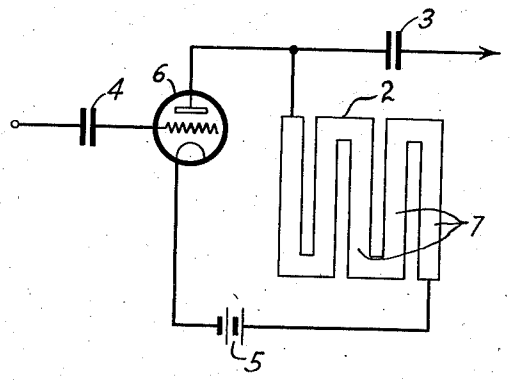
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RESISTANCE-COUPLED AMPLIFIER

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RESISTANCE-COUPLED AMPLIFIER

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1 Claim. (Cl. 179—171)

The amplification or gain of a resistance-coupled amplifier declines with increasing frequencies for the reason that the resultant plate-filament capacitance grows in importance in comparison with the ohmic plate resistance, and because a countercoupling (or degeneration) occurs at high frequencies by way of the grid-plate capacitance whereby the gain is diminished. In order that a uniform and smooth frequency curve may be insured, the internal tube resistance, according to prior practice, has been chosen low in contrast with the external A. C. resistance, or else the ohmic plate resistance has been chosen low compared with the capacitive reactance, or else both the said features were practiced simultaneously. However, these steps are unable to obviate the counter-coupling or degeneration effect.

It is also known in the art to connect an inductance in series with the ohmic resistance in order to raise the amplification of the high frequencies.

Now, according to this invention a simpler method is suggested which, in addition, offers a number of other advantages. The invention consists in that a resistance-coupled amplifier, the ohmic external resistance, with a view to insuring a uniform amplification throughout a wide frequency band, is so dimensioned that any drop in the frequency curve at the higher frequencies is compensated by an increase of resistance as a result of skin effect.

In resistance-coupled amplifiers known in the prior art, a skin effect has never been noticed because it is general practice to make the resistors in the form of an insulation rod bearing a tenuous film of carbon or to make the same entirely of carbonaceous material possessing low conducting powers, and since the film in these instances is very thin. Moreover, the skin effect arises only at such high frequencies as normally will not arise in such resistance-coupled amplifiers.

In the case of resistance-coupled amplifiers of the kind used, for example, for modulation in television apparatus it is possible because of the large powers to employ metallic conductors, and in this case skin effects may be expected to arise. The power of these amplifiers, as will be understood, must be very high on the ground that in the case of ultra-short-wave transmitters it is necessary to modulate almost at the very end of the transmitter as otherwise, that is to say, if modulation were effected in a stage further below, there would occur undesirable trimming of the side-bands by the oscillatory circuits.

In one exemplified embodiment of the invention, tape material is used of such a thickness that up to a frequency at which an appreciable drop of the frequency curve occurs, the entire cross-section will be traversed by current, while for higher frequencies a reduction in the active cross-section occurs as a result of skin effect.

For a better understanding of the invention, reference is made to the accompanying drawing.

As shown the resistance **2** is connected in series with the potential source **5** in the plate circuit of the electron discharge tube **6**, the amplified currents being transmitted through the condenser **3** to any preferred output device. The currents of the band of frequencies to be amplified are applied to the control grid in any preferred manner as through the condenser **4**.

The resistance could be made meander-shaped or of zigzag-form as shown in the figure. Current displacement will then be a function also of mutual magnetic actions of the parallel conductor sections **7**.

The advantage of the arrangement as here disclosed resides in that no distinct inductance is required, and that troublesome resonance effects are obviated. Moreover, the point where an increase in resistance is initiated can be accurately fixed.

Having described my invention, what I claim as novel and desire to secure by Letters Patent is:

Means for uniformly amplifying currents of a wide band of frequencies comprising the combination of a vacuum tube having a cathode, a control grid and a plate, means for impressing the currents to be amplified on said control grid, and an output circuit connecting said cathode and plate and including the series connection of a resistor and a source of positive potential, said resistor comprising a plurality of sections arranged parallel to one another and inductively coupled, adjacent ones of said sections being so connected together that the direct current therethrough flows in opposite directions and said resistor having a thickness such that up to a frequency at which an appreciable drop of the frequency response curve occurs the entire cross-section of the resistor is traversed by current, while for higher frequencies a reduction in the active cross-section occurs as a result of skin effect.

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