Sept. 2, 1958 H. H. PERSON, JR 2,850,734

TELEVISION ANTENNA

Filed Sept. 24, 1954

Fig. 1

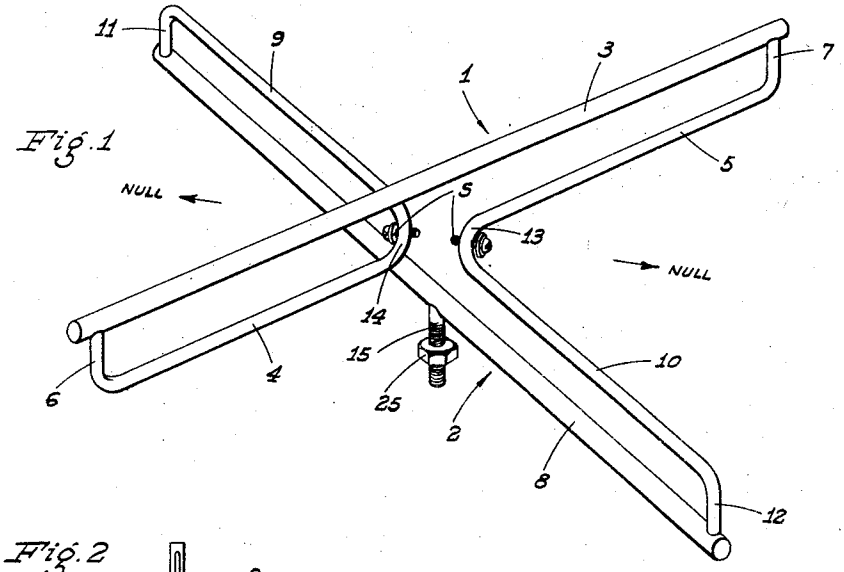


Fig. 2

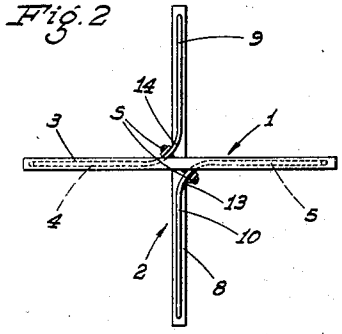


Fig. 3

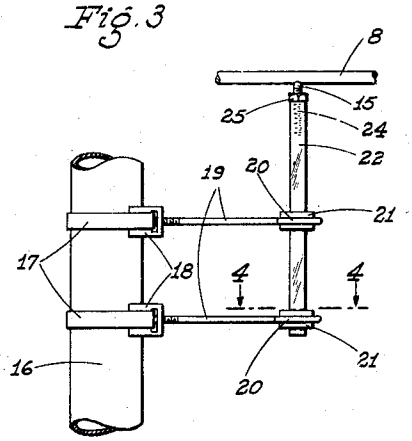


Fig. 5

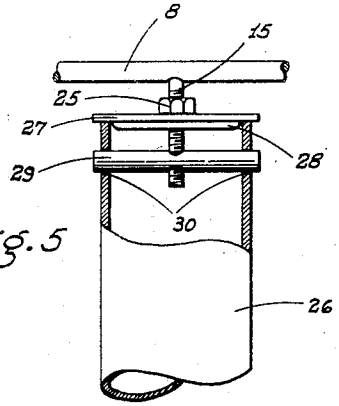
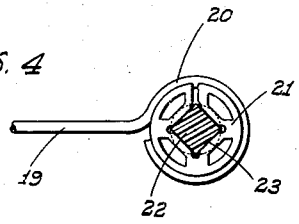


Fig. 4



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TELEVISION ANTENNA

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6 Claims. (Cl. 343—803)

The present invention is directed to, and it is an object to provide, an improved receiving antenna, particularly a high-frequency, turn-style-like antenna for reception of horizontally polarized waves such as are encountered in television transmissions.

Another object of the invention is to provide an effective multi-directional, high-frequency antenna for the reception of television transmissions.

An additional object of the invention is to provided a television antenna which is broadly resonant over a relatively wide range of frequencies, permitting multi-channel operation without undue frequency discrimination.

A further object of the invention is to provide an antenna characterized by the ability to accomplish a maximum of noise or reflected signal rejection.

A still further object of the invention is to provide an antenna, of the type described, which is entirely self-supporting; i. e., a rigid unit which eliminates the need of insulators between the elements and the resulting signal attenuation during periods of high humidity or dampness.

Still another object of the invention is to provide an antenna, for the purpose described, which is designed for ease and economy of manufacture; the antenna being very simple, yet compact and rugged.

A separate object of the invention is to provide versatile mounts for an antenna of the type described.

It is also an object of the invention to provide a practical and reliable television antenna, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a perspective view of the antenna, detached.

Fig. 2 is a top plan view, on a reduced scale, of the antenna.

Fig. 3 is a side elevation showing the mount employed for supporting the antenna from and laterally of a mast; the antenna being mainly broken away.

Fig. 4 is a fragmentary sectional plan view taken on line 4—4 of Fig. 3.

Fig. 5 is an elevation showing the mount employed to support the antenna above and from the upper end of a mast; the latter being partly in section, and the antenna being mainly broken away.

Referring now more particularly to the drawings and to the characters of reference marked thereon, and particularly at present to Figs. 1 and 2, the antenna comprises a pair of folded dipoles, indicated generally at 1 and 2; such dipoles being disposed in symmetrical, right angle, intersecting relationship.

The folded dipoles 1 and 2 are of identical construction, except that the lower dipole 2 is inverted relative ot the upper dipole 1.

The upper dipole 1 comprises an upper, full-length conductor rod 3, and a pair of substantially half-length conductor rods 4 and 5 disposed in spaced relation below rod 3 in parallelism both in a vertical and horizontal plane.

At their outer ends the conductor rods 5 are rigidly connected to corresponding ends of the rod 3 by integral upturned connection fingers 6 and 7 which are attached, as by welding or the like, to said rod 3.

The lower folded dipole 2 comprises a lower, full-length conductor rod 8 located a predetermined distance below the rod 3.

A pair of substantially half-length conductor rods 9 and 10 are disposed in spaced relation above the rod 8, being parallel thereto in both a vertical and horizontal plane. At their outer ends the conductor rods 9 and 10 are secured in rigid relation to the corresponding ends of the rod 8 by integral downturned fingers 11 and 12 which are attached, as by welding or the like, to said rod.

The substantially half-length conductor rods 5 and 10, and 4 and 9, are connected in integral relation at their adjacent ends by a rounded corner bend; said bends being indicated at 13 and 14, respectively.

These integrally connected rods 5 and 10, and 4 and 9, all lie in the same horizontal plane; the rods 3 and 8 being spaced, in the preferred embodiment, an inch and a half apart between centers, and the horizontal plane of the rods 5 and 10, and 4 and 9, being half way between said centers.

All the rods from which the antenna is constructed are preferably of cold rolled steel suitably plated; the rods 3 and 8 having a greater diameter than the remaining rods. In the instant embodiment the rods 3 and 8 are 5/16 inch in diameter, while the rods 4, 5, 9, and 10 are 3/16 inch in diameter.

The receiving field pattern of the described antenna is roughly circular, with the exception of two sharply and clearly defined null points. See Fig. 1. These null points provide an excellent method of ghost (reflected signal) or noise rejection. The antenna is rotated in azimuth until the unwanted signal falls within a null point, and thus for all practical purposes complete rejection is accomplished.

The described antenna, with its two folded dipoles, self-supportingly stacked at 90° one to the other, with the lower dipole inverted relative to the upper dipole, and both connected at the related center points, accomplishes a very effective, substantially omni-directional broad band, ultra-high-frequency television reception.

The corner bends 13 and 14 are provided, centrally, with terminal screws S to which the leads of a transmission line are connected; such line thence extending into the building to the television receiver. A stud 15 is rigidly secured on and depends from the rod 8 centrally of its length, for supporting connection with a mast or other upright, as will be hereinafter seen.

While the conductor rods 3 and 8 are described as full-length, and the rods 4, 5, 9, and 10 as half-length, their electronic value is of course one-half wave length, and one-quarter wave length, respectively.

The above described antenna is adapted to be supported in a horizontal position of use by a mount, such as shown in Figs. 3 and 4, or by a mount as shown in Fig. 5.

The mount shown in Figs. 3 and 4 is adapted to support the antenna laterally out from a mast 16 and comprises a pair of straps 17 which encircle the mast 16, in vertically spaced relation; such straps each including a buckle 18. Standoff rods 19 are threaded into and lock the buckles 18, and at their outer ends said standoff rods 19 each include a vertical axis eye 20 which carries a split grommet 21 of compressible material, such as rubber or the like.

An antenna supporting post **22** extends vertically through both of the grommets **21** and projects upwardly to a termination thereabove. The post, at least at the point of engagement in the grommets **21**, is square-sided, as at **23**, so that upon compression of each grommet by pinching the related eye **20** inwardly by a pair of pliers, the grommet grips the post in a manner to prevent its rotation about a vertical axis. This is important as it maintains the initial orientation of the antenna.

The antenna is disposed above the post **22**, with the stud **15** threaded into the upper end portion of said post, as at **24**; the stud being locked against accidental turning by a lock nut **25** on said stud which bears tightly against the upper end of the post **22**.

This same type of mount can be used to support the antenna laterally from a wooden part of a roof or from a wooden mast by omitting the straps **17** and buckles **18**, and forming the inner ends of the standoff rods **19** with screw points adapted to be run into the wood.

The mount as shown in Fig. 5 is adapted to support the antenna directly above the upper end of a tubular mast **26**, and this embodiment of the mount comprises a cap plate **27** of a diameter to rest on and close the upper end of said mast **26**. The cap plate **27** is centrally dished, as at **28**, to form a locator which depends into the upper end portion of the mast **26**, preventing lateral displacement of the cap plate **27**.

A cross pin **29** is disposed in the upper portion of the mast **26** adjacent but below the cap plate **27**, and said cross pin projects, at its ends, through alined bores **30** in opposite sides of said mast.

The antenna is disposed centrally above the cap plate **27**, with the stud **15** depending centrally through an opening in said plate and therebelow being threaded through the cross pin **29**, as shown.

The lock nut **25** on the stud **26** is turned down tightly against the cap **27**, which effectively imparts upward tension on the stud **15** and clamps the cap plate **27** downwardly against the upper end of the mast **26**.

In each of the embodiments the mount is simple in structure, easy to install, and thereafter rigidly supports the antenna in the selected rotative position thereof. Additionally, the mounts permit initial placing of the antenna in a location of maximum signal strength with a minimum of difficulty.

As the stud **15** is secured to the antenna at the low voltage point, it is possible to employ mounts which do not necessarily include insulators.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations therefrom may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. An antenna comprising an upper folded dipole and a lower folded dipole, said dipoles being stacked in symmetrical intersection at right angles to each other, the adjacent corresponding open ends of the dipoles being fixedly connected to form a rigid unit and to define signal take-off points, terminal elements at said points, and means on the unit to secure the same to a mount; the lower dipole including a full length rod at the bottom of the stack, and said securing means being a threaded stud fixed to and depending from said rod centrally of its ends.

2. An antenna comprising an upper folded dipole and a lower folded dipole, said dipoles being stacked in symmetrical intersection at right angles to each other, the lower dipole being inverted relative to the upper dipole, the latter including a full length upper rod, a pair of substantially half-length rods disposed in spaced parallel relation below said upper rod, connections between the outer ends of the substantially half-length rods and corresponding ends of said upper rod, the substantially half-length rods being alined but spaced at adjacent ends; the lower dipole including a full length lower rod, another pair of substantially half-length rods disposed in spaced parallel relation above said lower rod, connections between the outer ends of said other pair of substantially half-length rods and corresponding ends of said lower rod; corresponding rods of said pairs being connected at their adjacent inner ends; all of the connected parts forming a rigid unit; and means on said unit to secure the same to a mount.

3. An antenna, as in claim 2, in which all of said substantially half-length rods are disposed in a horizontal plane centrally between said upper and lower rods.

4. An antenna, as in claim 3, in which the upper and lower rods are of a diameter greater than the diameter of said substantially half-length rods.

5. An antenna comprising an upper folded dipole and a lower folded dipole, said dipoles being stacked in symmetrical intersection at right angles to each other, the adjacent corresponding open ends of the dipoles being fixedly connected to form a rigid unit and to define signal take-off points, terminal elements at said points, a threaded stud fixed to and depending from the lower dipole centrally of its ends, a post, the stud being threaded into the upper end of the post, a pair of vertically spaced standoff rods projecting laterally from the post, an eye on the adjacent end of each standoff rod surrounding the post, a grommet in each eye frictionally engaged about the post, and means to secure the standoff rods at the other end to a support.

6. An antenna comprising an upper folded dipole and a lower folded dipole, said dipoles being inverted relative to each other and each including a full length rod, one full length rod being uppermost and the other full length rod being lowermost, said dipoles being stacked in symmetrical intersection at right angles to each other, a pair of substantially half-length rods disposed in spaced parallel relation below the upper full length rod and another pair of rigid substantially half-length rods disposed in spaced parallel relation above the lower full length rod, means rigidly connecting said pairs of substantially half-length rods at their outer ends to the corresponding ends of the full length rods, the inner ends of corresponding, substantially half-length rods of the separate pairs being rigidly connected by an integral corner bend, all of said half length rods being in the same horizontal plane and said plane being disposed centrally between said upper and lower full length rods, terminal elements on each of said corner bends, and a mounting element secured centrally to and projecting vertically from one of said full length rods.

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