[Second Edition.]

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PROVISIONAL SPECIFICATION.

Improvements in Wireless Telegraph Receivers.

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and GEORGE MAURICE WRIGHT, Electricians, both of Marconi House, Strand, London, W.C., do hereby declare the nature of this invention to be as follows:—

The object of this invention is to provide a wireless telegraph receiver in which the noises due to atmospherics shall be so reduced that they do not overpower the sounds due to the signals it is desired to read. It has before been proposed to magnify the received signals by the employment between the aerial and the receiving circuits of an intermediate circuit including a valve or vacuous tube containing an anode, a screen and a hot filament.

According to our invention we employ a similar circuit including a valve or vacuous tube containing an anode, a screen and a metallic or carbon filament only heated to such a degree that there is no magnification. A valve in such a condition is not able to pass more than a certain definite amount of current and the currents due to atmospherics are therefore reduced to the dimensions of those due to the signals, and the noise in the telephone is no greater than the notes produced by the signals. If the sounds are too weak an ordinary magnifying valve circuit may be interposed between the intermediate circuit and the receiving circuit.

A valve having preferably a metallic or carbon filament so slightly heated as to produce only very small magnification may also be employed in the arrangement which is described in Specification No. 13,636 of 1913, and by which the resistance of the aerial circuit is reduced. The natural resistance of the aerial may then be made considerable so as to damp the atmospherics while the effective resistance for small amplitudes only is reduced by the interaction of the incoming and outgoing circuits of the valve. If greater resistances and consequently further magnification be desired several valves each producing small magnification may be used in series.

Dated the 16th day of June, 1915.

MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED.

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

W. RIALL SANKEY,
HENRY S. SANDERS,
Directors.
HENRY W. ALLEN,
Secretary.

G. M. WRIGHT.

[*Price* 6*d*.]

COMPLETE SPECIFICATION.

Improvements in Wireless Telegraph Receivers.

We, Marconi's Wireless Telegraph Company, Limited, and George Maurice Wright, Electricians, both of Marconi House, Strand, London, W.C., 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:—

The object of this invention is to provide a wireless telegraph receiver in which the noises due to atmospherics shall be so reduced that they do not overpower the sounds due to the signals it is desired to read. It has before been proposed to magnify the received signals by the employment between the aerial and the receiving circuits of an intermediate circuit including a valve or vacuous tube containing an anode, a screen and a hot filament.

According to our invention we employ a similar circuit including a valve or vacuous tube containing an anode, a screen or grid and a metallic or carbon filament only heated to such a degree that there is no magnification. A valve in such a condition is not able to pass more than a certain definite amount of current and the currents due to atmospherics are therefore reduced to the dimensions of those due to the signals, and the noise in the telephone is no greater than the notes produced by the signals. If the sounds are too weak an ordinary magnifying valve circuit may be interposed between the intermediate circuit and the receiving circuit.

A valve having a metallic or carbon filament so slightly heated as to produce only very small magnification may also be employed in the arrangement which is described in Specification No. 13,636 of 1913, and by which the resistance of the aerial circuit is reduced. The natural resistance of the aerial may then be made considerable so as to damp the atmospherics while the effective resistance is reduced by the interaction of the incoming and outgoing circuits of the valve. If further magnification be desired several valves each producing small magnification may be used in series.

The invention is illustrated by the accompanying diagrams.

In Figure 1 A is a vacuous tube enclosing a filament B heated by a battery C, a grid or screen D completely enclosing the filament and an anode E. A jigger system F is connected to the grid and to a resistance G across the battery C and is coupled to an aerial H. A second jigger system I is connected to the anode and through a high tension battery J to the filament and is coupled to a receiver K. The two jigger systems should have the maximum inductance possible and the minimum capacity.

A coil L in the system F is arranged to react with the system I so that no signals however strong can get through unless the valve is alight. Without such a coil signals may get through owing to the capacity of the valve, the leads, *etc.*

The filament is run at such a brilliancy that the strength of the signals in the receiver is less than or at most no greater than that which they would have if the receiver were coupled directly to the aerial.

By this means the strength of atmospherics is limited to that of the signals.

In practice we find that we obtain greater sensitiveness with better limiting if we direct the stream of electrons along a narrow path by means of a magnet and also if we cover only a small portion of the filament with electron emitting material such as lime instead of covering the whole of the filament.

Figure 2 shows a similar arrangement except that, to prevent signals getting through owing to the capacity, we employ in place of the reaction coil L shunting condensers M M and a choke coil N shunted with a condenser O. This method, however, is more troublesome and no more effective than the reaction coil.

Figure 3 shows an arrangement in which the aerial, which is coupled directly to the receiver, includes a resistance P and is coupled to the two jiggers F and I connected to a valve as in Figure 1.

The valve is used so that there is slight magnification and thus for the narrow limits within which owing to the dullness of the filament it can magnify, the resistance P is neutralized. The resistance is thus effective for the large amplitudes of atmospherics but is neutralized for the weaker amplitudes of signals.

By employing two valves in series we can double this magnification without decreasing the limiting property of the circuit and consequently we can increase the resistance P so as still further to reduce the effect of atmospherics.

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 wireless telegraph receiver the employment of a vacuous tube containing an anode, a grid and a filament which is only heated to such a degree that there is no magnification, substantially as described.

2. In a wireless telegraph receiver the combination of an aerial having considerable resistance and a valve containing a dull filament and connected to two jigger systems which are coupled to the aerial and so arranged that their interaction may reduce the effective resistance of the aerial, substantially as described.

3. A wireless telegraph receiver substantially as described with reference to Figure 1.

4. A wireless telegraph receiver substantially as described with reference to Figure 2.

5. A wireless telegraph receiver substantially as described with reference to Figure 3.

Dated the Third day of January, 1916.

MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED.

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

W. RIALL SANKEY,
HENRY S. SANDERS,
Directors.
HENRY W. ALLEN,
Secretary.

G. M. WRIGHT.

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(2nd Edition)

Fig. 1.

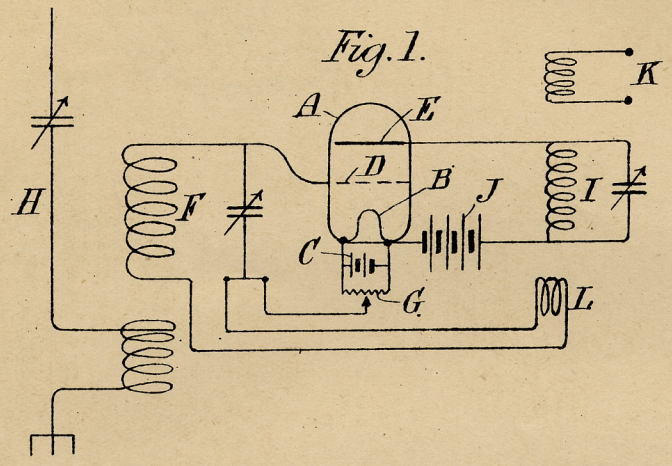


Fig. 2.

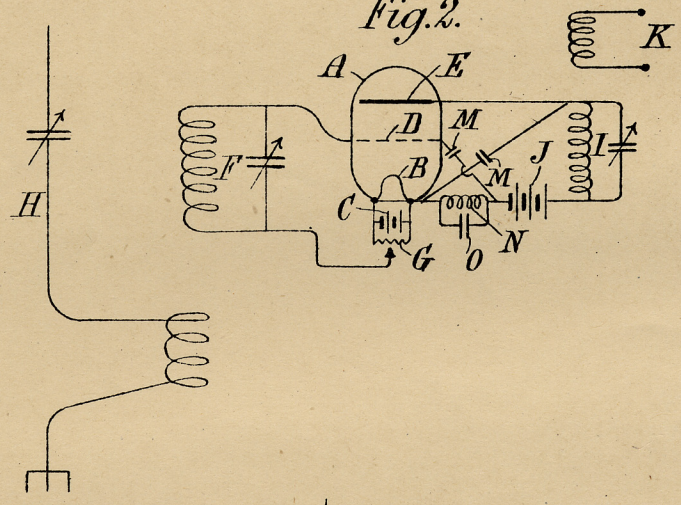
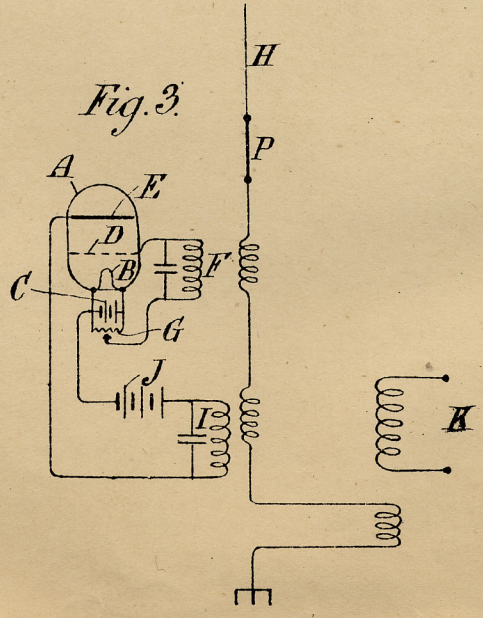


Fig. 3.



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

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