July 3, 1951 M. D. ERCOLINO 2,559,149

TELEVISION ANTENNA

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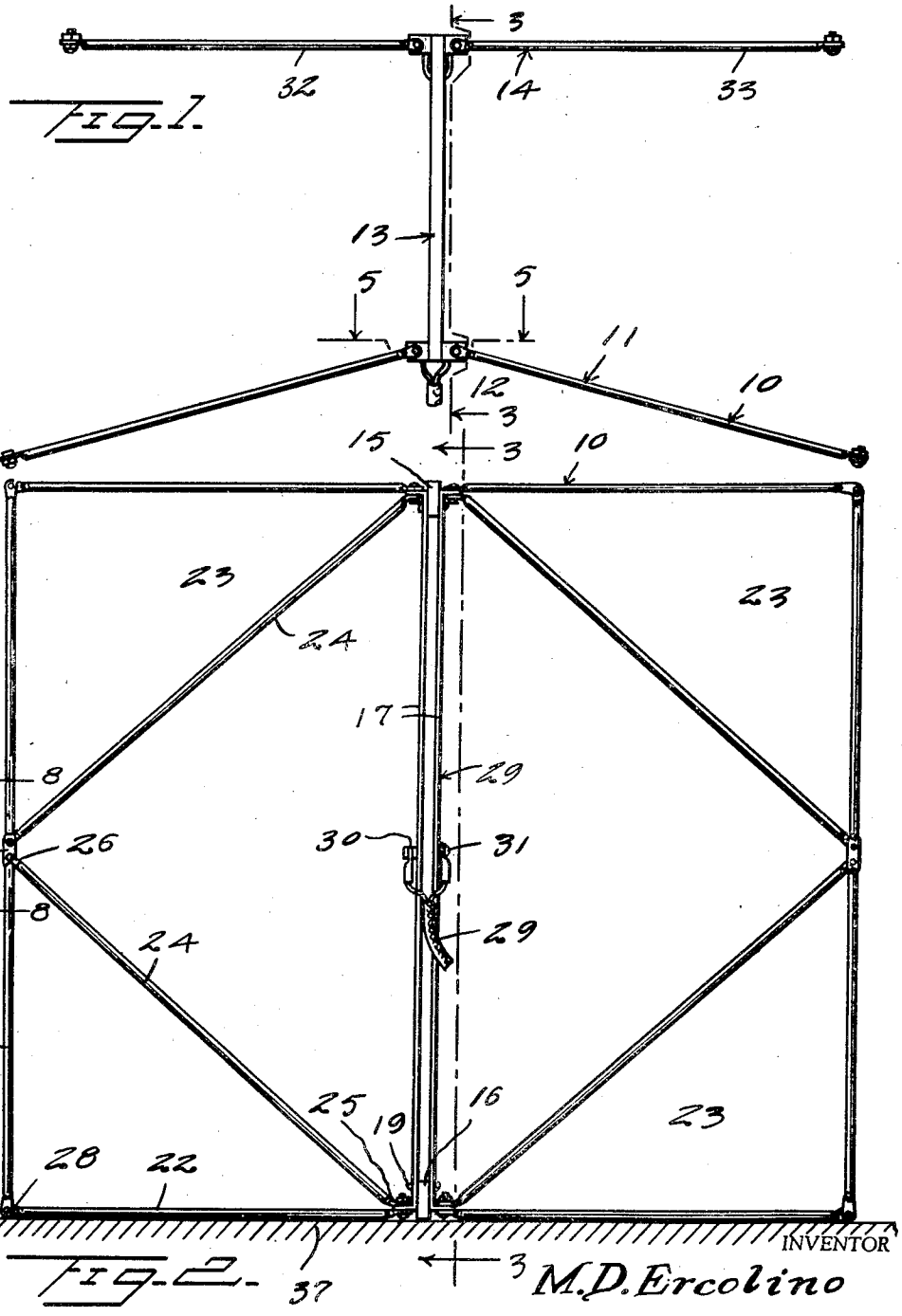


Fig. 1.

Fig. 2.

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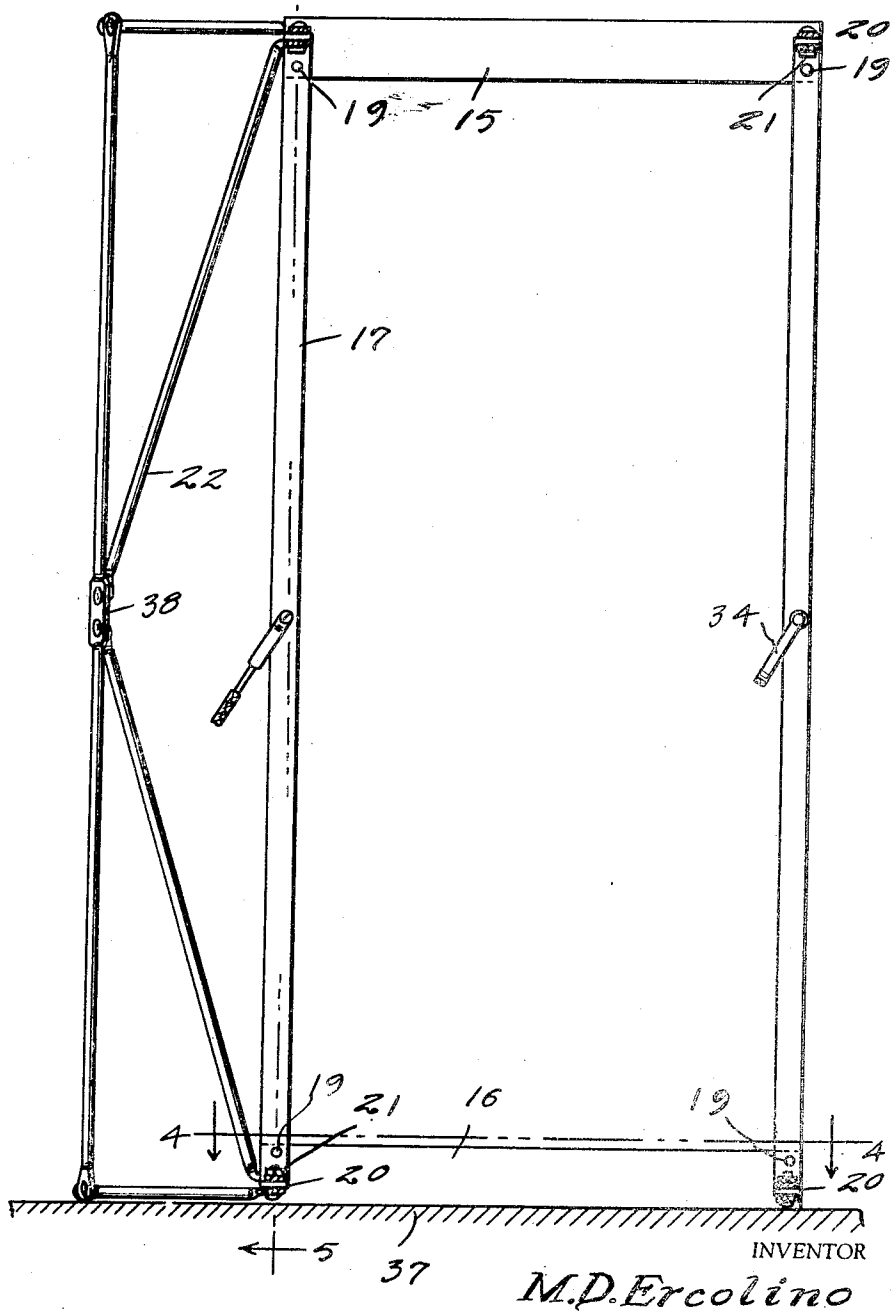
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FIG. 3



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Fig. 4.

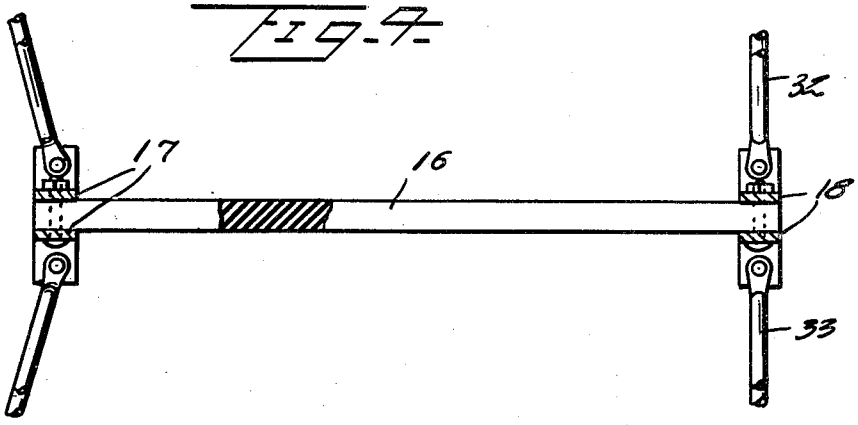


Fig. 5.

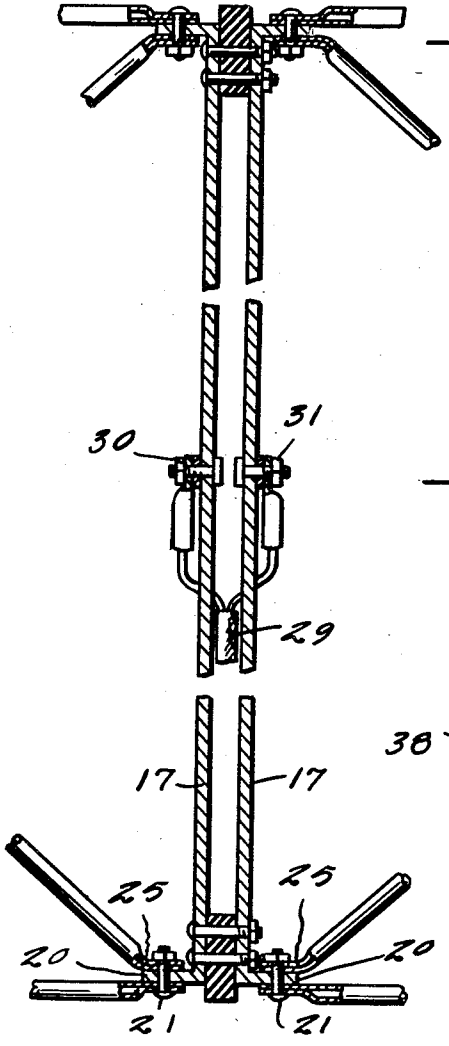


Fig. 6.

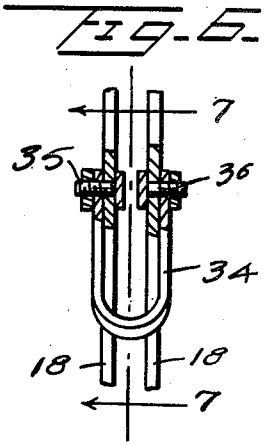


Fig. 7.

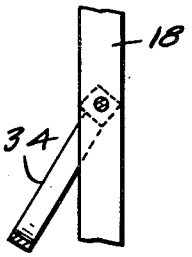
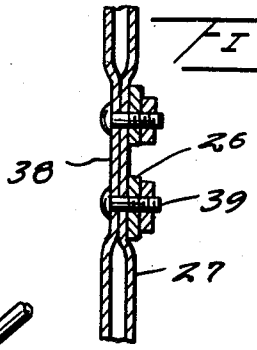


Fig. 8.



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Patented July 3, 1951

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UNITED STATES PATENT OFFICE

2,559,149

TELEVISION ANTENNA

Michael D. Ercolino, Wanamassa, N. J.

Application May 23, 1950, Serial No. 163,719

3 Claims. (Cl. 250—33)

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This invention relates to television antennas and more particularly a closed end conical stacked dipole mounted forwardly of a reflector and carried by a generally rectangular frame and suitable for mounting interiorly of a building.

A large number of homes in which television reception is desired are so situated as to make it necessary to avoid the use of an outside antenna. These homes are ordinarily provided with an attic space or a storage space conveniently located above the room in which the receiver is to be operated.

Therefore it is among the objects of this invention to provide a self-supporting antenna array suitable for mounting in an attic or storage space.

Another object is to provide an antenna array capable of receiving high frequency electromagnetic waves over all of the television and/or micro-wave bands.

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

A still further object is to provide an antenna so designed that it inherently provides a satisfactory match to a convention 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 present 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 of the antenna array of this invention in operating position.

Figure 3 is a side elevation taken on line 3—3 of Figures 1 and 2, showing details of the support frame.

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

Figure 5 is a detail view taken on line 5—5 of Figure 1.

Figure 6 is a detail view of the reflector bond in partial section.

Figure 7 is a detail view taken on line 7—7 of Figure 6.

Figure 8 is a detail view taken on line 8—8 of Figure 2.

Referring now in detail to the drawing the antenna of this invention is shown generally by the numeral 10 and is comprised of a pair of stacked dipoles 11 having ends 12 hingedly carried by a frame 13 to which is also attached a reflector 14 spaced therefrom. The frame 13 is formed generally rectangular and is comprised of a horizontal top member 15 spaced from a horizontal bottom member 16 by pairs 17 and 18 of vertical members bolted to the extreme ends of the horizontal members as best illustrated in Figure 3. This assemblage of parts is secured together by suitable bolts 19 that extend through the metal strips 17 and 18 as well as the horizontal top and bottom members 15 and 16 which are formed of insulating or non-conducting material such as wood. At each end of the pairs of strips 17 and 18 are provided right angularly disposed end portions 20 arranged as mount means extending out from the surface of the strips. Ends 20 of the strips 17 and 18 are apertured to receive a mounting bolt or pivot means 21 positioned laterally of said strips. The strip ends 20 are spaced inwardly from the outer edge of the horizontal members 15 and 16 just sufficiently to allow for positioning of pivots 21 approximately flush with the outer edge surfaces of these members.

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The dipoles 11 are formed of a plurality of tubing sections 22 cut to provide for oppositely disposed right angle triangular frames or cones 23 having the hypotenuse sides 24 of said triangles disposed from the vertical strips 17 and 18 and extending angularly therefrom. Said sections 24 have ends 25 flattened and angularly displaced suitable for mounting on pivot bolts 21 with an opposite end 26 flattened for attachment to a vertical member 27 of similar construction having a flattened portion 38 secured to the ends 26 by suitable bolt means 39 and extending from one end 28 of the outer side 22 of said triangle with said vertical 27 forming the other side of the triangle and positioned at right angles to section 22. This same construction is repeated in all of the cones 23 that constitute the stacked dipole array of this antenna with the dipoles 11 swingingly attached to the pair of vertical strips 17. This arrangement of the dipoles provides a unique V beam antenna system designed to be efficiently responsive over the entire television band range and is capable of adjustment to cancel out undesired signals by forward tilting of said dipoles as found necessary. The desired signals are picked up at a point spaced midway between the apexes of the dipoles from the conducting strips 17 by a twin lead 300 ohm transmission line 29 or any suitable radio frequency transmission line connected to the dipoles at the points 30 and 31 as best illustrated in Figure 2.

Spaced rearwardly of the dipoles 11 is a reflector means 14 formed of a pair of reflector panels 32 and 33 of similar construction as that of the dipoles swingingly attached to the pair of vertical strips 18 making it possible for the reflector panels to be adjusted for parallel or angular positioning relative to the dipoles 11. The reflector panels 32 and 33 act as parasitically driven elements effectively spaced from the "driven" dipoles 11 and are normally disposed at right angles to the frame 13. However, I have found that under certain conditions angular displacement of the panels 32 and 33 rearwardly of the frame 13 will effect clearer reception of certain desired signals not otherwise attained. Reflector panels 32 and 33 are electrically bonded together by a bond means 34 bonded to the strips 18 as at 35 and 36 as best illustrated in Figures 6 and 7. Bond 34 is of a predetermined length and functions to electrically lengthen the reflectors 32 and 33 with respect to the dipoles 11 while retaining the same physical dimensions. Such construction simplifies manufacture and assembly as both the dipoles and reflectors can be made interchangeable.

It is preferable that all of the parts of antenna 10 or at least a greater portion thereof be separable so as to provide for demountability for conveying to the point of use in a knockdown condition. This type of construction is highly desirable as it lends itself well to mounting of the array supported by an attic floor 37 or similar building construction.

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 claims.

I claim:

1. A demountable television antenna comprising a frame having oppositely spaced pairs of conducting strips, each of said strips being separated from an adjacent strip and the said pairs spaced apart by a pair of non-conducting cross bars disposed at the ends of said strips, the ends of said strips being formed with right angularly disposed lugs, a dipole having adjacent ends swingingly carried by said lugs with outer ends angularly adjustable for forward bending of said dipole, and a reflector means carried by the other pair of strips having oppositely disposed sides hingedly connected to spaced lugs of the strips with said strips being electrically bonded together.

2. A demountable television antenna comprising a frame formed with oppositely spaced pairs of conducting strips of uniform length, said strips being formed with ends bent at right angles thereto to provide spaced abutments, a pair of non-conducting spacers extending between said pairs of strips placed parallel, said spacers being secured between said ends with said spaced abutments disposed outwardly from the strips, a stacked dipole having adjacent poles formed of conducting sections joined together at the ends thereof to form right angle triangles disposed outwardly from a pair of said strips with apex ends pivotally connected to said abutments and opposite sides disposed parallel to said strips, the adjacent sides of two of the triangles being disposed in the same plane, a reflector means carried by a pair of parallel strips spaced from the first mentioned pair of strips, said reflector being comprised of independently swinging oppositely extended arms having inner ends pivotally attached to said spaced abutments of an adjacent strip, said arms being formed with bottom members horizontally adjustable in the same plane, and a conducting means extending between said arms.

3. A demountable antenna comprising a frame engageable with a plane surface, said frame being formed with a plurality of spaced conducting members spaced apart by non-conducting spacing members, opposed abutments carried by said conducting members, a stacked conical dipole carried by said conducting members, said dipole being formed with spaced poles formed generally rectangular with outer sides disposed from said conducting members and intermediate members extending at an acute angle from opposite corners to connect with one of said outer sides of each pole, said poles being disposed between opposed abutments at said opposite corners and pivotally connected thereto for swinging movement about the ends of said conducting members to vary the unidirectional characteristics of said dipole, with a transmission line connected to said poles, and a reflector means having electrically connected extended arms pivotally carried by conducting members spaced from said first mentioned members for swinging adjustment with said dipoles.

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