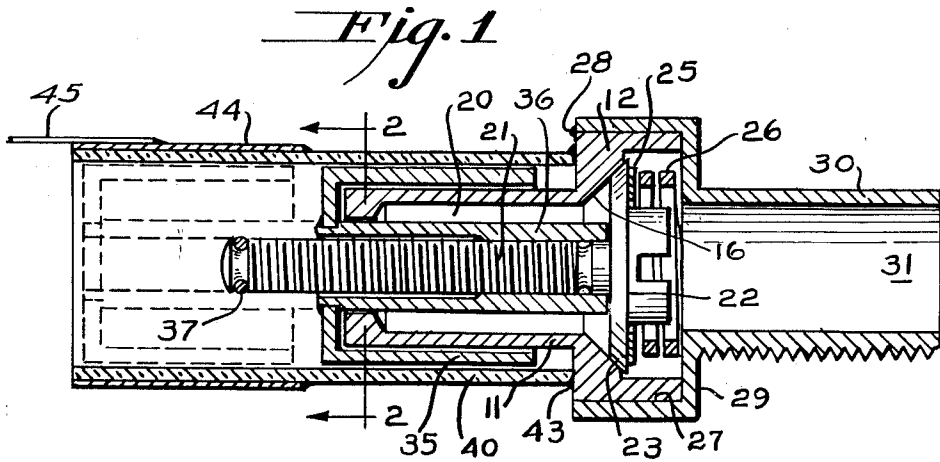
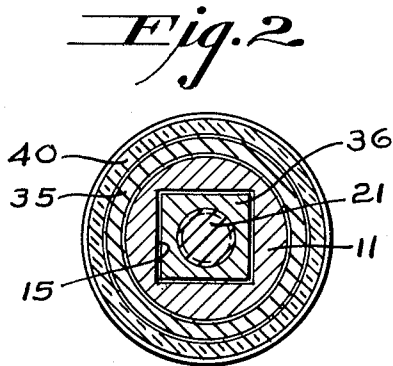
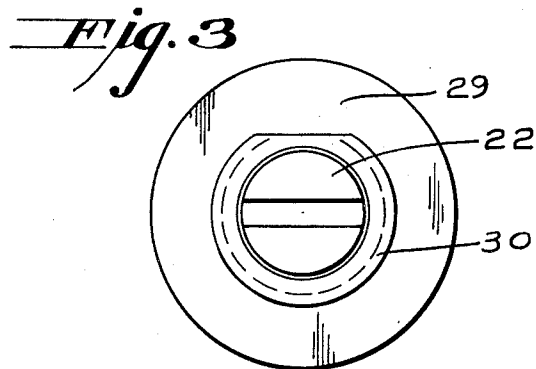
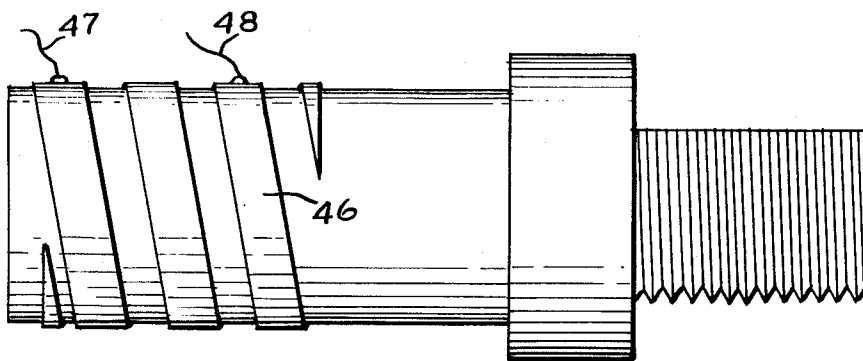


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N. LAZAR ET AL
VARIABLE IMPEDANCE DEVICE

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3,051,879

VARIABLE IMPEDANCE DEVICE

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The present invention relates to impedance devices which may alternatively take the form of a variable inductance or capacitance.

Such devices in order to satisfactorily serve their purpose, must be readily adjustable and reasonably free from microphonics, i.e., free from uncontrolled variables while being adjusted and subsequently when the equipment with which they are to be used is subjected to vibrations.

The invention has to do with an improved form of variable capacitor or inductor of the general type wherein a fixed cylindrical electrode element or spiralled conductor element is carried about one end portion of a glass or ceramic tube, and wherein such tube is secured at the other end to suitable hardware supporting an electrode element within the tube bore axially adjustable therein to change the electrical impedance of the device.

The invention can best be described by reference to the accompanying drawing wherein:

FIG. 1 is an enlarged sectional elevation of a trimmer capacitor embodying the invention.

FIG. 2 is a sectional view taken on line 1-1 of FIG. 1.

FIG. 3 is an end elevation of the capacitor.

FIG. 4 is a side elevational view of a variable inductor embodying the invention.

Referring to the drawing in detail, the hardware of either device comprises in the main an exteriorly circular metal shell comprising a tubular portion 11 of relatively small diameter and an adjoining tubular portion 12 of relatively large diameter. The tubular portion 11 at its free end has a square bore 15. In the region of juncture of portions 11 and 12 the bore defining wall surface 16 of portion 12 is preferably conical or may be said to slope outwardly.

A screw 21 occupies the coextensive bores of shell portions 11 and 12 and has a head 22 preferably having a chamfered peripheral surface portion 23 abutted against the surface 16 of shell portion 12.

The screw head 22 is resiliently held against surface 16 of portion 12 via a washer 25 and a compression spring 26, by means of a tubular impedance element support 29 which has a large diameter bore bordered by its wall 27 into which portion 12 is projected and held by means of solder 28 or the like. A small diameter externally threaded tubular portion 30 of the support 29 facilitates panel mounting of the device, while its bore 31 gives access to the screw head 22 for purposes of adjustment.

An electrode comprising an axially movable hollow cylinder 35 surrounds the tubular portion 11 of the shell and is provided with a tubular shaft 36 threaded onto the screw 21. Externally the shaft 36 is square in cross section and is freely slidable in the square bore 15 of tubular portion 11. A split ring 37 occupies the end thread of screw 21 to limit the movement of cylinder 35 in the direction away from the screw head 22.

Closely surrounding cylinder 35 is a tube 40 of dielectric material attached at one end to shell portion 12 by solder

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43. The other end of tube 40 is provided with a metal electrode element comprising a cylinder 44 to which is attached a suitable lead wire 45, or alternatively is provided with a spiralled winding 46 having suitable terminals 47 and 48. Electrical connection to the movable electrode element comprising cylinder 35 is made through the medium of screw 21 and the shell portion 12 or through the support 29.

When the screw 21 is rotated as by means of a screw driver or other suitable instrument, the axial position of cylinder 35 is changed with respect to cylinder 44 to modify the impedance of the device.

What is claimed is:

1. In a trimmer capacitor a metal shell comprising a small diameter externally circular tubular portion and an adjoining relatively large diameter tubular end portion, at least part of the small diameter tubular portion having a non-circular bore configuration and the large diameter portion having a circular bore wall defining surface tapered outwardly from its end of juncture with the small diameter tubular portion, a screw occupying the bore of said shell having a head having a chamfered portion engaging the sloping surface of said shell, means for resiliently seating said head against said surface, an axially movable core comprising a hollow cylinder closely surrounding the small diameter tubular portion of said shell having a tubular shaft projecting from one end thereof threaded over said screw, said shaft having a non-circular external cross section matching that of the non-circular bore configuration of such small diameter portion of the shell, and a tube of dielectric material closely surrounding said hollow cylinder at one end attached to the relatively large diameter tubular portion of said shell and at the other end carrying a cylinder of metal thereabout.

2. A trimmer capacitor as in claim 1 wherein the means for resiliently seating the head of said screw against the sloping surface of said shell comprises a support for the capacitor secured to the shell and a spring partly compressed between such head and the support.

3. A trimmer capacitor as in claim 2 wherein the support comprises a bushing having a large diameter bore portion occupied by the large diameter portion of said shell and has an externally threaded relatively small diameter tubular portion through whose bore access may be had to the head of said screw.

4. In a trimmer capacitor a metal shell comprising a small diameter externally circular tubular portion and an adjoining relatively large diameter tubular end portion, at least part of the small diameter tubular portion having a non-circular bore configuration and the large diameter portion having a circular bore wall surface sloping outwardly from its end of juncture with the small diameter tubular portion, a screw occupying the bore of said shell having a head having a chamfered peripheral portion engaging such bore wall surface, means for resiliently seating said head against said surface, a movable core comprising a hollow cylinder having a tubular shaft threaded over said screw and occupying the bore of the small diameter portion of said shell, said shaft having a non-circular cross section matching that of the non-circular bore configuration of such small diameter portion of the shell, and a tube of dielectric material closely surrounding said hollow cylinder at one end attached to the relatively large diameter tubular portion of said shell and at the other end carrying

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a cylinder of metal thereabout, whereby axial movement of one of said cylinders may be effected relative to the other by imparting a turning movement to said screw.

5. In an impedance device a metal shell comprising a small diameter externally circular tubular portion and an adjoining relatively large diameter tubular end portion, at least part of the small diameter tubular portion having a non-circular bore configuration and the large diameter portion having a circular bore wall-defining surface tapered outwardly from its end of juncture with the small diameter tubular portion, a screw occupying the bore of said shell having a head having a chamfered portion engaging the sloping surface of said shell, means for resiliently seating said head against said surface, an axially movable core comprising a hollow cylinder closely sur-

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rounding the small diameter tubular portion of said shell having a tubular shaft projecting from one end thereof threaded over said screw, said shaft having a non-circular external cross section matching that of the non-circular bore configuration of such small diameter portion of the shell, and a tube of dielectric material closely surrounding said hollow cylinder at one end attached to the relatively large diameter tubular portion of said shell and at the other end carrying an impedance element thereabout.

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