July 1, 1958 E. W. ROMANEK 2,841,774

ELECTRICAL COUPLING

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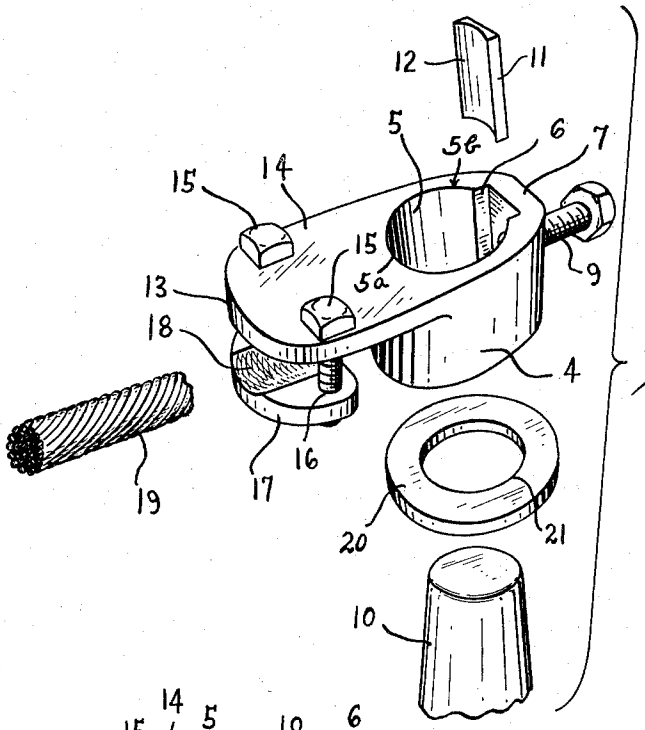


Fig. 1

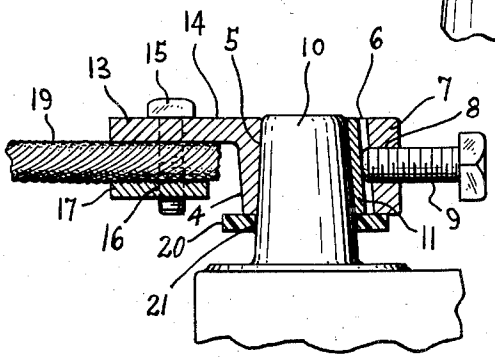


Fig. 2

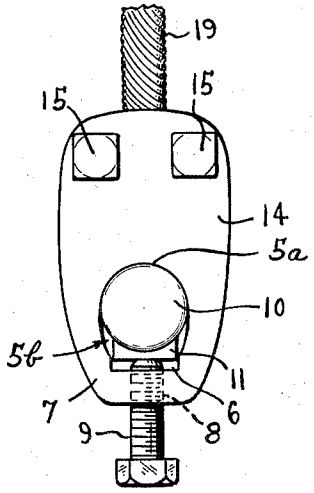


Fig. 3

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ELECTRICAL COUPLING

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1 Claim. (Cl. 339—237)

This invention relates to improvemnts in electrical couplings and has particular reference to the provision of a simple, novel and inexpensive storage battery coupling.

One of the principal objects of the invention is to provide a novel coupling for attaching electrical conductors to the terminal posts of a storage battery, and which may be fabricated in a simple and inexpensive manner, which may be attached to and disassembled from the battery posts with ease and simplicity and which will be less susceptible to corrosion.

Another object is to provide a battery coupling of the above nature which may be formed of cast metal in a simple and efficient manner and which may be attached to and disassembled from the battery posts without danger of marring or injuring said battery posts.

Another object is to provide a coupling of the above nature having means by which it may be attached to and disassembled from electrical cables with ease and simplicity.

Other objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawings wherein,

Fig. 1 is an exploded perspective view of the device embodying the invention;

Fig. 2 is a fragmentary sectional view of said device showing it in position of use; and

Fig. 3 is a top plan view of the device in position of use.

One of the major problems with prior art coupling devices of the character described has been the difficulty in detaching the coupling device from the battery post after the said device has been in use for a considerable length of time.

It has been the usual practice to form such coupling devices from a soft malleable metal in the form of a split sleeve having spaced tongues extending outwardly of one side thereof and through which a clamp screw is extended to attach the coupling to the battery post. It has been found from past experience that such malleable metals, due to acid corrosion, become in effect welded to the battery posts and, consequently, after being in use for some length of time great difficulty has been encountered in removing the couplings from the posts particularly without causing injury thereto or to the couplings. This difficulty has also been due in part to the prior art construction of such devices.

It, therefore, is one of the primary objects of the present invention to overcome all of the problems set forth above through the provision of a simple and efficient coupling device which may be attached to or removed from the battery post with ease and simplicity, which will be simple and inexpensive to manufacture, and which will be less susceptible to injury.

Referring more particularly to the drawings wherein like characters of reference designate like parts throughout the several views, the device embodying the invention comprises a main sleeve portion 4 having a tapered bore 5 therein. The bore 5 is provided with an inner tapered

side wall section 5*a* so dimensioned as to have a relatively intimate fit with the adjacent tapered side surface of the post 10 of a conventional storage battery. However, the wall 5*a* blends into an opposed slightly enlarged open area 5*b* which, in turn, communicates with a longitudinal channel 6 formed in an offset portion 7 on the main tubular portion 4.

The offset portion 7 has a threaded opening 8 therein through which a clamp screw or the like 9 is extended. The portions 5*a* and 5*b* of the tapered bore 5 are so dimensioned as to normally fit rather loosely over the standard tapered post 10 of the storage battery. Inwardly of the longitudinal channel 6 there is positioned a clamp plate 11 having a tapered cylindrical side surface 12 shaped to relatively intimately engage the side of the tapered post 10 opposite the wall 5*a* when the sleeve is fitted over the post 10 and the clamp screw 9 is tightened. The plate is dimensioned to fit rather loosely in the channel 6 and has relatively smooth inner and outer surfaces which respectively engage the post 10 and the end of the clamp screw. The coupling is rigidly attached to the post by tightening the clamp screw 9 against the outer side surface of the plate 11 to thereby force the inner surface 12 of the plate into intimate engagement with the post 10 and to simultaneously force the opposed inner wall section 5*a* of the bore 5 into intimate engagement with said post.

On the side of said sleeve 4 opposite the offset portion 7 there is provided an integral tongue 13 having its upper surface 14 in flush relation with the upper end surface of the sleeve 4. The tongue 13 is provided with spaced openings through which clamp screws or the like 15 are extended. The said clamp screws 15 are adapted to be threadedly received in spaced threaded openings 16 formed in a clamp plate 17. The clamp plate 17 is provided with an upper cylindrical surface 18 shaped to receive the end of a conventional electrical cable 19 of the type commonly used with such battery couplings.

The inner cylindrical surface 12 of the plate 11 and the inner surface 18 of the clamp plate 17, although preferably formed smooth, may be provided with corrugations or the like to more positively anchor them in coupled relation with the respective tapered posts 10 and cable 19.

The sleeve 4, offset portion 7, tapered opening 5, longitudinal channel 6 and tongue 13 are simultaneously formed in integral relation with each other from bronze or other suitable metal by a single casting operation. The plate 11 and clamp plate 17 may also be cast of bronze or other suitable metal.

In order to protect the coupling device from acid corrosion such as might result from the acids employed in storage batteries, and prior to placing the coupling on the tapered post 10, there is provided a washer 20 of acid resistant plastic such as vinyl chloride, polystyrene or the like, rubber, fibre glass or other suitable material which is forced downwardly on the tapered post 10 by an amount sufficient to form an intimate seal between the inner annular edge 21 of the washer and the tapered wall of the post 10. The coupling device is then placed on the post above the acid resistant washer whereby the said washer will prevent corrosive acids from working up the outer side wall of the post 10 and reaching the inner bore 5 of the sleeve 4 and the associated parts of the device.

To remove the device all that is necessary is to loosen the clamp screw 9 an amount sufficient to enable the plate 11 to be moved back into the channel 6, the sleeve 4 is then moved in a sidewise direction to locate the post 10 in the enlarged open area 5*b* which is of a width slightly greater than the diameter of the post 10 and the sleeve is then free to be forced upwardly of said tapered post

10. The plate 11 and the longitudinal channel 6 are provided with substantially parallel end walls and side walls respectively and are so dimensioned as to have a loose fit with each other.

The outer wall of the plate 11 is continuous and uninterrupted whereby the end of the clamp screw 9 will abut therewith and will not imbed itself in said plate, this being due primarily to the fact that the plate 11 is formed of bronze or other relatively hard metal or of a metal harder than the post 10. This also protects the post against damage such as might result from forcing the clamp screw 9 directly into engagement with the post 10.

While the plate 11 has been described as being tapered, it may be formed to a uniform thickness and the base of the channel can be so formed as to taper downwardly and outwardly on an angle substantially equal to the angle of the taper of the post as shown in Fig. 2.

It is also to be understood that the spaced openings in the tongue 13 through which the clamp screws or bolts 15 extend may be formed during the casting operation.

The only machining required of the present device is that of forming the threaded openings in the offset portion 7 and in the clamp plate 17. The end of the cable 19 is attached to the tongue 13 by tightening the clamp screws 15 whereby the clamp plate 17 will positively secure said cable to the tongue.

From the foregoing description, it will be seen that simple, efficient and economical means have been provided for accomplishing all of the objects and advantages of the invention. However, it is to be understood that various omissions, substitutions and changes in the form and details of the embodiments shown and described may be made by those skilled in the art without departing from the spirit of the invention as expressed in the accompanying claim and that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having described my invention, I claim:

A coupling device for attachment to a tapered terminal post comprising a sleeve of bronze metal having an oval shaped bore of controlled size adapted to receive the terminal post, said bore having a tapered wall section on one end thereof of a circular cross section dimensioned to fit relatively intimately with the taper and side surface curvature of the post and an intermediate enlarged open area of a diameter wider than the diameter of the post along a transverse line offset with respect to the axis of the post on the side thereof opposite to the end surface of circular cross section and having smooth inner walls which blend uninterruptingly into said tapered wall section, an offset portion on the side of said sleeve opposite the tapered end wall of circular cross section of the bore and having a normally related

threaded perforation therein, a longitudinal channel in said offset portion having substantially parallel side walls spaced apart a width less than the width of the intermediate enlarged open area and less than the diameter of the post and in communicating relation with said enlarged open area, said channel having a relatively smooth, flat uninterrupted base surface and substantially normally related parallel side walls, an integral tongue extending outwardly of the upper end of said sleeve on the side thereof opposed to said offset portion and embodying means for connecting an electric terminal thereto, a separate clamp plate of bronze metal shaped to loosely fit in said channel between it and the terminal post when assembled therewith and having substantially parallel relatively smooth uninterrupted outer side edge surface portions spaced apart a distance slightly less than the distance between the side walls of the channel permitting it to be freely slid in a direction longitudinally of the channel, the thickness of said clamp plate being tapered from one end thereof toward the other and having one of its face surface portions cylindrically smoothly curved and shaped to have a smooth uninterrupted fit with the side surface of the terminal post on the side thereof opposite the tapered end wall of circular cross section of the bore and having its opposed face surface smooth and shaped to the shape of and to loosely fit in the channel, and a clamp screw extending through said threaded perforation and adapted to engage said clamp plate to force it into binding relation with said post, said clamp plate being of a thickness and said channel being of a depth in accordance with the controlled size of the oval bore that when said plate is in clamped relation with the post a slight portion of said plate still remains in the channel and is adapted to be held against rotation in a sidewise direction by the side walls of the channels and only a slight portion of the screw is exposed between said clamp plate and the base of the channel, the said sleeve having the oval shaped bore therein, the offset portion with the longitudinal channel therein and the integral tongue extending outwardly of the upper end of said sleeve all being formed in integral relation with each other and to the finished size, shape and surface texture desired by a single casting operation.

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