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E. GERHARD ET AL

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REFLECTOR ARRANGEMENT

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Fig. 1

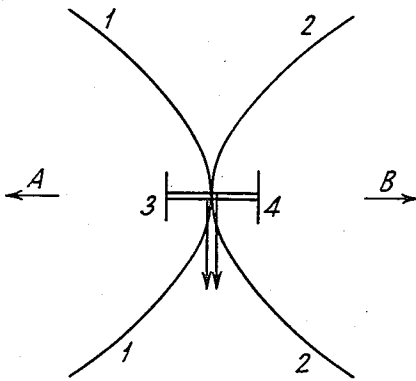


Fig. 2

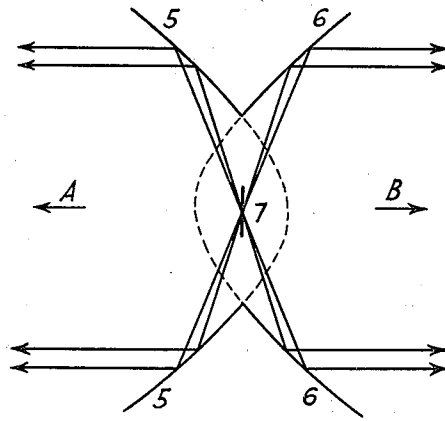


Fig. 3

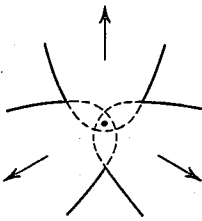


Fig. 4

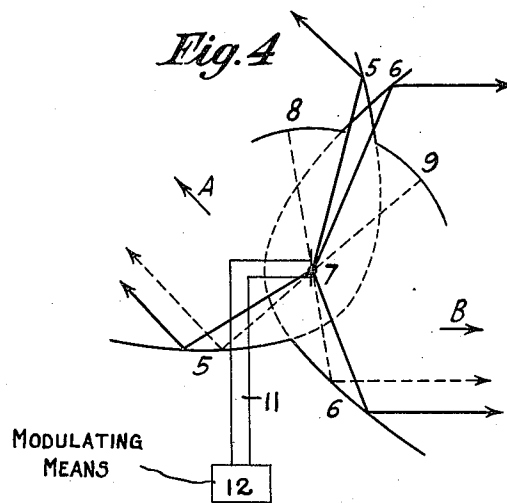
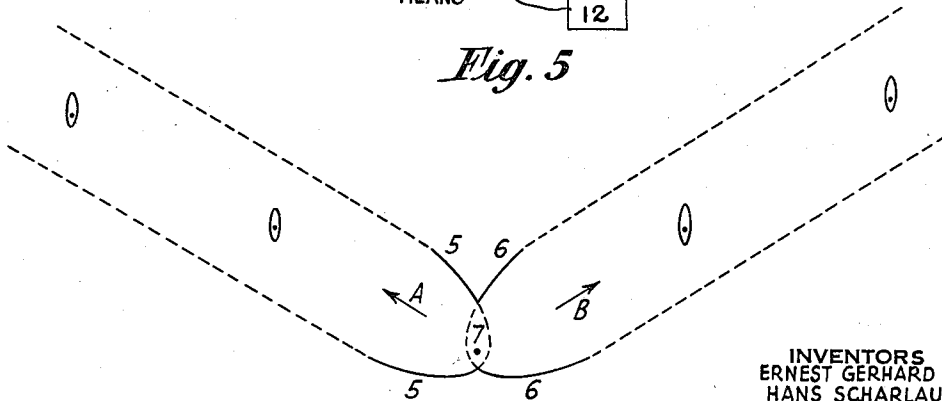


Fig. 5



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REFLECTOR ARRANGEMENT

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4 Claims. (Cl. 250—11)

The present invention relates to a reflector arrangement for enabling simultaneous transmission or reception in two directions.

To provide transmission in or reception from various directions it has hitherto been customary when using parabolic reflectors to arrange the reflectors with the convex surfaces against each other, and to place a radiator in the focal point of each reflector. An arrangement of this type is shown in Fig. 1, wherein the parabolic reflector 1 is equipped with the radiator 3 and radiates in the direction A, while the reflector 2 including the radiator 4 radiates in the direction B. The disadvantage of this type of arrangement is to be seen in the relatively large requirement of material, and in the necessity of matching both radiator dipoles with the power line to the transmitter or receiver.

The foregoing disadvantage, among others, is overcome by the present invention which provides an arrangement wherein only a single dipole is used for both reflectors.

In the drawing, Fig. 1 shows an antenna known to the art, and Figs. 2 to 5 illustrate various embodiments of the present invention.

Fig. 2 shows by way of example one embodiment of the invention. The two parabolic reflectors 5 and 6, representing the cross section of two paraboloids, are so inserted into each other that their focal points coincide. The overlapping parts of the reflector surfaces shown in broken lines in Fig. 2 are cut out leaving the surfaces of the two parabolic reflectors shown in full line in the cross section. The radiator 7 is placed in the common focal point. The course of rays is schematically indicated by the arrows A and B and reveals that dipole 7 has a directive radiation or reception in the direction A as well as in the direction B.

The invention is in no ways limited to the example shown herein. Thus, for instance, the arrangement according to Fig. 2 may, without its own energy source, receive the radiation coming in the direction A, and may radiate in the direction B serving as a relay or repeating station, whereby the ray may eventually be deflected at an angle to the incoming ray. Such arrangement is shown in Figs. 3 and 4. In order to avoid herein the unnecessary loss in radiation towards undesirable directions, auxiliary reflectors 8, 9 are preferably provided. Furthermore the energy of a non-modulated transmitter coming in the direction A could be received on single dipole 7, fed through a two-conductor transmission line 11 to modulating means 12, modulated thereby, and

may again be radiated or further transmitted in the direction B.

As shown in Fig. 3, three or even a greater number of reflectors may be so inserted into each other such that reception from entirely different directions could be assured.

These arrangements of the invention could be used for various purposes. Vehicles travelling at high speed could, with the arrangement according to Fig. 2, send out any desired type of signals in the direction of travel and arrival thereby indicating to vehicles coming from the opposite direction or such passing up the first mentioned vehicles the presence of the latter in fog, as an illustration. Arrangements according to Fig. 3 could be considered for commanding such crafts (or for transmitting signals to them) which move in a certain formation such as V-formation for instance (Fig. 5). Arrangements according to Fig. 4 could be installed on crafts and light towers whereby the individual directions are rendered distinguishable by keying or modulating the radiated energy by means of diaphragms, shields or controlled gas discharged tubes arranged in front of the individual reflectors.

What is claimed is:

1. A short wave radio antenna system comprising two parabolic reflectors facing different directions and arranged to have a common focus and being so designed and constructed that portions of said reflectors which would overlap are omitted, a single antenna in the common focus of both said reflectors, and means for modulating the energy received on one of said reflectors and transmitting said modulated energy from said antenna through said other reflector.

2. A short wave radio antenna system comprising two parabolic reflectors facing different directions and arranged to have a common focus and being so designed and constructed that portions of said reflectors which would overlap are omitted, a single dipole antenna in the common focus of both said reflectors, and means for modulating the energy received on one of said reflectors and transmitting said modulated energy from said antenna through said other reflector, and means for preventing radiation from said antenna in undesired directions.

3. A short wave radio antenna system comprising two parabolic reflectors facing different directions and arranged to have a common focus and being so designed and constructed that portions of said reflectors which would overlap are omitted, a single dipole antenna in the common focus of both said reflectors, and means for mod-

ulating the energy received on one of said reflectors and transmitting said modulated energy from said antenna through said other reflector, and auxiliary reflectors for preventing radiation from said antenna in undesired directions.

5 4. A short wave radio antenna system comprising, in combination, three nested reflectors in the form of surfaces of rotation facing different directions, said reflectors having a common focus
10 and being so constructed and arranged that the

portions of said reflectors which would overlap are omitted, the axes of said reflectors making angles of 120° with respect to one another, a single antenna in the common focus of said reflectors, and means for modulating the energy received on one of said reflectors and transmitting said modulated energy from said antenna through said other reflectors.

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