[54] BATTERY TERMINAL CONNECTORS

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[22] Filed: Aug. 7, 1970

[21] Appl. No.: 62,084

[30] Foreign Application Priority Data
Aug. 8, 1969 South Africa..........................69/5686

[52] U.S. Cl. .........................................339/95 B, 339/113 R, 339/228
[51] Int. Cl. .........................................H01r 11/24

[58] Field of Search ...................................339/95, 113, 224-240

[56] References Cited
UNITED STATES PATENTS
2,925,579 2/1960 Osborn..........................339/225

2,357,567 9/1944 Williams..........................339/225
592,123 10/1897 Ribble..........................339/113
1,968,432 7/1934 Wilson..........................339/236

FOREIGN PATENTS OR APPLICATIONS
972,740 10/1964 Great Britain..................339/228

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[57] ABSTRACT

This invention is concerned with connectors for connecting electrical cables to batteries wherein a socket for the terminal post is provided with a radially extended formation housing a springloaded post engaging plug and a cap is fitted to retain the plug in position with the cable secured to the plug.

11 Claims, 4 Drawing Figures
BATTERY TERMINAL CONNECTORS

This invention relates to connectors for connecting a cable to a battery terminal post and more particularly to connectors of the type comprising a socket adapted to receive a battery terminal post and a spring loaded plug adapted to project into the socket transversely thereof to engage a battery terminal post.

It is the object of this invention to provide a cable connector of this type which will be effective in use and simple to manufacture and assemble.

According to this invention there is provided a battery connector comprising a moulded housing having a socket adapted to engage a battery terminal, a radially extending hollow formation extending from the body and a cap over the end of the formation to retain a spring loaded post engaging plug adapted to be connected to a battery cable.

Further features of the invention provide for the cap to be made of moulded thermoplastic material, for the cap to be provided with inwardly directed formations on the inside surface thereof and engaging behind an external peripheral rib on the end of the hollow formation, and for the cap to be heat softened in order to secure it over the end of the hollow formation.

A preferred embodiment of the invention will now be described by way of example, reference being made to the accompanying drawings in which:

FIG. 1 is a longitudinal sectional elevation of the cable connector;
FIG. 2 is a sectional elevation of part of the connector having an insert therein;
FIG. 3 is a section along line A—A in FIG. 2; and
FIG. 4 is an elevation of the inside of the end cap.

In this preferred form of this invention the connector comprises a generally cylindrical moulded plastic body 1 having one end enlarged and formed with an inwardly tapering transverse socket 2 closed at one end so as to form a cap shaped to fit over a standard battery post.

The axis of the socket extends at right angles to the length of the body which extends therefore radially away from the socket. The body has an axial hole 3 through it which opens at one end 4 into the socket and has an outwardly projecting peripheral rib 5 at the other end.

The part 6 of the hole nearer the rib 5 is of circular cross-section and accommodates a compression spring 7. The remaining length 8 of the hole is of polygonal shape, in this case square and slidably accommodates a plug 9 of corresponding shape and made of brass or other suitable electrically conducting metal.

The spring acts on the plug 9 by way of a washer 10 abutting a shoulder 11 on the inner end of the plug and defined by a spigot 12 extending centrally out of the said inner end.

To retain the plug 9 and the compression spring 7 used to hold the plug in electrical contact with the battery terminal, an end cap 13 for the body is provided which is perforated to slide over any cables 14 secured to the plug and adapted to provide an abutment against which the compression spring may act.

To hold the end cap in position it carries an inwardly directed flange 15 engaging around the peripheral rib 5 formed in the outer surface of the body.

This cap is preferably made of moulded thermoplastic material and the inwardly directed flange is made discontinuous by providing breaks 16 therein around the periphery of the cap. Thus the cap may stretch more easily at the parts where the flange is discontinued to facilitate the securing of the cap onto the end of the body. It will be understood that in order to secure the cap onto the end of the body it is firstly heated and then forced over the end, the inoperative edges 17 and 18 of the rib and flange being tapered to facilitate this. Alternatively, the cap may be made simply of material which will stretch at normal temperature sufficiently to force the cap over the rib and into engagement therewith.

The spring 7 acts to press the plug into the socket and the end of the plug facing the socket is curved and tapered so that it is of similar shape to the wall of the socket. This end of the plug is also serrated to bite into a battery terminal post, the serrations preferably being in the form of parallel laterally extending teeth 19, with the upper edges 20 of the teeth extending at approximately right angles to the axis of the socket. This shape of serration has the advantage that vibrations will not cause it to creep up a battery post during use.

The spigot 12 at the end of the plug opposite the serrated face extends axially and has a slight divergent taper thereto. This spigot may have crimped thereon a conducting tube 21 for example of copper which at the other end is crimped into the conducting core 22 of the battery cable 14. Alternatively, the end of the plug may be provided with a socket into which one end of a battery cable may be soldered.

It will thus be understood that the cable 14 is secured to the plug prior to assembly of the cable connector and the cap is only secured onto the end of the body when all the other component parts have been assembled onto the plug and cable and the plug is introduced into the part 8 of the hole through the body.

To fit the connector to a battery post and accordingly connect the latter to the cable, the cable is used to pull the metal plug inwardly against the compression of the spring. The socket is then fitted over the battery post and the cable released to allow the metal plug to make electrical engagement with the battery post under the loading of the spring. To release the connector the reverse operations are carried out.

If the body of the cable connector is to be used for a variety of different sized or shaped battery posts, inserts such as that indicated by numeral 23 in FIG. 2 and 3 of the correct shape may be made to fit into the socket, these inserts being provided with a divergently tapered rib 24 adapted to fit into a complementary recess 25 around the periphery of the mouth of the socket. Where the socket is of the correct size and shape a non-corrosive flange 26 as illustrated in FIG. 1 is fitted into the socket mouth to finish it off.

Also, the outer surface of the closed end of the socket is preferably provided with a circular recess 27 adapted to receive a colored indicating disc 28. This enables the positive and negative battery connector bodies to be made identical but to be provided with different colored indicating discs such as green or red.

It will therefore be appreciated that the invention provides effective cable connectors which may be easily and inexpensively manufactured and assembled.

What I claim as new and desire to secure by Letters Patent is:

1. A battery connector comprising a molded socket body for engaging a battery terminal, a radially extending sleeve extending from said socket body, a cap covering the end of said sleeve and mounted thereto by a snap fit, and a springloaded post engaging plug connected to a battery cable and retained within said sleeve and in abutment with said battery terminal by said cap.

2. A battery connector as in claim 1 in which said cap includes an internal flange and said sleeve includes an external peripheral rib engaging said internal flange to retain said cap on the end of said sleeve.

3. A battery connector as claimed in claim 2 in which the cap is made of resiliently deformable material.

4. A battery connector as claimed in claim 2 in which the cap is made of thermoplastic material.

5. A battery connector as in claim 1 wherein the end of said plug engaging said battery terminal is serrated.

6. A battery connector as in claim 5 wherein said serrations extend transversely with respect to said socket body and the face of the plug engaging said battery terminal is shaped to conform to the shape thereof.

7. A battery connector as in claim 6 wherein the surfaces of said serrations are in planes extending substantially at right angles to the socket body axis.
8. A battery connector as in claim 1 wherein said plug has a polygonal shaped cross-section and at least part of said sleeve is of complementary shape.
9. A battery connector as in claim 8 wherein said plug has a divergent tapered spigot at the end thereof facing said cap.
10. A battery connector as in claim 9 wherein said spigot is connected to the conducting core of a battery cable by means of a conductive tube crimped onto the spigot and core.
11. A battery connector as in claim 10 wherein said socket body includes a recess in the exterior thereof, said recess is shaped to retain a colored indicating disc.