[Second Edition.]

N° 20,230 A.D. 1909

Date of Application, 3rd Sept., 1909
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PROVISIONAL SPECIFICATION.

Improvements in Wireless Telegraph Transmitting and Receiving Stations.

We, GUGLIELMO MARCONI, LL.D., D.Sc., and MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, both of Watergate House, Adelphi, London, W.C., do hereby declare the nature of this invention to be as follows:—

In our former Specification No. 14,788 of 1905 we have described transmitting and receiving stations, in which the antennæ are arranged horizontally in the vertical plane passing through the station with which it is desired to communicate.

It is found that the nearer such an antenna is to the surface of the ground the greater is the directional effect, but bringing the antenna nearer to the ground has the defect of very considerably reducing the persistency of the electrical oscillations in it.

This reduction of persistency is apparently due to the greater concentration of current in the ground as the antenna is placed nearer to it, and as a consequence greater resistance loss occurs in such a poorly conducting material as ordinary ground.

According to this invention we obviate this defect to a great extent by laying a conductor or number of conductors such as wires spaced a short distance apart upon, or just above, the ground beneath the antenna and substantially parallel to it. The conductors should preferably be joined to the ground to which the antenna is also connected.

These conductors may be similar to the antenna, but may with advantage extend beyond it, and may be earthed along their length, though this is not essential.

We find that such an arrangement adds greatly to the efficiency of the system.

Dated this 3rd day of September, 1909.

CARPMAEL & Co.,
Agents for Applicants.

COMPLETE SPECIFICATION.

Improvements in Wireless Telegraph Transmitting and Receiving Stations.

We, GUGLIELMO MARCONI, LL.D., D.Sc., and MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, both of Watergate House, Adelphi, 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:—

In our former Specification No. 14,788 of 1905 we described transmitting and receiving stations, in which the antennæ are arranged horizontally in vertical plane passing through the station with which it is desired to com-

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municate, and connected through the transmitting or receiving instrument to an ordinary "earth" as shown in Figure 1; *a* being the antenna connected through *b* the transmitter or receiver to the "earth" plate E.

It is found that the nearer the horizontal antenna *a* is brought to the surface of the ground *s*, the more pronounced is the directional effect of the antenna, but at the same time a loss of efficiency of the system occurs, owing to a very considerable reduction of the electrical oscillations in the antenna.

This reduction of persistency of oscillations is apparently due to a considerable resistance loss in that part of the ground which is beneath the antenna, the increase of resistance loss being caused by a concentration of current in the poorly conducting material constituting the surface of the ground, as a consequence of the antenna being brought near to it.

According to this invention we obviate this defect by placing a good conductor or number of good conductors such as wires spaced a short distance apart, upon or just above or just below the surface of the ground vertically beneath the antenna and substantially parallel to it where the current is a maximum and preferably beneath the whole length of the antenna.

Figures 2 and 3 are an elevation and plan respectively of such an arrangement. The conductors *c* should preferably be electrically connected to the "earth" plate to which the antenna is connected.

The conductors may be similar to the antenna but may also with advantage extend beyond it and may be earthed along their entire length, although this is not essential.

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 is not broadly new to lay conductors on the ground in the neighbourhod of an antenna and we make no broad claim to such but what we claim is:—

1. In a wireless telegraph transmitting or receiving station with a horizontal antenna, the use of good conductors placed on the surface or just above or below the surface of the ground beneath the antenna and parallel to it where the current is a maximum, substantially as described.

2. In a wireless telegraph transmitting or receiving station with a horizontal antenna, the use of good conductors placed on the surface or just above or below the surface of the ground beneath the antenna where the current is a maximum and electrically connected to the same earth plate as that to which the antenna is connected substantially as described.

Dated this 31st day of March, 1910.

CARPMAEL & Co.,
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Fig. 1.

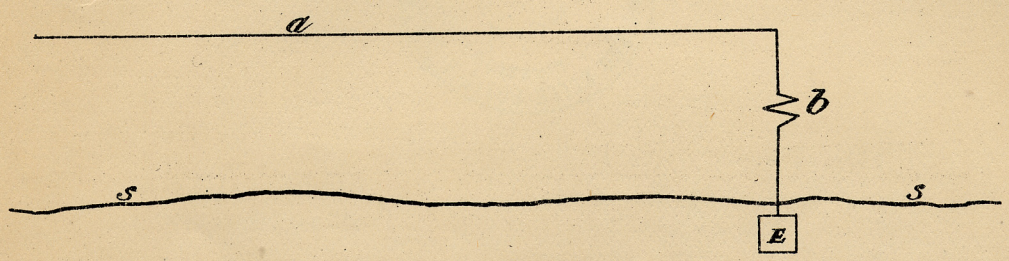


Fig. 2.

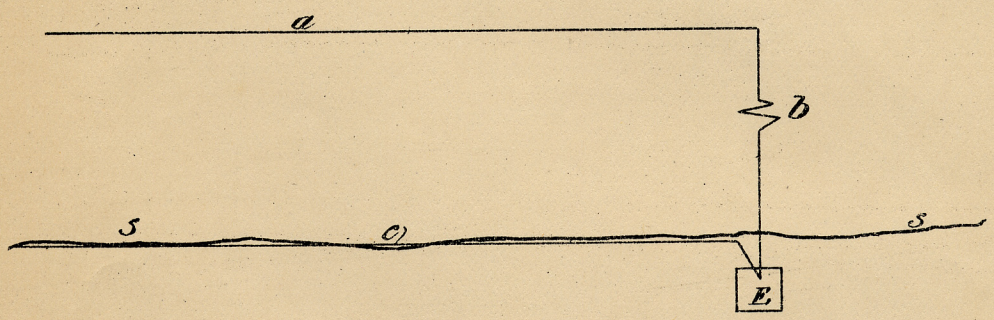
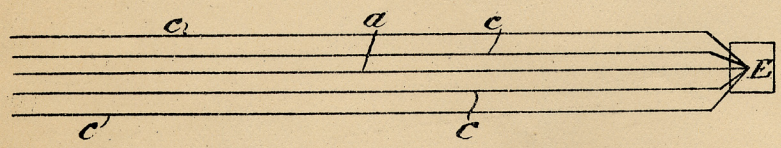


Fig. 3.



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

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