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TEMPERATURE COMPENSATED INDUCTANCE

Original Filed Feb. 28, 1939

Fig. 1.

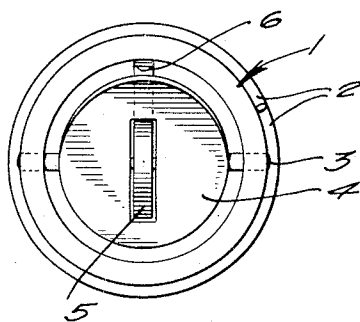
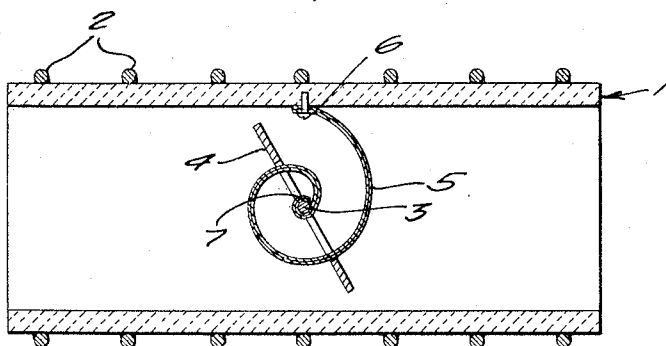


Fig. 2.



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TEMPERATURE COMPENSATED
INDUCTANCE

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Original application February 28, 1939, Serial No. 259,012, now Patent No. 2,265,390, dated December 9, 1941. Divided and this application November 7, 1941, Serial No. 418,202

1 Claim. (Cl. 171—242)

This invention relates to a new and novel method of controlling the temperature coefficient of frequency of vacuum tube oscillators, and is particularly adapted to an inductance coil with compensating means to maintain the oscillator frequency constant regardless of temperature changes in the coil.

This application is a division of my copending application Serial No. 259,012, filed Feb. 28, 1939.

An object of this invention is to provide an improved inductance coil having temperature compensating means.

Another object of this invention is to provide an inductance coil which may be placed in an oscillating circuit in which the frequency of the oscillator is maintained substantially constant.

Still another object of this invention is to reduce the temperature coefficient of frequency change of an inductance coil used in vacuum tube oscillators employing conventional circuits, such as the Hartley or Colpitts.

A feature of this invention is the novel arrangement of an adjustable metallic vane within the field of the inductance coil, wherein inductance changes due to variation in temperature are compensated by movement of the vane. The frequency of oscillator circuits generally varies with the supply voltage and with the temperature of the component parts. The effects of changes in supply voltage can be minimized by methods well-known in the prior art. Changes in capacitance and inductance of the elements of the tuned circuit and the tube with changes in the ambient temperature depend upon the thermal coefficient of the materials used in their construction and in the manner in which these materials are used. Variable tuning condensers are well known in the prior art to have either positive or negative temperature coefficients of capacitance by proper choice and disposition of material used in their construction. However, in the construction of low loss inductance coils, the choice of materials is somewhat limited. This applies particularly to the wire conductor, itself. Metals having suitable low values of specific resistivity have thermal coefficients of expansion of from approximately fourteen to twenty-five parts per million per degree centigrade. Metals having low coefficients of expansion, unfortunately, have resistivities that are generally too high for such use.

This invention will best be understood by referring to the accompanying drawing, in which:

Fig. 1 is an end elevation of an inductance coil with the temperature compensating vane located within the center of the coil; and

Fig. 2 is a longitudinal section of Fig. 1.

Referring now in detail to Figs. 1 and 2 of the drawing, the coil form 1, which is composed of any suitable insulating material having the necessary electrical insulating qualities and mechanical strength, has wound on its outer surface a metallic conductor 2 of low resistivity, the turns of which may be either close wound or suitably spaced. Located within the central portion of the insulating form 1 is a shaft 3 which carries a flipper plate or vane 4, which is pivoted on shaft 3. The vane 4 has a narrow slot provided in the central portion thereof for the passage of a bimetallic spiral strip 5. The angular position of vane 4 is controlled by the bi-metallic spiral member 5 which is firmly secured at one end to coil form 1 at point 6 by means of riveting, or any other suitable means, and at the other end to a point 7. Movable flipper plate or vane 4 may be of any suitable material. For example, in Fig. 2, the vane is preferably of copper.

In the operation of this device, any changes in temperature will vary the angular position of vane 4 within the field of inductance coil 2 and thus provide the proper temperature compensation.

This invention should not be limited to the precise arrangement shown.

What is claimed is:

35 An inductance coil having means for compensating for changes in its inductance due to temperature variations comprising a hollow insulating support member, a coil winding located on the outside of said insulating support member, a 40 pivoted shaft centrally secured to the inside walls of said hollow insulating support member, a movable metallic disc having a narrow central slot secured to and arranged to be rotated about the axis of said shaft, a spiral shaped narrow bimetallic strip of width sufficient for passing through 45 said narrow slot and secured at one end to the inside wall of said hollow insulating support member and at the other end to said movable disc whereby changes in temperature vary the 50 position of said movable member.

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