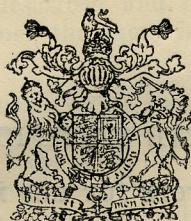




N° 28,413



A.D. 1913

*Date of Application, 9th Dec., 1913*

*Complete Specification Left, 8th July, 1914—Accepted, 9th Dec., 1914*

PROVISIONAL SPECIFICATION.

**Improvements in Receivers for use in Wireless Telegraphy.**

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:—

This invention relates to improvements in receivers for wireless telegraphy in which a vacuum tube of the type having a hot filament, a grid and a third electrode is connected to the oscillation circuit coupled to the aerial.

According to this invention we connect across the hot filament and the third electrode, and in addition to the ordinary telephone and battery, an oscillation circuit which is preferably tuned to a frequency slightly different from that of the first oscillation circuit. By suitably adjusting such circuits, signals produced by continuous waves can be heard in the telephones, provided there is sufficient capacity between the grid and the third electrode. If the capacity is insufficient, a small condenser may be connected across the grid and the third electrode, or the two oscillation circuits may be made to interact by so arranging them that there is mutual inductance between them.

In vacuum tubes of this type moreover even where the grid has entirely separated the hot filament from the third electrode, the glass has hitherto been exposed to the cathode stream and has become electrified producing a polarising effect which necessitated varying the potential between the electrodes and the filament.

To obviate this disadvantage, both the grid and the third electrode are, according to this invention, made in the form of cylinders which completely surround the hot filament. These cylinders effectively protect the glass from electrification, and possess the capacity above referred to as desirable.

Dated this 8th day of December, 1913.

MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED.

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

ALFONSO MARCONI,  
H. RIAL SANKEY,  
Directors.  
HENRY W. ALLEN,  
Secretary.

H. J. ROUND.

[Price 6d.]

M.i.w. 10840



*Improvements in Receivers for use in Wireless Telegraphy.*

## COMPLETE SPECIFICATION.

**Improvements in Receivers for use in Wireless Telegraphy.**

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:—

This invention relates to improvements in receivers for wireless telegraphy in which a vacuum tube of the type having a hot filament, a grid and a third electrode is employed.

According to this invention we connect across the hot filament and the third electrode, and in addition to the ordinary telephone and battery, an oscillation circuit which is tuned to a frequency slightly different from that of the received oscillations. By suitably adjusting the circuits, signals produced by continuous waves can be heard in the telephones. If the capacity between the grid and the third electrode is insufficient, a small condenser may be connected across the grid and the third electrode, or the oscillation circuit may be made to interact with the aerial or with an intermediate oscillation circuit by so arranging the circuits that there is mutual inductance between them.

In vacuum tubes of this type moreover even where the grid has entirely separated the hot filament from the third electrode, the glass has hitherto been exposed to the cathode stream and has become electrified producing a polarising effect which necessitated varying the potential between the electrodes and the filament.

To obviate this disadvantage, both the grid and the third electrode are, according to this invention, made in the form of closed cylinders which completely surround the hot filament. These cylinders effectively protect the glass from electrification, and possess the capacity above referred to as desirable.

Our invention is illustrated in the accompanying drawing.

In Figure 1 *a* is an oscillation circuit coupled to the aerial and connected to the grid *b* and the filament *c* of a vacuum tube, the third electrode *d* of which is connected through a battery and telephone to the filament, while *e* is the new oscillation circuit. This circuit *e* is tuned to a frequency slightly different from that of *a*. By varying the coupling between *a* and *e* oscillations may be caused at a frequency suitable for producing the desired beat tone with the frequency of the oscillations which are being received.

Figure 2 shows a similar arrangement except that the filament and grid are connected directly to the aerial instead of to an oscillation circuit coupled to it and that the inductance of the circuit *e* is acted upon by a coil *f* in the aerial. A crystal *g* is here shown introduced into the telephone circuit as a rectifier.

In Figure 3 a choke coil *h* shunted by a variable condenser *i* is inserted in series with the third electrode and in this case no magnetic coupling between the circuits *a* and *e* is necessary. *j* is a condenser connected to the grid which it is sometimes desirable to insert to negative the effect of the capacity *i* between *d* and *b*.

In all these figures the filament, grid and third electrode are shown in the conventional manner, but, as above stated, we find it advantageous to form the grid as a closed cylinder surrounding the filament and to form the third electrode as a cylinder outside the grid.



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*Improvements in Receivers for use in Wireless Telegraphy.*

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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 continuous waves having a vacuum tube containing a hot  
5 filament, a grid and a third electrode, an oscillation circuit tuned to a frequency slightly different from that of the received waves and connected across the filament and the third electrode substantially as described.
2. A receiver as claimed in Claim 1 in which the oscillation circuit is caused to interact with the aerial or with an intermediate circuit substantially as  
10 described.
3. A vacuum tube containing a hot filament, a grid formed as a closed cylinder completely surrounding the filament and a third electrode in the form of a cylinder surrounding the grid substantially as described.
4. Wireless telegraph receivers substantially as described with reference to  
15 the drawing.

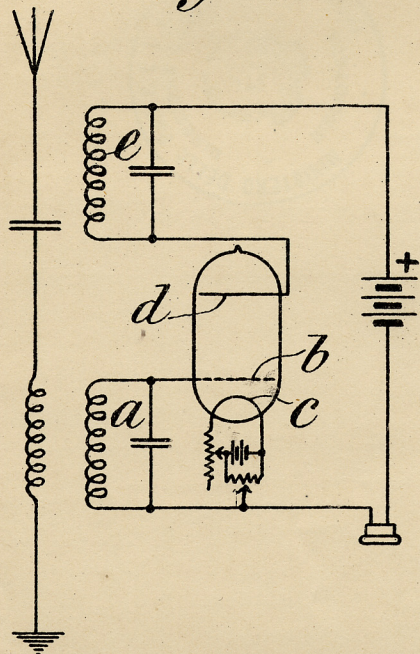
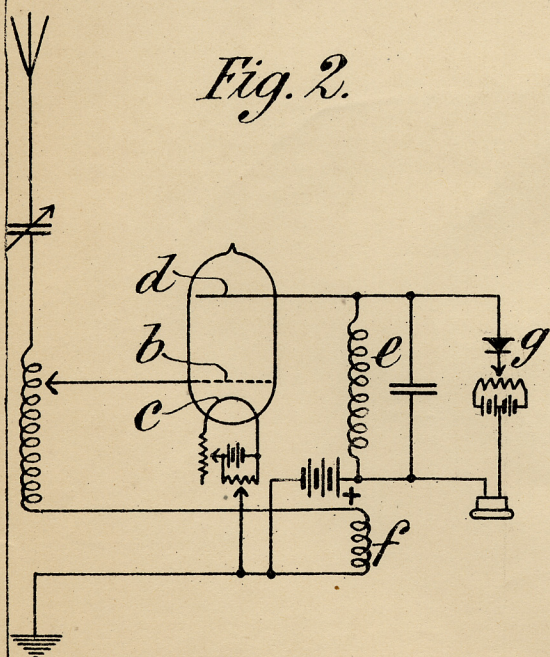
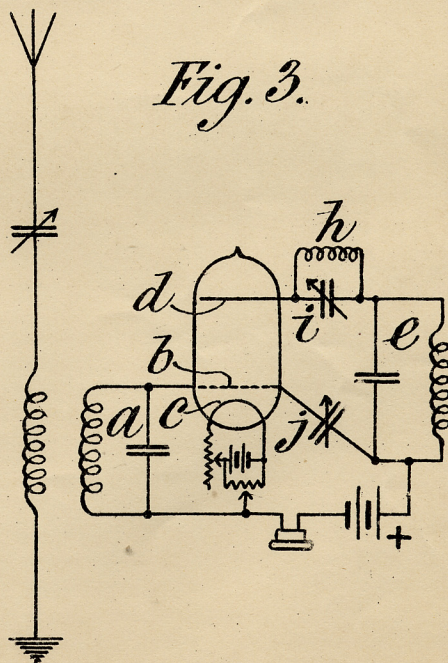
Dated the 8th day of July, 1914.

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[Wt. 3—125/4/1915.]



(2<sup>nd</sup> Edition)*Fig. 1.**Fig. 2.**Fig. 3.*

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