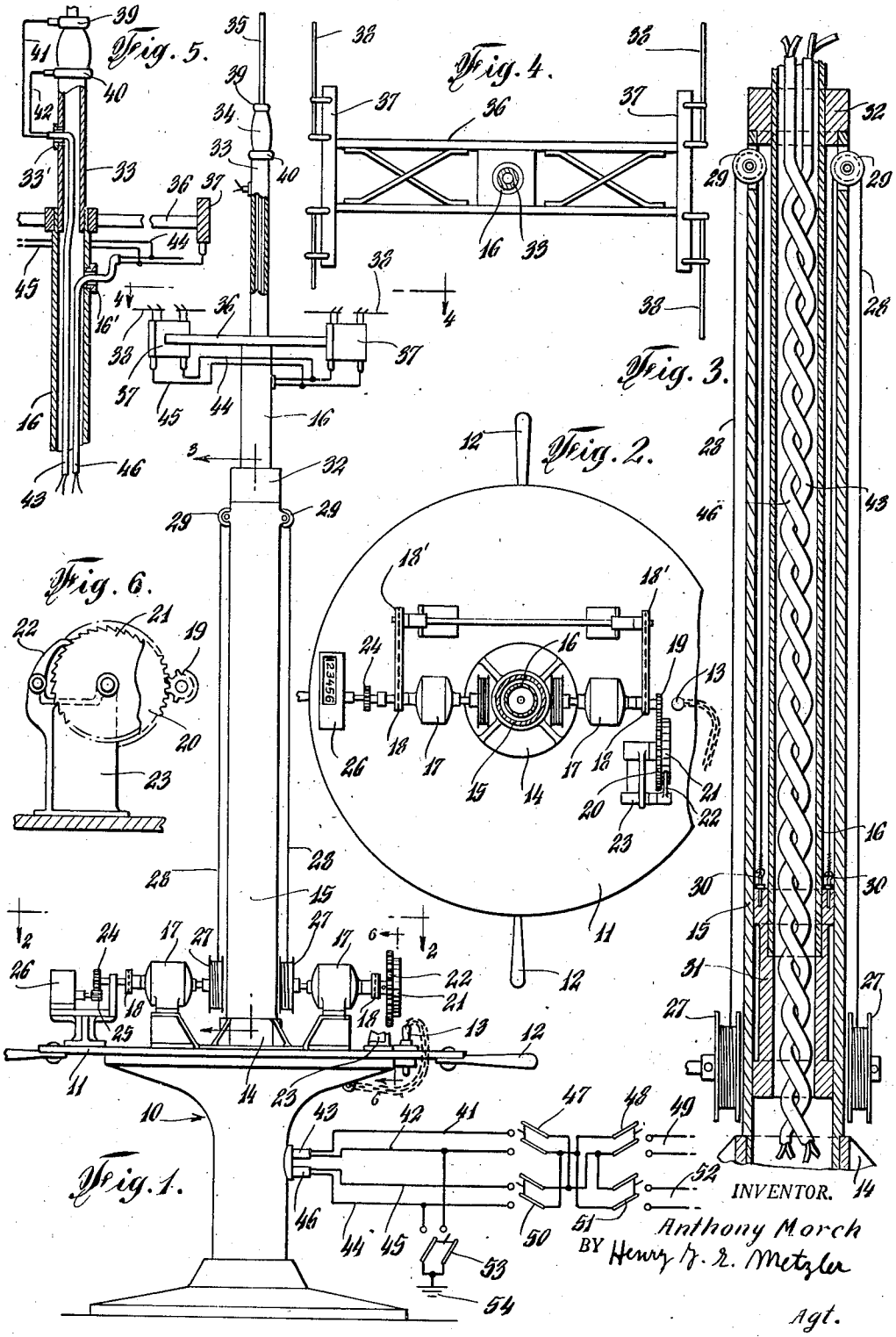
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ANTENNA

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INVENTOR.
Anthony Morch
BY Henry J. R. Metzler
Agt.

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## ANTENNA

Anthony Morch, Brooklyn, N. Y.

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2 Claims. (Cl. 250—33)

This invention relates to improvements in antennas and more specifically, to an improved antenna for high frequency or low frequency television and sound broadcasting.

The main object of the present invention is the provision of a new and improved antenna which eliminates such interferences as ground deflection or radiation or loss of signal strength or any multipath distortion, and which can be used for television as well as for sound broadcasting over greater distances than has been possible with the hitherto known antenna constructions;

Another object of the present invention is the provision of an antenna of the character described which will eliminate secondary images or "ghosts" produced by buildings, bridges, hills or any other objects which now interfere with the present system of television and sound transmission;

Still another object of the present invention is the provision of an antenna of the character described which will eliminate the necessity of the erection of many relay transmitting stations or the installation of concentric relay cables;

Yet still another object of the present invention is the provision of an antenna by means of which day time as well as night time transmission can be carried out with high or low frequency operation with sky waves as well as ground waves;

Still a further object of the present invention is the provision of an antenna whose operation is simple and carried out without any considerable efforts on the part of the operator.

Further objects of the instant invention reside in any novel feature of construction or operation or novel combination of parts present in the embodiment of the invention described and shown in the accompanying drawing whether within or without the scope of the appended claims and irrespective of other specific statements as to the scope of the invention contained herein.

In the drawing:

Figure 1 is a side elevation of a preferred embodiment of my invention;

Figure 2 is a cross-sectional view on the line 2—2, Figure 1;

Figure 3 is a longitudinal sectional view, drawn in an enlarged scale, on the line 3—3 of Figure 1 and showing a major portion of the device partially broken away;

Figure 4 is an enlarged cross-sectional view of the upper portion of the device on the line 4—4 of Figure 1;

Figure 5 is an enlarged side view, partially in lcngitudinal section, of the upper portion of the device; and

Figure 6 is an enlarged side elevation of a detail which will be explained hereinafter, and showing a part of the devicе in section on the line 6—6 of Figure 1.

Similar numerals refer to similar parts throughout the several views.

Referring first to Figures 1 and 2 of the drawing, the numeral 10 denotes a round-table-shaped base which is carried by a hollow stand, so that cables can be extended therethrough, and which can be made of cast iron or of any other suitable material. A circular plate 11, to which handles 12 are secured, is rotatably arranged upon the base 10, and has in its center a collar 14 from which the lower antenna mast portion 15 is perpendicularly extended. I prefer to provide one or more registering holes in plate 11 and in base 10 through which a base-locking pin 13 can be extended so as to prevent an accidental, unintended turning of plate 11 relative to base 10. The upper mast portion 16 is telescopically slidable within the lower mast portion 15, so that the height of the antenna mast can be changed at will, and both mast portions 15 and 16 are tubular and made preferably of light metal, such as Duralumin or the like.

In order to facilitate the raising and lowering of the mast portion 16 relative to portion 15, I prefer to use two electro-motors 17 mounted upon plate 11 and mechanically connected to each other by pairs of sprocket wheels 18 and 18' around which passes a chain, the wheels 18' being connected to each other by a shaft as may be seen in Figure 2. In this way, a running at exactly equal speed of both motors 17 will be assured. At least one of the motors 17 drives a pinion 19 which engages a gear wheel 20 that is connected to a ratchet wheel 21 (Figs. 1, 2, 6). A pawl 22 is normally in engagement with the ratchet wheel 21, so that the motors 17 can rotate only in one direction unless the pawl 22 is brought out of engagement with the ratchet wheel 21, as for lowering the mast portion 16 relative to portion 15. A bracket 23, which is secured to plate 11, carries the wheels 20 and 21 as well as the pawl 22. Another pinion 24 driven by one of the motors 17 engages a pinion 25, which actuates a revolution counter 26. Each motor 17 drives a reel 27 upon which an insulated hoisting cable 28 is wound. Each cable 28 passes over a pulley 29 through a slot into the mast portion 15, and is attached to a hollow piston 31 by

means of hooks 30 or the like, as illustrated in Fig. 3. A collar 32, adapted for guiding the mast portion 16, is secured to the upper end of portion 15.

A tube 33 is extended from the upper extremity of portion 16, and an insulator 34 secured to the top of tube 33, carries a vertical antenna rod 35 (Fig. 1) which is preferably of aluminum.

A rectangular frame of fiberboard or of any other suitable insulating material is secured to the upper end of the mast portion 16. Each of two insulating bars 37 of frame 36 carries two horizontal antenna rods 38, which are preferably made of aluminum.

Insulated double-pole cables 43 and 46 are extended through the tubular mast portions 15 and 16 and through piston 31 as well as through an aperture in the center of plate 11 and through base 10. Cable 43 is also extended through tube 33 and through a hollow insulator 33' (Fig. 5). One wire 41 of cable 43 is connected to the socket 39 of the vertical antenna rod 35, and the other wire 42 of cable 43 is connected to the part 40 of the horizontal antenna arrangement.

The cable 46 passes through the upper mast portion 16 and through a hollow insulator 16', and one of its wires 44 is connected to two of the four horizontal antenna rods 38, whereas its other wire 45 is connected to the two other horizontal antenna rods 38. The wires 41 to 44 inclusive of the cables 43 and 46 leave the base 10 through a hollow insulator and can be connected alternately to the receiver unit wiring 49 or to the transmitter unit wiring 52 by means of switches 47, 48, 50 and 51, as indicated in the wiring diagram at the lower part of Fig. 1. The wires 42 and 44 can also be connected to the ground by means of a switch 54 thus protecting the device against lightning. I prefer to use the vertically polarized antenna 35 for daytime transmission or a low frequency for ground wave operations; and for night time operation, I use the horizontally polarized antenna 38 for high frequency sky wave operation. It may also be understood that my type of antenna can be constructed so that its antenna elements can be of a half wave design, or can be arranged to give the best results on high or low frequency operation. While it should be understood by those skilled in this art that by using aluminum rods or tubing for the antenna elements 35 and 38 this particular metal has been found to be best suited for this purpose, since it has a greater electrical sensitivity as well as a greater conductive and electronic reaction if such metal is excited by the action of electrical current or by the reaction of an electromagnetic wave, than if the antenna elements were made of iron, brass, or copper. Another advantage of my antenna is that I can transmit or receive by using the vertical antenna, or I can use the horizontal antenna for the same purpose. Another advantage of my system is that I use a combination vertical and horizontal antenna for high frequency or low frequency operation. Moreover, the telescopic mast arrangement previously described makes it possible to raise the antenna to a greater height than any other types of antenna systems; thereby, I can transmit or receive at a much greater distance, if the transmitter power is increased to 10,000 watts or more. If this amount of power is used, a distance of about 1000 miles can be covered on a direct path from one station to another. So if two or three relay stations are located at distances of one thousand miles from one another, it will be possible to transmit television and sound to a distance of two or three thousand miles without any interference due to the greater height of the antenna as well as the arrangement of same. My antenna system can be mounted on a mountain top or can be mounted on a building top. I prevent any interference by having the antenna feed lines 43 and 46 insulated within the mast as shown.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent in the United States is:

1. An antenna comprising tubular mast portions which are telescopically shiftable in each other, a rotatably arranged base plate from which the lowest mast portion is extended, means for shifting the upper mast portion within said lowest mast portion, horizontal antenna rods carried by insulating means secured to the upper mast portion, vertical antenna rods extended from an insulator at the top of a tube which extends upwardly from said upper mast portion, insulated cables connected to said antenna rods and extended through said tubular mast portions and through said rotatably arranged plate, and switching means for alternately connecting said cables to receiver and transmitter units respectively, all substantially as set forth.

2. An antenna comprising tubular mast portions of light metal which are telescopically shiftable in each other, a plate rotatably carried by a hollow base and having a centrally located aperture around which the lowest mast portion is secured so that it extends perpendicularly therefrom, pulleys rotatably arranged in slots near the upper end of said lowest mast portion, reels driven by electromotors mounted upon said rotatable plate; an insulated hoisting cable wound upon each of said reels and passing over one of said pulleys and being connected to a hollow piston that carries the upper portion within said lowest mast portion, a frame of insulating material secured to the upper extremity of said upper mast portion, horizontal aluminum antenna rods extended from said frame, a vertical antenna rod extended from an insulator at the top of a tube which extends upwardly from said upper mast portion, insulated cables connected to said antenna rods and extended through said tubular mast portions and through said rotatably arranged plate, and switching means for alternately connecting said cables to receiver and transmitter units respectively, all substantially as described.

ANTHONY MORCH.