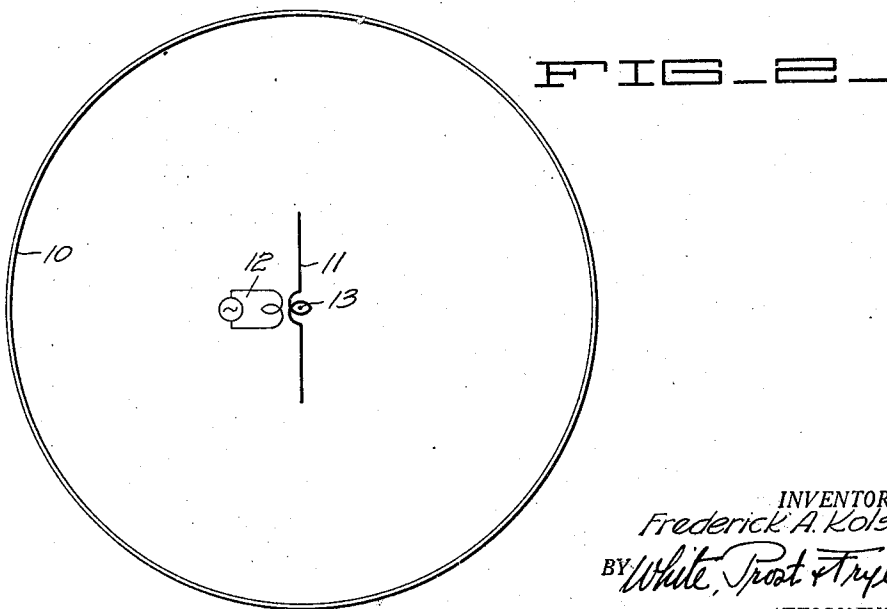
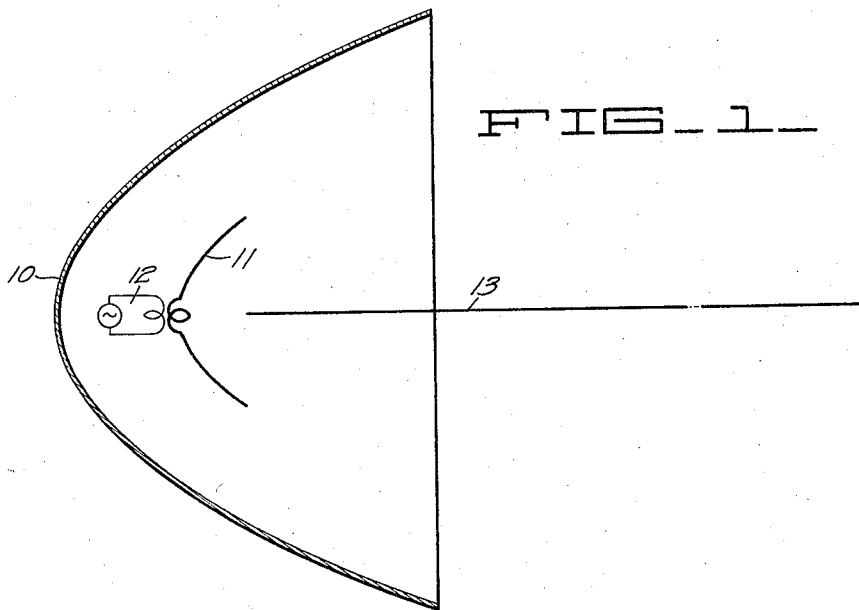


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F. A. KOLSTER
RADIO APPARATUS AND METHOD
Filed Oct. 15, 1928

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RADIO APPARATUS AND METHOD

Application filed October 15, 1928. Serial No. 312,431.

This invention relates generally to apparatus for securing an exchange of electromagnetic energy between signaling circuits and a natural medium, and which is particularly useful in connection with radio communication systems.

It is an object of this invention to devise novel means for modifying the radiation or absorption characteristic field of radio apparatus.

It is a further object of this invention to devise means and methods for use in connection with electromagnetic wave reflecting apparatus, whereby the characteristic field produced by the reflector and its associated antenna is concentrated in the direction of maximum effect.

It is a further object of this invention to devise means and methods for use in connection with paraboloid wave reflectors whereby radio waves are effectively guided in a direction substantially parallel to the axis of the paraboloid.

Further objects of the invention will appear from the following description in which I have set forth the preferred embodiment of my invention. It is to be understood that the appended claim is to be accorded a range of equivalents consistent with the state of the prior art.

Referring to the drawing:

Figure 1 is a side elevational view illustrating my invention associated with wave reflecting and propagating means.

Fig. 2 is a perspective view of the apparatus illustrating diagrammatically the positioning of the guided conductor.

In copending application No. 279,244, filed in the joint names of Frederick A. Kolster and Geoffrey G. Kruesi, there is disclosed a novel form of wave propagating apparatus which has a beam-like characteristic field concentrated in two dimensions. The specific apparatus disclosed in that application consists of a paraboloid wave reflector at the focal point of which is positioned suitable antenna means coupled to a signaling circuit. I have discovered that with wave propagating apparatus of this kind, the radiation field can be materially concentrated by

proper positioning of a conductor of substantial length in such a manner as to guide the waves as they are propagated from the reflector.

Referring to the drawing for a detail description of one form of my invention, there is shown wave reflecting means 10 in the form of the paraboloid, the surface of which is defined by some suitable conducting material such as sheet copper or copper mesh. Positioned at the focal center of this reflector there is an antenna conductor 11 coupled to a suitable signaling circuit 12. Antenna conductor 10 may take a number of forms such as those shown in copending application No. 279,244, and for simplicity I have shown it as consisting merely of a single conductor extending symmetrically upon opposite sides of the axis of wave reflector 10 and substantially parallel to the reflector surfaces. Its medial portion is coupled to signaling circuit 12. Signaling circuit 12 is tuned so as to secure an energy transfer of a definite frequency with respect to the focal length of the reflector, as for example a frequency having a wave length equal to four times the focal length. The different operating frequencies permissible have been explained in said copending application 279,244.

Positioned parallel to the axis of reflector 10 and preferably coincident therewith, there is a conductor 13, preferably in the form of a rod or wire. The operation of the apparatus is not critical to the length of conductor 13, but for best result this conductor should be at least a substantial fraction of one wave length. In practice I have secured good results by making conductor 13 about seven meters long when operating on a wave length of about four meters.

In operating my apparatus for transmitting energy, conductor 13 seems to guide the radio waves so that they are propagated with greater intensity in the desired direction, that is in a direction parallel to the axis of the reflector. By actual measurement with a given receiving apparatus in line with the axis of reflector 10 and at a given distance from the same, about 20% more energy was received with the apparatus explained above

than with the apparatus without the conductor 13.

It is to be understood that altho I have described the apparatus as being applied to a wave propagating apparatus, it can be used both for transmission and absorption of radio energy. It is also apparent that other forms of wave reflectors can be employed in place of the paraboloid reflector 10. For example a Hertzian or cylindrical paraboloid wave reflector can be employed, in which instance conductor 13 would be in the form of a plane rather than a rod, the plane being positioned parallel to the focal axis of the reflector and symmetrical with respect to the radiation field.

I claim:

In a radio system, a paraboloid wave reflector, an antenna conductor positioned within said reflector, and another conductor extended for a substantial distance coincident with the axis of the reflector.

In testimony whereof, I have hereunto set my hand.

FREDERICK A. KOLSTER.