May 15, 1951 J. O. SILVEY 2,553,339

VARIABLE INDUCTANCE TUNER

Filed June 22, 1948

Fig. 1.

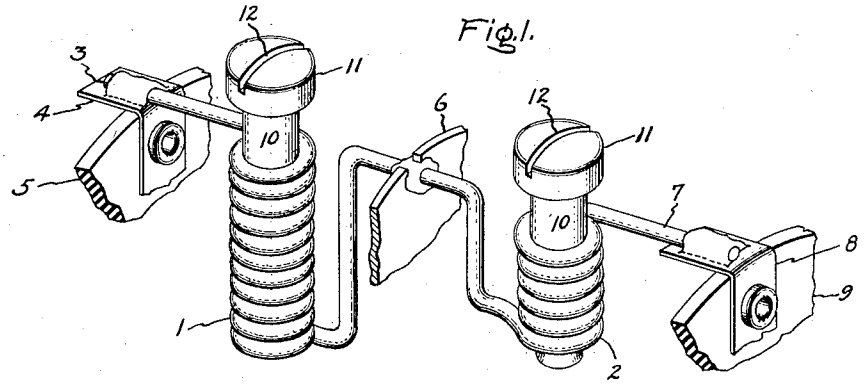
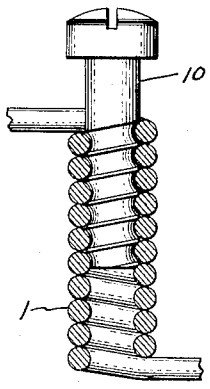


Fig. 2.



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VARIABLE INDUCTANCE TUNER

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2 Claims. (Cl. 171—242)

1

My invention relates to high frequency circuits, such as are used for the reception of television signals, and its primary object is to provide a new and improved arrangement for tuning such circuits.

Another object of my invention is to provide new and improved arrangements for adjusting the value of an inductance to tune a high frequency circuit.

One of the features of my invention consists in using a self-supporting solenoid wound coil in a high frequency circuit and tuning the circuit by movement of a threaded conductive non-magnetic member relative to the coil, adjacent turns of the coil forming threads for adjusting the position of the member relative to the coil.

The features of my invention which I believe to be novel are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawing in which Fig. 1 is a perspective view, partly in section, of a high frequency coil and tuning arrangement used in a television receiver, and Fig. 2 is a vertical sectional view of one of the coils of Fig. 1.

Referring to the drawing, I have shown a portion of the high frequency circuit of a television receiver which comprises a high frequency transformer comprising a primary winding 1 and a secondary winding 2. The input terminal 3 of the primary winding 1 is connected to a contact 4 which may be one of the contacts carried by a multi-contact wafer 5 of a multi-position switch of conventional type. The other terminal of the coil 1 is connected to a ground plate 6 positioned between the windings 1, 2. The secondary winding 2 has its low potential terminal connected to the grounding plate 6, as by soldering, and its higher potential terminal 7 connected to a contact 8 of a contact wafer 9 of a second multi-position switch. Such a contact 8 may be connected by the switch, for example, to the input electrode of a high frequency amplifying tube. Similarly, the contact 3 may be connected through a multi-position switch either to an antenna or to the anode of a preceding high frequency amplifying tube. In this arrangement, preferably, the shield 6, which is connected to ground, has an inherent inductance which is in series with the inductance of windings 1, 2 and which is traversed by the currents of both windings so that it functions as means for coupling the windings.

2

As illustrated, each of the windings 1, 2 is formed as a self-supporting solenoid wound coil, the wire forming the coil being sufficiently rigid that the coil, once wound, retains its form. In order to tune the respective windings 1, 2, I provide for each of the windings a threaded tuning slug or member 10 which may be inserted an adjustable distance into the respective winding.

The construction of the winding of the tuning member may best be illustrated by reference to Fig. 2 in which the winding is shown as a closely wound solenoid, while the tuning member 10 is illustrated as a threaded member having a thread pitch equal to the pitch of the winding 1 and a thread gauge such that the tuning member fits snugly within the self-supporting coil. The tuning member 10 is provided with a head portion 11 having a conventional slot 12 for adjusting the depth of entrance of the tuning member into its associated winding.

The tuning member 10 is formed of a conductive non-magnetic metal, such as brass. Accordingly, when the tuning slug or member 10 is moved in and out of the coil, the close fit of the brass screw with the turns of the coil has the effect of short-circuiting all the flux linkages of that portion of the coil surrounding the screw. Another effect of the presence of the member 10 in the field of the coil is to reduce the Q of the tuning circuit comprising the coil. It is known, however, that the Q of the tuned circuits normally found in television high frequency amplifiers is quite low so that the presence of the tuning member 10 in the field has no objectionable effect upon the tuning characteristic of the system.

An important advantage of my improved tuning arrangement is that it provides a very large range of adjustment of the tuning of a high frequency circuit. The only clearance between the turns forming the short-circuiting coil and the tuning member 10 is the thickness of the insulation on the wire forming the coil. As a result, very effective and accurately adjustable tuning is provided by movement of the tuning member within the coil.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a high frequency circuit comprising a coil comprising a plurality of closely spaced self-supporting turns of an insulated conductor, means for adjusting the inductance of said coil comprising a threaded conductive non-magnetic

member movable within said coil, said member having threads having a pitch equal to the pitch of the turns of said coil and having a diameter substantially equal to the internal diameter of said turns of said coil so that said self-supporting turns of insulated conductor form a complementary thread for said threaded member and said member forms a short circuit for flux linkages produced by the portion of said coil in ultimate relation thereto.

2. A high frequency adjustable inductance unit comprising a plurality of closely spaced turns of an insulated conductor having sufficient rigidity to form a self-supporting coil, said turns having equal diameters, and movable means for adjusting the inductance of said coil comprising an externally threaded conductive core member directly supported by the insulated turns of said coil, the threads of said core member having a pitch equal to the pitch of the turns of said coil and having a root diameter substantially equal

to the inner diameter of said turns so that said turns form a complementary thread for supporting said core member.

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