

A RESISTANCE RADIO TELEPHONE.

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In radio telephones we have a source of alternating current of high frequency which sends current out into the aerial. The disturbance in the ether which is caused by this current is called the carrier wave. The amplitude of this wave is changed or varied by some means which is controlled by the voice. This device is known as the modulator.

Since the three electrode vacuum tube has come into use, tubes are used as generators of the carrier wave and also as modulators. This is usually accomplished by connecting the telephone transmitter to the tubes with tuned or untuned inductance coils. In the case of the tuned coils, each set of coils must be separately tuned for every change of wave length. The untuned inductance method avoids this difficulty with a certain loss of efficiency. In either case one coil is liable to affect the second coil so that disagreeable cross squeals are set up in the set.

The cascade amplifying receiving sets have the same defects so that all amplification is produced by audio coils, untuned iron core coils, or by resistance amplification. Tuning being in the main circuits alone.

With the idea of simplicity and cheapness, I have devised a wireless tele-

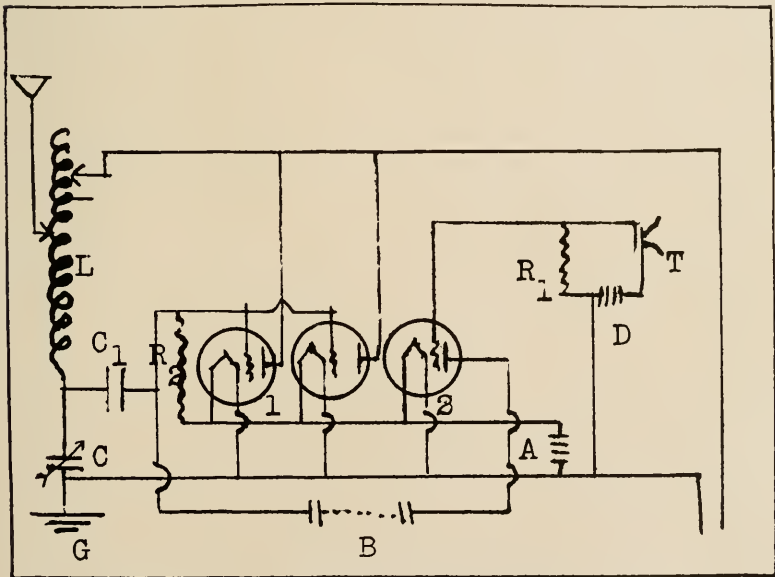


Fig. 1.—A Resistance Radio Telephone.

phone connection in which the modulation is accomplished by means of resistances alone. The circuit is diagrammed in figure 1. The oscillating circuit consists of the aerial, the inductance, L , and the variable oil condenser, C , connected to the ground at G . All tuning is accomplished by

varying the connections to the coil, L, and by changing the capacity at C. Two tubes or two sets of tubes are used. 1. is one or more power tubes or hard tubes connected in parallel. Two power tubes are shown in the figure. These tubes are the oscillating tubes by means of which the energy is sent out into the aerial. 2. is an ordinary receiving or amplifying tube by means of which the current from the telephone transmitter, T, is amplified. The transmitter, T, is connected in series with a resistance, R_1 , and a battery, D, of two or more ordinary dry cells. The resistance R_1 should have a resistance equal to that of the transmitter, T. The variation of the current through the carbon transmitter causes a variation of the potential difference at the terminals of the resistance, R_1 . This varies the potential of the grid of tube, 2, and causes a corresponding variation of the current of the plate circuit of tube, 2. This current flows through the grid leak resistance, R_2 and thus modulates the amplitude of the current sent into the aerial by the tubes, 1. R_2 should be a resistance comparable to the impedance of tube 2. The battery B is an ordinary plate battery of 20 or 40 volts. H is a source of high potential, about 300 volts.

This circuit has been tried out using an aerial of poor construction. The results compare very favorable with some of the standard connections. With an antennae current of 200 milliamperes the voice was transmitted to a coil aerial of six turns 2 meters square at a distance of one-half mile. This should lead one to expect the range should be five or ten miles with a good receiving aerial.

The resistance, R_1 , was an ordinary resistance box. R_2 , was made of card board painted with india ink.