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LOOP ANTENNA WITH IRON CORE

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Fig. 1

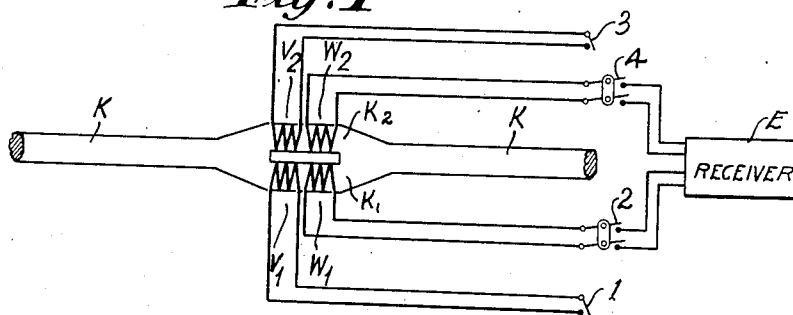
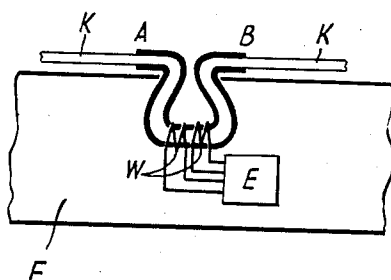


Fig. 2



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LOOP ANTENNA WITH IRON CORE

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3 Claims. (Cl. 250—33)

Loop antennae without iron core consist of two or more windings (coils), which serve for the reception in several wave bands. These coils are switched together, corresponding to the wave band it is to receive.

For many purposes, a loop antenna without an iron core will not work with several coils. For example, in case the receiver is tuned to the higher frequented wave, the coil for another wave band may produce a reaction. Another disadvantage of a loop antenna without iron core, in the case it is arranged on a vehicle or an airplane, is the large amount of space occupied by the several coils. At least, the self-capacity of such loop antennae with several coils is increased in an undesirable manner.

If an iron core is employed, it is to attain an intensive coupling between the single windings and also between several windings. If an iron core is used for the coils, it appears that the above-mentioned disadvantages will increase; however, the larger room for a frame with several coils is not necessary.

According to the present invention, several coils are arranged on a loop antenna with an iron core, thereby producing the following effect: The intensive coupling between the coils is obnoxious, if the self-wave of the coil for the lower frequency is disposed a sufficient distance from the wave band in which the other coil is active. This is accomplished in a better manner, if an iron core is provided. In such a loop antenna it is possible to reduce the internal- or inter-winding capacity.

The loop antenna according to the invention, that is, an iron core provided with several coils, has also another important advantage, in that the iron core may be formed into two parts for a portion of its length, each part having a coil. Thereby the opposite coupling is also reduced. In such an arrangement the part, which is not being used is barred by a short-circuited coil.

The foregoing and other objects of the invention will be more clearly understood from the following description when read in connection with the accompanying drawing, in which Fig. 1 illustrates a loop antenna system with a ferro-magnetic core made up in two sections; and Fig. 2 illustrates a loop antenna system with a core which is made up of braided wires.

In Fig. 1, the iron core K is formed into two parts K₁ and K₂ for a portion of its length, said parts having coils W₁ and W₂, respectively, arranged thereon. On the parts K₁ and K₂ are also arranged coils V₁ and V₂, respectively, which may be short circuited as it is wished.

The antennae W₁ and W₂ are adapted to be connected to the receiver by suitable circuits in which switches 2 and 4 are located. The circuit arrangement is such that the closure of switch 2 connects antenna W₁ to receiver E, and the closure

of switch 4 connects antenna W₂ to receiver E. In order to prevent reaction of antenna W₂ upon antenna W₁ when only the latter is connected to the receiver, the switch 3 is closed, thereby short circuiting winding V₂ which thereby acts as a short circuited turn. If antenna W₂ is desired to be connected to the receiver E, then to prevent reaction with antenna W₁, the winding V₁ is short circuited by the closure of switch 1.

If an iron core is used, which consists of several wires of iron, roped corresponding to a litzendraht, or an iron core, which consists of several bands, the core K may be arranged submerged in the vehicle or airplane F (Fig. 2); thereby the coils W, which are to switch, are arranged near the receiver E. Now it is possible to arrange the contacts for the switching of the frame coils in the receiver. The proposition to provide a shield between the coils and the iron core is recommended for the example according to Fig. 2. In this arrangement, a shield is provided between the points A and B.

I claim:

1. In a radio frequency signalling apparatus, a receiver including a loop antenna, said antenna being adapted to intercept radio frequency energy, a ferro-magnetic core for said antenna comprising a length of cable made up of a plurality of braided iron wires, said cable being looped along a portion of its length, a shield wrapped around said looped portion, said loop antenna being wound around the outer surface of said shield, and means for transferring the radio frequency energy intercepted by said loop antenna to the receiver.

2. In a radio frequency signalling apparatus, a receiver including a loop antenna, said antenna being adapted to intercept radio frequency energy, a ferro-magnetic core for said antenna comprising a length of cable made up of a plurality of iron wires, said cable being looped along a portion of its length, a shield wrapped around said looped portion, said loop antenna being wound around the outer surface of said shield, and means for transferring the radio frequency energy intercepted by said loop antenna to the receiver.

3. In a radio frequency signalling apparatus, the combination of a receiver including a loop antenna, said antenna being adapted to intercept radio frequency energy, a ferro-magnetic core for said antenna comprising a length of cable made up of a plurality of iron wires, said cable being looped along a portion of its length, a building panel, said looped portion of the cable penetrating one face of and being embedded in said panel, a shield wrapped around said looped portion, said loop antenna being wound around the outer surface of said shield, and means for transferring the radio frequency energy intercepted by said loop antenna to the receiver.

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