March 22, 1932. F. J. BODOH ET AL 1,850,914

RADIO AERIAL

Filed May 2, 1928

Fig. 1.

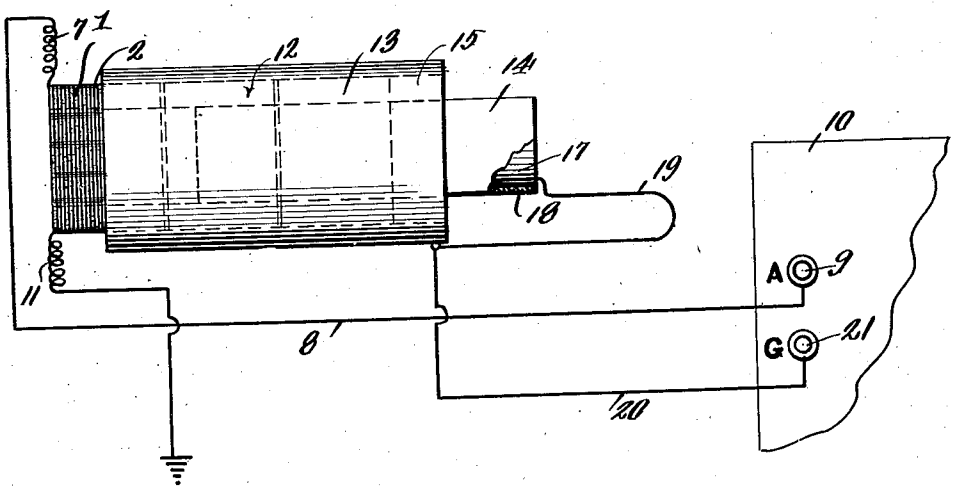



Fig. 2.

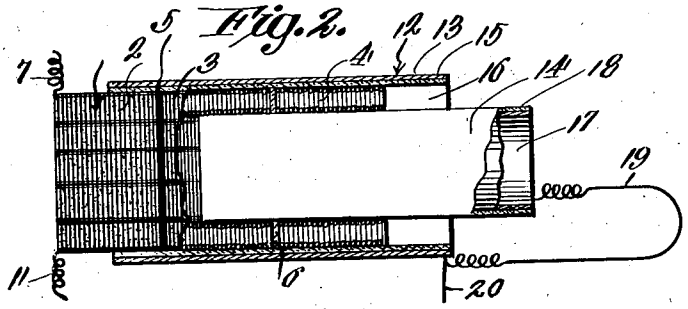



Fig. 3.

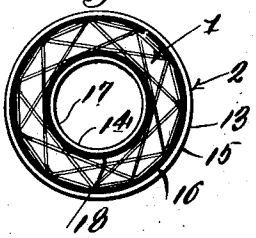



Fig. 4.

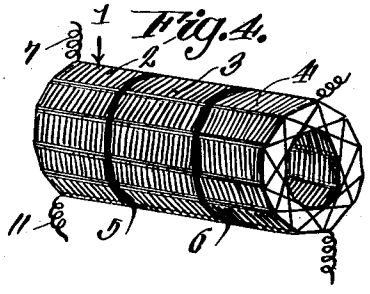
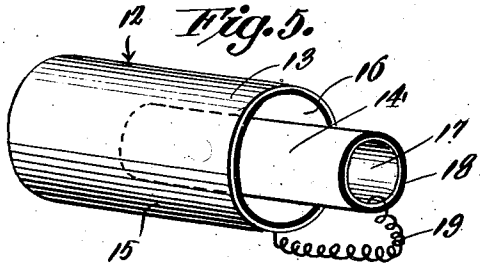



Fig. 5.




WITNESSES

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# UNITED STATES PATENT OFFICE

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## RADIO AERIAL

Application filed May 2, 1928. Serial No. 274,640.

This invention relates to improvements in radio aerials and more particularly to an aerial designed primarily for indoor use and especially in connection with electrified receiving sets of those types employing alternating current and battery eliminators and which aerial will take the place of and present marked advantages over outdoor aerials of the usual types.

One of the objects of the present invention is to provide an indoor aerial by the use of which increased volume may be obtained and the annoying effects of static and other interference may be overcome, the invention also contemplating an aerial whereby stations may be more readily and perfectly separated than is possible where ordinary aerials are employed.

While the accompanying drawings and the description which is to follow, constitutes a disclosure of the preferred embodiment of the invention, it will be understood that various changes may be made within the scope of what is claimed.

In the accompanying drawings:

Figure 1 is a view in elevation of the aerial embodying the invention, the view illustrating diagrammatically the manner in which the aerial is coupled with a receiving set;

Figure 2 is a view partly in longitudinal section and partly in elevation illustrating the aerial;

Figure 3 is a view in end elevation of the aerial;

Figure 4 is a perspective view of the coil unit of the aerial;

Figure 5 is a perspective view of the adjustable inductance-varying unit of the aerial separated from the coil unit.

The coil unit of the antenna is indicated in general by the numeral 1 and the same preferably comprises a set of three coils, indicated one by the numeral 2, another by the numeral 3, and the third by the numeral 4, these coils being disposed in axial alinement and the coils 2 and 3 being separated by an insulating ring 5 and the coils 3 and 4 being similarly separated by an insulating ring 6, the coils being wired in series. As illustrated in Figure 1 of the drawings, the primary terminal of the coil 2 of the series is provided with a tap 7 adapting it for the connection thereto of a wire 8 leading to the aerial binding post 9 of a radio receiving set 10, the secondary of the first coil 2 being provided with a similar tap 11 for connection with a suitable ground, it being understood, as before stated, that the coils are connected with one another, in series. As the coils 2, 3 and 4 are connected in series, the primaries of the coils and the secondaries will of course be mutually connected in the order in which the coils are arranged and the terminals of the primary and secondary of the coil 4 at the end of the coil opposite the end which is associated with the coil 3 are non-connected and are suitably arranged to avoid contact with any part of the aerial or any adjacent object.

The coils comprising the coil unit 1 are illustrated as of the honey comb type, but the coils may be otherwise wound, and it is preferable that they be of .00035 mfd. capacity.

In connection with the coil unit 1, the invention contemplates the utilization of an inductance-varying unit which is indicated in general by the numeral 12 and which comprises two inductance-varying elements, one indicated by the numeral 13 and the other by the numeral 14. The inductance-varying element 13 comprises a cylindrical body 15 of any suitable metal which is of a length equal substantially to the length of the coil unit 1 and which is of an internal diameter slightly greater than the external diameter of the coil unit and provided with a lining 16 of insulating material, this element of the inductance-varying unit being slidably adjustably fitted onto the coil unit 1 as clearly shown in Figures 1, 2 and 3 of the drawings. The element 14 of the inductance-varying unit likewise comprises a hollow cylindrical body 17 which corresponds to the body 15 of the element 13 and which is of any metal suitable for the purpose and exteriorly of a diameter slightly less than the internal diameter of the coil unit 1, a coating 18 of insulating material being provided upon the outer surface of the said element 17 and the element being slidably fitted into the coil unit 1 as shown

in Figures 2 and 3 of the drawings. A flexible conductor wire 19 is connected at one end, as clearly shown in Figures 1, 2 and 5 of the drawings, to the body 15 of the element 13 and at its other end is connected to the corresponding end of the body 17 of the element 14. The element 14, like the element 13, is preferably of a length equal substantially to the length of the coil unit 1 and the wire 19 is of a length to permit of complete freedom of adjustment of the two elements 13 and 14 of the inductance-varying unit with respect to each other and likewise with respect to the coil unit 1. A conductor wire 20 is connected at one end to the body 15 of the element 13 of the inductance-varying unit 12, preferably at the point of connection of the wire 19 therewith and is adapted to be connected to the ground binding post 21 of the receiving set 10.

While the elements 13 and 14 of the inductance-varying unit 12 have their bodies 15 and 17, respectively, illustrated as formed of metal and of cylindrical form, it will be readily understood that these elements may assume some form other than the form illustrated and that they may be constructed otherwise than of the true cylindrical and imperforate form shown in the drawings, the invention residing broadly in the provision, in combination with the coil unit, of an inductance-varying unit adjustably assembled therewith, together with the necessary conductors to complete the aerial circuit.

The aerial embodying the invention may be supported and connected with the receiving set, in connection with which it is to be employed, in any desired manner and likewise any suitable means may be employed for adjusting the inductance-varying unit elements, it being understood that these elements are intended to be selectively and independently adjustable.

Having thus described the invention, what we claim is:

1. A radio aerial comprising a coil including primary and secondary windings having terminals for connection respectively with the intake of a receiving apparatus and with ground, and an inductance-varying unit comprising elements of electro-conductive material one slidable longitudinally within and the other exteriorly of the coil, all of said elements being of substantially the same length, insulating layers upon said elements at their surfaces which oppose the coil, all of said elements and coils adapted to be arranged in complete nested relation, a flexible conductor electrically connecting the said elements, the said elements being adjustable, and a conductor leading from one of said elements for connection with the ground terminal of a receiving apparatus.

2. A radio aerial comprising a coil unit including a series of coils arranged in longitudinal alinement, an insulating ring separating the series of coils, the coils being in series with one another and including primary and secondary windings, the primary and secondary winding of one end of one of the coils of the series having terminals for connection respectively with the intake of a receiving apparatus and with ground, and an inductance-varying unit in circuit with the field of the coil and comprising elements adjustable independently of each other and with respect to the coil, the elements being of substantially the same length as the series of coils and capable of being arranged in nested relation with respect thereto, one of said elements being adjustable within the coil and provided with an outer insulating cover and slightly spaced from the coil and the other exteriorly thereof, the latter element provided with an insulating lining slightly spaced from said coil, a conductor connecting the said elements and flexible to permit of relative adjustment of the elements, and a conductor leading from one of the elements for connection with the ground terminal of the receiving apparatus.

In testimony whereof we affix our signatures.

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AUSTIN O. SARFF.