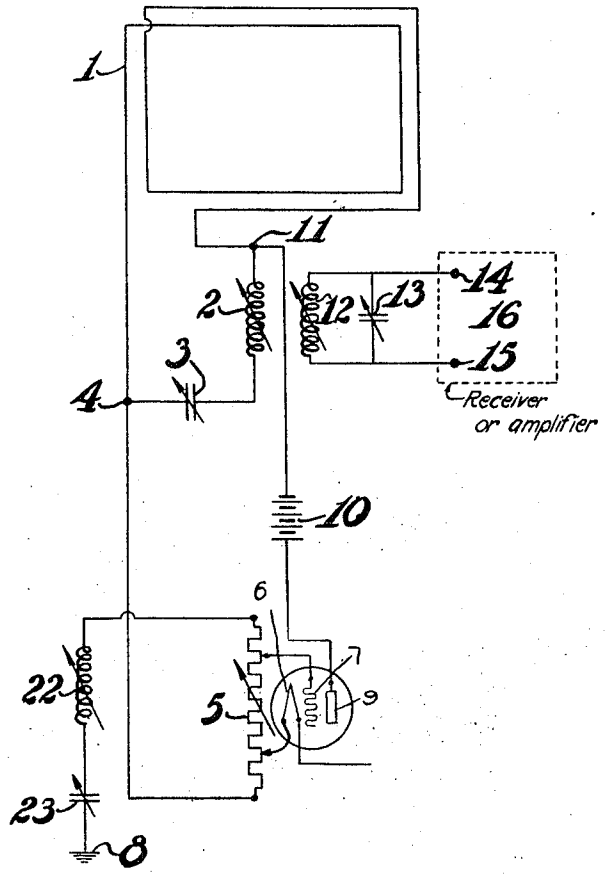
July 3, 1923. 1,460,801

R. H. MARRIOTT

DIRECTIONAL RADIO RECEIVING SYSTEM

Filed June 20, 1921



Inventor

Robert H. Marriott

By H. L. & C. L. Reynolds.

Attorneys

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UNITED STATES PATENT OFFICE.

ROBERT H. MARRIOTT, OF BREMERTON, WASHINGTON.

DIRECTIONAL RADIO RECEIVING SYSTEM.

Application filed June 20, 1921. Serial No. 478,980½.

(FILED UNDER THE ACT OF MARCH 3, 1883, 22 STAT. L., 625.)

To all whom it may concern:

Be it known that I, ROBERT H. MARRIOTT, a citizen of the United States of America, and resident of the city of Bremerton, in the county of Kitsap and State of Washington, have invented certain new and useful Improvements in Directional Radio Receiving Systems, of which the following is a specification.

This application is filed under the provisions of the act of March 3, 1883 and applicant hereby consents that the invention disclosed herein may, if and when patented, be used by the Government or any of its officers or employees in the prosecution of work for the Government, or by any other person in the United States, without the payment to him of any royalty thereon.

My invention relates to radio systems having for its object the unidirectionl control of the receipt of signals. To get a unidirectional receiving arrangement, I combine the two-directional characteristics of a periodic loop antenna with the four-direction characteristics of the loop to ground, in the loop circuit via a thermiomic repeater, to neutralize one of the two-directional characteristics of the loop.

This arrangement eliminates the separate open antenna which have been used with periodic loops for unidirectional effects and is less critical for adjustment. Also this arrangement permits of the use of the periodic loop in place of the less efficient aperiodic loop and loop to ground which has been described for unidirectional effects by E. F. W. Alexanderson in Patent No. 1,375,992.

In the accompanying diagram I have shown the type of apparatus and the manner of assembling and connecting it to secure the desired result.

In the diagram; antenna 1, inductance 2, and condenser 3, comprises a loop antenna circuit. The loop circuit is connected to ground 8 through a path 4, 5, 22, 23 which is coupled across a portion of resistance 5 to the filament 6 and grid 7 of a thermiomic repeater. 22 represents an inductance and 23 a capacity. The plate circuit coupling to the loop circuit is completed by the connection of plate 9 and battery 10 to a point 11 in the loop circuit. The loop circuit is coupled by inductance 2 to inductance 12 of the circuit containing 12 and condenser 13. The circuit 12, 13 is connected at 14 and 15 to a radio detector 16.

Radio waves from one direction in the plane of the loop set up currents in the loop circuit 1, 2, 3 and in the loop to ground circuit, 1, 4, 5, 22, 23, 8. By a coupling as shown in this figure across a portion of resistance 5, the effects in 1, 4, 5, 22, 23, 8 are impressed on the repeater 6, 7, 9, 10 and repeated in the loop circuit through connections 4 and 11 to neutralize the loop circuit currents. Radio waves from the opposite direction set up loop circuit currents and currents to ground which when repeated do not neutralize the loop circuit currents and the combined current effects are transferred to the detector 16 via the coupling 2 to 12 and circuit 12, 13.

In practice waves and disturbances of various lengths and forms may be receivable and loops of various dimensions located in various places and for connection to various types of receiving circuits may be desirable. The loops may for example be on buildings, dry sand, hills, ships or over a salt water marsh. These variations may be adjusted for by suitable changes of the capacities, inductances, resistances, couplings, filament current and plate battery.

What I claim as my invention is:

In a radio receiving system, a loop antenna circuit, an earth connection therefor, a thermiomic repeater having its grid and filament connected with said ground connection and a connection from the plate circuit of said thermiomic repeater to loop circuit, whereby the loop-to-ground potentials are repeated and impressed upon the loop antenna circuit.

Signed at Seattle, King County, Washington, this 15th day of June, 1921.

ROBERT H. MARRIOTT.