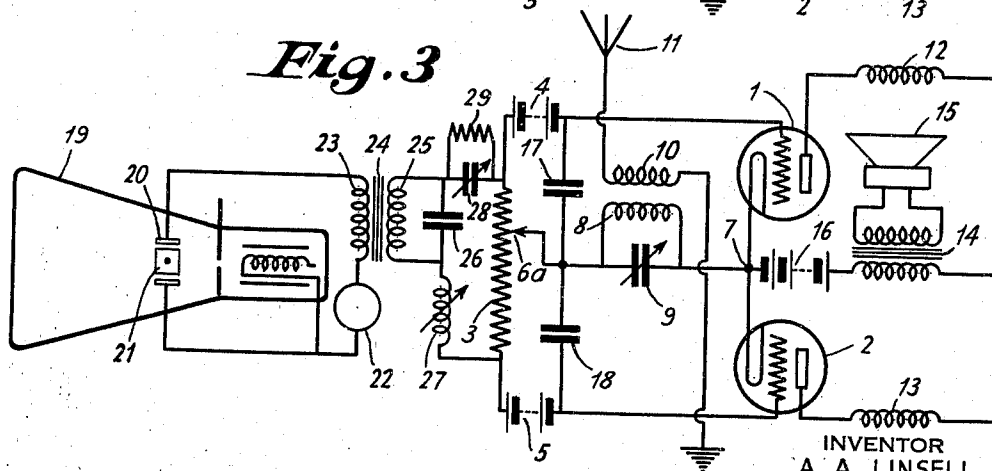
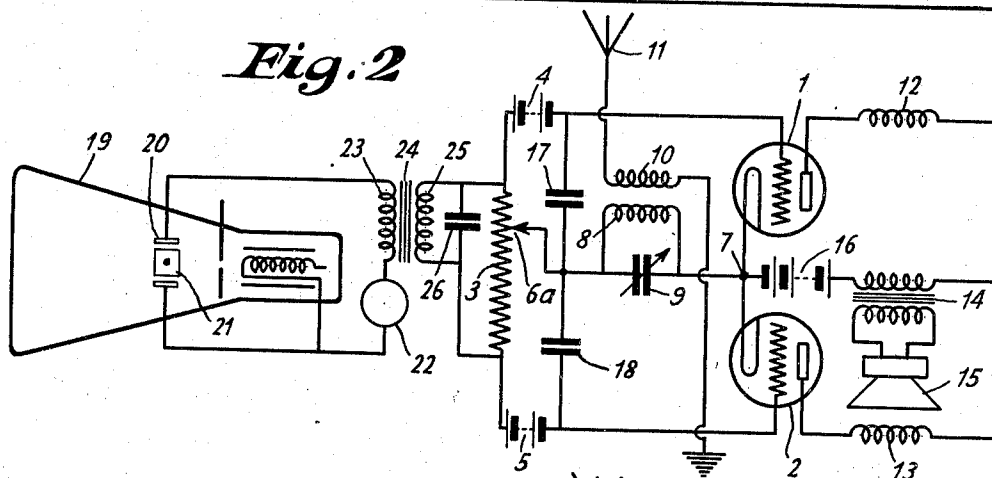
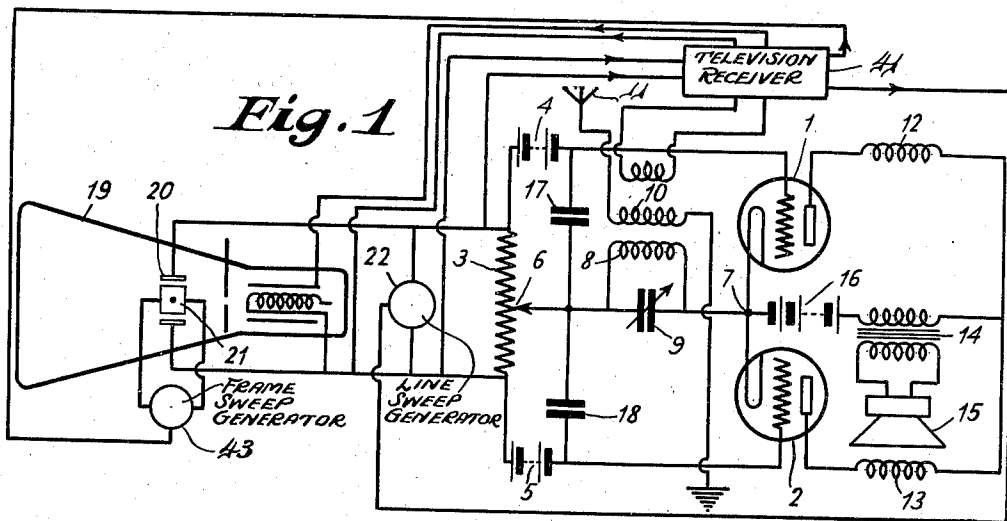


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TELEVISION SYSTEM

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## TELEVISION SYSTEM

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7 Claims. (Cl. 178—5.8)

This invention relates to television and cinematograph receivers and more particularly to such receivers of the kind adapted to reproduce pictures from signals which are transmitted as modulations of a carrier wave.

According to this invention, reception of sound or sound and television signal modulated carrier wave energy is effected at a television receiving installation by means of a receiver of the super-regenerative type, and the said invention is characterized in that the quenching frequency necessary for super-regenerative action is obtained from television scanning means necessarily provided in connection with television picture reproduction.

The invention is illustrated in the accompanying drawing, in which

Fig. 1 shows one form of my invention;

Fig. 2 shows a modification of the embodiment of the invention shown in Fig. 1, and

Fig. 3 shows a further modification of the embodiment of the invention shown in Fig. 1.

Figure 1 shows one way of carrying out this invention as applied to an installation for receiving television signals and accompanying sound signals and incorporating a television reproducer of the cathode ray tube type and a sound signal receiving super-regenerative receiver operating in accordance with the invention described in the U. S. Patent No. 1,982,694, issued December 4, 1934 to W. V. B. Roberts. Referring to Figure 1, the super-regenerative receiver comprises two valves 1, 2, whose grids are connected together through a resistance 3 (hereinafter for the sake of convenience in terminology termed the grid resistance, the ends of the resistance 3 being connected to the grids of the valves 1, 2 through suitable bias potential sources 4, 5, as shown.

A fixed centre tapping 6 upon the resistance 3 is connected to the common cathode point 7 of the two valves through a parallel tuned input circuit 8, 9 the coil 8 in which is inductively coupled to a coil 10 in a receiving aerial circuit. The aerial is shown at 11. The anodes of the two valves are connected together through two anode coils 12, 13, the junction point between which is connected through a suitable output device (e. g. the primary of a transformer 14 which feeds a loudspeaker 15) in series with a source 16 of anode potential to the common cathode point 7. The two anode coils 12, 13, are coupled to the coil 8 in such a way that the coupling of one anode coil to the said tuned circuit causes reaction in a regenerative sense while the coupling of the other anode coil to the said tuned input circuit causes reaction in a degenerative sense. The grid cathode spaces of the valve 1, 2, are shunted by suitable high frequency by-pass condensers 17, 18.

The cathode ray tube reproducer 19 of the installation may be of any known kind and scan-

ning action in this reproducer is effected as known per se by applying suitable sawtooth wave potentials to the usual mutually perpendicular pairs 20, 21, of electrostatic deflecting plates or coils (plates are shown), these potentials being derived from sawtooth wave generators which are synchronized with incoming signals as known per se. For the sake of simplicity in the drawing, applicant has merely represented in block diagram form the line and frame sweep generators 22 and 43 respectively. The television receiver 41 is likewise shown only in simple block diagram form with the synchronizing signal's path indicated by the lines drawn from the receiver 41 to the line and frame sweep generators.

The saw-tooth wave generator 22 which operates at the scanning line frequency and which applies an output to one pair of electrostatic deflecting plates or coils (as shown the plates 20) of the tube is also connected across the resistance 3 so that the generator serves the dual purpose of providing the quenching frequency and deflecting the ray in the tube. The arrangement is such that the quenching will take place during "return" or "fly-back" periods of the cathode ray, i. e. when the deflecting potential is at or near the maximum. Accordingly, the reproduced picture will not be adversely affected by the quenching action.

It is understood, of course, that a second receiver for the television signals, identical with that shown for the sound channel, may be coupled to the coil 10, and the resistor 3, and whose output transformer 14 would connect to the control electrode and cathode of the cathode ray tube to control the intensity of the cathode ray beam impinging on the fluorescent screen of the cathode ray tube. For simplicity and to prevent confusion, the individual elements of this receiver are not shown, since it is at once obvious that the operation of the receivers are identical.

Figure 2 shows a modification in which a harmonic of the line frequency is used for quenching purposes. Here the generator 22, instead of being connected directly across the resistance 3 is connected in series with the primary 23 of a loose coupling transformer 24 whose secondary 25 is tuned by means of a suitable shunt condenser 26 to a desired harmonic of the scanning line frequency, the tuned circuit 25, 26, being connected across the grid resistance 3. Since the generator 22 provides a saw-tooth wave its output will be rich in harmonics.

If desired and as shown in Figure 2, the fixed centre tapping 6 upon the grid resistance 3 may be replaced by an adjustable tapping 6a and, in this case, by moving this adjustable tapping 6a the relative time durations of regeneration and quenching may be varied as desired. Again, if desired, an adjustable impedance constituted by

an adjustable choke 27 or an adjustable condenser 28 shunted by a resisting 29 may be interposed in series between one end of the tuned secondary 25 and the adjacent end of the grid resistance 3.

In the modification shown in Figure 3, both these expedients are adopted, a choke 27 being in one lead and a resistance-capacity combination 28, 29, in the other. By adjusting the adjustable impedance (or impedances) the time of the quenching relative to the instantaneous position of the scanning ray in the cathode ray tube reproducer may be adjusted, i. e. may be advanced or retarded. Further, if desired, the ends of the tuned secondary of the transformer may be connected to the ends of the grid resistance through a frequency multiplier circuit instead of directly; in other words, the selected harmonic of the saw-tooth wave output from the saw tooth wave-generator may be frequency multiplied and the resultant higher frequency wave used as the quenching frequency for super-regenerative action.

It will be noted that the present invention enables the normally provided separate quenching frequency oscillator of a super-regenerative receiver to be dispensed with, the function thereof being performed according to the said invention by apparatus which is provided in any event in a television receiving installation for obtaining television scanning action. Furthermore, in carrying out the said invention the quenching frequency is caused to bear a fixed predetermined relationship to the scanning frequency and this is likely to result in improved reproduction so far as "background" or "grain" of the reproduced pictures is concerned.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, what I claim is:

1. The method of improving electro-optical reproductions which comprises the steps of generating an electron ray, directing the electron ray toward a viewing plane, receiving electrical energy representative of an electro-optical image to be reproduced, generating locally oscillatory wave energy, detecting the received electrical energy under the control of the locally generated energy, controlling the intensity of the electron ray in accordance with the detected energy, and controlling the position of the electron ray upon the viewing plane in accordance with the locally generated energy.

2. The method of improving sound reproductions accompanying electro-optical reproductions, which includes the steps of receiving electrical energy representative of the sound to be reproduced, receiving electrical energy representative of an electro-optical image to be reproduced, generating locally oscillatory wave energy, simultaneously controlling the position of the electro-optical reproduction and detecting the received energies under the control of the locally generated energy, and reproducing the sound accompanying the electro-optical reproductions in accordance with the detected energy.

3. The method of improving the reception of electro-optical reproductions accompanied by sound, which comprises the steps of generating an electron ray, directing the electron ray toward

a viewing plane, simultaneously receiving electrical energies representative of the light intensity of the elemental areas of the picture to be reproduced and representative of the sound to be reproduced, generating locally oscillatory wave energy, separately detecting the received electrical energies under the control of the locally generated energy, controlling the intensity of the electron ray in accordance with the detected energy representative of the light intensities to be reproduced, controlling the position of the electron ray upon the viewing plane in accordance with the locally generated energy, and controlling the generation of sound in accordance with the detected energy representative of the sound to be reproduced.

4. A television system comprising a cathode ray tube for reproducing pictures upon a fluorescent screen contained within the tube, means for receiving electrical energy representative of the light intensity of the elemental areas of the picture to be reproduced, means for generating locally oscillatory wave energy, means for detecting the received electrical energy under the control of the locally generated energy, means for controlling the intensity of the electron ray in accordance with the detected energy, and means for positioning the point of electron ray impingement upon the fluorescent screen in accordance with the locally generated energy.

5. A television system which comprises means for generating and directing an electron ray toward a viewing plane, means for receiving electrical energies representative of light intensity of elemental areas of a picture to be reproduced and representative of sound to be reproduced, means for generating locally oscillatory wave energy, means for separately detecting both of the received electrical energies under the control of the locally generated energy, means to control the intensity of the electron ray in accordance with the detected energy representative of the light intensity to be reproduced, means to control the position of the electron ray upon the viewing plane in accordance with the locally generated energy, and means for energizing a sound generator in accordance with the detected energy representative of the sound to be reproduced.

6. A sound accompanying system for use in connection with television comprising a television receiver, a super-regenerative sound receiver, and means for positioning a picture upon a viewing screen, said positioning means comprising locally generated saw-tooth wave energy, and means to energize the sound receiver by the locally generated saw-tooth wave energy.

7. A sound receiver to accompany a television receiver, comprising means for receiving electrical energy representative of the sound to be reproduced, receiving electrical energy representative of an electro-optical image to be reproduced, means for generating locally oscillatory wave energy, means for simultaneously controlling the position of the electro-optical reproduction and detection of the received energies in accordance with the locally generated energy, and means for energizing the sound reproducer in accordance with the detected energy representative of the sound to be reproduced.

ALFRED AUBYN LINSSELL.