Feb. 9, 1943. H. R. ELLINWOOD 2,310,622

CONDUIT FASTENER

Original Filed Sept. 25, 1940

FIG. 1.

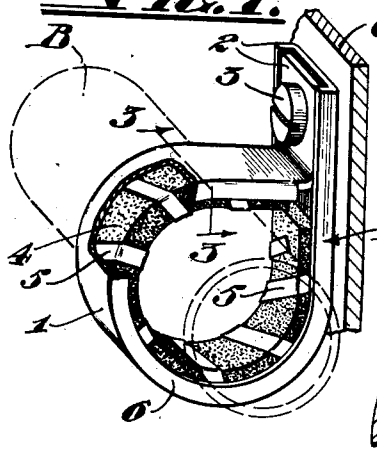


FIG. 3.

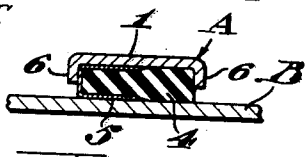


FIG. 4.

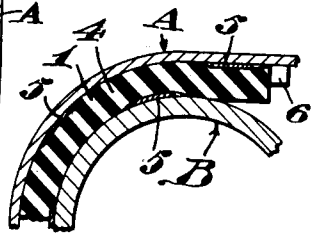


FIG. 2.

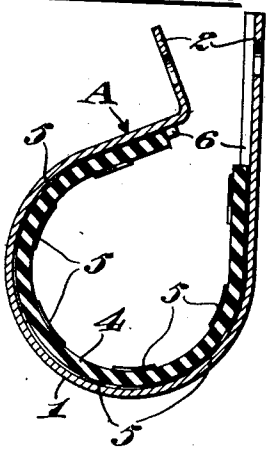


FIG. 5.

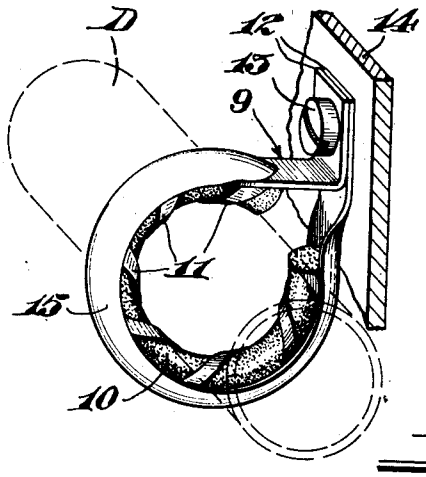


FIG. 6.

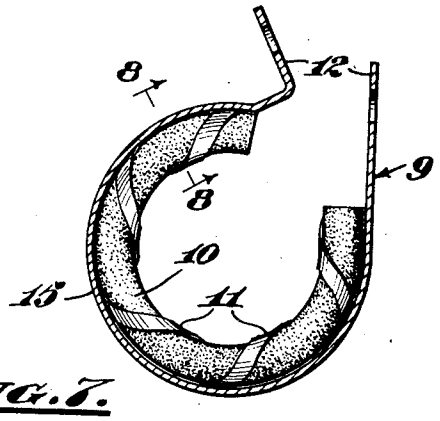


FIG. 7.

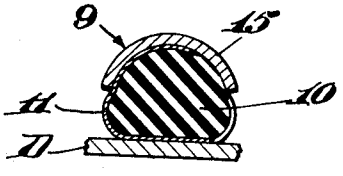
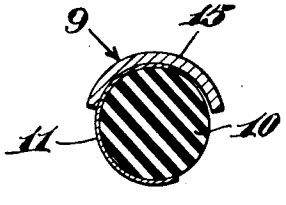


FIG. 8.



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UNITED STATES PATENT OFFICE

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CONDUIT FASTENER

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Original application September 25, 1940, Serial No. 358,366. Divided and this application September 29, 1941, Serial No. 412,728

9 Claims. (Cl. 174—40)

The present invention relates to an improved conduit fastener or clip of the type shown in the patent to Paul W. Adler, Number 2,215,283, issued September 17, 1940. This application is a division of my application Serial Number 358,366 filed September 25, 1940.

The primary purpose of the present invention is to provide a clip or fastener of the character described in which a metallic conduit embracing strap, a rubber or similar cushion, and a metallic grounding strip are so constructed and relatively arranged that the cushion and grounding strip will be securely held at all times in position to maintain an effective cushioning action and insure a positive electrical grounding of the conduit to the metallic structure to which the strap is attached, regardless of the imposition of vibratory and other stresses on the conduit, strap, cushion and strip and the resultant tendency of the conduit to move relative to the stray and thereby dislodge the cushion and strip from proper position.

A further and more specific purpose hereof is to provide a clip of the character described in which the conduit embracing portion or the metallic strap is of channelled cross section and the cushion is either made to lie and be held in the channel of such portion or itself formed with a channel for receiving the conduit embracing portion of the strap whereby in either case the flanges or sides of the channelled portion will retain the cushion strap and grounding strip in a predetermined overlapping relation regardless of the aforesaid relative movement and dislodgment tendency resulting from vibratory and other stresses.

Another purpose of this invention is to provide a conduit anchorage device of the character described in which the full cushioning action of a cushioning member arranged between the strap and the conduit is afforded while said member is compressed between the strap and conduit and without causing the dislodgment of the cushion from predetermined position relative to the strap and conduit or interfering with an effective electrical contact of the grounding strip with the conduit and strap.

A further purpose of this invention is to provide a conduit clip of the character described wherein the metallic grounding strip is associated with the cushion as by being carried in non-tensioned condition thereon and is presented thereby so as to maintain electrical contact of the maximum portion thereof with the strap and conduit, and thereby insure a reliable grounding of the conduit and at the same time provide adequate cushioning of the latter, said strip and cushion being capable of relative movement without impairment of their respective functions, due to manner of constructing the strip and cushion and the relative arrangement thereof.

Another purpose of this invention is the provision of a clip such as described in which the metallic grounding strip is mounted on the rubber or like cushion member in such manner that considerable saving in time and labor is effected in assembling the cushion strip unit.

With the foregoing objects in view, together with such other, objects and advantages as may subsequently appear, the invention is carried into effect as illustrated by way of example in the accompanying drawing, in which

Fig. 1 is a fragmentary perspective view of a clip embodying my invention;

Fig. 2 is a vertical sectional view of the clip;

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged fragmentary longitudinal section showing the manner in which the grounding strip contacts the conduit and the metal strap;

Fig. 5 is a perspective view of a modified form of the invention;

Fig. 6 is a vertical section of the clip shown in Fig. 5;

Fig. 7 is a cross sectional view showing the manner in which the cushion and grounding strip engage the metal strap and the conduit;

Fig. 8 is a cross sectional view taken on the line 8—8 of Fig. 6.

One embodiment of this invention as shown in Figs. 1 to 4 inclusive of the accompanying drawing comprises a bendable resilient metal strap member A having an arcuate loop portion 1 for embracing a metallic pipe or conduit line B and provided with apertured terminals 2 and adapted to be secured by means of a screw 3 or other fastening to and electrically contacted with a metallic structure (Fig. 1) which for example is a structural part C of an airplane or the like.

On the inner periphery of the loop portion 1 is an elongated soft rubber or similar resilient cushion member 4 which substantially surrounds and affords a cushioned support for the conduit, and has associated therewith in the particular manner of this invention a metallic grounding strip 5 arranged to contact the conduit and the strap respectively whereby the conduit will be grounded to the structure C through

the strap to prevent dangerous static discharges.

As here provided the strap A is of chanelled cross section so that the concave side thereof and the flanges 6 along its edges are on the inner side of the strap. The cushion 4 is of substantially rectangular cross section and fits snugly in the channel formed between the flanges 6 so that it will be effectively held for engaging the conduit line B, as shown in Fig 3. The flanges 6 extend at right angles to the loop portion 1 and therefore prevent displacement of the cushion. If desired the cushion may be glued or otherwise similarly adhered or secured to the loop 1 and is preferably fitted between the flanges 6 so as to be compressed and put under tension whereby to assist in the retention thereof on the strap.

In accordance with my invention the grounding strip 5 is wrapped helically around the cushion 4 and presents a plurality of portions on opposite sides of the cushion for contact with the strap A and conduit line B to ground the latter to the metal structure C as shown in Fig. 1.

It should be noted that the grounding strip 5 is non-tensional and supported by the cushion in such manner that the cushioning action of the latter will not be impaired yet the strip yieldably held by the cushion in good contact with the strap and conduit and conduit line.

The portions of the helically wound strip 5 crossing the longitudinal edges of the cushion will contact the flanges 6 on the loop portion 1 as additional "grounding" connection between the strap and the strip.

The helical winding of the strip 5 around the cushion from end to end makes for a quick and easy assembly of the cushion and strip as a unit and affords a maximum of contacting surfaces for engaging the conduit and strap.

A modified form of my invention shown in Figs. 5 to 8, inclusive, includes a bendable resilient metal strap 9 for embracing a conduit line, a resilient cushion 10 of soft rubber or the like supported on the strap, a metallic grounding strip 11 carried by the cushion apertured terminals 12 on the strap and a fastening 13 for securing the strap to a metallic structure 14. The line embracing portion of the strap 9 is semi-circular in cross section with its concave side innermost and the cushion 10 is of circular cross section and fits snugly in and conforms to the channel 15 formed in the strap. The metallic strap 11 is wound helically around the cushion from end to end and provides a plurality of segments or portions which effectively contact the strap and conduit line to ground the latter to the metal structure 14. The sides of the channel act as flanges to hold the cushion and strip unit in place. If desired the cushion may be cemented or otherwise adhered to the strap.

As shown in Fig. 7 the cushion is compressed so that the conduit engaging thereof is flattened when the strap is tightly secured around the conduit whereby to effectively hold the grounding strip in good contact with the conduit. The circular cross section of the cushion affords a full cushioning action and a close conformation and contact of the grounding strip with respect to the strap, while also insuring the retention of the cushion in place on the strap.

While I have shown and described a specific embodiment of my invention I do not limit myself to the exact details of construction set forth, and the invention embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims.

I claim:

1. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation material, means embodied in the strap for retaining said cushion in position lining said strap and a metallic grounding strip wound around said cushion between the ends of the cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap.

2. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation material carried by said strap, and a metallic grounding strip wound helically around said cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap, said strap having inwardly extending marginal flanges with which a portion of the grounding strip is engaged.

3. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation material carried by said strap, and a metallic grounding strip wound helically around said cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap, said cushion being of substantially rectangular cross section, said strap being of channelled cross section to retain the cushion in the channel thereof.

4. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation material carried by said strap, a metallic grounding strip wound helically around said cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap, and marginal flanges on said strap opposed to and contacting longitudinal edges of the cushion also the portions of said grounding strip which overlies said edges.

5. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation material carried by said strap, and a metallic grounding strip wound helically around said cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap, said cushion being of substantially circular cross section, said strap having an arcuate channel therein in which the cushion is retained.

6. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation material carried by said strap, and a metallic grounding strip wound helically around said cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap, said cushion being of substantially circular cross section, said strap having marginal flanges between which said cushion is engaged and with which said strip is contacted.

7. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of insulation mate-

rial carried by said strap, and a metallic grounding strip wound helically around said cushion so as to present a portion for contacting the conduit line and a portion in contact with the strap, said strap being of substantially semi-circular cross section and said cushion being of substantially circular cross section and fitting in the concave side of the strap.

8. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap, a resilient line embracing cushion of substantially circular cross section, said strap having marginal flanges between which the cushion is engaged and a metallic grounding strip carried by said cushion and held thereby in contact with the strap and in position to contact the conduit line.

9. In a clip for supporting a metallic conduit line on and electrically grounding it to a metallic support, a metallic line embracing strap member having terminals adapted to be secured to the metallic support, a compressible resilient line embracing cushion member carried on the strap member, a metallic flexible grounding strip wound around said cushion member between the ends thereof to provide on the opposite faces thereof a plurality of strip portions for contacting the strap member and the conduit line, and marginal flanges on said strap for engaging and retaining the cushion thereon.

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