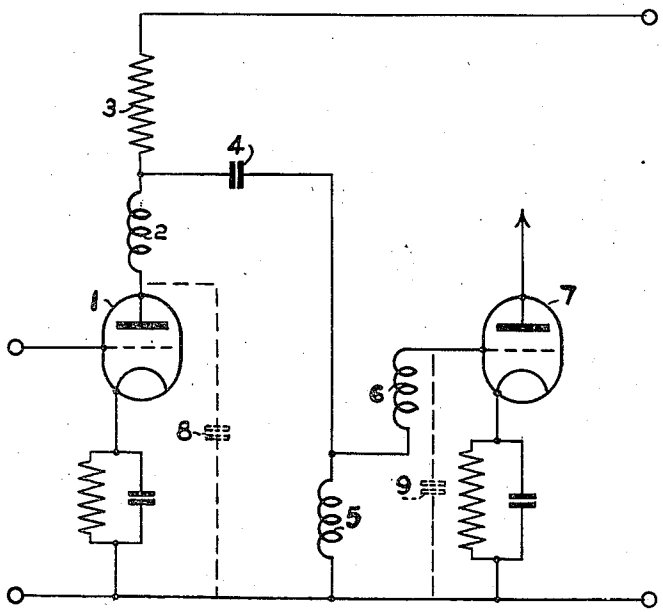
Jan. 28, 1941. C. E. MAITLAND 2,229,812

RADIO RECEIVER

Filed May 18, 1939

Fig. 1.



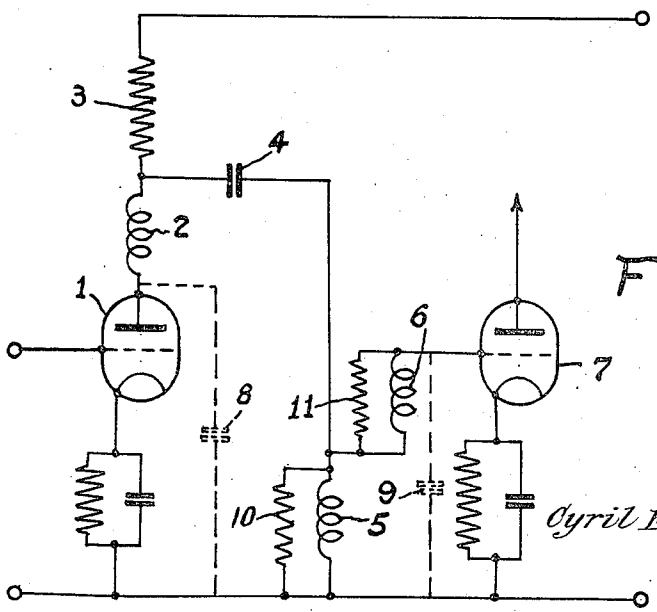


Fig. 2.

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RADIO RECEIVER

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Application May 18, 1939, Serial No. 274,330
In Great Britain June 13, 1938

5 Claims. (Cl. 179—171)

This invention relates to improvements in radio receivers and is especially concerned with an improved method of coupling the output circuit of one valve of a high frequency amplifier to the input circuit of the succeeding valve. In high frequency amplifiers difficulties are experienced when the signal to be amplified is of very high frequency, for example 5 megacycles or higher, due to the unavoidable stray capacities between circuit elements. If two stages of a high frequency amplifier are coupled by mutual inductance between the coils of tuned circuits connected in the output circuit of one valve and the input circuit of the next it is found that when a very high frequency is applied to the amplifier the inductive coupling is interfered with by the capacitative coupling obtained owing to the necessary juxtaposition of the two coils, also such a form of coupling necessitates an undesirable proximity of the two valves if the necessary connecting leads are to be kept short.

The present invention seeks to overcome these disadvantages either wholly or in part by the provision of an improvide form of coupling for high frequency amplifiers for use at very high frequencies.

According to the present invention there is provided a high frequency thermionic valve amplifier circuit comprising a first valve having connected between its anode and a source of high tension potential a tuned circuit in series with a resistance, the junction of the said tuned circuit and resistance being connected through a condenser having a low reactance at the frequency to be amplified and an inductance to earth, the junction of the said condenser and inductance being connected through a further tuned circuit to the grid of a second valve. It will be appreciated that the said inductance forms an impedance common to both the said tuned circuits and thus provides the desired inductive coupling without the disadvantageous stray capacities hereinbefore mentioned.

According to a feature of the present invention at least one of the said tuned circuits comprises an inductance of such value as to be tuned to a desired frequency by the stray capacities associated with the valve and wiring connected thereto.

In order that the present invention may be more particularly described reference is now made to the accompanying diagrammatic drawing Fig. 1 of which illustrates one and Fig. 2 a second embodiment of the present invention.

In Fig. 1 a valve 1 has signals to be amplified applied to its grid. The anode of the valve is connected to an inductance 2 and resistance 3 in series with the positive pole of an appropriate source of high tension potential. The junction of the inductance 2 and resistance 3 is connected through a condenser 4 and inductance 5 in series to earth. The junction of the condenser 4 and inductance 5 is connected through an inductance 6 to the grid of a further valve 7. The inductances 2 and 6 are of such value as to be tuned by the capacities existing between the anode of the valve 1 and earth and the grid of the valve 7 and earth respectively to appropriate frequencies. These capacities are shown dotted at 8 and 9 respectively.

In one particular embodiment of the circuit illustrated the components used were:

Valves 1 and 7	Mullard EE50
Inductance 2	1 microhenry
Inductance 6	1 microhenry
Inductance 5	0.15 microhenry
Condenser 4	0.002 microfarad
Resistance 3	1000 ohms
High tension	300 volts

The values given above are approximate only.

This circuit was employed to receive television signals on a carrier frequency of 45 megacycles.

Any or all of the inductances 2, 5 and 6 may be shunted by a damping resistance in order to increase the width of the pass-band or damping resistances may be connected in series with these inductances. By providing a damping resistance 10 (Fig. 2) across the inductance 5 the magnitude of the lower frequency peak of the band-pass curve of the amplifier is reduced, the higher frequency peak being unaffected. Similarly, by shunting the inductance 6 by a damping resistance 11 (Fig. 2) the higher frequency peak may be reduced in magnitude without alteration of the lower frequency peak. The reason for this is that the addition of a resistance in parallel with inductances 5 or 6 may be considered as introducing a frequency term into the coupling between primary 2 and secondary 6, and since the coupling would thus become a function of frequency, each resistance tends to influence the symmetry of the band-pass curve. Thus by suitable adjustment of damping resistances 10 and 11 across the coils 5 and 6 a substantially uniform response over a wide pass-band may be obtained. To economise in the number of resistances used resistance 3 can be made of such value as to act as decoupling for the anode circuit of valve 1, and damping for coil 5.

I claim:

1. A high frequency thermionic valve amplifier circuit comprising a first and a second valve having anode, cathode and grid electrodes, a source of high tension and a source of earth potential, a tuned circuit in series with a resistance connected between the anode of the first valve and the high tension poptential, a condenser having a low reactance at the frequency to be amplified and an inductance in series between the junction point of said tuned circuit and resistance and earth, and an additional tuned circuit connected between the junction of the said condenser and inductance and the grid of a second valve.

2. A high frequency thermionic valve amplifier circuit according to claim 1 in which at least one of the said tuned circuits comprises an inductance tuned to a desired frequency by the valve and wiring capacities associated therewith.

3. A high frequency thermionic valve amplifier circuit according to claim 1 in which at least one of the said tuned circuits is shunted by a damping resistance.

4. A high frequency thermionic valve amplifier circuit according to claim 1 in which said inductance is shunted by a damping resistance.

5. A high frequency thermionic valve amplifier circuit according to claim 1 in which said inductance and said additional tuned circuit are so proportioned as to produce a band-pass characteristic.

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