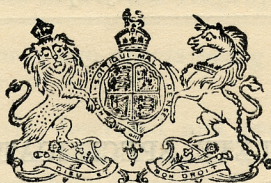




N° 4910



A.D. 1910

*Date of Application, 26th Feb., 1910*

*Complete Specification Left, 24th Aug., 1910—Accepted, 16th Feb., 1911*

PROVISIONAL SPECIFICATION.

**Improvements in Wireless Telegraph Receiving Stations.**

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and CHARLES SAMUEL FRANKLIN, both of Watergate House, York Buildings, Adelphi, in the City of Westminster, Electrical Engineers, do hereby declare the nature of this invention to be as follows:—

- 5 In wireless telegraphy, especially over long distances when waves of a comparatively great length are used, and during certain periods of the year, trouble arises from high frequency currents produced in the aerial or antenna by atmospheric disturbances. These currents, commonly called atmospherics or X's, produce sounds in the receiver, which tend to drown the feebler signals.
- 10 We have found that these currents usually behave as if caused by electrical waves of very great damping, and that the currents formed in the receiver system have a wave length and damping the same as those of that system. This renders them very difficult to separate from signals which have a similar wave length.
- 15 By the present invention we make use of this property of the X's of impulsing, or causing an oscillating system to oscillate with its own natural period, to separate them from the signals. We couple to the aerial circuit in any of the well known ways a closed circuit which has the same natural period as the aerial, thus giving the system two natural time periods. Any impulsing
- 20 of this system by a highly damped wave produces two waves which can be controlled by varying the coupling. We have found, however, that if a wave of low damping and in tune with one of these two natural time periods be allowed to act on this system, it induces in it an oscillation of the one frequency very much more strongly than one of the other frequency.
- 25 The aerial so coupled to a closed circuit is connected by variable couplings to two detecting circuits arranged as described in Specification No. 4125 of 1909, one of which circuits is tuned to one of these two frequencies while the other is tuned to the other frequency. The currents produced by the two waves are opposed in the way shown in the former specification, one detecting circuit receiving the natural disturbances and the signals, and the other the natural disturbances only, and these two effects being opposed, the signals only are observed.
- 30

Dated this 25th day of February, 1910.

MARCONI'S WIRELESS TELEGRAPH CO., LTD.

HENRY S. SAUNDERS,  
ALFONSO MARCONI,  
Directors.  
HENRY W. ALLEN,  
Secretary.

C. S. FRANKLIN.

[Price 8d.]

PRICE 6d.



*Improvements in Wireless Telegraph Receiving Stations.*

## COMPLETE SPECIFICATION.

**Improvements in Wireless Telegraph Receiving Stations.**

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and CHARLES SAMUEL FRANKLIN, both of Watergate House, York Buildings, Adelphi, in the City of Westminster, Electrical Engineers, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In wireless telegraphy, especially over long distances when waves of a comparatively great length are used, and during certain periods of the year, trouble arises from high frequency currents produced in the aerial or antenna by atmospheric disturbances. These currents, commonly called atmospherics or X's, produce sounds in the receiver, which tend to drown the feebler signals.

We have found that these currents usually behave as if caused by electrical waves of very great damping, and that the currents formed in the receiver system have a wave length and damping the same as those of that system. This renders them very difficult to separate from signals which have a similar wave length.

By the present invention we make use of this property of the X's of impulsing or causing an oscillating system to oscillate with its own natural period to separate them from the signals. We couple to the aerial circuit in any of the well known ways a closed circuit which has the same natural period as the aerial, thus giving the single system two natural time periods. Any impulsing of this system by a highly damped wave produces two waves which can be controlled by varying the coupling. We have found, however, that if a wave of low damping and in tune with one of these two natural time periods be allowed to act on this system, it induces in it an oscillation of the one frequency very much more strongly than one of the other frequency.

The aerial so coupled to a closed circuit is connected to two receivers one of which is tuned to one of these two frequencies while the other is tuned to the other frequency and the two receivers are so connected that they produce opposing effects upon the indicator.

In the figure A is the aerial connected to the earth E through a primary winding P and through the two receivers R<sup>1</sup> and R<sup>2</sup>. A secondary winding S which forms a variable coupling with the primary winding P is connected to a condenser C thus making a closed oscillation circuit.

The aerial circuit A P E is tuned to a frequency differing slightly from that of the signals which it is desired to receive. The closed circuit S C is tuned to the same frequency as the aerial circuit A P E and the coupling between the windings P and S is varied until one of the two frequencies of the system is the same as that of the signals which it is desired to receive. The receiver R<sup>1</sup> is tuned to one and the receiver R<sup>2</sup> is tuned to the other of the two frequencies of the system. The receivers R<sup>1</sup> and R<sup>2</sup> are connected so as to produce opposing effects upon the indicator.

The currents produced in the receivers may be opposed in the high frequency or low frequency circuits in any of the well known ways, but the method of connecting the receivers which we find most satisfactory is that described in the Specification of the Patent No. 4125 of 1909.

It is evident from the foregoing that natural disturbances of high damping will affect both receivers while signals of low damping will only affect that receiver with which they are in tune. Thus one receiver being affected both by the natural disturbances and the signals and the other receiver by the natural



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*Improvements in Wireless Telegraph Receiving Stations.*

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disturbances only, and these two effects being opposed, the signals only will be observed in the indicator.

5 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that we are aware that it has before been proposed to split up the aerial circuit into two parts having different time periods and to cause the oscillations in the two parts to act in opposition to one another upon an indicator and we wish it to be understood that we make no claim to such an arrangement, but what we claim is:—

- 10 1. In a wireless telegraph receiving station the combination of a single oscillation system having two natural frequencies, one of which is the same as the frequency of the signals which it is desired to receive, and two receivers respectively tuned to these frequencies and having opposing effects upon an indicator substantially as described.
- 15 2. Wireless telegraph receiving stations substantially as described and illustrated in the drawing.

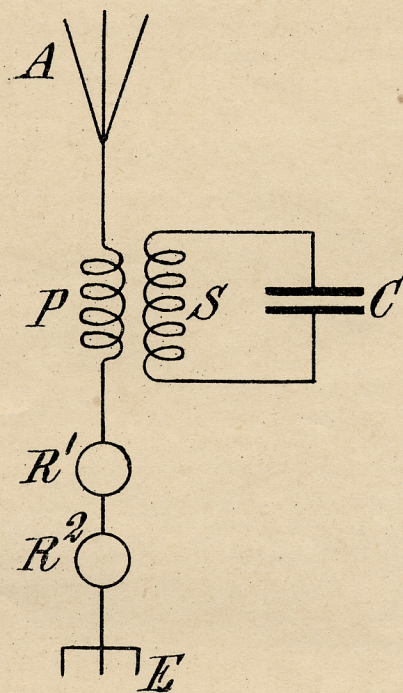
Dated this 24th day of August, 1910.

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CARPMAEL & Co.,  
Agents for Applicants,  
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(2<sup>nd</sup> Edition)



[This Drawing is a full-size reproduction of the Original.]