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METHOD OF GENERATING OSCILLATIONS

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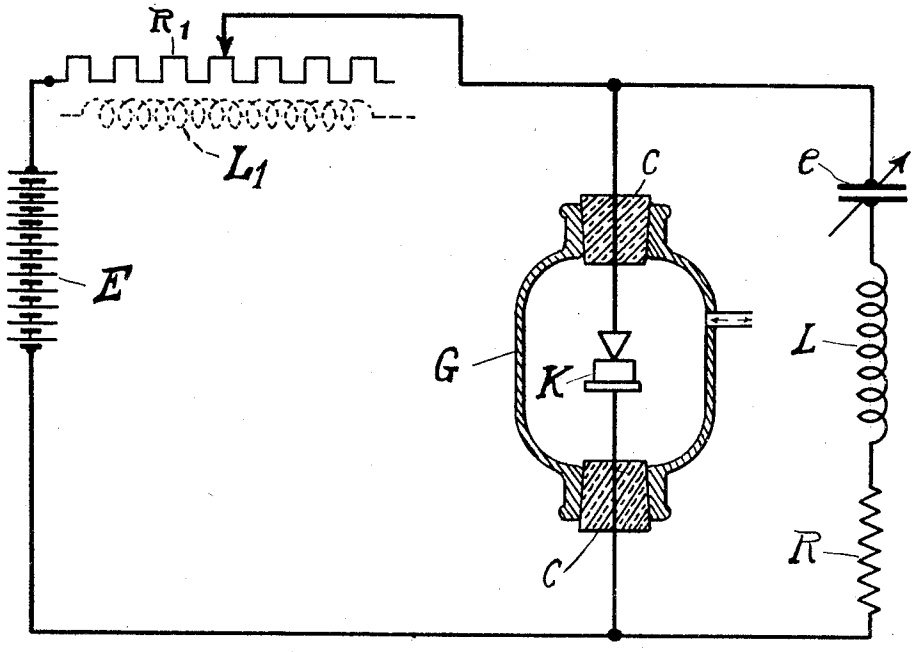

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UNITED STATES PATENT OFFICE

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METHOD OF GENERATING OSCILLATIONS

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The present invention relates to circuit arrangements for the production of oscillations and more specifically to such arrangements which include an oscillating crystal.

It has heretofore been known to produce regenerative oscillations by utilizing a crystal detector, battery and resistors. A detailed description of the physical phenomena and operation of oscillating crystals is set forth, among others, in a number of articles appearing successively in the "Wireless World" of October 1 issue, page 2, October 8th issue, page 47 and October 22nd issue, page 93, of 1924. In such circuit arrangements the establishment of the oscillations is controlled by adjusting either the battery voltage or the value of the resistor or both. This presents practical difficulties in such arrangements as it often affords a longer time and special skill to adjust such a crystal so as to produce oscillations.

In accordance with the present invention, the crystal is placed in a gaseous atmosphere. It has been found by experiment that various gases act differently upon the generation of oscillations. Some of the gases used do not show any effect whatever as compared with using the crystal exposed to the air. Argon is one of the gases which does not affect the generation of oscillations.

On the other hand, it has been found that certain gases will suppress the oscillations. Hydrogen, illuminating gases, alcohol vapors, and carbonic acid are among those gases which have been found to restrict the oscillations.

In acordance with the present invention it is proposed to place the crystal in a container and to admit a stream of gas selected to produce the desired oscillation.

It has been found that by regulating the gas in any well known manner that the oscillations are positively controlled especially in the case when conditions are maintained at the limit of the oscillating point of the crystal.

My invention is illustrated in the accompanying drawing which shows diagrammatically the crystal in an electric circuit. In the drawing K represents the crystal arranged to operate as an oscillator, E designates a source of potential, such as a battery connected in circuit with the crystal, R_1 indicates a regulating impedance which may also be an inductance indicated by dotted lines L_1, and G designates a vessel containing the gas heretofore described. The vessel is apertured at each end and is provided with insulated bushings C extending into each end thereof. The oscillating circuit which connects with the crystal K includes a variable condenser E and inductance L and a resistance R. Oscillations may be established and sustained in the crystal circuit.

The operation of such a device, in accordance with my invention is as follows:—Referring to the drawing and assuming that the crystal has been adjusted to produce oscillations, the introduction of a gas acting to suppress such oscillations, for instance, by opening an inlet valve V, will stop the oscillations and conversely, the removal of the gas by opening the valve, will start the oscillations again.

Modifications may be made in the arrangement, location and construction of parts within the spirit and scope of my invention and such modifications are intended to be covered by the appended claims.

I claim:—

1. The method of starting and stopping the oscillations in an electrical circuit including a crystal in an enclosure for containing gaseous atmosphere, which consists in admitting and exhausting the gas in the crystal inclosure.

2. The method of controlling the oscillations in an electrical circuit including a crystal in an enclosure for containing a gaseous

atmosphere, which consists in admitting gas to the enclosure to stop oscillations and exhausting the gas therefrom to start the oscillations.

3. In an electrical apparatus an oscillating crystal, a container for said crystal containing a gas and means to admit and exhaust the gas for stopping and starting oscillations.

4. An electrical apparatus comprising an oscillating crystal and a container for enclosing said crystal, a gaseous atmosphere of hydrogen within said container and surrounding said crystal, and means to vary the pressure of said atmosphere.

In testimony whereof I affix my signature.

GÜNTHER THILO.