

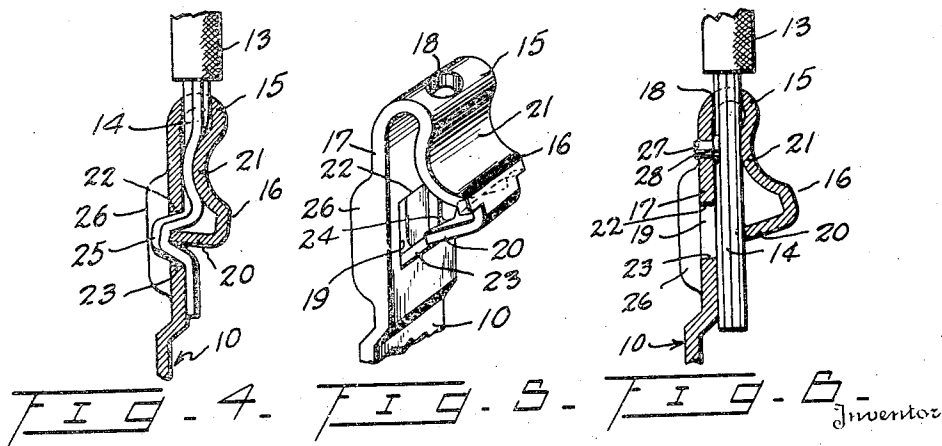
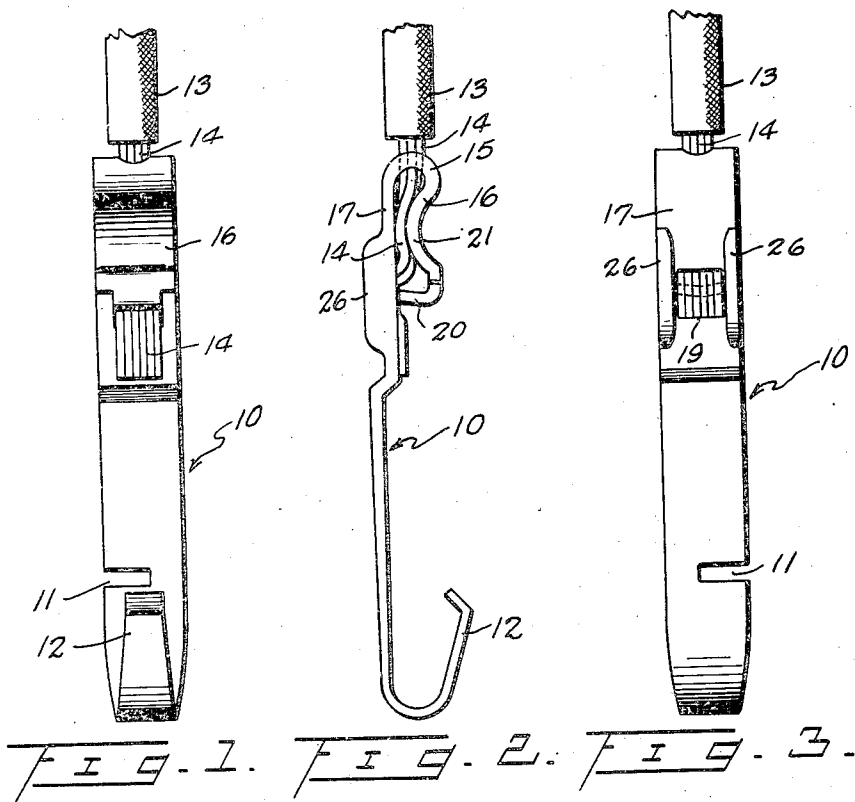
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LEAD CONNECTOR

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LEAD CONNECTOR

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This invention relates to a lead connector, particularly the means for connecting a lead to the connector, and has for an object to provide an improved and simplified means for connecting an electrical conductor to a connector which will provide a rigid tight connection without the use of solder or similar means, and one which may be easily and quickly applied.

With the foregoing and other objects in view I have devised the construction illustrated in the accompanying drawing forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details and arrangement shown but may include various changes and modifications within the scope of the invention.

In this drawing:

Fig. 1 is a front elevation of the connector with a lead connected thereto and shown on an enlarged scale;

Fig. 2 is a side elevation thereof;

Fig. 3 is a rear elevation thereof;

Fig. 4 is a longitudinal section through the lead securing means showing the lead in elevation;

Fig. 5 is a perspective view of the lead securing means in open condition, and

Fig. 6 is a section on the plane of Fig. 4 but showing the connector before being set to clamp the lead.

The device illustrated comprises a connector 10 made from a substantially flat strip of metal having means 11 and 12 at one end for connection to another connector of a similar or a different construction, this particular connecting means, however, being shown merely as an example and is not a part of the present invention. The means for connecting the strip or connector to a lead 13 is formed at the other end of the strip. The lead may be a single insulated wire but in the present case is shown as a cluster of a number of small wires 14 to provide greater flexibility. The strip 10 is bent or folded upon itself, as shown at 15, providing a front wall 16 and a rear wall 17 side by side in superimposed relation and spaced to permit insertion of the lead wires between them. At the bend is provided an opening 18 for the insertion of the stripped end portion of the lead wires 14 into the space between the front and rear walls 16 and 17. In the rear wall 17 and spaced from the loop or bend 15 is provided an opening 19, and the front wall 16 is provided with a rearwardly extending tongue 20 in front of and in alignment with this opening.

The tongue may be formed in different ways but is preferably provided by bending rearwardly the free end portion of the front wall 16 and this portion is preferably reduced in width to substantially the width of the opening 19. Between the tongue and the bend 15 the front wall is preferably curved with a concavo-convex portion 21, 60

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the convex surface being toward the rear wall 17, and the rear wall 17 being preferably substantially flat or straight from the bend 15 to a distance below the opening 19. As the device is formed the front wall 16 and the tongue 20 are spaced forwardly from the rear wall 17 as shown in Figs. 5 and 6.

In making the connection to the lead 13 the stripped or uncovered end portions of the wire or wires 14 are inserted through the opening 18 into a position in the space between the front and rear walls 16 and 17 and sufficient of the wires are stripped so that they can extend over the opening 19 under the free end of the tongue 20 and for some distance beyond the lower edge of the opening 19, as indicated in Fig. 6. The front wall 16 and with it tongue 20 are then pressed rearwardly toward the rear wall 17 and against the wires to the position shown in Figs. 2 and 4. This action forces the end of the tongue 20 against the portion of the lead wires over the opening 19 and bends it backwardly over the upper edge 22 of the opening, over the free end edge of the tongue 20 so that it extends forwardly through the opening and over the lower or opposite edge 23 of the opening. For best results the opening is of a length so that the lead wires are given a sharp bend and substantially fill the space between the edges 22 and 23 of the opening and the tongue 20 so as to give somewhat of a clamping action, but the size of the opening and the clearance provided would depend somewhat on the size of the wire or wires and their stiffness. The opening 19 is preferably substantially rectangular as shown but is not limited to this shape as differently shaped openings may be used. At the same time the front wall is pressed against the lead wires to fold them over the tongue and in the opening as described, the concavo-convex portion 21 is also shifted backwardly and the convex inner side thereof clamps the lead wires against the front surface of the rear wall 17, as shown in Figs. 2 and 3, to still further firmly hold and grip the lead wires.

This connection gives a very tight and permanent grip on the lead wires and effectively retains them in position and will give sufficient grip by both the clamping of the leads between surfaces and the relatively sharp bending thereof over suitably arranged edges to provide a gripping and holding effect which is practically as strong as the wires themselves, and will do this without the necessity of any soldering or similar operation.

To prevent the lead wires separating when the tongue is forced into clamping position the free edge of the tongue is preferably notched or made somewhat V-shaped, as shown at 24, so that in the clamping operation it tends to force the wires together instead of separating them.

Also as will be seen from Fig. 4, as the tongue is forced into the opening 19 portions of the wires are carried through this opening to the back of the rear wall 17 so that they extend beyond the rear surface of this wall as they fold over the free edge of the tongue as indicated at 25 in Fig. 4. If the operation of forcing the front wall and tongue backwardly to clamping position is performed against a die or other hard surface it will be seen there would be danger the free edge of the tongue might cut the wires by squeezing them against this surface. To prevent this the rear wall 17 is provided with a pair of ribs 26 extending rearwardly on the opposite sides of the opening 19 and in alignment therewith, these ribs being preferably somewhat longer than the opening 19 so that they extend a suitable distance above and below the opening as indicated. For best results these ribs should be of a height at least substantially the amount the wires at 25 over the edge of the tongue extend rearwardly of the rear surface of the wall 17 so as to be protected against the clamping or cutting action against the surface of the die in the clamping operation.

Although this connector firmly and permanently grips the wires so as to make a permanent tight connection without the use of solder, still if in some installations a soldered connection is specified or desired, as for example in radio equipment to make a noiseless connection, solder may be provided by forming in one of the walls 16 and 17, preferably the rear wall 17, an opening in which is placed a slug or rivet 27 of solder. This rivet may have a head 28 on the inner side of the wall 17 to retain it in position when the lead wires are clamped as above described. Then by merely heating the connection this slug or rivet of solder will melt and run between the surfaces of the wires and the metal strip to give the desired soldered connection.

It will be clear from the above that the device is of a very simple construction and that the connection to the lead wires can be made quickly with a very simple operation, that when once clamped or gripped in the connector the wires are permanently and firmly secured with sufficient strength to withstand the strains on the leads without separating them from the connector, and that a good electrical joint is secured without the necessity of soldering or similar operations.

Having thus set forth the nature of my invention, what I claim is:

1. A connector of the character described comprising a metal strip bent upon itself to provide front and rear walls and provided with an opening at the bend adapted for insertion of the end portion of a lead wire between them, the rear wall being provided with an opening therein and the front wall including a tongue arranged with its free end extending rearwardly in alignment with said latter opening, said front wall including a convexly curved portion between the bend and the tongue to clamp a lead inserted through the first opening to a position between the tongue and the second opening against the rear wall, and said tongue adapted to be pressed into the second opening against a lead so positioned to bend the lead over the end of the tongue and opposite edges of the opening, the material of the clip being such as to retain the tongue in the clamping position.

2. A connector of the character described comprising a metal strip bent upon itself to provide front and rear walls and provided with an

opening at the bend adapted for insertion of the end portion of a lead wire between them, the rear wall being provided with an opening therein and the front wall including a tongue arranged with its free end extending rearwardly in alignment with said latter opening and adapted to be pressed into this opening against a lead inserted through the first opening to a position between the tongue and the second opening to bend the lead over the end of the tongue and opposite edges of the opening to clamp it therein, and ribs extending backwardly from the rear wall at opposite sides of the second opening and of a height at least equal to substantially the height of the portion of such a lead passing over the end of the tongue.

3. A connector of the character described comprising a metal strip bent upon itself to provide front and rear walls and provided with an opening at the bend adapted for insertion of the end portion of a lead wire between them, the rear wall being provided with an opening therein and the front wall including a tongue arranged with its free end extending rearwardly in alignment with said latter opening, said front wall including a convexly curved portion between the bend and the tongue to clamp a lead inserted through the first opening to a position between the tongue and the second opening against the rear wall, said tongue adapted to be pressed into the second opening against a lead so positioned to bend the lead over the end of the tongue and opposite edges of the opening, and ribs extending backwardly from the rear wall at opposite sides of the second opening and of a height at least equal to substantially the height of the portion of such a lead passing over the end of the tongue.

4. A connector of the character described comprising a metal strip bent upon itself to provide front and rear walls and provided with an opening at the bend adapted for insertion of the end portion of a lead wire between them, the rear wall being provided with an opening therein and the front wall including a tongue arranged with its free end extending rearwardly in alignment with said latter opening and adapted to be pressed into this opening against a lead inserted through the first opening to a position between the tongue and the second opening, to bend the lead over the end of the tongue and opposite edges of the opening to clamp it therein, one of said walls being provided with an opening between the bend and the second opening, and a slug of solder in the third opening adapted on heating after clamping of a lead to flow against surfaces of the lead and strip to solder them together, the material of the clip being such as to retain the tongue in the clamping position.

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