Aug. 29, 1967 R. N. KIENE 3,339,173

BATTERY TERMINAL CONNECTOR

Filed Aug. 17, 1965

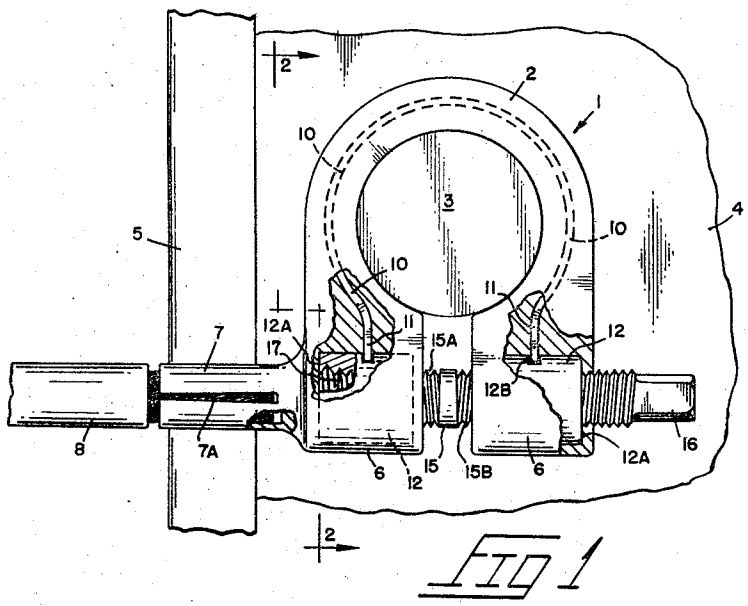


FIG 1

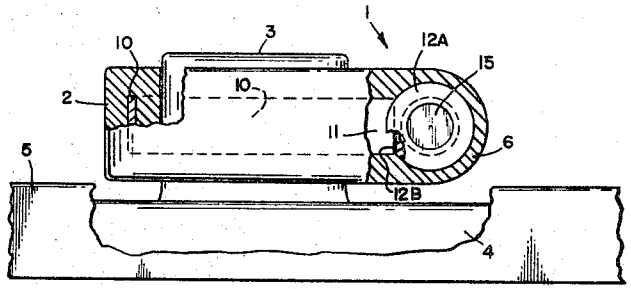


FIG 2

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United States Patent Office

3,339,173

Patented Aug. 29, 1967

3,339,173

BATTERY TERMINAL CONNECTOR

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Filed Aug. 17, 1965, Ser. No. 480,411
1 Claim. (Cl. 339—226)

ABSTRACT OF THE DISCLOSURE

A battery terminal connector having an unencumbered clamping ring including a resilient metal band with said ring being bifurcated and operably positionable to grip a battery post by means of a screw shank having oppositely directed threaded portions acting on the bifurcated ends of the ring.

This invention relates to battery connectors and more particularly to a unitary terminal securing the end of an electrical cable in circuit with the post of a wet cell storage battery.

An important feature of this invention is the provision of a terminal for clamping engagement about a battery post and which is particularly adapted for expeditious removal therefrom even though the post may be severely corroded. Important to this object are internal, resilient means provided within the terminal whereby clamping loads applied to the terminal may be evenly distributed thus averting deformation of the lead portion thereof.

A further object of this invention is the provision of cable receiving means integral with the terminal and formed thereon so as to not restrict the flexibility of the terminal which is of generally ring-like configuration. Such configuration of the terminal of the present invention results in a terminal unrestricted along its semicircular portion and hence capable of being substantially enlarged for convenient removal from a corroded battery post. The limited expansion capability of unitary terminals in the instant art coupled with corrosion of the screw members prevent their intended purpose of easy removal from being accomplished.

Another object is the provision of a battery terminal of simple, unitary design embracing the durable qualities of wear resistant metals and yet retaining the desirable electrical conductor and corrosion resistant qualities of lead.

A still further object of this invention is the provision of a resilient band member associated with a pair of internally threaded collars of durable material which receive a threaded shaft provided with oppositely directed threads to provide means for alternately "opening" and "closing" the terminal by the rotation of the shaft.

These and other objects will become subsequently apparent upon an understanding of the followintg specification and drawings referred to therein and in which:

FIGURE 1 is a plan view of the terminal of the present invention in place upon a battery post with fragments thereof broken away for purposes of illustration,

FIGURE 2 is a sectional view taken along line 2—2 of FIGURE 1 also with fragments thereof broken away for purposes of illustration.

With continuing reference to the drawings and particularly FIGURE 1 thereof the numeral **1** indicates generally a terminal affixed to one post **3** of storage battery **4** secured in place by an ordinary rectangular frame **5**.

The terminal **1** is preferably constructed for the most part of lead in the form of a bifurcated, narrow clamping ring **2** terminating at its ends in two opposing lugs **6** of substantial sectional area. Integral with the outer wall **6A** of one of the lugs **6** is a tubular extension **7** for the reception of the exposed core end of an insulated electrical

cable **8**. The extension **7** may be provided with an open ended slot **7A** to facilitate crimping engagement of the extension with the core end.

As best shown in FIGURE 2 the clamping ring **2** is of relative narrow sectional width, interiorly of which is embedded an open, spring steel band **10**. The ends of the band **10** terminates in tangentially extending leg portions **11** for respective engagement with a pair of internally threaded sleeves **12**, of wear resistant material which although shown as being in the cylindrical form of a sleeve may be formed as flat sided members. It will be noted that ends **12A** of sleeves **12** terminate interior of the end walls **6A** of the lugs **6** to provide leaded encasement of each sleeve **12** to minimize corrosion of the terminal. Each of the sleeves **12** has a chordal inset area **12B** in which is received, for retention therein, the end of leg portions **11**.

A threaded shaft **15** is provided with right and left hand threads as at **15***a* and **15***b* and, at its exposed end, a head **16** for the application of a wrenching tool. The internal threads (not shown) of the sleeves **12** cooperate with the threaded shaft **15** to alternately "open" or "close" the clamping ring **2** upon rotation of the shaft in opposite directions. The end of shaft **15** indicated at **17**, at all times remains within its sleeve as the operative rotation of the shaft results in only limited linear travel relative to its sleeve **12**.

In the fabrication of the terminal the metallic band **10**, sleeves **12** and threaded shaft **15** are supported as an assembly within a mold configured for the forming of the lead portion of the terminal. For fabrication purposes the shaft **15** occuplies fully the interior of the left hand sleeve adjacent its end **17** to prevent the admission of molten lead into said sleeve. The band **10** is outwardly biased and must be closed somewhat for the insertion of the ends of leg portions **11** within inset areas **12A**. Such outward biasing of the band may be relied upon to retain the leg ends within the inset areas **12A** during fabrication. For application to a battery post, the terminal's lugs **6** must be outwardly displaced from the molding position.

In operation the terminal is placed on the battery post and closed thereabout by rotation of the threaded shaft **15** against the opposing force exerted by steel band **10**. Clamping action by rotation of the shaft **15** overcomes the outwardly biased band **10** and causes the clamping ring **2** to close uniformly about the post **3**. In view of the clamping ring **2** being of a relatively uniform narrow section the present invention provides a terminal of considerable flexibility heretofore not found in unitary terminals.

The corrosion of battery terminals and posts makes the task of separating the terminal and post a difficult one while conversely the application of a terminal to the post is accomplished with little difficulty since the corroded parts are usually cleaned prior to engagement. From the foregoing it is apparent that in the removal of a corroded terminal substantial thrust loads are applied to the sleeves **12**. Repeated removal operations of the terminal in conjunction with the deformable characteristics of lead requires that thrust loads imparted to the sleeves **12** and particularly the end walls **12A** thereof be distributed by the band **10**. Similarly torsional loads applied to the sleeves **12** are transmitted to the band **10**.

While I have shown a particular form of embodiment of my invention, I am aware that many minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of the invention. Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

A battery terminal clamp comprising a substantially U-

shaped clamping ring unencumbered along its arcuate portion and terminating in opposed lug portions,

a pair of cylindrically shaped sleeves in axial alignment, one each being secured within one of said lug portions and each sleeve internally threaded in an opposite direction from the other, said cylindrically shaped sleeves each define a chordal inset area,

cable receiving means carried by one of said lug portions,

a screw shaft provided with threads of opposite direction for threaded engagement with said sleeves, and

a radially biased metal band embedded within said clamping ring terminating at its ends in locked engagement with said sleeves and urging said sleeves and said lug portions in opposite directions to a clamp

opening position, the ends of said radially biased metal band are squared to fully occupy said inset areas to prevent rotational displacement of said sleeves relative to its lug portion upon rotation of said screw shaft.

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