

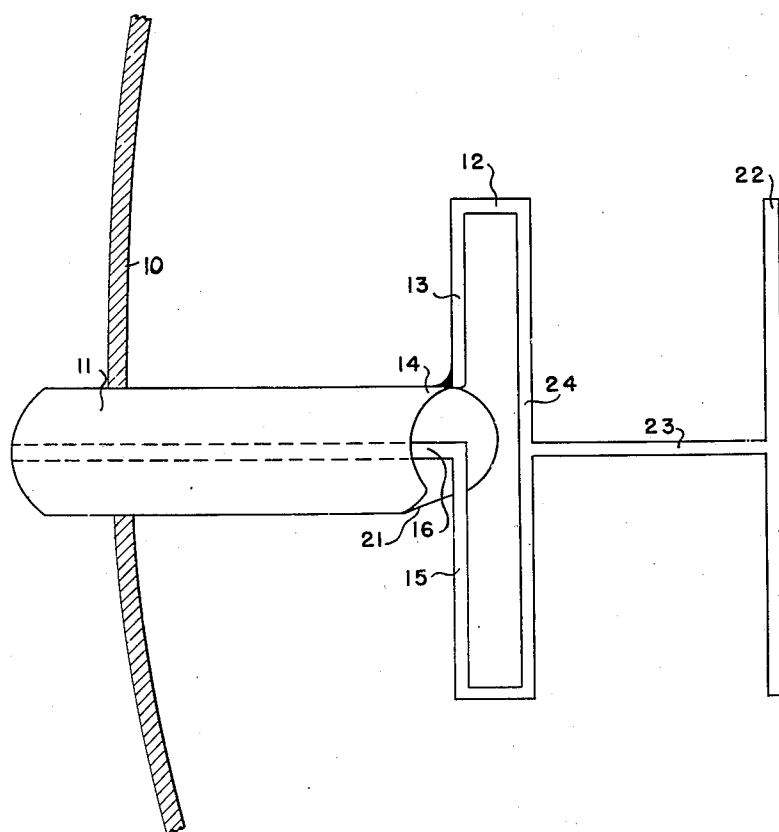
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This invention relates to antennae and more particularly to ultra high frequency radiators.

According to conventional practice, reflecting devices such as paraboloidal reflectors, or dishes as they are sometimes called, are used for radiating electromagnetic energy in highly directional beams. Single dipoles have been used extensively for illuminating such reflectors. Some type of reflecting element has generally been used in conjunction with the radiating dipole to reflect energy from the dipole into the dish so that substantially all of the energy is radiated into space from the dish and none directly from the dipole. The input impedance to such dipoles is very low thus necessitating use of transformers or extremely low-impedance transmission lines for feeding the device.

An object of the present invention is, therefore, to provide a novel illuminating device having a high input impedance.

Another object of the present invention is to provide a novel illuminating device which may be cast integrally with an associated reflecting element.

For a better understanding of the invention, together with other and further objects thereof, reference is had to the following description, taken in connection with the accompanying drawing which shows schematically a preferred embodiment of the invention.

The illustrated illuminating device comprises a coaxial transmission line 11 connected to a folded dipole 12. The illumination device is disposed at the focal point of a paraboloidal reflector 10, coaxial line 11 extending through a central opening in said reflector. One element 13 of the dipole 12 connects to the outer conductor 14 of the line 11 and the remaining element 15 connects to the inner conductor 16. A slot 21, cut in the outer conductor 14, allows the connection to be made between element 15 and conductor 16. A reflector element 22 is connected by a stub 23 to an element 24 of the dipole 12 as shown.

In the operation of this device it can be shown that the impedance which the folded dipole 12 presents to transmission line 11 is approximately four times the impedance of a single dipole. The reflector element 22 is normally slightly longer than the dipole 12 so that it has the proper impedance in order that the radiations from the element 22 be in the proper phase to act essentially as a reflector. Such an element is known in the art as a parasitic reflector. The length of the stub 23 is not especially critical but should

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be in general between 0.15 and 0.25 wavelength. The effect of adding the reflector 22 is to reduce the input impedance. However, the folded dipole, together with the reflector still has a considerably higher impedance than a single dipole.

It will be obvious to those skilled in the art that since no difference in potential exists between the center point of reflector 22 and the center point of the element 24, the stub 23 may be a conductor and so may be formed as an integral part of the complete structure.

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.

What is claimed is:

1. In an ultra high frequency radiator which includes a directional reflector and a coaxial feeder transmission line having an outer and an inner conductor, a device for illuminating the reflector comprising a folded dipole adapted to be connected to the inner and outer conductors of the coaxial feeder, a parasitic reflector element, and a conductive member for supporting said parasitic reflector adjacent to said dipole, said member being connected between a point on said dipole and a point on said parasitic reflector where no potential difference exists between said points.

2. In an ultra-high frequency radiator which includes a directional reflector and a coaxial feeder transmission line having an outer and an inner conductor, a device for illuminating the reflector comprising a folded dipole, means connecting said dipole to the inner and outer conductors of the coaxial line, a parasitic reflector element, and a conductive stub for supporting said parasitic reflector in spaced parallel relation to said dipole, said stub being connected between the center point on said folded dipole and the center point on said parasitic reflector.

3. In an ultra-high frequency radiator which includes a directional reflector and a coaxial feeder transmission line having an outer and an inner conductor, a unitary device for illuminating the directional reflector comprising a folded dipole, means connecting said dipole to the inner and outer conductors of the coaxial line, a parasitic reflector element, and a conductive stub for supporting said parasitic reflector in spaced parallel relation to said dipole, said stub being connected between the center point on said folded dipole and the center point on said parasitic reflector.

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said stub being integral with said dipole and said parasitic reflector.

4. In an ultra-high frequency radiator which includes a directional reflector and a coaxial feeder transmission line having an outer and an inner conductor, a unitary device for illuminating the directional reflector comprising a folded dipole, means connecting said dipole to the inner and outer conductors of the coaxial line, a parasitic reflector element, and a conductive stub for supporting said parasitic reflector in spaced parallel relation to said dipole, said stub being integrally connected between the center point on said folded dipole and the center point on said parasitic reflector, the length of said stub being in the order of 0.15 to 0.25 wave length.

5. A unitary illuminating device comprising a folded dipole, a parasitic reflector element, and a conductive stub for supporting said parasitic reflector adjacent to said dipole, said stub being integrally connected between the center point on

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said folded dipole and the center point on said parasitic reflector.

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