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(54) A BATTERY TERMINAL CONNECTOR.

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Description

The invention relates to a battery terminal connector having a housing of insulating material and with a terminal post hole to receive a battery terminal post as well as a cable hole which is preferably substantially perpendicular to the terminal post hole and serves to receive a contact device to establish connection between a battery cable and the terminal post and which extends through a threaded stub on the housing, said contact device being slidable in the cable hole and capable of being pressed against a terminal post in the terminal post hole by means of a nut or a threaded bushing of insulating material, said nut or threaded bushing being screwed on to or into the threaded stub and having an inwardly extending flange which cooperates with a substantially radial face on the contact device.

Such a battery terminal connector can be manufactured at a relatively low price because both the housing and the nut or the threaded bushing can consist of an inexpensive plastics material, e.g. acetal plastics. However, all the conducting parts of the applied terminal connector are enclosed by insulating material, which makes it impossible to connect a starter cable without first removing the terminal connector. In connection with battery terminal connectors of a similar type it has been proposed to overcome this drawback by providing the housing or a sleeve member corresponding to the threaded stub with an opening which is normally covered by a detachable or hinged cover, which may have the form of a clamp. Such a feature complicates the entire structure and adds to the cost.

Attention is directed to documents DE-A-2520651 and DE-A-2919178 both of which disclose arrangements similar to that defined by the preamble of Claim 1 of the present application.

The object of the invention is to provide a battery terminal connector of the present type which, without any noticeable increase in the cost, allows a starter cable to be connected to the applied terminal connector.

This object is achieved in that the contact device has a rearwardly extending conducting element which, in the applied position of the battery terminal connector, protrudes through the nut or the threaded bushing and over a portion of the cable insulation. In such a structure the projecting portion of the contact device is directly accessible for connection of a starter cable, and the additional cost involved is just the material of the extension.

When the contact device exclusively consists of conducting elements, the conducting rearwardly extending extension can expediently be constructed as stated in claim 2.

However, some cheapening of the battery terminal connector can be obtained when part of the contact device is made of insulating material, as stated in claim 3, in which case the conducting, rearwardly extending extension can be strip-

shaped, likewise as stated in claim 3.

Another expedient detail is stated in claim 4.

Preferably, as stated in claim 5, the nut or the threaded bushing is formed with two or more preferably axial legs which extend rearwardly at least to the rear end of the preferably tubular extension of the contact device. This minimizes the risk of battery short-circuit because of lost or carelessly placed tools or other conducting parts since the rearwardly extending legs can easily be shaped and dimensioned so as to offer effective protection against such short-circuit. Moreover, the legs form a convenient finger grip for screwing on and off the nut, just as they permit the use of pliers or wrenches for tightening or loosening the nut, when said nut is not hexagonal, but cylindrical.

The invention will be explained more fully below with reference to the drawing, in which

fig. 1 is a longitudinal section through an embodiment of the battery terminal connector of the invention,

fig. 2 is a perspective view of a sleeve-shaped nut incorporated in it,

figs. 3, 4 and 5 show part of an amended embodiment of the contact device, seen from the top, from the end and in an elevated longitudinal section, respectively, and

fig. 6 is a perspective view of a metal strip intended to be inserted in said part.

In the drawing, the numeral 10 represents a substantially frusto-conical battery terminal connector housing which has a lateral extension 11 and consists of insulating material, e.g. a suitable, strong plastics material. The housing has a terminal post hole 12 to receive a battery terminal post 13 shown in broken lines and a cable hole 14 which is substantially perpendicular to said post and extends through the lateral extension 11 and through an exteriorly threaded pipe stub 15 which is integral with the extension.

The cable hole 14 slidably receives a contact device consisting of two members, viz. a cylindrical contact element 16 and a sleeve 17, both made of lead or alloyed lead. The front end face 18 of the contact element 16 has a cone surface shape corresponding to the shape of the battery terminal post. On the rear end face 19 the contact element has a conical tip 20.

The front end of the sleeve 17 is formed with an inner conical face 21, and the sleeve has an outer annular flange 22 somewhat spaced from both ends. A sleeve-shaped union nut 23, which consists of an insulating material such as plastics and is screwed on to the threaded stub 15, has an inwardly extending end flange 24 which engages the flange 22 of the sleeve 17 during the screwing-in operation and thus presses the sleeve against the contact element 16, which is in turn pressed against the terminal post 13. As shown more clearly in fig. 2, the nut 23 has moreover two rearwardly extending legs 28 which, in the

applied position of the terminal connector as shown in fig. 1, extends axially a short distance beyond the rear end portion 27 of the sleeve 17 protruding from the tubular portion of the nut 23. A battery cable with an insulating sheath 25 whose end portion is stripped, is mounted in that the exposed threads 26 — after the nut 23 and the sleeve 17 have been pushed over the cable — are pressed over the conical tip 20 of the contact element 16 so that the threads will be spread and distributed over the surface of the tip. The sleeve 17 is now pushed forwardly over the threads, and the nut 23 is screwed on to the stub 15 and tightened so that the cable threads will be fixed between the conical face 21 of the sleeve 17 and the conical face of the contact element 16, and the contact element 16 will be clamped against the terminal post 13.

The rear end portion 27 of the sleeve 17, which protrudes through the tubular portion of the nut 23, makes it possible to establish connection to the battery terminal post, e.g. with a starter cable, without removing the terminal connector. The fact that the protruding sleeve portion has relatively modest dimensions and is in a retracted position with respect to the rest of the battery terminal connector, reduces the risk of short-circuit caused by lost or carelessly placed tools or the like. This risk is additionally reduced by the rearwardly extending legs 28 of the nut which have such a width that they cover a considerable portion of the surface of the sleeve. This in combination with the thickness of the legs has the effect that only under very unfortunate circumstances can tools or other metallic articles long enough to cause short-circuits simultaneously touch the lead sleeves of both terminals.

The conductive sleeve 17 can optionally be replaced by such a sleeve 29 of insulating material as is shown in figs. 3-5. This sleeve is constructed in the same manner as the sleeve 17, except that its inner wall is formed with an axial through-going groove 30 to receive such a metal strip 31 as is shown in fig. 6, and that it has a cut-out 32 at its outer end adjacent the groove 30. The metal strip 31 is of such length as to extend through the cut-out 32 and a distance beyond the rear edge of the sleeve so that it is readily accessible for connection of a starter cable.

The battery terminal connector of the invention may be designed in many other ways than those shown and described in the foregoing. For example, the contact device might be made in one piece and moulded around the exposed thread ends of the cable. And the pipe stub 15 might be internally threaded instead of externally, and in that case the nut 23 would be replaced by a threaded bushing with external threads. Moreover, the rearwardly directed extension 27 of the sleeve 17 does not have to be tubular, but might optionally be slitted or just consist of one or more rod-shaped or strip-shaped parts. Also the rearwardly extending legs of the nut may be formed in a manner other than the one shown in the drawing, and more than two such legs may be

provided.

Claims

1. A battery terminal connector having a housing (10) of insulating material and with a terminal post hole (12) to receive a battery terminal post (13) as well as a cable hole (14) which is preferably substantially perpendicular to the terminal post hole and serves to receive a contact device (16, 17 or 29) to establish connection between a battery cable (25, 26) and the terminal post and which extends through a threaded stub (15) on the housing, said contact device being slidable in the cable hole and capable of being pressed against a terminal post in the terminal post hole by means of a nut (23) or a threaded bushing of insulating material, said nut or threaded bushing being screwed on to or into the threaded stub and having an inwardly extending flange (24) which cooperates with a substantially radial face (22) on the contact device, characterized in that the contact device (16, 17 or 29) has a rearwardly extending conducting element (27 or 31) which, in the applied position of the battery terminal connector, protrudes through the nut (23) or the threaded bushing and over a portion of the cable insulation (25).

2. A battery terminal connector according to claim 1, in which said contact device (16, 17) comprises a conducting sleeve (17), characterized in that the rearwardly extending, conducting element is formed by a tubular extension (27) of said conducting sleeve (17).

3. A battery terminal connector according to claim 1, characterized in that the contact device (16, 29) consists of a conducting contact means (16) intended to engage the battery terminal post (13) and an insulating sleeve (29) formed with said substantially radial face to receive the stripped wire ends (26) of the battery cable and to press said wire ends together around a rearwardly extending, substantially conical part (20) of the contact means (16) upon tightening of the nut (23) or the threaded sleeve, and that the rearwardly extending conducting element (31) is strip-shaped and embedded along the inner wall of the insulating sleeve (29).

4. A battery terminal connector according to claim 3, characterized in that the inner wall of the insulating sleeve (29) is formed with an axial throughgoing groove (30) to receive the strip-shaped element (31).

5. A battery terminal connector according to claim 1 or 2, characterized in that the nut (23) or the threaded bushing is formed with two or more preferably axial legs (28) which extend rearwardly at least to the rear end of the preferably tubular extension (27) of the contact device (16, 17).

Patentansprüche

1. Batteriepol-VerbindungsVorrichtung, die ein

Gehäuse (10) aus isolierendem Material und mit einer Polbolzenöffnung (12) hat, um einen Batteriepolbolzen (13) aufzunehmen, sowie eine Kabelöffnung (14) hat, die vorzugsweise im wesentlichen senkrecht zur Polbolzenöffnung ist und dazu dient, die Kontakteinrichtung (16, 17 oder 29) aufzunehmen, um eine Verbindung zwischen einem Batteriekabel (25, 26) und dem Polbolzen herzustellen und die sich durch einen mit Gewinde versehenen Stutzen (15) am Gehäuse erstreckt, wobei die Kontakteinrichtung in der Kabelöffnung gleitbeweglich und fähig ist, daß sie gegen einen Polbolzen der Polbolzenöffnung mit Hilfe einer Mutter (23) oder einer mit Gewinde versehenen Hülse aus isolierendem Material drückbar ist, und wobei die Mutter oder die mit Gewinde versehene Hülse auf oder in den mit Gewinde versehenen Stutzen schraubbar ist und einen nach innen verlaufenden Flansch (24) hat, der mit einer im wesentlichen radialen Fläche (22) an der Kontakteinrichtung zusammenarbeitet, dadurch gekennzeichnet, daß die Kontakteinrichtung (16, 17 oder 29) ein nach hinten verlaufendes Leiterelement (27 oder 31) hat, das in der Gebrauchsstellung der Batteriepolverbindungs Vorrichtung durch die Mutter (23) oder die mit Gewinde versehene Hülse und über einen Abschnitt der Kabelisolierung (25) vorsteht.

2. Batteriepol-Verbindungs Vorrichtung nach Anspruch 1, bei der die Kontakteinrichtung (16, 18) eine Leiterhülse (17) aufweist, dadurch gekennzeichnet, daß das nach hinten verlaufende Leiterelement von einer rohrförmigen Verlängerung (27) der Leiterhülse (17) gebildet wird.

3. Batteriepol-Verbindungs Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Kontakteinrichtung (17, 29) aus einer leitenden Kontakteinrichtung (16) besteht, die dazu bestimmt ist, daß sie in Eingriff mit dem Batteriepolbolzen (13) und einer isolierenden Hülse (29) kommt, die mit einer im wesentlichen radialen Fläche ausgebildet ist, um die freigelegten Drahtenden (26) des Batteriekabels aufzunehmen und diese Drahtenden zusammen um einen nach hinten verlaufenden, im wesentlichen konischen Teil (20) der Kontakteinrichtung (26) beim Anziehen der Mutter (23) oder der mit Gewinde versehenen Hülse zu drücken, und daß das nach hinten verlaufende Leiterelement (31) streifenförmig ausgebildet ist und längs der inneren Wand der Isolierhülse (29) eingebettet ist.

4. Batteriepol-Verbindungs Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß die innere Wand der Isolierhülse (29) mit einer axial durchgehenden Ausnehmung (30) versehen ist, um das streifenförmige Element (31) aufzunehmen.

5. Batteriepol-Verbindungs Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Mutter (23) oder die mit Gewinde versehene Buchse mit zwei oder mehr vorzugsweise Axialschenkeln (28) versehen ist, die sich wenigstens zu dem hinteren Ende der vorzugsweise rohrförmigen Verlängerung (27) der Kontakteinrichtung (16, 17) nach hinten erstrecken.

Revendications

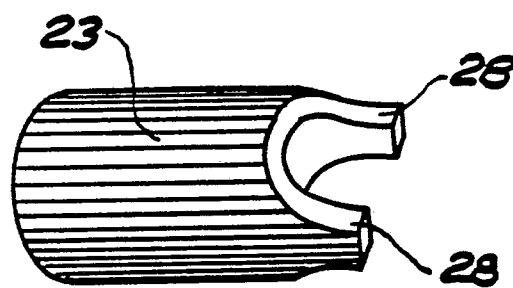
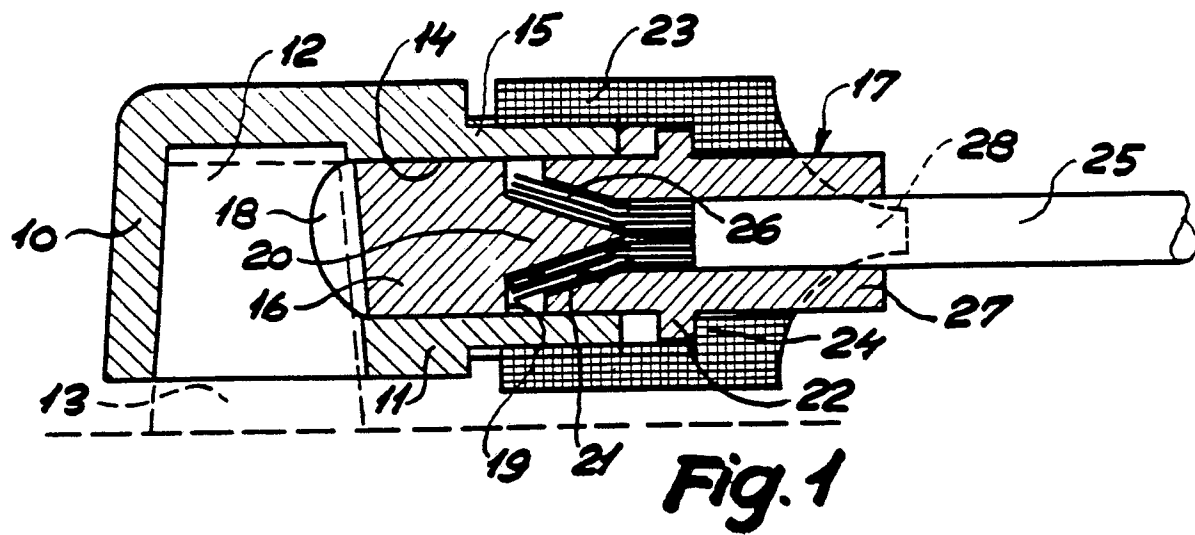
5 1. Connecteur pour borne de batterie comprenant un logement (10) en un matériau isolant et un trou à plot de borne (12) destiné à recevoir un plot (13) de borne de batterie, ainsi qu'un trou à câble (14) qui est de préférence sensiblement perpendiculaire au trou à plot de borne et sert à recevoir un dispositif de contact (16, 17 ou 29) pour établir la connexion entre un câble de batterie (25, 26) et le plot de borne et qui s'étend à travers un tronçon taraudé (15) sur le logement, ledit dispositif de contact pouvant coulisser dans le trou à câble et étant capable d'être pressé contre un plot de borne dans le trou à plot de borne au moyen d'un écrou (23) ou d'une douille fileté en un matériau isolant, ledit écrou ou ladite douille fileté étant vissé sur ou dans le tronçon taraudé et présentant un épaulement (24) s'étendant vers l'intérieur et coopérant avec une face sensiblement radiale (22) du dispositif de contact, caractérisé en ce que le dispositif de contact (16, 17 ou 29) comprend un élément conducteur (27 ou 31) s'étendant vers l'arrière et qui, dans la position d'application du connecteur de borne de batterie, fait saillie à travers l'écrou ou la douille fileté et sur une partie de l'isolation (25) du câble.

30 2. Connecteur pour borne de batterie selon la revendication 1, dans lequel ledit dispositif de contact (16, 17) comprend un manchon conducteur (17), caractérisé en ce que l'élément conducteur s'étendant vers l'arrière est formé par un prolongement tubulaire (27) dudit manchon conducteur (17).

35 3. Connecteur pour borne de batterie selon la revendication 1, caractérisé en ce que ledit dispositif de contact (16, 29) consiste en un moyen de contact conducteur (16) prévu pour venir en contact avec le plot de borne de batterie (13) et en un manchon isolant (29) comprenant ladite face sensiblement radiale pour recevoir les extrémités dénudées (26) des fils du câble de la batterie et pour presser lesdites extrémités de fils ensemble autour d'une partie sensiblement conique (20) s'étendant vers l'arrière du moyen de contact (16) lors du serrage de l'écrou (23) ou de la douille fileté, et en ce que l'élément conducteur (31) s'étendant vers l'arrière est en forme de bande et noyé dans la paroi interne du manchon isolant (29).

40 4. Connecteur pour borne de batterie selon la revendication 3, caractérisé en ce que la paroi interne du manchon isolant (29) comprend une gorge traversante axiale (30) pour recevoir l'élément en forme de bande (31).

45 5. Connecteur pour borne de batterie selon la revendication 1 ou 2, caractérisé en ce que l'écrou (23) ou la douille fileté comprend deux ou plusieurs branches (28) de préférence axiales qui s'étendent vers l'arrière au moins jusqu'à l'extrémité arrière du prolongement (27) de préférence tubulaire du dispositif de contact (16, 17).



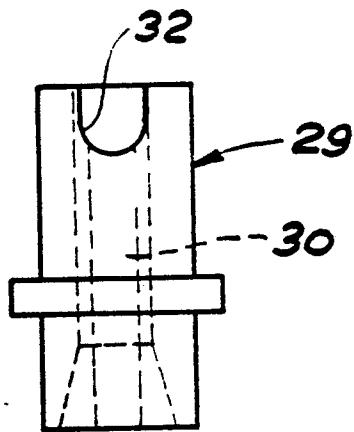


Fig. 3

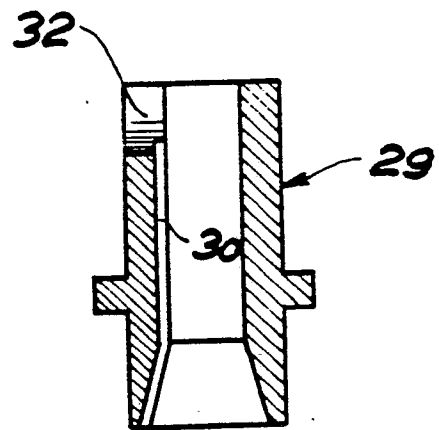


Fig. 5

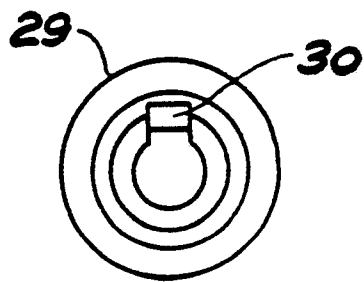


Fig. 4

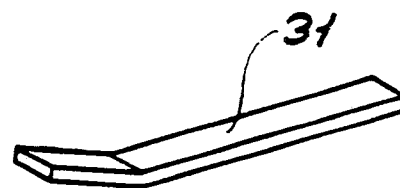


Fig. 6