

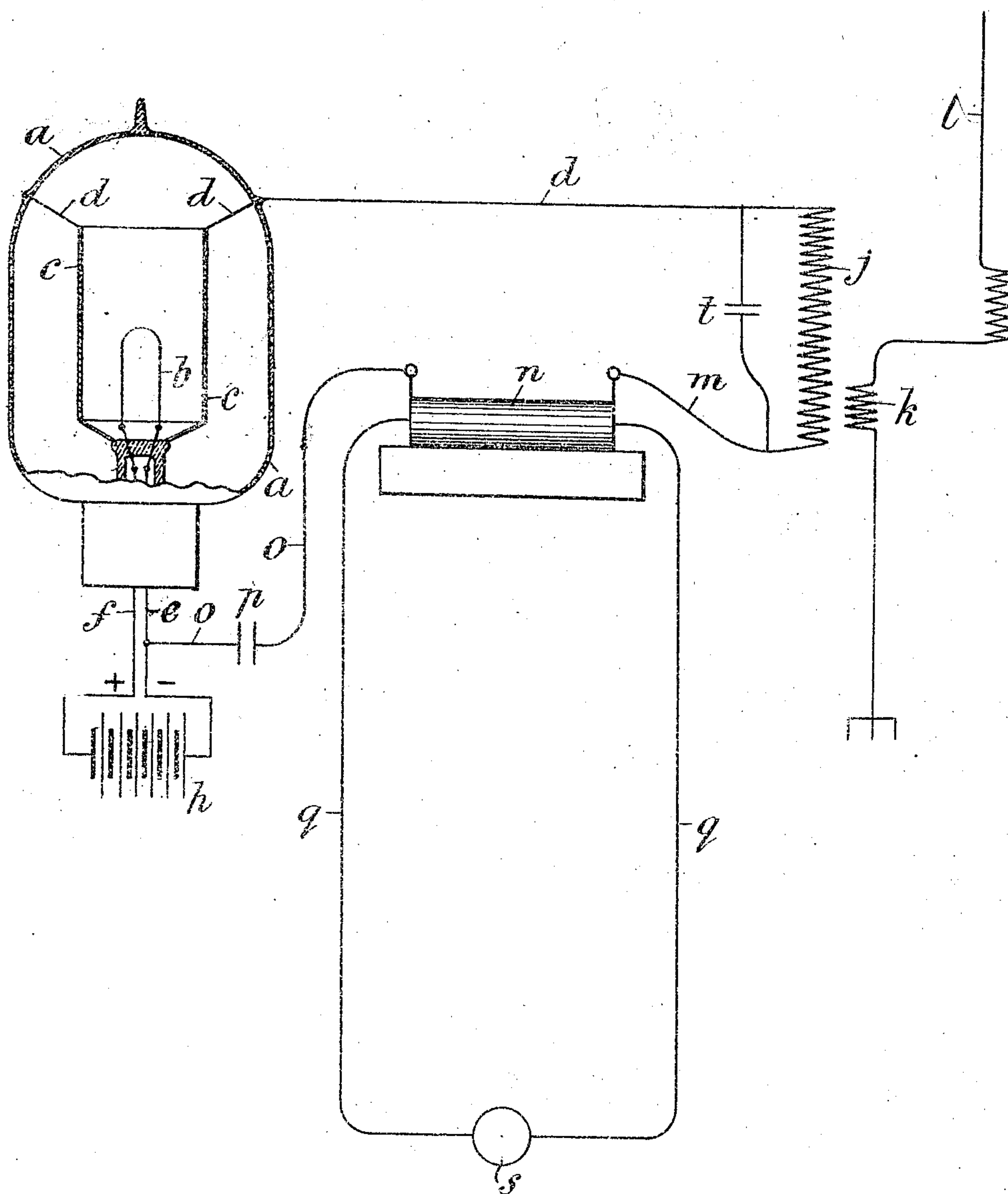
No. 896,130.

PATENTED AUG. 18, 1908.

G. MARCONI.

RECEIVER FOR WIRELESS TELEGRAPHY.

APPLICATION FILED MAR. 13, 1907.



Witnesses

Edward W. Vaile.

Wm. Tallman.

Inventor

Guglielmo Marconi

By

Samuel R. Betts

his Attorney

# UNITED STATES PATENT OFFICE.

GUGLIELMO MARCONI, OF LONDON, ENGLAND, ASSIGNOR TO MARCONI WIRELESS TELEGRAPH COMPANY OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## RECEIVER FOR WIRELESS TELEGRAPHY.

No. 896,130.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed March 13, 1907. Serial No. 362,121.

*To all whom it may concern:*

Be it known that I, GUGLIELMO MARCONI, LL. D., D. Sc., a subject of the King of Italy, residing at 18 Finch Lane, in the city of London, England, have invented new and useful Improvements in Receivers for Wireless Telegraphy, of which the following is a specification.

This invention relates to a method of employing the well known Fleming's oscillation valve (described in the U. S. A. specification No. 803684) in wireless telegraphy. This valve consists of a vacuum vessel having in it two conductors adjacent to but not touching each other one conductor being heated in any convenient manner while the other is connected to an external circuit.

The oscillation valve is preferably placed in shunt with the secondary of the step-up transformer or jigger, which is, as usual, connected with the aerial. The circuit including the secondary coil of the jigger and the oscillation valve, also includes the primary or fine wire winding of the induction coil or step-down transformer, the secondary winding of which is connected with a telephone receiver, relay, or other suitable wave responsive device for detecting the received signals.

A condenser may be placed in series between the valve and the induction coil and a second condenser in a shunt across the ends of the secondary of the jigger.

The condenser last mentioned, together with the secondary winding of the jigger, forms a closed oscillatory circuit when the capacity of this condenser is properly adjusted for syntonism.

The values of the inductance and capacity of the transformer or jigger and the value of the capacities of the condensers associated to it should be such as to bring the receiving circuit, including said jigger into resonance with the period of the transmitted oscillations.

The drawing is a diagram of the arrangement it is preferred to adopt.

*a* is a glass bulb, and *b* is a carbon filament like the carbon filament of an incandescent lamp, suitable say for taking a current of 6 to 8 volts and 2 to 4 amperes. *c* is a cylinder of aluminium open at the top and bottom which surrounds but does not touch the filament.

The cylinder *c* is suspended and steadied by platinum wires *d*, and the ends of the filament

*b* are connected to platinum wires connected to the leads *e* and *f*. The platinum wires are sealed through the glass in the ordinary manner. *h* is a battery by which the filament *b* is heated. This arrangement is one form of the oscillation valve described in the said former specification.

One of the wires *d* is connected to the secondary *j* of the jigger the primary *k* of which is connected to the ordinary aerial *l* and to earth. The other end of the secondary *j* is connected by a wire *m* to one end of the fine wire winding of an induction coil *n* (which should be such as usually manufactured to give say a 10 inch spark) the other end of its fine wire winding being connected by a wire *o* through a condenser *p* to the lead *e*. When the induction coil is thus connected, the fine wire winding, usually operating as a secondary winding, becomes the primary coil, while the coarse wire winding, usually operating as the primary winding, becomes the secondary coil. The ends of the secondary of the coil *n* are connected to a circuit *q* containing a detector *s* of any ordinary type such as a telephone or a relay operating a printing instrument. *t* is a condenser in a shunt across the secondary *j* of the jigger.

By using a condenser, such as the condenser *t*, in the resonant circuit, the receiving circuit not only may be more easily brought into syntonism with the received oscillations, but such condenser permits the oscillations in the resonant circuit to accumulate to such an extent that their electromotive force is sufficient to overcome the resistance of the space between the filament *b* and the cylinder *c* in the oscillation valve, thereby increasing the strength of the waves rectified by said valve. Inasmuch as the electromotive force of the oscillations rectified by the oscillation valve is high, while its current value is small, the induction coil *n* transforms the current so that it acts upon the detecting device as one of lower potential and higher current value. These conditions are, therefore, the reverse of those usually found in detectors for electromagnetic waves heretofore used.

Inasmuch as the fine wire winding of the induction coil *n* introduces a large amount of inductance into the receiving circuit, the condenser *p* is introduced to counteract the same.

The pulsating current produced in the



parts of the receiving circuit, comprising the filament *b*, the wire *e*, the wire *o*, the condenser *p*, the fine wire winding of the induction coil *n*, and the wire *m*, results in an alternating current in the wires *q* and the detector *s*, the latter current being of comparatively large volume and low potential.

The term "aerial" is intended to embrace any conductor in which oscillations are set up by the incoming Hertzian waves.

What I claim is:—

1. In a receiving apparatus for wireless telegraphy, the combination with an oscillatory circuit, of an oscillation valve, an induction coil, the oscillation valve and the primary winding of the induction coil being connected in series and operatively connected with said oscillatory circuit, and a detecting device connected with the secondary winding of said induction coil.

2. In a receiving apparatus for wireless

telegraphy, the combination with an oscillatory circuit including a condenser, of an oscillation valve, an induction coil, the oscillation valve and the primary winding of the induction coil being connected in series with each other but in shunt with said condenser, and a detecting device connected with the secondary winding of said induction coil.

3. In a receiving apparatus for wireless telegraphy, the combination with an oscillatory circuit, of an oscillation valve, an induction coil and a condenser, said valve, condenser and the primary winding of the induction coil being connected in series and operatively connected with said oscillatory circuit, and a detecting device connected with the secondary winding of said induction coil.

GUGLIELMO MARCONI.

Witnesses:

ROBERT B. RANSFORD,  
ARTHUR CARPMAEL, Jun.