

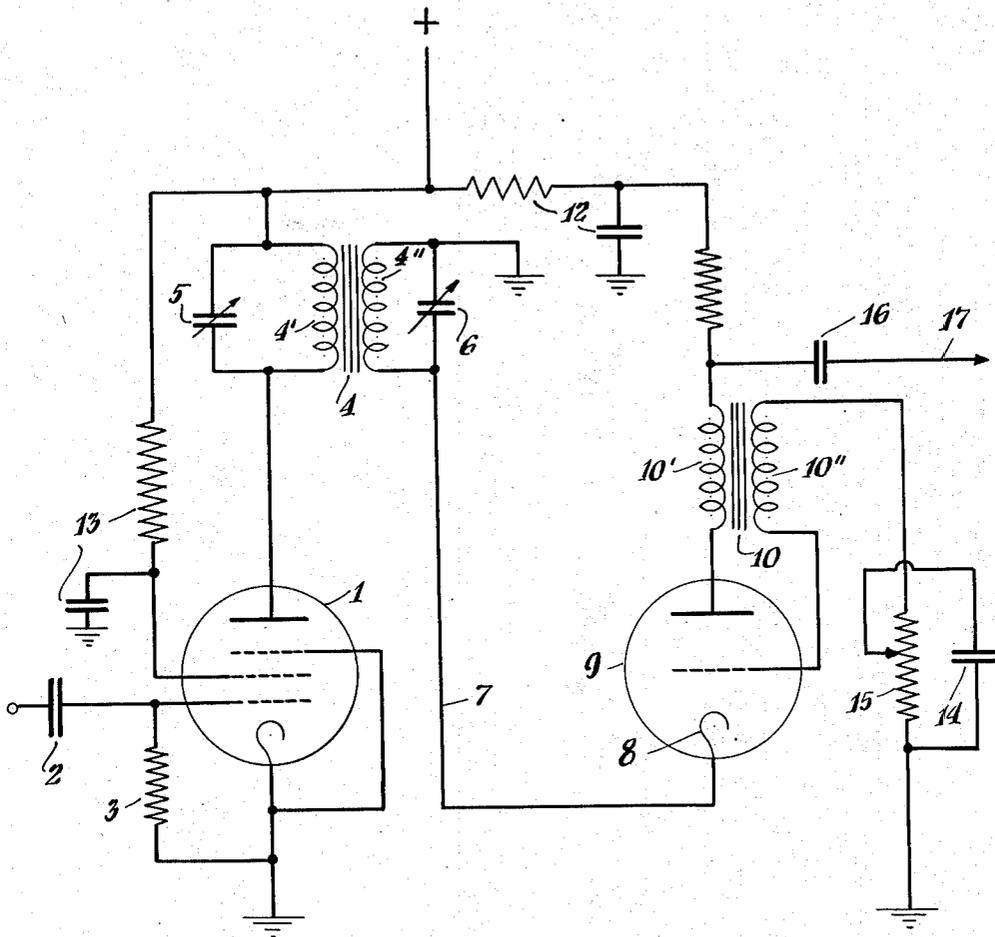
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CONTROLLED BLOCKING TUBE OSCILLATOR

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# UNITED STATES PATENT OFFICE

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## CONTROLLED BLOCKING TUBE OSCILLATOR

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8 Claims. (Cl. 250—36)

1

This invention is for a blocking tube oscillator having associated therewith means to control its repetition rate. In carrying out the invention, the blocking tube oscillator is so controlled that the repetition rate of its firing is synchronized with a desired frequency. It can be made to fire at the same rate and at any integral multiple or divisor of the said frequency. The frequencies used for synchronizing the blocking tube oscillator may vary over a wide range.

Two sorts of circuits already known in this art are used and so combined as to produce the desired result. One of these circuits is that of a blocking tube oscillator and the other one is that of a sine wave frequency multiplier which is used to control the frequency of the blocking tube oscillator.

The invention may be understood from the present description in connection with the accompanying drawing, in which:

Reference character 1 indicates a pentode having its control grid coupled by condenser 2 to a signal source, not shown, and being provided with a grid leak resistor 3. The cathode of this tube is grounded. Its screen grid is connected to a source of positive potential in the usual way. The plate of tube 1 is connected to this source of positive potential through a tunable circuit consisting of a primary 4' of transformer 4 and variable condenser 5 in parallel. The secondary 4'' of transformer 4 is connected in parallel with a variable condenser 6, one end of this parallel combination being connected to ground. The other end thereof is connected by lead 7 to the cathode 8 of triode 9. The plate of this triode is connected through the primary 10' of transformer 10 and load resistor 11 to the same source of positive potential to which the plate of tube 1 is connected. The usual filter 12 is provided in this circuit and a similar filter 13 is provided in the circuit between a source of positive potential and the screen grid of tube 1.

One end of the secondary 10'' of transformer 10 is connected to the grid of the tube 9 and the other end of this secondary is connected to ground through a circuit consisting of condenser 14 and variable resistor 15 in parallel.

The output from the device, which is a frequency which can be the same or a multiple of that appearing on the grid of tube 1, is coupled

2

by condenser 16 and lead 17 to the place of use.

The operation is as follows:

Any suitable frequency, such as that of a sixty cycle power line, is applied through condenser 2 to the grid of tube 1. The inductance 4', through which the source of positive potential is connected to the plate of tube 1, is tuned by variable condenser 5 to a multiple frequency of that applied to the grid of tube 1, and the inductance 4'' is tuned by variable condenser 6 to the same frequency so that this tuned multiple frequency is applied to the cathode 8 of tube 9.

The time constant of the condenser 14 and resistance 15 is made such that it is the same as or any integral division of the frequency applied to the cathode 8. The blocking tube oscillator 9 then starts to conduct during the times when the signal applied to the cathode 8 is well into its negative excursion, thus unbiasing the tube 9. The time constant of resistance 15 and condenser 14 is adjusted to be the same frequency as the tuned circuit 4'—6, or an integral division thereof.

What is claimed is:

1. In a device of the character described, a vacuum tube having its cathode grounded and having a signal lead connected to its control grid, an inductance and condenser in parallel in its plate circuit, an inductance associated with said first named inductance to provide a transformer, a condenser in parallel with said second named inductance, a vacuum tube to the cathode of which one side of said last named condenser is connected, the other side of said last named condenser being connected to ground, said last named vacuum tube having a resistance and the primary of a transformer in series in its plate circuit, one end of the secondary of said last named transformer being connected to the grid of said last named tube and the other end thereof to one end of a circuit having a time constant and having its other end grounded.
2. The device of claim 1 in which said first named condenser is variable.
3. The device of claim 1 in which said second named condenser is variable.
4. The device of claim 1 in which said time constant circuit is variable.
5. The device of claim 1 in which the resistance in said time constant circuit is variable.

3

6. The device of claim 1 in which the time constant of said last named circuit is adjusted to the frequency of said inductance and condenser that are in parallel.

7. The device of claim 1 in which a lead for the output of said device is connected between said resistance and said transformer primary that are in series. 5

8. The device of claim 1 in which a lead having a condenser therein for the output of said device is connected between said resistance and said transformer primary that are in series. 10

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4

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