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2,462,887

COAXIAL CABLE

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Fig. 1

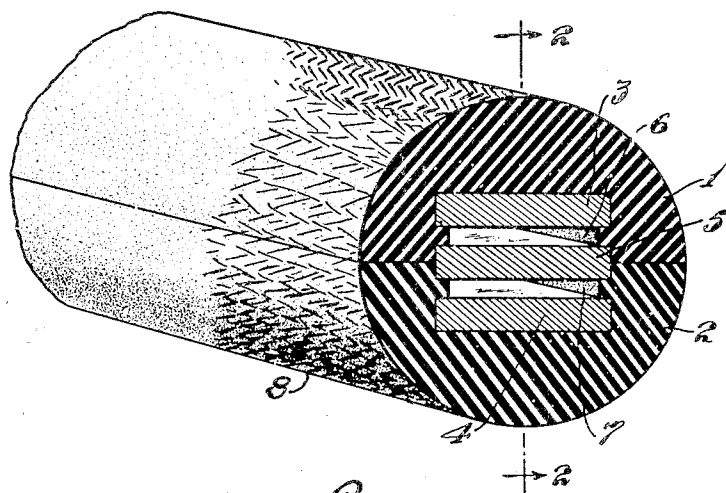
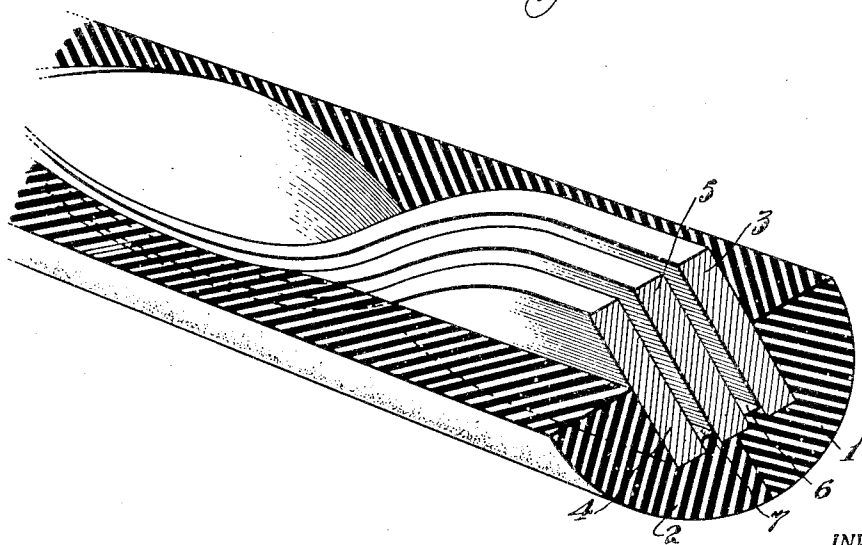


Fig. 2



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COAXIAL CABLE

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4 Claims. (Cl. 174—27)

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This invention relates to coaxial cables and particularly to those which contain air spaces. It has been recognized already for several decades that it is essential to design electric cables, particularly coaxial cables, with high insulating qualities for the conductors and with a low inductive capacity. It was also well known that the provision of air spaces around the conductor served both purposes, namely to provide extra insulation for and to reduce the capacity of the cable. In order to achieve the desired results, it has been proposed to surround the conductor with a covering containing longitudinal or radial air spaces. Thus, it can be seen that there was a clear tendency in the construction of transmission cables utilized in connection with conductors, microphones, television and radio frequency distribution, to lower the capacity and, therefore, to enlarge the air spaces in the covering of the cables and to provide predetermined portions of the interior of the cable with a lower average dielectric constant. This tendency brought about a cable having a cross-section shaped to provide a plurality of arms. Whereas these previous constructions proved to have a great proportion of solid material in close proximity to the conductor, in some cases surrounded the conductor even entirely with solid material, with the result that the desired low capacity of the cable could not be achieved, the later development in the art went into the direction of providing a large part of the dielectric surrounding the conductor, particularly in close proximity to the latter, of air. The conductors, however, were in this latter construction spaced from its surrounding still by solid material, which, though, occupied only a small proportion of the intervening space. It has been found that even this small proportion of solid material caused still undesired losses.

It is, therefore, the main object of the present invention to provide a coaxial cable which still reduces further the dielectric losses. This object is achieved by providing three conducting strip members in the cable in parallel arrangement to each other and further providing air filled spaces between each pair of adjacent strips.

With this and other objects in view which will become apparent in the following specification, the invention will be clearly understood in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a coaxial cable; and

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Fig. 2 is a perspective sectional view along the lines 2—2 of Fig. 1.

Referring now to the drawing it can be seen that the cable is preferably made of two similar portions, 1 and 2, each having a strip of metal, preferably of copper, 3 and 4, respectively, embedded therein near their flat face. The two portions 1 and 2 are then placed together and a third strip 5, which again is preferably of copper, inserted in between the first mentioned strips 3 and 4, the construction of the cable being such that the three strips 3, 4 and 5 will be equally spaced from one another and the spaces 6 and 7, respectively, be filled with air. The insulating portions 1 and 2 are suitably recessed to support the conductors 3 and 4 in respect to one of their respective faces and two of their sides, while the third conductor 5 is supported in recesses common to both insulating portions by two sides. This results in a tier-like arrangement of the three conductors with two intervening air-spaces 6 and 7.

The two portions 1 and 2 are held together by any convenient means as by braiding or jacketing 8 and the cable will be preferably twisted (Fig. 2) in order to provide sufficient flexibility, the insulating portions being suitably shaped to contiguously follow the twisted conductors.

The two outer copper strips 3 and 4 will be attached to the braid at the end of the cable, both strips 3 and 4 forming thus the outer conductor, while the center strip 5 forms the center conductor. The cable, as constructed in accordance with the present invention, has the advantage of substantially no great loss at all, large effective conducting area and an electrical field confined to air. Thus the present cable presents the ideal solution of the old problem of reducing the dielectric loss in coaxial cables.

While I have disclosed the principles of my invention in connection with a single embodiment, it will be understood that this embodiment is given by way of example only and not as limiting the scope of the invention as set forth in the objects and the appended claims.

What I claim is:

1. In a coaxial cable, three conducting strip members partially embedded in insulating material and each pair of adjacent conducting strip members spaced from each other, substantially all the space between each pair of adjacent conducting strip members being filled with air, the two outer conducting strip members together forming the outer conductor and the center strip member forming the center conductor, the said

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insulating material forming an enclosure for said conductors.

2. In a coaxial cable, as set forth in claim 1, in which said strip members are sheet-like strips of conductive material.

3. In a coaxial cable, as set forth in claim 1, said three conducting strip members assuming a twisted shape within said insulating material in order to improve the flexibility of the cable.

4. In a coaxial cable, at least two insulating members, a metal strip partially embedded in each of said members, a third metal strip inserted between the said members when the latter are put together, said latter metal strip being in spaced relation from the two first metal strips, substantially all the space between each pair of

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adjacent metal strips being filled with air, said first two metal strips forming together the outer conductor and the latter metal strip inserted between the two members forming the center conductor.

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