Jan. 25, 1927. 1,615,755

F. GRAUE

LOOP ANTENNA

Filed Nov. 11, 1925

Fig. 1.

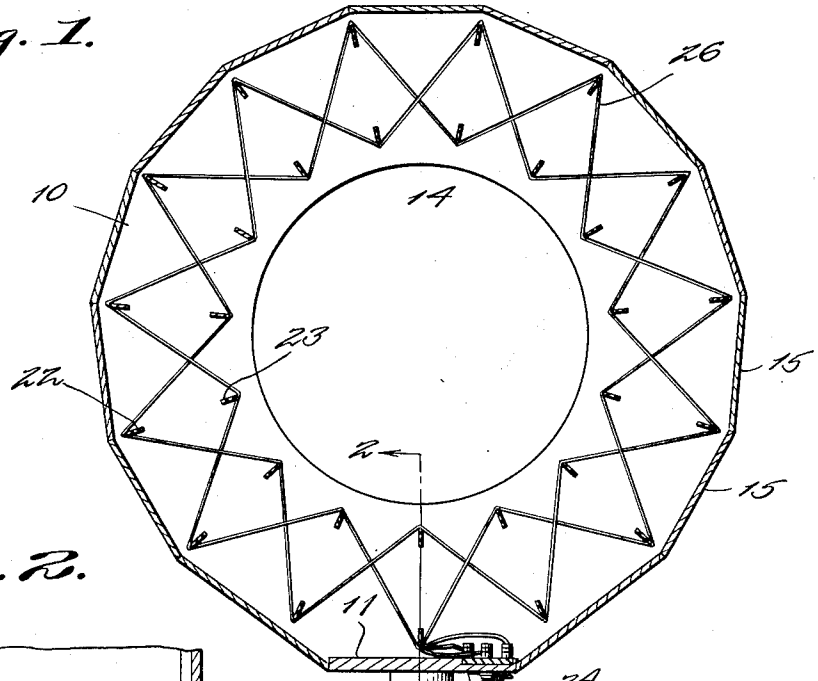
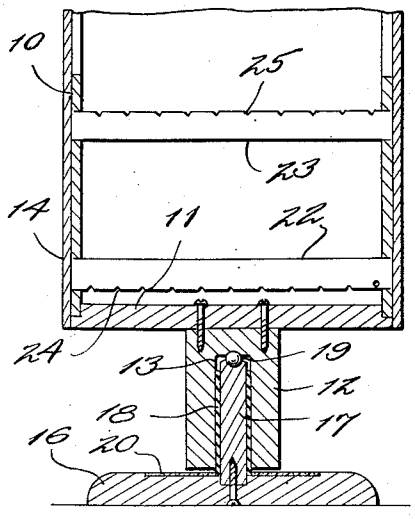


Fig. 2.



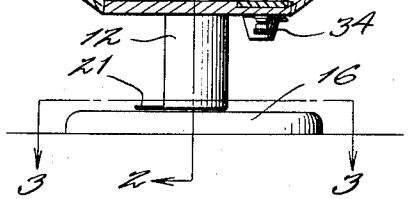


Fig. 4.

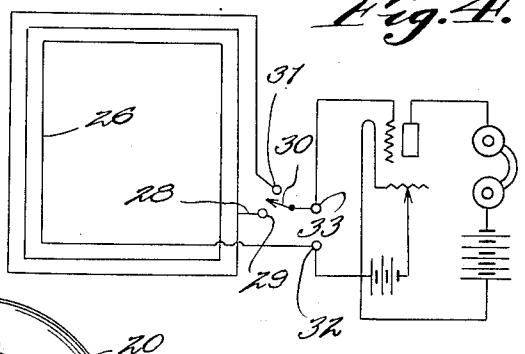
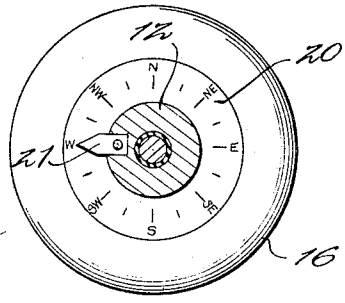


Fig. 3.



Frederick Graue

INVENTOR

BY Victor J. Evans

ATTORNEY

R. E. Wise

WITNESS:

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UNITED STATES PATENT OFFICE.

FREDERICK GRAUE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO GEORGE T. KEMP, OF BALTIMORE, MARYLAND.

LOOP ANTENNA.

Application filed November 11, 1925. Serial No. 68,396.

This invention relates to radio apparatus, particularly to antenna construction, and has for its object the provision of a novel loop antenna embodying an enclosed coil peculiarly wound to reduce the capacity and lessen the inductive effect between the successive convolutions so that tuning may be sharper and selectivity increased.

An important object is the provision of an antenna of this character entirely enclosed within a suitable cabinet rotatably mounted upon a supporting stand, indicating means being provided for accurately setting the coil in any direction.

Another object is the provision of a novel pivotal supporting means of such construction as to insulate the coil from any surface upon which the base of the device may be placed, thereby preventing losses from current leakage.

An additional object is the provision of a loop of this character which will be simple and inexpensive in manufacture, easy to adjust or control, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction and arrangement of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

Figure 1 is a vertical section through the device, the base being in elevation,

Figure 2 is a vertical section at right angles to Figure 1 taken on the line 2—2 of Figure 1.

Figure 3 is a horizontal section on the line 3—3 of Figure 1 showing a plan of the indicating means, and

Figure 4 is a diagram showing the loop connected in a conventional circuit.

Referring more particularly to the drawings, I have shown the loop itself as comprising a cabinet 10 which may be of any desired width and diameter and of cylindrical or polylateral shape, such details being capable of variation. Furthermore, any desired material may be used though veneered wood is ordinarily satisfactory. At the bottom of this cabinet is a platform-like member 11 to which is secured a depending shank 12 socketed as shown at 13 so as to be rotatably engaged upon the base. In the present instance the cabinet is represented as including sides 14 of polygonal shape with panels 15 secured to the flat faces thereof in edge to edge relation so as to form a complete enclosure.

The supporting structure preferably includes a relatively heavy base 16 at the center of which is suitably secured an upstanding post 17 surrounded by a sleeve 18 of insulating material, this sleeve being received within the socket 13 in the depending member 12. The upper end of the post is recessed for the reception of a bearing ball 19 of insulating material, preferably glass, and this bearing ball engages against the inner end of the socket 13. Obviously the entire cabinet is readily rotatable with respect to the supporting base and is thoroughly insulated therefrom owing to the provision of the insulating sleeve 18 and bearing ball 19.

In order that the device may be set to face in any desired direction, I have shown a disk 20 of celluloid or other suitable material let into the top surface of the base 16, this disk being graduated or provided with indicia corresponding to the points of the compass, intermediate degrees being also provided. The member 12 carries a pointer 21 cooperating with the graduated disk 20. This feature of accurate adjustment as to direction is of importance in view of the well known directional properties of loop antennæ.

Extending transversely between the sides 14 of the cabinet are outer and inner series of strips or bars 22 and 23 respectively, those in the inner series being in radial alinement with those in the outer series. The outer edges of the bars 22 and the inner edges of the bars or strips 23 are preferably notched as indicated at 24 and 25 respectively for retaining the successive convolutions of the coil to be described so that the convolutions will not slip longitudinally of the supporting strips or bars. The coil indicated generally at 26 consists of a suitable conductor wound over the outer strips 22 and under the inner strips 25. There is an uneven number of strips so that in the successive convolutions the stretches or portions of the conductor between the outer and inner strips will be at substantially right

angles thereby reducing the capacity and lessening the inductive action of the successive convolutions upon one another. Logically this will be of material benefit inasmuch as sharper tuning will be possible and reception improved.

As an added convenience a tap 28 may be taken off from some intermediate point along the coil and connected with a contact 29 forming part of a switch device including a movable arm 30 selectively engageable with either the contact 29 or a contact 31 with which one terminal of the coil is connected. The other terminal of the coil is connected with a suitable binding post 32 and the switch arm is connected with a similar binding post 33. This switch device is preferably located on the supporting member 11 and there is of course a suitable knob 34 provided for operating the switch.

Naturally the antenna may be connected with a receiving set in the usual manner, a conventional diagram being shown in Figure 4 simply for the purpose of illustrating the utility of the device. The loop acts in a manner similar to that of other loops and is intended to be rotated as is customary depending upon the direction of the sending station to be heard. However, owing to the peculiar winding it is clear that sharper results will be obtained. Owing to the fact that the convolutions have their stretches crossing each other at substantially right angles they may be placed closer together than is ordinarily possible without objectionable results and the cabinet may therefore be of less length than would otherwise be required, this reduction in bulk being obviously of advantage.

While I have shown and described a preferred embodiment of the invention, it should be understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. A loop antenna comprising a stationary support, a second support rotatably mounted with respect to said first named support, an outer circular series of transverse supporting elements carried by the second named support, an inner circular series of supporting elements aligning radially with the first named supporting element and likewise carried by said rotatable support, and a conductor having a plurality of convolutions supported upon said elements, each convolution being brought over and under the elements of the outer and inner series respectively whereby the corresponding portions thereeof will cross at substantially right angles.

2. A loop antenna comprising a stationary support, a cabinet rotatably mounted thereon and including side members, an outer circular series of transverse supporting elements within the cabinet, an inner circular series of supporting elements aligning radially with the first named supporting elements, and a conductor having a plurality of convolutions supported upon said elements, each convolution being brought over and under the elements of the outer and inner series respectively whereby the corresponding portions of the successive convolutions will cross at substantially right angles.

3. In a loop antenna, a relatively stationary base, an upstanding post thereon, a supporting member carrying a coil, a depending element at the bottom of said supporting member formed with a socket rotatably engaged upon said post, a sleeve of insulating material surrounding the post, and a ball of insulating material engaged between the end of the post and the inner end of the socket.

In testimony whereof I affix my signature

FREDERICK GRAUE.