MINISTERO DELLE POSTE E DELLE TELECOMUNICAZIONI
DIREZIONE GENERALE
BIBLIOTECA

[Second Edition.]

N° 11,371 A.D. 1913

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PROVISIONAL SPECIFICATION.

Improvements in Wireless Telegraph Transmitters.

I, Guglielmo Marconi, LL.D., D.Sc., of Marconi House, Strand, London, W.C., do hereby declare the nature of this invention to be as follows:—

In Specification No. 28,865 dated December 14th, 1912, I have described an arrangement wherein a condenser is charged through suitable inductances and resistances from a source of current preferably a high tension battery, and discharged through an inductance, which may be coupled directly to an aerial, and a revolving toothed disc or discs in series.

I have also described how a continuous stream of oscillations may be produced by this apparatus by arranging the speed of rotation of the disc so that the interval between two successive discharges is equal to or is a multiple of the natural time period of the aerial and of the closed discharge circuit.

According to this invention I employ a number of such condenser circuits charged from the same or independent supply sources through separate inductances and resistances if resistances are desired.

Each condenser discharge circuit comprises a toothed disc discharger and an inductance coil which is coupled to the aerial or to an intermediate closed circuit which is itself coupled to the aerial.

Either one common inductance coil is used for all the condensers or separate inductance coils are used for each condenser. Similarly one toothed disc which may have insulated teeth may be used to discharge all the condensers or independent discs may be used.

The disc or discs is or are so arranged that the condensers are discharged at regular intervals one after the other and the interval between the commencement of the discharge of one condenser and the commencement of the discharge of the next condenser may be equal to or an exact multiple of the half period of the aerial and intermediate closed circuit if any.

It is important that each condenser discharge circuit should have the same time period as that of the aerial and intermediate circuit.

Each condenser circuit may be allowed to oscillate during discharge for any predetermined number of oscillations by making the discharge electrodes at the discs of a suitable size and by correctly adjusting the coupling to the aerial; or quenching arrangements or rectifiers may be introduced into each condenser circuit so as to limit the oscillations to one or two oscillations or to only one half oscillation as may be desired.

In order the more accurately to time the commencement of the discharge of each condenser I preferably introduce into the discharge circuit of each condenser a spark gap which is of such a nature that the normal working potential will not spark but which is capable of being ionized by a second or trigger spark.

This spark gap may be a mercury spark gap in an atmosphere of mercury vapour or may be between metal or carbon electrodes in air or other suitable gas and the trigger spark may take place between a third electrode and one of the terminals of the main spark.

The trigger sparks are obtained by discharging comparatively small capacities

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through an inductance coil and a spark gap between fixed electrodes and teeth on a rotating disc which I will call the trigger disc. This trigger condenser circuit is arranged to have a comparatively high frequency and is coupled to another coil tuned to the same frequency across which coil the trigger spark gaps are connected. The trigger disc may be in one with the main disc but with special teeth.

When employing a trigger disc in this way so as correctly to time the commencement of the discharges in the main circuits it is not essential though it is still preferable to employ toothed discs in the main circuits.

Dated this 15th day of May, 1913.

G. MARCONI.

COMPLETE SPECIFICATION.

Improvements in Wireless Telegraph Transmitters.

I, GUGLIELMO MARCONI, LL.D., D.Sc., 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:—

In Specification No. 28,865 dated December 14th, 1912, I have described an arrangement wherein a condenser is charged through suitable inductances and resistances from a source of current preferably a high tension battery, and discharged through an inductance, which may be coupled directly to an aerial, and a revolving toothed disc or discs in series.

I have also described how a continuous stream of oscillations may be produced by this apparatus by arranging the speed of rotation of the disc so that the interval between two successive discharges is equal to or is a multiple of the natural time period of the aerial and of the closed discharge circuit.

According to this invention I employ a number of condensers connected in parallel fashion or independently to a source or sources of current through separate inductances and resistances if resistances are desired.

Each condenser discharge circuit comprises a toothed disc discharger and an inductance coil which is coupled to the aerial or to an intermediate closed circuit which is itself coupled to the aerial.

Either one common inductance coil is used for all the condensers or separate inductance coils are used for each condenser. Similarly one toothed disc which may have insulated teeth may be used to discharge all the condensers or independent discs may be used.

It is desirable that each condenser discharge circuit should have the same time period as that of the aerial and intermediate circuit.

Each condenser circuit may be allowed to oscillate during discharge for any predetermined number of oscillations by making the discharge electrodes at the discs of a suitable size and by correctly adjusting the coupling to the aerial; or quenching arrangements or rectifiers may be introduced into each condenser circuit so as to limit the oscillations to one or two oscillations or to only one half oscillation as may be desired.

Figure 1 illustrates such an arrangement with two condenser circuits. C^1 and C^2 are two condensers which are charged from the same source of current B through the inductances I^1 and I^2 respectively. These condensers discharge through primary coils P^1 and P^2, quenching arrangements Q^1 and Q^2 and a disc discharger D.

The electrodes E^1 and E^2 belonging to the condenser circuits C^1 P^1 Q^1

and C^2 P^2 Q^2 respectively are so arranged that discharges take place from E^1 and E^2 to the disc studs alternately at regular intervals, and the interval between the commencement of the discharge of one condenser and the commencement of the discharge of the next condenser should be equal to or an exact multiple of the period of the aerial and intermediate closed circuit if any, assuming that P^1 and P^2 are wound in the same way; if, however, they are wound in opposite ways, the interval should be equal to or an odd multiple of the half period. The primary coils P^1 and P^2 are coupled to a common secondary S which forms part of an aerial circuit or may form part of a circuit in tune with, and coupled to the aerial.

The inductances I^1 I^2 should be large compared with the inductances of the other parts of the circuits but should of course not be so large as to prevent the condensers being sufficiently charged in the time available.

In place of employing separate inductances P^1 and P^2 I may employ a common inductance inserted in any common part of the two circuits C^1 D and C^2 D say at the point H^1.

In order the more accurately to time the commencement of the discharge of each condenser I preferably introduce into the discharge circuit of each condenser a spark gap which is of such a nature that the normal working potential will not spark but which is capable of being ionized by a second or trigger spark, which by reason of the shortness of its wave length and also because its circuit has little interaction with the other circuits gives more accurate timing than is possible with the dischargers in the main circuits.

This spark gap may be a mercury spark gap in an atmosphere of mercury vapour or may be between metal or carbon electrodes in air or other suitable gas and the trigger spark may take place between a third electrode and one of the terminals of the main spark.

The trigger sparks are obtained by discharging comparatively small capacities through an inductance coil and a spark gap between fixed electrodes and teeth on a rotating disc which I will call the trigger disc. This trigger condenser circuit is arranged to have a comparatively high frequency and is coupled to another coil tuned to the same frequency across which coil the trigger spark gaps are connected. The trigger disc may be in one with the main disc but with special teeth.

When employing a trigger disc in this way so as correctly to time the commencement of the discharges in the main circuits it is not essential though it is still preferable to employ toothed discs in the main circuits.

Figure 2 illustrates an arrangement of two condenser circuits and a trigger disc as well as a main disc.

The main condensers C^1 and C^2, which are charged from the high tension battery B or other source of supply through inductances I^1 and I^2, discharge through primary coils P^1 and P^2 quenching arrangements Q^1 and Q^2, the secondaries, m^1 and m^2 of two small oscillation transformers, and electrodes E^1 and E^2 respectively to the main disc D.

The quenching arrangements and the adjustment of the electrodes E^1 and E^2 are such that the potential of the condensers C^1 and C^2 is not sufficient to cause a discharge between E^1 and E^2 and the disc D.

Auxiliary or trigger condensers K^1 and K^2, which are small in comparison with C^1 and C^2, are charged through suitable inductances X^1 and X^2 from a high tension battery B^1 or other source of supply which may conveniently be B^1. These condensers discharge through the primaries n^1 and n^2 of the small oscillation transformers, and electrodes Z^1 and Z^2 respectively to a trigger disc TD.

The trigger disc TD is preferably rigidly coupled to the main disc D and the electrodes are arranged so that when a stud on D is opposite E^1 or E^2 a stud on TD is opposite Z^1 or Z^2 respectively. The main circuits C^1 P^1 m^1 and C^2 P^2 m^2 are both coupled and tuned to the aerial circuit.

The trigger circuits K^1 n^1 and K^2 n^2 have preferably a very much higher frequency than the main circuits; the secondaries m^1 and m^2 of the oscillation transformers are preferably shunted by small condensers F^1 F^2 placed across them and the circuits m^1 F^1 and m^2 F^2 are tuned to the trigger circuits K^1 n^1 and K^2 n^2 respectively.

Immediately either condenser K^1 or K^2 discharges a high potential is induced in the oscillation transformer secondary m^1 or m^2 causing a spark at E^1 or E^2 thus allowing the main condenser C^1 or C^2 to discharge.

An air blast may be employed wherever desirable to interrupt the discharge.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a wireless telegraph transmitter the combination of a number of condensers continuously connected in parallel fashion or independently to a source or sources of current and means for discharging them independently in succession and in synchronism with the aerial, substantially as described.

2. In a wireless telegraph transmitter the combination of a number of condensers, means for charging them, and means controlled by trigger discharges for discharging the condensers in succession, substantially as described.

3. Wireless telegraph transmitters substantially as described with reference to the drawings.

Dated this 15th day of December, 1913.

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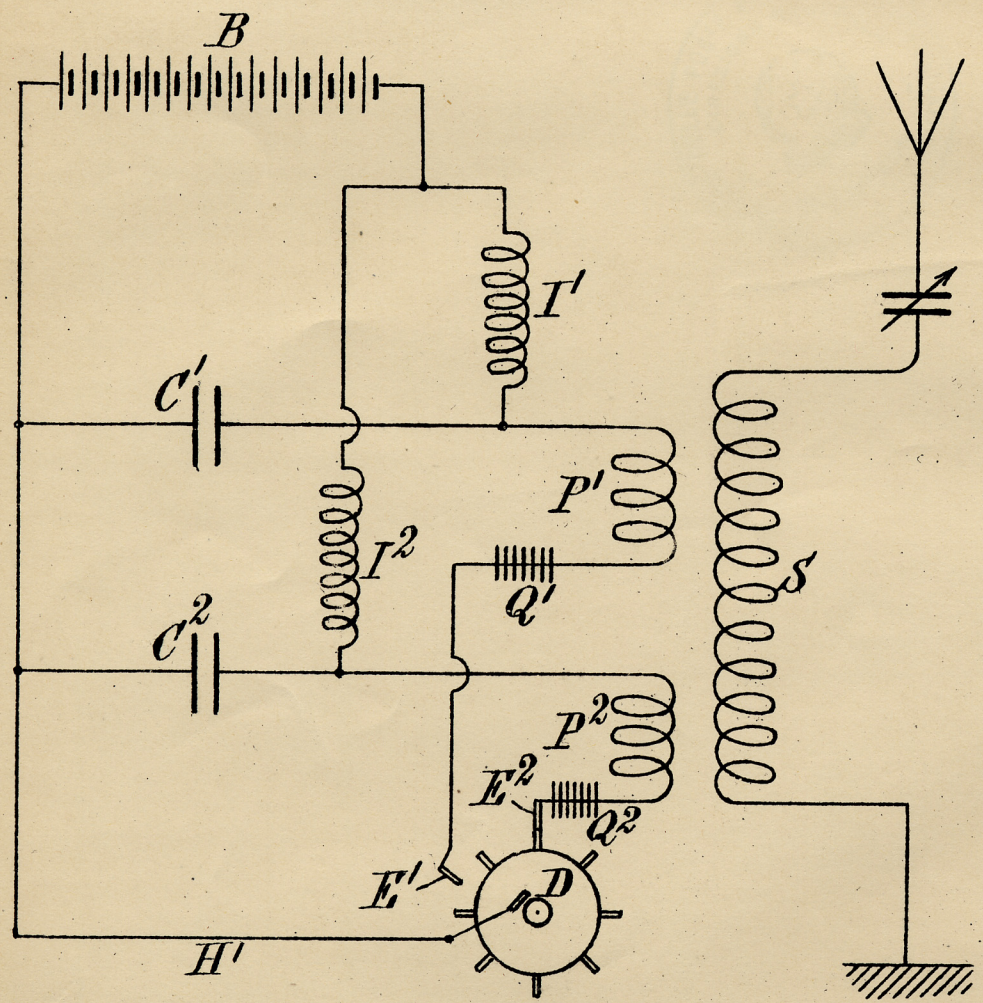
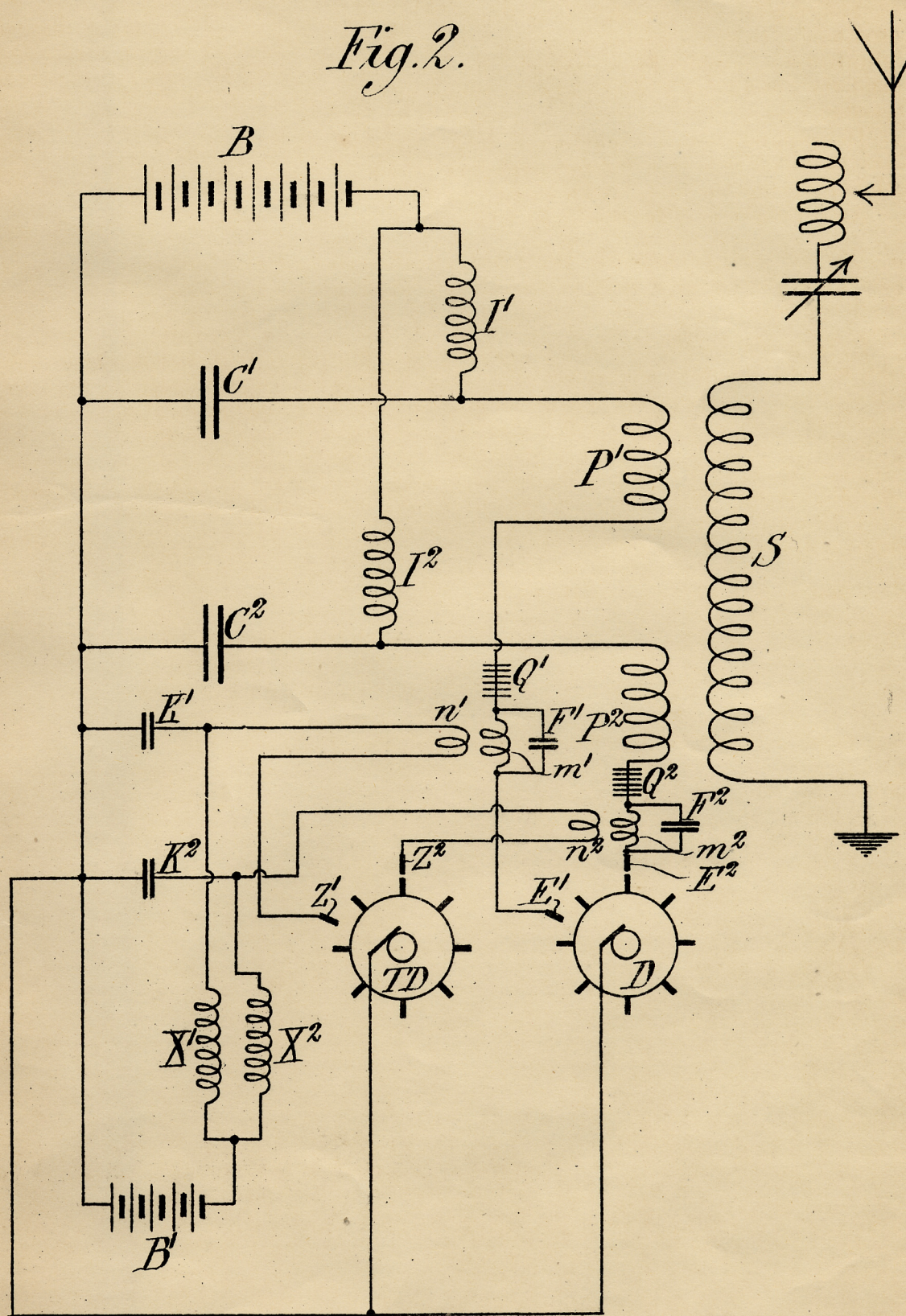
SHEET 1

Fig. 1.



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

Fig. 2.



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