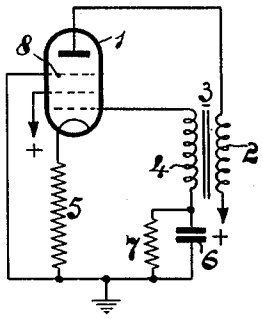
Dec. 23, 1952 C. J. SEUR ET AL 2,623,178

BLOCKING OSCILLATOR

Filed March 20, 1951



INVENTORS
CHRISTIAAN JACOBUS SEUR
DORUS GERARDUS KERKER

BY

AGENT

Patented Dec. 23, 1952

2,623,178

UNITED STATES PATENT OFFICE

2,623,178

BLOCKING OSCILLATOR

Christiaan Jacobus Seur and Dorus Gerardus Kerker, Hilversum, Netherlands, assignors to Hartford National Bank and Trust Company, Hartford, Conn., as trustee

Application March 20, 1951, Serial No. 216,511
In the Netherlands April 4, 1950

3 Claims. (Cl. 250—36)

1

This invention relates to a blocking oscillator producing a pulse-voltage and comprising a discharge tube, one output circuit of which is fed back through a transformer to the control-grid circuit, the cathode lead of the tube including a negative feedback impedance.

When producing pulse voltage by means of a blocking oscillator without making use of negative feedback, it is found that the amplitude of the voltage pulses obtained is not constant, but varies under the influence of different factors.

With the aid of negative feedback, which is usually obtained by means of a resistor included in the cathode lead of the tube, a certain stabilization is ensured, although at the cost of a decrease in the attainable amplitude of the pulses. The present invention has for its object to improve such a negatively blocking oscillator to raise the stabilization of the pulse amplitude still further.

A significant feature of the blocking oscillator according to the invention is that a multi-grid discharge tube is employed and at least part of the voltage set up across the negative feedback impedance is supplied to a second grid of the tube, which grid is located between the control grid and the electrode to which the output circuit is connected.

In order that the invention may be more clearly understood and readily carried into effect, it will now be described more fully with reference to the accompanying drawing which illustrates schematically a preferred embodiment of the invention.

A blocking oscillator according to the invention includes an electron discharge tube 1 whose anode circuit contains the winding 2 of a transformer 3, a second winding 4 of which is included in the control-grid circuit of the tube.

The control-grid circuit furthermore comprises the negative feedback resistor 5 inserted in the cathode lead of the tube, a condenser 6 and a parallel-connected resistor 7, if desired, connected in series with a fixed bias source.

Although the operation of the circuit-arrangement so far described is known per se it will be briefly explained. If the capacitor 6 is negatively charged at a given instant, the tube 1 is cut off. In this event the capacitor becomes discharged through the resistance 7 with the result that the voltage set up at the control grid of the tube increases. Upon reaching the cutoff point of the grid-voltage anode-current characteristic of tube 1, current tends to flow in the tube and the feedback becomes operative through the

2

transformer 3, thus producing across the winding 4 a voltage of such polarity that the grid voltage increases still further.

During this rapid increase in grid voltage, such a value is attained that grid current tends to flow, due to which the voltage through the capacitor again tends to drop. When the tube is cut-off owing to the less rapid increase in anode current whereby the polarity of the voltage induced across the winding 4 changes its polarity, the capacitor is left in the negatively charged state, whereupon the cycle is repeated.

Owing to the rapid increase in anode current, which increase is of a cumulative nature, voltage pulses are produced at the anode and the cathode of the tube and may be taken from these electrodes.

The resistor 5 brings about negative feedback, as a result of which the operation of the oscillator is stabilized in a known manner.

If, according to the invention, the tube 1 is a multi-grid tube, for example a pentode as shown in the drawing, and the voltage set up across the resistor 5 is supplied to a grid, for example the suppressor grid 8 located between the control-grid and the anode, further stabilization of the impulse amplitude is ensured.

In effect, the pulse voltage set up through the resistor 5 is supplied to the suppressor grid 8 with such a polarity as to suppress the passage of current to the anode of the tube at a sufficient value of this voltage.

In accordance with the current flowing in the tube, the value of the resistor 5 should consequently be so chosen that the voltage supplied to the suppressor grid is sufficiently high to suppress the anode current on exceeding a given impulse amplitude.

It will be appreciated that the oscillator according to the invention permits rigorous stabilization of the impulse amplitude.

If, in a multi-grid tube, not the anode but a different electrode is used to constitute the output circuit for the feedback, the additional grid, to which the voltage set up across the negative feedback impedance is supplied, should be located between the said electrode and the control grid.

This further grid need not be a suppressor grid but should be arranged and proportioned such that, under the influence of the voltage supplied thereto, the current to the output electrode may be cut-off.

What we claim is:

1. A blocking oscillator for producing voltage

pulses comprising an electron discharge tube including a cathode, first and second grids and an output electrode, and circuits therefor, a transformer having primary and secondary windings, means to apply a positive potential to said output electrode through said primary winding, a negative feedback impedance included in the cathode circuit of said tube, said secondary winding being included in the grid circuit of said tube, and means to apply at least a portion of the voltage developed across said impedance to said second grid, said second grid being disposed between said first grid and said output electrode.

2. An oscillator, as set forth in claim 1, further including a resistance-capacitance parallel network interposed in said grid circuit.

3. A blocking oscillator for producing voltage pulses comprising a pentode electron discharge tube having a cathode, a control grid, a suppressor and an anode, and circuits therefor, a transformer having primary and secondary windings, means to apply a positive potential to said anode through said primary winding, a negative feedback impedance connected in said cathode circuit, said second winding being connected in said grid circuit, said suppressor grid being connected to the end of said impedance remote from said cathode.

CHRISTIAAN JACOBUS SEUR.
DORUS GERARDUS KERKER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,360,697	Lyman	Oct. 17, 1944
2,373,165	Cawein	Apr. 10, 1945