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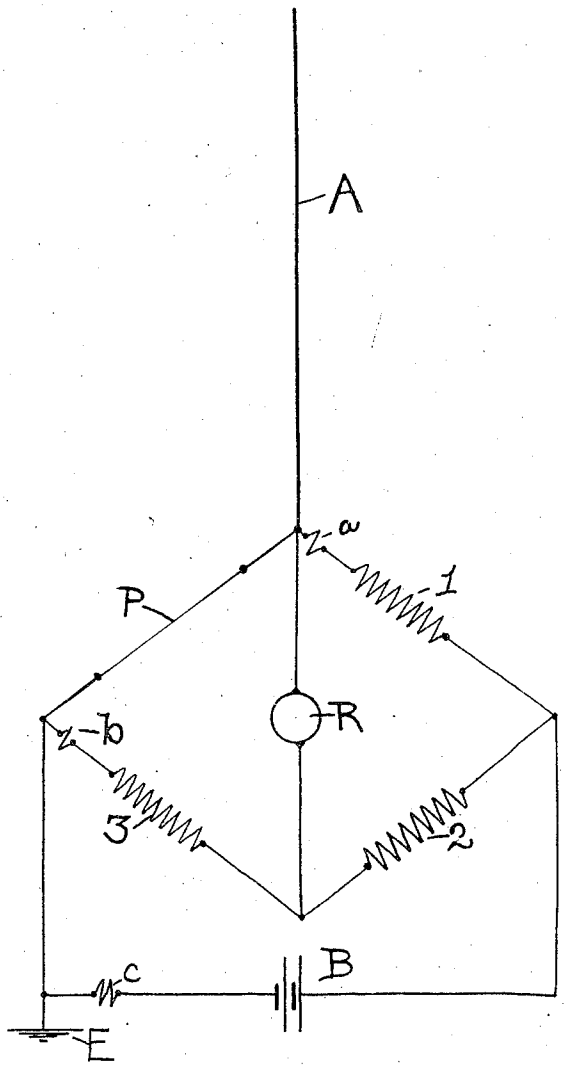
H. SHOEMAKER.

WIRELESS SIGNALING SYSTEM.

APPLICATION FILED AUG. 9, 1902.

NO MODEL.



Witnesses
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No. 756,718. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

HARRY SHOEMAKER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO INTERNATIONAL WIRELESS TELEGRAPH COMPANY, A CORPORATION OF NEW JERSEY, AND MARIE V. GEHRING, OF PHILADELPHIA, PENNSYLVANIA.

WIRELESS SIGNALING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 756,718, dated April 5, 1904.

Application filed August 9, 1902. Serial No. 119,031. (No model.)

To all whom it may concern:

Be it known that I, HARRY SHOEMAKER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Wireless Signaling System, of which the following is a specification.

My invention relates to electrical signaling, more especially that known as "wireless" signaling, in which the energy representing the message or signal to be transmitted is modified by and in accordance with such message and impressed upon the natural media and received at the receiving-station from the natural media and employed to record a message, either audible or visible, by means of apparatus controlled by the arriving energy.

My invention relates more particularly to the receiving apparatus of such a system and depends for its principle upon that of the Wheatstone bridge so commonly known in the electrical arts.

My invention comprises a system whereby a conductor of electricity which has either a great positive temperature coefficient or a great negative temperature coefficient is traversed by energy depending upon the received energy and when so traversed by electrical energy increases or decreases its resistance, and thereby throws out of balance a Wheatstone bridge, resulting in a flow of current from a source through the galvanometer-circuit of the bridge to operate a galvanometer, relay, or any other device.

My invention comprises a system for receiving wireless signals which depends upon the change of resistance of a conductor due to the heat produced in such conductor by the arriving energy or energy controlled by the arriving energy traversing the conductor. For the conductor of great temperature coefficient, either positive or negative, may be used a great variety of materials, those having high positive temperature coefficients being in general metals, and for such purposes iron, platinum, and the like may be used. I prefer platinum, however, especially in the case where I have it in the form of a very short and a very fine wire where its temperature is apt to be considerable, for the purpose of preventing oxidation or destruction. It is to be understood that any substance having a great temperature coefficient, either positive or negative, may be used and the choice will depend upon the attendant circumstances. By an inspection of the table of the temperature coefficients of the various substances those most suitable are readily found.

In the drawing, A represents the usual aerial conductor of a wireless-signaling system, which connects at its lower end with one terminal of the substance having a high temperature coefficient and which is represented by P. The other end of this member P is connected to earth-plate E. This member P forms (as clearly shown) one arm of a Wheatstone bridge, in the other arms of which are arranged resistances 1, 2, and 3, respectively. At R is shown the galvanometer or relay as located in the galvanometer-circuit of the bridge. At B is shown a source of energy whose terminals connect to the bridge at the junction of resistances 1 and 2 and at the junction of P and 3. Normally when no message is being received the bridge is in balance and there is no current flowing through the galvanometer or relay R. However, when any radiant energy is received the temperature of the device P is increased, with the consequent increase or decrease in its resistance, according as its temperature coefficient is positive or negative. In either event the bridge is thrown out of balance and a current will flow through the galvanometer or relay R. The galvanometer may be used directly as the indicating instrument or if R is a relay it can be used to control a local circuit, as is customary in telegraph systems and the like.

a and *b* are choke-coils in the arms 1 and 3, respectively, of the bridge. *c* is another choke-coil between the source B and the juncture of

the arms P and 3 of the bridge. The purpose of these choke-coils is apparent, for they prevent any of the high frequency oscillations received from going into undesired paths. The member P, as I have used it, has been a straight platinum wire. It is to be understood, however, that the conductor P may be coiled up to save space or for any other reason. It is to be understood also that a relatively long conductor P may be used. Preferably a very short length is to be used with a cross-section which is very small, indeed, so small, in fact, that the rise in temperature will be considerable, and thereby cause a corresponding change in the resistance of such wire.

What I claim is—

1. In a wireless-telegraph receiver, the combination with a receiving-circuit, of a Wheatstone bridge containing in one arm a conductor adapted to be heated by the received energy, choking-coils in the arms of said bridge adjacent to said first-mentioned arm and a recording instrument controlled by said conductor.

2. In a receiver of a wireless signaling system, the combination of a Wheatstone bridge containing in one arm a conductor having a large temperature coefficient, means for changing the temperature of such conductor in accordance with the energy received, choking-coils in the arms of said bridge adjacent to said first-mentioned arm, a source of energy controlled by such conductor and a recording device responsive to the changes in the current from said source of energy.

3. In a wireless-telegraph receiver, the combination with a receiving-circuit, of a Wheatstone bridge containing in one arm a conductor adapted to be heated by the received energy, means for preventing the received energy from passing to earth around said conductor, and a recording instrument controlled by said conductor.

4. In a receiver of a wireless-telegraph system, the combination of a Wheatstone bridge containing in one arm a conductor having a large temperature coefficient, means for changing the temperature of said conductor in accordance with the energy received, means for preventing the received energy from passing to earth around said conductor, a source of energy, and a recording device responsive to changes in the current from said source of energy.

HARRY SHOEMAKER.

Witnesses:
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