

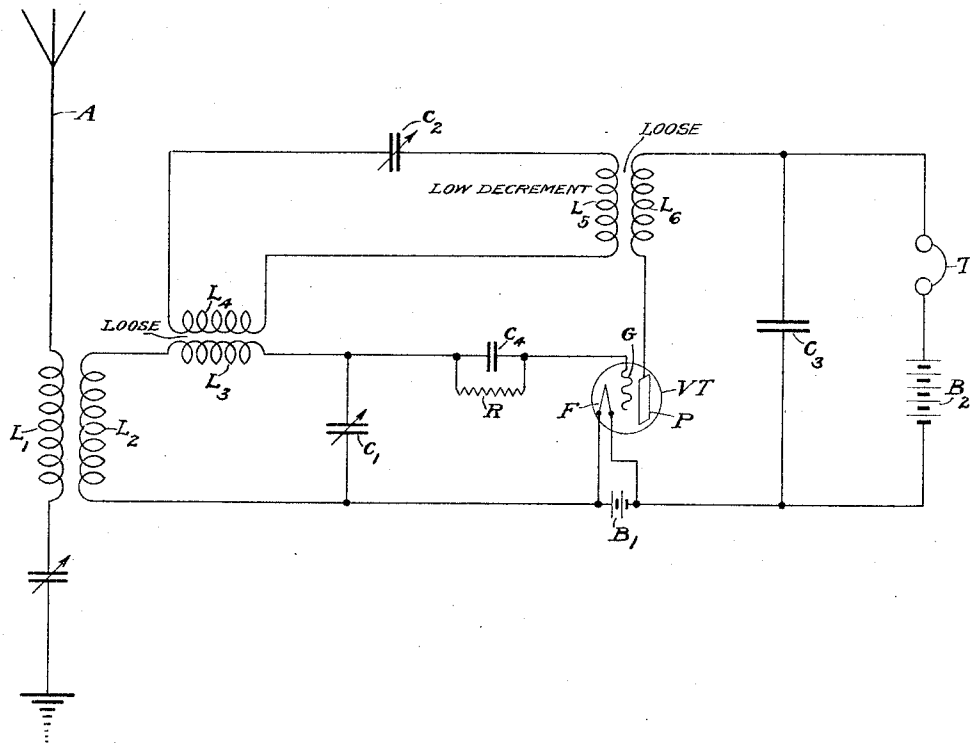
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L. W. AUSTIN

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ELECTRICAL CIRCUITS

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Inventor

Louis W. Austin

By

W. H. Austin

Attorney

UNITED STATES PATENT OFFICE.

LOUIS W. AUSTIN, OF WASHINGTON, DISTRICT OF COLUMBIA.

ELECTRICAL CIRCUITS.

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My invention relates generally to electrical circuits, and particularly those in which high frequency electrical currents are produced of the order of frequency commonly used in radio communication, the particular object of my invention being to produce high frequency electrical currents and maintain the frequency constant.

My invention is of particular value in receiving high frequency electrical currents by the heterodyne or beats methods, and is most effective in receiving such signals in the higher range of frequencies, for instance, 1000 kilo-cycles (300 meter wave length).

It is well known that in the use of a three-electrode vacuum tube oscillator having coupled grid and plate circuits to produce oscillations, the period of the oscillation being set by the period of one or the other of these circuits, that variations in the filament temperature or variations in the plate circuit energy supply potential will cause variations in the frequency of the oscillations, and these variations become particularly noticeable in receiving by heterodyne at the higher frequency where a slight change in the frequency of a locally generated oscillation produces a substantial change in the frequency of the beat oscillations, or may even cause the beat oscillations to vary beyond the range of audibility.

It is the principal purpose of my invention to prevent variations within the vacuum tube from materially influencing the constants of the circuit determining the period of the oscillations of the system.

My invention will be best understood by reference to the accompanying drawing in which A represents a conventional type of antenna connected through inductance L_1 to a secondary oscillatory circuit L_2, L_3, C_1 , which circuit is connected to the grid G and filament F of the three-electrode vacuum tube VT through the well known grid leak-stopping condenser combination C_4 and R. The plate circuit of the vacuum tube includes inductance L_6 , telephones T and battery B_2 , the telephones being shunted by the ordinary radio frequency by-pass condenser C_3 . Instead of coupling the plate and grid circuits directly by bringing to bear inductance L_6 on inductance L_3 , I interpose an intermediate

circuit including inductance L_4 , inductance L_5 and capacity C_2 , this circuit being preferably one having a decrement lower than the decrement of the circuit L_2, L_3, C_1 , and the coupling between this intermediate circuit and the grid and plate circuits being preferably quite loose.

I found that with the arrangement above described the frequency of the oscillations is set or fixed by the intermediate circuit, and that variations in the vacuum tube which may materially influence the period of the grid circuit do not manifest themselves in the system as a whole, and that practical constancy of frequency may be obtained even at frequencies of the order of 1000 kilo-cycles per second. Any desired frequency may be obtained by controlling the constants of the intermediate circuit. It is also desirable in radio receiving to control the constants of the antenna and secondary circuits for more efficient reception through resonance. A more ready control may be obtained by mounting the condenser C_1 and C_2 on a single shaft providing the inductances of the two circuits of which these condensers form a part are suitably designed to permit of an arrangement of this kind.

While I have described my invention in connection with the reception of radio signals, its application is not so limited as there are many uses for a constant frequency high frequency generator.

Having described my invention I claim:

In a regenerative detector circuit having grid-filament and plate-filament circuits, the combination of an antenna coil, a resonant circuit coupled thereto and located in the grid-filament circuit of the vacuum tube, said resonant circuit consisting of a plurality of inductances and a condenser in parallel therewith, an inductance in the plate-filament circuit, and a low decrement circuit loosely coupled to one of the inductances in the grid-filament circuit and to the said inductance in the plate-filament circuit, said low decrement circuit consisting of a plurality of inductances and a variable condenser, the inductances and condenser connected in series relation.

LOUIS W. AUSTIN.