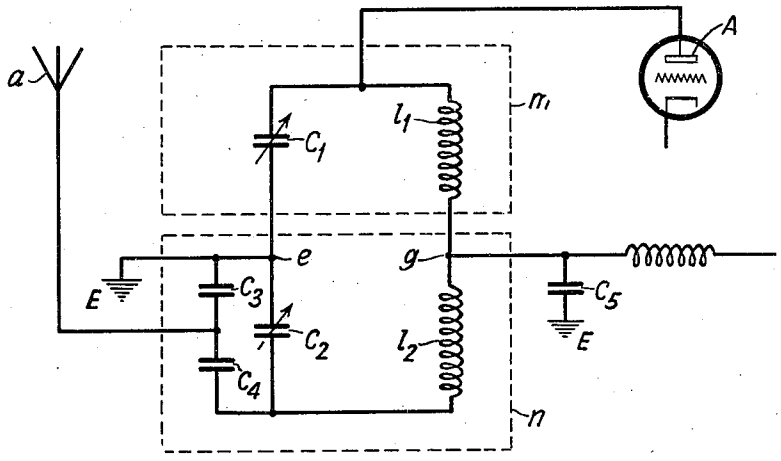
Jan. 13, 1942. R. THOM 2,269,640

TRANSMITTER

Filed Aug. 10, 1940



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Patented Jan. 13, 1942 2,269,640

UNITED STATES PATENT OFFICE

2,269,640

TRANSMITTER

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Application August 10, 1940, Serial No. 352,056
In Germany March 18, 1939

7 Claims. (Cl. 250—17)

The idea underlying the present invention is to solve the problem of preventing higher harmonics from being radiated in a transmitter arrangement. Of particularly great importance is the use of different means to suppress higher harmonics in the case of short-wave transmitters on the ground that with increasing frequency the different spurious and undesired couplings with the aerial grow. According to the invention, the oscillation circuit of the transmitter with which the antenna is coupled is of special construction, the antenna being coupled therewith in such a way that the harmonics arising in the oscillation circuit will, as far as feasible, be led away and drained from the antenna circuit and thus suppressed. In other words, the present invention has as its chief aim to disclose an optimum design and connection of the antenna and the oscillation circuit of the transmitter.

For further explanation of the nature of the invention reference shall be made to the single figure of the appended drawing in which the various circuit elements and the necessary connections and terminals appear. The oscillatory or tank circuit associated with the plate or anode A of a tube and from which the radio frequency energy is to be delivered to the antenna a consists of a branch arrangement. In one arm or branch thereof the inductance is split into two distinct coils l_1 and l_2. The capacitive branch consists of a rotary condenser c_1 and of a rotary condenser c_2. In parallel relationship with the last-named condenser is a capacitive potential divider comprising a seriation of condensers c_3 and c_4. The midpoint e between the rotary condensers is connected to ground E, while the midpoint g between the coils is also connected to ground E though not directly, but by way of a grounding condenser c_5. Coil l_1, and the condenser c_1 are so balanced in respect to each other that they are tuned to the useful or signal frequency. In a similar manner the lower portion of the oscillation circuit comprising the coil l_2 and the other portion of the capacitive arm is tuned to the signal frequency. The grounding condenser c_5 must be dimensioned in such a way that it will not constitute a short circuit for the signal wave, in order that the signal current may have a chance to reach the lower part of the oscillation circuit. However, for the higher harmonics the said condenser c_5 constitutes a considerably lower resistance, and the result is that the harmonics are precluded from the lower part of the oscillation circuit; that is, between the points marked e and g. Such remnants of harmonics as may remain encounter a considerable resistance in this part of the oscillation circuit inasmuch as this part of the oscillation circuit has an inductive effect upon the harmonics. The antenna a is thus fed with a certain potential of signal frequency determined by the ratio of the condensers c_3 and c_4 which is rid of harmonic potentials. Although the load is shown connected to the junction point of condensers c_3 and c_4, it will be obvious that for other conditions of adaptation and voltage relations between load and tank circuit the load can be coupled to the tank in other ways. In order to avoid the possibility of coupling relationship being established for the harmonics from the upper part of the oscillation circuit in the lower part, shielding is provided between the upper and the lower part. As can be seen from the drawing, the upper part of the oscillation circuit is combined with a shielding cage m, while the lower part has a cage or shield n.

The term "ground" used in the specification and appended claims is not limited to an earthed connection and is deemed to include any point or surface of zero or relatively fixed alternating current potential.

What is claimed is:

1. Transmitter arrangement especially for short waves, with the characteristic feature that the oscillation circuit of the transmitter to which the antenna is coupled, comprises two parallel arms, one of which includes at least two coils in series, the midpoint between these two coils being grounded by way of a condenser, while the other arm contains in series two rotary condensers, a point between the said two condensers being grounded, a capacitive voltage divider being connected in parallel relation to one of the said rotary condensers, with the antenna being associated with the said voltage divider.

2. Arrangement as claimed in claim 1, with the characteristic feature that the condenser by which the midpoint of the oscillatory circuit between the two coils is connected to earth is so dimensioned that it represents a capacitive reactance for the useful or signal wave, while for the harmonics it represents practically a short circuit.

3. In a transmitter, a single ended power amplifier vacuum tube having an anode and an output tank circuit coupled to said anode, said tank circuit comprising a pair of inductance coils connected in series and in shunt thereto a pair of series connected condensers, a capacitive connection from the junction point of said coils to

ground, and a direct connection of low impedance from the junction point of said pair of series condensers to ground, said capacitive connection having such constants that it constitutes a path of appreciable impedance to energy of the operating frequency and low impedance to harmonic frequencies, and a load circuit coupled to said tank circuit.

4. In a transmitter, a single ended power amplifier vacuum tube having an anode and an output tank circuit coupled to said anode, said tank circuit comprising a pair of inductance coils connected in series and in shunt thereto a pair of series connected variable condensers, a capacitive connection from the junction point of said coils to ground, and a direct connection of low impedance from the junction point of said pair of series condensers to ground, said capacitive connection having such constants that it constitutes a path of appreciable impedance to energy of the operating frequency and low impedance to harmonic frequencies, and a load circuit coupled to said tank circuit, said load being coupled to a part of said tank from which the harmonic frequencies have been removed and which has an impedance matching the impedance of said load.

5. In a transmitter, an electron discharge device having an output tank circuit in the form of a pair of inductance coils in series, and in shunt thereto a pair of series connected variable condensers; a capacitive connection from the junction point of said coils to ground; a connection of low impedance to energy of the operating frequency from the junction point of said variable condensers to ground; a capacitive voltage divider connected in shunt to one of said variable condensers; an antenna coupled to said voltage divider; said tank circuit constituting in effect two parts one of which includes one inductance coil and one variable condenser, while the other part includes the other inductance coil and the other variable condenser together with the capacitive voltage divider, and means for electrostatically shielding said two parts from each other.

6. In a transmitter, an electron discharge device having an output tank circuit tuned to the operating frequency and in the form of a pair of inductance coils connected in series and in shunt thereto a pair of series connected condensers, a capacitive connection from the junction point of said coils to ground, and a connection of low impedance to energy of the operating frequency from the junction point of said pair of series condensers to ground, said capacitive connection having such constants that it constitutes a path of certain impedance to energy of the operating frequency and considerably lower impedance to harmonic frequencies, and a load circuit coupled to said tank circuit.

7. In a transmitter, an electron discharge device, a load, and a network coupling said load to said device and being designed to prevent harmonics from being transmitted to said load, said network comprising a series connection including inductance between the device and load, a capacitor connected in shunt to the device and a capacitor connected directly in shunt to the load, said network also including points between which the operating frequency voltage is relatively low and means for reducing the transmission of harmonics between said device and load including a path of relatively low impedance to energy of the harmonics frequencies connected between said points on said network.

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