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M. OSNOS

2,034,769

FADING ELIMINATION

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Fig. 1

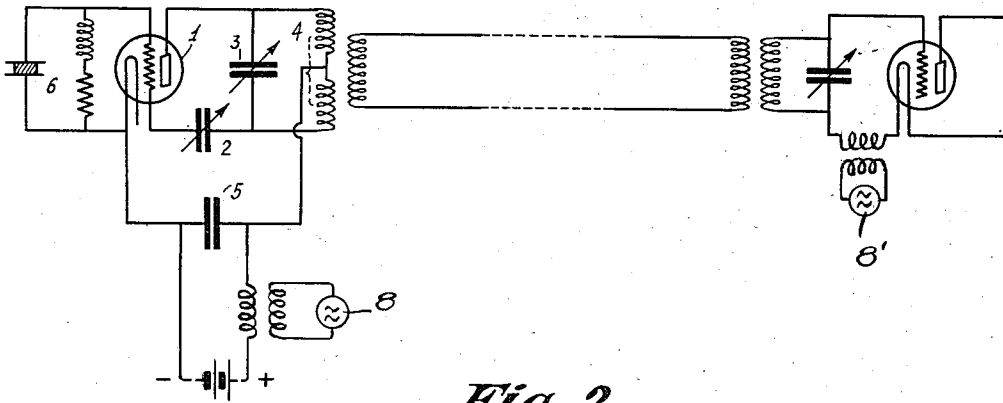
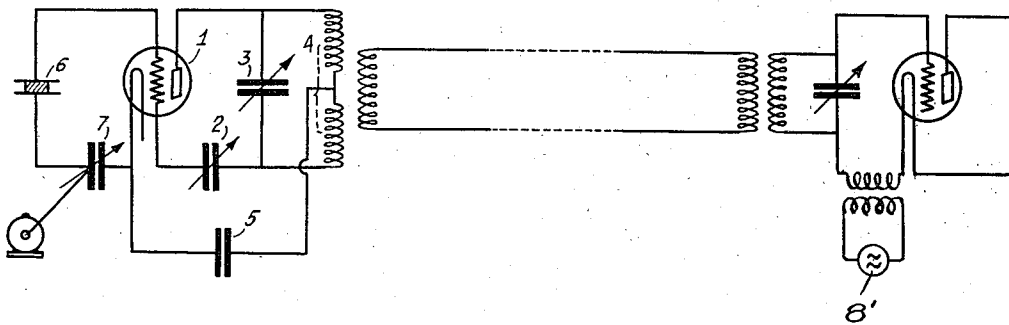


Fig. 2



INVENTOR
MENDEL OSNOS

BY

W. S. Snow
ATTORNEY

UNITED STATES PATENT OFFICE

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FADING ELIMINATION

Mendel Osnos, Berlin, Germany, assignor to Telefunken Gesellschaft für Drahtlose Telegraphie m. b. H., Berlin, Germany, a corporation of Germany

Application July 28, 1930, Serial No. 471,116
In Germany August 13, 1929

2 Claims. (Cl. 250—17)

This invention relates to methods and means for reducing fading in radio telegraphy or picture transmission on short waves and is a continuation of my copending application Serial Number 470,554 filed July 25, 1930.

In my copending application I have shown that fading may be combated by the simultaneous emission of two or more carrier waves. This may be attained by superposing on or modulating the direct current plate potential of one stage of the transmitter by alternating current potential. I have also shown that the multi-wave condition may similarly be produced by modulation of the grid circuit.

I have found by experiment the following combinations prove to be very advantageous for the reduction of fading, to wit:

1. Potential modulation in the crystal stage combined with grid potential modulation in another stage of the transmitter, say, in the stage preceding the last.

2. Wobbling in the quartz crystal stage combined with grid potential modulation in another stage, say, in the stage preceding the last.

The latter combination method has proved particularly useful for picture telegraphy work.

In either instance, grid potential modulation can be effected by the well-known method comprising the use of a rotating perforated disk of the kind usually employed in picture transmission work.

Grid potential modulation, however, can be insured also in some other manner, say, by paralleling a periodically variable impedance or reactance most preferably a capacity in relation to the grid of a tube of the transmitter whereby the grid is periodically short-circuited wholly or partly.

Anode potential modulation combined with grid potential modulation is illustrated in Figure 1, and crystal wobbling combined with grid potential modulation is shown in Figure 2.

In Figure 1 a. c. sources 8 and 8' produce the desired potential variations. In Figure 2 periodically variable capacity 7 and alternating current

source 8' produce, respectively, crystal frequency wobble and grid modulation.

Referring to the drawing more in detail, oscillator circuits are provided with crystals 6, tuning circuits 3, 4, neutralizing condensers 2 and blocking condensers 5. In Figure 1 plate potential modulation is accomplished by alternating current source 8, and in Figure 2 rhythmic variation of the condenser 7 causes frequency wobble.

I claim:

1. In combination, a multi-electrode device having an anode, a cathode, and a grid, the series combination of a reactance and a piezo-electric crystal connected between said grid and cathode, means for continuously varying the effective value of said reactance, and an output circuit connected between said anode and cathode, another multi-electrode device having grid, cathode and anode electrodes, said output circuit being inductively coupled to said grid and cathode of said last device, and means effectively connected between said last grid and cathode electrodes for modulating the oscillations in accordance with signal variations.

2. Signal transmitting means comprising a thermionic oscillation generator tube having anode, cathode and control electrodes, an oscillation circuit connected between the anode and cathode of said tube, a frequency determining circuit including a piezo-electric crystal in series with an impedance connected between the grid and cathode of said tube to determine the frequency of the oscillations produced in said oscillation circuit, means for applying varying potentials to the grid of said tube, means for continuously varying said impedance whereby said generated oscillations are wobbled, another multi-electrode device having grid, cathode, and anode electrodes, said oscillation circuit being inductively coupled to said grid and cathode of said last device, and means effectively connected between said last grid and cathode electrodes for modulating the oscillations in accordance with signal variations.

MENDEL OSNOS.