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VARIABLE SELF-INDUCTANCE WITH A CORE OF MAGNETIC MATERIAL

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Fig. 1

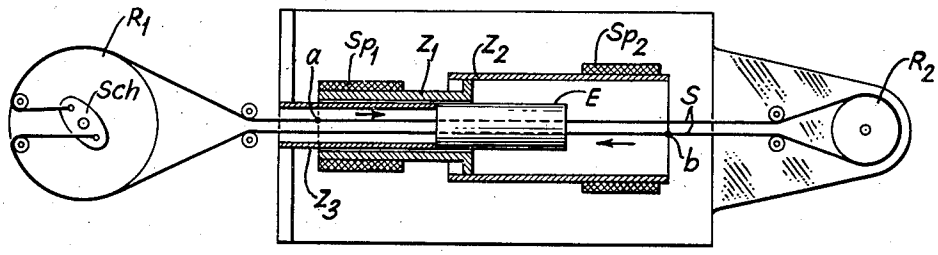
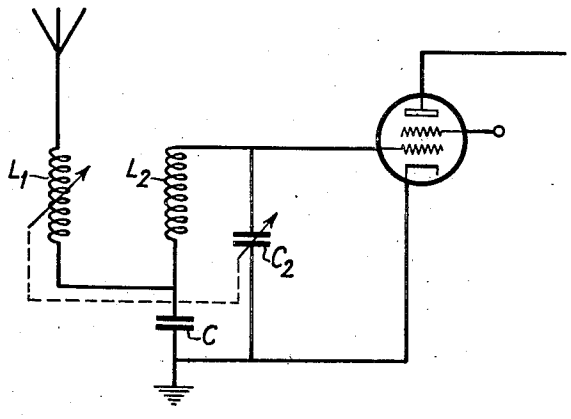


Fig. 2



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VARIABLE SELF-INDUCTANCE WITH A CORE OF MAGNETIC MATERIAL

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1 Claim. (Cl. 171—242)

Some of the known types of variable inductances with a movable magnetic core have a small inductance range. Therefore also the frequency range is small. It is well known to overcome this disadvantage by using two coils connected in series and varying the self-inductance and additionally the mutual inductance by moving the iron core. In such known devices the two coils are so far apart from each other that they are substantially not coupled together. The axis of the two coils lie parallel and the iron core is U-shaped and is movable into the two coils at the same time.

Another known type of variable inductance comprises two coils connected in series and a magnetic core having the shape of a bar. The coils lie in the common axis to the right and to the left of the core. The variable inductance then has a minimum of inductance. The maximum of inductance is achieved by moving the core into one of the coils and moving the other coil which has a greater diameter over the first coil.

The present invention is directed to a variable inductance arrangement which allows a variation of the inductance by rotation of a handle using an endless cord.

The invention will be better understood from the following description considered with the accompanying drawing.

Referring to the drawing

Fig. 1 illustrates in schematic form the construction of the variable inductance; and,

Fig. 2 illustrates in schematic form a wiring diagram of an antenna tuning arrangement using the variable inductance of Fig. 1.

In Fig. 1 the iron core E is fastened to the cylinder Z_3 and pierced to take up the cord S. This cord S at the point *a* is fixed to a cylinder of insulating material Z_1 carrying the coil Sp_1. At the point *b* the cord is fixed to the cylinder of insulating material Z_2 carrying the coil Sp_2. The two coils connected in series in the same sense move at rotation of the wheel R_1 in opposite direction because the cord is layed around the wheel R_2.

In the position of the coils shown in Fig. 1 which is one extreme position the inductance has the lowest value whereas in the other extreme position in which the two coils Sp_2 and Sp_2 surround the iron core the greatest inductance is attained.

The wheel R_1 may have a shape other than of a circle to attain a determined dependence of the inductance relative to the angle of rotation. For padding the tuning, for instance with a tuning capacity of a following receiving circuit, the two ends of the cord are fastened to a disc *Sch* movable relative to the wheel R_1. In this manner the value of the lowest inductance is regulated.

Fig. 2 shows a wiring diagram employing the variable inductance according to the invention. The variable inductance L_1 is connected into the antenna circuit and makes possible a tuning of the antenna circuit to the received frequency at the same time with the tuning of the input circuit L_2, C_2 by the tuning capacity C_2. The antenna circuit is coupled to the input circuit with the capacity C as loosely as in a bandpassfilter.

It is also possible to use an inductive coupling, however the capacitive coupling is better in an automobile-receiver because the bandpassfilter acts at the same time as a lowpassfilter with two filter sections for the short wave ignition disturbances. This wiring showing a bandpassfilter for the received frequency has the advantage that with the same antenna the voltage at the grid of the first tube is greater.

We claim as our invention:

In a variable inductance device, a pair of coaxially mounted, axially displaceable coils connected in series in the same sense, the internal diameter of one of said coils being larger than the outer diameter of the other coil whereby the smaller thereof may be substantially completely inserted within the larger coil, a core of magnetic material for said coils, said core being mounted in co-axial relation with said coils, the diameter of said core being smaller than the internal diameter of the smaller coil, each of said coils being axially displaceable in relation to said core in opposite directions between a position wherein the core is substantially completely inserted within the coil and a position wherein the core is substantially completely outside of the coil, and a single operable means for adjusting said coils along their own axis in unison, said last named means including an endless belt drive device, a rotatable wheel device, a driven wheel, said endless belt being wound around both said wheels, said core being axially pierced thereby to permit both sections of the belt to pass therethrough, one section of the belt being secured to one coil, the other section of the belt being secured to the second coil whereby said belt acts in one sense to displace said coils axially toward each other and in the other sense to displace said coils axially away from each other.

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