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A. MEISSNER

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ANTENNA

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Fig. 1

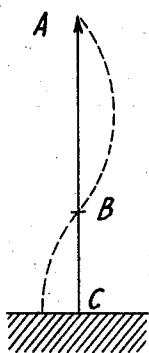


Fig. 2

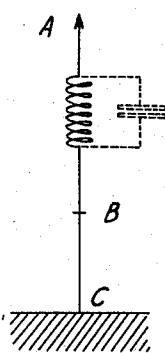


Fig. 3

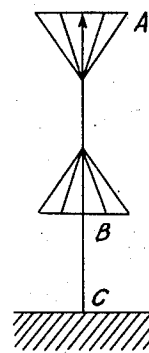


Fig. 4

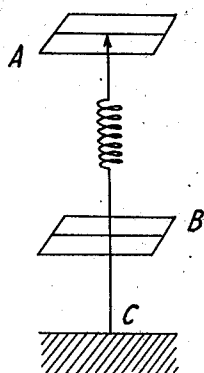
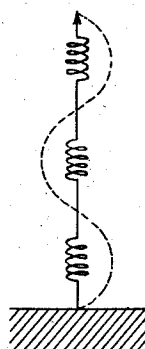


Fig. 5



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ANTENNA

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One object of the invention is the provision of an antenna suitable for transmitting or receiving short wave lengths.

Another object of the invention is the provision of an antenna for transmitting or receiving long or short wave lengths.

Still another object of the invention is the provision of an antenna for transmitting or receiving short wave lengths which shall also be adapted for transmitting long wave lengths by means of impedances, inductances or capacities inserted therein.

Still another object of the invention is the provision of an antenna suitable for short wave lengths and having loading devices inserted therein in symmetrical relationship with the current distribution under short wave operation.

The invention is illustrated in the accompanying drawing in which

Figure 1 shows a three-quarter wave antenna for radiating short waves;

Figure 2 represents a similar antenna inductively loaded;

Figure 3 shows capacitive loading;

Figure 4 indicates a combination of inductive and capacitive loading; and

Figure 5 shows the vertical portion of the conductor leading to a quarter wave antenna as a plurality of half waves in length.

It is well-known that for the purposes of intelligence transmission by means of short electrical waves so-called space-radiation antennæ have been used. These antennæ as a rule consist of a rectilinear wire which is excited to oscillate at three-quarter wave length or a whole multiple of a half wave length plus one quarter wave length. In Fig. 1 such a straight oscillator is shown jointly with the curve showing the current distribution when excited at three quarter wave length. The part of the antenna between points A and B gives the proportion of the space radiation, while the current of part BC contributes more to the production of surface waves. It is a well known fact that operation on short waves is more desirable at certain times of the day than at others, so that there arises the necessity to work on longer wave lengths during certain portions of the day. Now, the present

invention provides a simple arrangement adapted to change to long wave operation while using the same antenna tower or mast and the same antenna wire. This is accomplished by the insertion of wave extension means such as coils, larger condensers, as well as combinations of coils and capacitive resistances which of course is well known in itself. Now, according to the invention these extension means are inserted or connected in the antenna wire and are positioned in a symmetrical manner with reference to the current loops of the short working waves. For instance, in the case of a space-radiation antenna which is excited in the manner illustrated in Fig. 1, the coil must be inserted in the middle of portion AB, as depicted in Fig. 2. Also a condenser (shown by the broken lines in the figure) could be connected with the antenna coil mentioned in order that the desired extension may be obtained. Another form of construction according to the invention is illustrated in Fig. 3. According to the latter, at both ends of the section AB enlarged capacity surfaces by the addition of fan like disposed wires are provided. In the form of construction of Fig. 4, horizontal capacity surfaces are used at A and B. Fig. 5 illustrates the use and application of the idea underlying the invention to the case in which the antenna radiates at a short wave and in which the longitudinal dimensions of the antenna wire correspond to one quarter wave length.

The advantage which the invention offers, as can be readily seen from the examples here cited, consists in that one and the same mast or tower is employed for the antenna working on short waves and longer waves, and in that the antenna wire for short waves is adapted in the simplest possible way to the transmission and reception of waves of greater length by the insertion of the extension means at the proper places, in accordance with this invention.

By the adoption of the means and measures suggested conformably with the invention, it is readily feasible to change comparatively short antennæ whose natural period

corresponds to a short wave length to a substantially longer wave length.

In the claims which follow I shall use the term "loop" to mean a half of an electrical wave. Thus, the three-quarter wave antennæ in Figures 1 through 4 contain one and one-half loops

Having described my invention, I claim:

1. The method of changing the wave length of a space radiation antenna, the current distribution of which has an odd number of half loops and includes at least an entire current loop, which comprises the step of loading the antenna symmetrically with respect to the current loop.

2. A space radiation antenna comprising a conductor the current distribution in which contains a whole and a half current loop, and reactance devices located symmetrically with respect to the whole current loop.

3. The combination with an antenna having a current distribution whereby there are a plurality of current nodes, and at one end a current anti-node, of loading devices located symmetrically with respect to a pair of adjacent current nodes.

4. An antenna structure for use with either short or long waves comprising a grounded linear oscillator the length of which is an odd number of fourths of the short wave length, and having for use with the longer wave loading devices located symmetrically with respect to the current distribution existing during short wave operation.

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