

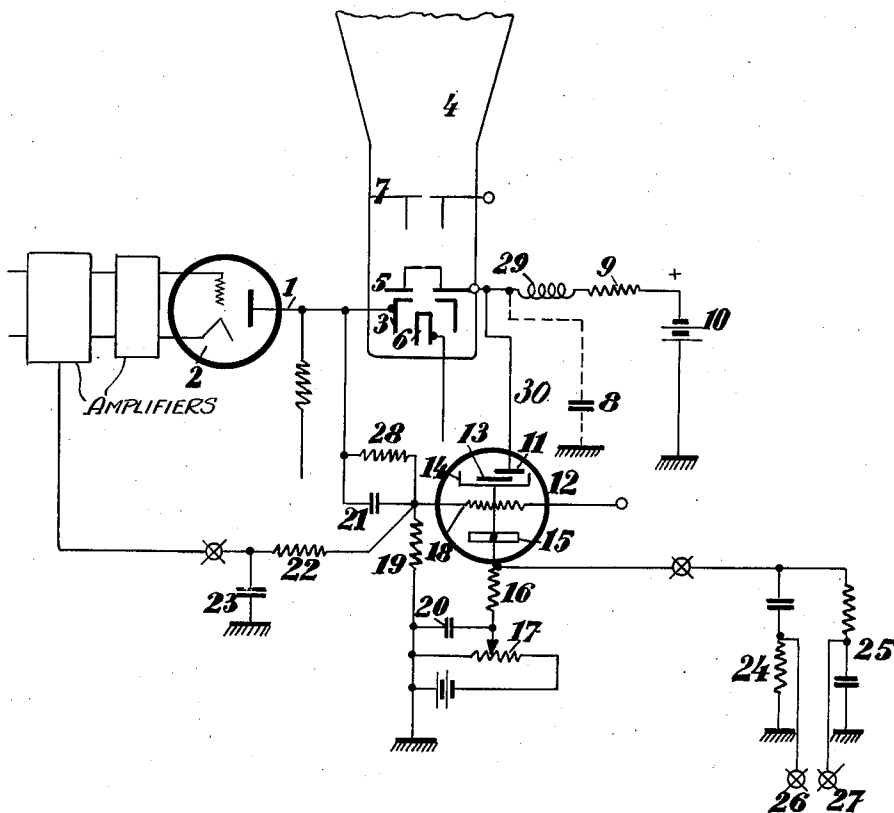
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TELEVISION RECEIVING CONNECTION SYSTEM

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TELEVISION RECEIVING CONNECTION
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mesne assignments, to Loewe Radio, Inc., a cor-
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3 Claims. (Cl. 178—7.5)

Recently transmission methods have been de-
vised, particularly by the applicant, in which the
synchronisation takes place by means of impulses
which raise the aerial current in the transmitter
to a maximum. If the transmitter is so modu-
lated that white points of the image represent
strong currents and black points small serial
currents, the reception from a transmitter syn-
chronised in this fashion reveals particularly
light stripes along the edges of the image. This
is not permissible in practice, as the return lines
caused by the white stripes are also brightened,
and there is produced in the image a light back-
ground, which interferes considerably with the
effect of the image, particularly at dark points of
the image. Since the system of "white signals"
possesses certain technical advantages in lack of
interference, adjustment and operation of the
transmitter and also in the generation of the
signals by optical means, it is important to find
circuits which permit of reception from these
white-synchronised transmitters without the dis-
turb- ing return-line effects.

The accompanying drawing shows a single-
valve circuit according to the invention, which
incorporates the following technical advantages:

1. Darkening of the white return lines.
2. Separation of the synchronisation impulses
from the contents of the image (by amplitude
separation).
3. The production of a negative bias dependent
on the strength of reception and capable of being
used for automatic regulation of the amplifica-
tion.

4. Fundamental preclusion of false actuation
of the relaxation apparatus even in the case of
excessive intensity in the reception.

In the single figure, 1 is the lead proceeding
from the anode of the final receiving rectifier 2,
the construction of which is not of interest for
the present purpose; this lead is connected di-
rectly to the first control grid 3 of the cathode
ray tube 4. This line supplies positive potential
values to the grid if white points should occur in
the image. According to the invention, the tele-
vision tube 4 is furnished with a second control
grid 5, which has the specific object of blocking
the ray during the return lines, but which, how-
ever, except in the relaxation moments, should
not participate in the control of the ray. The
grid 5 may at the same time assume an electron-
optical function. For example it may, as a "con-
denser", perform the task of reproducing sharply
on the aperture of the diaphragm 7 the stream
of electrons proceeding from the cathode 6. In

the case of present-day television tubes with ex-
treme light intensity, a condenser of this kind
is necessary in any case, and the inclusion of the
electrode 5 does not, therefore, represent any
particular complication. According to the in-
vention, the electrode 5 is connected, whilst
avoiding in every possible way all detrimental
earth capacities 8, i. e., making use of leads as
short as possible, through the medium of a series
resistance 9 of 10^5 ohms with a positive bias 10.
A connecting lead, which should also be very
short, leads to the anode 11 of the filter valve 12,
according to the invention, which anode is led
out preferably at the top. This valve is pref-
erably furnished with an intercepting grid 13
and screening grid 14, and agrees fully otherwise
in construction with the pentodes employed
in the present-day radio art with good mutual
conductance ($g_m \geq 3$ mA per volt) and indi-
rectly heated cathode 15. The cathode is con-
nected through the medium of a resistance 16
of approximately 500 ohms with a positive poten-
tial with respect to earth adjustable at the poten-
tiometer 17, whilst the control grid 18 is con-
nected to earth through the medium of the high
ohmic resistance 19 of approximately 2-3 meg-
ohms. The wiping contact of the potentiometer
17 is earthed dynamically through the condenser
20 of 0.01 mf. The control grid 18 of the filter
valve 12 is connected with the image current lead
1 through the medium of the blocking condenser
21 of 0.01 mf. There then occurs the following:
So long as the positive potential peaks occurring
at the grid 18 are not equal to, or greater than,
the bias of the cathode 15 adjusted at 17 no
current of any kind is able to flow through the
valve 12. If, however, sufficiently strong poten-
tial peaks occur, a powerful grid current passes
to 18. The grid current ensures that the bias of
18 in the limiting case becomes exactly to the
same extent negative as the cathode 15 is positive
at the highest peak amplitude, so that in the
limiting case no more current passes to 18 than
is employed for supplementing the portions of the
charge which have leaked off through 19 during
the signal intervals. With the stated dimensions
of 21 and 19 only the extreme potential peaks
will, therefore, be able to liberate electrons from
the cathode 15. The bias of 18 may be utilised
through the medium of a filter chain 22, 23 (0.1
megohm, 1 mf.) for biasing the regulating grids,
in accordance with the invention the intercept-
ing grid, of the pentodes employed in the re-
ceiving amplifier. In this manner there is ob-

tained an effective regulation of the receiving potential supplied to the television tube.

The extreme potential peaks produce in the cathode resistance 16 of approximately 500 ohms small positive potential impulses. These may be divided in simple fashion by means of a CR or RC filter 24 or 25 into short and long signals, and these may be supplied separately at the terminals 26 to the line relaxation apparatus and to the terminal 27 of the image relaxation apparatus.

A false actuation of the relaxation apparatus in the case of very big signals is rendered impossible by the utilisation, in accordance with the invention, of the grid D. C. potential effect, which ensures that only the extreme peaks of the signals, i. e., only a definite proportion of the total amplitude, is capable of producing a cathodic current. A state of constancy of the intensity of the synchronisation signals is effectively assisted by the fading compensation effect, according to the invention, via the circuit 22—23.

The blocking of the ray results from utilisation of the anode circuit 11. This circuit is obviously traversed by amplified impulses which have become negative. According to the invention, the connection between the anode 11 and the electrode 5 is made so poor in capacity that the tube 12 has a good high frequency amplification. The amplification, in accordance with the invention, is made at least of such extent as prescribed by the reciprocal of the control sensitivity of the blocking electrode 5 compared with that of the main control grid 3 in the tube 4. This degree of amplification cannot be accomplished solely by making the lead 39 and the resistance 9 low in capacity, but also involves the selection of the valve 12 with particularly great mutual conductance and possibly resonance chokes 29. Whereas the quenching of the long image change signals causes no difficulties at all in practice, this is not quite so simple in the case of the short line impulses. The circuit 39 requires to possess an amplification only in respect to these two periods. It is, therefore, also possible to employ two series-connected resonant step-up transformers, the secondary sides of which are connected to the electrode 5 (maintained in accordance with the invention without current), and the natural frequencies of which coincide with the two basic periods of line impulse and image change impulse. For this purpose transformers are suitable having small iron cores, which the applicant has already described and used previously in synchronisation connections.

According to the invention, the strength of the impulse reaching the blocking electrode 5 is adjusted by the screening grid 13 independently of the adjustments of the grid circuit 15, 18. It is, therefore, possible to adjust the responding potential for the filter independently at the potentiometer 17, and to determine at the screening grid 14 without interference to the occurrences at the grid-cathode circuit what amounts of current are to be allowed to reach the blocking electrode. These advantages would not be obtainable when using triodes 12, and could also not be utilised fully when employing tetrodes in which the intercepting grid 13 is missing.

According to the invention, the coupling of the grid 18 with the image current circuit 1 does not take place in purely capacitative fashion through the medium of a condenser 21, but additionally in galvanic fashion by way of the resistance 28. The latter is made highly ohmic,

and is in such relation to the grid resistance 19 that the direct potential possesses in the line 22 the value required by the regulating grids of the receiving amplifying tubes for full sensitivity. The applicant has found that in the case of transmitters and receivers which transmit also the D. C. value of the light intensity, such as possible in the case of superhet receivers and certain transmission amplifiers, for example intermediate frequency amplifiers, a separation of the synchronisation signals from the contents of the image in the case of all possible image contents is only possible without interference if the transmission of the direct potential is performed not only to the grid of the television tube but also to the grid of the filter tube. If, for example, the transmitter operates with black impulses, and if it transmits a uniformly black area, the differences in amplitude between the impulse and the mean value of the image is merely small. If a pure condenser coupling were provided between grid 18 and line 1, the bias of the grid 18 would be much too high to permit of a regulation of the tube 12 with these small differences in amplitude. By reason of the galvanic coupling, however, the bias of the grid is decreased to such extent in the desired direction that the small differences in amplitude are sufficient for removing the blocking effect on the tube 12.

I claim:

1. In a television receiver an amplifier for amplifying the mixture of the image signals and of the synchronizing signals, a cathode ray tube having at least a cathode, a main control electrode and an auxiliary control electrode, a grid controlled tube for filtering the synchronizing signals from said mixture, and at least one deflecting voltage generator, the output of said amplifier being connected on the one hand to said main control electrode and on the other hand to the grid of said filter tube, the anode of said filtering tube being connected to said auxiliary control electrode, the cathode of said filter tube being connected on the one hand via a resistance to a fixed potential and on the other hand to said deflecting voltage generators.

2. In a television receiver an amplifier for amplifying the mixture of the image signals and of the synchronizing signals, a cathode ray tube having at least a cathode, a main control electrode, and an auxiliary control electrode, a grid controlled tube for filtering the synchronizing signals from said mixture, and at least one deflecting voltage generator, the output of said amplifier being connected on the one hand to said main control electrode and on the other hand to the grid of said filter tube, the anode of said filtering tube being connected to said auxiliary control electrode, the cathode of said filter tube being connected on the one hand via a resistance to a fixed potential and on the other hand to said deflecting voltage generator, said filtering tube being a pentode, the screen grid of which being biased independently on the cathode potential.

3. In a television receiver an amplifier for amplifying the received modulated high frequency, an amplifier amplifying the mixture of demodulated image and synchronizing signals, a cathode ray tube having at least a main control electrode and an auxiliary control electrode, a grid controlled tube for filtering the synchronizing signals from said mixture and at least one deflecting voltage generator, the output of said second mentioned amplifier being connected on

the one hand to said main control electrode and on the other hand via a condenser to the grid of said filtering tube, the anode of said filtering tube being connected to said auxiliary control electrode, the cathode of said filtering tube being connected on the one hand to a fixed potential

and on the other hand to the input of said deflecting generators, the grid of said filtering tube being connected on the one hand to earth and on the other hand to the input of the first mentioned amplifier for fading regulation.

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