Dec. 6, 1927. 1,651,374

A. CHAMPION

TERMINAL CONNECTER FOR SPARK PLUGS

Filed July 20. 1925

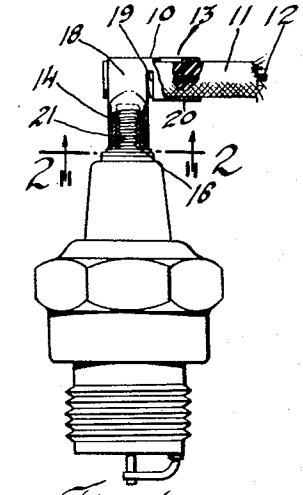

Fig. 1

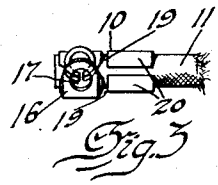

Fig. 3

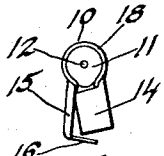

Fig. 4

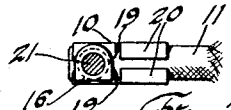

Fig. 2

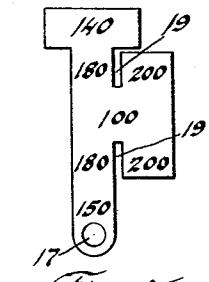

Fig. 5

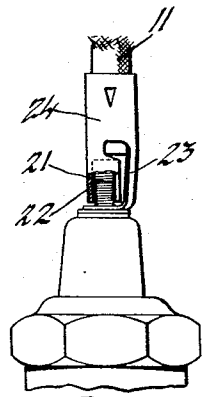

Fig. 6

Fig. 7

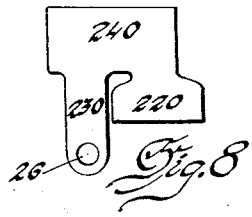

Fig. 8

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Patented Dec. 6, 1927. 1,651,374

UNITED STATES PATENT OFFICE.

ALBERT CHAMPION, OF FLINT, MICHIGAN, ASSIGNOR TO A C SPARK PLUG COMPANY, OF FLINT, MICHIGAN, A COMPANY OF MICHIGAN.

TERMINAL CONNECTER FOR SPARK PLUGS.

Application filed July 20, 1925. Serial No. 44,762.

My invention relates to terminal connecters designed especially for connecting an end of a supply cable leading to a spark plug to the central insulated electrode thereof; although the connecter may be used in other relations, and in fact wherever it becomes necessary to provide a secure and readily detachable connection between the end of a supply conductor and a device to which electricity is supplied through such a conductor.

The object of my invention is to provide an improved connecter for the purpose stated having features whereby the end of a supply conductor or cable is more securely fastened to the plug electrode or other device, and is held in a more definite and fixed relation thereto, than has heretofore usually been the case; to provide a connecter which may be readily attached to and detached from the element to which current is supplied, and in which enhanced holding action is secured by the resilience of the comparatively thick and resilient rubber insulating covering with which high tension supply cables are commonly provided; to provide an improved connecter which may be readily and cheaply made from a suitably shaped sheet metal blank, by subjecting the same to proper bending and shaping operations; and to otherwise improve upon terminal connecters of the type or class to which my invention relates.

The drawing accompanying and forming a part of this specification illustrates the preferred form of my invention, although the same may be embodied in other forms; and the concluding claims enumerate the particular features wherein my invention consists.

In the drawing:

Figure 1 is a view showing my improved connecter in elevation for the most part, and as used to fasten the end of a high tension supply conductor or cable to the central electrode of a spark plug.

Figure 2 is a view showing a section upon a plane indicated by the line 2—2, Figure 1, looking up.

Figures 3 and 4 are views showing the connecter alone, and unattached to the plug electrode.

Figure 5 is a view showing the sheet metal blank, of spring material such as hard brass, from which the connecter shown in Figures 1 to 4 is made; the view showing the connecter developed.

Figure 6 is a view similar to Figure 1, but showing another form of my invention.

Figure 7 is a view showing the end of the connecter shown in Figure 6.

Figure 8 is a view showing the sheet metal blank or development from which the connecter shown in Figures 6 and 7 is made.

Referring now to the drawing, and first to Figures 1 to 4 thereof, my improved connecter comprises a tubular base portion 10 which receives the end of the supply conductor 11, and the wall of which base is forced into permanent holding engagement with the comparatively thick insulating covering of the metallic conductor 12 of the conductor, during the securing of the connecter in place upon the end aforesaid. Figure 4 shows how the insulating covering is deformed more or less as the base 10 is compressed, by the use of a suitable tool or device, and forced into holding engagement with the insulating covering, which is ordinarily made of a rubber composition and is quite soft during the act of fastening the connecter to the supply conductor; with the result that after the connecter is fastened to the end of the supply cable said resilient covering is held in a state of compression, and acts as a resilient member or spring to press the parts of the connecter into engagement with the terminal which it engages. The connecter as a whole, because it is made from a springy material such, for example, as hard sheet brass, is as a matter of course resilient to a certain degree; but a considerable part of the resilience inherent in the connecter when assembled and ready for use is due to the thick and resilient insulating covering, held in a state of compression by the tubular base aforesaid, of the high tension cable to the end of which the connecter

is fastened. The necessary electrical connection between the base 10 and the core 12 may be provided for in various ways as, for example, by forcing a cut free spur 13 of the wall of the base inward and causing its extremity to engage the core, as will be understood from Figure 1 of the drawing.

Extending substantially at right angles from one side of the base portion, referring to Figure 4, is a tubular steadying portion 14 having an internal diameter slightly greater than that of the terminal with which the connecter is designed to be used; so that when the connecter is in use the steadying member fits the terminal closely, and prevents wobbling movement of the connecter. The length of this tubular portion may be varied with corresponding variation in the degree of steadying of the connecter as a whole and the adjacent end of the supply conductor or cable; it being obvious that the greater the length of said member, and the more closely it fits about the terminal, the less the lateral movement of the connecter will be.

Extending also from the base at the side opposite that from which the steadying portion aforesaid extends and alongside and approximately parallel with said portion, is an arm 15 the end 16 of which is bent at right angles, and lies adjacent the free end of the steadying portion 14; said bent end having a hole 17 therein in line with the axis of the tubular steadying portion of the connecter.

The portion 18 of the base with which the steadying member 14 and arm 15 merge is preferably cut free from the rest thereof by slots 19, so that the sides of the base above the steadying member and arm may move in and out slightly without communicating their motion to the other portion 20 of the base which remains tightly clamped upon the insulating covering of the supply conductor.

In view of the premises it will be appreciated that when the connector is not fastened to the spark plug or other terminal the tubular steadying portion and the arm thereof stand at an angle to one another, as shown in Figures 3 and 4, due in part to the resilience inherent in the connecter and in part to the resilience of the insulation of the supply conductor. Said parts, however, upon being grasped in the hand may be readily pressed toward one another to bring the hole 17 into line with the axis of the tubular steadying member; whereupon the connecter may be placed upon the terminal 21 and, upon being relieved from the pressure exerted by the fingers, will be held in place thereupon by the clamping action due to the resilience of the insulating covering and to its own resilience. The terminal 21 is shown as threaded, and a more secure holding action thereby results. Spark plug terminals, however, are commonly threaded; and my invention does not include the threads, and may in fact be used with smooth, or with terminals roughened otherwise than by threads.

As stated, Figure 5 shows the spring sheet metal bank from which the connecter shown in Figures 1 to 4 is made, the same being obviously a development of the connecter. The central portion 100 of the blank forms the base 10, the parts 180 and 200 thereof which form the parts 18 and 20 of the base being separated by the slots 19; while the steadying portion 14 and arm 15 of the connecter are formed from the portions 140 and 150 of the blank.

The form of my invention illustrated in Figures 6 to 8 operates in substantially the same way as the form hereinbefore described and explained, but differs therefrom in that the tubular steadying portion 22 of this second form, and the arm 23, extend substantially in line with the base portion 24 thereof, instead of substantially at right angles to the base. In this form the end 25 of the arm 23 is bent at right angles, and is provided with a hole 26 arranged in line with the axes of the steadying portion. In this form and while the resilient action of the connecter is due to the resilience of both the connecter itself and of the insulating covering of the supply cable 11, the connecter as a whole is somewhat stiffer than the form first described because the arm and steadying portion are not free to move relative to the base to as great a degree as in the form first described; such freedom of movement in the form first described being due to the slots 19 as will be appreciated.

This second form of my invention is made from the blank shown in Figure 8 wherein the part 240 provides for the base 24, the part 230 for the arm 23, and the part 220 for the tubular steadying portion 22 of the connecter, as will be appreciated.

Having thus described and explained my invention I claim and desire to secure by Letters Patent:

1. A resilient terminal connecter comprising a tubular base portion; a tubular steadying portion corresponding in diameter, approximately, with the diameter of a terminal with which said connecter is designed for use, and the length of which steadying portion is substantially greater than its diameter, said tubular steadying portion extending from said base; and an arm extending from said base alongside of and the end of which is arranged substantially at right angles to and lies adjacent the free end of said steadying portion; said end being provided with a hole located in line with the axis of said tubular steadying portion.

2. A resilient terminal connector comprising a tubular base portion; a tubular steady-

ing portion corresponding in diameter, approximately, with the diameter of a terminal with which said connecter is designed for use, and the length of which steadying portion is substantially greater than its diameter, said tubular steadying portion being integral with and extending substantially at right angles to said base; and an arm integral with said base and extending alongside of and the end of which is arranged substantially at right angles to, and lies adjacent the free end of said steadying portion; said end being provided with a hole located in line with the axis of said steadying portion, and said base portion being provided with slots whereby said steadying portion and said arm are partially separated from said base.

In testimony whereof I affix my signature.

ALBERT CHAMPION.