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VARIABLE INDUCTANCE RADIO FREQUENCY COIL

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Fig. 1

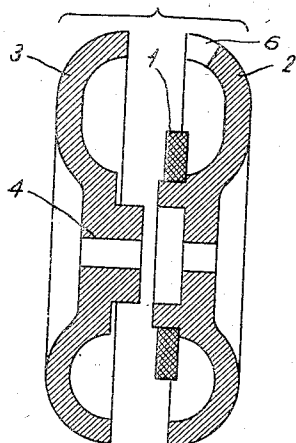
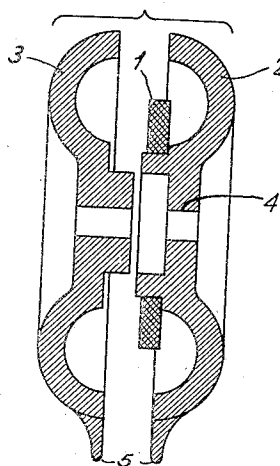


Fig. 2



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VARIABLE INDUCTANCE RADIO FREQUENCY COIL

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In Germany June 23, 1934

4 Claims. (Cl. 171-242)

The present invention relates broadly to inductance devices and the like and more particularly to such inductance devices which employ cores of magnetic material and are chiefly of use in radio frequency work.

In a copending application Serial No. 20,160, filed May 7, 1935 there is disclosed a radio frequency coil provided with a magnetic core which is composed of sub-divided magnetic material compressed and mounted to the desired shape. In the device described in said copending application the total losses are reduced to a minimum by reason of the fact that the turns of the coil at closest proximity to the iron-core present to the latter only a comparatively low voltage. The same application discloses that with the use of a core which has the shape of elliptic shells, the inductance of the coil may be varied by shifting the relative position of the two shells.

It has been found that the elliptical form of shell involves the drawback that the molds used to form the same are comparatively complicated and thus costly in manufacture. Another shortcoming thereof is that the inductance of such a coil can not be steadily varied with as fine steps or gradations as may be desired.

According to the present invention the radio frequency coil is furnished with an iron-core consisting of two circular shell halves, one of the said halves of the shell is provided with an eccentric pin or pivot, and the respective other half with an eccentric recess in reference to the rim of the shell. Both of the said eccentric parts are provided with a central bore adapted to receive a screw or the like for suitably holding the two halves of the shell together. By turning the two halves of the shell in reference to each other, it is possible to provide for varying the inductance of the radio frequency coil in an extremely simple way by as much as from 5 to 10%. In order to bring out the ends of the winding of the coil there is provided an incision or notch in one of the two halves of the shell.

Instead of eccentrically positioned cross-shaped shell halves, it is also possible to use concentric halves with projections or lugs which are relatively displaced with respect to one another when turning the two halves.

Both embodiments of the radio frequency coils here disclosed may be used in combination to form a set comprising a plurality of coils.

The invention will be more clearly understood by referring to the accompanying drawing in which Figure 1 is a cross-section through an inductance coil unit wherein the core portion is

eccentrically positioned with respect to the outer periphery of the core shell and Figure 2 is another embodiment of the invention wherein the shells are provided with lugs.

Referring to Figure 1, it will be seen that the combination core and shell is made up of two cooperating parts 2 and 3 which are substantially circular in shape. The shell 3 is provided with an eccentric pin or pivot 4 which is inserted within a corresponding recess formed in an eccentric pin or pivot on the shell part 2. The coil 1 is wound around outer part of the last named eccentric pin so that the coil will be completely enclosed when the two shell portions 2 and 3 are assembled. A notch 6 is provided on the shell half 2 which serves to allow connection of the coil 1 to external circuits through suitable lead wires. The two shell halves 2 and 3 are provided with a suitable bore 4 through which there may be passed any suitable bolt or rivet which serves to hold the two shell halves together after they are assembled. The arrangement shown in Figure 2 is substantially the same as that shown in Figure 1, except that the pins or pivots are centrally disposed with respect to the two shell halves and the adjustment may be provided by means of two abutments 5 which may be displaced relative to one another by rotating the shell halves with respect to each other. The remaining portions of the arrangement shown in Figure 2 are substantially the same as shown in Figure 1.

What I claim is:

1. An inductance coil provided with a combination core and enclosure composed of compressed powdered magnetic material, said combination core and enclosure comprising a pair of substantially circular shell halves both of said shell halves having formed thereon centrally located hubs, the hub of one of said shell halves being provided with a recess for receiving the hub of the other shell half, said coil being wound around the outer periphery of one of said hubs, said recess and cooperating hub being eccentrically positioned with respect to the outer rims of the shell halves whereby the inductance of the coil may be varied by rotating one of the halves of the shell with respect to the other thereof.

2. An inductance coil having a core composed of powdered magnetic material which has been compressed to form a self sustaining solid, said core comprising two substantially circular shell halves, one of said shell halves having a hub formed thereon, the other shell half being provided with a recess for receiving the hub of the other shell half, said hub and recess being ec-

centrically positioned relative to the rims of their respective shell halves whereby the inductance value of the coil may be varied by rotating one of the shell halves with respect to the other thereof while maintaining the hub of the first mentioned shell half within the recess of the other shell half.

3. The arrangement described in the next preceding claim characterized by that the two shell halves form an enclosure for the coil, the coil being placed around the hub.

4. An inductance coil provided with a combination core and enclosure, said combination core

and enclosure comprising two substantially circular shell halves, one of said shell halves having a hub formed thereon, the other shell half being provided with a recess for receiving said hub, said hub and recess being eccentrically positioned relative to the rims of their respective shell halves, said shell halves being rotatable with respect to one another when the said hub is positioned within the recess, whereby the inductance value of the coil may be varied by rotating one of the shell halves with respect to the other thereof, while maintaining the hub within the recess.

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