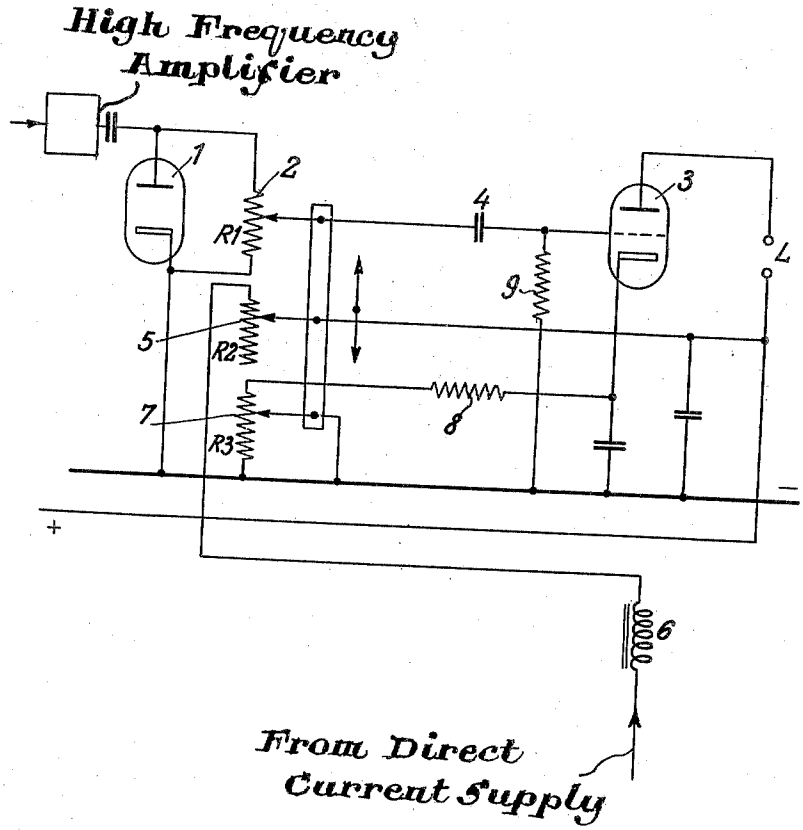
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RADIO RECEIVING DEVICE

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RADIO RECEIVING DEVICE

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3 Claims. (Cl. 179—171)

The present invention relates to radio receiving devices, and more specifically to improvements in or relating to the accommodation of the power consumption to the effective load particularly in broadcast receiving apparatus where the effective load customarily corresponds to the output volume in form of acoustic waves.

It is well known to equip broadcast receiving devices with means for adjusting the output amplitude so as to provide the possibility of adjusting the volume at will. Little attention has heretofore been paid to the possibility to simultaneously decrease the power consumption with volume decrease. In fact, arrangements exist which employ some kind of economizer circuits but such arrangements are not well adapted to satisfy the requirements of modern technics. A further known arrangement selectively connects the loud-speaker either to the last or to the last but one tube so that the energy costs may be reduced by disconnecting the final tube in cases that the incident high frequency energy is of sufficient intensity, for instance on reception from a local transmitter. Apart from the fact that the last but one tube of such arrangements is dimensioned as a high power tube, the arrangement suffers under the disadvantage that a changeover and thus a reduction of the current costs is possible only under such circumstances that the incident high frequency energy is of sufficient intensity.

In contradiction to the above described arrangement the present invention proposes to couple the means which are adapted to change the effective load, that is the volume, with a device which accommodates the current consumption to the effective load when this load is subjected to changes. This device may either influence the anode voltage of the tube or influence the grid biasing voltage so as to change the operating point on the tube characteristic, or even to simultaneously influence the anode potential and the grid potential. Preferably, the final tube is subjected to such influence since the larger percentage of the effective load is drawn by this tube.

The invention will be more readily understood from the following description taken in conjunction with the accompanying drawing, the single figure of which shows a wiring diagram according to the invention. In the drawing there are shown the two last tubes of a broadcast receiving device. 1 denotes a rectifier tube or diode which demodulates the high frequency oscillations received from an antenna or from a preceding high frequency amplifying stage. This rectifier diode operates into a resistance 2 to which the final tube 3 is coupled through a coupling condenser 4. The operating resistance 2 of the diode 1 is variable for the purpose of regulating the volume. The glide contact of this resistance is according to one feature of the invention mechanically coupled with means which are adapted to simultaneously reduce the current consumption of the receiver. These means may as shown in the embodiment according to the drawing comprise two additional variable resistances the glide contacts of which are simultaneously displaced together with the glide contact of the resistance 2. One of the last mentioned resistances is a series resistance 5 through which the anode current from an anode potential source and the choke coil 6 flows and which in response to the desired volume dissipates more or less of the anode potential so as to reduce the overall efficiency of the final tube. A further resistance 7 has for its object to simultaneously enhance the grid biasing voltage when the volume is decreased. A decrease with respect to the volume is in the present embodiment identical with downward displacement of the glide contacts. The resistance 7 together with the fixed resistance 8 serve as cathode resistance through which the direct anode current flows and at which a potential drop is set up in the known manner for obtaining the grid biasing potential which is applied to the grid of the final tube over the high ohmic grid resistance 9.

The invention is by no means limited to the embodiment heretofore described and illustrated. In many cases it might be sufficient to apply one of the above described possibilities, that is, to regulate either the anode voltage or the grid biasing voltage.

It will be noted that the additional arrangement for reducing the current consumption as described in connection with the embodiment does not directly effect volume decrease. It may, for instance, be assumed that the resistance R1 is regulated from its position corresponding to a large volume to a position which corresponds to a low volume and that the two other resistances remain unchanged. When said last-mentioned resistances are then adjusted in the same sense onto a given point, the volume will not decrease and no distortion will be introduced but merely a decrease of the current consumption is obtained.

It has already been pointed out that the present invention is not limited to broadcast receiving devices. The invention is also applicable

to television systems in which the effective power occurs in the nature of an optical effect, or in connection with printing telegraph or similar telegraph systems in which the effective power performs a mechanical action.

What is claimed is:

1. A circuit for reducing the current consumption of volume control amplifiers such as radio broadcast receivers upon adjustment for decreasing the useful output, comprising a final voltage amplifier stage having a grid and plate, control means for adjusting the useful output of said stage, and a device mechanically coupled to said control means for concurrently regulating the grid bias and plate potentials of said stage with said control means to correspondingly control the current consumed by the amplifier.

2. A circuit according to claim 1 in which said device comprises an adjustable resistance in the anode circuit of the final amplifier stage.

3. A circuit in accordance with claim 1 in which said device comprises an adjustable cathode resistance through which the anode current flows and to which the grid is connected, whereby the grid biasing potential is increased as the output volume of said system is decreased.

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