

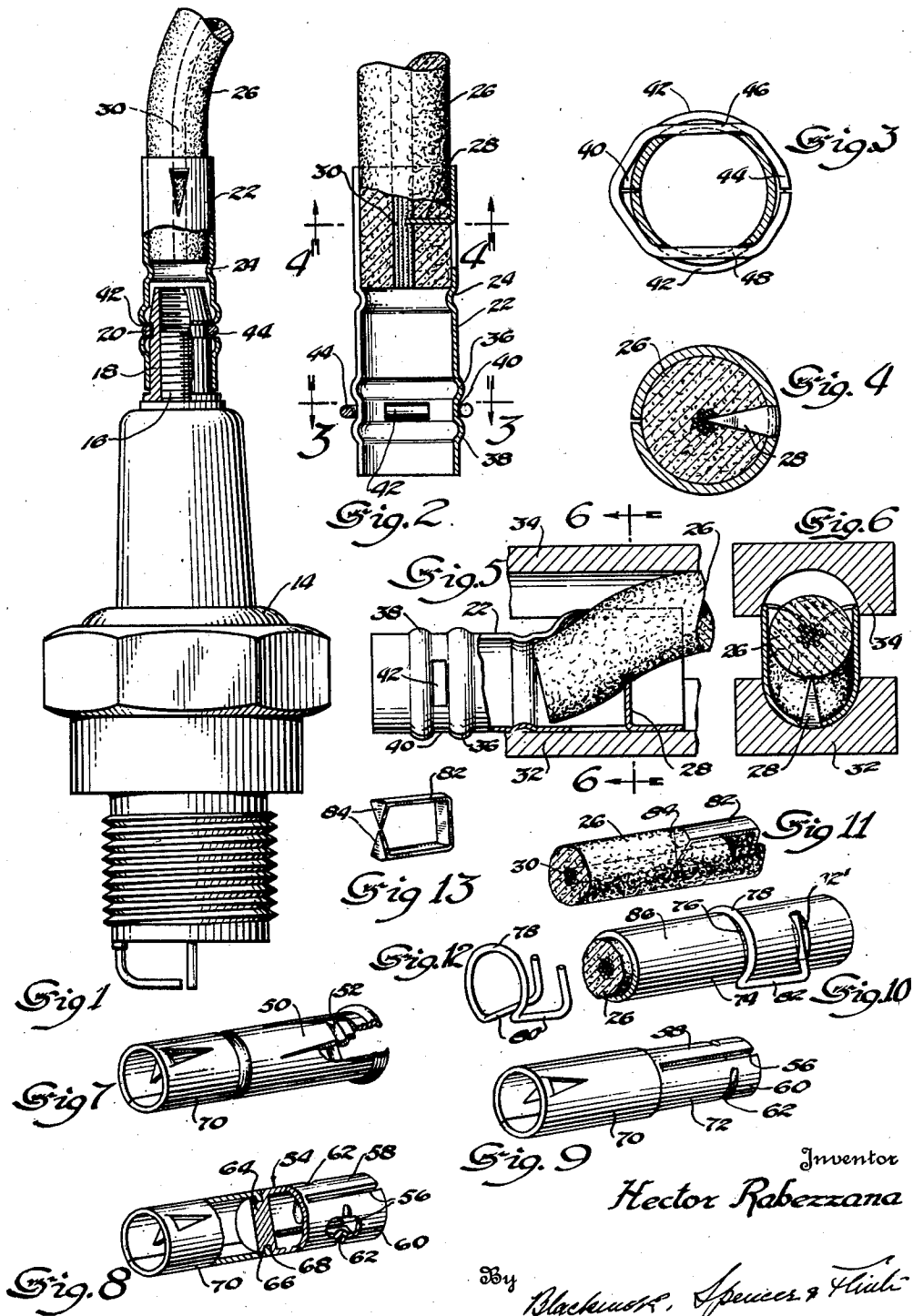
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CABLE TERMINAL FOR SPARK PLUGS

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## UNITED STATES PATENT OFFICE

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## CABLE TERMINAL FOR SPARK PLUGS

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This invention relates to cable terminals for connecting ignition cables to the terminals of spark plugs. My improved terminal is marked by the ease by which it may be applied to the cable end and to the spark plug terminal and by the cheapness and simplicity of its construction.

The invention may be embodied in many forms but consists essentially of a cylinder within one end of which the cable is secured and the other end of which is adapted for gripping engagement with the spark plug terminal. The connection with the cable is preferably made by means of a tongue bent inwardly from the cylinder and forced through the cable covering into electrical contact with the conductor. Gripping engagement with the spark plug terminal may be obtained by providing the cylinder with a resilient clip for engaging the terminal or by providing it with an integral inwardly projecting tongue for the same purpose. The cylinder is also preferably equipped with an abutment or constriction for limiting the extent of insertion of the plug.

Various specific modifications of the invention will be described in the course of the specification.

Figure 1 is a partial section through one form of my connector showing it applied to a conventional form of spark plug.

Figure 2 is a view of the same connector taken at right angles to Fig. 1.

Figures 3 and 4 are sections on corresponding lines of Figure 2.

Figures 5 and 6 show steps in the method of connection of the cable end to the terminal.

Figures 7, 8 and 9 are perspective views showing modified forms of the connector.

Figure 10 is a view showing a further modification of the cable terminal fitted on to a cable equipped with a special clip.

Figure 11 shows the cable and clip.

Figure 12 is a view showing the wire clip used with the terminal assembly shown in Figure 10.

Figure 13 is a perspective view of the cable end engaging clip shown applied to the cable in Figure 11.

In Figure 1, 14 indicates a conventional

spark plug provided with a terminal 16 shown as screw threaded and equipped with a sleeve 18 provided with an annular groove 20 for cooperation with the cable terminal. The only essential part of this construction so far as the present invention is concerned is the provision of an annular groove or equivalent engaging means on the spark plug terminal. Obviously this may be integrally formed if preferred. My preferred form of terminal consists of a cylinder 22 formed of sheet metal and provided midway of its length with an annular constriction or abutment 24 serving to limit the extent of insertion of the spark plug cable shown at 26. 28 indicates a pointed tongue pressed inwardly from the metal of the cylinder 22 and adapted to pierce the cable insulation and to make electrical contact with the cable conductor 30.

The manner of assembling the cable with the terminal is shown in Figures 5 and 6. At one stage in the forming of the cylinder 22 the cable engaging end is left open at the seam, as shown in these figures, so as to permit the introduction of the cable. The cable is inserted as shown in Figures 5 and 6 while the cylinder 22 is seated in a lower die member 32. When properly positioned, the upper die member 34 is brought down closing the end of the cylinder and impaling the cable end on the pointed tongue 28.

The other end of the cylinder 22 is preferably provided with spaced corrugations 36 and 38 forming a channel 40, the bottom of which is slotted at diametrically opposite points 42 to receive the spring clip 44, best shown in Figure 3. The clip is preferably made of spring wire and is provided with flattened sides 46 and 48 for engagement in the slots 42. As shown in Figure 1 the flattened sides are adapted to seat in the groove 20 provided in the spark plug terminal.

The form of the invention shown in Figure 7 is like that shown in the preceding figures except that the clip 44 is replaced by an inwardly bent tongue 50 having an inwardly pressed portion 52 for engagement in the groove 20.

In the form in Figure 8 the cable terminal

is formed in two parts. The part 54 is slotted at 56 to form opposed spring fingers 58 and 60. The fingers are provided with inwardly pressed ribs 62 adapted to seat in the groove 20 in the same manner as the part 52 in the form shown in Figure 7. The member 54 is provided with a closed end 64 having an annular groove 66 receiving an inturned flange 68 formed on the cable end engaging portion 70. This portion of the terminal is like that shown in the preceding views.

The construction shown in Figure 9 is identical with that shown in Figure 8 except that it is in the form of a one-piece seamless tube. The end of the tube which engages the spark plug terminal is reduced as shown at 72 so as to provide a restriction for limiting the inward movement of the cable.

In the form shown in Figure 10 the cable terminal is in the form of a seamless tube 74 provided with an inwardly pressed channel 76 and, at the spark plug terminal engaging end, with opposed slots 42' similar to the slots 42 in the form shown in Figures 1 and 3. Figure 12 illustrates a spring wire clip having an arcuate portion 78 received in the channel 76 and spring arms 80 having their ends received in the slots 42' as shown. In this form of the invention the cable 26 is provided with the clip 82 shown in Figure 13. The tines 84 formed on the clip pierce the insulation and engage the conductor 30 as shown in Figure 11. In assembling this construction the cable end with the attached clip 35 is simply forced in the cylindrical portion 86 of the cable terminal, as shown in Figure 10. Obviously both in the form shown in Figures 10 to 13 and in the form shown in Fig. 9 the connector may be rolled out of flat stock if preferred.

While I have shown in this application a number of specific forms of my invention and have presented not only generic claims common to all forms but specific claims to different species I wish it understood that I elect to prosecute in this application claims to the form shown in Figures 1 to 6.

I claim:

1. A terminal connector comprising a tubular member provided with an annular channel having slots in its bottom, said channel being formed by spaced annular corrugations in the tubular member, and a clip seated in the channel and having portions extending through said slots.

2. A terminal connector comprising a tubular member provided with a channel having slots formed in its bottom, said channel being formed by spaced corrugations in the tubular member, and a clip seated in the channel and having portions extending through said slots.

3. A terminal connector comprising a tubular member provided with an outwardly extending annular shoulder, slots adjacent

to said shoulder, and a clip embracing the tubular member and having portions extending through said slots.

4. A terminal connector comprising a tubular member provided with an outwardly extending annular shoulder and with a slot adjacent to said shoulder, and a clip resiliently seated on the tubular member and having a portion extending through said slot.

5. A terminal connector comprising a tubular member provided with an outwardly extending shoulder and with a slot, and a clip resiliently seated on the tubular member, said clip being adjacent to said shoulder and extending through said slot.

In testimony whereof I affix my signature.  
HECTOR RABEZZANA.