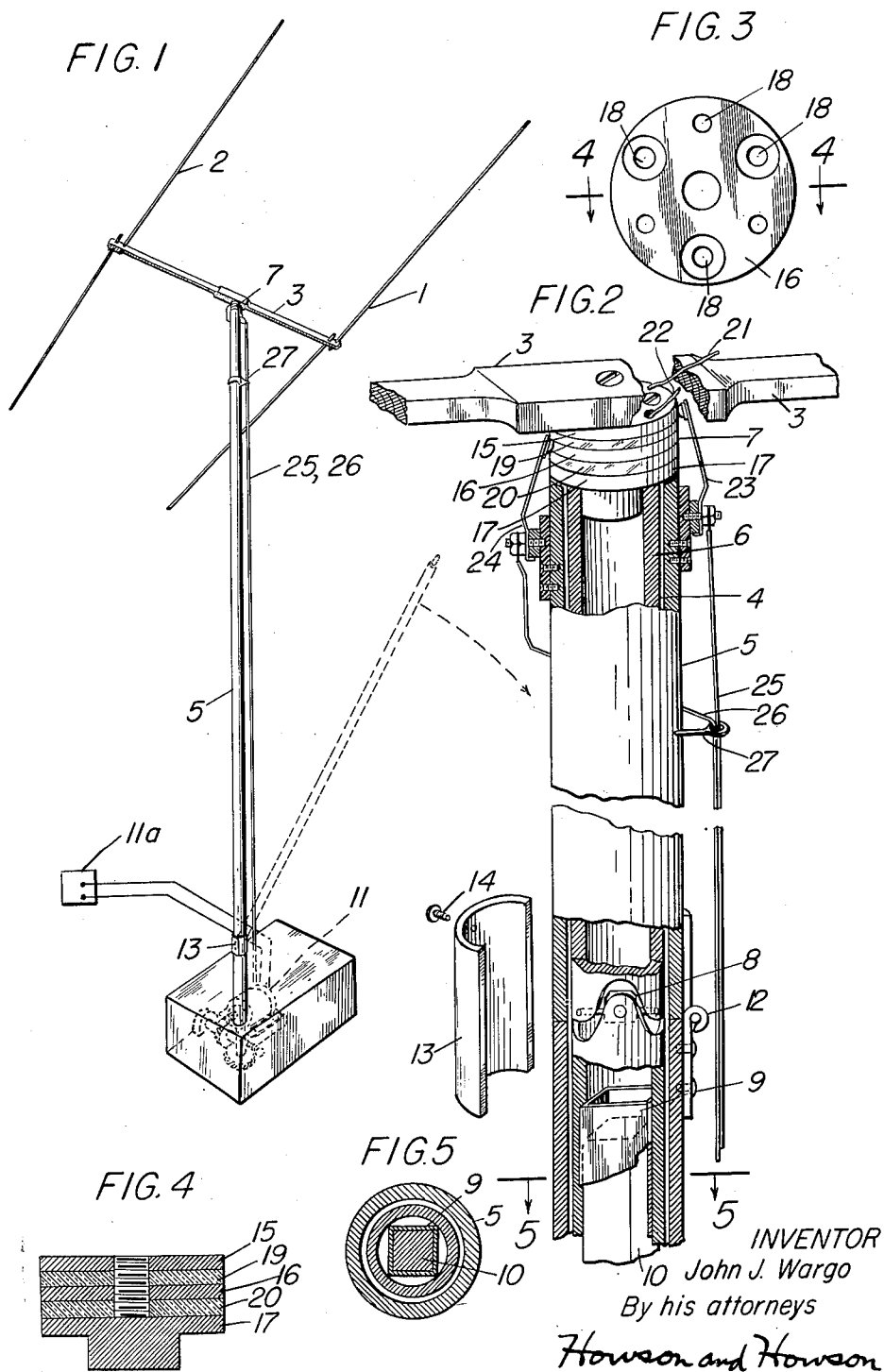


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TELEVISION ANTENNA
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TELEVISION ANTENNA

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6 Claims. (Cl. 250—33.51)

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This invention pertains to a television antenna and more particularly a directional antenna.

It is well known that because of the attenuation of television frequencies by the walls of buildings it is desirable, and in most cases necessary, to install an outdoor antenna for television receivers. It has been estimated that 90% of the reception difficulties in television receivers are due to losses and distortions occurring in the antenna and the transmission lines from the antenna to the television set. It is therefore evident that a proper antenna installation is very important for the efficient functioning of the set.

One of the problems inherent in the design of such antenna installations is how to bring in stations from all points of the compass with full force and clarity. Non-directional antennas are known which, because of the construction and arrangement of their driven and parasitic elements, receive signals from all directions. Practically speaking, however, it is usually impossible to use these non-directional antennas in areas where there are buildings or prominent terrain features because of so-called "ghost" images.

On the other hand, if a directional antenna is employed and it is oriented to receive the maximum signal from one station, it may fail entirely to pick up the signal from another station.

Directional antennas have been designed which are rotatable by the receiver operator and thus may be adjusted to receive the maximum signal from every station. In many cases, however, these have been subject to a reception defect known as "snowy screen" which is manifested by the appearance of white spots over the surface of the viewing screen. They have been generally quite expensive, heavy, apt to snap off in a strong wind, and difficult to erect and repair. Moreover, they have not been adaptable to the great variety of receiving elements which are presently in use.

The present invention provides a simple, inexpensive antenna whereby any directional combination of driven and parasitic receiving elements may be rotatably mounted.

It is characteristic of my novel antenna that transmission means carrying signals are properly insulated from each other and from other metallic elements and that the electric motor for rotating the antenna is positioned so that the receiving elements of the antenna are outside the influence of its electromagnetic field. It is further characteristic of my antenna that means are provided whereby the antenna may be folded down thus facilitating inspection and repair of the driven elements and transmission means. It is also characteristic of my antenna, that no heavy elements are supported above the base, thus making for a light, wind-resistant construction.

In the drawings:

Fig. 1 is a perspective view showing an an-

tenna according to my invention comprising a simple dipole and reflector.

Fig. 2 is a fragmentary perspective view partly cut away showing constructional details of the standard used in my novel antenna;

Fig. 3 is a plan view of one of the contact discs used in the head of my novel antenna;

Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 3 and showing in further detail the head of the standard used in my novel antenna;

Fig. 5 is a horizontal sectional view taken on line 5—5 of Fig. 2 and showing the relation of the socket and shaft in the standard of my novel antenna.

My antenna is shown in the drawings as used with a simple dipole 1 and reflector 2. These are mounted on opposite ends of a cross beam 3, which may be of wood or light metal. Rotatably supporting the cross beam is an inner standard 4 partly enclosed within an outer casing 5. The standard preferably comprises a hollow tube 6 and a head 7, the head being fixed to the tube and the cross beam fixed to the head. The tube 6 is made foldable by a universal joint 8 located near its lower end (Figs. 2, 5), the tube 6 being longitudinally slidable within the casing 5. The standard 4 is rotated through a square shaft 10 fitted into a square socket 9 in the lower end of the tube 6. For turning the shaft 10 I have provided an electric motor 11 positioned near the bottom of the antenna and away from the dipole and reflector. The motor is coupled to the shaft through suitable gearing. I have found a convenient speed of rotation of the antenna to be $1\frac{1}{2}$ revolutions per minute. A reversing switch 11a is provided for shutting the motor on and off and for changing the direction of rotation of the motor, and thus of the standard and antenna.

The arrangement of the standard 4 and the casing 5 is such that the standard may be rotated within the casing. The casing 5 is made foldable with the standard 6 through the provision of a circular hinge 12 and a cover plate 13 in the casing at the level of the universal joint 8 in the tube 6. The cover plate 13 is attached by short screws 14.

The head 7 at the top of the standard 4 comprises two contact discs 15, 16 and a cap 17 (Fig. 4). The discs (Fig. 3) are of metal, preferably of copper. They may be provided with holes 18 for screw fastening means. Separating the contact discs are insulating discs 19 and 20 of a dielectric material, preferably a methyl methacrylate plastic. The cap 17, which is preferably of metal, is shaped to provide a bearing surface for the upper edge of the casing 5.

From the arms of the dipole two connecting wires 21 and 22 run to the discs 15 and 16, respectively.

Brushes 23 and 24 are mounted on the casing 5 and contact the discs 15 and 16. Transmission lines, which may be wires 25 and 26 run from brushes 23, 24 to the television set (not shown).

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The wires 25, 26 are carefully spaced from the casing 5 by insulators 27.

The operation of my antenna is as follows: The observer, having set his channel selector to a desired frequency, operates the reversing switch 11a. The motor 11 rotates the standard 4 slowly and thereby the dipole and reflector. The signal from the station is received on the dipole 1, passes through the connecting wires 21, 22 to the contact discs 15, 16. Thence it is removed via the brushes 23, 24 and passed along the transmission wires 25, 26 to the television set. The operator observes the image on his screen and when a satisfactory image is obtained, shuts off the motor by the reversing switch 11a. If, in searching for a satisfactory image, the operator allows the antenna to rotate past that position where the best possible image is obtained, by means of the reversing switch he may rotate the antenna in the opposite direction, thus returning to the optimum position. This reversing may be repeated several times and a "bracketing" procedure followed for obtaining the best antenna setting. When such setting is obtained the reversing switch is manipulated to shut the motor off and stop the rotation of the antenna. By such methods it is possible with my novel antenna to enjoy the full strength of all transmitting stations and at the same time avoid the annoyance of "ghosts" on the television screen.

The present construction, as well as eliminating "ghosts" substantially corrects the "snowy screen" defect to which many television antennas are subject. I have discovered that the novel combination of contact discs separated from one another by insulating discs, the spacing maintained between the transmission wires and the outer casing, and the location of the receiving elements outside the electromagnetic field of the motor result in a television screen free from the annoying snow effect referred to. While I do not know the fundamental reasons behind this improvement, I believe it is due in part to a "jump" or capacitive effect provided by the novel construction of the head of my standard.

Although the head of the standard as described above is of simple and sturdy design, it may sometimes become desirable to make minor adjustments on the brushes and clean or replace the contact discs. When such repairs become necessary it is a simple matter to remove the cover plate 13 from the outer casing and fold the standard and casing over, thus providing easy access to the head of the standard and to the driven and parasitic receiving elements.

As I have already stated, many types of directional driven and parasitic elements may be used with my novel mounting. As well as the simple dipole here illustrated, folded dipoles, V-antennas, H-antennas, di-fan antennas and many others may be used on my novel mounting with good results.

While the preferred embodiment described above and shown in the drawings includes an electric motor for rotating the standard, within the scope of my invention are included antennas having other means for rotation, such, for example, as hand cranks.

What I claim is:

1. A television antenna comprising a directional receiving element and supporting means including a stationary outer casing, a foldable inner standard of substantially the same length as said outer casing, fixed to said receiving element and rotatable within said outer casing said

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standard having a joint and said outer casing being hinged at a corresponding point whereby said standard and said casing may be folded over and electrical means for rotating the standard; in combination with transmission means comprising conductive discs fixed on the standard, insulating discs fixed on the standard, brushes fixed on the outer casing and contacting said conductive discs, and leads connecting said receiving element and said conductive discs, said insulating discs being interposed between and separating the conductive discs from one another, whereby a snowy screen is eliminated.

2. A television antenna as set forth in claim 1 wherein said transmission means includes transmission wires leading away from said conductive discs, said wires being carried by the outer casing, but being kept isolated from the casing.

3. A television antenna as in claim 1 and having a reversing switch whereby the direction of rotation of said receiving element may be changed.

4. A television antenna as claimed in claim 1 wherein said rotational means comprise an electric motor coupled to the end of said standard opposite to the end whereto said receiving element is fixed.

5. A television antenna comprising a directional receiving element, transmission means for conducting a signal from the receiving element and supporting means comprising an outer fixed casing, an inner standard of substantially the same length as said outer casing, fixed to the receiving element and rotatable within the outer casing, and means for rotating the standard, said standard having a joint at a point near its base and said outer casing having a hinge at a corresponding point whereby said standard and said outer casing may be folded over to facilitate inspection and repair of the antenna.

6. A television antenna comprising a directional receiving element and supporting means including an outer fixed casing, an inner standard of substantially the same length as said outer casing, fixed to the receiving element and rotatable within the outer casing and means for rotating the inner standard, said standard having a joint at a point near its base and said casing having a hinge at a corresponding point whereby said standard and said outer casing may be folded over to facilitate inspection and repair; in combination with transmission means comprising conductive discs fixed on the standard, insulating discs fixed on the standard, said insulating discs being interposed between and separating the conductive discs from each other, brushes fixed on the outer tube and contacting the conductive discs, leads connecting the receiving element and the conductive discs, and transmission wires leading away from said brushes, said wires being carried by said outer casing, but isolated therefrom.

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