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SAW-TOOTH WAVE GENERATOR

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Fig. 1

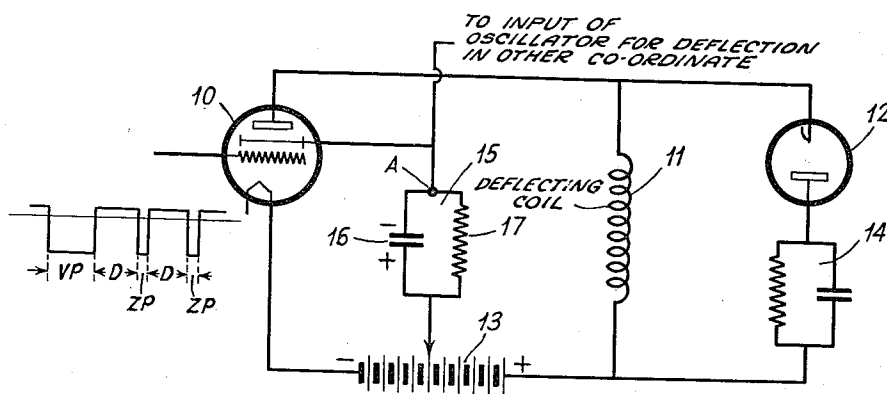


Fig. 2

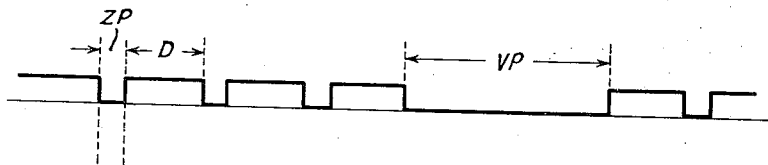
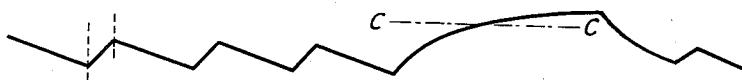


Fig. 3



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SAW-TOOTH WAVE GENERATOR

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In Germany March 19, 1936

4 Claims. (Cl. 250—36)

My invention relates broadly to apparatus for the generation of a current or voltage of serrated or so-called saw-tooth wave formation, and more particularly to an apparatus which is con-
5 trollable by impressed synchronizing impulses which themselves are segregated by the apparatus in order to be actuated by the correct impulse.

My previous application United States appli-
10 cation Serial No. 61,499, filed January 30, 1936, describes a circuit arrangement for producing a current of saw-tooth form in the deflecting coil of a cathode ray tube, and preferably a tube
15 used for television purposes. There are provided parallel to the deflecting coil or coils two different current conducting branches or circuits, of which one contains a multi-grid tube and a po-
20 tential source and the other a diode and likewise a potential source. The potential source which is connected in series with the diode is
25 impressed with a smaller potential than the potential source in the current branch containing the multigrid tube. It was assumed in the arrangement according to the parent applica-
30 tion that blocking impulses were periodically impressed on one of the control grids of the multi-grid tube resulting thus in a current course in deflecting coil of saw-tooth character. Repre-
sentative impulses of such type are the signal
impulses which are filtered out in a television
receiver after demodulation of the carrier wave
modulated with such impulses and the image
pattern.

The invention concerns a further development
35 of the circuit arrangement disclosed in the parent application and has for its purpose to utilize the saw-tooth generator not only for the line deflection but at the same time for separating the vertical impulses from the signal im-
40 pulses, said vertical impulses differing in their duration with equal amplitude from the line impulses in the manner usual in television. This is accomplished in accordance with the invention
45 in that in the circuit of a screen grid of the multigrid tube is provided an RC-member to which is coupled an amplitude selection stage.

My invention will be best understood by referring to the accompanying drawing, in which—
Fig. 1 illustrates an embodiment of the in-
50 vention,

Figs. 2 and 3 are explanatory curves.

Referring to Fig. 1, a multigrid tube 10, which is shown as usual screen grid tube for the sake of simplicity, has joined serially to its anode
55 and in the anode-cathode circuit, a deflecting

coil 11 of a Braun tube. A diode 12, and 14 a resistance-capacity circuit whose time constant must be chosen very great in comparison to the line duration, and as a rule even great with re-
5 spect to the image duration are connected serially and the combination is connected in shunt to the coil 11. A potential source 13 energizes the plate of the tube 10. In the screen grid circuit of tube 10 and connected in series in the
10 screen grid-cathode circuit is disposed a resistance capacity circuit 15 provided in accordance with invention and which insures, as will be noted from the description of the mode of operation
15 to follow, the separation of the vertical impulses from the line impulses.

As stated previously, on the control grid of tube 10 is impressed blocking impulses during the line pauses, which impulses, as described in the parent application, start a free half-oscilla-
20 tion of current in the deflecting coil 11, with the result that the current direction in the deflecting coil has after completion of this free half-oscillation the opposite direction and practically the
25 same amount as at the start of same. For the separation, to be explained in what follows, of the vertical impulses from the line impulses, it must merely be kept in mind that current flows
30 through the screen-grid circuit of tube 10 during the line duration D in Fig. 1, but that on the other hand the screen grid circuit is without
current during the line pause ZP, as well as during vertical pause VP (see Figs. 1, 2 and 3). This current course in the screen grid circuit is
35 shown in Fig. 2. If current now flows in the screen grid circuit, condenser 16 will take on a charge in the sense of the indicated plus and minus signs resulting at the same time in a shift
40 of potential at point A in negative direction. This is illustrated in Fig. 3 which shows the potential variations of the point A of Fig. 1.

But during the line pause, condenser 16 dis-
45 charges through resistance 17 to a degree which is dependent upon the time constant of the resistance-capacity circuit 15 so that the potential at point A (see Fig. 1) must move at the same time
in a positive direction. In this manner the potential variations occur at point A as shown in Fig. 3 during the continuous arrival of line im-
50 pulses. But if during a vertical pause the tube 10 is without current for a longer period, condenser 16 discharges completely through resist-
ance 17, or at least to a much higher degree than during the short line pauses. During this time, potential A wanders as in the case of the short
55 line pauses in positive direction. If during this

time for instance value C—C is exceeded, the saw-tooth generator may be started for the vertical deflection by means of an amplitude selection stage on which is impressed the potential at point A and which may for instance consist of a correspondingly biased amplifier tube. For given cases the arrangement may also be designed in the manner that the input tube, or the sole tube of the saw-tooth generator, is controlled directly by the potential at point A for the vertical deflection. After completion of vertical pause VP the potential course of the resistance capacity circuit 15 again assumes the course shown to the left of Fig. 3 within a few lines.

15 What I claim is:

1. A saw-tooth wave generator comprising a multigrid vacuum tube containing anode, cathode and a plurality of grids, an inductive member serially joined to said anode and connected in the anode-cathode circuit of said tube, a circuit connected in parallel with said inductive member comprising a unidirectional conductor and a circuit of predetermined time constants, an electrical circuit comprising a parallel joined resistance and capacity serially joined to one of the grids of said tube and connected in the grid-cathode circuit of said tube and an input circuit connected between the other grid of the plurality of grids and the cathode.

2. A saw-tooth wave generator comprising a multigrid vacuum tube containing anode, cathode and a plurality of grids, a deflecting coil serially joined to said anode and connected in the anode-cathode circuit of said tube, a circuit connected in parallel with said inductive member comprising a unidirectional conductor and a circuit of predetermined time constants, an electrical circuit comprising a parallel joined resistance and capacity serially joined to one of the grids of said tube and connected in the grid-cathode circuit of said tube, and means for impressing electrical signals onto a control electrode comprising another of the grids of said tube.

cuit of predetermined time constants, an electrical circuit comprising a parallel joined resistance and capacity serially joined to one of the grids of said tube and connected in the grid-cathode path of said tube and an input circuit connected between the other grid of the plurality of grids and the cathode.

3. A saw-tooth wave generator comprising a multigrid vacuum tube containing anode, cathode and a plurality of grids, an inductive member serially joined to said anode, a circuit connected in parallel with said inductive member comprising a unidirectional conductor and a circuit of predetermined time constants, an electrical circuit comprising a parallel joined resistance and capacity serially joined to one of the grids of said tube and connected in the grid-cathode path of said tube, and means for impressing electrical signals onto a control electrode comprising another of the grids of said tube.

4. A saw-tooth wave generator comprising a multigrid vacuum tube containing anode, cathode and a plurality of grids, a deflecting coil serially joined to said anode and connected in the anode-cathode path of said tube, a circuit connected in parallel with said inductive member comprising a unidirectional conductor and a circuit of predetermined time constants, an electrical circuit comprising a parallel joined resistance and capacity serially joined to one of the grids of said tube and connected in the grid-cathode path of said tube, and means for impressing electrical signals onto a control electrode comprising another of the grids of said tube.

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