

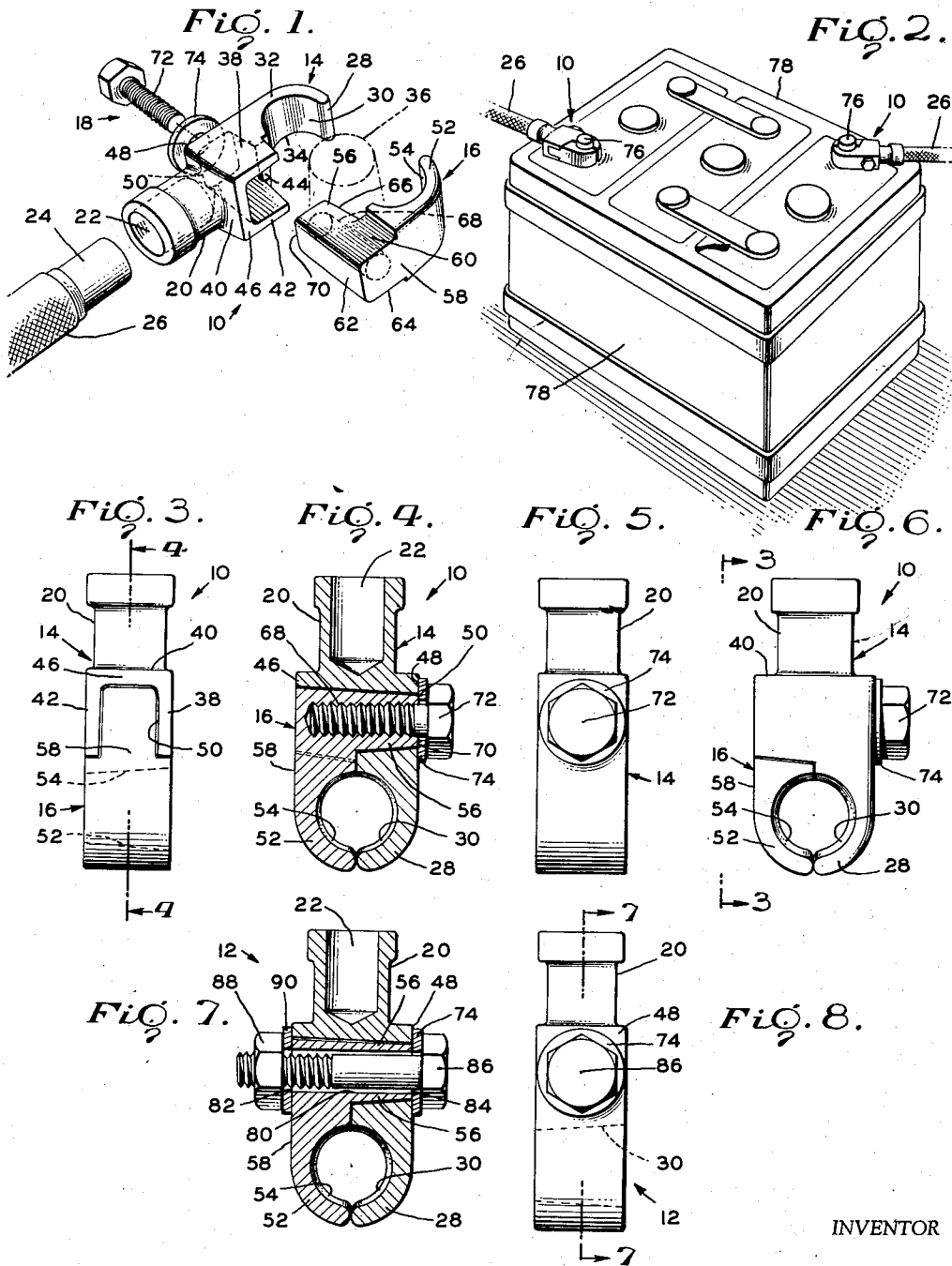
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BATTERY TERMINAL CLAMP

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BATTERY TERMINAL CLAMP

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The present invention relates to improvements in battery terminal clamps of the type carried by the ends of the electrical cables in automobile and other electrical circuits.

A primary object of the present invention is to provide an improved split-type terminal clamp wherein the component elements thereof have cooperative means whereby guided relative sliding movement of the elements is afforded when clamping the elements to a terminal.

A further object of the present invention is to provide an improved split-type terminal clamp wherein the component clamping elements thereof are guidingly associated with each other so as to move along a fixed path when urged to clamping relationship.

Another object of the present invention is to provide an improved split-type terminal clamp wherein the component elements have cooperative means slidably guiding each other toward clamping relation and wherein the cooperative means are so formed as to be readily separable.

A still further object of the present invention is to provide an improved split-type terminal clamp wherein the component elements have cooperative means slidably guiding each other toward clamping relationship and wherein means is provided for clampingly urging the component elements together which latter means is associated with the cooperative means.

Other objects of the present invention are to provide a simplified split-type terminal clamp which will be of inexpensive and lightweight construction and yet which will be relatively strong notwithstanding the fact that it is of the split type, and also which will be easy to separate when removal from a terminal is desired.

Various other objects and advantages will become apparent from the detailed description to follow.

In my preferred embodiments my invention is comprised of a pair of elements each having a clamping face adapted to cooperatively engage a terminal, and one of the elements having a recessed portion in which the end of a cable can be received and secured, as by solder. Additionally, one of the elements is formed with a lug extending toward the opposing element and having tapered wall surfaces, and the other element is provided with a recess formation, also with tapered wall surfaces complementary to the lug. The two elements are slidably guided relative to each other by the lug and recess formation and a bolt extends through an opening in the recess of said other element and is threadably engaged in a tapped bore of the lug of said one element.

In the modified arrangement, a bolt extends entirely through the lug and a nut is engaged thereon for securement purposes.

In the drawings:

Fig. 1 is an exploded perspective view of a first form of split-type clamp in accordance with the present invention;

Fig. 2 is a perspective view showing the terminal clamp

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of Fig. 1 as utilized in securing cables to terminals of a conventional battery;

Fig. 3 is an end elevational view of the assembled clamp;

Fig. 4 is a vertical sectional view as taken substantially along the plane of line 4—4 of Fig. 3;

Fig. 5 is an elevational view of the end opposing that shown in Fig. 3;

Fig. 6 is a side elevational view of the clamp as viewed from the left of Fig. 5;

Fig. 7 is a sectional view similar to Fig. 4 but showing a modification; and

Fig. 8 is an end elevational view of the modification of Fig. 7.

Referring more particularly to the drawings it will be seen that a first form of split-type clamp 10 is shown in Figs. 1—6 and a second form 12 is shown in Figs. 7—8.

The split-type clamp 10 is comprised of a pair of elements 14 and 16 and means 18 for clampingly joining the elements.

The element 14 is comprised of a substantially cylindrical portion 20 in which a recess 22 is formed for reception of the end 24 of a conventional cable 26 as of an automobile electrical system, solder or other suitable means as desired being employed for securement of the cable end 24 in the recess 22. Additionally element 14 includes an arcuate clamping portion 28, the inside face 30 of which is tapered from side 32 to side 34 for cooperation with the tapered surface of the battery terminal 36, as shown in dotted lines in Fig. 1.

Intermediate the cylindrical portion 20 and the arcuate clamping portion 28 the element 14 is formed with a box-like body portion including wall sections 38, 40, 42 and 44. A recess formation is defined by the inside surfaces of the wall sections 38—44 which are all inwardly tapered from the end surface 46 to the opposing end surface 48. The recess formation opens out onto end surface 48 at 50.

The other element 16 is formed with an arcuate clamping portion 52 including inside clamping face 54 which tapers similarly to face 30 and is opposing thereto. Integrally formed with the arcuate portion 52 is a lug 56 which has its longitudinal axis extending substantially parallel to a line drawn through the center of the circle defined by the arcuate face 54 and substantially perpendicularly from the flat end surface 58. The exterior surface of the lug is comprised of four converging faces 60, 62, 64 and 66 which are complementary to the interior of the recess formation defined by the walls 38—44 of the element 14. The lug 56 has a threaded bore formation 68 extending from its end 70 axially inwardly.

The means 18 includes a bolt 72 with a washer 74.

In assembly and clamping to a terminal, as 76 of battery 78, the lug 56 of element 16 is engaged in the complementary recess formation of element 14 and bolt 72 is disposed through the opening 50 and into the threaded bore formation 68. With the terminal 76 engaged between the clamping faces 30, 54, the bolt is tightened so as to draw the two clamping elements into tight clamping relationship with the terminal. It will be seen that in this tightening operation the arcuate jaw ends 28 and 52 will be tightened gradually over the battery terminal 76 by a leverage including sliding or rubbing line contacts between the tapered male and female lug surfaces at diagonally opposite ends of the tapered joint. This provides a good clamping leverage at the jaws without placing any bending stresses on the tightening bolt. At the same time the rubbing line contacts always produce a good electrical contact because of the scraping away of any intervening dirt which might otherwise cause a poor electrical connection across the contacts, if they were

merely pressed together over the dirt. When it is desired to release the clamp from the terminal, the bolt 72 is loosened and if the clamp is not easily released from the terminal a slight blow on the head of the bolt should effect release. It will be understood that the bolt need not be entirely removed but may be left partially threaded into the lug for holding the assembly together.

In the modified form of clamp 12, the structure is identical except as follows. The lug 56 instead of having a threaded bore 68 is formed with a smooth bore 80 which extends entirely through the length of the lug opening onto the face 58 at 82 and face 48 at 84. The bolt 86 has a longer shank substituted therefor with a nut 88 and washer 90 for engagement on the bolt 86 adjacent the face 58.

The assembly and clamping of the modified form is the same as in the first described form except that the bolt 86 is engaged through the opening 50 and bore 80 and has the nut 88 threaded against the washer 90 until proper clamping is achieved.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of this invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within the metes and bounds of the claims or that form their functional as well as conjointly cooperative equivalents, are therefore intended to be embraced by those claims.

I claim:

1. A split type battery terminal clamp having a pair of substantially semi-cylindrical jaws having opposed internal surfaces on a radius conforming to that of a standard battery terminal post, the jaws at the adjacent ends of said surfaces being slightly cut away to provide good clamping clearance for undersize posts, means for clamping said jaws around a battery terminal post comprising tapered rectangular, transversely telescoping male and female lugs at one end of said jaws respectively, for guiding and providing sliding electrical contacts between said jaws during clamping, and bolt means for drawing said lugs together into interfitting relation with the jaws fully closed, to form a substantially solid rectangular body, the female lug providing unbroken upper and lower faces coextensive with the upper and lower faces of said jaws, the side faces of said body having the opening through the female lug filled substantially flush by the ends of the male lug, said faces tangentially extending from the outer sides of said jaws, said male lug having shoulder portions extending upwardly and downwardly over the inner edges of the upper and lower walls of the female lug opening in its half of the body, and a cylindrical axial extension at the end of the body opposite said jaws for the reception of a conventional electrical cable.

2. A battery terminal clamp as defined in claim 1, said male lug being bored all the way through for the reception of said bolt.

3. A split type battery clamp comprising a pair of separable members, one member including a cylindrical socket at one end for the reception of the bared end of a battery cable, a generally U-shaped intermediate portion having a bottom wall and upstanding side walls, with said socket being joined with the under surface of said bottom wall medially thereof and at right angles thereto, and an

upstanding clamping jaw having a base joined with the upper edges of said side walls, bridging the same and extending along said edges of the side walls from one end thereof to terminate at a point midway between the ends thereof, the opposite sides of said jaw being coplanar with and merging smoothly with the outer surfaces of said side walls, the outer end surface of said jaw blending smoothly with the said one end of the side and bottom walls, and the inner surface of said jaw being of concave, semi-circular configuration to present a stepped surface substantially perpendicular to the upper free edges of said side walls which extend beyond the base of said jaw, said upper free edges of the side walls being coplanar and being inclined downwardly from said stepped surface toward the opposite end of the intermediate portion, the inner surface of said bottom wall being inclined downwardly from said one end of the intermediate portion toward said opposite end thereof, the under surface of the base of said clamping jaw being inclined downwardly toward said one end of the intermediate portion and the inner surfaces of said side walls being convergent toward said one end of the intermediate portion; the other member including an elongate male portion substantially coextensive in length with said intermediate portion and a clamping jaw joined with and disposed in upstanding relation to one end of the male portion on the upper side thereof, the last mentioned jaw having a base extending from said one end of the male portion to a point midway between the ends thereof, said male portion being defined by opposite side faces converging toward the free end thereof, a bottom face inclined upwardly toward said free end, and an upper face extending beyond the base of the last jaw which inclines downwardly toward said free end of the male portion, said male portion being of such dimensions as to fit snugly within the intermediate portion of said one member and the base of said last jaw being of the same width as said intermediate portion so as to present overhanging under surfaces extending outwardly from the opposite side faces of said male portion, said undersurfaces being inclined upwardly toward said free end of the male portion to overlie and snugly fit with said upper free edges of the side walls when the members are fully interengaged yet permit relative twisting between the members when not fully engaged whereby the jaw members may properly align with an associated battery post, said last jaw having a concave, semi-circular inner surface presenting a stepped surface substantially perpendicular to the upper face of said male portion, which latter stepped surface is engaged in face-to-face contact with the first mentioned stepped surface when the members are fully interengaged, said male portion having an internally threaded base extending axially inwardly from the free end thereof, and a bolt engaged within said base and having a head overlying the said one end of said intermediate portion whereby to urge said members into interengagement.

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