

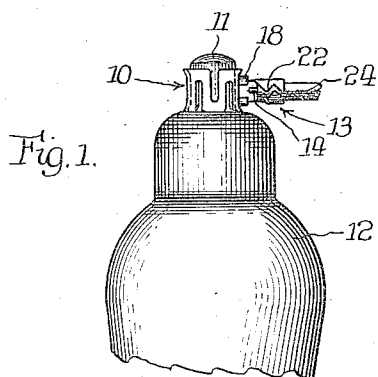
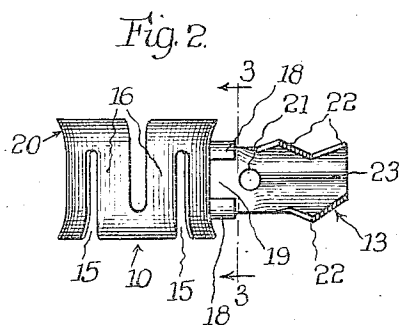
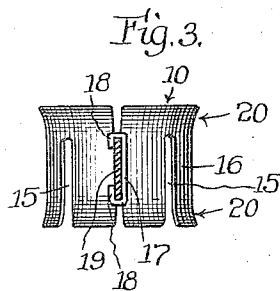
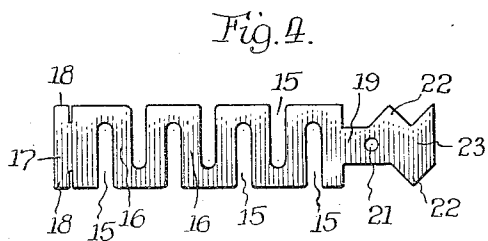
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ELECTRICAL CONNECTER

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## UNITED STATES PATENT OFFICE

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## ELECTRICAL CONNECTER

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5 Claims. (Cl. 173—269)

The invention relates generally to electrical connectors and more particularly to devices for establishing a connection between a radio valve terminal and a lead thereto.

5 Certain types of present day radio valves embody a terminal, usually in the form of a cylindrical cap, at the upper end of the valve. In-  
10 clusion of the valve in a circuit is, in part, through this terminal and in the past various forms of connectors have been employed, all of  
15 which are subject to the disadvantage of being incapable of engaging the cap with sufficient force to maintain the connection under all con-  
20 ditions of operation. For example, in automobile receiving set installations where unusual  
25 conditions of vibration are present, there is a decided tendency for these connectors to work free of the cap.

An object of the invention is to provide a new  
30 and improved connector which is capable of exerting a strong gripping force on the terminal ample to maintain the connection under all con-  
35 ditions of operation.

Another object is to provide a novel connector  
40 embodying a closed loop which is extensible along its length so that it may be forced over a somewhat larger cap.

More specifically stated, another object resides  
45 in the provision of a connector formed of a strip of material which has been fashioned to produce  
50 inherent longitudinal resiliency therein, said strip being bent upon and secured to itself short of one end to form a closed expansible loop for  
55 engaging a terminal, and a part extending therefrom for connection with a lead.

Another object of the invention is to provide  
a connector of this nature which is capable of  
being cut or stamped from a sheet of metal and  
which is so formed that very little waste mate-  
40 rial results, thereby effecting a substantial saving in the cost of production.

Other objects and advantages will become ap-  
parent in the following description and from the  
accompanying drawing, in which:

45 Figure 1 is a side elevation of a valve showing a device embodying the features of the invention assembled thereon.

Fig. 2 is a side elevation of the connector on an  
enlarged scale.

50 Fig. 3 is a side elevation of the device partially in section as indicated by the line 3—3 of Fig. 2.

Fig. 4 is an extended view of a formed strip, the  
scale on which this view is made being somewhat  
less than that of Figs. 2 and 3.

55 The invention is illustrated and will be de-

scribed in the environment of a connector for the screen grid terminal cap of a thermionic valve but it will be evident that the invention is ca-  
pable of other uses without substantial modi-  
fication.

5 In the illustrated embodiment of the invention, the connector generally comprises a closed ring or loop 10 which is adapted to fit over the terminal  
10 cap 11 of a valve 12 as shown in Fig. 1 and has an outwardly extending part 13 through which an electrical connection is permanently made  
15 with a lead 14 (Fig. 1). The loop 10 of the connector is made somewhat smaller than the dimension of the cap over which the loop fits and the loop is so fashioned that, while it is per-  
20 manently closed, longitudinal extension thereof is possible whereby the loop may be forced over the cap into a substantially fixed engagement therewith. The material from which the con-  
25 nector is formed may of itself be distortable so that, when the connector is forced onto the cap, the longitudinal expansion occurs through dis-  
30 tortion of the metal itself. It is preferable, however, to form the connector of a material which is inherently resilient, thus introducing yielding  
35 resistance to longitudinal distortion which results in the creation of a force tending always to contract the loop into a firm holding engagement with the cap.

A preferred formation of a strip by which the  
30 desired longitudinal extensibility is obtained is best seen in Fig. 4. The device is fashioned from an elongated blank strip of suitable current con-  
35 ducting material such as thin gauge sheet steel, the overall dimensions of the blank strip being only slightly larger than the dimensions of the formed strip shown in Fig. 4. By a die-cutting  
40 or similar operation, a series of transversely extending recesses 15 are formed to extend substantially but not entirely across the strip from op-  
45 posite longitudinal sides thereof and are disposed in alternate or staggered relation. Thus, a series of relatively narrow transversely extending and longitudinally spaced bars 16 is formed, said  
50 bars being successively connected at alternate ends with each other. In other words, the pattern embodies an elongated relatively narrow strip of material which is wound back and forth upon itself through a substantially circuitous or  
55 serpentine path.

At one end of the formed strip (in this instance the left-hand end as shown in Fig. 14) an end  
portion 17 is defined by a pair of short ears or  
fingers 18 produced by making small transverse  
cuts in the blank strip. At the opposite or right-

hand end the connection part 13 is fashioned by cutting away opposite longitudinal sides of the blank strip to form a relatively narrow extension 19.

5 The properly fashioned blank strip is bent upon itself into the form of a loop which is usually circular. The end portion 17 and extension 19 are bent to extend outwardly and generally radially of the loop so that these parts may be brought into abutment as the loop is formed, after which the ears 18 may be crimped or bent about the opposite sides of the extension 19 to secure these parts together and thereby produce a permanently closed loop.

15 The resulting structure is one which may be readily slipped over a cap to establish an electrical connection. Preferably, the material about each open face of the loop flares slightly outwardly as indicated at 20 (Figs. 2 and 3) to facilitate assembly of the device on the cap. If the current conducting material is soft or, in other words, is readily deformable the loop will be expanded or extended in the assembly operation. However, if the device is formed, as is preferable, of a resilient material, the loop will be expanded during assembly but will have an inherent tendency to contract thereby to establish a substantially rigid union between the cap and the connector and to effect an excellent electrical connection between the parts.

The extension 19 may be constructed in any suitable manner to provide for the connection of the lead 14 therewith. In the present instance, an aperture 21 is arranged to receive the end of the lead 14 which may then be soldered in place. In addition, projections 22 are formed on an end portion 23 which is substantially a continuation of the extension, and this end portion is usually channel-shaped as shown in Fig. 2 to receive the end of the insulation 24 enclosing the lead 14 and to facilitate bending of the material about the insulation.

It will be evident from the foregoing that a novel connector has been provided which may be economically manufactured and which will embrace and firmly engage a part with which it is assembled. The connector may be easily slipped on or removed from a terminal, yet will not become accidentally disengaged therefrom under operating conditions.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and have described in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alterna-

tive constructions falling within the spirit and scope of the invention as expressed in the appended claims.

I claim as my invention:

1. A connector comprising an elongated resilient strip of current conducting material having transverse recesses extending inwardly from opposite side edges in alternate and staggered relationship, said strip having at one end transversely extending fingers and near the other end a portion of reduced width about which said fingers may be bent to form the strip into a closed loop.

2. A connector fashioned as a loop comprising an elongated strip of resilient current conducting material formed to turn back and forth a number of times in a circuitous path, and means including an integral bendable finger near one end of the strip bent over into engagement with the strip for securing said one end short of the other end to form a closed loop and provide a free end for connection with a conductor.

3. A connector comprising an elongated resilient strip of current conducting material partially severed from opposite sides to render the strip longitudinally extensible and bent to form a closed loop, the ends of said strip being bent laterally and lying in face to face abutment, one of said ends being longer than the other to provide means for connection of a conductor, and means integral with the other end connected with said one end to secure said ends permanently together in said face-to-face abutment.

4. A connector of the character described, comprising a loop formed from an elongated strip of resilient current conducting material having transversely extending recesses therein extending from opposite sides of the strip in staggered relation and rendering said strip longitudinally extensible, one end of said strip providing a connection to a conductor, the other end of the strip being disposed in position adjacent said one end, and means for securing said ends in permanent relationship to form a closed loop.

5. Means adapted to form a connector of the character described, comprising an elongated resilient strip of current conducting sheet material having transversely extending spaced apertures to render the same longitudinally extensible and arranged to be fashioned as a loop to fit over an electric terminal, a bendable member near one end of said strip adapted to be bent over against an adjoining part for connecting the strip into a closed loop, and means near the opposite end of the strip for engagement by said member after the same has been bent over.

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