

N<sup>o</sup> 5133



A.D. 1910

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COMPLETE SPECIFICATION.

**Improvements in Wireless Electric Signalling.**

I, REGINALD AUBREY FESSENDEN, of Brant Rock, Massachusetts, United States of America, Engineer, 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:—

5 My invention relates primarily to the receipt and transmission of electrical signals and more particularly to the arrangement of circuits for the simultaneous reception and transmission of signals by electro-magnetic waves when the received signals are due to the production of beats in a telephonic receiver by  
10 superposing on the oscillations in the receiving circuit due to the received electro-magnetic waves other oscillations of different frequency due to a locally generated high frequency current.

The present invention consists in the special arrangement of balancing transformer circuits whereby, when signals are being simultaneously received and transmitted, the completion of the transmitting circuit shall have no effect upon  
15 the receiving circuit at the same station, the particular arrangement of the circuits being more especially adapted to the case in which the signals are produced in a static receiver or condensing telephone, in which case it is of importance that there should be as small ohmic resistance as possible in the receiving circuit.

20 The arrangement of circuits is illustrated in the accompanying drawing in which 105 is an antenna grounded at 115; 114 is an adjustable inductance and 106 the primary of a transformer the secondary 107 of which has in series with it the receiver 116, an adjustable resistance 118 and the secondaries 126, 127 of two transformers of which the primaries 124, 125 are connected with the  
25 source 131 (usually a high frequency alternator) of the locally generated high frequency current. The transmitting circuit comprises the key 120, an adjustable resistance 121, the primary coil 122 of a transformer the secondary 123 of which is included in the antenna circuit, and the primary 124 of one of the transformers before mentioned. A second circuit from the alternator 131, independent of the key 120, causes a high frequency current to flow continuously  
30 through the primary 125 of the other transformer.

The inductive effects of the coils 106, 124 on the receiving circuit are arranged to neutralise each other so that on depressing the key 120 the click, which would otherwise be produced in the telephone receiver 116 is obviated, while on the  
35 other hand the oscillations in the antenna circuit due to the reception of electro-magnetic waves of slightly different frequency from those produced by the generator 131, create by the interaction of the currents induced in the coils 107, 127 respectively, beats in the telephone receiver 116.

40 A second telephone receiver 128 inductively connected through the transformer 129, 130 with the receiver circuit is also shewn in the fig., and when two telephonic receivers are provided as shewn, they may conveniently be mounted on a head-piece as a double telephone in the known manner.

[Price 8d.]



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*Fessenden's Improvements in Wireless Electric Signalling.*

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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:—

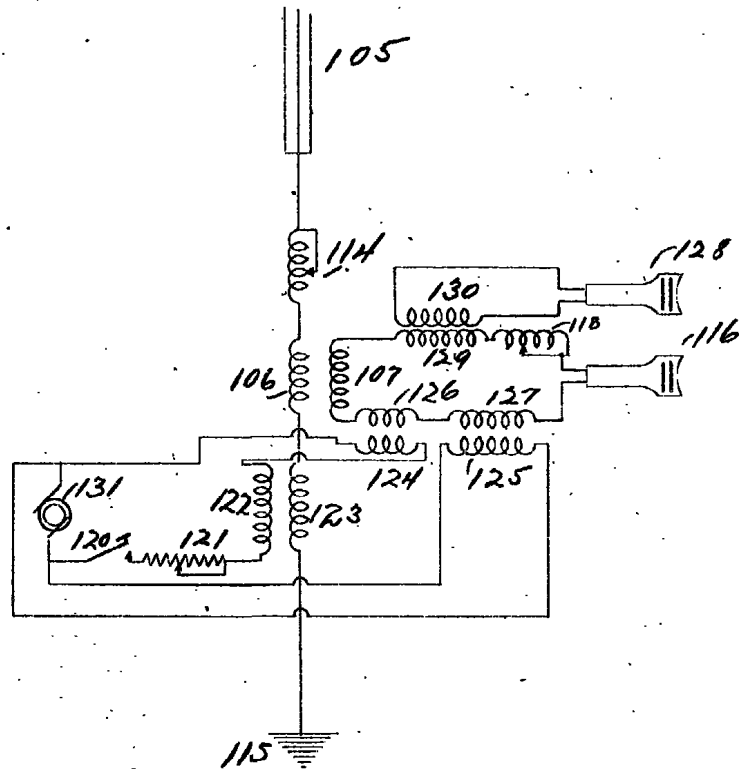
The arrangement of circuits for the simultaneous transmission and reception of signals by electromagnetic waves and the production of signals by the heterodyne or beat method, in which two circuits from the local source of high frequency current are provided, one circuit including the transmitting key and the primary of a balancing transformer adapted to prevent any disturbance in the receiver on closing the transmitting circuit, and the other circuit including the primary of a transformer which is permanently in connection with the local source of high frequency current and which is adapted to impress oscillations of predetermined frequency on the receiving circuit, substantially as herein described with reference to the drawing. 5 10

Dated this 1st day of March, 1910.

ABEL & IMRAY,  
Agents for the Applicant,  
Birkbeck Bank Chambers, London, W.C.

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



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