Nov. 23, 1926. 1,608,110

W. O. MEISSNER

LOOP AERIAL

Filed Dec. 18, 1925

Fig. 1

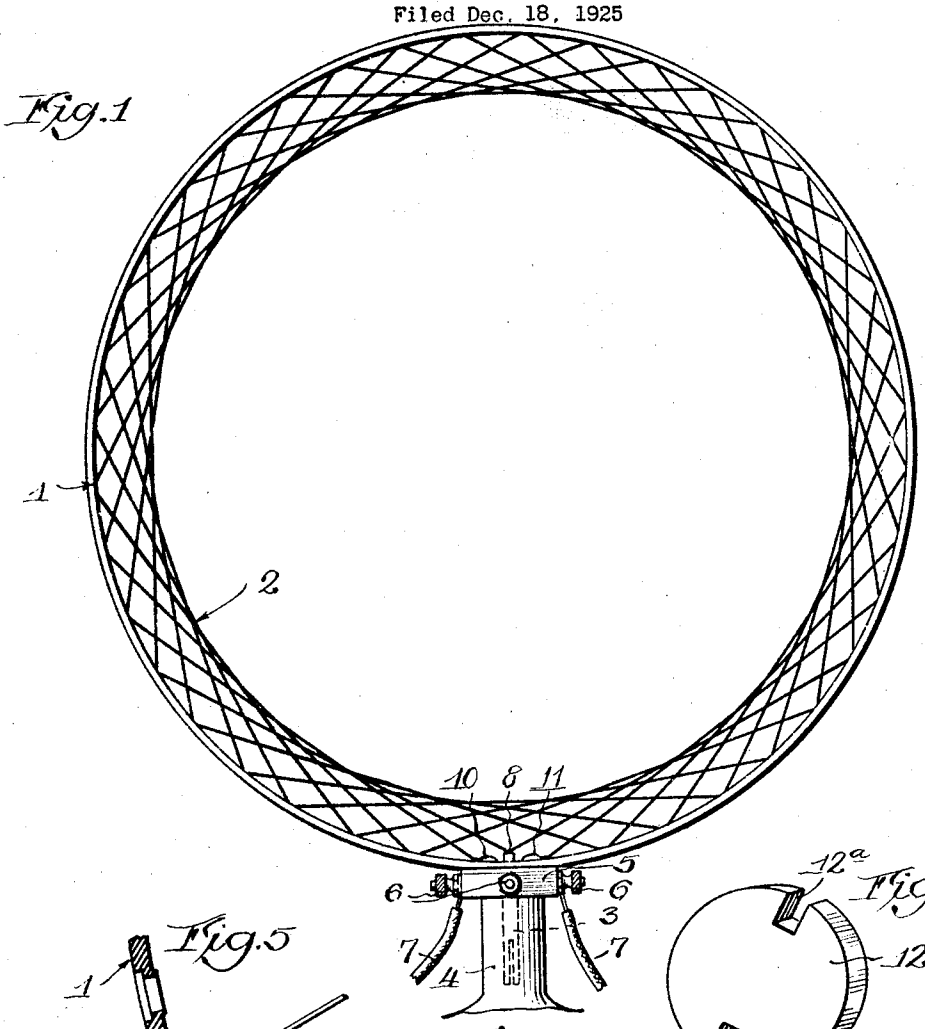
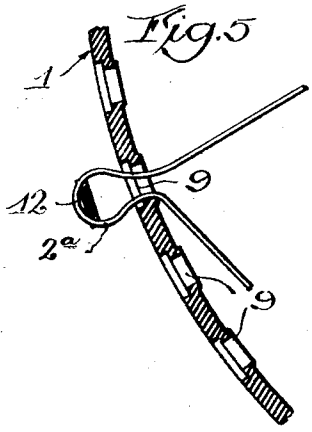


Fig. 5



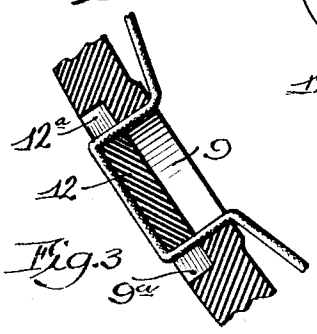
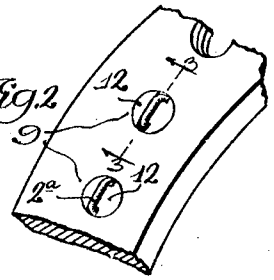


Fig. 3

Fig. 4

Fig. 2



Witness:
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UNITED STATES PATENT OFFICE.

WILLIAM O. MEISSNER, OF CHICAGO, ILLINOIS.

LOOP AERIAL.

Application filed December 18, 1925. Serial No. 76,149.

This invention relates to improvements in loop aerials, and more particularly to an improved method of constructing aerials of the character described.

The object of the invention is to provide an improved construction for loop aerials calculated to reduce the cost of production and to eliminate certain undesirable electrical effects common to loop aerials as ordinarily constructed, and as will hereinafter be more fully explained.

A preferred embodiment of the invention is disclosed in the accompanying drawings, in which

Figure 1 is a view in side elevation of the completed aerial.

Figure 2 is an enlarged perspective view of a section of the aerial frame.

Figure 3 is an enlarged detail view in section taken on line 3—3 of Figure 2.

Figure 4 is a perspective view of one of the discs, and

Figure 5 is a view showing the method of wiring.

A loop aerial, so-called, is one in which the antenna of a receiving set is brought within a relatively small compass, by winding a length of antenna wire on a suitable frame in the form of a plurality of loops or turns. While an aerial of this type gives satisfactory results with sets designed for their use, it has been found that their effectiveness is reduced by the electrical phenomena, known as distributive capacity, which has been attributed to the fact that the turns of wire have been arranged in parallel relation. It follows, therefore, that by winding the aerial in such a way as to have none of the turns, or portions of the several turns in parallel relation reduced the effect of distributive capacity to a minimum.

Thus the present construction is characterized by the complete absence of parallelism in any portion of the loop or turns of wire, this being brought about by a novel method of applying the wire to a circular supporting frame. Moreover, by the improved construction, the operation of winding has been very much simplified and the time required greatly shortened.

Referring now to the aerial as preferably constructed, the same consists of a circular frame 1, of the desired diameter of say 16 to 18 inches, about the inner periphery of which is wound a network of covered flexible wire 2, in the form of a band of say two (2) inches in width. At one point on the frame is a supporting stem 3, projecting radially therefrom and adapted to rotate in a suitable standard or base 4, so that the aerial will assume a vertical position when in use, and be capable of being shifted into different vertical planes by turning it about the axis of said stem. Mounted on the stem 3 is a terminal block 5, in which are embedded the binding posts 6, which form the terminals of the antenna wire, and which are connected with the receiving set by conductors 7—7. In the present construction there are three such terminals or binding posts, one of which is connected with a shunt terminal or tap 8, electrically connected with the aerial wire at a point midway of its length to form what is known as a "split" loop.

As a preferable construction the frame 1 is made of a strip of fibre or other non-conductive material bent into the form of a hoop, the material being about one inch in width and one-eighth of an inch in thickness. Around the frame are formed a plurality of equidistantly spaced holes 9, located midway between the edges. These holes are punched out of the material and are about one quarter of an inch in diameter. Moreover, these holes are counter-sunk as shown in Figure 1, to form annular shoulders 9^a, shown as square, although they may be tapered if desired. The distance between holes, measured on the circumference of the frame, varies with the diameter of the frame and the number of turns in the aerial to be made.

For convenient in illustrating the method of wiring, a concrete example will be given. Thus assuming that an aerial of 14 turns or complete circuits of the frame is to be made, there are 80 holes extending completely around the frame, and which include the two just above the terminal block and on either side of the tap 8, in which are mounted terminals 10 and 11 for the ends of the antenna wire. These holes are designated by numbers. Thus starting with the left hand terminal 10 as hole number 1, the holes are numbered consecutively around the frame in a clockwise direction with the right terminal as No. 80. Having first connected the free end of the wire to the terminal 10, it is carried to hole No. 15, then to No. 29, then to No. 43, then to No. 57, and then to No. 71. At the last mentioned hole the wire has practically made one complete turn of the

frame, passing from point to point with intervals of 14 holes between. Having reached hole No. 71, the next or 14th hole beyond is No. 5 (4 holes beyond No. 1), so that the first complete loop or turn, carries the wire four holes beyond its starting point where the second turn is begun. Thus adhering to the same spacing of 14 holes between points of attachment, the second turn of wire is secured at holes Nos. 19, 33, 47, 61, 75 consecutively, and thence to No. 9, for the beginning of the third turn. This method is continued with each succeeding turn, the wire being drawn taut so that each turn consists of six chords about the circle, although, as is evident, the arcs subtended by these chords are slightly greater than a complete circle, the differential being the distance between 4 holes. When seven turns are applied, the last chord of the seventh turn is secured to the tap 8, and then the winding of the second seven turns is commenced, this time using the even numbered holes instead of the odd numbers. Thus, for the eighth turn, holes Nos. 14, 28, 42, 56, 70, 4, etc. is the order in which the wire is threaded, finally ending at the end of the 14th turn with the left hand terminal 11. Thus on the completion of the winding a web-like network of wire is built up within the frame, forming a uniform design or pattern in which no two turns or chords of any turns are parallel with each other.

Having described the arrangement or scheme of wiring, the method followed in the actual operation will now be set forth. For convenience a rotative table may be used having a circular form in which the frame is held. At the center of the form is a spindle on which a spool of wire is mounted. The end of the wire being secured to one terminal, as already described, the frame is turned as the wire is carried from hole to hole. This, of course, permits the operator to remain in one position, instead of moving about the frame. In making a connection with the frame, the operator uses a suitable instrument with a hooked end which he passes through the hole from the outside, engaging and drawing a loop 2^a of the wire outwardly through the hole as shown in Figure 5, and somewhat after the manner of crocheting. This having been done, a small circular disk 12 having diametrically opposed marginal notches 12^a is inserted through the loop of wire thus drawn through and thence slipped into the hole where it fits within the seat formed by the countersunk shoulder, and flush with the outer surface of the frame (Figure 3). The wire thus passes outwardly through one notch over the disc, and inwardly through the other notch, and thence to the next hole, where the same fastening is made, the wire being pulled taut as the winding progresses from hole to hole. In each instance the discs are disposed with the notches in alignment with each other, the loops over the discs being likewise in the same circumferential line. As the winding progresses, the wire is unwound from the spool which remains in one position, since the feeding of the wire is entirely from the inner side of the frame, and hence the winding proceeds rapidly and without confusion.

Manifestly the exact form of loop securing members, the arrangement of the turns or wire and the method of wiring may differ from that herein illustrated and described without departing from the spirit of the invention, and therefore I do not wish to be limited to the specific disclosure, except in so far as set forth in the appended claims.

I claim as my invention:

1. A loop aerial comprising a circular frame, provided with a plurality of holes spaced around said frame, and an antenna wire supported by said frame, and consisting of a plurality of turns attached to the frame at predetermined points about its circumference, each point of attachment consisting of a hole through which a loop of wire is drawn and a fastening member passing through said loop and bearing against said frame.

2. A loop aerial comprising a circular frame, and an antenna wire supported by said frame and consisting of a series of turns fixed to the frame at a series of predetermined points about its circumference, there being a hole formed at each of said points through which loops of said wire are drawn from one side of said frame and fastening members adapted to be inserted through said loops on the opposite side of said frame.

3. A loop aerial comprising a circular frame, and an antenna wire supported by said frame and consisting of a series of turns, each fixed to the frame at a series of predetermined points about its circumference, there being a hole formed at each of said points, through which a loop of said wire is drawn outwardly, and a fastening member passing through each loop and seating over said hole, and the outside of said frame.

4. A loop aerial comprising a circular frame, and an antenna wire supported by said frame and consisting of a series of turns fixed to the frame at a series of predetermined points about its circumference, there being a hole formed at each of said points through which loops of said wire project, and fastening members adapted to seat within said holes, over which said loops pass.

5. A loop aerial comprising a circular frame, and an antenna wire supported by said frame and consisting of a series of

turns each fixed to the frame at a series of predetermined points about its circumference, there being a hole formed at each of said points into which loops of said wire extend, and circular discs provided with oppositely disposed notches, adapted to seat within said holes and having portions on opposite sides removed to permit said loops to pass over said discs.

6. A loop aerial comprising a frame consisting of relatively thin material having a plurality of relatively large holes extending around its circumference, and an antenna wire consisting of a series of turns each secured to said frame at predetermined holes spaced apart equidistantly, by passing looped portions of said wire through said holes, and means for securing said looped portions in substantially the same circumferential line.

7. A loop aerial comprising a strip of relatively pliable material shaped in circular form, and provided throughout its circumference with a plurality of equidistantly spaced holes, a plurality of discs provided with oppositely disposed marginal notches adapted to seat within said holes, and an antenna wire supported within said frame and consisting of turns secured at said holes by extending looped portions therethrough, and discs adapted to seat within said holes and to extend through said looped portions of the wire.

8. A method of constructing a loop aerial consisting of bending a strip of relatively thin material having a plurality of relatively large holes extending lengthwise, into circular form; mounting a spool of antenna wire at the center of said frame, and attaching said wire at successive points around said frame, by imposing loops through a hole at each successive point from the inside of said frame, inserting a fastening member through each loop on the outside of said frame and drawing the wire taut after each loop has been fastened.

9. A method of construcing a loop aerial consisting of bending a strip of relatively pliable material provided throughout its length with a plurality of equidistantly spaced holes into circular form, providing a plurality of discs adapted to seat within said holes, and winding turns of an antenna wire around said frame by passing successive looped portions of said wire through said holes and inserting said discs through said looped portions.

Signed at Chicago, Ill., this 14th day of December, 1925.

WILLIAM O. MEISSNER.