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L. R. KRAHE

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COMBINATION FEED FOR REFLECTOR DISH-TYPE ANTENNA

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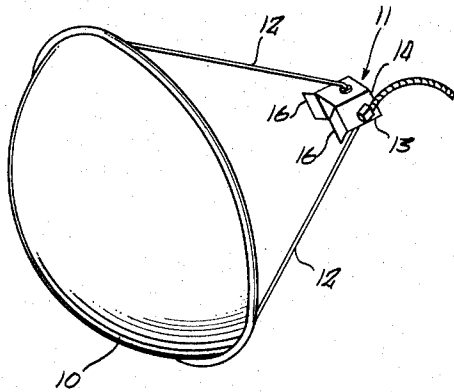


Fig. 1.

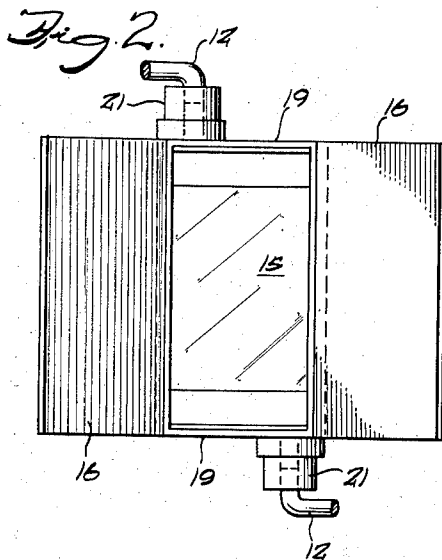


Fig. 2.

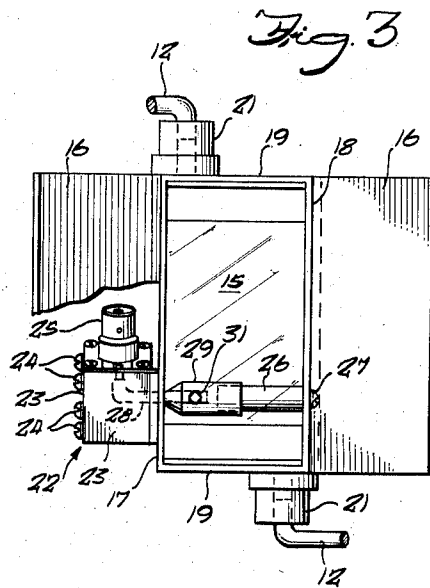


Fig. 3.

Inventor
Lawrence R. Krahe
Attorney

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COMBINATION FEED FOR REFLECTOR
DISH-TYPE ANTENNALawrence R. Krahe, Homewood, Ill., assignor to
Andrew Corporation, Chicago, Ill.

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3 Claims. (Cl. 343—782)

This invention relates to a broad band feed for antennas, and more particularly to a combination feed for a reflector dish type of antenna.

It is an object of this invention to provide a new and improved combination feed for a reflector dish type of antenna.

Another object of this invention is to provide an improved combination feed which is simple in mechanical configuration and inexpensive to produce.

A further object of this invention is to provide an improved combination feed, the impedance of which can be readily matched over a broad band while maintaining the pattern relatively uniform over such band.

Other objects and advantages of the invention will be apparent during the course of the following description when read in connection with the accompanying drawings, wherein:

Figure 1 is a perspective view of the wave guide feed and dish using a solid or air dielectric coaxial cable to feed the wave guide;

Figure 2 is a front view of the wave guide feed of Figure 1; and

Figure 3 is a front view of the wave guide section of Figure 1.

Referring now more particularly to the drawing, there is shown a reflector dish 10 having a combination feed 11 mounted near its focal point by means of support rods 12. The combination feed 11 consists of a rectangular wave guide section 13 which is closed at one end by a wall 14 and has its other open end covered by a plastic window plate 15. Two rectangular flaps 16 each extends at an obtuse angle to the direction of propagation from the long sides 17 and 18, respectively, of the open wave guide section end. The support rods 12 are connected to the short sides 19 of the wave guide section 11 by means of mounting bosses 21.

A feed block assembly 22 is connected to the wave guide section 13 by means of screws 24. A coaxial cable connector 25 is mounted in the center of one of the sides 23, and has appropriate connections for the outer and inner coaxial conductors inside the feed block assembly. An insulating mount 26 is connected by means of a screw 27 to the wave guide wall side 18 opposite the feed block assembly 22. The outer coaxial conductor of connector 25 is connected through the feed block assembly 22 to the walls of the wave guide section 13. The inner coaxial conductor of the connector 25 is connected to a structurally rigid lead 28 which extends into one end of a metal sleeve 29. The metal sleeve 29 is supported on an insulating mount 26 on which it is slidably position. Electrical continuity between the lead 28 and the sleeve 29, as well as a fixed position for the sleeve 29 on its insulating mount 26, is assured by a set screw 31 which can be tightened onto the lead 28 through the sleeve 29. The lead 28 together with the sleeve 29 acts as a probe exciter in the wave guide. The electric waves to be radiated by the combination are introduced by a coaxial conductor connected to the con-

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ductor 25. In a typical model the wave guide has a height of 2.31 inches and a width of 4.46 inches. The flap 16 extends $2\frac{1}{8}$ inches at an angle of 30° to the normal from the wave guide walls 17 and 18.

While there has been shown and described an invention in connection with certain specific embodiments, it will, of course, be understood that it is not wished nor intended to be limited thereto since it is apparent that the principles herein disclosed are susceptible of numerous other applications, and modifications may be made in the structural arrangement and in the instrumentalities employed without departing from the spirit and scope of this invention as set forth in the appended claims.

I claim as my invention:

1. In combination with a dish-type reflector, a broad band antenna feed comprising a short rectangular wave guide section having an open end and a closed end, support rods connecting the wave guide section to the reflector to support the wave guide section, a coaxial feed for said wave guide section having inner and outer conductors an insulating mount in said guide, said outer coaxial conductor being connected to said wave guide section, said inner coaxial conductor extending to said insulating mount, two flaps extending at 30° to the normal from the long sides of said open wave guide section end, said flaps having a width not greater than the lesser dimension of the wave guide section, said open wave guide section end being directed to propagate the high frequency waves supplied by said coaxial feed towards said dish-type reflector.

2. In combination with a dish-type reflector, a broad band antenna feed comprising a short rectangular wave guide section having an open end and a closed end, support rods connecting the wave guide section to the reflector to support the wave guide section, a coaxial feed for said wave guide section having an inner and outer conductor, an insulating mount in said guide, said outer coaxial conductor being connected to said wave guide section, said inner coaxial conductor extending to said insulating mount, two flaps extending at an obtuse angle to the direction of propagation from the long sides of said open wave guide section end, said flaps having a width not greater than the lesser dimension of the wave guide section, said open wave guide section end being directed to propagate the high frequency waves supplied by said coaxial feed towards said dish-type reflector.

3. An antenna comprising a dish-type reflector, a short wave guide section having open and closed ends, support rods supporting the wave guide section with its open end facing the reflector, a coaxial cable having its outer conductor connected to the wave guide section and its inner conductor extending into the wave guide section, an insulator in the wave guide section opposite the end of the inner conductor, a conducting sleeve slideable on the insulator, and conductive fastening means securing the sleeve to the inner conductor to constitute an extension thereof.

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