

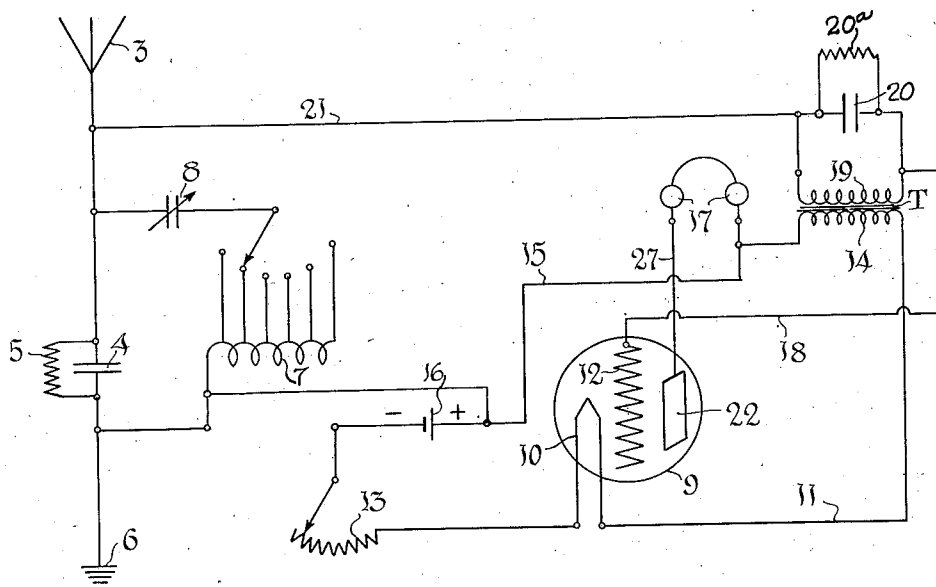
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RADIO RECEIVING SYSTEM

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RADIO RECEIVING SYSTEM

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2 Claims. (Cl. 250—27)

This invention is a radio receiving system of the electron-tube type.

In radio receiving circuits of the prior art, employing electron discharge devices or vacuum tubes, it has almost universally been necessary to make use of a plurality of current sources in order to supply the filaments, plates and grids of the tubes with potential necessary for their operation. These sources have included a filament battery, a plate or "B" battery, and frequently, a grid or "C" battery. Such a multiplicity of sources has rendered the circuits cumbersome and has interfered materially with supplying the elements of the vacuum tubes satisfactorily.

Alternating current sources for supplying the elements of vacuum tubes in such systems require various forms of filters to reduce noise which results from the use of an alternating current source. These filters are quite complicated and expensive, and are subject to breakdown which renders them unsatisfactory.

One of the objects of the invention is to provide a radio receiving apparatus adapted for use with direct current, and so constructed and arranged that a single voltage current source will have direct conductive connections with each of the circuits which respectively include the several elements of an electron discharge device.

An additional purpose of my invention is to produce a circuit in which different standard styles of electron tubes may be employed.

Other objects and purposes of my invention will be apparent from the following specification when read in connection with the accompanying drawing, in which—

The figure is a diagram of one form of radio receiving circuit embodying my invention, and employing a single voltage direct current source.

Referring to the drawing, the reference character 3 designates the usual antenna of a radio receiving circuit connected to ground 6 through a condenser 4 having a resistance 5 shunted around it. Connected in parallel with the resistance and condenser are a tapped tuning coil 7 and a variable condenser 8, either or both of which may be adjusted to tune the aerial circuit to the frequency of incoming signals.

The detecting device here shown is a standard form of three-element vacuum tube 9 containing filament 10, plate 22 and grid 12. The filament circuit of the tube 9 is supplied with direct current from a low voltage direct current source 16. This circuit comprises the positive terminal of battery 16, wire 15, primary 14 of

a radio frequency transformer T, wire 11, filament 10, and filament rheostat 13 back to the negative terminal of the battery 16. The current flowing through the filament 10 may be varied by adjustment of the rheostat 13.

The input or grid-filament circuit includes the aerial circuit, battery 16, filament rheostat 13, filament 10, grid 12, wire 18, secondary 19 of transformer T and wire 21. As here shown, the secondary 19 of transformer T is shunted by a condenser 20 having a resistance 20^a shunted around it. This condenser is preferably of low capacity and improves the sharpness of tuning, its use, however, is not essential and I have found that the operation of the circuit is entirely satisfactory when the secondary 19 is short circuited.

The output or plate-filament circuit includes the positive terminal of battery 16, wire 15, receiver 17, wire 27, plate 22, filament 10 and filament rheostat 13, back to the negative terminal of battery 16.

The drop in potential through the filament 10 is sufficient to establish a difference in potential between the plate and filament. This difference in potential is, however, increased by the drop in potential through the transformer primary 14 which is included in the filament circuit and has substantial resistance.

As before stated, the condenser 20 connected in parallel with the secondary 19 of transformer T is not essential and may be omitted. Likewise, in some instances, the condenser 4 may be omitted without reducing the effectiveness of the circuit.

The use of a metal core transformer, such as the transformer T, in the manner described is unusual in the art, but I have found that it renders my circuit particularly effective. The vacuum tube 9 may be of any standard form, and the circuit is adapted to operate satisfactorily with any of them.

By the terms "direct conductive connection" and "directly connected" used in the specification and claims is meant that the elements of the electron discharge device are so connected with the circuit as to avoid the necessity of separate intervening or inter-positioned voltage control apparatus of any character.

Circuits embodying my invention are applicable to use, not only in receiving circuits as illustrated, but also as amplifiers of general application, and in numerous other relations which will readily suggest themselves to persons skilled in the art.

Although I have herein shown and described only one circuit arrangement embodying my invention, it will be obvious that various changes may be made in the details, within the scope of the claims, without departing from the spirit and scope of my invention.

What is claimed is:

1. A radio receiving set comprising means providing an antenna circuit, an electron discharge device provided with a plate, a grid and a filament, an input circuit therefor, means for connecting the input circuit with the antenna circuit, means providing a single circuit including a directly connected single voltage source together with connections therefrom to the plate, grid and filament of said electron discharge device such as to utilize said single voltage source for complete energization thereof, a metal core transformer, said single circuit being connected in series with the primary of the transformer

and the filament, the secondary of the transformer being connected in series with the input circuit, and means providing an output circuit including connection from said plate to said single circuit.

2. In a radio receiving apparatus, an electron discharge device having a plate, a grid and a filament, means providing a single circuit including a directly connected single voltage source together with connections therefrom to the plate, grid and filament of said electron discharge device such as to utilize said single voltage source for complete energization thereof, an amplifying transformer, the primary of said transformer being connected to said single circuit in series with the filament, and in multiple with the plate to filament circuit, the secondary of said transformer being connected with said grid.

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