G. M. LAIRD.

CONNECTOR.

APPLICATION FILED MAY 11, 1916.

1,259,752. Patented Mar. 19, 1918.

Fig. 1.

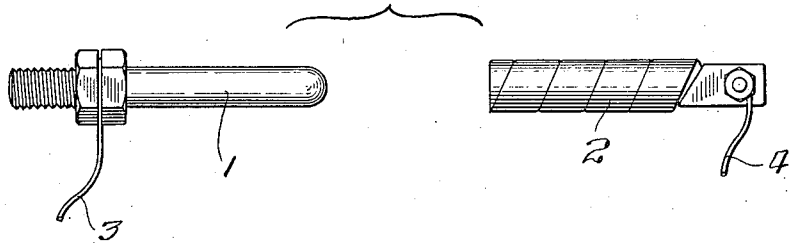


Fig. 2.

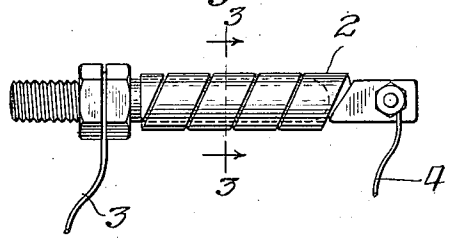


Fig. 3.

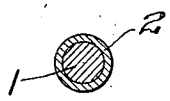


Fig. 4.



Fig. 5.



Fig. 6.

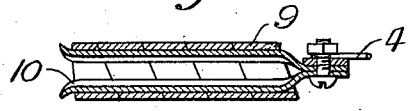


Fig. 7.

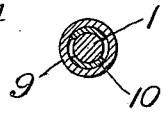
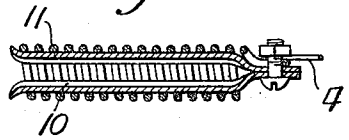


Fig. 8.



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UNITED STATES PATENT OFFICE.

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CONNECTOR.

1,259,752. Specification of Letters Patent. Patented Mar. 19, 1918.

Application filed May 11, 1916. Serial No. 96,762.

To all whom it may concern:

Be it known that I, GUY M. LAIRD, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Connectors, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to produce a simple, strong and durable detachable coupling or connector for electrical conductors which will give good contact initially and will not become distorted and thus make poor contact under long continued severe use or under careless handling such as applying a transverse or bending force to the device as the two members are drawn apart.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its object and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is an elevation of the two parts of a coupling or connector embodying my invention, the two members being shown separated from each other;

Fig. 2 is a view similar to Fig. 1 and showing the two members of the coupling or connector engaged with each other;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Figs. 4 and 5 are views similar to Fig. 3, illustrating modifications;

Fig. 6 is a longitudinal section through a modified form of female member;

Fig. 7 is a transverse section through the member illustrated in Fig. 6, with the post engaged therewith; and

Fig. 8 is a view similar to Fig. 6, illustrating a still further modification.

Referring to Figs. 1 to 5 of the drawing, 1 represents a post and 2 a sleeve adapted to be slipped upon the post and make metallic contact therewith so as electrically to connect conductors such as indicated at 3 and 4, attached to the members 1 and 2 respectively.

Great difficulty has heretofore been experienced in securing and maintaining good contact between the members of any comparatively simple detachable connector or coupling because of wear and distortion of the parts even when used carefully, because of the setting of the metal in parts intended to give a spring action, and particularly because it may be said that no device of this kind ever receives careful usage. For example, where a device of this kind is used on a flat iron or other electrically heated household device, one member of the coupling or connector will be jerked in almost any direction except that which will not produce a lateral component tending to spread or bend the resilient member.

In accordance with my invention I have made one of the members, preferably the sleeve, in such form that it will grip or press against the other member, when the two are brought together, with sufficient force to insure electrically-conductive continuity, will be stiff and rigid enough for all purposes for which it is intended, and yet will be so flexible that rough careless handling of the device tending to bend and twist the same out of shape will produce no bad effect whatever. I accomplish this by making the resilient member in the form of a long strip, preferably of spring metal, bent into the form of a helix of such a diameter that a slight change in diameter results when the two members are pressed together. The strip is preferably made wide as compared to the thickness thereof and is wound so that the coils or turns lie close together and thus give the resilient member the appearance of a tube made of a thin flat spirally wound strip. When the post is pushed into the tubular member, the coils of the latter expand slightly, as illustrated in exaggerated manner in Fig. 2, gripping the post firmly with a yielding pressure. The distortion of the spiral from its normal inactive condition is so slight that there is no possibility of straining the material thereof sufficiently to cause it to set. Furthermore, when the two members are pulled apart it makes little difference whether the pull is straight or not because the spirally wound sleeve will yield and bend as it is drawn off the post if the pull is not a straight one. The bending stresses do not have to be borne at any one point in the tube, however, because they are distributed not only from one end of the tube to the other but from one end of the

spirally wound strip to the other end of the strip; and, the strip being several times as long as the tube or sleeve, it will be evident that any ordinary amount of bending of the tube or sleeve resulting from an uneven pull in separating the two members of the connector, will have only a very slight effect on any given section of the long spring strip so that there is no danger whatever of the tube or sleeve taking a set and failing to spring back to its normal position as soon as it is released from the bending pressure.

As I have heretofore stated I prefer to make the strip comparatively wide although I do not desire to be limited to a wide strip. With a construction of the kind illustrated the tendency is for the spiral to grip the post more tightly as the post is withdrawn and, if the material be very narrow it will be very difficult to separate the parts from each other. By making the strip comparatively wide, however, the tendency of the outer member to close upon the inner member when the latter is withdrawn therefrom is reduced to a point where it is not noticeable and allows the parts to be separated without difficulty.

While the two members of the device will ordinarily be made round in form, they may take any other cross sectional shape; members, 5 and 6, one of which is triangular, corresponding to the members 1 and 2 being illustrated in Fig. 4; and rectangular members, 7 and 8, being illustrated in Fig. 5.

In Figs. 6 to 8 I have illustrated an arrangement in which the helix or spiral does not contact directly with the post, contact shoes being interposed between the sleeve and the post.

Thus, in Figs. 6 and 7, the spiral 9, similar to the member, 2, of Figs. 1 to 3, surrounds and bears against a longitudinally-split sleeve, 10, or what may be termed a pair of long curved shoes constituting the actual terminal; the post, 1, spreading the split sleeve or shoes against the tension of the spiral when inserted in the female member.

In Fig. 8 the arrangement is the same as that in Fig. 6 except that the helix or spiral, 11, is in the form of an ordinary coil spring.

While I have illustrated in detail only a single preferred form of my invention with slight modifications in cross sectional shape, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the terms employed in the definitions of my invention constituting the appended claims.

I claim:

1. A connector element comprising a tube made of a flat strip of spring metal wound in the form of a spiral.

2. A connector element comprising a tube made of a piece of spring metal wound in the form of a spiral, and a contact piece fastened to and extending longitudinally through the tube and bearing against the wall thereof.

3. A device of the character described comprising two members adapted to be telescoped on each other, one of said members being in the form of a spirally wound sleeve having a contact piece extending longitudinally through the same, and the other member being a post adapted to be inserted into the sleeve and yieldingly held by the same against said contact piece.

4. A device of the character described comprising two members adapted to be telescoped one upon the other, one of said members being a post and the other member comprising a contact piece adapted to lie beside and engage with the post and a helical coil having its axis extending in the direction of the length of the post surrounding the contact piece and adapted to press the same against the post.

5. A connector element comprising a tube made of a piece of spring metal wound in the form of a spiral, the cross section of said piece being such that the inner surface of the tube is substantially continuous and smooth.

6. A connector element comprising a tube made of a strip of spring metal having a flat side, said strip being wound in the form of a spiral with the flat side directed inwardly.

7. A connector element comprising a tube made of a strip of spring metal having a flat side, said strip being wound in the form of a spiral with the flat side directed inwardly, and a contact piece fastened to and extending longitudinally through the tube and bearing against the wall thereof.

8. A connector element comprising a tube made of a flat strip of spring metal wound in the form of a spiral the turns of which lie close together, the strip being of a greater width than thickness.

In testimony whereof, I sign this specification.

GUY M. LAIRD.