May 13, 1952 M. D. ERCOLINO 2,596,389

TELEVISION ANTENNA

Filed May 23, 1950

2 SHEETS--SHEET 1

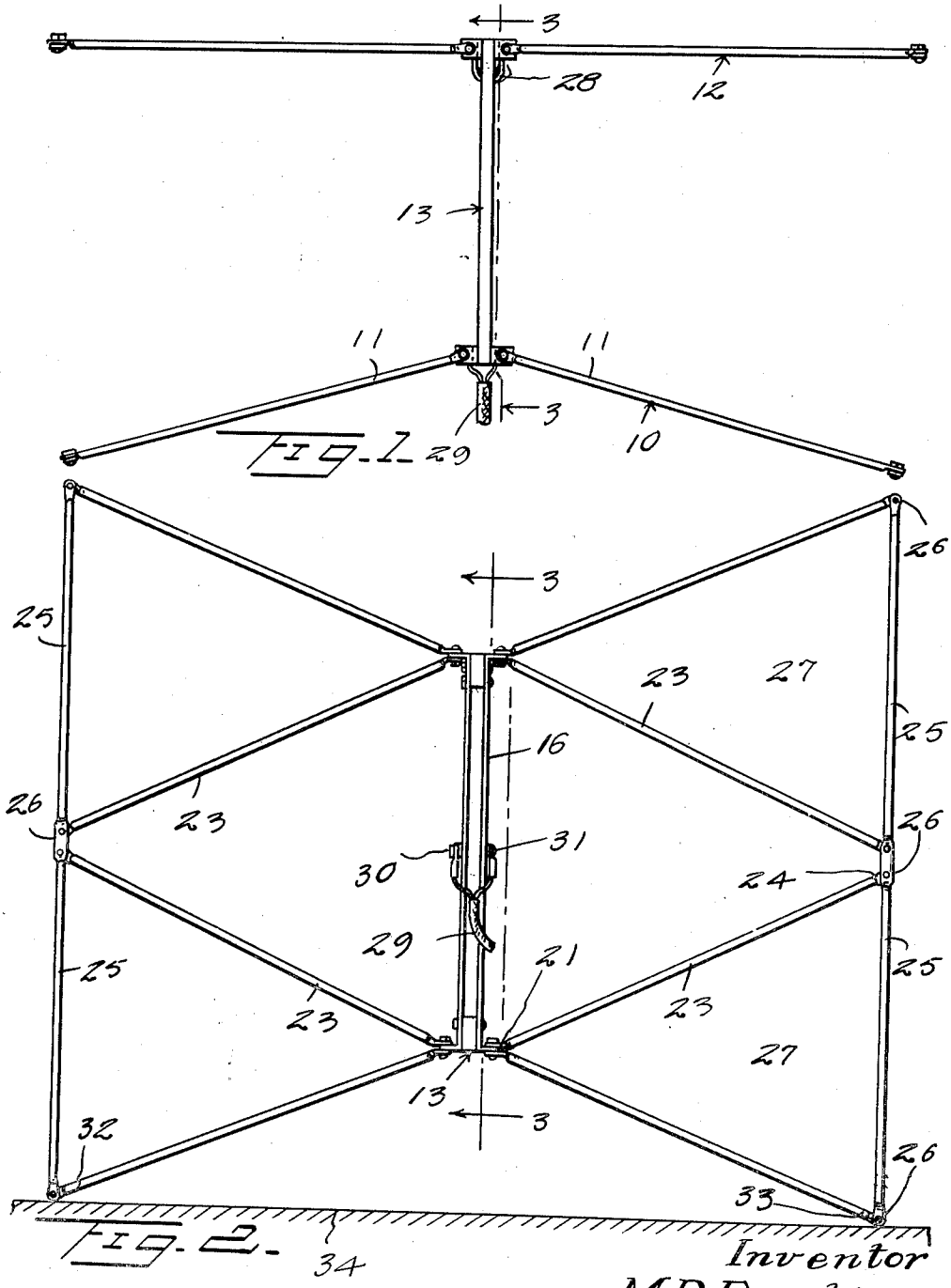


FIG. 1

FIG. 2

Inventor
M.D.Ercolino

By

Kimmel & Crowell Attorneys

May 13, 1952 M. D. ERCOLINO 2,596,389

TELEVISION ANTENNA

Filed May 23, 1950 2 SHEETS—SHEET 2

Fig. 3.

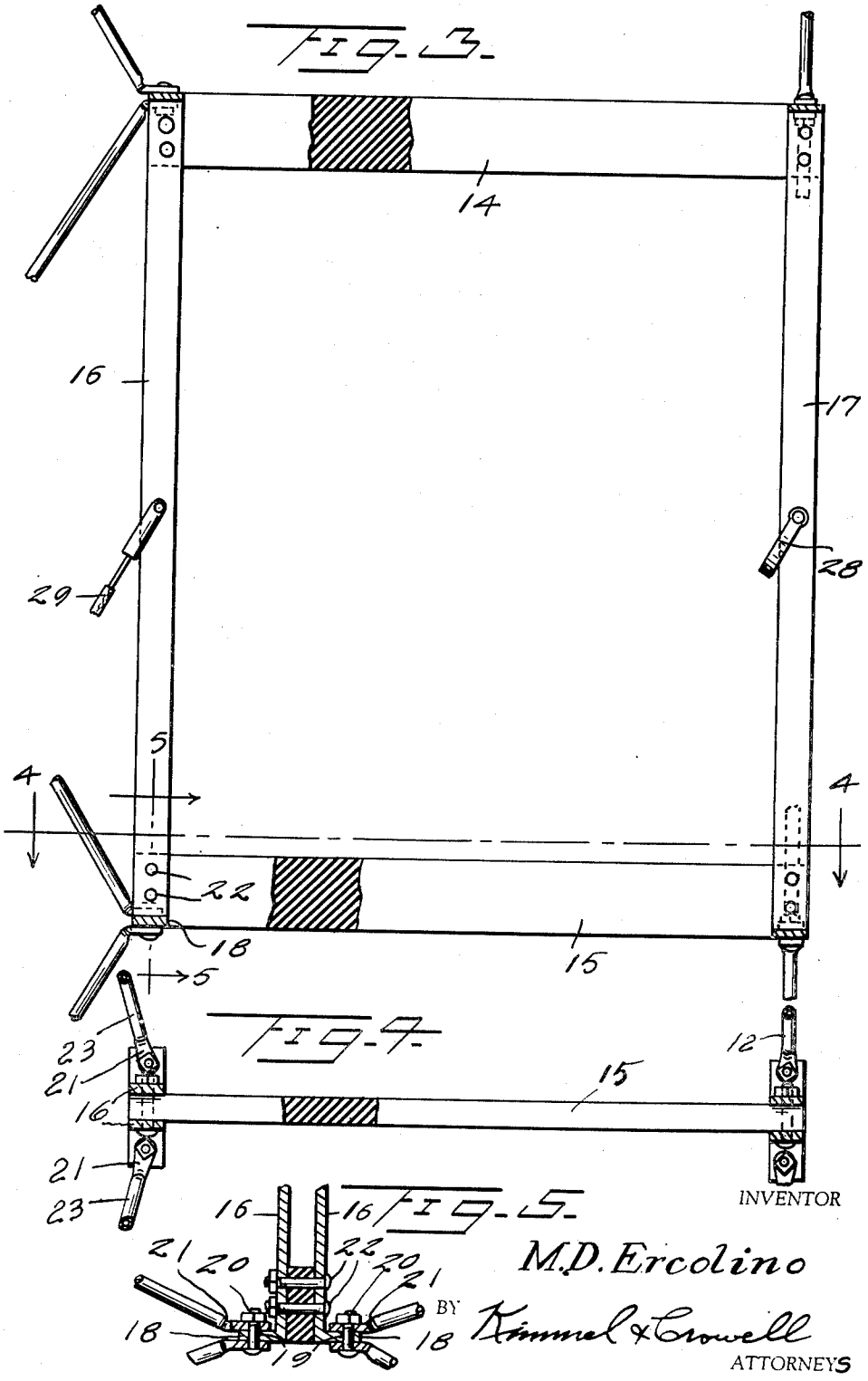


Fig. 4.

Fig. 5.

INVENTOR

M. D. Ercolino

BY Kimmel & Crowell

ATTORNEYS

Patented May 13, 1952

2,596,389

UNITED STATES PATENT OFFICE

2,596,389

TELEVISION ANTENNA

Michael D. Ercolino, Wanamassa, N. J.

Application May 23, 1950, Serial No. 163,717

1 Claim. (Cl. 250—33.57)

1

This invention relates to television antennas and more particularly a closed ended conical dipole type of antenna assembly carried by a self-supporting mount adapted for use within a building.

The conical type of antenna has become well recognized as having high gain characteristics making it efficiently responsible for any wide band application to which it is suitably dimensioned. However, the conventional construction of a conical receiving antenna and particularly a stacked array requires a relatively large heavy assembly that must be well supported and firmly fixed on a roof or a special supporting tower. Such construction is not always feasible at the site of the receiver either due to lack of space or due to restrictions prohibiting the erection of an outside antenna.

The present invention overcomes these difficulties by providing antenna construction wherein a stacked conical array is made self-supporting and ready of assembly in the loft of a building or like space enabling the antenna to be completely concealed and supported by ordinary floor or similar building construction.

It is therefore an object of this invention to provide an antenna assembly that is self-supporting and ready of assembly.

Another object is to provide an antenna array for receiving very high frequency, ultra-high frequency, and higher frequencies of electromagnetic waves comprising a correlated reflector and closed ended conical dipoles capable of being angularly adjusted.

A further object is to provide an antenna that is simple and inexpensive of construction capable of favoring desired signals from one direction while excluding signals from other directions.

A still further object is to provide an antenna so designed that it inherently provides a satisfactory match to a conventional transmission line of either the twin lead or coaxial type.

With these and other objects in view that may appear as the description proceeds, the invention consists in the novel arrangement of cooperating parts as hereinafter more specifically set forth, claimed, and shown in the drawings in which like numbers refer to like parts in the different views.

In the drawings:

Figure 1 is a plan view of the present invention.

Figure 2 is an end elevation.

Figure 3 is a side elevation taken on line 3—3 of Figure 2 showing details of the frame assembly.

Figure 4 is a detail view taken on line 4—4 of Figure 3.

2

Figure 5 is a detail view taken on line 5—5 of Figure 3.

Referring now in detail to the drawings, the antenna of this invention is shown generally by the numeral 10 and is comprised of an antenna array characterized by having a pair of dipoles 11 spaced forwardly of a reflector 12 and angularly adjustable relative to and carried by a vertical frame 13. The frame 13 as best illustrated in Figure 3 is provided with a pair of vertically spaced horizontal separating members 14 and 15. The lengths of members 14 and 15 are such as to provide for suitable spacing of the reflector 12 from the dipoles 11. This spacing is conventionally accepted as approximately one-fourth wavelength of the mean operating frequency at which the system is to operate with the antenna designed for one-half wavelength operation. The members 14 and 15 are constructed of insulating material such as wood or plastic and of suitable strength to support the weight of the dipoles and reflector members. At opposite ends of the members 14 and 15 are provided pairs 16 and 17 of vertical strips separating the members 14 and 15 vertically from each other. The strips 16 and 17 are formed of a conducting material such as aluminum or like metal and are provided with oppositely extending end portions 18 turned at right angles to the strips and bored to provide apertures 19 in which are mounted suitable bolt means 20 for angular connection thereto of the ends 21 of the dipoles and reflector members as best illustrated in Figure 5. The pairs of strips 16 and 17 are secured to the horizontal members 14 and 15 by connecting bolts 22 spaced from the angular ends of the strips.

Both the dipoles 11 and the reflector 12 are formed of suitable metal tubing sections 23 arranged to provide a plurality of irregular triangular shaped cones 27 extending outwardly from the joined frame members 14, 15, 16 and 17. The tube sections 23 are of approximately the same length and are provided with flattened inner ends 21 bolted to the cross members with bolts 20 as previously described with their outer ends 24 also flattened and bolted to vertical tube members 25 as at 26. The lengths of the vertical tube members 25 are such as to close the ends of the cones 27. By closing the ends of the cones 27 by vertical sections 25 causes the dipoles to appear electrically longer, for instance, in securing good coverage for television channel No. 2, namely, 54–60 megacycles, it would be necessary for the sides of the cone 27 to be 46 inches in length whereas by closing the ends of the cones I have secured efficient re-

sponse in this frequency band with a cone of approximately 36 inches in length. This reduction in length or overall dimensions of the dipoles provides a more compact antenna array that will require much less space for its operation and yet provide the same reception that could be attained with a much larger antenna array. This same principle holds true with the construction of my reflector 12 which is similarly constructed and dimensioned to provide an antenna structure having the desired construction characteristics attained by this assemblage. In the forming of the sections 23 only sufficient lengths need be provided to form a conical dipole response to the lowest frequency desired. Dipoles 11 as well as the reflector 12 being bolted at their inner ends to the supporting members by bolts 20 provides for angular adjustment to decrease or increase the angle at the apexes formed thereby to enable the conical dipols to be tilted forwardly as desired to change the electrical pattern of the antenna with the reflector panels 12 disposed either perpendicular to the vertical frame 13, as shown, or angularly thereto as found most desirable. Such tilting forwardly of the dipoles 11 and the angular adjustment of reflector 12 causes the lobes formed in such a pattern to stay in line for all of the higher frequencies enabling the antenna to respond to the desired signals while making it possible to eliminate undesired signals.

The reflector 12 is formed in two parts similar to the dipoles 11 in order to provide for angular adjustment relative thereto. The two parts of the reflector 12 are electrically bonded together by a bond means 28 bolted across the pair of strips 17. The bond 28 functions to electrically lengthen the reflector elements 12 with respect to the driven elements or dipoles 11 while retaining the same physical dimensions as that of the driven elements. This simplifies manufacture and assembly. A twin lead 300 ohm transmission line 29 or any suitable radio frequency transmission line is centrally connected to the dipoles 11 by being bonded to opposite sides of the pair of vertical strips 16 as at 30 and 31.

The preferred mode of mounting and use of

my antenna is to attach the dipoles 11 and reflector 12 to the frame 13 with the extended bottom ends 32 and 33 of cones 27 and corresponding ends of the reflector 12 resting on the floor surface 34 of an attic or like portion of a building in which the antenna is to be used.

The form of the invention illustrated and described herein is the preferred embodiment of the present assemblage in the form now commercially manufactured; however, it is to be understood that this embodiment is for illustrative purposes only and it is pointed out that various modifications and alterations may be made within the scope of the appended claim.

I claim:

A television antenna assemblage comprising a generally rectangular support frame formed of upper and lower horizontal bars formed of nonconducting material, pairs of conducting spacer bars disposed one pair between each end of said first named bars, outwardly projecting ears at each end of said spacer bars, oppositely disposed pairs of superposed conical dipoles having the apex ends thereof inwardly, means securing said apex ends to the ears of one pair of said spacers, vertically disposed connecting members connecting the outer divergent ends of said dipoles together, a reflector means, means securing said reflector means to the ears of the other pair of spacers, and a conducting connector connected between each pair of said spacers.

MICHAEL D. ERCOLINO.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
D. 156,399	Baldi	Dec. 13, 1949
2,175,253	Carter	Feb. 15, 1938
2,199,050	Jenkins	Apr. 30, 1940
2,371,539	Morch	Mar. 13, 1945
2,494,665	Marshall	Jan. 17, 1950
2,535,049	De Rosa	Dec. 26, 1950