

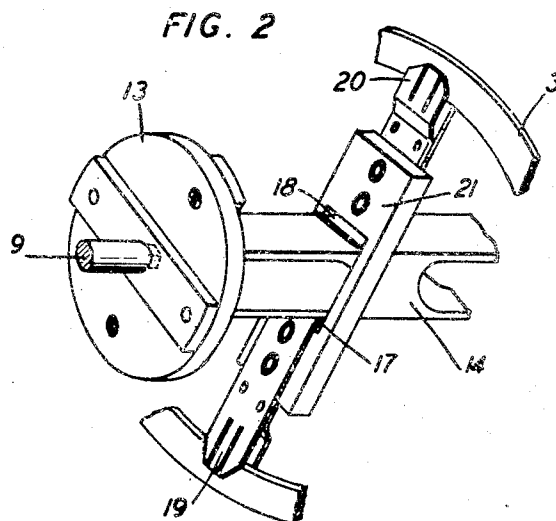
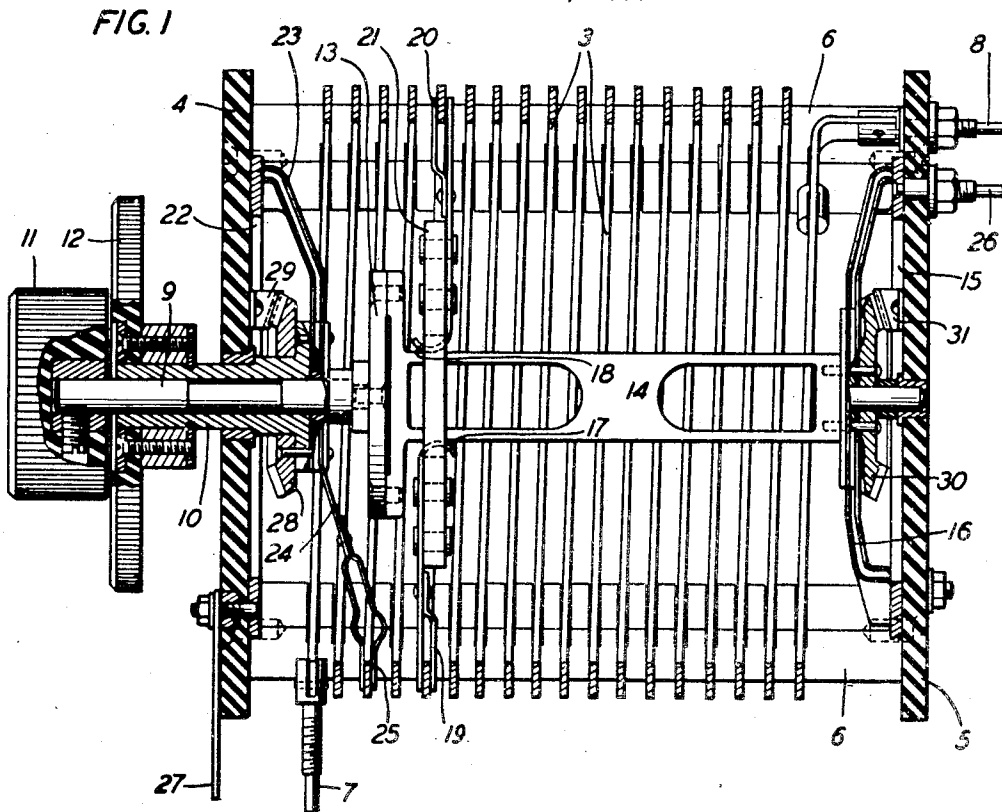
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ELECTRICAL TUNING DEVICE

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ELECTRICAL TUNING DEVICE

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This invention relates to variable inductance coils and more particularly to coils of the rigid helix type in which variation of the inductance is effected by means of contactors adapted to make adjustable connection to different points on the helical winding. The invention provides adjusting arrangements for coils of this type of improved mechanical structure and of high current carrying capacity.

The invention will be fully understood from the following detailed description, reference being made to the accompanying drawings in which Fig. 1 shows an elevation of the completed coil partially in cross section and Fig. 2 is a perspective view of a portion of the coil which embodies certain novel features of the invention.

Referring to the drawings, 3 is a coil formed from a metallic ribbon wound edge-wise into a helix. The coil is supported by a framework including the end plates 4 and 5 and a number of posts such as 6 which are notched on the inside to receive the turns of the coil winding. The ends of the coil are brought out to the terminals 7 and 8. Concentric shafts 9 and 10 project through end plate 4 and are provided respectively with knobs 11 and 12. Shaft 9 is joined by means of an insulated coupling 13 to a square metallic conducting shaft 14. An adjustable connection is made from a collector ring 15 on the rear end plate through brushes 16 attached to shaft 14, and thence through the shaft to spring contacts 17 and 18 and contact wipers 19 and 20 to the coil 3. Collector ring 15 is provided with a terminal 26 by which connection may be made to an external circuit. The brushes 17, 18, and the wipers 19, 20 are attached to a block 21 which is slidably and non-rotatably mounted on the square shaft 14. Another adjustable connection is made from a second collector ring 22 on the front end plate, through brushes 23, tongue 24 and wipers 25 to coil 3. Collector ring 22 is provided with a connecting lug 27. A bevel gear 28 is attached to the shaft 10 and meshes with a spring detent 29 flexibly attached to end plate 4. A similar gear 30 is

attached to the square shaft 11 and engages detent 31.

Coarse adjustment is made by turning the forward knob 11 which rotates the inner shaft 9, and the square shaft 14 and the brushes 16 attached thereto. The block 21 is forced to rotate with the shaft 9. The contact wipers 19 and 20 grip the coil 3 and thus cause the block 21 to slide along the square shaft 14 as the wipers are guided by the helical winding. During this sliding motion the brushes 17 and 18 maintain contact with the square shaft 14. The gear 30 and detent 31 facilitate the making of a definite change in the adjustment and also prevent accidental motion of shaft 14 after a setting has been made.

Fine adjustment is made by turning the knob 12 which propels the shaft 10 and turns the brushes 23, tongue 24 and wiper 25. Due to the flexibility of the tongue 24 the wiper remains in contact with the coil 3 throughout a few revolutions of the knob. The motion of the fine adjustment is controlled by gear 28 and detent 29.

To use the coil as a variable inductance, connections from an external circuit may be made to terminals 26 and 27. If it is desired to short circuit the unused turns of the coil, the terminals 8 and 26 may be connected together and likewise the terminals 7 and 27. To use the coil as an auto-transformer for coupling two circuits, one circuit may be connected between terminals 7 and 8 and the other between the terminals 26 and 27.

The form of coil described above is merely illustrative of the invention and many other embodiments may be employed without departing from the invention itself, the scope of which is defined in the appended claims.

What is claimed is:

1. A cylindrical coil comprising a helical conductor, a support therefor, a collector ring attached to said support, a rotatable shaft positioned coincident with the axis of said coil and having a rigid conductive portion, a contact arm slidable along said shaft, a contact wiper on said arm engaging said conductor, a contact brush on said arm connected to said wiper and engaging the conductive

portion of said shaft, and a second contact brush connected to said conductive portion of the shaft and engaging said collector ring.

2. A cylindrical coil comprising a helical conductor, a support therefor, a collector ring attached to said support, a rotatable conducting shaft positioned coincident with the axis of said coil, a block slidably and non-rotatably mounted on said shaft, a contact wiper and a contact brush electrically connected, said wiper and brush being attached to said block, said wiper engaging said conductor and said brush engaging said shaft and a second contact brush connected to said shaft and engaging said collector ring.

3. A cylindrical coil comprising a helical conductor, a support therefor, a collector plate attached to said support, a rotatable shaft positioned coincident with the axis of said coil and having a rigid conductive portion, means slidably and nonrotatably mounted on said shaft, said means including contact wipers and contact brushes electrically connected, said wipers engaging said conductor and said brushes engaging said shaft and other contact brushes connected to said conductive portion of the shaft and engaging said collector plate.

4. An adjustable coil assembly comprising a conductor grounded at one end, a source of potential connected between the ends of said conductor, adjustable means for connecting to points adjacent to the respective ends of said conductor, concentric metallic shafts in electrical contact with each other and adapted for manipulating said adjustable connections, an insulating link between said adjustable connections at the ungrounded end of said conductor and said metallic shafts, whereby said shafts are maintained at substantially ground potential.

In witness whereof, I hereunto subscribe my name this 27th day of October, 1930.

WILLIAM J. ADAMS, JR.

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