June 14, 1966 J. P. DE OLIVEIRA 3,256,522

TV ANTENNA WITH CIRCULAR SEMI-DIPOLES

Filed Feb. 19, 1963 2 Sheets-Sheet 1

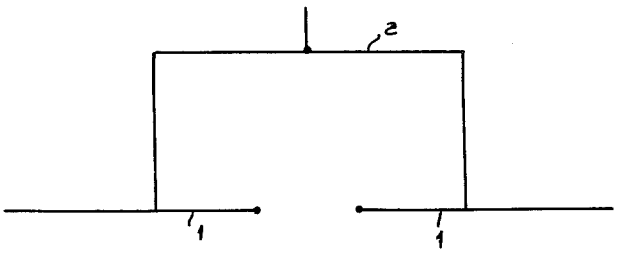


FIG. 1

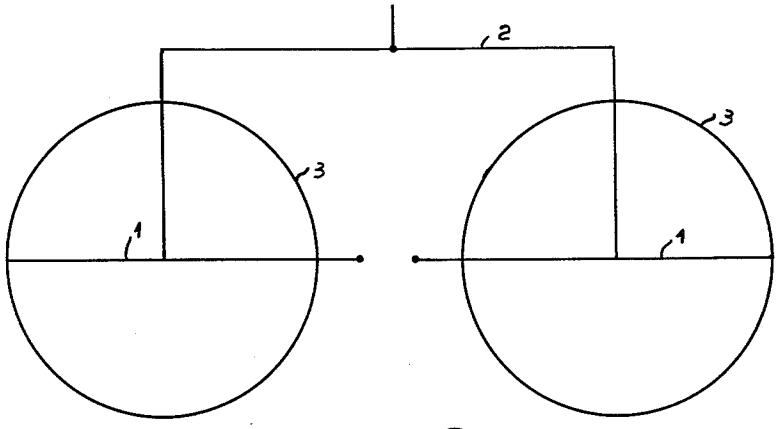


FIG. 2

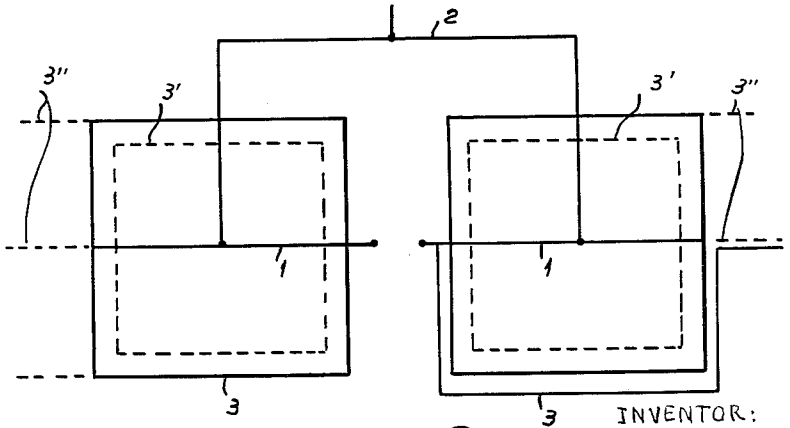


FIG. 3

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TV ANTENNA WITH CIRCULAR SEMI-DIPOLES

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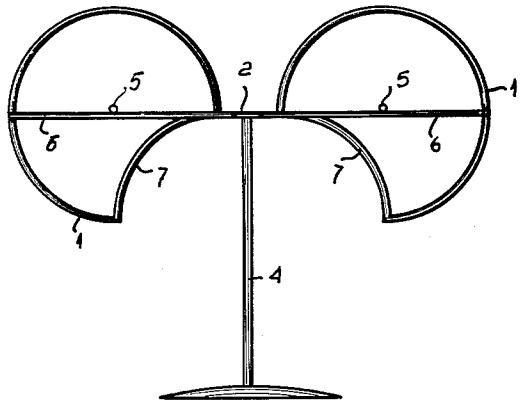


FIG. 4

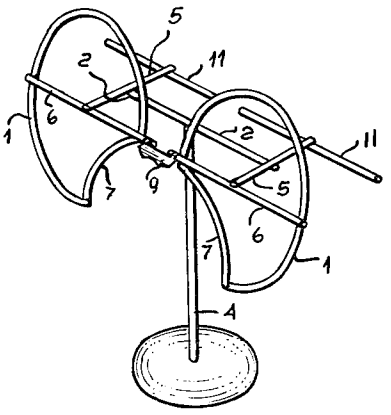


FIG. 5

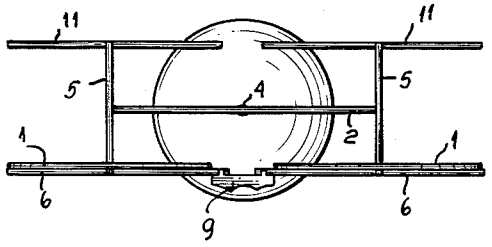


FIG. 6

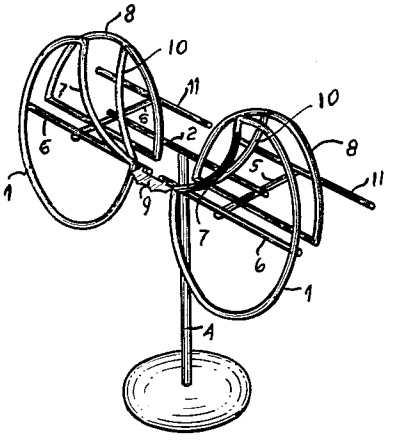


FIG. 7

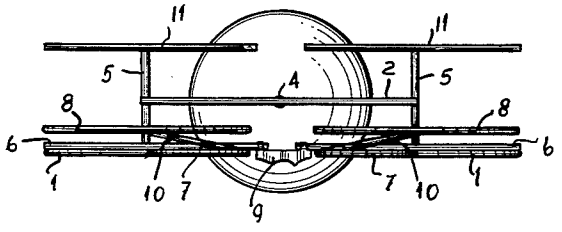


FIG. 8

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TV ANTENNA WITH CIRCULAR SEMI-DIPOLES

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5 Claims. (Cl. 343—807)

This invention relates to a television antenna and refers more particularly to a receiver antenna for all frequencies provided with circular semi-dipoles.

In prior art there are many different types of antennas of varied forms and sizes ranging from the simplest ones to antennas with the most complicated dipoles having directional elements, reflectors and inductors for picking up television broadcasts from great distances.

As a rule all these known antennas have a low output, and they produce superposed images or ghosts. Furthermore, as a rule, they are heavy and massive and shake under the wind since they have large open surfaces.

An object of the present invention is to improve prior art constructions through the provision of an antenna having a high output and low weight, since it consists of aluminum tubes of reduced dimensions, the antenna being so constructed that ghosts are entirely eliminated.

Another object is the provision of an antenna of comparatively simple construction which despite its small size has substantially high and uniform efficiency for providing good reception throughout a wide range of television channels, including VHF, UHF and MF bands irrespective of its distance from the transmitter.

Other objects of the present invention will become apparent in the course of the following specification.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings in which:

FIGURES 1, 2 and 3 illustrate diagrammatically three antennas which were developed by the present inventor in the course of his experimental work.

FIGURE 4 is a front view of an antenna constituting the present invention and developed as the result of such experimental work.

FIGURE 5 is a perspective view of the antenna shown in FIG. 4.

FIGURE 6 is a top view of the antenna shown in FIGS. 4 and 5.

FIGURE 7 is a perspective view of a somewhat differently constructed antenna of the present invention adapted for reception from great distances.

FIGURE 8 is a top view of the antenna shown in FIG. 7.

The antennas shown in FIGS. 5 and 7 and constituting the present invention were the results of many years of tests and experimentation by the present inventor.

Initially it was determined that an antenna of greater output could be obtained with whole wave dipoles **1** the centers of which were connected to the boom **2**, as illustrated in FIG. 1. An antenna of this type could be specifically set for a given channel but it could also pick up adjacent channels.

However, it was found that an antenna of this type is too large, particularly when required to pick up low frequency channels, so that it is impractical for domestic installation.

In the course of further experimentation one dipole was cut into two semi-dipoles having a length of 60 centimeters, the centers of the dipoles **1** being linked to the boom **2**; furthermore, the ends of the dipoles were linked by circular conductors **3**, thus resulting in the construction shown in FIG. 2. It was found that this antenna can be perfectly directed and has excellent reception including UHF. The reception of low frequency channels is greatly improved due to longer central connections.

It was also found that the interlinkage instead of being circular can be polygonal, as in FIG. 3. The reception of low frequency channels was still further improve by the square shape of the conductors **3**, which were combined with inner concentric conductors **3'** and side extensions **3''**. The inner conductors increase the gain while the side extensions are made proportional to the wave length of each channel.

Finally, as the result of experimentation with these structures the antennas of the present invention were produced which are shown in FIGS. 4 to 8.

The antenna shown in FIGS. 4, 5 and 6 is intended for use in urban and suburban areas at short distances from broadcasting stations. It includes a post **4** supporting the center of a bar **2**. Transverse conductors or conducting rods **5** are attached to opposite ends of the bar **2**. There are two semi-dipoles **1** connected at their centers by conducting booms or rods **6**. Each semi-dipole **1** has a circular portion and a concave reentering portion **7** covering about one quarter of the circle. Experimentation has shown that this concave portion improves the pick up of broadcasts in low frequencies. The centers of the rods **6** are connected to alined ends of the rods **5**. The opposite ends of rods **5** carry reflector bars **11** of equal length which is about the same as the diameter of the semi-dipole.

The semi-dipoles can be square instead of round or they can have any other suitable annular shape.

Practical experience has shown that the bars **11** constitute an important feature of the present invention since they function as powerful reflectors which impede the reception of back waves and avoid wave echoes, so that ghosts are entirely eliminated. It is important, however, that the bars extend in alinement with the horizontal diameter of the semi-dipoles.

FIGURES 7 and 8 illustrate an antenna of the present invention which is reinforced with additional elements so that it is particularly suitable for reception from far away stations. This antenna is an excellent substitute for complicated and heavy antennas known in prior art. It includes the basic parts of the antenna of FIG. 5, namely, it has a post **4**, a central bar **2** upon the post, transverse rods **5** carried by the ends of bar **2** and two semi-dipoles **1** each having a concave section **7** which, however, in this construction is located in the upper portion of the semi-dipole, the two concave sections of the two semi-dipoles facing each other. However, this antenna additionally includes a second pair of conductors or semi-dipoles **8** mounted upon the same rods **5** a short distance from the semi-dipoles **1** and functioning as inductors. In the example illustrated the conductors **8** are semicircular in shape having the same diameter as that of the semi-dipoles.

However, for longer distances the conductors **8** may have the shape of full circles.

The adjacent parts of the semi-dipoles **1** are joined by an electrical connection **9** leading to the feeding source (not shown). The conductors **8** are joined to the connection **9** by slightly curved slantingly extending rods **10**. One end of each rod **10** is connected to the electrical connection **9** while its other end is connected to a conductor **8** adjacent the top of the curved conductor. The antenna is also provided with bars **11** which are carried by the ends of rods **5**. The construction and the arrangement of bars **11** are the same as in the antenna shown in FIG. 5 and they have the same purpose, namely, that of serving as powerful reflectors.

It is apparent that the antennas of the present invention as shown in FIGS. 5 and 7 constitute a substantial improvement over prior art antennas since despite their small dimensions (the maximum overall length being about 51 inches) they operate with high efficiency and have excellent reception throughout a wide frequency range including VHF, UHF and MF bands irrespective of the distance from the transmitter. The small size and light weight of the antennas make them economically advantageous; their shape makes it possible for them to resist strong winds and any kind of bad weather.

What I claim is:

1. A television antenna, comprising a post, two semi-dipoles symmetrically disposed on opposite sides of said post, each of said semi-dipoles comprising a conductor of closed geometrical configuration and a horizontal boom extending across said conductor and connected to opposite sides thereof; transverse conductors having ends connected to the centers of said booms, a bar connected at its center to said post and connected to said transverse conductors intermediate their ends, and reflector bars connected to opposite ends of said transverse conductors.

2. A television antenna in accordance with claim 1, wherein the first-mentioned conductor is of substantially circular configuration.

3. A television antenna in accordance with claim 2, wherein the first-mentioned conductor has a concave re-entering portion comprising substantially one quarter of the circular configuration.

4. A television antenna, comprising a post, two semi-dipoles symmetrically disposed on opposite sides of said post, each of said semi-dipoles comprising a conductor of substantially circular configuration, and a horizontal boom extending across said conductor and connected to opposite sides thereof; transverse conductors having ends connected to the centers of said booms, reflector bars extending parallel to said booms and having centers connected to the other ends of said transverse conductors, the lengths of said reflector bars being equal to the diameters of the first-mentioned conductors, and a bar connected at its center to said post and having ends connected to the centers of said transverse conductors.

5. A television antenna in accordance with claim 4, further comprising two conductors located adjacent the first-mentioned conductors and having a closed geometrical configuration which at least partly corresponds to and is in alignment with that of the first-mentioned conductors, a receiver connection connected with said booms and means connecting the last-mentioned conductors to said receiver connection.

References Cited by the Examiner

UNITED STATES PATENTS

2,546,322	3/1951	Smith	343—821
2,615,005	10/1952	White	343—815 X
2,939,143	5/1960	Zisler	343—807 X
2,992,430	7/1961	Winegard	343—816

FOREIGN PATENTS

128,728	7/1950	Sweden.
873,711	4/1953	Germany.

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