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2,379,457

VARIABLE INDUCTIVE DEVICE

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FIG. 1

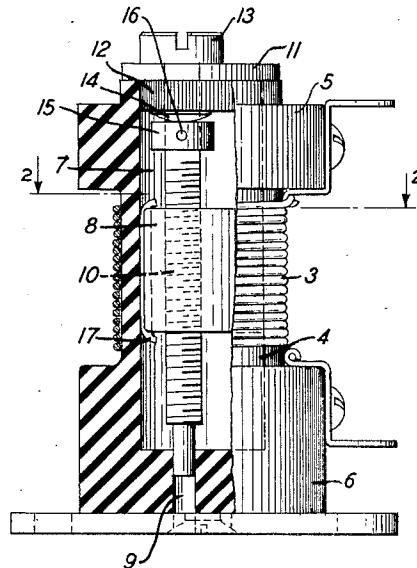
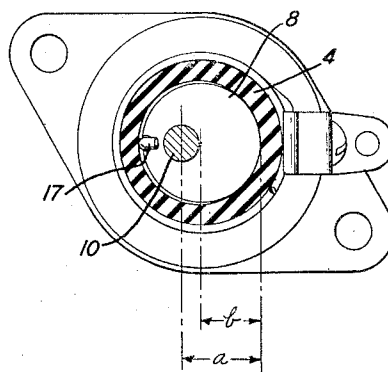


FIG. 2



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VARIABLE INDUCTIVE DEVICE

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2 Claims. (Cl. 171-242)

This invention relates to inductive devices and more particularly to variable inductive devices.

In certain high frequency electrical equipment the inductive elements required are small and the space taken by them must be kept to a minimum. Where variable inductances are needed the space limitations present a difficult problem because the adjusting means usually extend away from the devices thereby adding to the space requirements.

An object of the present invention is a variable inductive device which requires very small space for the adjusting means.

Another object of this invention is a mechanically simple variable inductive device which is easy and inexpensive to manufacture.

Where it is desired to vary the inductance of an electrical device one common method consists in moving a magnetic or a conducting non-magnetic body in the field of a winding. Such movement has heretofore required a threaded rod attached to the body. In certain cases the rod as well as the body moves relatively to the winding while in other cases where the rod does not move axially somewhat complicated arrangements are necessary to assure the movement of the body.

This present invention is directed particularly to the latter type of apparatus, that is, that type in which the adjusting rod does not move axially. The simplicity of design and hence the related advantages are due primarily to having the adjusting rod connected to the movable plug along a line parallel to the main axis of the plug but eccentric thereto. With this arrangement the plug is restrained from rotating about its own axis when the adjusting rod is actuated, primarily by the member upon which the winding is placed.

The invention will be better understood from the following description and attached drawing forming a part thereof which is directed to one form that the invention may take. In the drawing,

Fig. 1 is an elevation partly in section of one form of an inductive device incorporating the invention; and

Fig. 2 is a section thereof on line 2-2 of Fig. 1.

The inductive winding 3 is wound on an insulating spool 4 having enlarged heads 5 and 6. Spool 4 is provided with a bore 7 to accommodate the adjusting plug 8 and a reduced bore 9 to receive the lower unthreaded end of adjusting rod 10. Bore 7 and plug 8 are preferably right cylinders in form with the bore having a slightly larger diameter than the plug.

The upper end of bore 7 is covered by a cap 11

which has a knurled portion 12 forming a force fit with the upper portion of the bore. Cap 11 is provided with a hole through which the upper unthreaded end of adjusting rod 10 projects.

Adjusting rod 10 is provided at its upper end with a slotted head 13 so that the adjusting rod may be turned with a screw-driver or similar tool. Any other means, such as a wing-nut, knurled head, etc., may be used for turning rod 10. On the rod and just under cap 11 there is a spring washer 14 held in place by a collar 15 which is attached to the rod by a pin 16. Head 13, washer 14 and collar 15 prevent axial movement of adjusting rod 10. Bore 9 and the hole in cap 11 are in a line parallel to the axis of spool 4 but not coincident therewith.

Adjusting plug 8 is provided with a threaded hole to receive the thread of adjusting rod 10. The axis of plug 8 is coincident with the axis of bore 7 and spool 4 but the hole through the plug, although parallel to the common axis, is offset therefrom to the same distance as the hole in cap 11 and reduced bore 9. That is, the adjusting rod is eccentric relative to plug 8, bore 7 and spool 4.

With the structure just described it is apparent that plug 8 is restrained from turning when adjusting rod 10 is turned. This is more readily seen from Fig. 2 where a , the radius necessary for rotation about rod 10, is greater than b , the radius of bore 7. When rod 10 is turned about its axis and plug 8 is restrained from turning about its axis, plug 8 will move relatively to winding 3 thereby causing a variation in the inductance of the winding. If plug 8 rotated with rod 10 there would be no relative motion between plug 8 and rod 10 and hence no relative motion between plug 8 and winding 3.

To prevent undesired movement of plug 8 which may be caused by vibration of the device, a piece of bowed wire spring 17 may be inserted in a longitudinal groove cut in plug 8 substantially as shown. The tension of spring 17 forces plug 8 against spool 4 thereby increasing the friction between the contacting surfaces.

Means for connecting the winding to a circuit and means for mounting the device are shown in the drawing, but since they form no part of the invention no detailed description thereof is believed necessary.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention and the present embodiments are therefore to be considered in all re-

spects as illustrative and not restrictive and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

What is claimed is:

1. A variable inductive device comprising a hollow insulating spool, a winding on the outside of said spool, a metallic body within said spool adapted to move relatively to said winding to vary the inductance thereof, a rod attached to said body eccentrically and adapted to move said body longitudinally when said rod is turned about its

axis, means associated with said rod and said spool near the head of said rod to prevent longitudinal movement of said rod, and spring means associated with said body adapted to force said body against the inside of said spool.

2. A variable inductive device in accordance with claim 1 characterized in that said rod and said spring means are associated with said body so that their longitudinal axes intersect the same diameter of said body.

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