MINISTERO DELLE POSTE E DELLE TELECOMUNICAZIONI
DIREZIONE GENERALE
BIBLIOTECA

[Second Edition.]

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Date of Application, 12th Aug., 1913

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PROVISIONAL SPECIFICATION.

Improvements in Wireless Telegraph Receivers.

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and HENRY JOSEPH ROUND, both of Marconi House, Strand, London, W.C., Electrical Engineers, do hereby declare the nature of this invention to be as follows :—

For the purpose of receiving wireless signals from either continuous wave or damped wave transmitting stations, we employ a resonant circuit coupled to the antenna circuit in the usual way. Across the condenser of the resonant circuit we place a telephone or galvanometer usually shunted with a condenser, in series with a small spark gap, vacuum tube, parallel opposed valves or crystals, or any well-known device which becomes very conductive when a definite potential is applied to its terminals, thus making the detector circuit one of variable resistance.

It is preferable for the purpose of this invention that the spark gap, *etc.*, shall not be a rectifier, but that it shall be substantially non-conductive in both directions until a definite potential applied in either direction is reached, when its resistance in both directions must become low.

In this circuit and from another circuit such as a shunted buzzer exciting a wavemeter or an oscillating circuit excited with direct current and sparking to a rotating studded disc, is induced a damped wave or an intermittent undamped wave preferably of a frequency very much higher than the wave frequency to be received, and it is arranged that each train of waves shall not materially exceed the length of one half wave of the oscillations to be received. This exciting wave is adjusted to give no effect in the detector circuit by carefully adjusting the spark gap, vacuum tubes or the balance of the balanced valves.

For most efficient working with a galvanometer the train frequency of the exciting circuit must be equal to the frequency of the received oscillations or to half the frequency or one third frequency or to any sub-multiple of the frequency.

By this means the variable resistance is rendered conductive for impulses from the signals in the same direction only. If the exciting circuit's train frequency is above audibility and if the wave being received is a continuous wave it will be necessary, in order to obtain audible signals in the telephone, to slightly throw out of resonance or sub-resonance this train frequency with the received frequency ; or preferably the trains can be cut up into groups—the group frequency having a musical tone—which will only be heard when the signals arrive.

Dated this 12th day of August, 1913.

MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED.

The common seal of Marconi's Wireless Telegraph Company, Limited, was hereto affixed in the presence of

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

H. J. ROUND.

[*Price* 6*d*.]

M. inv. NSI 10835

COMPLETE SPECIFICATION.

Improvements in Wireless Telegraph Receivers.

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and HENRY JOSEPH ROUND, both of Marconi House, Strand, London, W.C., 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 :—

For the purpose of receiving wireless signals from either continuous wave or damped wave transmitting stations, we employ a resonant circuit coupled to the antenna circuit in the usual way. Across the condenser of the resonant circuit we place a telephone or galvanometer (usually shunted with a condenser) in series with a small spark gap, vacuum tube, parallel opposed valves or crystals, or any well known device which becomes very conductive when a definite potential is applied to its terminals, thus making the detector circuit one of variable resistance.

The spark gap or other device is preferably not a rectifier, but is substantially non-conductive in both directions until a definite potential applied in either direction is reached, when its resistance in both directions becomes low.

To the spark gap or other variable resistance we apply damped waves or intermittent undamped waves preferably of a frequency very much higher than the wave frequency to be received. These waves may be set up in a circuit including the variable resistance by means of a shunted buzzer or an oscillating circuit excited with direct current and sparking to a rotating studded disc.

The arrangement is such that each train of waves does not last materially longer than one half period of the oscillations to be received. The spark gap or vacuum tube or the balance of the balanced valves is so adjusted that these exciting waves give no effect in the detector circuit except when the condenser is charged by oscillations falling upon the aerial.

The invention is illustrated in the accompanying drawing.

In Figure 1 *a* is an aerial, *b* a resonant circuit tuned to it; across the condenser *c* of this circuit is placed a telephone *d* in series with a spark gap *s* included in another circuit *j* in which waves can be set up by a buzzer circuit *w* coupled to it.

Preferably however we employ as shown in Figure 2 balanced crystals *k k* such as are described in Specification No. 20,441 of 1910.

The length of the exciting waves should be short compared with that of the oscillations received say 100 m. as compared with 6000 m. with a spark frequency of 4000 per second which can be easily obtained with a buzzer.

For most efficient working with a galvanometer the train frequency of the exciting circuit should be equal to the frequency of the received oscillations or to half that frequency or some other sub-multiple thereof so that the condenser *c* always discharges in the same direction when the spark gap, crystals or the like is rendered conductive by the exciting circuit.

If the train frequency of the exciting circuit is above the limit of audibility and if the oscillations being received are continuous it will be necessary, in order to obtain audible signals in the telephone, to throw this train frequency slightly out of resonance or sub-resonance with the received frequency; or preferably the trains can be cut up into groups—the group frequency having a musical note which will only be heard when the signals arrive.

Improvements in Wireless Telegraph Receivers.

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 what we claim is :—

1. In a receiver for wireless telegraphy the combination with a resonant circuit of a detector across the condenser thereof and in series with a spark gap or other device the conductivity of which varies rapidly at a certain potential and means for intermittently creating that potential at the device substantially as described.

2. In a receiver for wireless telegraphy the combination with a resonant circuit of a spark gap or other device, included in a local circuit, and means for creating in the latter circuit frequent trains of short waves substantially as described.

3. Wireless telegraph receivers substantially as described.

Dated this 12th day of March, 1914.

CARPMAEL & Co.,
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MARCONI'S WIRELESS TELEGRAPH CO. & *another's* COMPLETE SPECIFICATION.

(2nd Edition)

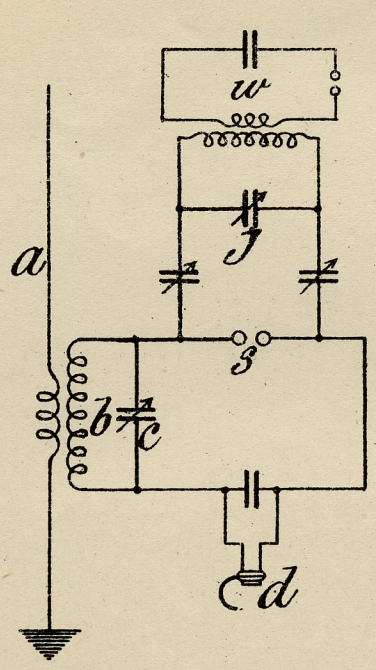

Fig. 1.

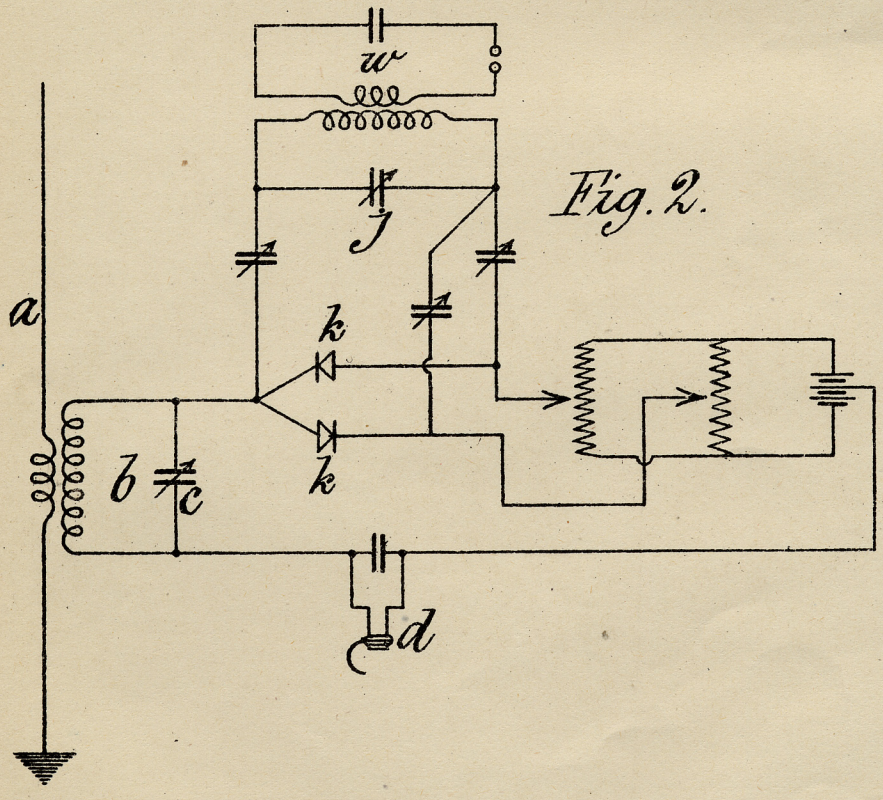

Fig. 2.

[This Drawing is a reproduction of the Original on a reduced scale.]

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