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1,661,953

J. McINTOSH

INDUCTIVE REACTOR

Filed June 13, 1925

Fig. 1.

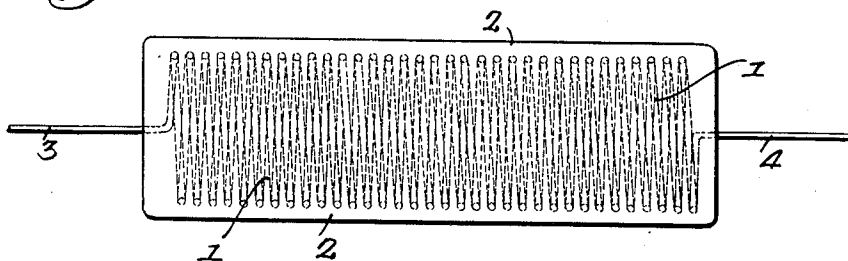


Fig. 2.

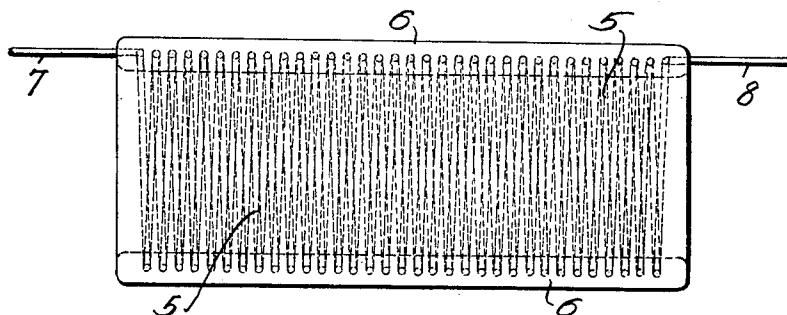


Fig. 3.

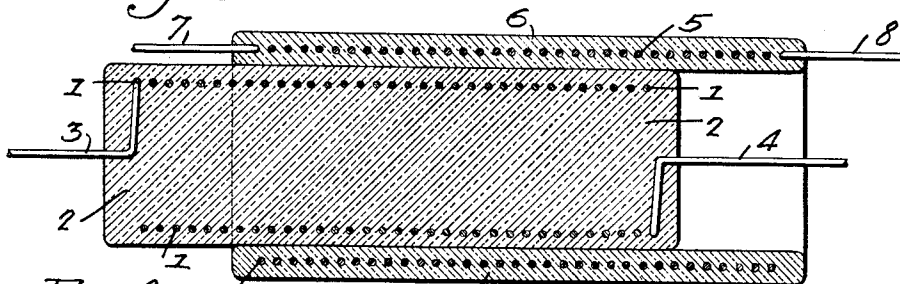
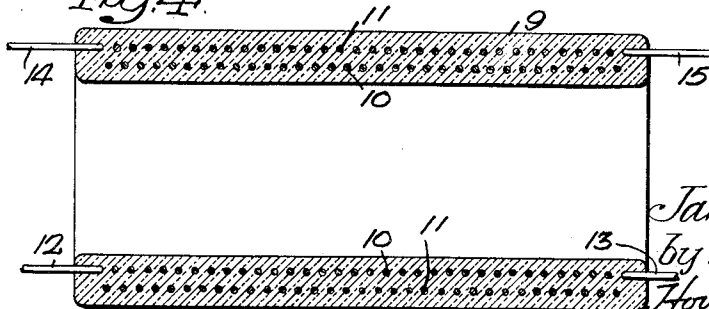


Fig. 4.



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UNITED STATES PATENT OFFICE.

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INDUCTIVE REACTOR.

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This invention relates to tuning devices or inductive reactors such as used in radio apparatus, and the principal object of the invention is to provide a novel device of this character having by reason of its inherent characteristics entire freedom from the faults and defects to which devices of like nature as made prior to my invention are subject.

More specifically, an object of the invention is to provide a tuning coil or inductive reactor so formed that the coils are positively and rigidly held in their proper form and are not subject to variations due to changes in atmospheric conditions, and are incapable of distortion.

Another object of the invention is to produce a device of this character in which the dielectric losses are extremely low.

In the attached drawings, in which I have illustrated a tuning device made in accordance with my invention:

Figure 1 shows a coil of wire encased in a solid cast or molded body, the material of which entirely surrounds each of the separate coils of wire, and not only completely covers and protects them, but retains them in their proper relative positions;

Fig. 2 shows a coil of wire embedded in a solid body of hollow cylindrical form;

Fig. 3 is a longitudinal section illustrating the coils shown in Figs. 1 and 2 arranged with the former coil partially inserted within the latter, and

Fig. 4 is a longitudinal section illustrating an inductive reactor comprising a primary and secondary coil, the former within the latter, both embedded in a hollow cylindrical body.

In practicing my invention, I prefer to employ glass as the embedding or body material. Thus, as in Fig. 1, I may embed a wire coil 1 of suitable dimensions and with a desired number of convolutions within a solid cylinder, 2, of glass, the coil being preformed and cast in the glass cylinder. As therein illustrated, the opposite ends, or terminals of the coils, 3 and 4 project through the ends of the cylinder 2 to provide for connecting the coil in an electric circuit.

As an alternative form of this device and one which may be used in conjunction with

coils made as illustrated in Fig. 1 to form inductive reactors of a type hereinafter set forth, I may, as illustrated in Fig. 2, embed a coil 5 in a hollow cylinder 6 of glass, the ends, or terminals of the coil, 7 and 8 projecting from the ends of the cylinder 6 as clearly illustrated.

The coils shown in Figs. 1 and 2 may be employed in conjunction with each other to form an inductive reactor consisting of an inner or primary coil and an outer secondary coil. Thus the cylinder 2 illustrated in Fig. 1 may be of such size as to fit neatly within the hollow cylinder or tubular body 6, and when arranged as illustrated in Fig. 3, a well known form of inductive reactor is formed in which the coil 1 constitutes the primary and the coil 5 the secondary. The inductive relation between the coils may be varied by varying the axial position of the cylinder 2 within the cylinder 6.

Where an inductive reactor of this character but having a fixed relation between the primary and secondary coils is desired, the two coils may be embedded in a single cylinder 9, as illustrated in Fig. 4. In this instance, the cylinder 9, preferably of glass, is shown hollow, but it may be made solid if desired. The device comprises an inner coil 10 and outer coil 11, the terminals 12 and 13 of the coil 10 extending through opposite ends of the cylinder on a side diametrically opposite the terminals 14 and 15 of the coil 11.

In making a device of this character, exceptionally desirable results may be obtained with the use of glass, and glass, therefore, is preferred as the embedding or body-forming material. I do not, however, wish to limit my invention to glass alone, and other electrical insulating materials capable of being cast or molded around the preformed coil and hardened may be successfully used without departing from the invention. Such materials for example as rubber or rubber composition, shellac, and natural or synthetic resins or waxes may be used. Bakelite or similar phenolic condensation product is particularly well adapted for formation of these devices.

While the present description is confined to tuning devices involving coils, it is obvious that the invention in its broader prin-

ciples may extend to other devices such for example as condensers.

I claim:

1. An inductive reactor comprising a hollow cylindrical form of glass, a coil of wire embedded in said form with its ends projecting therefrom, a second form of glass adapted to fit within the first-mentioned form, and a coil of wire embedded in said

second form and having its extremities projecting therefrom. 10

2. An inductive reactor comprising at least two coils of wire arranged one within the other and each embedded in a suitably shaped form of glass, the ends of each of the coils projecting and exposed. 15

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