

Aug. 25, 1931.

P. A. MICHELL

1,820,240

COIL

Filed March 30, 1929

Fig. 1.

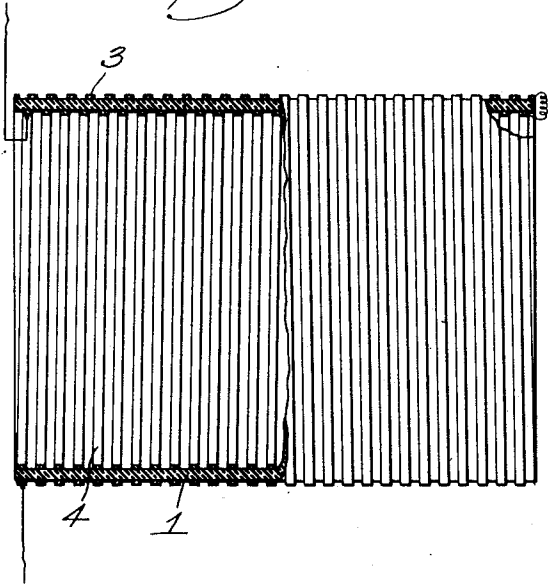


Fig. 2.

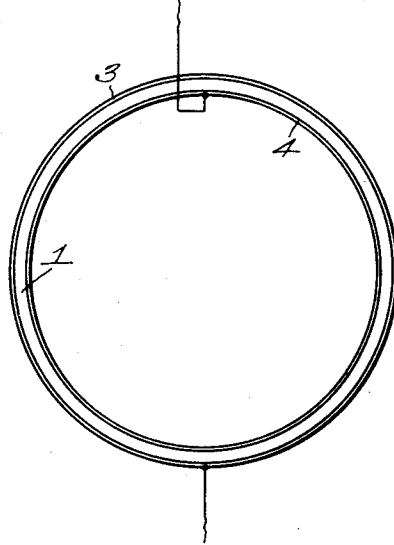


Fig. 3.

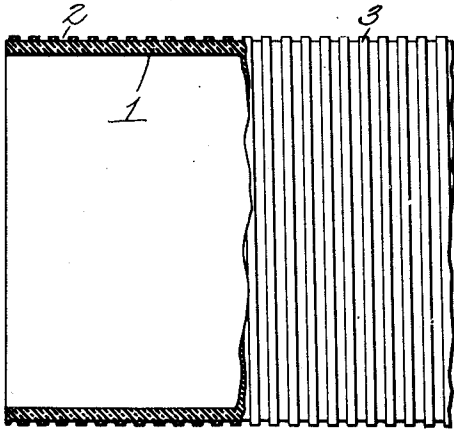


Fig. 4.

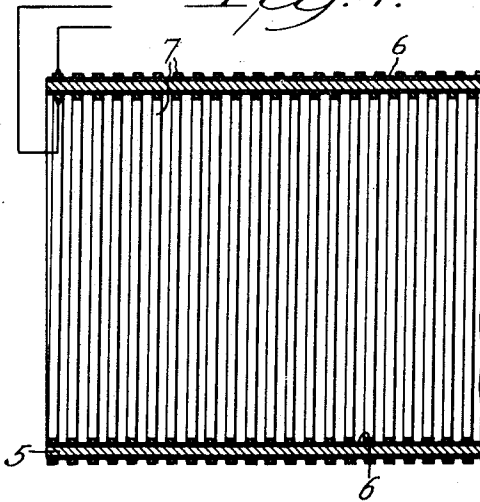
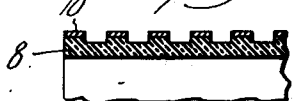


Fig. 5.



Fig. 6.



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COIL

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This invention relates to coils, such for example as are used in radio apparatus, and my improvement is directed to a new product wherein the electrically conductive helix is cut from a metallic surfacing upon a cylinder that is either composed of non-conductive material or is a metallic body coated with a non-conductive substance.

The object of my invention is to simplify the production of coils, to economize in their cost of manufacture, and to render them highly efficient.

Therefore my invention consists, in one phase thereof, in coating a cylinder of non-conductive material, such for example as bakelite, hard rubber, fibre or the like, with an electro-deposit of copper, silver or other suitable conductive material. As is usual when making such metallic deposition the non-conductive cylinder is first surfaced with graphite or other cathodic element and it is then subjected to the galvanic process that it may become coated with a metallic deposit.

The next step in the process of forming my improved coil is to cut a spiral path through the metallic coating, this path extending to and exposing the surface of the non-conductive cylinder, and creating a conductive spiral whose convolutions are evenly spaced apart. There is thus provided a flat, ribbon-like conductive helix, mounted on an insulating base and constituting a highly efficient coil.

Also the cylinder of insulating material may be in the form of a tube and have a similar conductive helix provided on its inner surface.

In another phase of my invention the insulation cylinder may be provided with a spiral cut in its surface and then given the electro-deposit. In this instance the conductive helix can be created either by removal of the deposit from the spiral groove, leaving the deposit on the top of the thread, or by removal of the deposit on top of the thread, leaving the deposit in the groove.

Another modified method of producing my improved coil is by employing a metallic cylinder, as of aluminum, for example, coating it with lacquer or other suitable insulating

material to provide a non-conductive base, depositing conductive material thereon and then cutting the spiral through the conductive material down to the lacquer.

Other features and advantages of my invention will hereinafter appear.

In the drawings:—

Figure 1 is a side elevation, partly in section, of a coil constructed according to my invention, said coil being composed of a hollow cylinder of insulating material with conductive helices provided on both outer and inner surfaces.

Fig. 2 is an end view thereof.

Fig. 3 is a side elevation partly in section, corresponding with the device of Fig. 1 excepting that the conductive helix is provided only on the outer surface of the cylinder.

Fig. 4 is a view of a modified form of coil wherein a hollow metallic cylinder is provided with a non-conductive coating upon which the conductive helix is formed.

Fig. 5 is a partial view of a non-conductive cylinder having a spiral groove therein and a conductive path formed between the convolutions of the thread, and

Fig. 6 is a similar view wherein the conductive path is formed on the top of the thread.

In Figure 3, wherein my invention is illustrated in its most simple form, a cylinder 1, composed of non-conductive material, is shown as provided with copper or other conductive material deposited thereon and a spiral path 2 cut through the deposit down to the surface of the non-conductive cylinder, exposing said surface, and leaving a spiral thread 3 of the conductive material, whose convolutions are thereby spaced apart and in insulated relation.

There is thus produced a coil whose conductive helix is of flat ribbon like character.

In Figs. 1 and 2 the hollow, non-conductive cylinder 1 having the spiral conductive thread 3, as shown in Fig. 3, also has a similarly produced conductive thread 4 produced in like manner upon its inner surface, to thereby increase the capacity of the coil without adding to its bulk.

In the form of my invention shown in Fig. 100

4 a metallic hollow cylinder 5 appears, this cylinder being surfaced with lacquer or other suitable insulating material, indicated at 6, conductive material being deposited upon the 5 lacquer, and a spiral path cut therethrough to leave the conductive helix 7.

In another modification a spiral groove may be cut in the surface of a cylinder of insulating material, the surface then receiving 10 the conductive deposit which is finally cut to provide the helix.

In each of Figs. 5 and 6 the insulating cylinder 8 has the spiral groove referred to and the deposit of conductive material. In Fig. 15 5 the conductive helix 9 is produced within the groove by cutting away the deposit from the top of the non-conductive thread, and in Fig. 6 the conductive helix 10 is produced upon the top of the non-conductive thread 20 by cutting away the deposit from within the groove.

The work of cutting the spiral paths or grooves referred to herein may be performed by a lathe or other suitable machine tool, as 25 will be apparent to a machinist.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

I claim:—

30 1. The method of producing a coil which consists in depositing conductive material upon a non-conductive cylindrical surface and forming the deposit into a helix of spaced convolutions.

35 2. The method of producing a coil which consists in first depositing conductive material upon a non-conductive cylindrical surface, and then in mechanically cutting a spiral path through said conductive material, 40 thereby leaving upon said non-conductive surface a series of equi-spaced conductive turns.

Executed this 27th day of March 1929.

PHILIP A. MICHELL.

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