Nov. 14, 1950 H. J. RIBLET 2,530,079

DIRECTIVE ANTENNA SYSTEM

Filed April 3, 1945

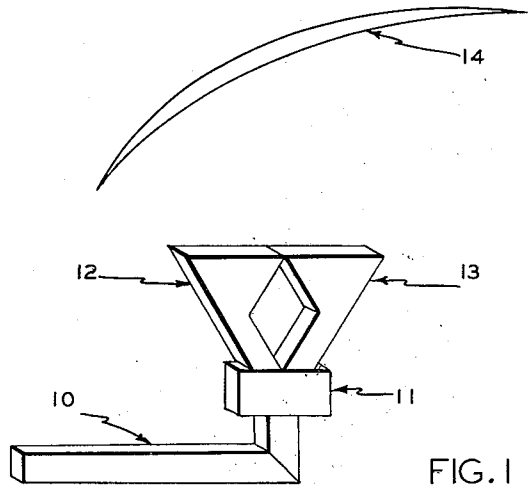


FIG. 1

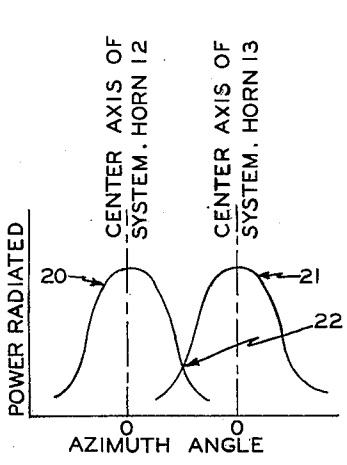


FIG. 2

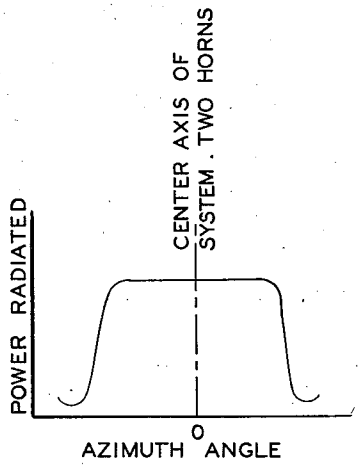


FIG. 3

INVENTOR.
HENRY J. RIBLET
BY
William D. Hall
ATTORNEY

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DIRECTIVE ANTENNA SYSTEM

Henry J. Riblet, Cambridge, Mass., assignor, by mesne assignments, to the United States of America as represented by the Secretary of War

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1 Claim. (Cl. 250—33.65)

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This invention relates in general to antennas and more particularly to antennas radiating a constant amount of power over a wide azimuth angle.

In some types of very short wave communication practice it is desirable that the antenna have a characteristic such that the power radiated vs. azimuth angle is flat over a range of angles. Hereinafter the term "very short wavelengths" means those wavelengths at which conventional two-wire lines can no longer be used practicably, and wave guides or coaxial lines must be resorted to.

Among the objects of the present invention therefore, are:

1. To provide an antenna system which radiates substantially the same power over a wide range of azimuth angle.

2. To provide such a system for use at very short wave-lengths.

In accordance with the present invention there is provided a wave guide-fed antenna system in which the end of the wave guide feed is spread into two flared horns, with the radiated energy from the horns being reflected from a paraboloid.

My invention will best be understood with reference to the drawings, in which:

Fig. 1 shows the antenna system according to my invention;

Fig. 2 is a curve of the radiation pattern from each horn showing how the two patterns are superimposed; and

Fig. 3 is a curve of the radiation pattern of the complete antenna system, according to my invention.

Referring now to the operation of the system and to Fig. 1, the transmitted energy comes up wave guide 10 into matching section 11 which allows substantially maximum power transfer into the two horns 12 and 13. The energy radiated from the horns is directed towards the paraboloid 14 where it is reflected out into space.

Fig. 2 shows the radiation pattern from horn 12 as curve 20 and the radiation pattern from horn 13 as curve 21 with the center axes of a system using each of the horns as marked. The

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two horns are so placed with respect to one another that their radiation patterns intersect at the 0.25 power point 22.

When the two horns are placed in the aforementioned positions, the addition of the two radiating patterns, taking into account the phase at every point, results in a composite radiation pattern as shown in Fig. 3, with the center axis of the system as marked. Thus it is seen that the power radiated from the composite system is substantially constant over a wide range of azimuth angle.

While there has been described what is at present considered the preferred embodiment of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is, therefore, aimed in the appended claim to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

A directive antenna system for microwave energy comprising a paraboloidal reflector and means for illuminating said reflector to provide a sector shaped directive pattern characterized by a major directive lobe having substantially uniform power over a predetermined directive angle comprising a wave guide translating member and a pair of similar radiating horn members symmetrically attached to said guide member, the apertures of said horns being directed toward said reflector and the size and spacing of said apertures being chosen to provide a pair of overlapping directive lobes intersecting each other at their quarter power points.

HENRY J. RIBLET.

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The following references are of record in the file of this patent:

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