



N° 21,672



A.D. 1913

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PROVISIONAL SPECIFICATION.

Improvements in the Connections of Electrical Condensers.

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and RICHARD NORMAN VYVYAN, Electrical Engineers, both of Marconi House, Strand, London, W.C., do hereby declare the nature of this invention to be as follows:—

5 The object of this invention is to provide improved connections for electrical condensers especially such as are used in wireless telegraph transmitting apparatus.

10 In large condensers, especially those employed in wireless telegraphy it is of great importance that the oscillation constants of all the individual portions of the condenser bank shall be as nearly as possible the same in order that surging currents may not be set up between different rows of condenser jars. It is also important that the inductance of the primary circuit outside the jigger should be reduced to a minimum, in order that as large a proportion of the total inductance in the circuit as possible may be in the jigger.

15 With these objects we connect the units of which the whole condenser is composed and which consist of a few, say three, condenser jars in series to the main busbars by connections which are identical in every respect. The busbars are made of thin copper strip, affording a large surface area for the passage of the oscillatory currents, and the main and return connections to any one point in the condenser circuit are kept strictly parallel to one another and as close together as possible taking into consideration the voltage and the nature of the insulation utilised.

20 The adjacent terminals of the jars in a unit are connected together by means of a straight piece of copper strip, the inner terminal being connected to the busbar. This copper strip is covered by a porcelain insulator of H section, the ends of which are recessed back to prevent leakage. The long copper strip from the outer terminal to the busbar lies in this insulator, and is thus brought as close as possible to the connecting pieces between the condensers without any danger of flashing over. The distance between the long copper strip and the interconnecting pieces is also kept constant in all the condensers, thus preventing the surging spoken of above.

30 The whole condenser is usually made up of eight nests each consisting of a number of units of three condenser jars in series. It is of the utmost importance that the circuits from the points where all the main busbars from the nests unite to the nests themselves shall be exactly identical in order that the surging currents above mentioned may not be set up between the nests, where of course they would be of much greater magnitude than between separate units.

The main busbars are rigidly held at a fixed distance apart by means of porcelain insulators suitably supported so that the inductance in the main busbars may be constant.

40 Since the rotating disk is that part of a wireless telegraph transmitter which is most likely to break down we usually connect a condenser bank to two disks either of which may be used. The connections to the disks are identical, and

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the disk connections are joined to exactly similar points on the main busbars in order that there may be no change of wave length when one disk is changed for the other. A slightly inductive link may be used in conjunction with one or the other of the disks in order to correct any slight differences in wave length.

The invention is illustrated in the accompanying drawings in which Figure 1 5 is a side elevation and Figure 2 a plan of a unit of three jars.

a are the jars, *b* *b*¹ the busbars, *c* the insulators shown in cross section in Figure 3.

Figures 4 and 5 are respectively a plan and side elevation of a condenser composed of eight nests of jars connected to a jigger *d* which can be connected 10 at *e* or *e*¹ to one of two disk transmitters.

Figure 6 is a plan of an arrangement in which two condensers of four nests each are connected to two independent jiggers so connected to three disks at *e* *e*¹ *e*² that each jigger is served by two disks.

Each jigger is fixed with its axis in such a line that the mutual inductance 15 between it and the condenser busbars may be a minimum; at the same time it is so arranged in a position as nearly as possible symmetrical to all the nests of condensers that the mutual inductance between it and the busbars of any one nest is the same as that between the jigger and the busbars of any other nest. 20

Dated this 24th day of September, 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.

R. N. VYVYAN.

COMPLETE SPECIFICATION.

Improvements in the Connections of Electrical Condenser.

We, MARCONI'S WIRELESS TELEGRAPH COMPANY, LIMITED, and RICHARD NORMAN VYVYAN, Electrical Engineers, both of Marconi House, Strand, London, 35 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:—

The object of this invention is to provide improved connections for electrical condensers especially such as are used in wireless telegraph transmitting 40 apparatus.

In large condensers, especially those employed in wireless telegraphy it is of great importance that the oscillation constants of all the individual portions of the condenser bank shall be as nearly as possible the same in order that surging currents may not be set up between different rows of condenser jars. 45 It is also important that the inductance of the primary circuit outside the jigger should be reduced to a minimum, in order that as large a proportion of the total inductance in the circuit as possible may be in the jigger.

Our invention is illustrated in the drawings accompanying our Provisional Specification Figure 1 being a side elevation and Figure 2 a plan of a unit of 50 three jars.

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With the objects set out above we connect the units of which the whole condenser is composed and which consist of a few, say three, condenser jars a in series to the main busbars b b^1 by connections which are identical in every respect. The busbars are made of thin copper strip, affording a large surface
 5 area for the passage of the oscillatory currents, and the main and return connections to any one point in the condenser circuit are kept strictly parallel to one another and as close together as possible taking into consideration the voltage and the nature of the insulation utilised.

The adjacent terminals of the jars in a unit are connected together by means
 10 of straight pieces of copper strip f the inner terminal being connected to the busbar b^1 . This copper strip is covered by a porcelain insulator c of **H** section (see Figure 3), the ends of which are recessed back as at g to prevent leakage. The long copper strip f^1 from the outer terminal to the busbar b lies in this insulator, and is thus brought as close as possible to the connecting pieces between
 15 the condensers without any danger of flashing over. The distance between the long copper strip f^1 and the interconnecting pieces f is also kept constant in all the condensers, thus preventing the surging spoken of above.

The whole condenser is usually made up of eight nests each consisting of a number of units of three condenser jars in series.

20 Figures 4 and 5 are respectively a plan and side elevation of a condenser composed of eight nests of jars connected to a jigger d , each nest comprising 16 units like Figure 1.

It is of the utmost importance that the circuits from the points h where all the main busbars b b^1 unite to the nests themselves shall be exactly identical in
 25 order that the surging currents above mentioned may not be set up between the nests, where of course they would be of much greater magnitude than between separate units.

The main busbars are rigidly held at a fixed distance apart by means of porcelain insulators i suitably supported so that the inductance in the main
 30 busbars may be constant.

Since the rotating disk is that part of a wireless telegraph transmitter which is most likely to break down we usually connect a condenser bank to two disks either of which may be used. The connections to the disks are identical, and the disk connections are joined to exactly similar points on the main busbars
 35 in order that there may be no change of wave length when one disk is changed for the other. A slightly inductive link may be used in conjunction with one or the other of the disks in order to correct any slight differences in wave length.

In Figures 4 and 5 the jigger d may thus be connected to either one or other
 40 of two disks at e e^1 .

Figure 6 is a plan of an arrangement in which two condensers of four nests (each comprising 26 units) each are connected to two independent jiggers so connected to three disks at e e^1 e^2 that each jigger is served by two disks.

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

1. A bank of condensers comprising a number of units connected together so that the oscillation constants of all the units is practically the same substantially as described.
- 50 2. A bank of condensers comprising a number of units connected together so that the inductance of the connections is as small as possible substantially as described.
3. A bank of condensers comprising a number of nests each composed of a number of condenser jars, the nests being connected together by identical con-
 55 nections substantially as described.

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4. Means for connecting condenser jars substantially as described with reference to Figures 1, 2 and 3.
5. A condenser substantially as described with reference to Figures 4 and 5.
6. A condenser substantially as described with reference to Figure 6.

Dated this 17th day of March, 1914.

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.

R. N. VYVYAN.

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(2nd Edition)

Fig.3.

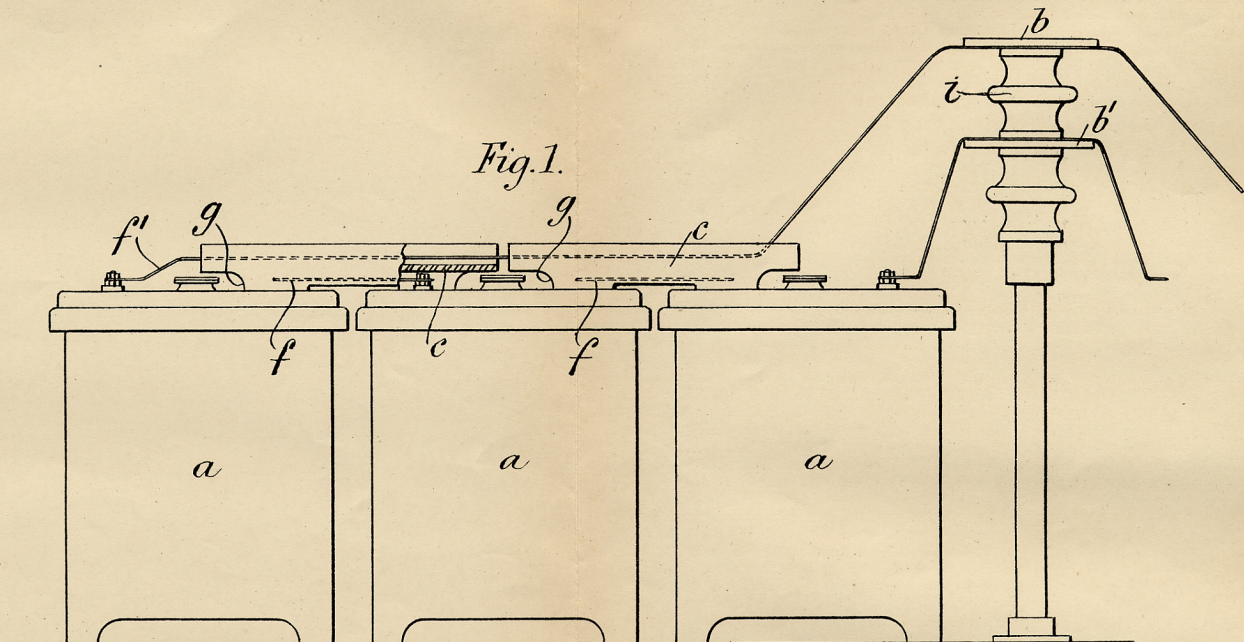


Fig.2.

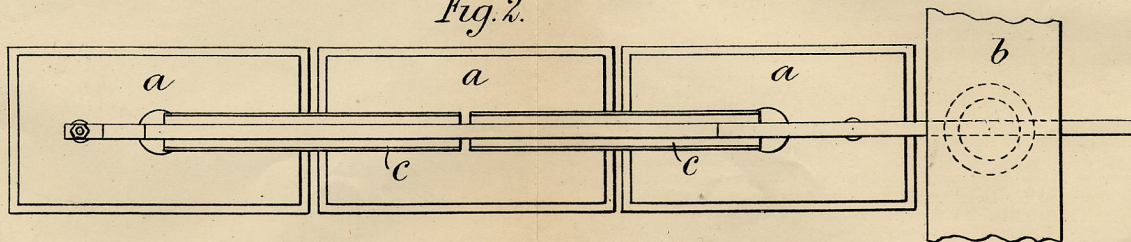


Fig. 5.

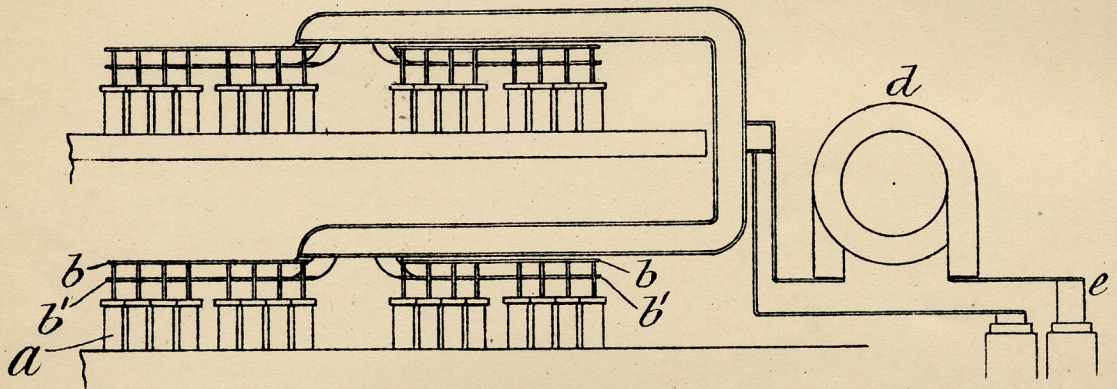
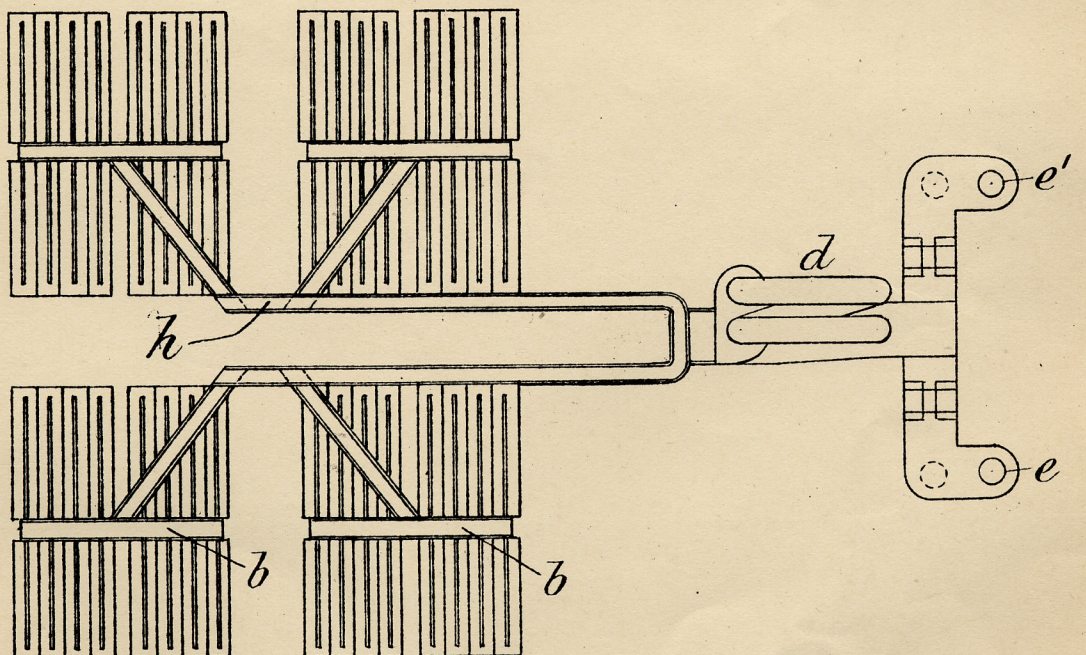


Fig. 4.



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

Fig.6.

