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HOLLOW SPACE RADIATOR
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Fig. 1.

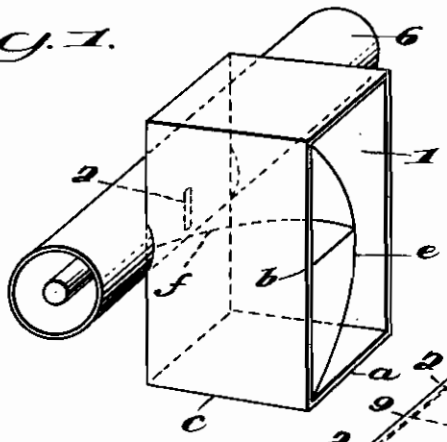
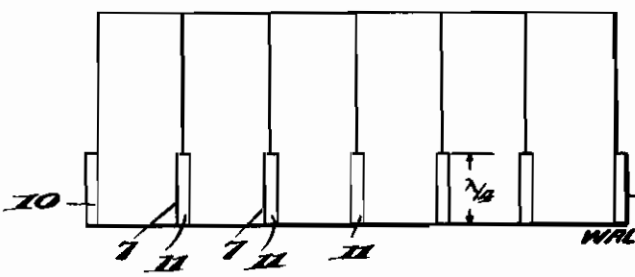


Fig. 2.

Fig. 3.



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ALIEN PROPERTY CUSTODIAN

HOLLOW SPACE RADIATOR

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The invention relates to a device for radiating ultra short waves consisting of several tuned hollow space radiators being built of conducting surfaces.

This invention particularly can be used as sending or receiving aerial for oscillations having a wave length less than 1 m.

One feature of this invention is the tuned hollow space radiator consisting of surrounding conducting surfaces being open at one side, the hollow space being coupled to an energy conducting device or alike by means of a slit in the back wall of said hollow space radiator. Several of such hollow space radiators are being coupled side by side to an energy conducting device or alike for the purpose of improving the directing effect. The distance of these single radiators having a seize of one or a multiple of λ. It is necessary that the single radiators of such a group are being tuned accurately so getting exactly one single frequency supplying the possibly highest effect.

A further feature of this invention is that the single radiator walls can be put directly one close to the other and that they can be coupled electrically through openings of the walls such providing an automatic adjustment of the different radiators. In this way the adjusting of the single radiators by hand being rather difficult and troublesome can be avoided. Furthermore it is not necessary to spend special attention to the exact situation of the slits in the back walls of the single radiators forming the connections to the energy conducting device being put exactly into the loops of the current.

Fig. 1 represents a single hollow space radiator consisting of a boxlike device.

Fig. 2 shows a group radiator consisting of several hollow space radiators put one close to the other and being provided with openings in the side walls.

Fig. 3 illustrates a plan view of a set of hollow space radiators forming a group as said before showing the side walls of the single hollow space radiators being split up into two at the outside such forming pocketlike small cases of a depth of λ/4.

Fig. 1 represents the hollow space radiators consisting of a box with parallel walls these having conducting surfaces. The side length of the box are signed with *a*, *b* and *c*. The front side of the box is open. The back wall of the box contains a slit **2** being connected with the interior of an energy conducting device **6** said device being fitted with or without an inner conductor. The hollow space radiator thus is coupled with the energy conducting device and is being excited in such way that the electric vector of the oscillations is perpendicular to the walls *bc*. The intensity of the electrical vector is divided sinusoidal as well along the edge *c* as along the edge *b*, as shown in Fig. 1 by the curves *e* and *f*. A box tuned in such a way represents a resonator being equivalent to a Lecher system of a length of λ/4. In the open front side **1** there is a potential loop whilst there is a potential node in the back wall at the slit **2**. The tuning of the box will not be changed whilst altering the length of the edge *a*.

Fig. 2 represents another special feature of the invention, this being a group radiator, consisting of several single boxes as shown by Fig. 1. This group radiator is showing its edge *a* being very much longer than the other edges *b* and c. In this group radiator box several separating and electrical conducting walls **7** are provided parallel to the sides *bc*, thus forming a device of a set of single radiators being built closely together. Every single radiator box in its back wall has a slit **2**, for coupling the box to the energy conducting device **6**. The walls **7** contain openings **9** for providing a radiation of only one wave length. These openings should be particularly placed close to the back walls **8** of the group box. F. i. these openings may be formed semicirclelike, it also may be useful to form these openings **9** rectangularly by leaving off that small piece of a separating wall **7** which is next to the back wall **8**, i. e. the separating wall being not led close up to the back wall. The coupling of the single radiators resulting from these openings **9** in the side walls **7** effects in all boxes equal amplitudes of oscillations also if the excitation of the different slits **2** in the single boxes is not exactly the same. Therefore it is not necessary as said before to place the slits **2** in respect to the energy conducting device mathematically exact into the current loops. In many cases it is quite sufficient that the slits **2** are placed near to currents of equal direction, i. e. having a distance of about λ. In some cases it might be necessary to regulate the coupling of the single radiators and therefore it will be useful to make alterable the openings **9** f. i. like a variable screen. Instead of building only one large box containing separating walls for making a radiator device one also can put together several single boxes each box being meant for one hollow space radiator. The construction as per Fig. 2 has essential advantages.

Fig. 3 schematically shows some improved device as per Fig. 2 thus avoiding even the additional spraying appearing at the edges of the walls. This already is explained in the former application of the applicant Ser. No. 64,604. As per Fig. 3 the edges of the surfaces next to the front side especially the side walls **10** and the separating walls **7** as well as also the covers **12** and the grounds **13** (Fig. 2) are split getting thus pocket-like small cases **11** of a depth of λ/4. By this at all edges of the front sides the intensity of the current will be exactly zero.

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