Sept. 13, 1938. H. SCHARLAU 2,130,033

DIRECTIVE BEAM RADIATOR

Filed July 5, 1935

Fig. 1

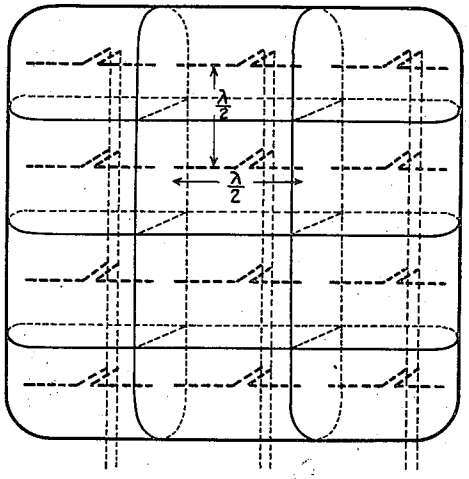


Fig. 2

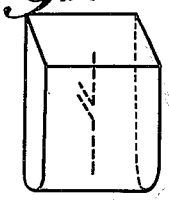


Fig. 2a

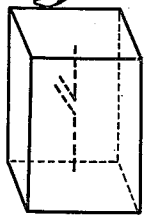


Fig. 2b

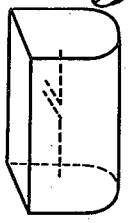


Fig. 2c

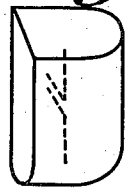


Fig. 3

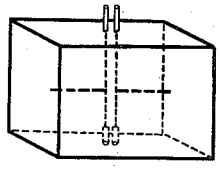
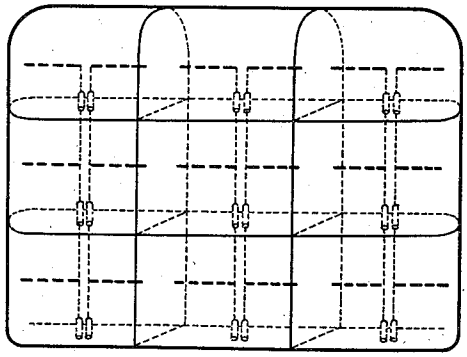


Fig. 4



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DIRECTIVE BEAM RADIATOR

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Application July 5, 1935, Serial No. 30,036
In Germany July 5, 1934

2 Claims. (Cl. 250—33)

This invention relates to an improved short-wave beam radiator, and is concerned with short-wave directive or beam radiators which, for the purpose of affording protection from climatic, mechanical and temperature agencies, are totally surrounded by or embedded in an electrically suitable insulation material.

In the unprotected mounting of short-wave beam radiators in the open air, it has been found that by action of the climate, temperature, soiling by birds and insects, etc., the tuning and the radiation properties are greatly altered or impaired. What is referred to are such phenomena as hoarfrost, icicles due to splashing of water, deposits of animal faeces, etc., which are inevitable where beam radiators are used on marine vessels.

In order to free antenna structures from ice deposits, heating means have been suggested. However, where radiators designed for decimeter waves are dealt with, such arrangements are hardly practicable any longer or they would mean a troublesome complication of the equipment.

The object of this invention is a short-wave directive radiator (say, a radiating system comprising planar or curved reflectors, multiple aerials of the "Tannenbaum" or Christmas tree form, a so-called beam or a simple dipole) which in its entirety is surrounded by some electrically suitable insulation material or is embedded in the latter. Such a directional short-wave radiator or beam radiator may be erected at exposed places while insuring conditions so that even in wind and under the inclemencies of the weather and external mechanical agencies, the same will neither change in tuning nor in its radiativeness. Such a short-wave beam or directive radiator may suitably serve as a building block or unit in multiple-type arrangements in such a way that by vertical and/or horizontal alinement of a plurality of such units a larger radiator results having certain desirable radiation properties. In order that such shape of diagram as may be desired in any given instance may be obtained, each of the constituent units may be given radiation characteristics, or all of the units may be made of identical characteristics. Preferably the individual radiator unit should be so designed that the same may be re-tuned by ways and means accessible and operable from the outside or may be altered in its directive effects.

In the practical execution of such lining or embedding, attention must be paid to the refraction of radiations by the ambient material. In fact, it is recommendable to avoid sharp peaks and edges and other unsteadiness or irregularities in the lining.

Fig. 1 shows, by way of example, the construction of a multiple short-wave beam radiator without reflector which consists of constituent elements resembling those shown in Figs. 2, 2*a*, 2*b* and 2*c*, inclusive. Fig. 3 discloses one way of providing suitable contact means for the individual aerial elements. Fig. 4 is a modification of Fig. 1. In a case wherein multiple radiators are employed, of course, only the edges of the outside units of construction must be rounded off.

The use of the basic idea of the invention is not restricted to the embodiments here illustrated, for antenna arrangements of other shape or nature together with suitable reflectors surrounded by insulation material in their entirety could be similarly used as units of construction. In a great many instances, it will be desirable to place the leads brought to the individual radiators into the lining or envelope as shown in Fig. 4. For the electrical connection of the various units or elements, suiable contact means could be provided, such as plugs and sockets, as indicated in Fig. 3.

In order to protect the radiator from damage, or else to dispense with and save special constructions for mounting, the lined or enclosed directional radiator could be placed or recessed in existent structures, say, in the wall of a station building.

Having thus described my invention, what I claim is:

1. A short wave system comprising a plurality of dipole aerial units adapted to be assembled together, each dipole aerial unit having two arms located within an individual envelope, said envelopes being in the form of blocks having flat surfaces whereby they can be superposed one above the other, a pair of terminal connections connecting the adjacent ends of the arms of each dipole to a pair of terminals on one of the flat surfaces of its surrounding envelope, the terminals of one envelope comprising jacks and the cooperating terminals of its immediately adjacent envelope comprising plugs for directly connecting their associated dipole aerial units together.

2. A system in accordance with claim 1, characterized in this that each aerial is embedded in insulation material.

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