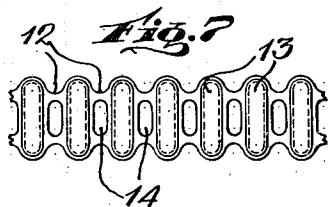
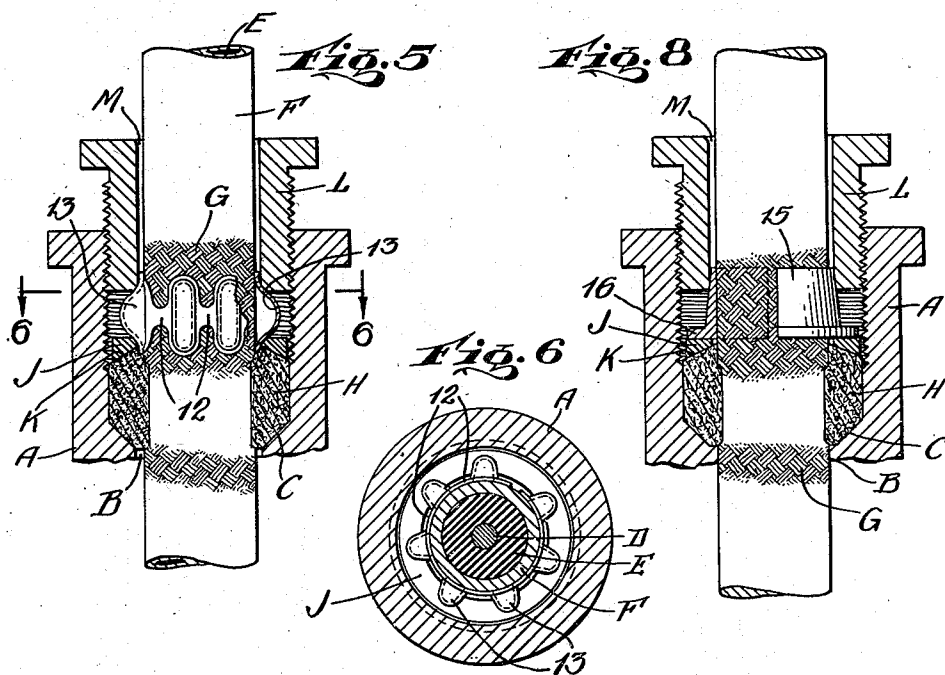
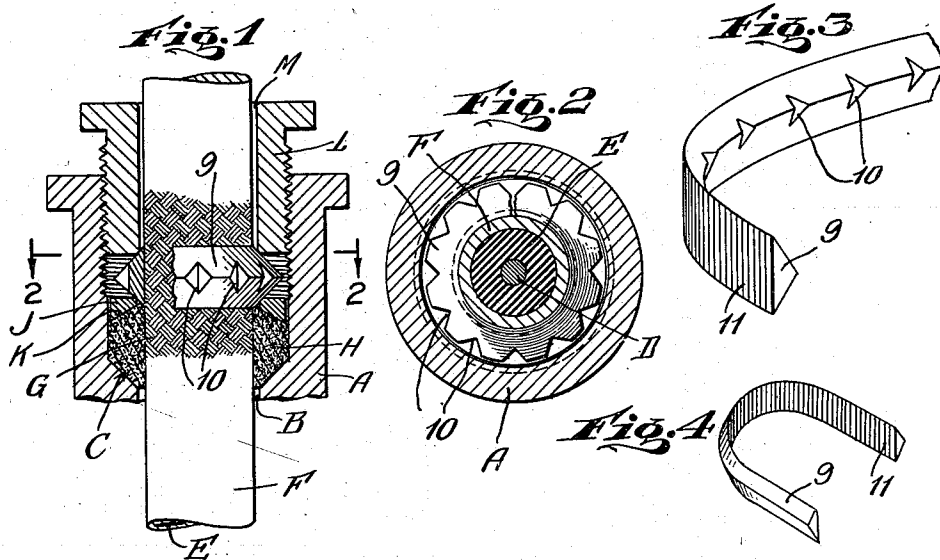


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F. G. GARDNER
CABLE BONDING MEANS
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INVENTOR.
FRANK G. GARDNER
BY *C. C. Cousins*
ATTORNEY

UNITED STATES PATENT OFFICE

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CABLE BONDING MEANS

Frank G. Gardner, Maplewood, N. J., assignor
to Breeze Corporations, Inc., Newark, N. J.

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This invention relates to a cable bonding means.

Where radio equipment is used in proximity to ignition or other electrical circuits it is necessary to shield and ground the circuits to prevent interference with the radio equipment. To achieve efficient shielding it is necessary to properly bond the various parts of the shield to one another and to ground. Unless the parts are properly bonded noises will be set up in the radio equipment which will seriously interfere with its operation. Furthermore, a fire hazard is presented where shields surrounding electrical circuits have loose connections because of the danger of electrical flashes. Therefore, the broad object of this invention is to provide means to effectively bond together the parts of a radio shielding system.

In connecting parts of a shielding system together it is common practice to provide a terminal or stuffing box to receive a shielded conductor. The terminal member is larger than the shielded conductor and packing is applied around the conductor and held in place by a packing nut. The opening through the terminal member and the packing nut is larger than the shielded conductor to permit ease of installation. This provides a relatively liquid-proof joint, which is desirable and necessary, but does not provide a good electrical bond between the parts. In such a construction the electrical contact between the parts is only casual or intermittent. Therefore, the specific object of this invention is to provide a bonding means which may be applied between cables and terminal members to which the cables may be connected.

A further object of the invention is to provide a simple, inexpensive means for bonding which may be applied to cables of any size, and which may readily be used with new or existing installations without any modification of the existing parts.

A further object of the invention is to provide a continuous strip from which a section may be cut or broken so that such section may be applied to a particular size of cable.

The invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawing, forming part hereof, are illustrated various embodiments of the invention, in which drawing similar reference characters designate corresponding parts, and in which reference letters designate parts old in the art and reference numerals designate the actual invention herein, and in which:

Figure 1 is a vertical section through a ter-

minal box, the bonding means being partly broken away;

Figure 2 is a horizontal section, taken approximately on line 2-2 of Figure 1, looking downward;

Figure 3 is an enlarged detail in perspective, of one form of bonding means;

Figure 4 is a detail in perspective of one form of bonding means;

Figure 5 is a vertical section, similar to Figure 1, but showing the application of a modified form of bonding means;

Figure 6 is a horizontal section, taken approximately on line 6-6 of Figure 5, looking downward;

Figure 7 is a plan view of another modification of bonding means; and,

Figure 8 is a vertical section, similar to Figure 1, showing the application of a still further modification of the invention.

Referring to the drawing, A designates a terminal or stuffing box into which a cable is introduced. The member A may be a junction box or any device to which an electrical cable might be connected. The inner end of the member A is provided with a bore B so that the cable may pass therethrough. Adjacent the bore B the member A is provided with an annular inclined face C to receive a packing as hereinafter described. Disposed through the member A is a cable comprising one or more conductors D, insulation E and shielding F. The shielding F may be a lead covering of ordinary form or may consist of a shielding conduit having an outer covering of braided wire G. The cable may be rigid, semi-rigid or flexible.

Disposed around the shielding F in the terminal A is packing H which is usually either a non-conductor or a very poor conductor. Above the packing H is disposed a washer J having a tapered lower face K. An exteriorly threaded packing nut L is carried by the member A and exerts pressure on the washer J to compress the packing H and make a liquid-proof seal around the shielding F.

The packing nut L is provided with a bore M through which the cable and its shield F may pass. The bore M is larger than the shielding F so that the parts may be readily assembled. However, as shown by the drawing, this construction does not provide for a good electrical joint between the parts. The same thing is true where the shielding F passes through the bore B of the terminal A. The foregoing parts are old in the art and are presently in use. The present in-

vention is designed to overcome the difficulties presented with the foregoing construction.

Referring to Figures 1 to 4, 9 designates a wire which may be triangular in cross-section. The base of the wire 9 is applied against the shielding F, while one side of the triangle contacts the packing nut L and the opposite side contacts the washer J. The wire 9 is provided with a series of notches 10, which permit the bending of the wire 9 around the shielding F and permit any desired length of wire 9 to be readily broken off from a roll or other quantity of wire 9.

The notches 10 may be formed by cutting portions from the apex of the triangular wire 9, or the notches 10 may be formed by simply displacing some of the metal without actual removal. The base of the triangular wire 9 is provided with a straight knurl 11, as shown in Figure 3, so as to provide a rough surface to bite into the shielding F to make a good electrical contact. In some cases the shielding F will be covered with a lacquer, varnish or other non-conductor, and the roughened portions provided by the knurl 11 will break through such covering to establish an electrical bond.

When it is desired to apply the wire 9, the packing nut L is unscrewed to give access to the interior of the terminal A. A piece of wire 9, of sufficient length to surround the shielding F, is broken off from the main body of wire 9 at the nearest notch 10. The wire 9 is then bent around the shielding F, with the notches 10 outward, the notches 10 reducing the resistance of the wire 9 to permit bending. The packing nut L is replaced and tightened. One edge of the wire 9 will enter the bore M between the shielding F and the nut L. The opposite edge of the wire 9 will enter the corresponding opening in the washer J. Since the bottom edge of the nut L rides against the tapered face of the wire 9, the nut L will force the wire 9 securely against the shielding F and a good electrical bond will be achieved. In addition, the cable will be held rigidly in position to prevent casual removal. To this extent the bonding means also acts as a locking means, since previously only the pressure of the packing H restrained the casual movement of the cable in the terminal A.

In Figure 4 is shown a section of wire 9 without notches 10. Where the diameter of the cable to be bonded is sufficiently small to permit the use of a small wire 9, it is sometimes feasible to use a triangular wire 9 without any notches 10. If the wire 9 is sufficiently small in cross-section and of such character as to be readily bent around the shielding F, the notches 10 are not necessary. However, where a relatively large wire 9 is used the notches 10 are necessary to permit either bending or breaking off of the wire 9 at any desired point.

In Figure 5 is shown a modified form of bonding means in which there is provided a continuous strip having reduced portions 12 to facilitate bending or breaking off of a given length. Intermediate of the portions 12 the strip is provided with curved projecting surfaces 13. This form of bond may be cut from a single flat strip, the portions 13 being formed by rolling or other suitable means. The application of this form is the same as the triangular wire 9. The edges of the parts 13 will enter the space between the shielding F and the nut L. As the nut L is tightened a permanent electric bond will be made between the parts.

In Figure 7 is illustrated a further modification

of the means shown in Figure 5. The reduced portions 12 are made wider but are provided with openings 14 to weaken the material between the projecting surfaces 13. In this way the surfaces 13 are held together by two strips of metal rather than by one, as shown in Figure 5.

In Figure 8 is illustrated a further modification. Instead of a wire or strip there is provided a split tapered wedge 15 provided with an annular flange 16. The upper portion of the wedge 15 enters the space between the shielding F and the packing nut L. As the nut L is tightened the flange 16 forces the washer J to compress the packing H and at the same time the split wedge 15 is constricted around the shielding F and makes a good electrical bond between the shielding F and the nut L.

From the foregoing it will be seen that a good electrical bond is provided with all forms of the invention. The various forms may be readily applied to any installation using a stuffing or junction box of the type described. It will be obvious that a good electrical connection exists between the nut L and the terminal A. The terminal A will have a suitable ground so that the shielding circuit is complete.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. As a new article of manufacture a metal bonding wire having a substantially triangular cross-section, said wire being bendable and having one apex thereof formed with reduced portions to facilitate the bending of the wire.
2. As a new article of commerce a metal bonding wire of triangular cross-section, one apex of the triangle being formed with notches to facilitate the severance of a section of wire from the main body thereof and to facilitate the bending of said wire, the base of the triangle opposite the notched apex being knurled.
3. A device to make an electrical bond between a metal covered cable and a terminal which receives the cable comprising a strip having weakened portions to facilitate bending of the strip, said strip being bent around a cable and having a terminal contact face extending outwardly from the cable.
4. A device to make an electrical bond between a metal covered cable and a terminal which receives the cable comprising a strip of substantially triangular cross-section having weakened portions to facilitate bending of the strip, said strip being bent around a cable and having a terminal contact face extending outwardly from the cable.
5. A device to make an electrical bond between a metal covered cable and a terminal which receives the cable comprising a substantially triangular wire disposed around a cable with the base of the wire contacting the cable, the apex of said triangular wire being formed with notches to facilitate bending of the wire.
6. A device to make an electrical bond between a metal covered cable and a terminal which receives the cable comprising a substantially triangular wire disposed around a cable with the base of the wire contacting the cable, the apex of said triangular wire being formed with notches to facilitate bending of the wire and the base of said wire being knurled.
7. A device to make an electrical bond between a metal covered cable and a terminal which receives the cable comprising a strip formed with reduced areas to facilitate bending of the strip

around a cable, said strip being formed intermediate of said reduced areas with curved, projecting surfaces.

- 5 A device to make an electrical bond between a metal covered cable and a terminal which receives the cable comprising a strip formed with reduced areas to facilitate bending of the strip around a cable, said reduced areas being further weakened by having openings formed therein and
10 said strip being formed intermediate of said reduced areas with curved, projecting surfaces.

9. In combination with a packed terminal, a cable disposed through the terminal and a terminal nut, an electrical bonding strip disposed around the cable within the terminal, said strip being in electrical contact with both the cable and the terminal nut and said strip being formed with weakened portions to permit bending of the strip around the cable. 5

FRANK G. GARDNER.