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HIGH-FREQUENCY POWER SUPPLY TO MULTIPLE LOADS

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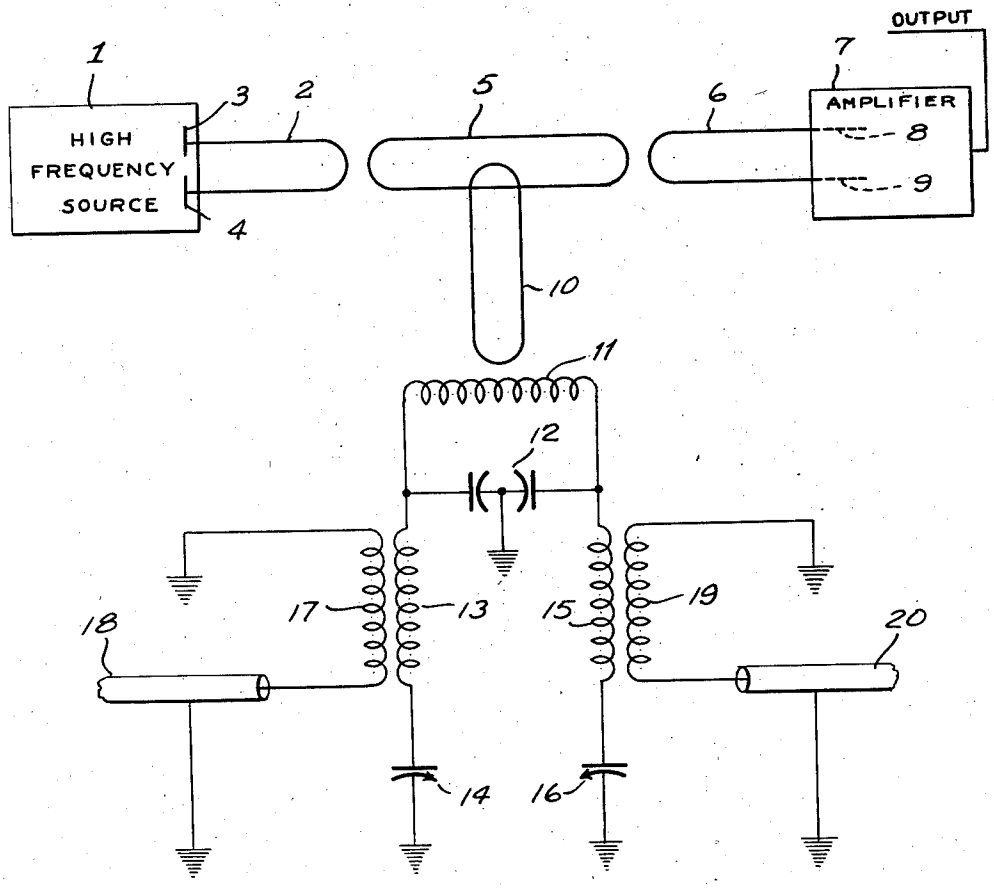

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HIGH-FREQUENCY POWER SUPPLY TO MULTIPLE LOADS

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3 Claims. (Cl. 178—44)

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This invention relates to high frequency apparatus and has for its principal object to provide circuits for supplying multiple high frequency power loads from a single source of power.

Another object of the invention is to provide circuits for feeding a plurality of loads from a balanced high frequency circuit without disturbing the balance of the circuit.

Still another object of the invention is to provide a circuit for feeding load circuits from a balanced high frequency supply circuit in which the amount of power absorbed by the various load circuits may be adjusted without disturbing the balance of the balanced supply circuit.

Still another object of the invention is to provide a circuit for removing power from a link, used to couple a balanced power supply circuit to a load circuit, without unbalancing said supply circuit.

Other objects of the invention will be apparent as the description proceeds.

One embodiment of the invention has been illustrated in the accompanying drawing in which the single figure shows the circuit for delivering power to two additional load circuits besides the main load circuit of the system.

In the embodiment used to illustrate the invention a high frequency supply circuit 1 which is of the push-pull type is shown with an output circuit 2 comprising a conducting loop which is connected to the plates of two output tubes, as represented at 3 and 4. A conducting link 5 is shown inductively coupled to the loop 2 and is in turn inductively coupled to a loop 6 which is the input circuit of an output amplifier 7, the loop being attached to the grids of the input tubes which are indicated at 8 and 9. The amplifier 7 may have its output connected to an antenna or other load circuit.

It is difficult to remove additional power from the push-pull balanced type of circuit, described above, without upsetting the balance of the high-frequency supply circuit 1. By means of this invention, however, it is possible to remove power and feed it to two different load circuits without upsetting the balance. To this end a conductive link 10 is inductively coupled to the link 5 and also to an inductance 11 across which is connected a dual-section condenser 12, thus forming a high impedance tuned circuit. The condenser 12 has two sets of stator plates, one being connected to one end of the inductance 11 and the other being connected to the other end of the inductance, and a plurality of rotor plates which cooperate capacitively with the stator plates. The rotor plates are connected to ground so that the tuned circuit 11—12 is balanced with respect to ground. This type of dual-section condenser is well known in the art.

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A low impedance circuit comprising an inductance 13 and variable condenser 14 in series with the inductance is connected between ground and one side of the high impedance circuit 11—12, the connection being made to the junction between one end of the inductance 11 and one set of stator plates in the condenser 12. Another low impedance circuit comprising an inductance 15 and a variable condenser 16 connected in series with the inductance is connected between ground and the other side of the high impedance circuit 11—12, the connection being made to the junction between the other end of the inductance 11 and the other set of stator plates of the condenser 12.

An inductance 17 may be coupled to the inductance 13 and is connected between ground and the central conductor of a coaxial transmission line 18, the outside conductor of which is connected to ground. Likewise, an inductance 19 is coupled to the inductance 15 and is connected between ground and the central conductor of a coaxial line 20, the outer conductor of which is connected to ground. The circuits including the inductances 17 and 19 are untuned and the transmission lines 18 and 20 lead to any desirable load circuits.

In operating the circuit of the invention the high impedance circuit 11—12 is tuned to the frequency of the power being transmitted between the power source 1 and the amplifier 7. Power will then be supplied to the high impedance circuit 11—12 through the coupling link 10. Because of the balanced condition of the high impedance circuit 11—12 the balance of the power source 1 will not be disturbed, and because of the difference in impedance between the circuit 11—12 and the low impedance circuits 13—14 and 15—16, power can be supplied to these latter circuits without unbalancing the high impedance circuit 11—12. The low impedance circuits 13—14 and 15—16 will then deliver power to the inductances 17 and 19, respectively, and thus to the transmission lines 18 and 20, respectively.

The amount of power received by each transmission line will depend on the setting of the condensers 14 and 16. These may be adjusted so that equal amounts of power may be removed by the two transmission lines, or it is possible to adjust these condensers so that very little or sub-

stantially no power is delivered to one, so that power is fed only to the other.

The circuit of the invention forms a convenient method of delivering power from a single balanced source to two or three separate load circuits. The diagram shows three separate load circuits, but it will be evident that the amplifier 7 and input loop 6 might be eliminated, in which case the power would be delivered through the transmission lines 18 and 20 in any desired proportions depending on the adjustment of the condensers 14 and 16.

What is claimed is:

1. A high frequency circuit comprising a source of high frequency power having a balanced output circuit, a high impedance circuit tuned to the frequency of said source, means coupling said high impedance circuit to said balanced output circuit in such manner as to maintain the latter in balance, means to balance said high impedance circuit with respect to ground, a pair of low impedance circuits, one connected between one side of said high impedance circuit and ground and the other connected between the other side and ground, and a pair of output circuits, one coupled to each of said low impedance circuits.

2. A high frequency circuit as set forth in claim 1, said pair of low impedance circuits comprising each an inductance and a variable condenser connected in series with said inductance.

3. A high frequency circuit as set forth in claim 1, said pair of output circuits comprising each an inductance coupled to each inductance of said pair of low impedance circuits, a pair of coaxial transmission lines comprising each a grounded outside conductor and a central conductor connected to one end of each output circuit inductance, the other end of which is grounded.

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