Dec. 30, 1941. E. HEINECKE 2,267,914

HIGH FREQUENCY OSCILLATION GENERATOR

Filed June 23, 1939

Fig. 1

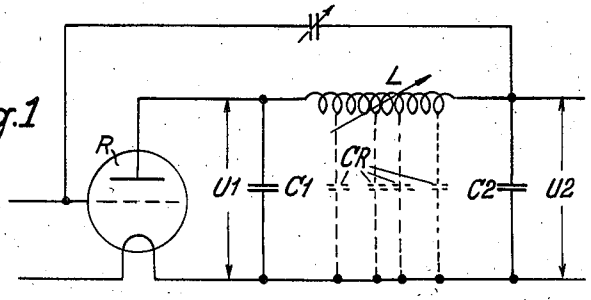


Fig. 2

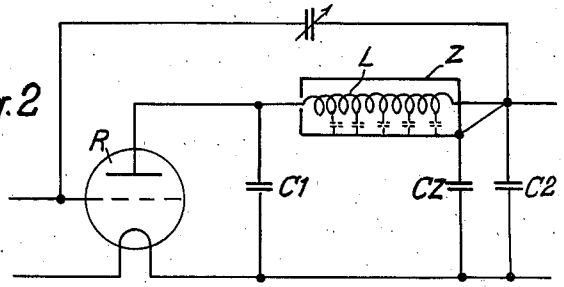
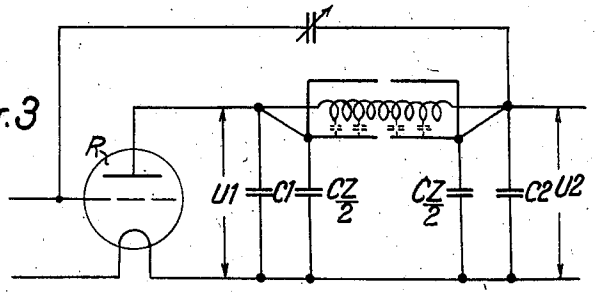


Fig. 3



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HIGH FREQUENCY OSCILLATION GENERATOR

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1 Claim. (Cl. 178—44)

This invention relates to high frequency circuits, and more particularly to new and useful improvements in circuit arrangements for ultra high frequency oscillators and consists in certain features of novelty which will be fully understood from the following description and be pointed out in the appended claim, reference being made to the accompanying drawing, in which

Fig. 1 shows a circuit arrangement of conventional art explanatory of my invention, while the Figs. 2 and 3 diagrammatically show two different embodiments according to my invention.

It is frequently desirable in oscillation generating systems having a voltage divider connected in the output circuit of an electron discharge device to secure constant phase relations and a constant voltage ratio of $U1/U2=-K$ across this output circuit, for the purpose of neutralization, for example. A voltage divider of conventional type as schematically shown in Fig. 1 consists of two condensers C1 and C2 and an adjustable tuning variometer L which together constitute a fourpole having a series branch, i. e. the variometer coil L of indefinite space capacitance, and two cross branches such as condensers interconnected between the input and the output terminals, respectively. Assuming that the space capacitance CR of the series branch with respect to the cross branches C1 and C2 is neglectable, approximately the desired voltage ratio of

$$U1/U2=-K$$

would be obtained which is constant and cophasal. This desired voltage ratio, however, cannot be maintained in high frequency operation because of the fact that the space capacitance CR assumes a value which is in the order of that of the cross branch condensers C1 and C2 so that the effect thereof alters the conditions of the circuit arrangement from which follows that not only the absolute magnitude of the voltage ratio but also the phase conditions are considerably changed.

It is the object of my invention to overcome the last mentioned disadvantage and to provide means which allow the desired voltage ratio to be maintained constant also at high and ultra high frequency operation.

According to the main feature of this invention, the space capacitance effect of a series branch connected in the output circuit of an ultra high frequency generator is nullified by the provision of shielding means surrounding this branch, and by electrically connecting the shielding means to a point at which a cross branch is joined to the series branch. Such electric connection must be possibly non-inductive. The capacity to ground of the shielding means, preferably of tubular shape, is thus effective as a shunt capacity with respect to the cross branch, or in other words, acts in parallel with a condenser of the voltage divider, in which case either of the cross branch capacities must be correspondingly decreased. It is thus possible by means of such shielding and its electric connection to one end of the series branch to convert the fourpole, as formed by the series branch in conjunction with its space capacitance and as such undesirable in utlra high frequency operation, into a desired circuit arrangement in which the capacity acts as a lumped capacity at the end of the series branch or coil.

The Fig. 2 shows one embodiment according to this invention. A voltage divider constituted by the two capacities C1 and C2 is connected across the output circuit of an electron tube R. Reference letter L denotes a tuning coil, the distributed space capacity of which is rendered ineffective for the desired phase relation by means of a shielding cylinder Z since this member is electrically connected with one end of the coil L, whilst its capacity CZ to ground is shunted across the capacity C2. It is obvious that the same result will be obtained if the cylinder Z would be electrically connected in parallel with the capacity C1 instead of the capacity C2.

A further embodiment of my invention is shown in Fig. 3, in which the shielding cylinder Z is subdivided into two halves, the ends of which being connected to the junction points of the coil and the capacities C1 and C2, respectively. Also in this case the voltage ratio $U1/U2=-K$ may be maintained even at ultra short wave operation by adjusting the capacities C1 and C2 of the voltage divider so as to correspond to the shunt capacity CZ.

What is claimed is:

A fourpole network comprising a series branch and a plurality of cross branches, shielding means consisting of two halves, each half surrounding a portion of said series branch, one-half being electrically connected to the junction point between said series branch and one of said cross branches and the other half being electrically connected to the junction point between said series branch and another of said cross branches to constitute leakage paths directly shunted across said cross branches.

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