Sept. 2, 1930. G. W. AEGERTER 1,774,538

RADIO RECEIVING AERIAL

Filed Dec. 8, 1924 3 Sheets-Sheet 1

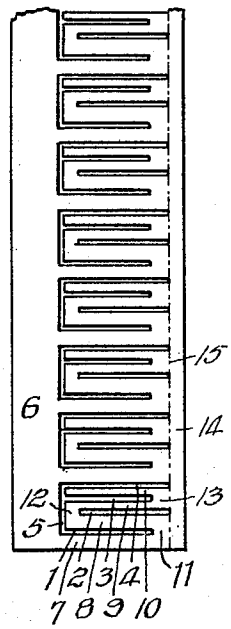


Fig. 1.

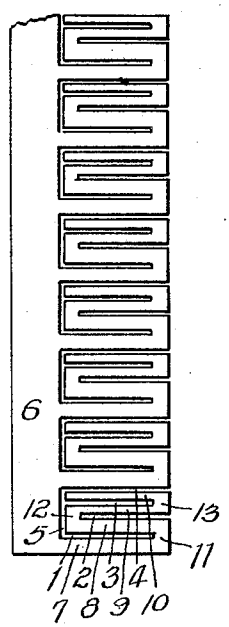


Fig. 2.

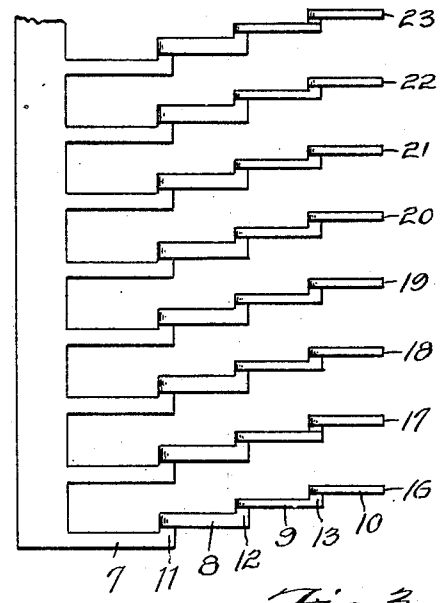


Fig. 3.

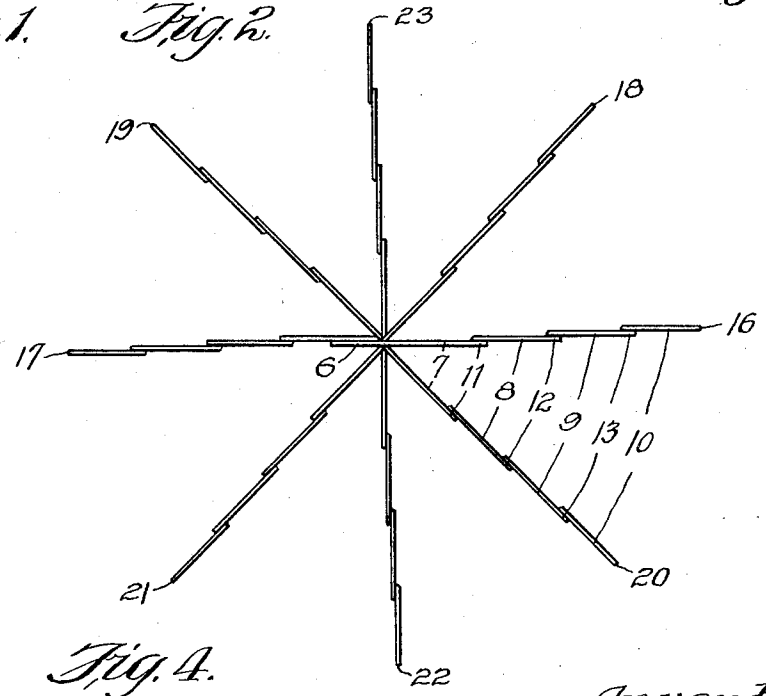


Fig. 4.

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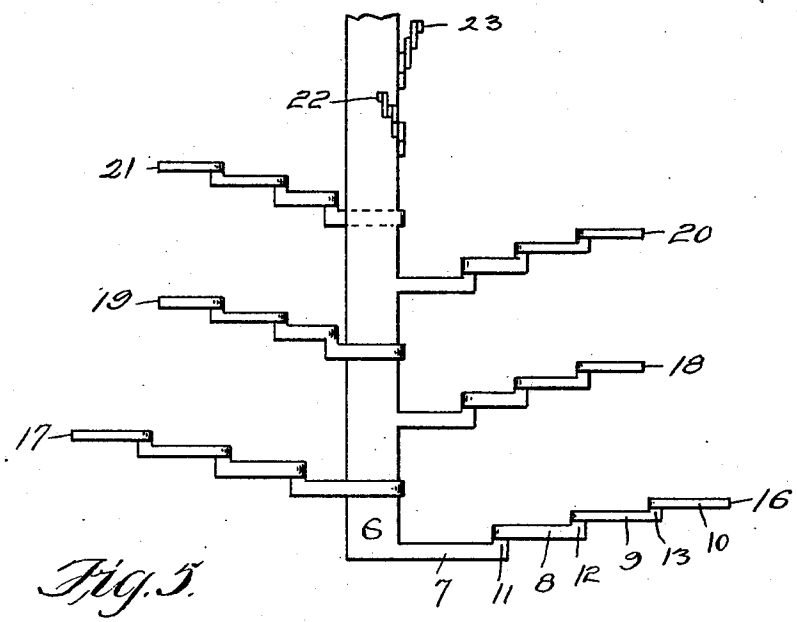


Fig. 5.

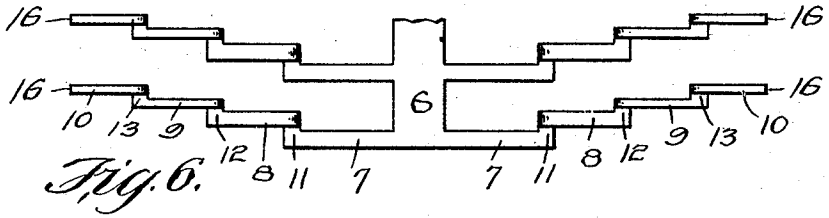


Fig. 6.

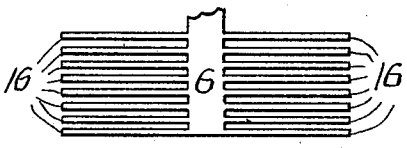


Fig. 7.

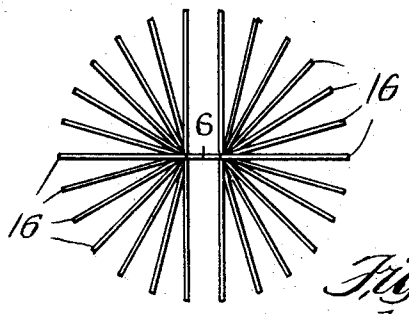


Fig. 8.

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RADIO RECEIVING AERIAL

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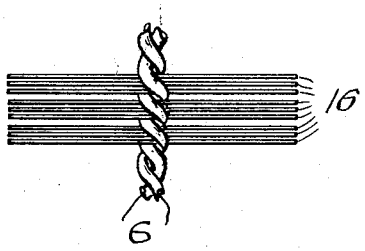


Fig. 9.

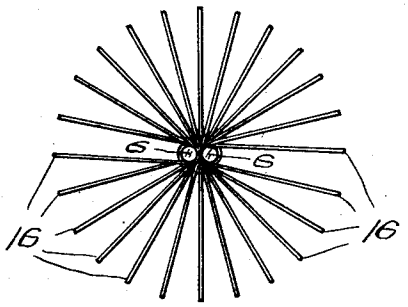


Fig. 10.

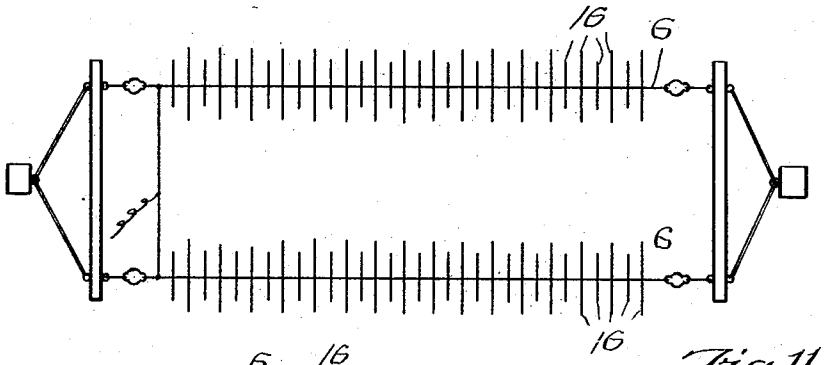


Fig. 11.

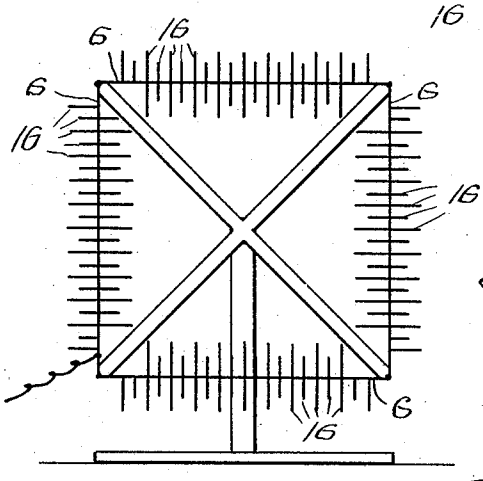


Fig. 12.

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Patented Sept. 2, 1930 1,774,538

UNITED STATES PATENT OFFICE

GUSTAVE W. AEGERTER, OF ST. LOUIS, MISSOURI

RADIO RECEIVING AERIAL

Application filed December 8, 1924. Serial No. 754,516.

My invention relates to aerials, and more particularly to radio receiving aerials, although not limited thereto, as it is equally useful as a sending aerial, and, it is a distinct and practical improvement to overcome certain practical objections to, and defects in, the present types of radio aerials.

The primary object of my invention is to provide a radio aerial giving greater volume, clarity, receivability and directional effect due to the cutting of a spiniferous conductor by electro-magnetic waves.

A further object of the invention is to provide an aerial comprising a main conductor which is provided with a multiplicity of prong like auxiliary conductors adapted to be cut by electro-magnetic waves.

A further object of the invention is to provide a radio aerial having a flat straight main conductor provided with a multiplicity of radially directed auxiliary conductors adapted to be cut by electro-magnetic waves.

A further object of the invention is to provide a porcupine type of radio aerial.

A still further object of the invention is to provide a radio aerial which possesses advantages in points of simplicity and particularly efficiency, and at the same time prove itself comparatively inexpensive in manufacture.

With the above and other objects in view, the invention consists in the novel features of construction, arrangement and combination of parts hereinafter more fully described and finally pointed out in the claims hereto appended.

Referring to the accompanying drawings forming a part of this specification, wherein like characters of reference denote similar parts throughout the several views:

Fig. 1, is a plan view of a portion of a strip of flat copper stock showing portions thereof punched out with a die, so that the aerial can be transported and sold in rolls of any desired length to be completed by the purchaser.

Fig. 2, is a plan view of the same strip of flat copper stock shown in Fig. 1, after the purchaser thereof has severed what I term the selvage edge.

Fig. 3, is a plan view of the same strip of flat copper stock shown in Fig. 2, after the several sections comprising each prong like auxiliary conductor adapted to be cut by electro-magnetic waves has been extended by folding one section thereof over the other.

Fig. 4, is an end view of the aerial showing eight positions in which the auxiliary conductors are adapted to be cut by electro-magnetic waves may be bent into with relation to the main conductor.

Fig. 5, is a plan view of Fig. 4, but only showing a short section of the length of the aerial.

Fig. 6, is a plan view of a modified form of aerial embodying my invention.

Fig. 7, is a diagrammatic view of another modified form of aerial embodying my invention.

Fig. 8, is an end elevation thereof with the auxiliary conductors bent into operative positions.

Fig. 9, is a plan view of another form of aerial embodying my invention.

Fig. 10, is an end elevation thereof with the auxiliary conductors bent into operative positions.

Fig. 11, is a diagrammatic view of the double main conductor type of aerial embodying my invention.

Fig. 12, is a diagrammatic view of a loop type of aerial embodying my invention.

In carrying out the aim of my invention, I employ a flat strip of copper, or other suitable metallic stock of any designed gauge, length and width.

From the strip of metallic stock, I punch out pieces of the material, with suitable dies, to provide the transversely disposed slots 1, 2, 3 and 4, as shown in Fig. 1, which slots are disposed parallel to each other in suitable spaced relation. I also punch out material to provide an inner longitudinally disposed slot 5 connecting the slots 1, 3 and 4 to provide what I term a main longitudinal conductor section 6, the transversely disposed auxiliary conductor sections 7, 8, 9 and 10, the longitudinally disposed connecting sections 11, 12 and 13, and the selvage edge section 14, as clearly shown in Fig. 1. It will be ob-

served from Fig. 1, that the inner edge of section 7 is integral with one edge of the main conductor section 6, and that the outer edge of the connecting sections are integral with the selvage edge 14. It will also be here observed that by first stamping or punching the copper strip, as shown in Fig. 1, that I can make the aerial from any desired length of strip, which permits me to roll the strip in say one hundred foot, or any other desired lengths for transportation and for sale, and if shorter lengths are desired to be purchased, they can be cut from the roll. It will also be seen that the selvage edge 14 serves the purpose of holding the several auxiliary conductor sections from displacement during manufacture of the aerial from strip stock, during transportation thereof, the sales thereof and in the handling thereof in general prior to its intended use. I may state here for the sake of clarity that the aerial strip is made up of sections, each section taking in but one auxiliary conductor.

After the desired length of aerial has been purchased from the dealer, by the radio operator, the radio operator then severs the selvage edge 14 from the strip along the broken line designated 15, as shown in Fig. 1, which then results in an aerial strip, as shown in Fig. 2. After the severing operation of the selvage edge, the radio operator, or installation man extends the auxiliary conductors by folding sections 8 over the connecting sections 11, the sections 9 over the connecting sections 12 and the sections 10 over the connecting sections 13, which folded sections then provide a plurality of auxiliary conductors adapted to be cut by electro-magnetic waves, as is evident from Fig. 3 of the drawing.

I have shown in Figs. 3, 4 and 5, of the drawings for the mere purpose of illustration, eight sections of the aerial strip, which provides eight auxiliary conductors and for the convenience of conveying the intended positions and purpose of these auxiliary conductors more clearly, I have designated the auxiliary conductors in these figures as 16, 17, 18, 19, 20, 21, 22 and 23. In the other views, I have eliminated the reference numerals 17 to 23, inclusive. It is not to be understood however, that the few auxiliary conductors I have illustrated, owing to lack of space to show more, must be finally bent to the exact positions shown in Figs. 4 and 5, as it is evident that where each auxiliary conductor requires substantially thirteen sixteenths of a linear inch of material to form it and the average straight aerial being about one hundred feet long, it is evident that there will be over a thousand prong like auxiliary conductors which will enable the installation man or radio operator to bend and position each auxiliary conductor to suit his own fancy, it only being intended to provide a spiniferous form of aerial and not to designate the exact positions of each auxiliary conductor with relation to the main conductor 6, or with its co-auxiliary conductors. The main point I have in mind is to provide a spiniferous type of aerial regardless as to the exact direction the spine like auxilary conductors are directed from the main conductor or the axis of the aerial, except longitudinally thereof, thus providing a wider range in all directions from the main conductor within which the conductors of the aerial can be cut by electro-magnetic waves.

The modified form of spiniferous aerial shown in Fig. 6, is illustrated to show the auxiliary conductors 16 before being bent or displaced in various radially directed position and is of a double extensible comb type of aerial, wherein the aerial shown in Figs. 1, 2, 3, 4 and 5 is of the single comb type. The modification shown in Fig. 6, is exactly like the aerial shown in Fig. 3, except the auxiliary conductors are formed on both side edges of the aerial strip. In the modified form of spiniferous aerial shown in Fig. 7, the main conductor is also flat and is provided on both side edges with straight non-extensible auxiliary conductors 16 which are formed like teeth in a comb and then bent into the desired position with relation to the main conductor.

In the modified form of spiniferous aerial shown in Fig. 9, I eliminate the flat copper strip conductor 6 and substituted therefore two copper wires 6 between which are placed auxiliary copper wire conductors 16 of the desired length and which are held in position between the main wire conductors 6 by twisting of the main conductor 6 and by soldering or otherwise positively connecting the auxiliary wire conductors 16 to the main conductor 6 to eliminate broken connections. The auxiliary wire conductors 16 in this modified form of spiniferous aerial are also radially, or outwardly directed from the main conductor 6, in all directions, to provide a spiniferous form of aerial capable of occupying a large field in which it is cut by electro-magnetic waves.

In the diagrammatic view shown in Fig. 11, it will be observed that I have shown two of my spiniferous aerial strips arranged in spaced parallel relation with each other and supported in the usual well known manner.

In the diagrammatic view shown in Fig. 12, it will be observed that I have shown the spiniferous aerial as forming a loop and mounted upon a suitable supporting frame in the usual well known manner. In the loop form of aerial it is evident that a single aerial strip may be bent to form the loop, or it may be made of straight sections suitably united at their ends. Several rows of aerial strips may be used in the looped aerial, if de-

sired, in order to provide an aerial of the proper length for receiving purposes.

It will be noted in Figs. 1, 2, 3, 5 and 6 that the auxiliary conductor sections 7 and 8 are wider than sections 9 and 10 for the purpose of making the inner ends of sections 7 and 8, and especially section 7 heavier and stronger than the remainder of the auxiliary conductors so as to properly support the weight of the auxiliary conductors to prevent sagging thereof due to a weak connection with the main conductor 6. This arrangement it will be observed, provides offset, tapered auxiliary conductors.

From the foregoing description and the accompanying illustrations, it is evident that I provide a new and novel type of aerial, one which is spiniferous in its formation, thereby capable of a wider range for receiving electromagnetic or radio waves from the ether, one which is adapted to use as a single straight line aerial, a double line aerial, looped aerial and adapted to either indoor or outdoor use. It may be here stated that while I have quoted a flat copper strip throughout the specification, that this strip can be of any other suitable metallic substance which can be used for the purpose intended.

The many advantages of the herein described invention will readily suggest themselves to those skilled in the art to which it appertains.

I do not wish to be understood as having limited myself to the specific details of construction shown and described, but desire to have it understood that the invention I have shown in the drawings is merely illustrative as it is manifest that various minor changes may be made in the exact construction and particular arrangement of parts without departing from the spirit of my invention, hence I reserve the right to make any such changes, or modifications as may fairly fall within the scope of the appended claims when fairly construed.

What I claim is:

1. A radio aerial comprising a main conductor, a multiplicity of auxiliary conductors disposed in spaced relation along said main conductor and directed radially therefrom, said auxiliary conductors having a plurality of offset integral sections and each section being folded over the adjacent preceding section at its base.

2. A radio aerial comprising a main conductor, a multiplicity of auxiliary conductors disposed in spaced relation along said main conductor and directed radially therefrom, said auxiliary conductors having a plurality of offset integral sections and each section being folded over the adjacent preceding section at its base and the outer sections of the auxiliiary conductors being of less width than the inner sections.

3. In a radio aerial, a flat main conductor and a multiplicity or flat extensible auxiliary conductors carried thereby and integral therewith.

4. In a radio aerial, a flat main conductor and a multiplicity of flat extensible auxiliary conductors carried thereby in suitable spaced relation along its entire length and directed from one side edge of the main conductor.

5. In a radio aerial, a flat main conductor and a multiplicity of flat extensible auxiliary conductors carried thereby in suitable spaced relation along its entire length and directed radially from said main conductor.

6. A radio receiving aerial comprising a flat strip of copper stock capable of being rolled into a compact body prior to use as an aerial, said strip being provided with a plurality of transversely disposed parallel arranged slots and a longitudinally disposed slot to provide a main conductor section, a plurality of auxiliary conductor sections integrally connected and a selvage strip section for retaining the auxiliary conductor strips from displacement until the selvage edge section has been severed from the strip stock when the auxiliary conductors can then be extended and directed as desired from the main conductor section.

7. A radio aerial strip comprising a strip of flat metallic stock, said strip having transversely slotted openings therein, a longitudinal slot for each set of three transversely disposed slots to provide a main conductor, a plurality of auxiliary conductor sections and a selvage edge section, which selvage section when severed from the auxiliary conductor sections permits the auxiliary conductor sections within the distance of each longitudinal slot to be extended by folding one section over a portion of the preceding section to constitute a single auxiliary conductor.

8. A radio aerial strip comprising a flat strip of metallic stock, said strip stock being provided with a plurality of laterally disposed and directed slotted openings and with a longitudinally directed slotted opening for connecting certain of the laterally directed slotted openings to provide a main conductor, a plurality of auxiliary conductor sections and a selvage edge section, which selvage section when severed from the auxiliary conductor sections permits the auxiliary conductor sections within the distance of each longitudinal slot to be extended by folding one section over a portion of the preceeding section to constitute a single auxiliary conductor.

9. A radio aerial strip comprising a strip of metallic stock provided with slotted openings to form extensible radially directed auxiliary conductors and a selvage edge section adapted to be severed from the strip when the auxiliary conductors are to be extended.

10. A radio aerial comprising a strip of flat metallic stock provided with cutaway portions to constitute a main conductor and opposed auxiliary conductors consisting of offset radially directed sections.

11. A radio aerial comprising a strip of flat metallic stock provided with cutaway portions to constitute a main conductor and opposed auxiliary conductors consisting of offset radially directed sections, said sections being folded over a portion of the preceding section.

In testimony whereof, I have hereunto signed my name to the specification.

GUSTAVE W. AEGERTER.