Feb. 22, 1949. S. E. WRIGHT 2,462,247

ELECTRICAL SNAP-ON WIRE CONNECTOR

Filed Feb. 4, 1948 2 Sheets-Sheet 1

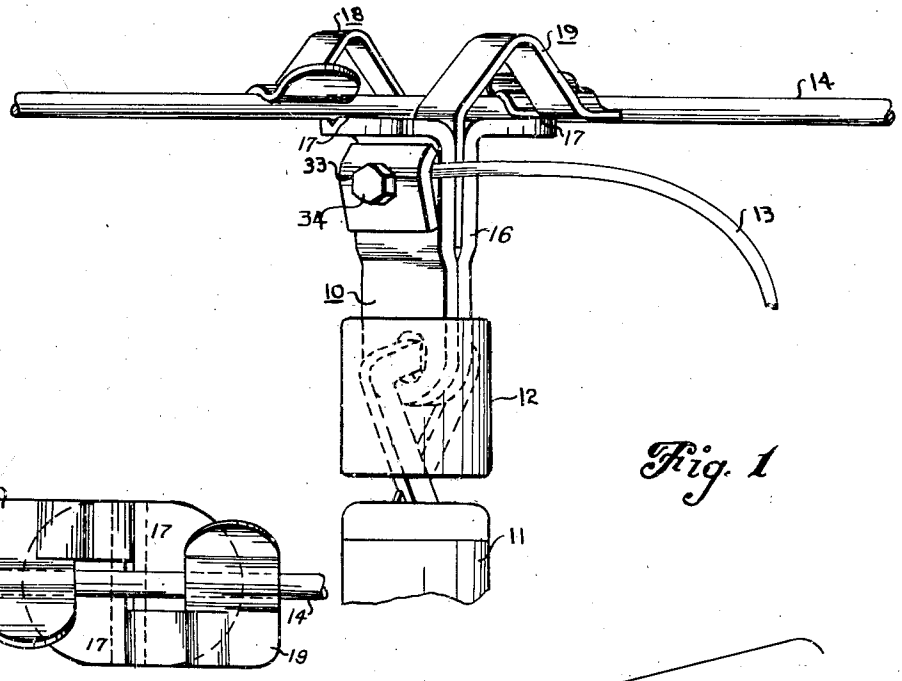


Fig. 1

Fig. 2

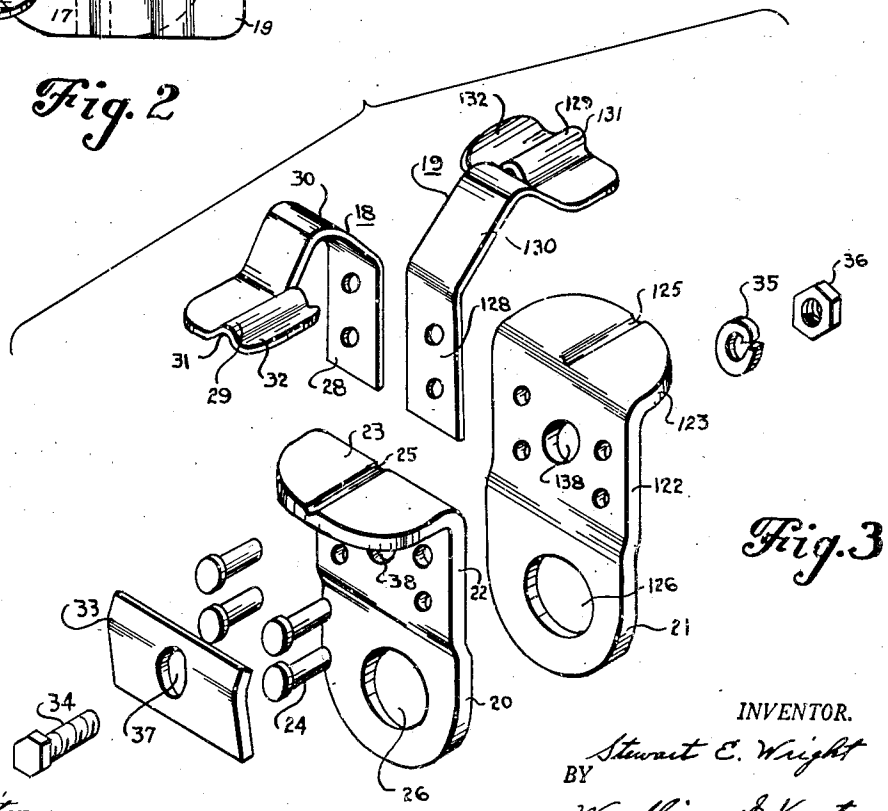


Fig. 3

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ELECTRICAL SNAP-ON WIRE CONNECTOR

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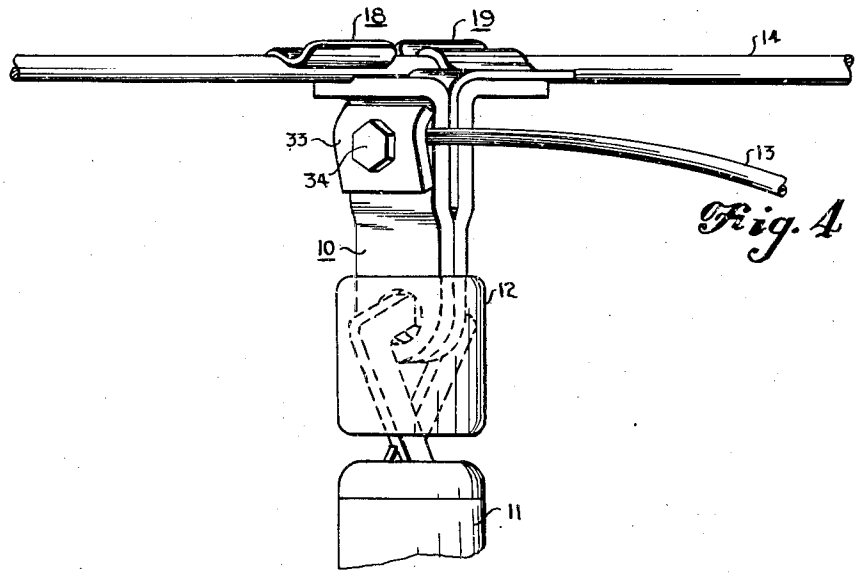


Fig. 4

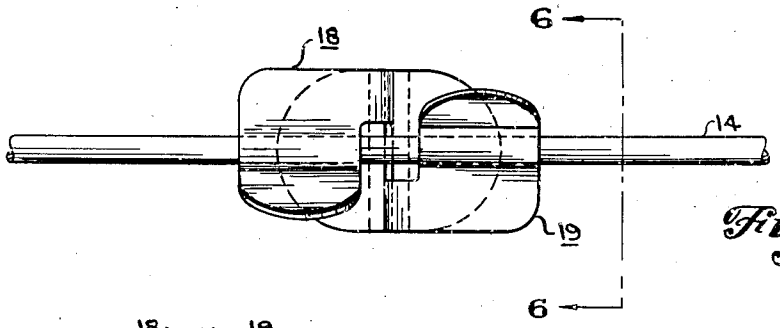


Fig. 5

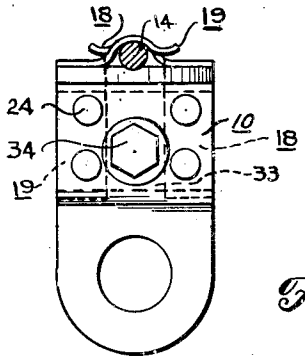


Fig. 6

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ELECTRICAL SNAP-ON WIRE CONNECTOR

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9 Claims. (Cl. 173—273)

1

My invention relates to snap-on connectors for use in connecting a tap or secondary wire to an elongated line wire or main line wire. My snap-on connector is well adapted for use with distribution lines or transmission lines.

One of the objects of my invention is the provision of a wire snap-on connector which is simple in construction and operation.

Another object of my invention is the provision of a connector for connecting a tap wire to a main line wire in which the connector is held to the main line wire with spring tension.

Another object of my invention is the provision of a snap-on device for connecting a tap wire to an elongated line wire in which the wire engaging parts of the device may be constructed from stampings thereby making an efficient and economical snap-on device.

Another object of my invention is to provide a snap-on device for connecting a tap wire to an elongated line wire which has a body portion with a contact surface and has laterally spaced contact springs extending from this body portion and adapted to press the line wire thereagainst.

Still a further object of my invention is the provision of a line wire snap-on connector which when connected to the line wire is not loosened by the vibration of the line wire or does not mechanically injure the line wire.

Another object of my invention is the provision of a wire connector in which the working parts do not become corrosively bound.

My invention has for another of its objects the provision of a snap-on connector which is readily connected to or disengaged from a high voltage line and which prevents excessive sparking when it is connected to or disengaged from the high voltage line.

Other objects and a fuller understanding of my invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a diagram showing my snap-on connector in actual use with an attachment pole, during the connecting or disconnecting of it from a high voltage line;

Figure 2 is a top end view of my snap-on connector;

Figure 3 is an exploded view of my snap-on device or connector shown in perspective to better illustrate the construction of the parts;

Figure 4 illustrates a modification of my snap-on device;

Figure 5 is a top view of my modified snap-on device as illustrated in Figure 4; and

2

Figure 6 is a view taken along the lines 6—6 of Figure 5.

Linemen often connect tap wires to the line or distribution line without de-energizing the line. In referring to a line wire, I wish to include distribution lines, transmission lines and other wires used for conducting electricity. To make this connection, the linemen should have a snap-on device or wire connector which they may use in a quick, effective and safe manner without damaging the elongated line wire or distribution line. The present screw type hot line clamp is not a quick connected device and consequently tends to damage the wire through arcing. The linemen generally use operating handles, which may be up to eight or ten feet long and are constructed of an insulating material, to snap the snap-on device or wire connector onto the elongated line wire while standing at a safe distance from the line wire.

I have discovered that my snap-on device, in which the parts may be constructed of stampings or from forgings or castings, forms a good electrical connection between the tap wire and the line electrical wire. My snap-on device maintains this good electrical connection and thereby prevents sparking or other injury to the connector or the line wire. In many instances, it is necessary to leave the snap-on device on the distribution line for several days while major repairs are being made to the distribution line. My snap-on device has no parts which will cause it to become corrosively bound while it is connected to the line wire for this period of time. My snap-on device may be easily removed from the elongated line wire, such as the distribution line even though it has been connected for a long period of time. Previous connectors often become corrosively bound and are not easily removed.

In Figure 1 of my drawings, I illustrate my snap-on device 10 as being fastened on the end of an operating handle 11 by a suitable claw and chuck arrangement 12. The Figure 1 further illustrates the snap-on device 10 as being clamped to a tap wire 13 and snapped on an elongated line wire 14, such as a distribution line. It is understood that this operating handle 11 and the claw and chuck arrangement 12 carried thereby may be of any suitable design which will hold the snap-on device 10 on the end of the operating handle to permit alignment of the snap-on device and the line wire for connecting the tap wire 13 to the elongated line wire 14 without the line-

man's being endangered or being subjected to electrical shock.

My snap-on device 10 may preferably be constructed of stampings. The design and structure of each of the parts of my new and improved snap-on device is easily ascertainable in Figure 3 of the drawings. My snap-on device 10 in general comprises a body portion 16 having contact surfaces 17 to engage the elongated line wire or distribution line. Wire engageable springs 18 and 19 are carried by this body portion 16 and, in my preferred device, extend outwardly through the contact surface 17. These wire engageable springs are laterally spaced to freely and transversely receive the elongated line wire therebetween, and each terminates in a line wire engagement portion. Each engagement or contact portion may be disposed opposite the contact surface and urged toward the contact surface to engage the line wire and thereby hold the same against the contact surface 17 of the body portion 16. However, the engagement portions may be disposed entirely beyond the contact surface to engage the line wire projecting beyond the contact surface, or they may be disposed whereby the contact surface engages the line wire projecting beyond the wire engagement portions.

The body portion 16 of my snap-on device may be constructed of any suitable material which will conduct electricity. Although the body portion may be constructed from one piece, I have found it economical and practical to construct it from two stamped pieces. Therefore, I preferably construct body portion 16 from a pair of substantially L-shaped members 20 and 21, each having a fastening portion and a wire engageable portion. These L-shaped members may also be constructed from castings or forgings. On the L-shaped member 20, the number 22 designates the fastening portion and the number 23 designates the engageable portion. On the L-shaped member 21 the number 122 designates the fastening portion and the number 123 designates the engageable portion. These fastening portions 22 and 122 of the L-shaped members 20 and 21 respectively are preferably riveted together by rivets 24, but may be fastened by other suitable means such as soldering or bolting. The wire engageable portions 23 and 123 cooperate to define the line wire contact surface 17 which is engageable by the elongated line wire 14. When the fastening portions 22 and 122 of the L-shaped members are fastened together (or the L-shaped members 20 and 21 are fastened together in back-to-back relationship) the wire engageable portions 23 and 123 of these L-shaped members extend in opposite direction from the fastening portions. In the preferred embodiment of my invention, I have provided each of these wire engageable portions 23 and 123 with a line wire engageable groove 25 and 125 respectively. These wire engageable grooves 25 and 125 are in longitudinal alignment in the contact surface 17 and are positioned to longitudinally receive the elongated line wire when the snap-on connector is fastened thereto.

The wire engageable spring 18 is described as having a fastening portion 28 and a line wire contact portion 29 integrally connected by a spring portion 30, while the wire engageable spring 19 is described as having a fastening portion 128 and a line wire contact portion 129 integrally connected by a spring portion 130. These wire engageable springs are fastened to and therefore carried by the fastening portions 22 and 122 of the L-shaped members 20 and 21 and extend outwardly from the contact surface 17. The fastening portions 28 and 128 of the wire engageable or contact springs 18 and 19 respectively are disposed between the fastening portions 22 and 122 of the L-shaped members 20 and 21 respectively and are securely held in place by the rivets 24 which hold the L-shaped members 20 and 21 together. The line wire contact portions 29 and 129 are positioned to press the elongated line wire 14 against the contact surface 17. I have found it advisable to provide these line wire contact portions 29 and 129 with grooves 31 and 131 respectively positioned in alignment with the grooves 25 and 125 of the L-shaped members. When the snap-on device is fastened or snapped on the elongated line wire 14 as indicated in Figures 1 and 2, the line wire 14 engages both grooves 25 and 125, and 31 and 131 to prevent disconnection of the snap-on device from the elongated line wire by vibration. The grooves also offer a greater contact area to the line wire.

The wire engageable springs 18 and 19 are laterally displaced, that is the engageable spring 18 is fastened on one side of the body portion and the engageable spring 19 is fastened on the other side of the body portion. When the snap-on device is snapped on the elongated line wire 14, the wire 14 engages the groove 25 and extends between the engageable spring 18 and the engageable spring 19. The contact portion 29 of the engageable spring 18 therefore extends in one direction to engage the line wire 14 while the contact portion 129 of the engageable spring 19 extends in the opposite direction to engage the line wire 14 at the same time. Although I have indicated in my drawings that these line wire contact portions 29 and 129 extend over the contact surface 17, and also longitudinally beyond the contact surface 17, it is understood that they may be positioned entirely over the contact surface, entirely beyond the contact surface, or partly over and partly beyond the contact surface. Similarly, the contact surface may extend longitudinally beyond the limits of the wire engageable springs. I have further discovered that providing the contact portion 29 with a curved tip 32 and the contact portion 129 with a curved tip 132 guides the line wire between the contact portions 29 and 129 and the contact surface 17 during connecting of the snap-on device to the high tension or a distribution line, and also causes a quick break or free disengagement of the wire and the connector.

The spring portions 30 and 130 urge the respective line wire contact portions 29 and 129 in the general direction of the respective wire engageable portions 23 and 123 of the L-shaped members. The spring portions 30 and 130 of the wire engageable springs 18 and 19 respectively are disposed parallel to the grooves 25 and 125 with one spring portion on one side of the grooves and the other spring portion on the other side of the grooves whereby the line wire 14 may be freely received therebetween. The contact portions 29 and 129 extend from the side of their respective spring portions to engage the line wire 14 when the snap-on device is turned to connect it to the line wire. A long spring portion is also found preferable and is constructed by curving the spring portion as is illustrated in the drawings.

The tap wire 13 may be fastened to the body portion 16 of the snap-on device by a clamp 33 and a bolt 34. The bolt 34 extends through an opening 37 in the clamp 33 and openings 38 and 138 in the fastening portions 28 and 128 respectively of the L-shaped members and may be held

in place by means of lock washer 35 and nut 36. The end of the tap wire 13 is shown clamped between the clamp 33 and the L-shaped member 20. However, it is understood that the tap wire may be soldered to the body portion or electrically connected thereto by any other suitable means used in the electrical industry.

To connect my snap-on device onto the line electrical wire 14, such as an overhead high tension or a distribution line, the lineman fastens the snap-on device into the claw and chuck arrangement 12 on the end of operating handle 11. In my drawings, I have illustrated the L-shaped members 20 and 21 as having openings 26 and 126 to receive the claws of this claw and chuck arrangement 12 to insure turning of the snap-on device when the handle 11 is turned. The snap-on device is positioned against the elongated line wire 14, the elongated line wire 14 being freely and transversely received between the wire engageable springs 18 and 19 and against the contact surface 17. When the contact surface 17 and the line wire 14 have come into engagement, the lineman turns the handle to turn in one direction, the snap-on device relative to the line wire 14. This turning of the snap-on device relative to the line wire causes the line wire contact portions 29 and 129 of the wire engageable springs 18 and 19 respectively to be urged in a direction away from the respective engageable portions of the L-shaped members and against the urging of the wire engageable springs. The instant the grooves 25 and 125, and 31 and 131 in the wire engageable portions of the L-shaped members and the wire contact portions of the engageable springs respectively are longitudinally in alignment with the elongated line wire 14, the urging of the engageable springs 18 and 19 lock the line wire in the snap-on device. Thus, the line wire is contacted by the snap-on device at spaced intervals, thereby dampening vibration and insuring non-damaging but positive electrical contact between the line wire and the tap wire. After the high tension line or elongated line wire has been completely repaired or when the lineman wants to disconnect the tap, he simply turns the operating handle in the opposite direction to disengage the wire contact portions of the wire engageable springs from the line wire. I have discovered that by providing these line wire contact portions 29 and 129 with the curved tips 32 and 132, the urging of the curved spring portions will cause these curved tips 32 and 132 to snap the wire contact portions away from the line wire 14 during disengagement, thus providing a fast, non-sparking break in the electrical contact.

In Figures 4, 5 and 6 of my drawings, I illustrate a modified device in which I have greatly reduced the length of the spring portion of the line wire engageable springs. The operation of the snap-on device is the same as that of the preferred embodiment of my invention as shown in Figure 1. The line wire engageable or contact springs are laterally spaced to receive the line wire therebetween and are adapted to clamp the line wire against the contact surface upon turning of the snap-on device relative to the line wire.

It is also thought that the wire engageable springs can be constructed integral with the L-shaped members, thus eliminating the extra number of stampings required. However, I have described the preferred construction of my wire snap-on device.

Although I have described my invention with a certain degree of particularity, it is understood

that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be fastened to the tap wire, said body portion comprising a pair of L-shaped members fastened in back-to-back relationship and defining a contact surface to be engaged by the line wire, wire engageable spring means carried by said body portion and extending outwardly from said contact surface, said wire engageable spring means terminating in line wire contact means urged toward the said contact surface to engage the line wire to thereby hold the same between the contact surface and the wire engagement surface when the snap-on device is connected to the elongated line wire.

2. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be clamped in an operating handle and fastened to the tap wire, said body portion comprising a pair of L-shaped members fastened in back-to-back relationship and defining a contact surface to be engaged by the line wire, first and second wire engageable spring means carried by said body portion and extending outwardly from the said contact surface and laterally spaced apart to freely and transversely receive the said elongated line wire therebetween, said first and second wire engageable spring means each terminating in line wire contact means urged toward the said contact surface to engage the line wire at spaced points to hold the same against the contact surface when the snap-on device is connected to the line wire.

3. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be clamped in an operating handle and fastened to the tap wire, said body portion having a contact surface to be engaged by the line wire, a first line wire engageable spring carried by said body portion and extending outwardly from said contact surface, a second line wire engageable spring carried by said body portion and extending outwardly from said contact surface and laterally spaced from said first line wire engageable spring to freely and transversely receive said elongated line wire therebetween, said first and said second line wire engageable springs respectively having reversely disposed wire engagement portions extending in substantially opposite direction, said wire engagement portions each having a wire engagement surface facing said contact surface to engage the line wire and to thereby hold the same between the contact surface and the wire engagement surface upon turning the snap-on device relative to the elongated line wire.

4. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be clamped in an operating handle and fastened to the tap wire, said body portion comprising a pair of L-shaped members fastened in back-to-back relationship and defining a contact surface to be engaged by the line wire, a first line wire engageable spring carried by said body portion and extending outwardly from said contact surface, a second line wire engageable spring carried by said body portion and extending outwardly from said contact

surface and laterally spaced from said first line wire engageable spring to freely and transversely receive said elongated line wire therebetween, said first and said second line wire engageable springs respectively having reversely disposed wire engagement portions extending in substantially opposite directions, said wire engagement portions each having a wire engagement surface facing said contact surface to engage the line wire and to thereby hold the same between the contact surface and the wire engagement surface upon turning the snap-on device relative to the elongated line wire.

5. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be clamped in an operating handle and fastened to the tap wire, said body portion having a contact surface to be engaged by the line wire, a first line wire engageable spring carried by said body portion and extending outwardly from said contact surface, a second line wire engageable spring carried by said body portion and extending outwardly from said contact surface and laterally spaced from said first line wire engageable spring to freely and transversely receive said elongated line wire therebetween, said first and said second line wire engageable springs respectively having reversely disposed wire engagement portions extending in substantially opposite directions, said wire engagement portions each having a wire engagement surface to engage the line wire projecting beyond the contact surface of the body portion and to thereby hold the same between the wire engagement surface and the contact surface upon turning the snap-on device relative to the elongated line wire.

6. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be clamped in an operating handle and fastened to the tap wire, said body portion comprising a pair of L-shaped members fastened in back-to-back relationship and defining a contact surface to be engaged by the line wire, a first line wire engageable spring carried by said body portion and extending outwardly from said contact surface, a second line wire engageable spring carried by said body portion and extending outwardly from said contact surface and laterally spaced from said first line wire engageable spring to freely and transversely receive said elongated line wire therebetween, said first and said second line wire engageable springs respectively having reversely disposed wire engagement portions extending in substantially opposite directions, said wire engagement portions each having a wire engagement surface to engage the line wire projecting beyond the contact surface of the body portion and to thereby hold the same between the wire engagement surface and the contact surface upon turning the snap-on device relative to the elongated line wire.

7. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a first L-shaped member defining a body portion and a line wire engageable portion, a second L-shaped member defining a body portion fastenable to the body portion of the first L-shaped member and a line wire engageable portion disposed in the plane of the wire engageable portion of the first L-shaped member, a first line wire engageable spring having a fastening portion thereof disposed between the said

L-shaped members and carried thereby, a second line wire engageable spring also having a fastening portion thereof disposed between the said L-shaped members and carried thereby and laterally spaced from said first line wire engageable spring to freely and transversely receive said elongated line wire therebetween, said first and said second line wire engageable springs extending from between said L-shaped members and respectively having reversely disposed wire engagement portions extending in substantially opposite directions, said wire engagement portions each having a wire contact surface facing its respective wire engageable portion of the respective L-shaped member to engage the line wire and to thereby hold the same against the wire engageable portions of the L-shaped members upon turning the snap-on device relative to the elongated line wire.

8. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a first L-shaped member defining a body portion and a line wire engageable portion, a second L-shaped member defining a body portion fastenable to the body portion of the first L-shaped member and a line wire engageable portion disposed in the plane of the wire engageable portion of the first L-shaped member, a first line wire engageable spring having a fastening portion thereof disposed between said L-shaped members and carried thereby, a second line wire engageable spring also having a fastening portion thereof disposed between said L-shaped members and carried thereby and laterally spaced from said first line wire engageable spring to freely and transversely receive said elongated line wire therebetween, said first and said second line wire engageable springs extending from between said L-shaped members and respectively having reversely disposed wire engagement portions extending in substantially opposite directions, said wire engagement portions each having a wire contact surface to engage the line wire projecting beyond the wire engageable portions of the L-shaped members to thereby hold the same against the wire engageable portions of the L-shaped members upon turning the snap-on device relative to the elongated line wire.

9. A snap-on device for connecting a tap wire to an elongated line wire, said device comprising a body portion adapted to be fastened to the tap wire, said body portion comprising a pair of L-shaped members fastened in back-to-back relationship and defining a contact surface to be engaged by the line wire, wire engageable spring means joined with said body portion and extending outwardly from said contact surface, said wire engageable spring means terminating in line wire contact means urged toward the said contact surface to engage the line wire to thereby hold the same between the contact surface and the wire engagement surface when the snap-on device is connected to the elongated line wire.

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