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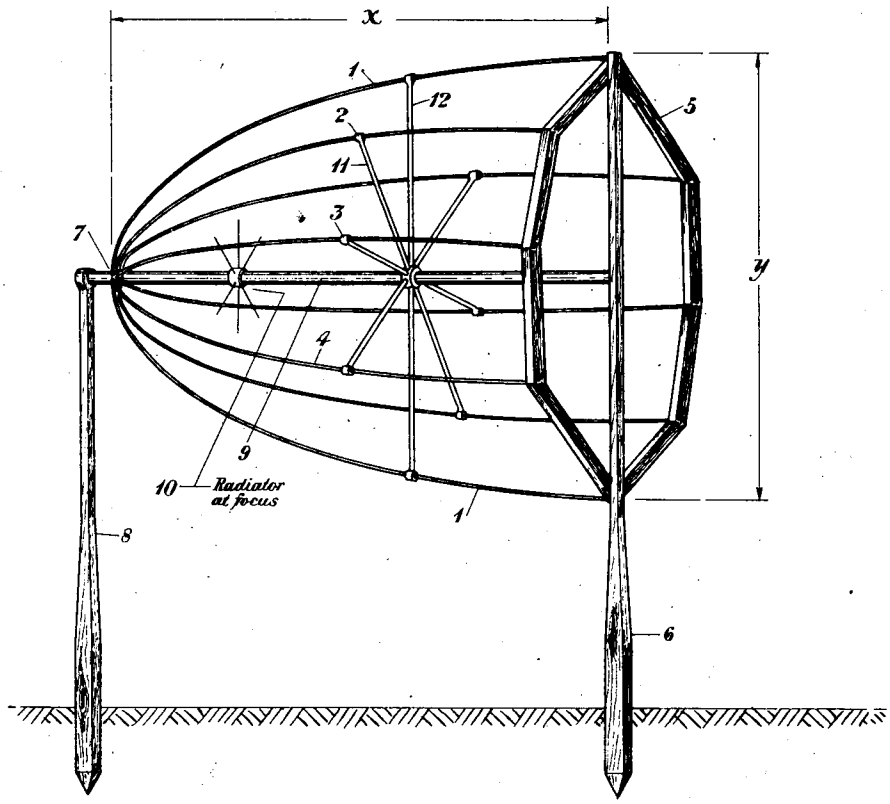
RADIOANTENNA

Filed May 19, 1925



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UNITED STATES PATENT OFFICE.

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RADIOANTENNA.

Application filed May 19, 1925. Serial No. 31,434.

This invention relates to radio antennæ and particularly to that type of antenna adapted to control the direction of radiation of the signaling waves.

Various devices have been suggested heretofore for controlling the direction of radiation of radio oscillations. Certain of these systems employ an antenna array in which the several antennæ are spaced apart a predetermined part of a wave length and to which currents are applied having certain predetermined phase relationship. The wave resulting from such an antenna array will have a definite directional characteristic. Owing to the large number of antennæ required to produce satisfactory directional control and also to the relatively complex circuit network required to supply to the antenna the energy to be radiated, such means of directional control has proven impracticable.

The present invention resides in a method and means for transmitting an unpolarized beam of radio energy, which method and means are particularly well adapted for use in the transmission of signals by short waves.

This invention will be clearly understood from the following description when read in connection with the attached drawing showing a simple form of embodiment of the invention.

The invention consists broadly in a parabolic reflector made up of a network of wires or conductors, each arranged in the form of a parabola. These conductors, which are designated 1, 2, 3 and 4 upon the drawing, may be supported at the open end of the reflector by means of an insulating framework 5, which may be of wood or other suitable material. This framework is supported above the ground by means of an insulating support 6. The apex 7 of the conic section is held by an insulating support 8. In order to make the structure sufficiently rigid, a supporting member 9 might be extended from the apex 7 to the rod 6, extending diametrically across the framework 5, that constitutes the base of the paraboloid. This member 9 might also be used to support the radiating element 10 consisting of a plurality of rods by means of which the energy to be transmitted is transferred to the conductors 1 to 4, inclusive, of the reflector. This radiating element per se forms no part of this invention but is described in the co-pending application of R. S. Ohl, Serial No. 23,639, filed April 15, 1925. The conductors should be so spaced that the plane in which any parabolic conductor lies will be equi-angularly spaced from the planes in which the adjacent conductors lie. In order to maintain the symmetry of spacing, insulating supports such as 11, 12, etc., might be inserted within the network of conductors radiating out from the supporting member 9. The conductors 1 to 4, inclusive, should be tuned to a fraction of the wave length employed in the system, as, for example, one-half, three-halves or five-halves thereof. In the arrangement described above, the radiating element 10 should be placed at the focal point of the reflector in order to avoid diffusion of the radiated energy. The length of the parabola, viz, the distance designated x, should be relatively large with respect to the diameter of the opening of the reflector, viz, the distance designated y.

In the operation of an antenna of the type described above, the energy to be radiated is applied to the conductors of the antenna by means of the rods of the radiating element 10. These rods are spaced apart an equal distance each from the other so that the energy applied to the conductors of the antenna 1 to 4, inclusive, will approach from different angles and the beam of radiated energy transmitted by the parabolic reflector will be unpolarized.

The advantage of this type of beam over that transmitted by the devices of the prior art is that any type of receiving antenna located within the effective area of the beam will receive the energy or the signal transmitted thereby.

While this invention has been disclosed as embodied in a particular arrangement it is to be understood that it is capable of embodiment in other and widely different forms without departing from the spirit of the invention as defined in the following claims.

What is claimed is:

1. A directive antenna consisting of a paraboloid of conductors, each conductor being a parabola lying within the surface of the paraboloid, the plane in which each conductor lies intersecting the planes of the other parabolic conductors.

2. In a directive signaling system, the com-

bination with an antenna consisting of a paraboloid of conductors, each conductor being a parabola lying within the surface of the paraboloid, the plane in which each conductor lies intersecting the planes of the other parabolic conductors, of a source of high frequency oscillations located at the focal point of the said paraboloid, the said source being so arranged as to cause the radiation of an unpolarized beam of energy.

In testimony whereof, we have signed our names to this specification this 14th day of May, 1925.

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