Oct. 17, 1939. S. E. CARLSON 2,176,060

BATTERY TERMINAL CONNECTION

Filed March 25, 1936

Fig. 1.

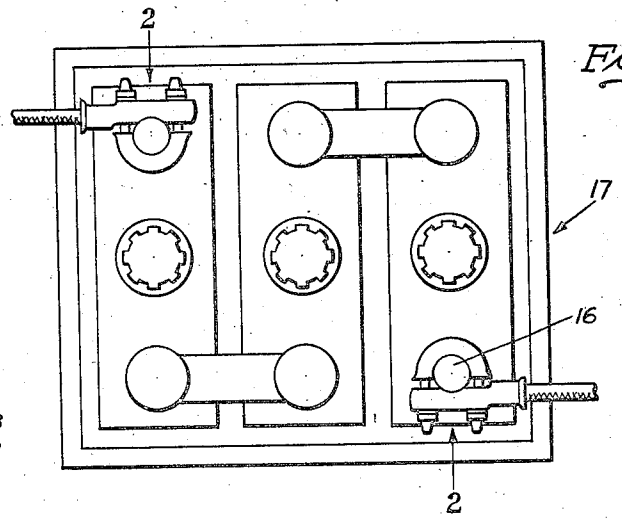


Fig. 6.

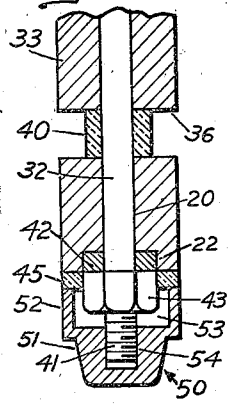


Fig. 2.

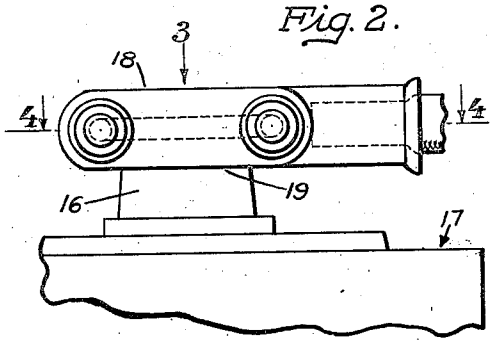


Fig. 3.

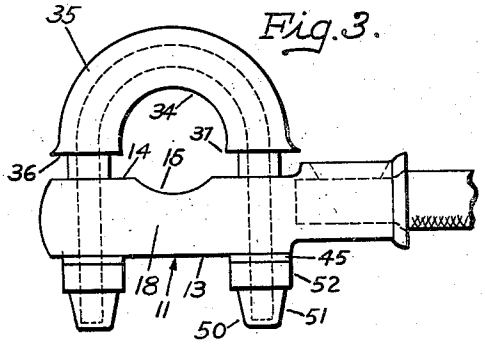


Fig. 5.

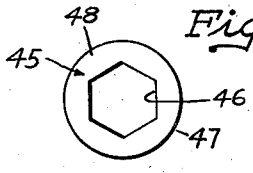
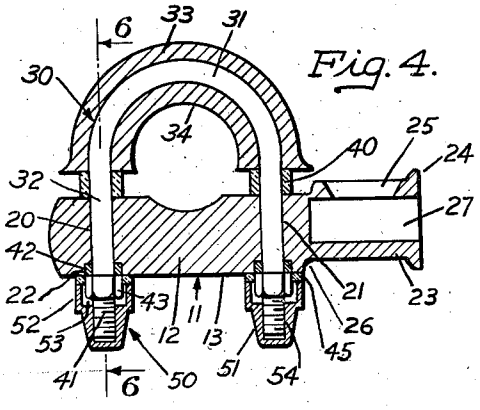


Fig. 4.



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UNITED STATES PATENT OFFICE

2,176,060

BATTERY TERMINAL CONNECTION

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Application March 25, 1936, Serial No. 70,823

4 Claims. (Cl. 173—259)

My invention relates to a terminal connector for storage or similar batteries in which the connection is subject to the fumes of acid or other corroding gases or liquids and hence an object and feature of my invention is a connection in which the metal parts which are designed to give strength and a firm attachment of a connector to the terminal, are covered by material which is non-corrosive, such as by lead, rubber, fiber or the like, on all exposed parts.

Another object and feature of my invention is in its main characteristics clamping a connector to a battery or similar terminal by means of bolts having nuts thereon in which both the bolts and the nuts are covered by a casing of non-corrodible material. With this construction thereafter, as the thread on the bolts cannot corrode, the nuts may be readily removed. A detail feature of my invention in this regard is using cover caps of lead or similar non-corrodible material threaded on the ends of the bolts and enclosing the nuts which are used to tighten the clamps to the part having the connector. These caps engage a compressible and non-corrosive washer.

A more detailed object and feature of my invention is providing a connector made of lead or similar material to which an electric cable may be soldered or secured in a similar manner, then employing a clamp for securing the connector to the terminal plug of a battery. This clamp has a U shaped bolt with two threaded ends, these extending through the connector, the U shaped end of the bolt being covered with lead or similar material cast on the bolt. Compressible sleeves space the lead covering from the connector. The nuts are threaded on the two ends of the bolt and over these nuts is a cover cap. The bolt may be made of steel or similar material having the requisite strength and the lead covers the bolt except for the exposed non-corrodible sleeves and the cap with its washer, therefore all the parts that are corrodible are completely covered.

My invention is illustrated in connection with the accompanying drawing in which Figure 1 is a plan of a battery showing my improved connectors attached to terminal posts.

Figure 2 is an elevation taken in the direction of the arrow 2 of Figure 1 of one of the connectors attached to a battery terminal.

Figure 3 is a plan of the combination connector-clamp taken in the direction of the arrow 3 of Figure 2 omitting the battery post.

Figure 4 is a horizontal section on the line 4—4 of Figure 2 in the direction of the arrows.

Figure 5 is a detail of a resilient washer.

Figure 6 is a section on the line 6—6 of Figure 4 in the direction of the arrows.

In my invention I utilize a connector bar 11 which is made of a non-corrosive type of metal, preferably lead. This has a thick body portion 12 which is substantially square in cross section, having a flat outer or vertical side 13, a flat inner side 14 with a curved notch 15, the curvature approximating that of the battery post 16 of the battery 17. These posts are usually tapered. The top and bottom sides 18 and 19 are also preferably flat and horizontal. There are two perforations 20 and 21 extending from the inside surface 14 to the outside surface 13 and at each of these perforations there is a small socket 22.

The remaining portion of the connector bar has an end extension 23 which is preferably cylindrical, having an outer rim 24 with a tapered slot 25 through one side. The extension is slightly offset from the center of the bar 12 providing a side shoulder 26 on one side. A socket 27 is formed in the extension and is for the purpose of inserting the electrical conductor to be attached to the connector, this being firmly secured by a solder or melted lead poured through the slot 25.

A U shaped clamping bolt 30 is formed of steel or metal with a sufficient tensile strength. This bolt has a U bent end 31 and two shanks 32 which are parallel. A non-corrosive shield 33, preferably formed of lead, is cast on the U portion of the bolt. This shield has preferably an inside vertical surface 34, slightly tapered to conform to the taper of the battery post 16. The outside portion 35 may be curved somewhat concentric with the portion of the U shaped bolt inclosed by the shield. The shield preferably terminates in two flat vertical end surfaces 36. The curve of the inside surface 34 is slightly greater than a semicircle so that the terminal points 37 are spaced apart slightly less than the diameter of the portion of the battery post on which the clamp fits.

A resilient sleeve 40 is fitted on each of the shank portions 32 of the bolt between the surface 36 and the inside surface 14 of the body structure. These sleeves are made of non-corrosive material such as fiber or rubber. The remaining portion of the shank has a somewhat close fit in the perforations 20 whereby the two threaded ends 41 extend beyond the sur-

face 13 of the body of the connector. There is a hard metal insert 42 fitted in each of the small sockets 22. These may be ordinary metal washers and after the connector has been placed snugly on a battery post, hard metal nuts 43 are threaded on the threaded ends of the bolts, these nuts bearing on the inserts 42 instead of on the soft lead of the connector. These bolts are drawn up sufficiently tight to firmly attach the connector and clamp portion to the battery post which action compresses the resilient sleeves 40. Such compression seals the joints between the surface 36 of the shield 33 and the sleeve and also seals the joint at the surface 14 of the connector bar, therefore the shank portion of the U shaped bolt is completely covered and protected from corrosive fumes or acids.

In order to protect the threaded ends 41 and the nuts 43 from corrosion, a non-corrosive soft washer 45, Figure 5, is inserted over each of the nuts 43. This washer has an internal opening 46 of the same configuration as the outside of the nuts and being shown in the present instance as hexagonal in shape. The washer is preferably cylindrical as to its outside periphery 47 and has parallel face surfaces 48. Non-corrosive caps 50 are preferably tapered on the outside surface 51 and have a circular skirt section 52 leaving an enlarged recess 53 on the inside to accommodate the nut 43. Each cap is threaded internally as indicated at 54 so that it may be threaded on one of the ends of the U shaped bolt. The inner edge of the skirt section 52 bears on the washer 45 and thus forms a tight seal preventing any corrosive vapors or liquids from coming in contact with the nuts 43 or the threaded ends 41 of the bolts and such washers also exclude any corrosive vapors or liquids from entering the perforations 20 from the outside of the connector bar.

The caps are preferably formed with a smooth outside surface as this allows the caps to be tightened sufficiently by hand or by use of pliers and it will be apparent that when the nuts 43 are tightened, the shank portions 32 may be drawn slightly through the bar portion of the connector hence when it is desired to remove the connector and clamp from a battery post the caps are first removed, then, if desired, the washers 45 may be removed or these may be disconnected while the nuts 43 are loosened. It is not necessary to remove the nuts completely from the threaded ends 41 of the bolt to allow a sufficient looseness of the clamp portion for removal of the connector assembly from the battery post.

Various changes may be made in the details of the construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A battery connector comprising a connector-bar with a plurality of perforations and having means for attaching a cable, a clamp having a U shaped corrosive bolt with two shanks, one extending through each perforation, each shank having a screw threaded end with a nut thereon, the bent end only of the bolt having a thick sheath, a compressible sleeve on each shank between the ends of the sheath and the bar whereby a battery terminal may be clamped between the sheath and the bar, the bar, sheath and sleeve being formed of non-corrosive material.

2. A battery connector having a connector-bar formed of lead substantially square in cross section with two perforations therethrough, one end of the bar having a socket for attachment of a cable, a U shaped bolt of ferrous metal having two shanks, each passing through a perforation and each shank being threaded on the end projecting beyond the bar, a ferrous nut threaded on each end of the shank, a lead sheath on the U bent end of the bolt and on portions of the shank, the inside surface of the sheath and part of the said bar being shaped to engage a battery post, a compressible sleeve on each shank between the sheath and the bar, a washer surrounding each nut and engaging the opposite side of the bar from the sleeve a cover cap of lead threaded on each shank and inclosing a nut, each cap bearing on a washer, the washers and sleeves being formed of non-corrosive material.

3. A battery connector comprising a connector bar having means for attaching a cable and with a straight perforation, a bolt of corrosive material having a straight and curved part with a non-covered portion of the straight part extending through the said perforation and being thus enclosed by the connector bar and protected by the connector bar from corrosion, a nut on the bolt adjacent the end which projects beyond the connector bar and remote from the curved part, a relatively thick non-corrosive metal sheath on the curved part of the bolt to engage a battery post between the sheath and the connector bar, a compressible sleeve slidable on the bolt between the sheath and the bar and a cap secured to the bolt and enclosing the nut, the said bar, sheath, cap and sleeve being formed of relatively non-corrosive material compared with the bolt.

4. A battery connector having a clamp formed in two parts including a non-corrosive connector element with two straight perforations and a corrosive bolt having straight and curved parts of relatively high tensile strength engaging said element and said element covering a straight part of the bolt to protect said part from corrosion, the said straight part of the bolt being slidable in said perforations, said bolt having a thick sheath of non-corrosive metal on the curved part of the bolt to engage a battery post between the connector element and the said sheath, means constructed and adapted to slidably attach the bolt to the connector element of the clamp to exert a tension on the bolt when a battery post is engaged between the sheath and the connector element and adapted to clamp said battery post, and removable means for encasing all exposed parts of the bolt in non-corrosive material.

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