

July 6, 1926.

1,591,601

A. S. ALBRO

STATIC ELIMINATING SYSTEM

Filed Sept. 12, 1922

Fig. 1.

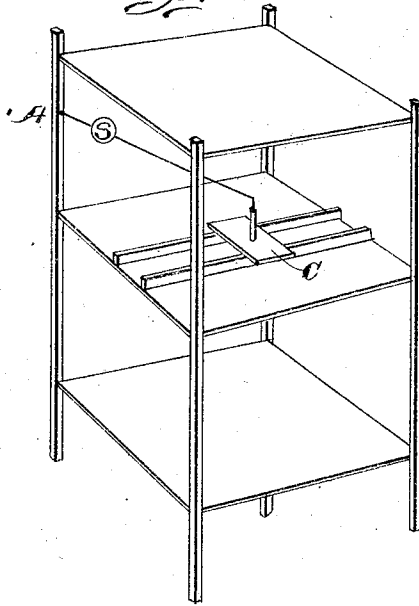


Fig. 2.

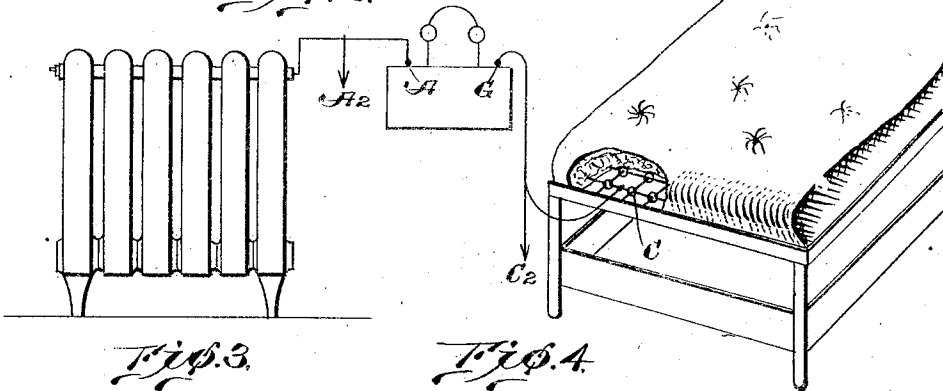


Fig. 3.

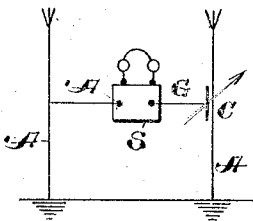
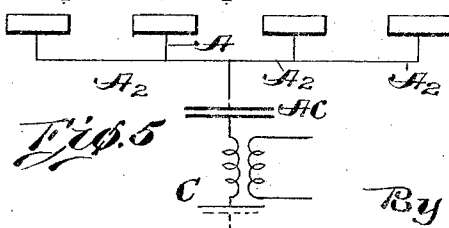
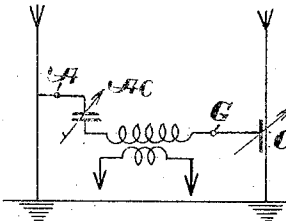


Fig. 4.



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UNITED STATES PATENT OFFICE.

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STATIC ELIMINATING SYSTEM.

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This invention relates to antenna systems and has more particular reference to interior antenna installations.

In those cases where the usual Marconi aerial has been disadvantageous, whether for military or other reasons, it has been suggested that coil or loop antennæ be employed. In contradistinction the present invention comprises a system for the reception of signals particularly where neither loop nor aerial as such, is employed, and yet the strength of signal is remarkably great and moreover substantially free from static or spark disturbances of the decremental type.

The system according to the present invention comprises attaching one end of a receiver set to the metallic structure either of a building or apartment house and employing a balancing condenser or counterpoise connection within the same building structure from the other end of the set placed within the building or the like. In this way it is found that hardly any length of wire at all is required and remarkably clear and strong signals, especially of the continuous wave type, can be received through the strongest type of local spark set interference.

Naturally in a building, or apartment house or the like, of several stories there is one particular floor for which a simple connection at the one end to a radiator or the like, and at the other end to a bed spring or the like, adjustably arranged as to height from the floor or walls, will give the strongest type of signals. The internal tuning of the set by means of the above system becomes exceedingly sharp, so much so, that on the sixth floor of an apartment house in Washington, D. C., it was possible to entirely tune out the Arlington Spark Set Station and receive distance signals from Schenectady, Detroit, etc. The only connections made were a direct wire leading from the set to the radiators, up to four in number, in the apartment, and a bed spring, or springs, metallic circuit or the like as insulated counterpoise for the other end of the set.

The remarkable freedom from static interference according to the present invention is possibly to be explained by the iron framework of the building acting as a Faraday cage with the internal, really single turn loop connection forming as it were an "underground" type of antenna as the receptor.

In other words, the ground connection the radiators and the like, with the present invention form part of a tuned receiving single turn through the counterpoise capacity to ground.

There would seem therefore to be present a number of peculiar antenna effects for it is well known that the vertical frame work of a building acts as an unloaded antenna. In addition thereto there is what might be called the "underground" effect, and thirdly there is present the single loop tuned effect already referred to.

However, in order better to understand my invention I have attached hereto a number of drawings forming part of this specification in which

Figure 1 represents the metallic frame work of a building forming as it were a Faraday cage acting on the whole as an unloaded vertical antenna;

Figure 2 corresponds to a perspective view of a possible form of layout involving the principles of the present invention;

Figure 3 is illustrative of the single turn loop effect combined with the Faraday cage shielding set up according to the principles of this invention;

Figure 4 is conformable to the showing of Figure 3 illustrating the preferred form of antenna condenser adjustment as contradistinguished from the counterpoise connection with the walls of the Faraday cage.

Fig. 5 is another modification illustrating the addition of several units to antenna.

Referring more particularly to the drawing, it will be seen that in Figure 1, the framework of the building is used as an antenna A and the radio set S is connected to a vertical member of the framework. The counterpoise C is also connected to the set S and is shown spaced from one of the floors of the building. Figure 3 shows diagrammatically this layout.

An actual layout of the present invention is best shown in Figure 2, in which the antenna terminal A of the radio set is connected to the radiator of the heating system and the ground terminal 3 is connected to the counterpoise C, in this case a bed spring. In order to vary the capacity of both the antenna and counterpoise, additional units may be added as indicated at A₂ and C₂ in this figure.

It should be pointed out as a feature of the system contemplated that it appears to

work much better when the receiving set includes the use of an adjusting antenna condenser. Under these circumstances there is a material advantage offered in connecting up the antenna and ground connections in the particular manner indicated in Figure 4 of the drawings.

With the radiators of the building forming an antenna connection to the antenna condenser A C (see Figure 4) of the sets, the ground connection G of the primary is preferably adjustably connected to the static eliminating counterpoise illustrated in the drawings. Such adjustable counterpoise can be made of a plurality of bed springs, or the like, connected in parallel as by means of the connection C₂ (see Figure 2) as the conditions of the weather (static) or the distance from the sending station may warrant. It would appear that the question of necessary adjustment for a particular station resolves itself into the matter of static introducing influences between the sending and receiving stations in question. In the same way the extent of aerial connections can also be effected by means of the lead A₂ (see Figures 2 and 5) serving to make greater or less contact with the frame work of the building.

In operation therefore the antenna side of a set S preferably including an antenna tuning condenser A C is connected to a radiator, or desired number of radiators,

with the ground side of the set connected to a counterpoise, or desired number of counterpoises, within the building or frame work. Tuning for a wave length is then effected in the usual manner including the proper adjustment of the antenna condenser. Thereafter the counterpoise connection is suitably varied for a given station and also for atmospheric conditions, static, prevalent at the time.

Having described the nature of my invention what I claim is:

In combination with a grounded equivalent of a Faraday cage adapted to act as an unloaded vertical antenna, a radio receiving apparatus attached through a removable conducting element of said cage to a point vertically along the frame work of said cage, means for capacitively and adjustably connecting the other end of said receiving set to one or more points on a second removable element of said cage on substantially the same horizontal lines as the first named connection, said second element by means of its connection being adapted to act as a counterpoise to correspond with a particular transmitting station at a given distance, the capacity of said counterpoise being different than that of the condenser of said antenna.

In testimony whereof he affixes his signature.

AMES S. ALBRO.