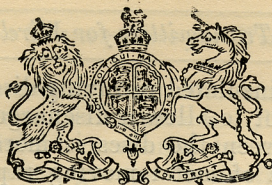


N^o 20,119



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PROVISIONAL SPECIFICATION.

"Improvements in Transmitters for Wireless Telegraphy."

We, GUGLIELMO MARCONI, LL.D., D.Sc., and MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, both of Watgate House, York Buildings, Adelphi, in the County of Middlesex, do hereby declare the nature of this invention to be as follows:—

- 5 According to this invention each of the plates of a condenser is respectively connected to one of a pair of insulated revolving discs or spheres of metal situated at such a distance apart as not to allow a discharge to pass when the condenser is charged, and the gap between the discs is more or less bridged at regular intervals by a short piece or pieces of metal which move rapidly between the two
10 discs. These bridging pieces are preferably formed of pegs or studs attached to a third disc which is made to revolve between the discs first mentioned.

The condenser is charged to a sufficiently high potential by a generator of continuous or alternating currents, and in the connections to said generator it is desirable to place an inductive resistance.

- 15 The condenser circuit is connected inductively or conductively to the antenna in the ordinary way.

- By this method it is possible efficiently to utilise a large amount of electrical power in the transmitter, and to cause the condenser discharge to produce a musical note which is distinguishable in a telephone attached to the receiver,
20 thereby rendering it easier to differentiate between signals emanating from the transmitting station and noises caused by atmospheric electrical disturbances.

Dated this 6th day of September 1907.

G. MARCONI.

For MARCONI'S WIRELESS TELEGRAPH CO., LIMITED.

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By G. MARCONI,
Director.

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Agents for Applicants,

24 Southampton Buildings London W.C.

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COMPLETE SPECIFICATION.

"Improvements in Transmitters for Wireless Telegraphy."

- We, GUGLIELMO MARCONI, LL.D., D.Sc., and MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, both of Watgate House, York Buildings, Adelphi, in the County of Middlesex, do hereby declare the nature of this invention and in what
35 manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

According to this invention each of the plates of a condenser is respectively

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connected to one of a pair of insulated revolving discs or spheres of metal situated at such a distance apart as not to allow a discharge to pass when the condenser is charged, and the gap between the discs is more or less bridged at regular intervals by a piece or pieces of metal moving rapidly between the two discs. These bridging pieces are preferably formed of pegs or studs attached to a third disc which is made to revolve between the discs first mentioned.

The condenser is charged to a sufficiently high potential by a generator of continuous or alternating currents, and in the connections to said generator it is desirable to place inductive resistances.

The accompanying diagram shows in plan a transmitting apparatus made in accordance with this invention.

a is a metal disc which is carried on a shaft with an insulating coupling in insulated bearings *b* and is capable of being rotated at a very high speed from an electric motor, turbine or other convenient machine *c*. *d d* are copper studs or pegs arranged opposite one another in pairs round the periphery of the disc the whole being of course made strong enough to stand very rapid rotation. *e e* are rotating discs carried on insulated supports one on each side of the disc *a* and so placed that the studs *d d* pass very close to them when the disc is rotated. The discs *e* are connected by means of suitable brush contacts to a condenser *f* and inductance *g*, this oscillation circuit being connected either inductively as shown or else conductively to an aerial conductor or antenna *h* which is connected to earth or to a capacity in the usual way. The capacity of the condenser *f* and the inductance of this oscillation circuit, are of such values that the circuit has a period of electrical resonance of the desired frequency. Each plate of the condenser is connected to a generator *i*, suitable inductances or resistances *k* being included in the connections.

The discs *e e* are rotated at a sufficient speed to obviate burning or pitting their surfaces by any suitable means for instance by means of worm wheels *l* gearing with worms *m* on a spindle *n* rotated by an electric motor *o* through an insulating coupling.

Or the discs may be replaced by any other suitably moving terminals for instance by rods or bars reciprocated by cams or eccentrics on a rotating shaft.

In order to obtain the best results it is necessary to give to the inductances *k k* and to the capacity of the condenser *f* such values that the natural time period of the oscillations in this circuit shall be equal to or some exact fraction of the time interval which elapses between the passage of two successive pairs of studs between the discs *e*.

At the occurrence of each discharge the condenser is cut out of circuit and when the discharge stops it is inserted again and is charged by the generator with oscillations, the time period of which is approximately equal to $2\pi\sqrt{CL}$ where *C* is the capacity of the condenser in farads, and *L* is the whole inductance in henrys, such inductance *L* including that of the alternator or transformer if an alternating current generator be employed or of the dynamo armature if a continuous current generator be employed.

The time interval between the passage of two pairs of studs between the revolving discs is equal to $1/NX$ where *N* is the number of revolutions of the disc per second and *X* is the number of pairs of studs.

The right value of the inductance *k* to be inserted can therefore be determined from the equation $2m\pi\sqrt{CL} = 1/NX$ where *m* is an integer.

It is essential that the speed of the studs should be considerable. Good results have been obtained with discs 2 feet in diameter revolving at the rate of 50 revolutions per second, but a higher speed than this would be better.

A suitable speed for the discs *e* which may be a foot in diameter is say 10 revolutions per minute.

By means of this invention it is possible efficiently to utilise a large amount of electrical power and to emit oscillations in regular groups so as to produce in a telephonic receiver a readily recognisable note which makes it easy to differ-

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entiate between signals emanating from the transmitting stations and noises caused by atmospheric electrical disturbances. By this invention it is moreover possible to obtain very efficient resonance by means of appropriate receivers which are tuned to the emitted groups of electric waves.

5 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. A wireless telegraph transmitter in which the gap between two moving terminals of the oscillation circuit is bridged at regular intervals by means of
10 bridging pieces in very rapid movement substantially as described.

2. A wireless telegraph transmitter comprising a disc having studs around its periphery and means for causing the disc to rotate rapidly between the moving terminals of the oscillation circuit substantially as described.

3. A wireless telegraph transmitter covered by Claim 1 in which the interval
15 therein mentioned bears an integral ratio to the electrical time period of the circuit containing the condenser and the generator.

4. Wireless telegraph transmitters substantially as described with reference to the drawing.

Dated this 9th day of April 1908.

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