Sept. 4, 1951 H. G. KOENIG 2,566,897

ELECTRICAL ROTATING APPARATUS FOR DIRECTIONAL ANTENNAE

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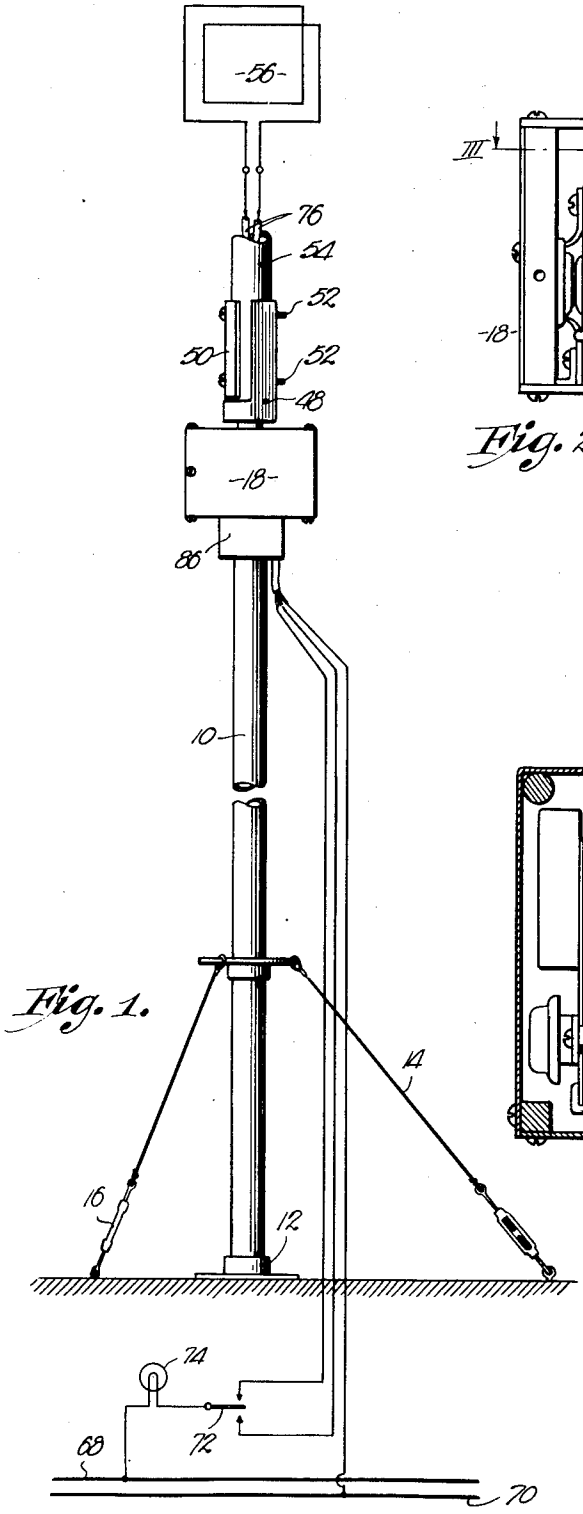


Fig. 1.

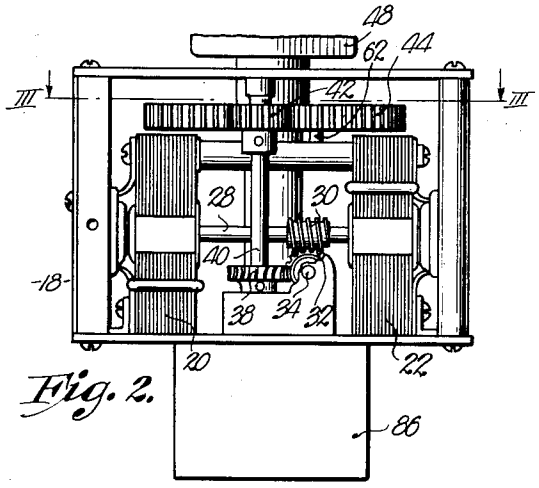


Fig. 2.

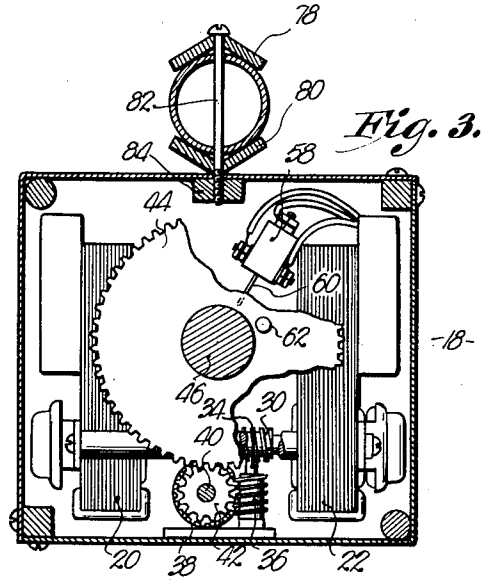


Fig. 3.

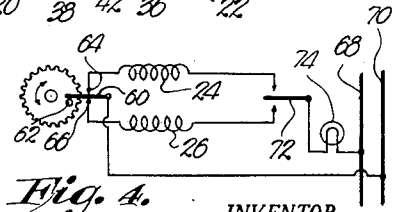


Fig. 4.

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ELECTRICAL ROTATING APPARATUS FOR DIRECTIONAL ANTENNAE

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1 Claim. (Cl. 318—267)

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This invention relates to the field of radio and more particularly to antenna supporting structure having as a component part thereof means for automatically imparting rotative motion to the antenna.

The most important object of the present invention is the provision of an electronic rotating apparatus for directional antennas including a sectional standard, the uppermost section thereof being rotatable and having a pair of interconnected, reversible motors coupled therewith for rotating the uppermost section as the motors are alternately energized for oscillating the antenna carried by said uppermost section.

Another important object of the present invention is to provide directional antenna rotating apparatus having a pair of motors mounted with their armatures interconnected by a common shaft, there being a train of gears interposed between the said single shaft and the standard upon which the directional antenna is mounted for oscillating the latter as the motors are alternately energized.

Other objects of the present invention include the way in which the entire rotating apparatus may be remotely controlled; the manner of limiting the extent of rotative movement of the antenna in either direction; and the manner of indicating to the operator, at a point remote from the antenna, when the device is operating.

In the drawing, Fig. 1 is a side elevational view of an electrical rotating apparatus for directional antenna made in accordance with the present invention.

Fig. 2 is an enlarged, side elevational view similar to that shown in Fig. 1, showing the rotating apparatus, per se, with one wall of the housing therefor entirely removed.

Fig. 3 is a transverse, cross sectional view taken on line III—III of Fig. 2; and,

Fig. 4 is a schematic wiring diagram showing the electrical circuit forming a part of the apparatus.

As interest has developed in the field of radio among the public generally and particularly among amateurs, a need has arisen for an inexpensive, accurate, easily manufactured means for imparting the necessary oscillatory movement to a directional antenna in an automatic manner. This invention, as will hereinafter appear, contemplates use thereof on a relatively small scale among amateurs and others desiring to attain better radio reception.

In Fig. 1, there is shown an elongated standard 10 that may be mounted upon a roof top or the like through the medium of a base flange 12, the length of standard 10 varying in accordance with the desires of the user. Standard 10 is shown simply as a tubular member, but the precise material from which the same is made has no bearing as long as sturdiness and cheapness of construction are maintained.

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Standard 10 is supported in an upright, vertical position through the medium of a plurality of brace wires 14 having turn buckles 16 interposed therein for tightening purposes. The uppermost end of the standard 10 carries a hollow casing 18 having the six walls thereof entirely closed by removable, L-shaped side plates, as illustrated in Fig. 3, and a top and a bottom.

A pair of alternating current motors 20 and 22 are mounted within the housing 18 in spaced apart relationship. These motors 20 and 22 are preferably of the shaded pole induction type, and each is provided with a rotating armature 24 and 26, respectively, shown only in Fig. 4 of the drawing. Motors 20 and 22 have their armatures integrally connected by a common shaft 28 which, in turn, has a worm 30 formed thereon and between the motors 20 and 22.

Worm 30 is in mesh with a gear 32 mounted within the casing 18 upon a shaft 34 having its rotative axis substantially perpendicular to the shaft 28. The shaft 34, is, also, provided with a worm 36 that meshes with a gear 38 upon the lowermost end of a vertical shaft 40 that intersects the axis of rotation of shaft 28.

A pinion 42 on the uppermost end of the vertical shaft 40 is in constant mesh with a relatively large gear 44 that is, in turn, keyed to a vertical member 46 that extends outwardly beyond the top of the housing 18. One section 48 of a clamp is secured to the uppermost end of the rotative member 46, said section 48 cooperating with a plate 50 through the medium of a pair of screws 52 in mounting a pipe 54 upon the member 46.

The clamp 48—50 is contoured to present an inner face which is V-shaped in form to grip the pipe 54, as illustrated in Fig. 1 of the drawing. This pipe may be of any cross sectional configuration. A directional antenna 56, shown diagrammatically only in Fig. 1, may be mounted upon the uppermost end of the pipe 54 in any suitable manner.

An electrical switch 58 is mounted within the housing 18 with its actuating arm 60 in the path of travel of a downwardly-projecting pin 62 on the gear 44. The arm 60 is made from flexible material; and, when the pin 62 comes into con-

tact with the arm, one of the contacts 64 or 66 shown in Fig. 4 will be broken.

Conversely, when the gear 44 is rotating in the opposite direction, movement of the pin 62 against the arm 60 will break with the other contact 64 or 66.

Fig. 4 illustrates the manner in which the armatures 24 and 26 are disposed in parallel circuits coupled with lead lines 68 and 70 through a manually-operable switch 72 that is movable alternately to bring either motor 20 or 22 within the circuit. Thus, when the switch 72 that is mounted within a room next to the user's radio at a point remote from the standard 10 and its component parts is moved in one direction, the circuit will be closed through armature 24; and, when switch 72 is swung to the opposite end of its path of travel, the armature 26 will be energized.

Obviously, the direction of rotation of the member 54 and the antenna 56 carried by support 54 will depend upon which of the contacts 64 or 66 is closed by the arm 60 at the initial movement of switch 72. The operator can tell whether or not the device is in operation through the medium of a lamp 74 within the circuit.

Both arms 64 and 66 are in contact with arm 60 at all times until pin 62 is rotated enough to move arm 60 away from contacts 64 or 66, thereby de-energizing motor 24 or 26, as the case may be. The object is to limit the rotation to 360 degrees of arc.

Since the gear 44 and, accordingly, the member 54 can only rotate in either direction one cycle because of limit switch 58, the interconnecting lines 76 between antenna 56 and the radio with which the same is connected will not become entangled about the standard 10. The manner of mounting housing 18 upon the standard 10 is illustrated in Fig. 3 of the drawing and constitutes a pair of V-shaped, opposed brackets 78 and 80 having bolt 82 passing therethrough, through the standard 10 and into a tapped block 84 within housing 18.

The necessary electric terminals, wiring, etc., for bringing the electric circuit into coupling relationship with the motors 20 and 22 can be conveniently housed within a small case 86 depending from the housing 18.

The over-all simplicity, ease of manufacture and inexpensive construction of the assembly above described will become apparent to those skilled in the art, and all problems in this respect have been fully met by the directional antenna rotating means forming the subject matter hereof.

While only one modification has been illustrated and described, it is manifest that the same is subject to many changes and modifications, and those that fairly come within the scope of the appended claim are contemplated hereby.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

Antenna rotating structure comprising a vertical support; a housing secured to said support; a vertical, antenna-rotating shaft extending upwardly from said housing and rotatably carried thereby; a pair of electric motors for selectively rotating said vertical shaft in opposite directions, each of said motors having a rotatable armature, said armatures being adapted for rotation in opposite directions upon energization of the motors; a horizontal shaft joining said armatures; a train of gears in said housing operably interconnecting the vertical shaft to said horizontal shaft between said armatures and including a gear mounted on the vertical shaft for rotation therewith; an electric circuit for each motor respectively; a pair of switches common to said circuits, one of said switches being mounted in the housing and having a resilient actuating arm normally disposed in closing relationship to both of said circuits, the other of said switches being normally open relative to both circuits and being adapted to alternately close the circuits to thereby selectively energize either of said motors; and a single pin mounted on the gear of said vertical shaft for rotation therewith around the axis of rotation of the vertical shaft, said actuating arm being disposed within the path of travel of said pin for movement thereby to a position opening one of the circuits when the pin is rotated in one direction and to a position in opening the other of said circuits when the pin is rotated in the opposite direction.

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