

Oct. 13, 1942.

R. R. HARRISON

2,298,560

CLAMP

Filed Dec. 20, 1941

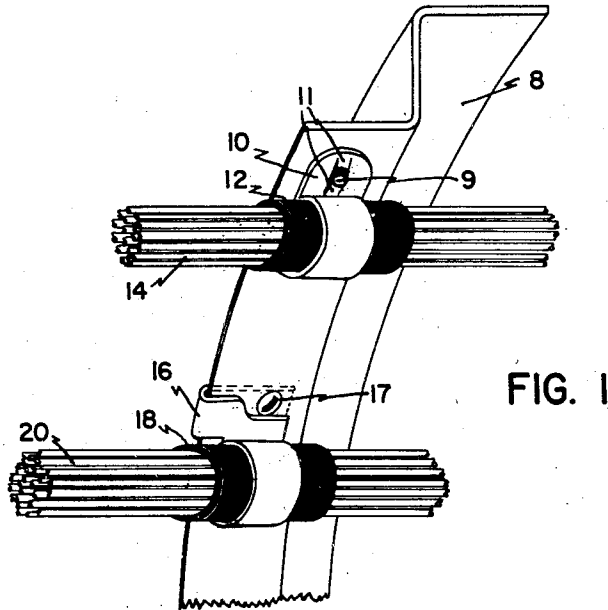


FIG. 1

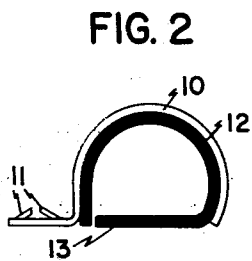


FIG. 2

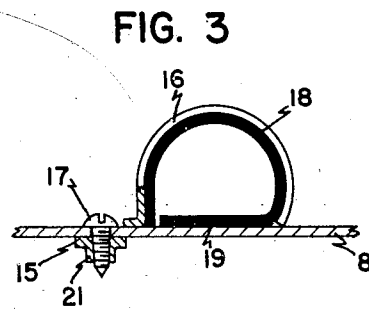


FIG. 3

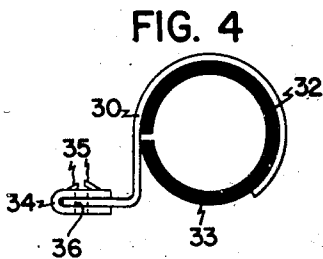


FIG. 4

INVENTOR.
ROBERT R. HARRISON
BY *H. W. Buelford*
ATTORNEY

UNITED STATES PATENT OFFICE

2,298,560

CLAMP

Robert R. Harrison, North Hollywood, Calif., assignor to Bendix Aviation Corporation, South Bend, Ind., a corporation of Delaware

Application December 20, 1941, Serial No. 423,844

1 Claim. (Cl. 248—71)

This invention relates to clamps for supporting elongated objects, and relates more particularly to a cushioned clamp adapted to support wires grouped in bundles or cables.

In the past it has been common practice in electrical work to group together numerous wires, and place them within a protecting conduit. For example, in airplane work radio wires in the past have been tied together in cables and then inserted in a conduit of solid or woven metal. Such conduits have added unnecessary weight, and have hindered the repair of wires when they were broken, as by gunfire in military airplanes. The present tendency, therefore, is to omit conduits from airplane wire cables.

In the past with wire cables having metal conduits protecting them, it has been common practice to use clamps of bare metal to secure the wire cables in position. With the elimination of metal conduits, however, clamps must be used which are provided with a cushion so as to protect the wire forming the cables from the metal forming the clamp. This cushion is preferably an insulator such as rubber or a synthetic rubber such as neoprene or other rubber-like materials.

Several types of clamps are available on the market having a cushion element which would protect wires from contact with the metal forming the clamp. One such type of cushion is that in the form of a tube through which a metal strip is inserted, the tube being stretched over the metal strip. Such a cushion would completely protect the wires from injury. Another available type of cushion for clamps is one wherein the cushion is formed in the shape of a channel with intumed edges so that a cushion may be snapped on to a metal strip. Both types of cushions are shown in my co-pending application Serial Number 387,210.

The present invention relates to a clamp particularly designed for holding cables of wires. Its basic structure comprises a strip of metal bent to form a loop, and having sheet cushion material vulcanized or bonded to the inside of the loop. The forming of the cushion from sheet material is much cheaper than cushions formed from tube or channel sections as have been described. Further, clamps made according to the present invention can be made much more easily and quickly by using a sheet material cushion rather than a tubular cushion. In the present invention the sheet material extends beyond the edge of the metal clamp so as to adequately shield any wires from the metal of the clamp in any possible condition of service or assembly of the wires.

It is therefore an object of the invention to provide an inexpensive and easily manufactured cushioned clamp particularly adapted for use with wire cables.

Another object of the invention is to provide a metal clamp having a cushion of sheet material wherein the cushion projects a substantial amount beyond the edges of the metal forming the clamp.

Another object is to provide a clamp in which is formed inexpensive and very useful nut means for holding a screw which may be used to secure the clamp to a support.

Other objects and advantages of the invention will be apparent in the following description taken in connection with the following drawing in which:

Figure 1 is an isometric view of a section of a structural member in an airplane to which are secured two clamps made in accordance with the invention each of which holds a wire cable;

Figure 2 is an elevation view of the upper clamp of Figure 1 showing the shape of the cushion element and showing nut means formed in the metal of the clamp;

Figure 3 is an elevation view partial in section along the lines 3—3 of the lower clamp of Figure 1 showing a different nut means integrally formed therein; and

Figure 4 is an elevation view of a clamp made according to the invention, having a circular opening therein and having nut means applied to the clamp by placing over the clamp a separate piece of metal with a nut formed therein.

Referring to Figure 1, mounted on an airplane structural member 8 is a clamp 10 having a cushion 12 and supporting a wire cable 14. Secured to structural member 8 is a second clamp 16 having a cushion 18 and supporting a wire cable 20. It will be noted that the upper clamp 10 is secured to structural member 8 by a screw 9 inserted from the back of structural member 8 and passing therethrough to contact raised fingers 11 comprising nut means in the clamp 10 which act as a nut. The lower clamp 16 is secured to the member 8 by screw 17 inserted from the face of member 8 through it to contact nut means, which will be later described, on the clamp 16.

The upper clamp 10 is shown in more detail in Figure 2. There it will be noted that the cushion element 12 is not bonded to the clamp 10 throughout its length, but rather has a free flap 13 which hinges at the far end of the clamp 10 and reaches nearly to the other end of the clamp

forming a complete enclosure therein. The nut means 11 are also shown in Figure 2 and a screw passed through the clamp at this point will be engaged by nut means 11 to hold the clamp to any desired support as shown in Figure 1.

The lower clamp 16 is shown in more detail in Figure 3. There it will be noted also that the cushion element 18 also has a free flap 19 used to complete the enclosure of the clamp and thereby cushion any wire cables from the support member 8 to which the clamp is secured. As shown in Figure 1, the clamp 16 has an ear 15 which passes around to the back of structural member 8 and has nut means formed therein as shown in Figure 3. The nut means comprises an extrusion 21 formed in ear 15 by merely piercing the original sheet metal of ear 15. The screw 17 holding the ear 15 to the support 8 is of the self-threading type, and cuts its own threads into extrusion 21 when it is screwed therein.

The clamp shown in Figure 4 is an alternative type wherein it is desired to maintain the wire cable or other held element in a substantially circular form. A clamp 30 has bonded or vulcanized thereto a cushion 32 of rubber-like material having a free flap 33 to complete the enclosure of the clamp. Placed over the flat end of clamp 30 is a U shaped metal member 34 having nut means 35 formed therein, these nut means being placed over a hole 36 in the flat end of clamp 30. This type of structure permits the use of aluminum or other soft materials in making the clamp 30, while maintaining the quality of the nut means 35 by having the small piece of metal 34 made of steel or other hard metal which will form a high quality nut.

It will be seen from Figure 1 that the cushion elements 12 and 18 extend beyond the edges of their respective clamps 10 and 16 a considerable amount. This extension is advantageous in protecting the cables 14 and 20 from the metal of the clamps when the cables are bent at sharp angles, which may be the case during assembly or during repairs. Also, with some types of movable equipment such as headphones, wire cables or individual wires may be bent at very sharp angles in the region of the supporting clamp, and it is therefore necessary to provide protection from the metal. The cushion elements are most easily applied to their respective clamps by bonding them thereto when the metal is in the flat strip form. After the bonding is complete the metal of the clamp may be bent into any desired shape and will thereafter be ready for use. The fabrication of the cushions from sheet material permits the use of cushion stock material in its cheapest form, that of sheets.

Although this invention has been described with reference to particular embodiments thereof, it is not limited to these embodiments nor otherwise except by terms of the following claim.

I claim:

Means for securing a bundle of wires to a support comprising a substantially semi-circular loop having a flange-like extension at one end for attachment to a support, the other end being free, and a cushion of flat material bonded to the inner face of the loop and having a portion extending beyond the free end of the loop adapted to be disposed between the bundle of wires and the support.

ROBERT R. HARRISON.