

Dec. 29, 1936.

W. BERNDT ET AL

2,065,787

SYMMETRICAL ANTENNA FOR SHORT OR ULTRA-SHORT ELECTRICAL WAVES

Filed Aug. 1, 1935

Fig. 1

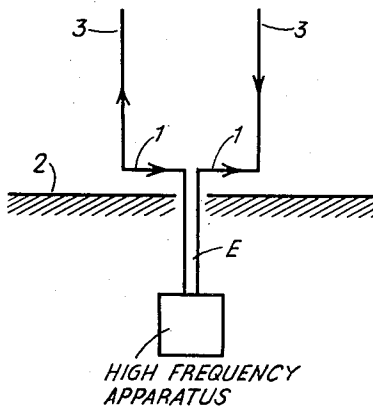


Fig. 2

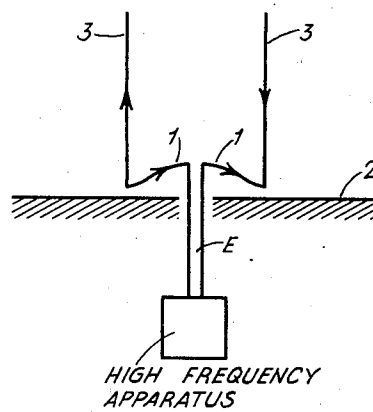


Fig. 3

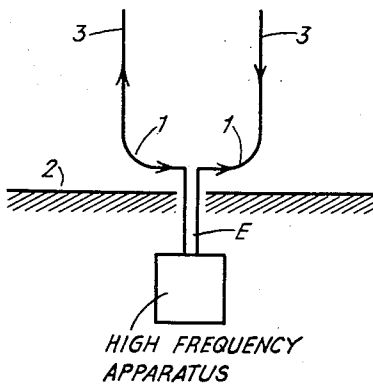
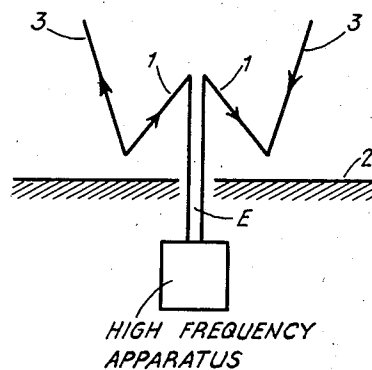


Fig. 4



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SYMMETRICAL ANTENNA FOR SHORT OR
ULTRA-SHORT ELECTRICAL WAVES

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Application August 1, 1935, Serial No. 34,195
In Germany August 31, 1934

2 Claims. (Cl. 250—11)

Antennas are known to be arranged in front of a reflector wall to obtain a concentration in the direction at right angle to said wall. In this case, the antenna extends parallel to the reflector wall. The radiation equals zero in the direction of the wall.

If a concentration along the reflector wall is desired, antennas are used extending at right angle to the wall. This arrangement does not produce radiation at right angle to the wall.

For a variety of technical purposes, a concentration of the rays along the reflector wall as well as an appreciable radiation in the direction at right angle to the wall, is desired. In accordance with the present invention, this is accomplished in the following manner:

A symmetrically fed antenna comprising buckled or bent conductors, either of the U shaped or zig-zag form, is so arranged in front of a reflector wall that the inner conductors of the antenna, whose direction extends primarily parallel to the wall, are passed by currents of identical sense, while the outer conductors, whose directions are preferably at right angle to the wall, conduct currents in the opposite sense to the former currents. This current distribution is obtained, for instance, if each side of the antenna is longer than $\lambda/2$, so that a current node appears at some distance from the place of feeding.

Figs. 1 to 4, inclusive, represent several examples of construction. The antennas comprise wires 1, 1 parallel, or substantially so, to wall 2, and wires 3, 3 perpendicular, or substantially so, to wall 2, and are fed in the current node or current loop, across the symmetrical energy lines E from high frequency apparatus, or at any other place when known adapting means are used. The total length of the antenna can be shortened by the provision of end capacitances. By changing the distances between the individual parts of the antenna and the distance of these parts relative

to the reflector wall, the directional diagram can in this manner be influenced within wide limits. Other concentrations in definite directions can be obtained through a combination of several antennas of the above described shape.

What is claimed is:

1. An antenna system comprising a reflector surface, a pair of radiating wires substantially in the same line and substantially parallel to said surface, a pair of substantially parallel wires substantially perpendicular to said surface and located on the same side of said surface as said first pair, said pairs of wires being in a single plane which is perpendicular to said surface, each wire of said first pair being connected to one of the wires of said second pair, whereby there is obtained a U-shaped arrangement, the overall length of each wire of the first pair and the wire of the second pair to which it is connected, being greater than one-half wave length, and high frequency apparatus connected to the wires of the first pair at their adjacent ends.

2. An antenna comprising a reflector surface, a pair of substantially arcuate shaped wires near said surface, a pair of substantially parallel wires substantially perpendicular to said surface and located on the same side of said surface as said first pair, said pairs of wires being in a single plane which is perpendicular to the plane of said surface, each wire of said first pair being connected to one of the wires of said second pair, whereby there is obtained a substantially U-shaped arrangement, the overall length of each wire of the first pair and the wire of the second pair to which it is connected, being greater than one-half wavelength, and high frequency apparatus connected to the wires of the first pair at their adjacent ends.

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