Nov. 22, 1938. K. SCHLESINGER 2,137,354

RECEIVING CONNECTION SYSTEM FOR TELEVISION RECEIVERS

Filed April 15, 1935

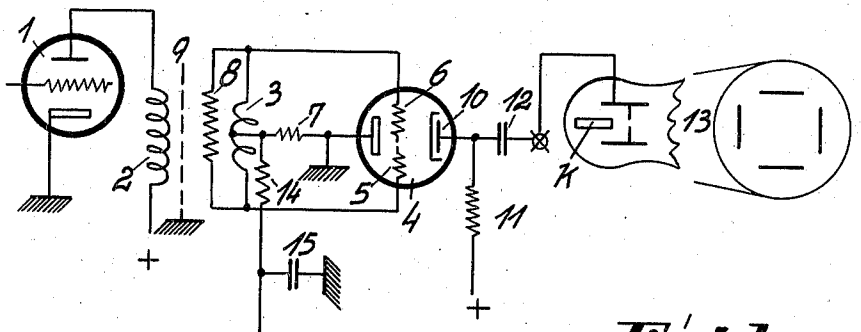


Fig. 1

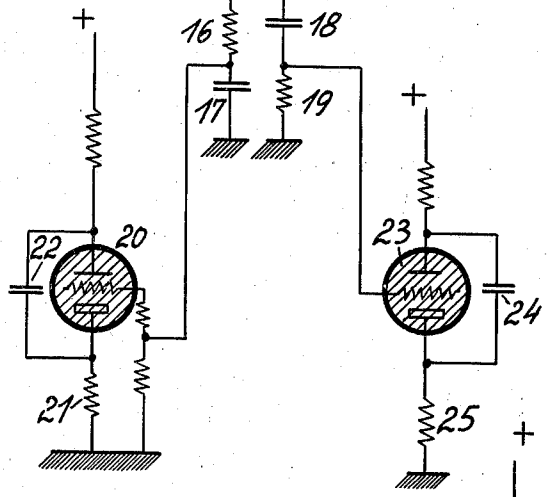


Fig. 2

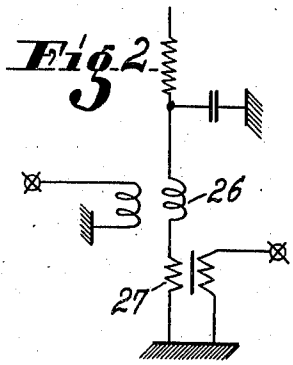
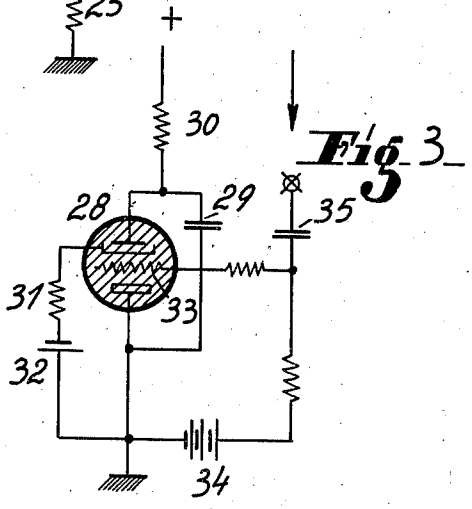


Fig. 3



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RECEIVING CONNECTION SYSTEM FOR TELEVISON RECEIVERS

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In Germany April 20, 1934

4 Claims. (Cl. 178—7.5)

In the patent application Ser. No. 717,310 there are described detecting arrangement for television reception, which is distinguished by particular lack of sluggishness in the rectification and by compensation of the intermediate frequency carrier wave simultaneously with the rectification.

The subject matter of the present invention is an arrangement which permits of utilization of this connection system for obtaining simultaneously the synchronization signals from the detecting circuits.

The essence of the invention is described in conjunction with the arrangements illustrated by way of example in the accompanying drawing, in which Fig. 1 illustrates the system and Figs. 2 and 3 particular parts thereof.

In the same 1 is the final intermediate frequency amplifying tube of a television superhet. The same acts on an intermediate frequency output transformer with the coils 2 and 3. These coils—as already set forth, the American patent specification Ser. No. 749,511—are preferably so timed that the natural oscillation of 2 is lower and that of 3 higher than the extreme side frequencies of the transmission. The latter coil acts in push-pull connection on the twin grids 4, 6 of the detector tube 4. The secondary coil 3, which is designed to be extremely poor in capacity, is earthed not in direct fashion, but at the centre through the medium of a high ohmic resistance 7. Its damping may be adjusted by means of a parallel resistance 8. The exact counter-phase may conveniently be ensured by an earthed intermediate screen 9. In this manner it is accomplished that no further intermediate frequency but merely the demodulated low frequency occurs at the anode 10 of the tube. The image current may accordingly be tapped at an anode resistance 11, and passed through the medium of a blocking condenser 12 to the control grid of a Braun tube 13. The synchronization signals are obtained according to the invention as follows:

The television transmitter is assumed to be one in which the carrier wave disappears completely only for the duration of the synchronization impulses. The anode 10 is accordingly strongly charged negatively during the synchronization impulses. Negative signals of this kind cannot be employed in direct fashion for controlling the relaxation oscillator controlling the scanning. The problem of reversing the phase accordingly arises.

According to the patent application Ser. No. 717,310, this problem is solved by the use of transformers. The solution to the second part of the problem, viz., the separation of the signals from the image current by an amplitude filter, is provided in accordance with the patent application Ser. No. 717,310 by a special glow lamp with hot cathode.

According to the invention, these two problems are solved in a simple way by deriving the synchronization currents not from the anode circuit of the detector 4, but from the grid circuit thereof.

For this purpose a tapping is applied to the middle point of the coil 3. This point is devoid of high-frequency potentials against earth and carries the pure modulating potentials in opposite phase to the anode circuit. The synchronization signals accordingly consists at this point of positive impulses.

This point may accordingly be connected in direct fashion to the filter circuit of the relaxation apparatus via a series resistance 14, which has to be somewhat larger than the resistance 7.

By means of a small blocking condenser 15, which is earthed, it is possible to leak-off any traces of carrier high frequency. The filter circuits separating the long frame impulses from the short line impulses consist of a low pass resistance-capacity filter 16, 17 conducting to the input of the frame synchronizing relaxation tube 20 and a high-pass capacity-resistance filter 18, 19 conducting to the input of the line synchronizing relaxation tube 23.

The gas-filled relaxation tubes 20 and 23 are negatively biassed by resistances 21 respectively 25. The bias preferably amounts to a few volts. A control of this relaxation apparatus, therefore, only takes place when a certain minimum potential of a few tenths of a volt has been exceeded, and then only when the relaxation condenser 22 has already been charged nearly up to the ignition potential. This means that the frequency of the free relaxation oscillation must preferably be selected to be approximately equal to the scanning frequency, and that the smaller the potentials which are sufficient for the control the more exact this agreement between the frequencies will be required to be.

The tubes 20 and 23 accordingly attend automatically to the requisite amplitude selection between synchronization signals and image current impulses.

In order to improve the amplitude selection it is advisable to replace the tubes 20 and 23 of Fig. 1 by screen grid tubes, preferably as shown in Fig. 3. Discharge in screen grid tubes of the gas-filled type is entirely dependent on the potential of the

control-grid, and therefore on the synchronizing impulse potential, whereas upon the using gas-filled triodes premature discharge may occur under control of the local oscillation. The relaxation condenser **29**, shunting cathode and anode is in the manner known per se charged through the medium of a resistance **30**. The screening grid is connected through the medium of a series resistance **31** with a battery **32**, the potential of which is so adjusted that a desired negative bias **34** may be applied to the control grid **33** to which through the medium of the condenser **35** the impulse signals are supplied. The advantage of a screening-grid tube of this nature is characterized by the fact that the ignition no longer depends on the instantaneous value of the anode potential, but merely on that of the screening-grid and the inner grid. The former remains constant and the latter is more or less positively controlled. The biasses of both grids are so adjusted that solely the positive peak values which are supplied by the synchronization signals are capable of initiating a discharge. This immediately jumps over through the screening grid to the anode, and leads to the desired discharge of the relaxation condenser **29**. If this control should occur too late, **29** is nevertheless unable to discharge until the inner grid **33** releases the ignition, and the discharge then takes place with increased intensity of current. The screening-grid tube accordingly has the advantageous property of being positively dependent on the synchronization signals even in the case of appreciable detuning between the free oscillation and the desired frequency, whilst the single-grid tube according to Fig. 1 discharges prematurely, when the synchronization signals fail to occur.

I claim:

1. In a television receiver for receiving a mixture of image signals and negative synchonization impulses modulated onto the same carrier wave including a push-pull detector tube having input and output for demodulating said carrier wave a picture reproducing device connected to the output of said detector and relaxation oscillators for line and frame synchronization, said input consisting of a selfinduction coil connected to the grids of said detector tube, the middle point of said coil being connected by an impedance to the cathode of said tube and by filtering means to the input of the relaxation oscillators.

2. In a television receiver according to claim 1, said impedance consisting of an ohmic resistance.

3. In a television receiver according to claim 1, said filtering means consisting of a resistance-capacity and a capacity-resistance member, the mean point of each member being connected to one of said relaxation oscillators.

4. In a television receiver according to claim 1, each of said relaxation oscillators being provided with a gas-filled screening grid discharge tube.

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