March 13, 1951 W. J. MILLER 2,545,003

MECHANISM FOR ANTENNA TUNING

Filed Dec. 3, 1949

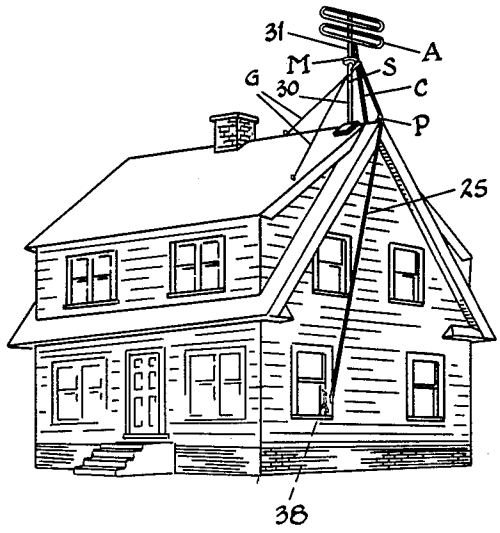


Fig 1

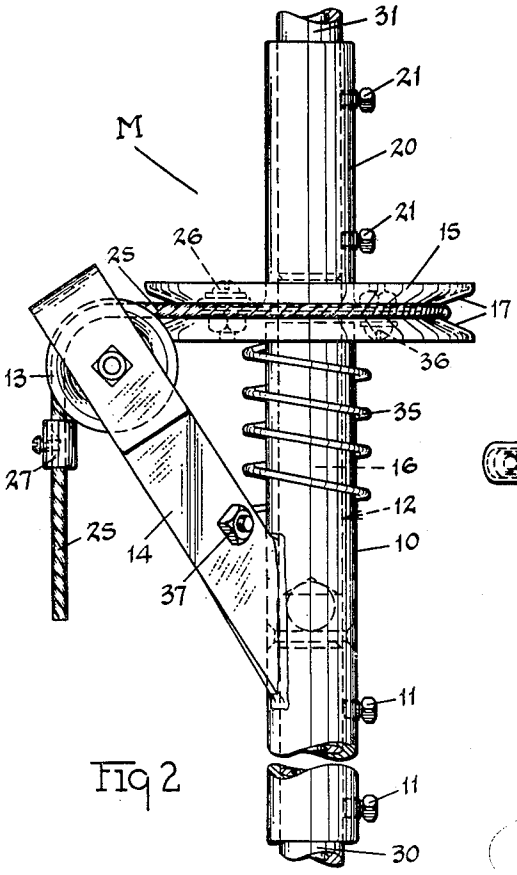


Fig 2

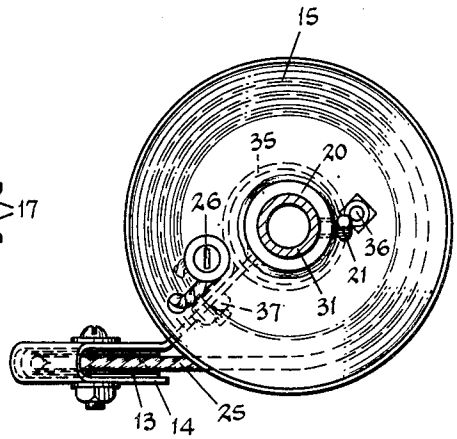


Fig 3

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Patented Mar. 13, 1951

2,545,003

UNITED STATES PATENT OFFICE

2,545,003

MECHANISM FOR ANTENNA TUNING

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Application December 3, 1949, Serial No. 131,023

2 Claims. (Cl. 74—501)

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My invention relates to mechanisms for disposing radio-video antenna in a desired angular position relative to various broadcast signals. As is known a radio-video receiver with fixed antenna experiences various degrees of distortion or mis-interpretation of signal issuing from broadcasters, because of the geographical relation of the broadcaster to the receiver. It is also known that such distortion or mis-interpretation may be eliminated by "tuning" the antenna, that is by angularly moving the antenna into focus with the broadcast signal beam.

My invention provides a simple, inexpensive and easily maintained mechanism by which antenna tuning or focusing may be obtained. Particularly, my invention provides a mechanism that may be installed by an unskilled person without wiring or concern for weather effects. The parts of a mechanism embodying my invention are by reason of their simplicity long lasting and may on breakage or wear be easily replaced.

Generally speaking, my invention has for an object to provide a simple turnable joint in the antenna supporting strut by which the antenna may be controllably moved angularly. Particularly, the invention has for an object to provide a line actuated reel for effecting angular movement at the joint of the antenna supporting strut.

The invention consists in other features and advantages which will appear from the following description and upon examination of the drawing. Structures containing the invention may partake of different forms and still embody the invention. To illustrate a practical application of the invention, I have selected a mechanism for antenna tuning as an example of the various structures and details thereof that contain the invention and shall describe the selected structure hereinafter. It is understood that variations may be made without departing from the spirit of the invention. The particular structure selected is shown in the accompanying drawing and described hereinafter.

Fig. 1 illustrates a suggested installation of a mechanism embodying my invention. Fig. 2 illustrates an enlarged elevation of the mechanism shown in Fig. 1, parts being shown in section. Fig. 3 is a top plan view of the mechanism shown in Fig. 2.

I acknowledge that predecessors have provided mechanisms for moving antenna to effect tuning. However, the constructions of such predecessors involve utilization of expensive and complicated parts, motors and skilled installation facilities. I intend to provide, in the combination embodying my invention, a mechanism of simple parts, low cost and installable as by the unskilled receiving set owner, if desired.

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Referring to the drawing, a typical installation is shown in Fig. 1. The radio-video antenna A is supported atop a vertically extending strut S. The strut S is supported by suitable guy wires G on the roof of a typical residence building B in which a receiver is located. The antenna A is electrically connected by conductor lead C to the receiver within the building. A mechanism M embodying my invention about to be described is disposed as shown in the drawing.

The mechanism M shown in greater detail in Figs. 2 and 3 of the accompanying drawing has essentially a sleeve member 10, a reel 15, a socket hub 20 and a cable line 25. The sleeve member 10 has an internal diameter in excess of the cross dimension of the strut S. Suitable means, such as set screws 11, are threaded in the sleeve member. These set screws 11 act to chuck-lock an end of the strut S telescopically disposed within the sleeve member, as explained hereinafter. The sleeve member 10 provides by its inner annular surface 12 a journal for receiving and bearing a stub shaft 16 of the reel 15.

The stub shaft 16 is preferably keyed to the reel 15 and hence rotates therewith. The reel felly 17 is channeled, after the manner of sheaves, for receipt and winding of the cable line 25. One end of the line 25 is affixed by stud and washer 26 to the reel and the line is wound in one or more bights around the felly 17.

Extending axially upward from the reel 15 is the socket hub 20. The inner diameter of the socket hub 20 exceeds the cross dimension of the strut S. Hence, the socket hub 20 is adapted to receive an end of the strut S telescopically therein. Preferably, the hub 20 is provided with set screws 21 which operate, as hereinafter explained, to chuck-lock an end of strut S disposed in the hub 20.

In installation of the mechanism M, the strut S is cut to provide a lower fixed part 30 and an upper movable part 31. The cut ends of the parts 30 and 31 are interjoined through the medium of the mechanism M. The upper cut end of part 30 is inserted into the sleeve member 10, being locked thereto by set screws 11, and the lower cut end of part 31 is inserted into socket hub 20 and being locked thereto by set screws 21. It will be seen now that when cable line 25 is drawn radially of the reel 15, the reel will tend to rotate moving part 31 and the antenna A surmounting said part angularly. By such angular

movement the antenna A may be located in a desired position for receiving a broadcast signal.

In order to guide the cable line 25 in drawing the same from the reel 15, I provide a sheave 13. The sheave 13 is rotatably mounted at one end of an arm 14 extending from sleeve member 10. Preferably, the arm 14 is twisted slightly to locate sheave 13 for rotation in a plane extending tangentially to the felly 17 of reel 15. By such disposition, the cable line 25 is drawn in smooth flow from the felly 17.

In order that the antenna A may be turned in an opposite direction from that produced by drawing the line 25, I provide resilient means tending to resist reel turning. Such means is embodied in a helical spring 35, one end 36 of which is connected to the reel 15 and the other end 37 to the arm 14. The spring 35 encloses or nests with the outer surface of sleeve member 10 which serves to guide the spring convolutions as the reel is turned by the withdrawal of cable line 25. Thus, as the reel is turned on draw of the cable line 25, the spring 35 will be distorted. Upon release of drawing tension on the cable line, the spring 35 will effect counter-rotation of the reel, rewinding the cable line on the reel felly and disposing the antenna A in a position from which it was first moved.

In order to provide a check on the cable line 25 and limit the spring induced movement of the reel 15, a ferrule 27 is clamped to the cable line 25. The ferrule 27 is of such size that it will not pass between the sheave 13 and portion of arm 14 which supports and substantially houses the sheave 13. The location of the ferrule 27 on cable line 25 is such that the reel 15 will be checked in rotation at a point where the spring 35 is under tension. Thus the cable line between the sheave and reel will be maintained taut and the antenna A held against rotation induced by forces other than those exerted through the cable line 25.

The cable line 25 in the installation shown in Fig. 1 extends through a series of pulleys P to a cleat 38. The receiver operator by drawing line 25 and cleating the same may dispose the antenna A at a desired angular position for clear reception. Desiring to tune to another broadcast, the user by uncleating line 25 and drawing or releasing the same may effect the particular adjustment in antenna position desired for that particular broadcast signal.

Thus it will be seen that I provide a remarkably simple, inexpensive and efficient antenna tuning mechanism.

I claim:

1. A mechanism for moving a radio-video antenna angularly in a horizontal plane thereby to focus the antenna for reception of a broadcast signal comprising the combination of a pair of elongated vertically extending strut parts, one of which is adapted to be connected to an antenna and the other of which is adapted to be fixed against movement; a reel; bearing means in engagement with the reel adapted to rotatably support the same; means extending from said bearing means and having manually operable parts adapted for removably connecting the bearing means to the upper end of the fixed strut part, whereby the reel will be rotatably mounted on the upper end of the fixed strut part, a line connected to said reel and passing around the periphery thereof, the reel having connector means including manually operable parts adapted for removably connecting the reel to the lower end of the antenna connected strut part whereby the antenna will move angularly as the line is drawn from around the periphery of the reel.

2. In combination with an oscillatable element including a pair of elongated vertically extending strut parts, one of which is adapted to be fixed against movement, the provision of a mechanism for moving one strut part relative to the fixed strut part about an axis of the fixed strut part to thereby position the oscillatable element as desired, said mechanism comprising the combination of a reel and sleeve member for rotatably supporting the reel and adapted to telescopically fit the upper end of the fixed strut part, lock bolts extending through the sleeve member and adapted to engage the upper end of the fixed strut part and removably lock the sleeve member thereto, the sleeve member having a projecting arm, a pulley, bearing means adapted for rotatably supporting the pulley on the arm in offset relation to the periphery of the reel, the reel having a socket in coaxial relation to the reel axis and extending axially of the reel adapted to telescopically fit the lower end of the other strut part, lock bolts extending into the socket and adapted to engage the strut part end and removably lock the end in the socket, a cable line connected at one end to the reel and passing around the reel periphery and over the pulley and being adapted when drawn to cause rotation of the reel and rotative movement of one strut part relative to the other to position the oscillatable element, a helical spring in nesting relation to and surrounding the sleeve member having one of its ends connected to the reel and the other to the sleeve member and adapted to yieldably resist rotation of the reel in a direction of rotation produced by drawing the cable line off the reel periphery.

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