Jan. 15, 1929. 1,699,506

H. T. FAUS

ADJUSTABLE INDUCTANCE

Filed May 12, 1928

Fig. 1.

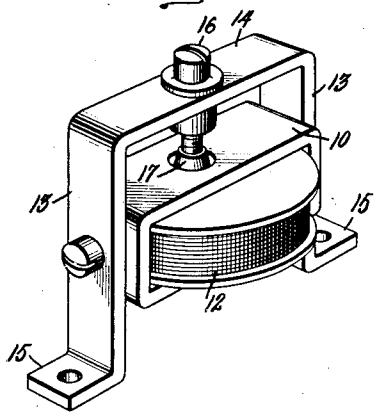
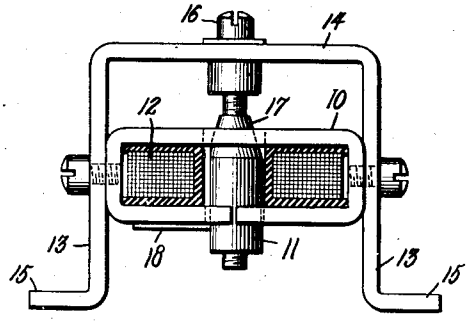


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ADJUSTABLE INDUCTANCE.

Application filed May 12, 1928. Serial No. 277,352.

My invention relates to adjustable inductances, and its general object is to produce an inductance of simple construction which may be gradually adjusted to any desired value between its maximum and minimum limits.

The invention will be better understood from the following description taken in connection with the accompanying drawing in which Fig. 1 is a perspective view of an adjustable inductance constructed in accordance with the invention and Fig. 2 is a side view of the inductance with the coil or winding shown in section.

Like reference characters indicate similar parts in both figures of the drawing.

In the particular form shown in the drawing, the inductance includes a hollow magnetic core member 10 of rectangular shape with oppositely disposed openings at the centers of its two opposite long sides. A second magnetic core member 11 extends between the centers of the two long sides of the member 10 and into or through their openings. This second member 11 is surrounded by a winding 12 so that the member 11 constitutes the winding leg of the core and the outer member 10 provides two parallel outer return paths for the magnetic flux.

The core member 10 is secured between the two spaced side members 13 of a U-shaped frame or support having its cross member 14 adjacent one of the long sides and its opening of the core member 10. A single flat strip of material is bent to form the U-shaped frame and the ends 15 of the side members 13 are bent and provided with screw holes so that the device may be secured in desired position against some supporting surface.

A screw 16 is held against longitudinal movement by the cross member 14 and engages the winding leg 11 of the core so that the winding leg may be moved or adjusted gradually in either endwise direction by turning the screw.

One end 17 of the winding leg 11 is tapered, the remainder of it having a cross section substantially fitting the openings in the two longer sides of the core member 10. It is usually convenient to make the openings in the core member 10 and the cross section of the winding leg 11 circular but the winding leg must be prevented from turning with the screw 16. A small plate 18 mounted on the core member 10 and engaging a small flattened side surface of the winding leg 11 as shown in Fig. 2 will prevent any turning of the winding leg but will not interfere with its endwise adjustment by the screw 16.

When the adjustment of the winding leg 11 is such that its portion which is of full size in cross section substantially fills both openings in the core member 10, then the reluctance of the joint between each end portion of the winding leg and the adjacent longer side of the core member 10 is small and the reactance of the winding 12 is high. As the winding leg 11 is moved by the adjusting screw 16 so that the tapered end 17 of the winding leg is carried back toward the inside of the core member 10 and the winding 12, the gap between the tapered end 17 of the winding leg and the edge of the surrounding opening in the core member 10 is gradually increased. This causes a gradual increase in the reluctance of the magnetic path through this gap or joint so that the reactance of the winding 12 is correspondingly gradually reduced. Adjustment of the winding leg in the opposite direction will of course gradually increase the reactance of the winding.

A specific form of the invention has been described but it will be apparent that various changes may be made without departing from the scope of the invention as defined in the appended claims.

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

1. An inductance including a magnetic core having an outer member and a winding leg, a winding surrounding said winding leg, said outer core member having an opening, one end of said winding leg being tapered and disposed within said opening, and said winding leg being longitudinally adjustable to vary the gap between its tapered end and the edge of said surrounding opening.

2. An inductance including a magnetic core having an outer member and a winding leg, a winding surrounding said winding leg, said outer core member having oppositely disposed openings, the end portions of said winding leg being disposed within said two openings, one end of said winding leg being tapered, and said winding leg being longitudinally adjustable to vary the gap between its tapered end and the edge of the surrounding opening.

3. An inductance including a magnetic core having an outer member and a winding

leg, a winding surrounding said winding leg, said outer core member having an opening and one end of said winding leg being tapered and disposed within said opening, and a screw engaging said winding leg to adjust it longitudinally to vary the gap between its tapered end and the edge of said surrounding opening.

4. An inductance including a support having two spaced side members and a cross member, an outer magnetic core member secured between said side members of the frame and having an opening, an adjustable magnetic winding leg having a tapered end disposed within said opening, and means carried by said cross member and engaging said winding leg to move it longitudinally to vary the gap between it and said outer core member.

In witness whereof I have hereunto set my hand this 8th day of May, 1928.

HAROLD T. FAUS.