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W. M. HAHNEMANN

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ANTENNA STRUCTURE

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Fig. 1

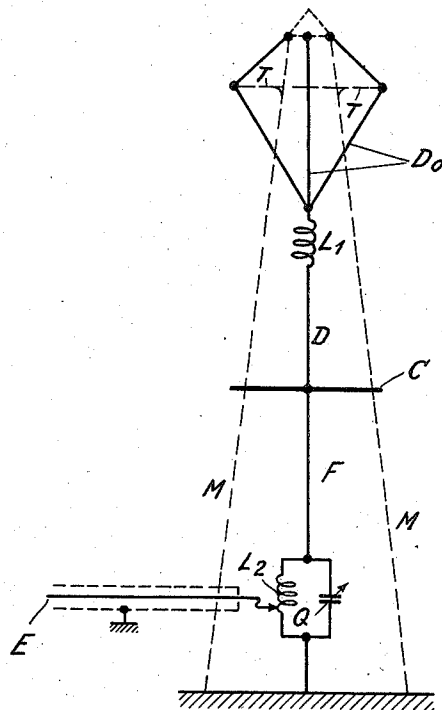
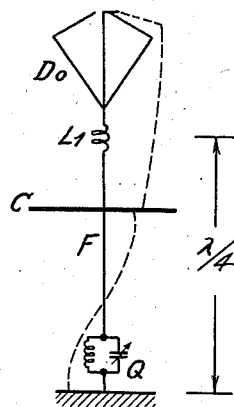


Fig. 2



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ANTENNA STRUCTURE

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Application October 30, 1934, Serial No. 750,697
In Germany November 2, 1933

3 Claims. (Cl. 250—33)

In my copending patent application Serial No. 628,674, filed August 13, 1932, for Antenna structures, to reduce the space-wave component and to radiate energy that is predominantly earth-bound, it is proposed to arrange a vertical dipole so that it is positioned with its centre of oscillation about a quarter of a wavelength above the earth's surface but sufficiently close thereto to produce substantial ground radiation.

10 According to the invention described hereafter a dipole arranged as indicated above is connected to ground at its lower end and is fed at a point at or near the ground.

The accompanying drawing shows one embodiment of the invention. Fig. 1 is a schematic elevation of a dipole structure. Fig. 2 is a view similar to Fig. 1 but drawn to a smaller scale than this. Certain parts represented in Fig. 1 are not shown in Fig. 2, this disclosing instead the current distribution referred to hereafter.

20 The upper half of the dipole comprises a plurality of parallel-fed wires Do, whilst the lower half comprises a single conductor D. An inductance Li is inserted between the two sections. The wires Do are spanned beyond the mast M (shown in broken lines) upon spreaders T in order to avoid too close a proximity of the mast to the potential-carrying parts. For structural reasons this arrangement can be carried out more easily than the erection of a single-wire dipole connected to the top point of the mast. Moreover the upper portion has a greater capacity than the usual free-ended single wire dipole.

35 In the said prior patent application the dipole is energized over a power line at a point at or near the centre of the dipole, that is, over an inductance corresponding to the inductance Li shown in Fig. 1 of the accompanying drawing. In the present arrangement the dipole is not fed at a current node but by potential energization from below. An energizing wire F is provided for this purpose, the wire F being grounded over a tuned circuit Q. The power is fed over a transmission line E which is variably coupled to the inductance coil L2 of the circuit Q over an adjustable tapping. As shown, in order to increase

the capacity of the lower part of the dipole and thus obtain a more favourable voltage distribution, a capacity surface or member C may be connected to the lower end of the dipole. A wire extending outwards to the mast M is suitable for this purpose.

The current distribution obtained is indicated in broken lines in Fig. 2. The current distribution shown in the lower portion F has the advantage that the radiation diagram of the antenna is unfavourably influenced to the least possible degree by the radiation from the portion F.

10 Instead of coupling the transmission line E in the manner illustrated, any other suitable coupling may be employed and in particular a coupling which renders it possible to pass from a symmetrical arrangement or transmission line to an asymmetrical arrangement or transmission line, such for example as the transmission line E shown.

20 What is claimed is:

1. In an antenna structure, a vertical dipole positioned with its center of oscillation about a quarter of a wavelength above the earth's surface, means including a single energizing wire connecting said dipole to ground and means for feeding said wire at a point substantially at the ground, said dipole having a capacity surface arranged at its lower end whereby a current minimum results at an intermediate point of said energizing line and the radiation diagram of the antenna is unfavourably influenced to the least possible degree by the radiation from said energizing wire.

2. An arrangement according to claim 1, wherein the upper half of the said dipole comprises a plurality of outwardly-spread parallel-fed-wires.

3. An arrangement according to claim 1, characterized in that said connecting means comprises a tuned circuit connected to the lower end of the said dipole, and by the provision of an energy supply line adjustably coupled to this tuned circuit.

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