameter than the original coil of the spring, whereas in terminals of smaller diameter the coil may be sprung back toward its circular shape with relatively little effort. This elliptical shape also permits a more satisfactory engagement of one turn of the helix within the latch recess 13 of the terminal. This is because the edges of the wire on the longest diameter may engage in the recess 11, while the portion of the spring on the shortest diameter will normally come within the smaller part of the terminal 11.

In Fig. 4 I have shown another form of terminal to illustrate how the connector of my invention will adapt itself readily to any of the various terminals which are in common use.

It will be observed that in the preferred embodiment illustrated in the drawing, the helix upon which the spring is wound is left-hand. This is because one attempting to insert the spring into its opening would normally twist it in a right-hand direction, as in turning a screw

into a threaded opening. If a connector with a right-hand helix were turned in this way, the tendency would be to expand, instead of to attenuate, the spring and, as a consequence, there would be substantial difficulty in inserting it into its opening. There is less danger of twisting in the wrong direction in the case of removal of the connector, since the connectors which have been used heretofore are largely of the type which require a direct pull and not a twist. A direct pull upon this connector will serve to attenuate the spring, and therefore will permit removal from the opening. In the case of insertion, however, a push upon the spring would serve to expand the coils in diameter, and consequently a twist is desirable.

Although I have illustrated the spring as being connected to a ferrule, it will be understood that the spring may be connected to its conductor in any of numerous other ways. Thus, for example, the spring itself could be wrapped around the terminal, and, for example, secured thereto by an end driven through the insulation and into the central conductor.

It will be understood that many changes and modifications other than those specifically discussed above may be made within the scope of this invention.

What I claim is:

1. A terminal connector comprising a female terminal and a male terminal which comprises a coil of spring wire secured to the end of a conductor and freely extending therefrom, the coil being slightly deformed in cross-sectional shape from the inside shape of the female terminal, so that one radius is increased and another is decreased from the corresponding radii of the inside of the female terminal.

2. A terminal connector comprising a female terminal and a male terminal which comprises a slightly flattened helical coil of spring wire, the greatest outside diameter of said coil exceeding the inside diameter of the female terminal, and the least diameter thereof being less than said diameter of the female terminal.

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