Aug. 29, 1933. A. TAUBER 1,924,334

ELECTRICAL AND MECHANICAL CONNECTION

Filed May 29, 1931

FIG. 1.

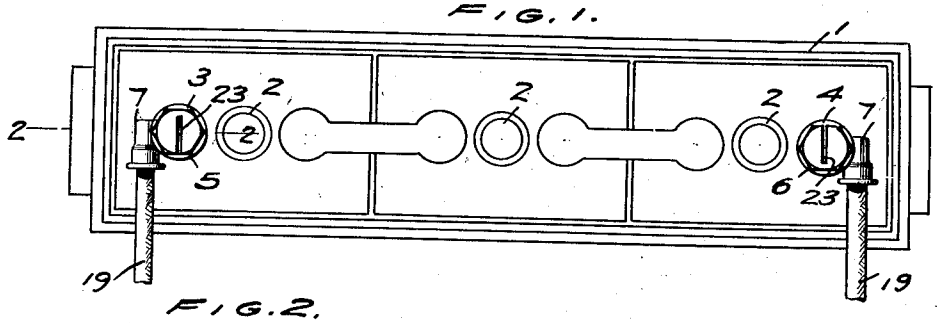
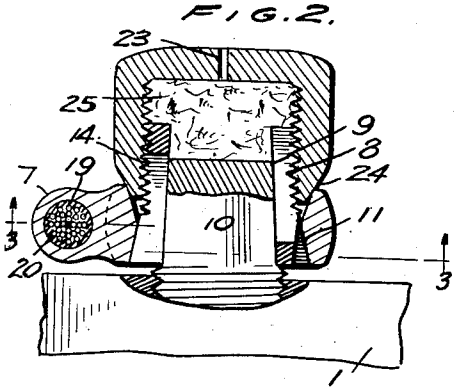
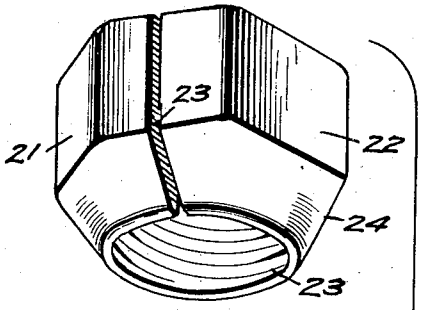


FIG. 2.





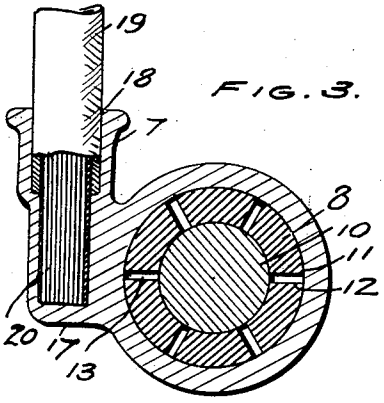


FIG. 3.

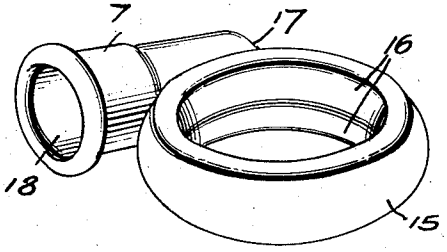
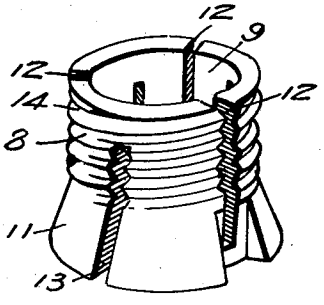


FIG. 4.



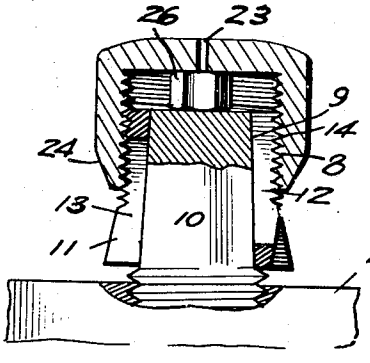


FIG. 5.

INVENTOR
ARTHUR TAUBER

BY Robert H. Young
ATTORNEY

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ELECTRICAL AND MECHANICAL CONNECTION

Arthur Tauber, Yonkers, N. Y.

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7 Claims. (Cl. 173—259)

My invention relates to connectors for making electrical and mechanical connections such as connections of battery cables to battery terminal posts.

An object of my invention is to provide a connector having a large area of firmly contacted surface between the connected elements whereby the great frictional engagement between the elements prevents shaking loose, and when used for an electrical connection, the contact resistance will be minimized.

Another object of my invention is to provide a device for connecting battery cables or wires to battery terminals which is simple and inexpensive, and easily attached or removed, but which will tightly and securely engage a battery terminal, and will not be shaken loose from the terminal by vibration or jolts.

Another object of my invention is to provide a battery terminal connector which has a part adaptable to fit on and conform to the size and shape of various battery terminals and to uniformly engage a terminal post on an extensive area.

A further object of my invention is to provide a device for connecting conductors to battery terminals which is easily adaptable for connecting a conductor to either the positive or negative terminals without interference by the cell caps.

Still another object of my invention is to provide a battery terminal connector having a cup for containing a supply of anti-corrosion substance in position to maintain the connection covered with the substance.

A still further object of my invention is to eliminate the troublesome corrosive nut and bolt of the most commonly used form of connector in which a split ring is drawn tight about a battery post by a nut and bolt.

Other objects of my invention will become apparent from the following description of an embodiment of my invention.

In the accompanying drawing—

Figure 1 is a top plan view of a storage battery showing one of my connectors attached to each terminal.

Figure 2 is a vertical sectional view of my connector attached to a battery terminal, on line 2—2 of Figure 1.

Figure 3 is a horizontal sectional view of my connector attached to a battery terminal, on line 3—3 of Figure 2.

Figure 4 is a perspective view of the parts of my connector disassembled.

Figure 5 is a vertical sectional view illustrating how the connector may be easily pulled loose from a battery terminal post.

In the drawing numeral 1 designates an ordinary storage battery composed of a number of cells having detachable cell caps 2. The battery has a positive terminal or post 3, and a negative terminal or post 4. In ordinary types of batteries very little space is left between the cell caps and terminals, and this presents a complication when a cable or conductor is to be attached to a terminal. As shown in Figure 1, one of my connectors is attached to each post, and it is to be noted that connectors 5 and 6 are similar but reversed. In the ordinary types of storage batteries there is not sufficient space between the cell caps and terminals with the cable sockets 7 on the same sides of the terminals as the cell caps. Where the battery cables extend from the battery in the same direction as in Figure 1, the connectors must be oppositely formed or assembled to be properly attached to the terminals and have the cables extend directly into the sockets without bending.

My connector comprises a sleeve 8, having a tapering bore 9 that is preferably larger at the bottom than at the top, and the lower outside portion of the sleeve is gradually enlarged downwardly as at 11. The sleeve may be provided with one or more cuts, gaps or slots 12 extending downwardly from its upper edge, and also one or more cuts, gaps or slots 13 extending upwardly from its lower edge but spaced from the cuts 12. By means of these cuts the sleeve is adapted to expand when pushed onto a battery terminal post that is larger than the bore 9, and to be contracted into close contact and firm engagement with a battery terminal post by pressure applied externally by means hereinafter to be described. In order to permit this expansion and contraction the sleeve 8 must, of course, be made of a metal, such as brass, capable of considerable deformation without breaking. The upper outside portion of the sleeve is provided with screw threads 14 the purpose of which will presently appear.

A ring 15 is tapered or rounded outwardly both ways from its center, as at 16, and is of the proper size to freely pass onto the upper portion of sleeve 8, but engages the enlarged lower portion and the lower portion will be compressed as the ring is pushed downwardly. The outside of ring 15 has a cable socket 7 formed integral therewith or securely attached thereto. This socket, preferably, has a closed end 17 and an open end

18, and is adapted to have the end of a battery cable 19 inserted therein and retained by solder 20 or a similar substance, or by any other suitable means.

A cap or sleeve 21 may be formed in the shape of a cup and may be formed on its outer surface with angular surfaces 22 similar to an ordinary nut so as to be readily turned as with a wrench, and its interior is screw threaded, as at 23 so as to be screwed upon the upper end of sleeve 8. The cap 21 is provided with a cut, or gap 23 which extends from its bottom edge upwardly and partially across the top. This cut allows the cap to be expanded and contracted to some extent. The lower outer portion of cap is bevelled as at 24, and this bevelled portion cooperates with the inside of ring 15 to compress the cap and the upper portion of sleeve 8 when in use. The cap is adapted to contain an anti-corrosion substance 24, such as grease, and supplies this substance to the other parts of the connector when in use so as to keep corrosive fumes from the battery from attacking the metal.

When a battery cable is to be connected to a battery terminal post by my connector, the end of the cable should have the insulation stripped off. The ring 15 is held in such position that molten solder may be poured into socket 7. The socket is then partially filled with solder and the end of the cable is inserted therein and the solder is let harden. Sleeve 8 is then placed on the battery terminal post 10. If the battery post is somewhat too large for the bore 9 of the sleeve, the sleeve may be forced onto the post, the cuts 12 and 13 allowing the sleeve to expand to some extent. The ring 15 is then placed over the sleeve with the socket 7 on the opposite side from the adjacent cell cap and with the cable extending in the desired direction. Either end of the ring may be placed downwardly and thus the socket may be selectively positioned on the side of the terminal away from the adjacent cell cap. Cap 21 is partially filled with grease or similar substance and is screwed onto sleeve 8. If it had been necessary to expand the sleeve to adapt it to a large size battery post, the cut 23 of the cap will allow the cap to expand to the desired extent to screw onto the sleeve. As the cap is screwed downwardly the tapered portion 24 passes within the ring 15, and comes into engagement with the upper inclined or rounded surface 16 of the ring. Further downward movement of the cap 21 forces the ring 15 downwardly relative to the sleeve and, since the lower portion of the sleeve is gradually enlarged, the lower portion of the sleeve will be compressed into firm engagement with the battery post 10. The cap 21 will also be compressed by the ring and this compressive force will be transmitted to upper portion of the sleeve and thereby compress this portion of the sleeve into engagement with the battery post. Thus, the entire sleeve is brought into close contact with the battery post.

When it is desired to remove the connector from the battery post, the cap 21 may be readily unscrewed, and no difficulty will be encountered in removing ring 15. However, it may sometimes be found that the sleeve 8 firmly grips the battery post. In order to easily remove the sleeve it is only necessary to place a solid body 26 of such size as to be able to pass through bore 9 of the sleeve, such as, for instance, a small nut, on the end of battery post 10 and screw cap 21 onto the sleeve. The nut 26 will engage the inner face of the top of the cap and prevent further downward movement of the cap. Continued turning of the cap draws the sleeve 8 upwardly and releases its grip on the battery post. This removal operation is illustrated in Figure 5. While the embodiment of this invention herein disclosed is its application to a battery terminal connector, it is to be understood that the disclosure is merely illustrative and that the invention is not to be construed as limited, except as specified in the appended claims.

Having described my invention, I claim—

1. In a battery terminal connector, a sleeve having its upper portion provided with screw threads and its lower outer portion gradually enlarged, said sleeve also being provided with a cut extending upwardly from its lower edge and a cut extending downwardly from its upper edge out of alignment with the first mentioned cut, a ring encircling said sleeve, means for connecting an electrical conductor to said ring, a cap provided internally with screw threads adapted to engage with the threads of said sleeve and provided with a cut extending upwardly from its lower edge, the lower outer portion of said cap being bevelled and adapted to engage within the ring, whereby, as said cap is screwed downwardly on said sleeve, both end portions of the sleeve are compressed against a battery terminal.

2. In a battery terminal connector, a sleeve provided with screw threads on its upper outer portion, said sleeve having a cut therethrough extending upwardly from its lower edge, and having a cut therethrough extending downwardly from its upper edge peripherally spaced from said upwardly extending cut, the lower portion of said sleeve being gradually thickened outwardly, a ring encircling said sleeve and having enlarged internal diameter toward both ends, means for attaching an electrical conductor to said ring, a cap having internal screw threads to engage the screw threads of the sleeve, and provided with a cut therethrough extending upwardly from its lower edge and across its top, the lower edge of said cap being bevelled and adapted to engage within the ring.

3. In a battery terminal connector, a sleeve having its upper portion provided with screw threads and its lower outer portion gradually enlarged, said sleeve also being provided with a plurality of peripherally spaced cuts extending upwardly from its lower edge and a plurality of peripherally spaced cuts extending downwardly from its upper edge out of alignment with the upwardly extending cuts, the upwardly and downwardly extending cuts overlapping, a ring embracing said sleeve, means for connecting an electrical conductor to said ring, a cap provided internally with screw threads adapted to engage with the threads of said sleeve and provided with a cut extending upwardly from its lower edge, the lower outer portion of said cap being bevelled and adapted to engage within the ring, whereby, as said cap is screwed downwardly on said sleeve, the sleeve is compressed against a battery terminal.

4. In a battery terminal connector, a sleeve having its upper portion provided with screw threads and its lower portion gradually enlarged, and having its upper portion provided with a cut therethrough extending downwardly from its upper edge, a ring embracing said sleeve and having the upper portions of its internal diameter increasing upwardly, a cap provided with screw threads adapted to engage the screw

threads of the sleeve and provided with a cut extending upwardly from its lower edge, the lower portion of said cap engaging within the ring, whereby as said cap is screwed downwardly on said sleeve, the upper portion of the sleeve is compressed against a battery terminal post.

5. In a connection, a connection post, a sleeve embracing said post, said sleeve being provided with screw threads at one end and being gradually enlarged at its other end, said sleeve being provided with a gap therethrough extending from the edge of its screw-threaded end toward its enlarged end, a ring embracing said sleeve, a second sleeve fitting over the first sleeve and provided with screw threads adapted to engage the screw threads of the first sleeve, said second sleeve provided with a gap therethrough extending in the opposite direction from the gap of the first sleeve, the leading edge of the second sleeve being externally bevelled and engaging within the ring as the second sleeve is screwed forwardly onto the first sleeve, whereby the two sleeves are compressed and the end of the first sleeve provided with the gap is forced into firm contact with the post.

6. In a connector, a post, a sleeve on said post, said sleeve being provided with a cut therethrough extending from one end toward the other end and provided with a cut therethrough extending from the other end in the opposite direction from the other cut, one end portion of the sleeve being gradually enlarged and the other end portion being screw-threaded, a ring embracing said sleeve, said ring having enlarging internal diameter toward both ends, a second sleeve screw-threaded to engage the threads of the first-mentioned sleeve, one end of said second sleeve being bevelled to engage within the ring, said second sleeve being provided with a cut therethrough extending from its bevelled end toward its other end whereby as the second sleeve is screwed on the first sleeve both ends of the first sleeve are forced into firm mechanical and low electrical resistance contact with the post.

7. An electrical connector comprising a contractible sleeve having a cut therethrough extending longitudinally from one end, said sleeve having an externally screw-threaded portion adjacent the said cut end, the other end portion of said sleeve being gradually enlarged toward said other end, a ring embracing said sleeve of less internal diameter than the enlarged end of the sleeve, an internally screw-threaded contractible nut adapted to be screwed on the sleeve and having its leading edge bevelled to engage within the ring, said nut having a cut therethrough extending longitudinally, whereby as said nut is screwed on the sleeve the bevelled portion of the nut engages within the ring and the nut is contracted upon the sleeve and the sleeve is likewise contracted.

ARTHUR TAUBER.