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April 27, 1937. H. E. HOLLMANN 2,078,246

SHORT WAVE SHIELD

Filed Aug. 22, 1934

Fig. 1

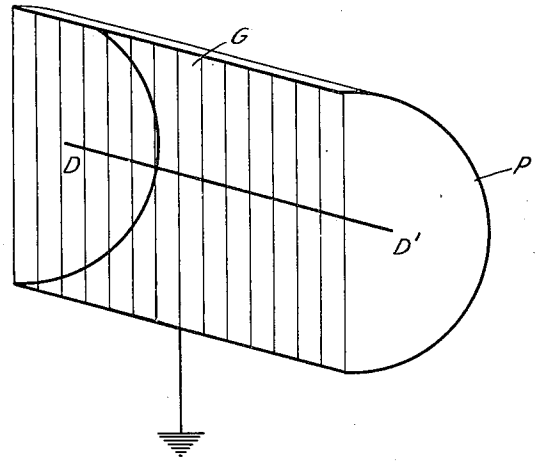
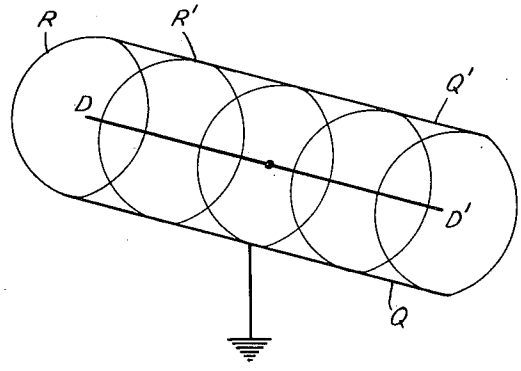


Fig. 2



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SHORT WAVE SHIELD

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In Germany August 29, 1933

3 Claims. (Cl. 250—11)

My present invention relates to a method of interference elimination in receiver equipment for ultra-short waves. The susceptibility of ultra-short waves to atmospheric disturbances is extremely slight as well known in the art. However, there are other sources of interference which may manifest themselves under certain circumstances, such as "technical" installations, primarily the ignition apparatus of internal-combustion engines. Another source of trouble resides in the aperiodic collective reception of powerful modulated transmitters. It will be remembered that also the demodulator action of a retarding-field tube of the kind used for rectification for extremely short waves in a general way is predicated upon its curved characteristics and therefore exists at all frequencies in the same manner. This action becomes particularly critical if signal transmission on the ultra-short wave channel is insured by the use of a longer intermediate wave (auxiliary carrier) as done, for instance, in duplexing work for the purpose of precluding mutual actions of two parallel channels. In this instance, the ultra-short wave receiver for the intermediate frequency acts directly as an antenna so that the intermediate wave, in turn, is exposed to atmospheric disturbances and above all to actions by extraneous transmitters working practically on the same wave-length.

Now, in order to obviate this difficulty, recourse is had according to the present invention to the fact that a grid consisting in the simplest case of paralleled conductor elements will permit of the unimpeded passage of the electrical waves only when the said conductors are positioned or oriented in the polarizing plane (i. e., at right angles to the oscillation plane), while they represent an impenetrable reflector wall for all waves otherwise polarized. If, then, the antenna or still better the entire receiver is shielded by such a grate, it follows that only such waves as are properly polarized will reach the receiver, whereas all other frequencies, especially all disturbances and interfering actions as well as the above-mentioned intermediate frequencies will be precluded.

The basic idea of the invention is realizable in various ways in practice.

Fig. 1 shows a perspective view of a shield having a plurality of parallel arranged rods;

Fig. 2 shows a perspective view of a shield having a plurality of parallel arranged rings.

Referring now in detail to the drawing, Fig. 1 shows an embodiment in which the receiver itself comprising the dipoles D, D' is mounted in the interior of a parabolic mirror or reflector P so that rearwardly it will be shielded from all waves. Now, in order that interfering waves falling in also anteriorly may be precluded, the opening of the reflector is closed by a grate system G which, of course, must be oriented in the polarization plane of the receiving antenna, so that the grate rods will cross the dipoles at right angles.

Another embodiment is shown in Fig. 2 in which the receiver dipole D, D' throughout its entire length is surrounded by the wire loops or rings R, R', etc., which will allow of the penetration only of the short waves orientated in the plane of polarization of the dipole, while all other interfering waves will be kept out. By transverse connections Q, Q', etc. the shielding action may be still further enhanced. The constituent wire rings may be replaced also by a solenoid surrounding the receiver dipole.

The basic idea of the invention and the method here disclosed could also be used in connection with otherwise polarized waves, for instance, by circular polarization.

What I claim is:

1. In combination, an antenna, and a polarizing grating comprising a plurality of parallel spaced rings surrounding said antenna substantially throughout its entire length.

2. In combination, a dipole antenna, a polarizing grating comprising a plurality of parallel spaced rings surrounding said antenna, said antenna being located substantially in the center of said rings, and means for connecting said rings together and to ground.

3. In combination, means for receiving electromagnetic waves, and a polarizing grating comprising a plurality of parallel spaced rings surrounding said means substantially throughout its entire length.

HANS ERICH HOLLMANN.