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### PROVISIONAL SPECIFICATION.

#### Improvements in Apparatus for Wireless Telegraphy.

We, GUGLIELMO MARCONI, LL.D., D.Sc., and MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, both of 18, Finch Lane, in the City of London, do hereby declare the nature of this invention to be as follows:—

Our invention consists in a method of and appliances for creating continuous  
5 or closely adjacent trains of electric oscillations, either undamped or very slightly damped, and applying these to create the corresponding electric waves required for wireless telegraphy.

The apparatus comprises a metal disc, which we will call the middle disc, and which is insulated from the earth and can be rotated at a very high speed  
10 by means of an electric motor, steam turbine, or engine of any type either directly connected to it or coupled by a belt or other gearing. Adjacent to the discs are placed two other insulated conducting discs, which we will call the polar discs, and which also can be rotated at a high speed by any convenient means, so that the adjacent parts of the moving discs are travelling in opposite  
15 directions. These polar discs should have their peripheries very close to the surfaces or edges of the middle disc.

In place of these polar discs we may use stationary balls or points which we will call polar balls or points and which are placed so as very nearly to touch the surfaces of the middle disc. We may if necessary cool either the  
20 balls or points by water circulation or otherwise.

The two polar balls, points or discs are connected respectively to the outer ends of two condensers joined in series and hereinafter called the reservoir condenser by means of conductors in which we may insert resistances or inductances, and these condensers are also connected through inductive  
25 resistances of suitable value to the terminals of a source of electric supply which may be either a continuous current dynamo, a secondary battery, an induction coil or transformer, or an alternator of sufficiently high voltage to discharge across the two small air gaps which separate the middle disc from the polar discs, balls or points on either side. If the generator has a sufficiently  
30 low internal resistance the reservoir condenser may be dispensed with.

At some convenient place on the middle disc a metallic or rubbing contact is provided, and between this contact and the middle point of the reservoir condenser or the middle point of the generator circuit if this condenser be not used, is inserted an oscillation circuit consisting of a condenser  
35 in series with an inductance, which last is connected inductively or conductively to a suitable antenna and to the earth or to a balancing capacity.

Under some circumstances when generators of high electromotive force are used we may employ a series of discs with their peripheries closely adjacent all rotating at a high speed but so that adjacent portions of neighbouring discs are  
40 rotating in opposite directions. In this case the middle disc of the series is connected through a rubbing contact with one end of the oscillating circuit, and the two outside discs with the reservoir condenser or source of electric supply, the other arrangements remaining the same as above described.

[Price 6d.]

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*Improvements in Apparatus for Wireless Telegraphy.*

In any case, to obtain the best results the electric time period of the antenna must be syntonised with that of the oscillating circuit comprising the condenser and inductance connected between the middle wheel and the centre point of the reservoir condensers or the generator.

Dated this 11th day of April 1907.

CARPMAEL & Co.,  
Agents for Applicants,

24, Southampton Buildings, London, W.C.

**COMPLETE SPECIFICATION.****Improvements in Apparatus for Wireless Telegraphy.**

We, GUGLIELMO MARCONI, LL.D., D.Sc., and MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, both late of 18, Finch Lane, in the City of London, but now of Watergate House, York Buildings, Adelphi, in the County of Middlesex, 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 consists in a method of and appliances for creating continuous or closely adjacent trains of electric oscillations, either undamped or very slightly damped, and applying these to create the corresponding electric waves required for wireless telegraphy.

The apparatus comprises a metal disc, which may be called the middle disc, and which is insulated from the earth and can be rotated at a very high speed by means of an electric motor, steam turbine, or engine of any type either directly connected to it or coupled by a belt or other gearing. Adjacent to the discs are placed two other insulated conducting discs, which may be called the polar discs, and which also can be rotated at a high speed by any convenient means, so that the adjacent parts of the moving discs are travelling in opposite directions. These polar discs should have their peripheries very close to the surfaces or edges of the middle disc.

In place of these polar discs stationary balls or points may be used, these stationary balls or points which may be called polar balls or points are placed so as very nearly to touch the surfaces of the middle disc. If necessary either the balls or points may be cooled by water circulation or otherwise.

The two polar balls, points or discs are connected respectively to the outer ends of two condensers joined in series and hereinafter called the reservoir condenser by means of conductors in which may be inserted resistances or inductances, and these condensers are also connected through inductive resistances of suitable value to the terminals of a source of electric supply which may be either a continuous current dynamo, a secondary battery, an induction coil or transformer, or an alternator of sufficiently high voltage to discharge across the two small air gaps which separate the middle disc from the polar discs, balls or points on either side. If the generator has a sufficiently low internal resistance the reservoir condenser may be dispensed with.

At some convenient place on the middle disc a metallic or rubbing contact is provided, and between this contact and the middle point of the reservoir condenser or the middle point of the source of electro motive force if this condenser be not used, is inserted an oscillation circuit consisting of a condenser in series with an inductance, which last is connected inductively or conductively to a suitable antenna and to the earth or to a balancing capacity.



*Improvements in Apparatus for Wireless Telegraphy.*

Under some circumstances when generators of high electromotive force are used a series of discs may be employed with their peripheries closely adjacent all rotating at a high speed but so that adjacent portions of neighbouring discs are rotating in opposite directions. In this case the middle disc of the series is  
 5 connected through a rubbing contact with one end of the oscillating circuit, and the two outside discs with the reservoir condenser or source of electric supply, the other arrangements remaining the same as above described.

In any case, to obtain the best results the electric time period of the antenna must be syntonised with that of the oscillating circuit comprising the condenser  
 10 and inductance connected between the middle wheel and the centre point of the reservoir condenser or the generator.

The drawing is a diagrammatic representation of a transmitter in accordance with this invention.

*a* is the middle disc capable of being rotated at a very high speed and  
 15 carried on insulated supports *b b*. It is found that a peripheral speed of 300 feet or more per second works well and the disc should of course be so made as to stand such speeds. *c c* are the polar balls or discs connected through resistances or inductances *d d* to the outer plates of the reservoir condenser *e* which plates are also connected through inductive resistances *f* to a source of  
 20 electric supply or generator *g*. In circuit with the middle or neutral point of the reservoir condenser or a neutral point in the generator circuit and with a brush or contact *h* on the disc *a* are a condenser *i* and inductance *k* connected either conductively or inductively as shown to an aerial conductor or antenna which is as usual connected to earth or to a capacity. It is preferable to  
 25 have the inductance and resistance of the circuit last named small as compared with those of either arm of the circuit containing the reservoir condenser and the polar balls or discs.

The condenser *i* may in some cases be omitted provided the reservoir condenser is retained.

30 The polar discs may be placed at such an angle with respect to the middle disc that their peripheries shall travel in opposite directions to adjacent points on the middle disc.

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  
 35 what we claim is:—

1. A transmitter for wireless telegraphy including a generator, a pair of condensers in series across the terminals of the generator and connected to a pair of fixed or rotating metal balls or discs discharging to a rapidly rotating metal disc and an oscillatory circuit connected between this last disc and the  
 40 middle point of this pair of condensers substantially as described.

2. A transmitter for wireless telegraphy in which a source of electromotive force creates discharges across a spark gap between a pair of fixed or rotating balls or discs placed close to a rapidly rotating metal disc, which is connected through an oscillatory circuit with the middle point of either the source of  
 45 electromotive force or of a condenser or condensers substantially as described.

3. Transmitters for wireless telegraphy substantially as described with reference to the drawings.

Dated this 13th day of September 1907.

G. MARCONI.

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Carpmael & Co.,  
 Agents for Applicants,  
 24, Southampton Bldgs., London, W.C.



(3<sup>rd</sup> Edition)

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

