

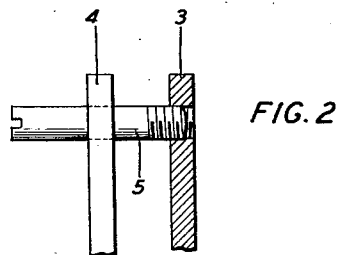
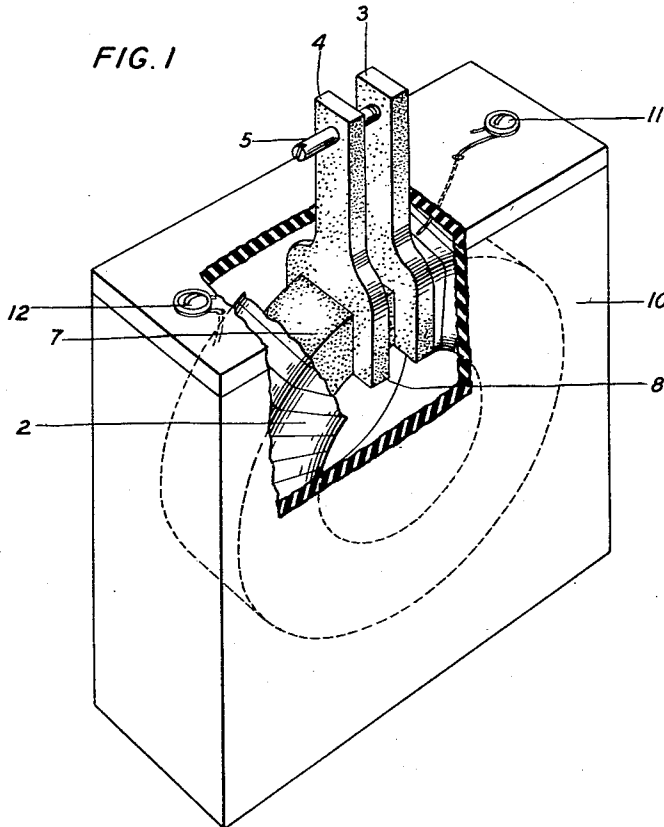
July 19, 1932.

R. M. C. GREENIDGE

1,868,318

ADJUSTABLE INDUCTANCE

Filed July 9, 1930



INVENTOR
R.M.C. GREENIDGE

BY

H. A. Burgess

ATTORNEY

UNITED STATES PATENT OFFICE

RALPH M. C. GREENIDGE, OF ARLINGTON, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

ADJUSTABLE INDUCTANCE

Application filed July 9, 1930. Serial No. 466,663.

This invention relates to adjustable inductances and more particularly to toroidal coils, the inductances of which may be varied.

Toroidal coils have gone into wide use as loading or filter coils, transformers, etc., due to the inherent efficiency of the magnetic circuit and other recognized advantages. However, the use of such coils in places where a high degree of accuracy of inductance is required, has been limited due to the extreme difficulty of adjusting the inductance of such coils to the accuracy required. Even with extreme care in manufacturing, it has been found that coils will differ sufficiently in inductance from the value required to make their use difficult for certain purposes. Placing toroidal coils in an enclosed case, impregnating the windings or mounting the coils in proximity to other apparatus may vary their inductance.

An object of the present invention is a toroidal coil whose inductance may be varied.

Another object of the invention is a toroidal coil whose inductance may be accurately adjusted after being prepared for commercial use.

The above objects are realized in one form of the invention by providing a shunt to a portion of the magnetic circuit of the coil which shunt has a lower reluctance than the core and which may be varied.

The invention will be better understood from the following description in connection with the accompanying drawing which illustrates one form the invention may take and in which Fig. 1 is a perspective view in partial section showing the general arrangement; while Fig. 2 illustrates the method of adjustment.

Referring now to Fig. 1, a winding 2 is mounted upon a core 7 composed of a magnetic material such as that disclosed and claimed in G. W. Elemen Patent 1,586,884, June 1, 1926. Extending away from the core substantially as shown are arms 3 and 4. These arms may be of the same class of material as the core 7 but of a much higher permeability and are preferably molded into the core, however, the invention is not to be so limited. If any other form of structure is

used care must be taken that the lower portion does not extend around the core because it would then form a short-circuited turn. The winding is continued in the space between the arms.

At their outer ends, arms 3 and 4 are joined by rod 5, of the same material as arms 3 and 4, which has a slot at one end and a threaded portion at the other end. Arms 3 and 4 and rod 5 being of higher permeability than core 7 form a low reluctance shunt path around a portion of the main core.

The coil is enclosed in a case such as 10 and the remaining space filled with an impregnating compound to insulate and moisture proof the coil. The ends of the winding are brought out to terminals 11 and 12 mounted in any convenient place on the case. Of course if the coil contains more than one winding an equivalent number of terminals is provided.

The method of adjusting the inductance of the coil is more readily seen from Fig. 2. One end of rod 5 is provided with a screw thread which cooperates with a thread tapped in arm 3. The threads in each case are cut with extreme care to provide a very close fit. Arm 4 is drilled as shown to receive the unthreaded end of rod 5. The fit between the hole in arm 4 and rod 5 is also made very close.

By means of a screw driver or other equivalent means for turning rod 5, the threaded part of the rod is caused to move further into or out of the tapped portion in arm 3. The movement of rod 5 changes the reluctance of the shunt path formed by arms 3 and 4 and rod 5. This change in reluctance of the shunt path causes a change in the reluctance of core 7 which in turn causes a change in the inductance of winding 2. With the arrangement as disclosed herein a very accurate adjustment of the inductance of the coil may be obtained.

It is to be understood that this invention is applicable to a coil having a plurality of windings and is not to be limited to a coil having only a single winding as described. The adjustment feature may also be modified from that shown and the invention is there-

fore to be limited only by the scope of the appended claims.

What is claimed is:

1. An inductance device comprising a
5 toroidal core, a winding thereon and means
to vary the inductance of said device comprising arms extending away from said core, a rod in contact with said arms, said arms and rod being of higher permeability than said
10 core and means to vary the amount of contact between said rod and one of said arms.

2. An inductance device comprising a toroidal core, a winding thereon, and means to vary the inductance of said device comprising arms extending away from said core,
15 a rod in contact with said arms, said arms and rod being of higher permeability than said core, a threaded portion at one end of said rod, a cooperating thread in one of said
20 arms, and means by which said rod may be turned about its axis whereby greater and smaller amounts of said cooperating threaded portions are in engagement.

In witness whereof I hereunto subscribe
25 my name this 7th day of July, 1930.

RALPH M. C. GREENIDGE.

30

35

40

45

50

55

60

65