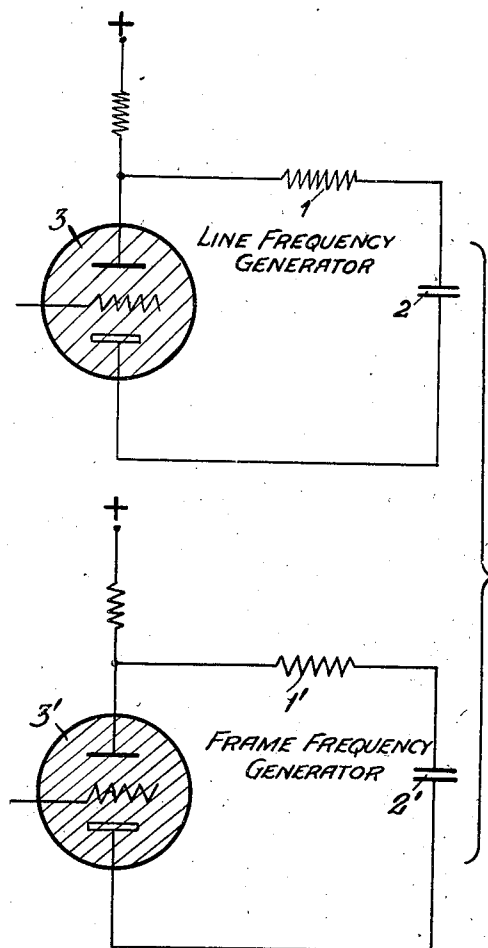


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RELAXATION APPARATUS

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Inventor:

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RELAXATION APPARATUS

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2 Claims. (Cl. 250—36)

In my application Ser. No. 668,940, filed May 2, 1933, Patent No. 2,083,202, granted June 8, 1937, there is described an arrangement for generating relaxation oscillations consisting of a charging condenser, which is periodically charged through a charging resistance by a direct current source and discharged by means of a grid controlled glow discharge tube.

In these discharge tubes the grid does not act as a control element but as blocking element. As long as the control grid possesses a corresponding negative potential a discharge does not take place, however high the potential may be between the anode and the cathode. Immediately, however, the discharge—by shifting of the grid potential—having once commenced, the same—irrespective of any variation in the grid potential—continues as long as a potential exists between the cathode and the anode.

In television receiving arrangements there is applied a synchronizing potential to the grid of the discharge tube. The generator then will produce relaxation oscillation controlled by the transmitter.

It has been pointed out in this earlier application that it is advantageous to insert a resistance in the discharge circuit of the glow discharge tube. This resistance has the object of limiting the intensity of the discharge current, more particularly shortly after effected ignition. If this resistance is not provided, there occurs a more or less extensive lack of steadiness in the television image, which is due to the fact that the points of ignition and quenching of the glow tube do not remain sufficiently constant and each discharge is more or less dependent on the course of the preceding discharge. This state of dependence is explained by the fact that the internal resistance of present-day gas filled grid controlled glow discharge tubes is comparatively small, and accordingly even at the commencement of the ignition very considerable amounts of current are taken from the condenser in very short periods, viz., in a manner which is not capable of exact control.

In the drawing there is shown the fundamental arrangement of the resistance 1, the condenser being designated 2, whilst 3 is the gas filled grid controlled glow discharge tube of the line frequency, 1', 2', and 3' indicating corresponding elements of the frame frequency generator.

It has been found that a resistance 1 of this kind is necessary not only in the line relaxation circuit but also in the vertical relaxation circuit, i. e., the so-called frame circuit. The two relaxation condensers 2 in these two circuits are, however, very different, their ratio being the same as the number of lines in the image, i. e., as 1:200.

For example, 2 in the line portion is 0.01 mf. and in the frame portion 2 mf.

The present invention sets forth in what manner under different conditions of this kind the resistance 1 may conveniently be dimensioned. It has been found that the time constant $\tau = R \cdot C$ must always be equal in both circuits. In consequence, according to the invention, there is found in the line circuit a resistance of 500 ohms and in the image-change circuit a resistance of about 3 ohms as optimum.

The absolute length of this time constant $\tau = R \cdot C$ amounts in the stated cases taken from practice to approximately $5 \cdot 10^{-6}$ sec. The selection of these particular time constants results from a requirement which is closely associated with the length of the synchronization signals and has likewise been described and substantiated in an earlier application. The duration of the total discharge should be equal to or greater than the duration of the synchronization signal. This condition ensures that unsteadiness of the screen owing to the co-operation of the relaxation connection with the control signals is unable to occur.

I claim:

1. A relaxation oscillation arrangement consisting of a line frequency generator and a frame frequency generator, each of said generators comprising a gas filled glow discharge device having a hot cathode, a grid and an anode, a charging condenser having one of its electrodes connected to said cathode and its other electrode connected through a resistance to said anode, means for charging said condenser, means to bias said grid negatively with respect to said cathode and means to apply a synchronizing voltage to said grid, the time constant of the system constituted by said resistance and said charging condenser being in the order of $5 \cdot 10^{-6}$ sec. for each of said generators.

2. A relaxation oscillation arrangement consisting of a line frequency generator and a frame frequency generator, each of said generators comprising a glow discharge device having a hot cathode, a grid and an anode, a charging condenser having one of its electrodes connected to said cathode and its other electrode connected through a resistance to said anode, means for charging said condenser, means to bias said grid negatively with respect to said cathode and means to apply a synchronizing voltage to said grid, said charging condenser having a value of 0.02 mf. for the line frequency generator and a value of 2 mf. for the frame frequency generator, said resistance having a value of 500 ohms for the line frequency and a value of 5 ohms for the frame frequency generator.

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