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RADIO SIGNALING SYSTEM

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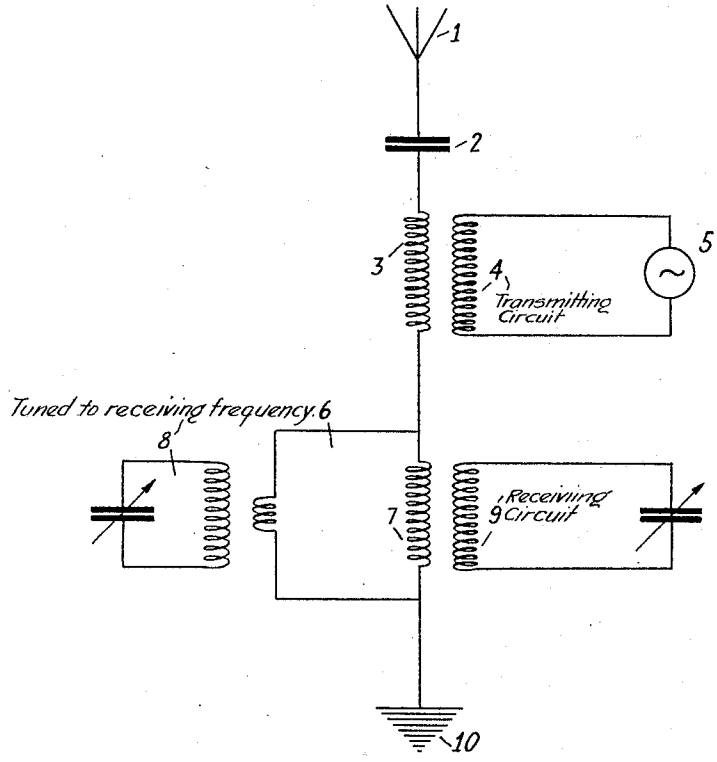

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RADIO SIGNALING SYSTEM.

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This invention relates to what is known as a duplex signaling system wherein the antenna circuit is common to the transmitter and receiver. The object of the invention is to minimize the voltage disturbances in the receiver which arise from the transmitter.

Another object of my invention is to employ as few high potential condensers as possible.

A further object of my invention is to obtain radio telephony communication by duplex system in as simple a manner as possible.

The above objects are accomplished and the advantages secured by my invention will be understood by a brief explanation of the operation of my device, reference being made to the drawing wherein the figure is a circuit arrangement of the system.

Referring to the figure the numeral 1 represents an antenna, 2 a condenser, 3 an inductance, 4 a transmitting circuit, 5 a high frequency alternator for the transmitting circuit, 6 is a coil consisting of a limited number of turns in parallel with an inductance 7, 8 is a resonant circuit tuned to the incoming wave and coupled inductively to the coil 6, 9 is a radio receiving circuit. 10 is a ground.

In the duplex system it is of special importance that the transmitting and the receiving apparatus should be mounted in as close proximity as possible and that they should be connected to one and the same aerial. This desideratum is particularly true of radio telephony over high potential lines. In this connection it is, very difficult, to provide more than one aerial contiguous to the high tension wires in instances where the coupling between the high frequency apparatus and the high tension lines consists of an aerial system. The same situation holds true when high potential condensers are employed as the coupling elements. The aim evidently then should be to use as few high potential condensers as practicable and these condensers should be used for both transmission and reception.

It is very important that the antenna connections in radio telephony be so made as to reduce to a minimum the interference occasioned by transmitted waves of low frequency in the receiving apparatus.

The method of using but one coupling wire for both reception and transmission has been made use of in the art where the transmitter and receiver were arranged in series and where a circuit branch was disposed in parallel to the receiver having a blocking action with reference to incoming oscillations, while possessing a short circuiting effect with regard to the sending wave. The blocking was accomplished by what is known as a stopper or blocking circuit and the short circuit effect was realized by means of the series arrangement of an impedance which compensated the impedance of the blocking circuit for the transmission frequency.

While the above method in principle solves the problem it involved the disadvantages that the magnitude of the two systems of waves has to be comparatively disproportionate in order that the short circuiting shunt at the receiver might not offer an unduly high ohmic resistance for the sending current whereby the effect aimed at would have been impaired. Another difficulty arose in that the resonance adjustments thus obtained were relatively sharp with the result that ease of operation and manipulation was lost. Also slight changes in the sending frequency rendered the system unstable.

The present invention provides a parallel branch for the receiving apparatus consisting of a coil 6 of a limited number of turns with which a tuned or resonance circuit 8 tuned to the incoming wave is coupled inductively. This arrangement has exceptionally valuable characteristics. The disturbing potential impacts from the transmitter are deprived of their inductive actions upon the receiver since the latter is completely short circuited to all save receiving frequency. Slight changes therefore in the transmitting wave are unnoticeable so far as the receiver is concerned.

Some slight attenuation of the receiving oscillations is encountered by reason of the shorting effect of the shunt. By the selection of variable coupling between the coupled circuit 8 and the shorting shunt 6, it is possible by the transfer of capactive resistance, to compensate for whatever undue self-inductance for the transmitting frequency there may be in the short circuiting shunt.

It will be clear that the general principles herein disclosed may be embodied in many other organizations different from those illustrated without departing from the spirit

of the invention as set forth in the hereinafter claims.

What is claimed is:—

1. In a duplex radio signaling system, an aerial, a source of high frequency oscillations and a receiving circuit, means to connect the source of high frequency oscillations and the receiving circuit in series with the aerial, a coil in parallel to the aerial comprising a few turns, and a circuit tuned to the incoming wave coupled to said coil.

2. In a duplex radio signaling system, a source of electrical oscillations inductively coupled to an antenna, an inductance in series with the antenna, receiving means for incoming oscillations coupled to said inductance, a circuit in parallel to the inductance and a tuned circuit non-conductively coupled to said circuit.

3. In a duplex radio signaling system in combination, an antenna circuit, a source of high frequency oscillations, a receiving circuit, means to couple the source of high frequency oscillations and receiving circuit to the antenna circuit, means to shunt transmitting voltage disturbances from the receiving circuit, said shunting means consisting of a coil connected to the antenna and, a resonance circuit tuned to the incoming wave coupled to said coil.

4. In a duplex radio signaling system, an antenna, a transmitter of electrical oscillations, a plurality of inductances in series with the antenna, an indicating circuit inductively coupled to one of the inductances, means coupling the transmitter and other inductance, a coil connected to the antenna, a tuned circuit inductively coupled to the coil and resonant with incoming oscillations and means to tune the indicating circuit to resonance with incoming oscillations whereby disturbing transmitting voltages are minimized.

5. In a duplex radio signaling system, a circuit adapted to receive incoming oscillations, a source of high frequency oscillations coupled to said circuit, an indicating circuit coupled to said circuit, means to tune the indicating circuit to resonance with incoming oscillations, means to short circuit the transmitting oscillations, said short circuiting means comprising a circuit consisting of an inductance, and an independent tuned circuit inductively coupled to the short circuiting means.

6. In a duplex radio signaling system, a source of transmitting electrical oscillations, an indicating circuit resonant to incoming oscillations, an aerial common to the source of electrical oscillations and to the indicating circuit, a plurality of inductances in series with the antenna, a coil circuit in parallel with one of the inductances, a second coil inductively coupled to the coil circuit and means to tune the second coil to resonance with incoming oscillations.

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