Feb. 21, 1933. W. LUDENIA 1,898,197

REFLECTOR FOR VERY SHORT WAVES

Filed Feb. 11, 1931

Fig. 1

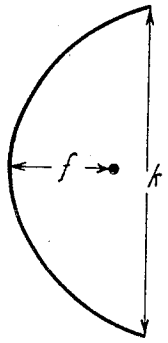


Fig. 2

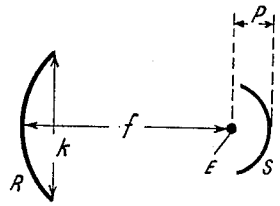
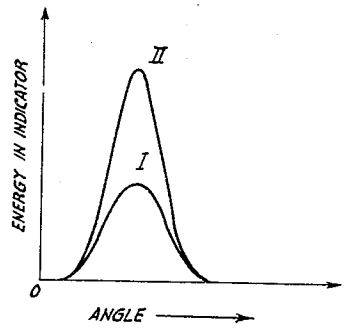


Fig. 3



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REFLECTOR FOR VERY SHORT WAVES

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Heinrich Hertz has shown that very short Hertzian waves may be bunched or concentrated by a parabolic mirror. Investigations with mirrors of this type have proven that the width of the radiated cone is the smaller the larger the ratio

$$\frac{f}{\lambda}$$

f being the focal length and λ the wave length (see Figure 1). However, if for instance, a wave length of the order of decimeters is considered, the mirrows would assume a magnitude which would be too large for practical purposes for insuring directive action.

It is an object of the present invention to provide a reflector system giving a highly directional characteristic, which shall not be impractical because of its size.

In the accompanying drawing, which is illustrative and explanatory of the present invention,

Figure 1 illustrates a parabolic reflector having a focal length f and an opening k,

Figure 2 illustrates an arrangement of parabolic reflectors according to the present invention, and

Figure 3 is a graph illustrating the relative directivity of the present invention with respect to an ordinary parabolic reflector.

Referring to Figure 1, for good directivity, it is necessary that the focal length f of the parabolic reflector be large relative to the wave length. Consequently, the reflector would assume proportions such that it would be impractical to construct and use one for desired directive action. To overcome this difficulty, and in accordance with the present invention, and as illustrated in Figure 2, a reflecting mirror of focal distance f is used having a small opening k, and in the focal point or line thereof there is disclosed a small mirror S having a focal distance P of one-quarter wave length.

By virtue of the small mirror S the energy radiated by the excitor E is acted upon such that it is almost completely concentrated on the larger reflector R. In other words, the action is similar to that of an optical search light. Consequently, the radiated cone of energy is greatly narrowed by virtue of which the reflector R is given increased directivity as illustrated by the radiating diagrams 1 and 2 of Figure 3. Curve 1 of Figure 3 was obtained without the reflecting mirror S and curve 2 with the mirror S.

Having thus described my invention, what I claim is:

1. A reflecting system for very short Hertzian waves comprising a reflector whose focal distance is great relative to the wave length of energy to be radiated and with respect to the opening of the reflector, and, another reflector located on the focal line of said first mentioned reflector having a focal length equal to one-quarter of the wave length of energy to be radiated, said last mentioned reflector directing energy into said first mentioned reflector.

2. A short wave reflecting system comprising a first reflector whose focal distance is large with respect to the opening of the reflector, a second reflector located on the focal line of said first reflector, a radiating element in the focus of said second reflector and spaced therefrom a distance equal to one-quarter of the wave length of the energy to be radiated, said second reflector being arranged to direct energy into said first reflector.

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