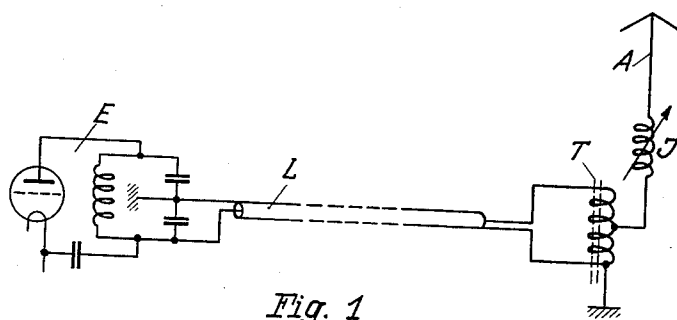
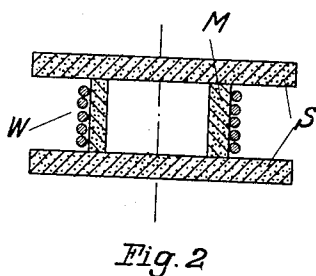


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HIGH FREQUENCY SYSTEM
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HIGH FREQUENCY SYSTEM

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5 Claims. (Cl. 250—33)

The present invention relates to high frequency systems, and more specifically to improvements in or relating to selective transmission and/or reception in the ranges of ultra-short wavelengths and of long wavelengths.

It is frequently necessary in connection with high frequency systems, particularly when such systems are mounted on a vehicle, to feed the antenna over a feeder, that is, to provide a feed line between the transmitter and the antenna, such feed line being a co-axial type of cable or a two-wire line.

Considerable difficulties arise when the antenna of a high frequency system is adapted to operate in a wide frequency range so as to transmit, or receive, waves of ultra-short wavelengths and such of long wavelengths by means of the same antenna. These difficulties are attributable to the necessity of matching the resistance of the energy supply line to the resistance of the antenna, which matching must be independent of frequency. Such resistance matching independent of frequency cannot be accomplished either by the use of the normal type of transformers having two air-coupled coils, or by means of capacitive coupling elements. A change from one wave range to another wave range during transmission, or reception, inevitably requires an interchange of coils when the above mentioned coupling means are employed and, moreover, investigations have proven that the degree of coupling depends upon the length of the energy supply line or feeder.

The invention has for its object to avoid the heretofore mentioned difficulties. This is accomplished according to the main feature of the invention by coupling the antenna feeder to the antenna through an auto-transformer having a core of finely dispersed ferromagnetic material, said auto-transformer being so dimensioned that its stray field becomes so faint that the auto-transformer presents a pure ohmic termination at a tuned antenna system.

The expedient to equip the auto-transformer with a core of ferromagnetic material and the manner of dimensioning the winding thereof involve the further improvement that the auto-transformer in an untuned condition creates a pure choking effect for the high frequency concerned. In cases that normal air-coupled coils are used, a strong inductive component is present which introduces a matching which is dependent upon frequency.

The invention will be more readily understood from the following description taken in conjunction with the accompanying drawing, in which

Fig. 1 is a wiring diagram according to one feature of the invention, while Fig. 2 is a cross

section through a core of the auto-transformer forming part of the wiring diagram of Fig. 1.

In the drawing, E denotes the final stage of a transmitter to which is coupled a feeder L having a characteristic impedance of 60 ohms, for example. The antenna A and the allotted tuning inductance J is, according to the invention, coupled to the feeder L through an auto-transformer T dimensioned as mentioned above. The ferromagnetic core of said auto-transformer preferably presents the shape of a variable spool as shown in Fig. 2 having two large lateral discs S at either side of the center portion M on which the winding W is applied.

The heretofore described novel arrangement is suitably adopted in the same manner for coupling a receiver at an antenna when difficulties arise in connection with the resistance matching.

What is claimed is:

1. In a high frequency system having a high frequency signal device, an antenna system having means to tune it to a desired frequently at long and short wavelengths, means to couple said device to said antenna including a feeder line and an auto-transformer, said auto-transformer having a core of finely divided ferromagnetic material and provided with means to reduce the stray field to such a low value that the impedance match between the antenna and the feeder line is substantially independent of frequency in the long and short wave lengths when the antenna is tuned to the desired frequency.

2. A high frequency system according to claim 1, in which said high frequency signal device is a radio transmitter.

3. A high frequency system according to claim 1, in which said frequency signal device is a radio receiver.

4. In a high frequency signalling system, a high frequency transmitter, an antenna system having means to tune it to a desired frequency, and means to couple said transmitter to said antenna including a feeder line and an auto-transformer interposed between the feeder line and the antenna, said auto-transformer having a core of finely divided ferromagnetic material and having means to reduce the stray field to such a low value that it provides a substantially pure resistance termination for said line at the frequency to which the antenna is tuned.

5. A high frequency signalling system according to claim 4, in which the core of said auto-transformer is in the form of a spool with a hub portion and extending flange portions, both of which are of said ferromagnetic material, the said flanges extending beyond the transformer winding to reduce the stray field.

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