April 19, 1932. W. J. SPIRO 1,854,566

LOOP ADJUSTING DEVICE

Filed Oct. 15, 1927 2 Sheets-Sheet 1

Fig. 1.

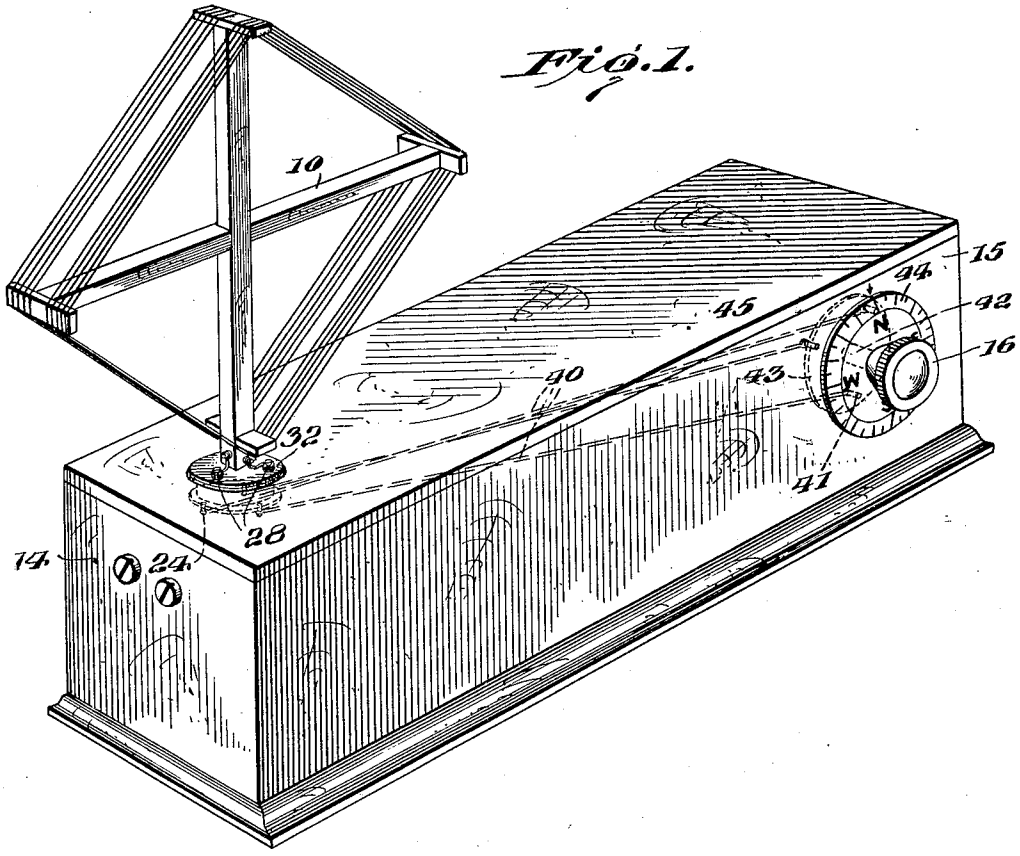
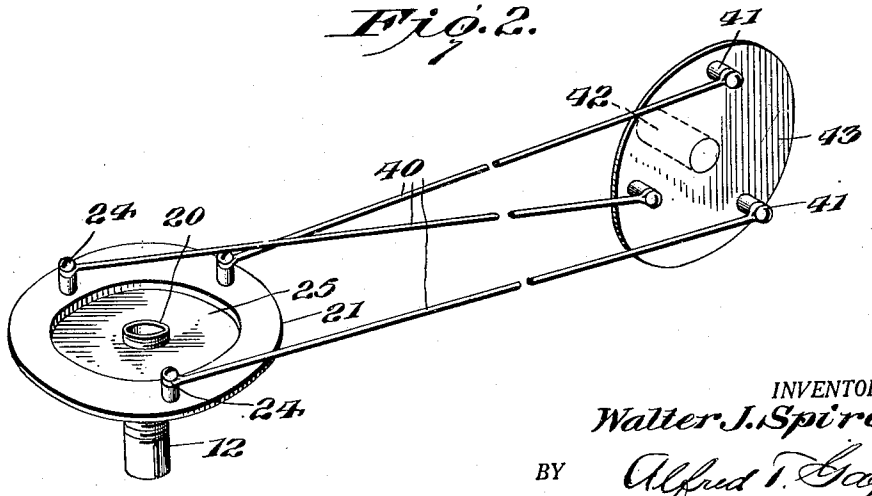


Fig. 2.



INVENTOR.
Walter J. Spiro,
BY Alfred T. Gage
ATTORNEY.

April 19, 1932. W. J. SPIRO 1,854,566

LOOP ADJUSTING DEVICE

Filed Oct. 15, 1927 2 Sheets-Sheet 2

Fig. 3.

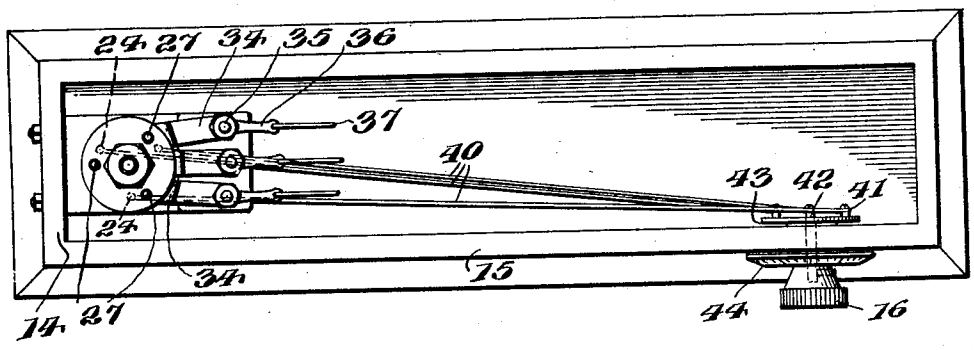


Fig. 4.

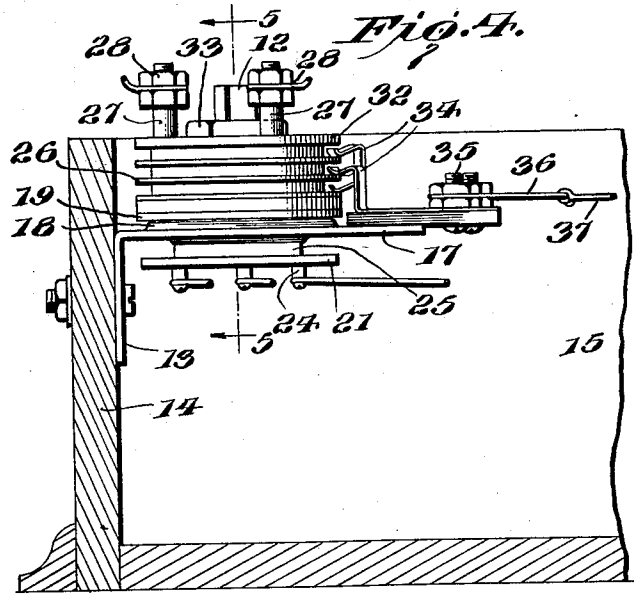


Fig. 5.

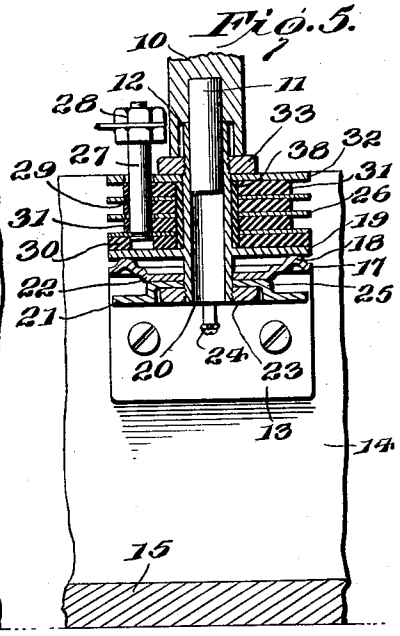


Fig. 6.

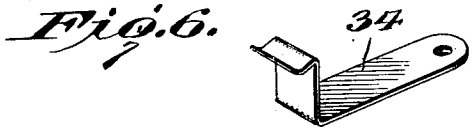
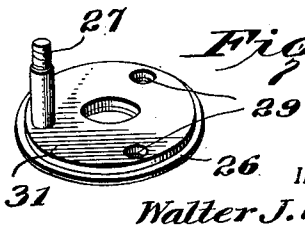


Fig. 7.



INVENTOR.
Walter J. Spiro,
BY
Alfred T. Gage
ATTORNEY.

Patented Apr. 19, 1932 1,854,566

UNITED STATES PATENT OFFICE

WALTER J. SPIRO, OF WHITE PLAINS, NEW YORK

LOOP ADJUSTING DEVICE

Application filed October 15, 1927. Serial No. 226,442.

This invention relates to a loop adjusting device, and particularly to a construction for varying the directional position of a loop antenna used in connection with a radio receiving apparatus.

In this art it has been found important to provide for a delicate directional adjustment of the loop to most efficiently receive the radio wave and thereby assure the best reception, and such finer adjustment cannot be secured when the loop is shifted by hand or the ordinary connections for that purpose. It is further essential to perfect results to avoid the hand or body capacity effect in adjusting the loop and also the use of any electrical conductor extending therefrom to an operating device. For these reasons I have provided a remote control member for turning the loop connected thereto by non-conducting members arranged to effect an even movement for a complete circle with the minimum of resistance and without dead centers, which if existent, would render a very fine adjusting of the loop difficult. It is also desirable to avoid the use of extended wire connections necessary to permit rotative movement of the loop relative to the fixed connections for the receiving apparatus. To avoid such objectionable wiring I have mounted upon the loop support independent insulated conducting disks, each having a connecting post for one of the antenna wires and cooperating with separate brushes in circuit with the receiving connections.

The invention has for an object to provide a novel and improved construction of loop adjusting device, including a support for the loop, a hand control at a remote point, and a plurality of connectors pivoted to the control and loop support to effect a fine or vernier adjustment of the loop.

A further object of the invention is to provide an improved loop support comprising a series of disks insulated from each other and each carrying a terminal post for circuit connection with the loop, together with separate brushes contacting with such disks and connected to a receiving apparatus.

Another object of the invention is to present a new mounting for an antenna loop consisting of a sleeve carrying at its lower portion a bearing plate operating upon the annular bearing of a support, said sleeve having clamped thereon a series of alternate conductor disks and insulating disks, the former being provided with upwardly extending terminal posts, and the lower portion of the sleeve carrying an operating plate having pivotal connections for the directional control means.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claim.

In the drawings—

Figure 1 is a perspective of the invention;

Figure 2 is a detail perspective of the control means;

Figure 3 is a top plan, with the cover removed;

Figure 4 is a front elevation of the loop support;

Figure 5 is a section on line 5—5 of Figure 4;

Figure 6 is a detail of one of the brushes; and

Figure 7 is a similar view of one conductor disk.

Like numerals refer to similar parts in the several figures of the drawings.

The loop antenna to be directionally tuned by a rotative movement may be of any desired construction or configuration and is indicated by the numeral 10. The post 11 of the antenna frame is disposed in the sleeve or bushing 12 which is supported by an angle bracket 13 secured to a wall 14 of the casing 15. This casing may be of any preferred material and shape, but is generally elongated so as to remove the hand control 16 from the vicinity of the circuit connections to avoid any effect thereon of the hand or body capacity of the operator.

In supporting the loop antenna there is considerable side strain and it is important that an extended bearing be secured to permit a well balanced movement of the loop and avoid its accidental oscillation or vibration due to air pressure or other causes. A long bearing for this purpose is not practical in

this type of device so that provision has been made for a wide bearing in which the horizontal portion 17 of the angle bracket 13 is formed with an annular bearing face 18 upon which the bearing plate 19 secured to the sleeve 12 rests. The sleeve is extended below this plate at 20 where it carries a connector plate 21 with a raised portion 25 clamped in connection with a depressed face 22 of the bracket by a nut 23 threaded upon the sleeve. The plate 21 has upon its under face a plurality of connector pivots 24, preferably equally spaced as shown in Figure 2.

Supported by the sleeve and its plate 19 are a plurality of conductor disks 26, each having secured thereto a vertical terminal post 27 provided with the usual binding nuts 28. The upper one of these disks is shown in Figure 7 and is formed with apertures 29 therethrough for the passage of the terminals from the lower disks. These disks are mounted upon an insulating block 30 carried by the bearing plate 19 and are separated by insulating spacers 31 suitably apertured to correspond with the terminals of the conductor disks. The upper spacer 31 is covered by a cap plate 32 clamped in position by nut 33 threaded upon the sleeve to retain the disks in firm contact for rotation therewith. The disks are insulated from the sleeve by means of an interposed collar 38. The spacers are of less diameter than the conductor disks which leave an exposed peripheral portion of the latter for contact with the separate spring brushes or wipers 34 which extend to binding posts 35 carrying plates 36 from which conducting wires 37 extend to the receiving instrument, not shown.

For the purpose of directionally adjusting the loop from the hand control 16 any desired number of connectors may be used, but in order to effect a smooth even movement with proper power and avoid dead centers, it is desirable to use at least three of these connectors 40, they being connected at one end to the three equally spaced pivots 24 carried by the loop support and at their other ends to similarly spaced pivots 41 upon a crank member or plate 42, secured to the shaft 43 of the hand control 16. These connectors are disposed in different planes and their paths of travel so arranged as not to interfere in the rotative movement of the connected parts. The connectors are preferably of electrical nonconducting material, such as bakelite, in order not to influence the receiving circuits through the loop support and are pivoted at each end radial to the axis of the operating plates, but other forms of crank or lever connection may be provided for such purpose. The elongated casing 15 provides for the location of the loop support and hand control at its opposite ends and the mechanism is enclosed by a suitable cover 45 apertured to receive the loop support and its conductor disks. The control 16 also carries a dial plate 44 provided with suitable indicia for the directional adjusting.

The invention presents a simple, efficient and economically manufactured construction in which the two extremities of the loop winding, as well as the midtap if used, are electrically connected to the receiving instrument by means of the insulated conductor disks directly connected to the loop and having a brush connection with such instrument. The adjusting connectors from the hand control provide for an even balanced movement of the loop support which is important in effecting a fine directional adjustment of the loop to secure the most efficient reception. The device may be used in association with a receiving instrument or independent thereof, as when located at a removed point for collecting and transmitting the radio current.

While the specific construction of the several parts has been shown and described the invention is not confined thereto, as changes and alterations may be made therein without departing from the spirit of the invention as recited in the following claim.

What I claim is:—

In combination, a casing, a loop antenna rotatably supported in and arranged above one wall of such casing, said loop support including a plate, a second plate mounted for manually-controlled rotational movement in one wall of the casing, the plates being at right angles to each other, and rods pivotally connecting at least three separate and equally spaced points on each of said respective plates, whereby in any adjustment of the antenna at least two of said rods are acting positively in moving the antenna to insure regularity and smoothness of antenna movement.

In testimony whereof I affix my signature.

WALTER J. SPIRO.